



Zoonotic Diseases

Veterinary Medicine Meets Public Health

ONE HEALTH COMMITTEE SEEKS TO IMPROVE COMMUNICATION AND RESPONSE TO ZONOTIC DISEASES

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The United States Department of Agriculture (USDA) Veterinary Service's Wyoming Area Office, Wyoming Department of Public Health, and Wyoming Livestock Board recently formed a state One Health committee. Our goal is to form a framework for One Health partners in Wyoming to efficiently communicate important disease outbreak information. Other agencies involved include the Wyoming Department of Environmental Quality (DEQ), Wyoming Game and Fish Department (WGFD), Wyoming Department of Agriculture, USDA Wildlife Services, University of Wyoming Extension, and many other agencies.

The committee will work to improve communication related to emergency response and One Health issues. We hope to increase membership in the future. For information contact Dr. Avery Strait at avery.e.strait@usda.gov.

Today, we ask your help in raising awareness about zoonotic diseases of special concern in Wyoming.

Rabies

Rabies is a virus that is spread through saliva and tears of infected animals. Bites from infected animals can pass the disease to other animals, including pets and people.

Rabies virus travels along nerves and up to the brain caus-

ing neurologic signs. Early signs of rabies in humans include fever and headache. As time progresses, the person may develop delirium, hydrophobia, an inability to swallow, and abnormal behavior. Signs of rabies in animals include excessive drooling or "foaming at the mouth," aggression, incoordination, unusual behavior, and seizures.

In 2019, Wyoming confirmed 24 cases of animal rabies, 10 in skunks, 11 in bats, two in raccoons, and one in a fox.

It's important for the public to be aware of the threat of rabies in these animal species, especially bats. Bat bites may go unnoticed due to their small size especially during sleep if they enter the house undetected. For this reason, any person who feels they may have been exposed to a bat while sleeping should be evaluated by a medical professional to determine whether post-exposure prophylaxis is needed.

In Your Backyard:

The first known rabies fatality in Wyoming occurred in 2015. An elderly woman was bitten by an infected bat in Lander. The woman's symptoms included abnormal behavior, delirium, and hallucinations. The woman's close contacts were treated with post-exposure prophylaxis (PEP) and no other cases developed.

Plague

Plague is a bacterial disease that is caused by *Yersinia pestis* and is often spread by fleas from rodents. Signs of plague in humans varies by route of inoculation. Signs of bubonic plague include swollen, painful lymph nodes, fever, chills, and weakness. Signs of septicemic plague include fever, shock, tissue necrosis of extremities, abdominal pain, and petechial hemorrhages. Signs of pneumonic plague include weakness, cough, fever, chest pain, rapidly developing pneumonia, and eventually respiratory failure.

Pneumonic plague is the most life-threatening form and most easily transmitted form by way of aerosolization of infectious droplets.

Signs of plague in animals varies on the species of animal affected. Rodents and cats may develop swollen and necrotic lymph nodes, petechial, pneumonitis, and may also develop necrotic nodules throughout the body. Dogs present with more generalized symptoms such as difficulty breathing, lethargy, and fever. Transmission of the disease occurs by being bitten by an infected flea, handling an animal infected with plague, or infectious droplets from a person infected with pneumonic plague.

In Your Backyard:

Animal health officials diagnosed three cases of bubonic plague in Wyoming cats in 2019.

Approximately seven human plague cases are reported each year in the US. In Wyoming, we confirmed a total of six human plague cases since 1978, with the last case occurring in 2008.

Prairie Dog colonies in Thunder Basin National Grassland were greatly affected by plague in 2017. Dramatic die-offs of prairie dogs led to an investigation by the state wildlife veterinarian, Wyoming Game and Fish, and the Wyoming Department of Health. This investigation led to the diagnosis of plague.

Tularemia

Tularemia is disease caused by a highly infectious bacteria. People become infected when the bacteria enters the body through the eyes, mouth, skin, or lungs. There have been no reports of transmission from person to person.

Signs of Tularemia in humans may be generalized or specific, depending on route of infection. These signs include fever, ulcers on the skin that may become necrotic, lymphadenopathy, pneumonia, weight loss, and mucopurulent ocular/nasal discharge. Signs of Tularemia in animals include

fever, ulcers, regional lymphadenopathy, incoordination, and abscesses.

