



New World Screwworm Infestation (Disease) Guidelines

Summary

New World Screwworm (NWS) disease is caused by larval infestation of the blowfly *Cochliomyia hominivorax*. In the United States, NWS infestation is a foreign animal disease which is reportable in every state. It is known to exist in parts of the Caribbean (Cuba, Haiti, Dominican Republic), Central and South America. NWS is a threat to the United States due to its recent detection in south Texas and Northern Mexico. NWS can continue to enter the U.S. via the continued northward expansion from endemic countries or through movement of infested animals and people. Regulatory agencies are actively applying strategies for its treatment, control and mitigation in the United States.

Causal Agent

C. hominivorax larvae consume only living flesh of warm-blooded animals, which makes NWS unique in comparison to native blowflies in the United States that consume dead tissue. Females breed once and die after an approximately 21-day life cycle (varies regionally due to climate). *C. hominivorax* can travel up to 12 miles (19.5 km) in warm, humid climates to find a host. However, if there are ample hosts and preferred climate conditions, this blowfly generally remains within a 2-mile (3 km) range.

Clinical Signs

Clinical signs are dependent upon the location and severity of the NWS-infested wound and may include but are not limited to the following:

- Discomfort, irritation or depressed behavior
- Decreased appetite
- Self-isolation
- Head shaking
- Wounds range in size (i.e. tick bite) and can enlarge in diameter and depth rapidly over time
- Animals may be malodorous, smelling of rotten flesh
- Wounds may have blood-tinged discharge
- Presence of hundreds of white egg packets laid in a shingle like pattern on the wound edge, with larvae seen deep within the wound

Differential Diagnoses

- Myiasis – maggot-infested wounds secondary to other domestic fly species
- Wounds with secondary bacterial infections
- Other skin conditions (i.e. habronemiasis, pythiosis, abscess, squamous cell carcinoma)

Incubation Period

After the female NWS blowfly lays eggs in an open wound or on a mucous membrane, the eggs hatch within 10-12 hrs. and mature to visible larvae after 3 days. NWS larvae then burrow into skin and consume tissue, thereby enlarging/deepening the wound.



Risk Factors

1. Animals with wounds are at highest risk for NWS infestation. The NWS blowfly is attracted to the scent and secretions from wounds. Wounds may originate from feeding ticks, castration, branding, clipping, barbed wire fencing, trauma, etc.
2. The NWS blowfly does not require a wound to lay eggs and start an infestation, as NWS blowflies are also attracted to mucous membranes associated with the eyes, nose, mouth, ears, genitalia or umbilicus of neonates, and may lay their eggs at these sites to initiate an infestation.

Transmission

Contact with the NWS blowfly is required for transmission. The female NWS blowfly lays 200-300 eggs at the wound edge. A single female can lay several batches of eggs in its lifetime. After larvae hatch from these eggs and burrow for ~1 week, the larvae fall off the host animal and burrow into the ground to pupate. Depending on weather, pupae mature in 7-65 days and emerge as flies from the soil. The NWS blowfly then breed and start the cycle over again.

Diagnostic Sampling, Testing, and Handling

- PPE should be worn when investigating suspect NWS infestation cases (gloves at minimum). Wounds anywhere on the body should be kept covered while in the presence of a suspect NWS case.
- Using forceps, collect multiple-sized larvae from different places within the wound. This is important as secondary, non-NWS myiasis can occur. Wounds may contain both NWS larvae and those of domestic blowfly species. NWS and domestic blowfly species are difficult to distinguish from one another and will require the assistance of a trained parasitologist. Parasitologists will use the NWS shape (cylindrical with a pointed end and a blunt end) and the rings of dark spines around their body to aid in their identification.
- Put larvae in a leak-proof container. Add enough 70% alcohol (not formalin) to submerge the larvae. If flies are collected, place them in a dry leak-proof container, separate from the larvae. Flies have orange eyes, a metallic blue/green body and 3 dark stripes along their back.
 - Place all containers in a sealed plastic bag.
 - If possible, take pictures of the larvae and lesions.
- Upon identifying a suspect NWS infestation case and prior to sample submission, notify a regulatory veterinarian, such as your State Animal Health Officer (SAHO) and/or federal Area Veterinarian In Charge (AVIC). Suspect NWS infestation cases will be handled as Foreign Animal Disease Investigations by the regulatory veterinarians overseeing your area because NWS is a foreign animal disease and is reportable in all U.S. states.
- Depending on guidance from your SAHO, an accredited veterinarian or a regulatory veterinarian will submit these specimens to the National Veterinary Services Laboratories



(NVSL) in Ames, Iowa, using the VS Form 5-38 or to another approved National Animal Health Laboratory Network (NAHLN) laboratory for confirmatory identification. Consult with your area regulatory veterinarian prior to submission for specific instructions.

Post-Mortem Findings

Post-mortem findings are dependent upon the location of wound(s) and may include deep thickened skin, foul odor, presence of eggs or larvae at the wound site, and poor body condition

Treatment

For treatment guidance, consult with a regulatory veterinarian and utilize the most current [approved list of pharmaceuticals](#) and the [AAEP NWS Equine Veterinary Prevention and Treatment Options Guide](#) for dosing recommendations to direct treatment and/or prevention of equine myiasis.

For animals suspected of NWS infestation follow the following treatment steps:

1. Begin by applying an approved insecticidal spray topically to the infested area to attempt to kill any larva that may fall on the ground during the cleaning process, as this will minimize the chances of the larva burrowing into the ground where they may pupate and mature.
2. Next, proceed with cleaning the wound and removal of all eggs and larvae. Attempt to collect all larva for diagnostic testing and safe disposal.
3. If possible, keep the wound covered after cleaning.
4. Treat the entire animal prophylactically with an approved insecticide as recommended by the [approved list of pharmaceuticals](#) and the [AAEP NWS Equine Veterinary Prevention and Treatment Options Guide](#).
5. Keep the affected animal isolated until all wounds are fully healed.
6. Treat the patient supportively for secondary bacterial infections and for any other clinical signs observed.

Prognosis

Prognosis can vary depending on the extent and location of wounds, and ability to treat. Infested animals that are not treated within 7-14 days may die because of advancing wound severity leading to septicemia and complications related to the horse's debilitated state.

Environmental Persistence

The NWS blowfly prefers hot, humid environments (77-86°F), but can survive in a range of temperatures and climates. Pupae are killed if soil temperatures are consistently below 46°F or freezing. Availability of hosts with suitable wounds is critical for NWS persistence in the environment.



Specific Control and Biosecurity Considerations for Horses in Regions at Risk for NWS

- Isolate and inspect all new animals closely upon arrival for evidence of wounds. If wounds are present, inspect closely for signs of NWS. If any wounds are concerning, contact a regulatory veterinarian.
- Routinely examine animals thoroughly (including an oral exam), allowing for the rapid identification of wounds, prompt wound treatment and careful monitoring.
- Apply insecticides to animals with wounds and/or prior to transport.
 - For the most up to date approved list of pharmaceuticals for the prevention of NWS in equids, visit the [FDA New World Screwworm: Information for Veterinarians](#). Also consult the [AAEP NWS Equine Veterinary Prevention and Treatment Options Guide](#).
- In regions with NWS presence, whenever possible eliminate or delay husbandry practices that could cause wounds (branding, clipping, castration) until NWS presence is eliminated, fly season ends or control measures are put in place.
- Check and remove from animal holding areas any sharp objects that could create wounds.
- Manage tick levels if possible, as tick bites create small wounds that may become infested.
- [SIT \(Sterile Insect Technique\)](#) has been instituted by the USDA to control fly reproduction.

Release of Animals from Isolation

Animals suspected of or diagnosed with NWS infestation should be isolated and the premises will be quarantined by regulatory officials. Release of animals from isolation and premises from quarantine will be subject to regulatory veterinarian oversight.

Zoonotic Potential

Larvae can infest humans. Humans working with animals suspected of or infested with NWS must wear PPE to protect mucous membranes and exposed wounds from infestation with NWS eggs or larvae. Exposed and contaminated wounds should be thoroughly cleaned, covered and monitored by a human medical professional.

Additional Resources

<https://www.aphis.usda.gov/livestock-poultry-disease/stop-screwworm#comp-32826>

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