The most common forms of transmission include tick or deer fly bites; inhaling aerosolized bacteria during landscaping activities; and handling/skinning infected animals, including prairie dogs, rabbits, rodents, and muskrats.

In Your Backyard:

Between 2015 and 2019, there were 34 cases of confirmed or probable human tularemia cases in Wyoming.

In 2015, Devils Tower National Monument had an outbreak of tularemia in prairie dogs and rodents. Officials found eight dead voles in multiple areas of the park in July. Tissues from several voles and black-tailed prairie dogs were confirmed as tularemia positive by the Bacterial Diseases Branch reference laboratory at the CDC. The National Park Service (NPS) Office of Public Health, NPS Wildlife Health Branch, and state partners conducted an environmental investigation. The park provided employees with educational materials about tularemia. Three human cases of tularemia were confirmed that summer in the region of the park.

Vesicular Stomatitis

Vesicular stomatitis is a viral disease that primarily affects horses and cattle. The disease occasionally affects sheep, goats, swine, llamas, and alpacas.

People who handle infected animals may become infected by contact with saliva, nasal discharge, and lesions. The symptoms in humans are flu-like with generalized clinical signs including; muscle aches, fever, headache, and lethargy. Signs in animals include excessive salivation, blister-like lesions (vesicles), fever, weight loss, teat lesions, and coronary band lesions.

In Your Backyard:

In 2019, animal health officials confirmed 43 vesicular stomatitis cases in 11 Wyoming counties. There were also 106 presumed cases. Outbreaks of vesicular stomatitis occur every few years, yet there are no specific indicators to determine what year an outbreak will occur.

No human cases have been reported in Wyoming but due to the generalized symptoms, it could easily be misdiagnosed. Owners of infected animals are advised to wear gloves when handling infected animals.

The impact of vesicular stomatitis on owners of infected animals has yet to be studied.



Zoonotic Diseases

Brucellosis

Bovine Brucellosis is a zoonotic disease that can be found in cattle, elk, and bison in Wyoming. Wild animals serve as the reservoir for infection for farmed animals in the Designated Surveillance Area in the Greater Yellowstone Area. The virus can be transmitted to people by eating or drinking raw dairy products; handling infected blood, tissues, and fluids associated with the birthing process; and by accidental injection of vaccine.

Signs of infection in humans are generalized initially and include fever, lethargy, anorexia, pain in muscles and joint, and fatigue. As the infection progresses, endocarditis, neurologic symptoms, chronic fatigue, and swelling of the liver and/or spleen may develop. Brucellosis is often identified in animal herds due to a large number of abortions or a decline in milk production.

Animals can be vaccinated against bovine brucellosis using vaccine strains RB51 and 19. RB51 vaccines must be administered by an accredited veterinarian or state/federal animal health official. The most common exposure of veterinarians to RB51 is accidental needlesticks when animals are being vaccinated. It is estimated that 4 million calves are vaccinated annually, increasing the chances that an exposure to the vaccine will occur.

Human Treatment

- People exposed to the RB51 strain should be treated with doxycycline.
- Standard serologic tests will not detect RB51 human infections
- Health care providers should immediately report an RB51 exposure to their local health department
- Strain RB51 is resistant to rifampin and penicillin

In Your Backyard:

A man in Wheatland was diagnosed with brucellosis in 2017 after experiencing an irregular pattern of joint pain, fatigue, chills, high fever, headaches, backache, weight loss, and loss of appetite. The patient experienced severe pain in his back, resulting in a nine-day hospital stay with multiple imaging modalities and laboratory tests conducted. After being referred to a neurosurgeon, an infectious disease specialist diagnosed the disease. The patient believed he could have been exposed to the disease by sustaining a laceration on his finger while field-dressing an elk.

A study conducted by Wyoming, Montana, and Idaho public health departments and livestock agencies found that 52% of veterinarians have had exposure to either strain 19

or RB51 (exposure includes; needle stick with vaccine, eye splash, wound splash, abortive material, and other including aerosol and oral exposure). This study had 143 respondents and indicated that needlestick was the most common type of exposure, with eye splash being the second most common type of exposure.

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CORONAVIRUS

USDA is working closely with the CDC to investigate reports of COVID-19, known as SARS-CoV-2 in animals. The most current information can be found at the CDC website [cdc.gov/coronavirus/2019-ncov/index.html](https://www.cdc.gov/coronavirus/2019-ncov/index.html) and USDA APHIS website [usda.gov/coronavirus](https://www.usda.gov/coronavirus).



Before surgically addressing Margaret’s knee pain, her doctor wanted to set her up for success through the Impact Clinic, a prehabilitation program for patients choosing elective surgery.

Prehabilitation for elective surgery impacts recovery and reduces hospital readmission

BY KATI BLOCKER
UCHealth

Margaret Gonzales gripped an aluminum railing, slowly descended stairs and submerged herself in the pool. Her face lit up like a child at play. She waved her hands in the air in excitement, then began to move her legs as if running, allowing the current of the “lazy river” to carry her weight.

It was exciting for Gonzales to be back in the pool: She had a new knee and no pain.

For years the pool provided a gravity-free activity after long days of being on her feet. So after retirement, she moved to Cheyenne, Wyoming in 2017 and began visiting the Cheyenne Aquatic Center daily. Despite her best efforts, her right knee pain wouldn’t go away.

“I was limping and dragging it,” she said. “It was dead weight.” Initially, Gonzales tried two rounds of steroid injections for six months. There was no improvement so her doctor asked her if she’d thought about surgery.

“I didn’t want to be in pain the rest of my life,” Gonzales said. She told her primary care physician that she had decided to have surgery. Her physician sent her to an orthopedic surgeon who recommended she go to the UCHealth Pre-procedural Impact Clinic before having surgery.

The Impact Clinic (Interdisciplinary Management of the Pre-Procedure Assessment, Consultation, and Treatment) works to ensure patients are in good physical condition before elective surgery. Clinicians work to help patients grow stronger by working with them 30 to 90 days before their surgery date. Data shows improved clinical outcomes, decreased health care costs, and improved patient satisfaction and engagement.

When a high-risk surgical patient, such as one with untreated diabetes, sleep apnea, anemia, or weight concerns, is contemplating or scheduled for elective surgery, a referral to the Impact Clinic may be made.

Laura Hildebrand, a nurse practitioner in the clinic, evaluates a patient’s medical history, medications, past conditions and social habits.

“We have an assessment tool that looks at 11 different post-operative risks and where they may be at increased risk,” Hildebrand said.

Studies show that people with diabetes, for example, have a higher risk for surgical-site infections. People with untreated sleep apnea have an increased risk of pulmonary complications after any surgical procedure. There also are specific surgical risks for those who are anemic, or for those who are over- or underweight.

Gonzales’ diabetes was under control. However, she had an elevated BMI (body mass index) and untreated sleep apnea.

The program provides a fast track for specialty referrals for such procedures as echocardiograms and sleep studies.

“We really try to individualize the (patient’s) plan based on their resources and what they want to do,” Hildebrand said.

Hildebrand worked with a primary care physician to get her a new CPAP machine.

Weight loss and improved muscle tone lower risks for post-surgery problems and since Gonzales already was going to the pool several times a week, she didn’t need more encouragement, just a little direction.

Gonzales implemented the plan right away, increasing her pool visits to five days a week and changing how she exercised.

“With Laura’s directions, I started pushing myself to pick up my knees,” Gonzales said. “I started losing weight and going faster.”

During the first 11 months of the clinic, 93% of Impact Clinic patients consulted for elevated BMI lost weight. Those seen four to six weeks prior to surgery lost an average of 5 pounds, while those seen more than six weeks before surgery lost an average of 15 pounds. Patients with diabetes who consulted decreased their A1C level by 0.8% on average.

Gonzales stuck with her plan until surgery at UCHealth Poudre Valley Hospital in Fort Collins. After a few days in the hospital, she spent two weeks in inpatient rehabilitation and then a month with at-home therapy.

Her flexibility in her knee quickly returned, and Gonzales credits her work and Hildebrand’s advice with strengthening her joints before surgery.

And as soon as Gonzales got the note from her doctor, she was back at the pool.