

## FOCUS ON

## Re-emergence of the New World Screwworm

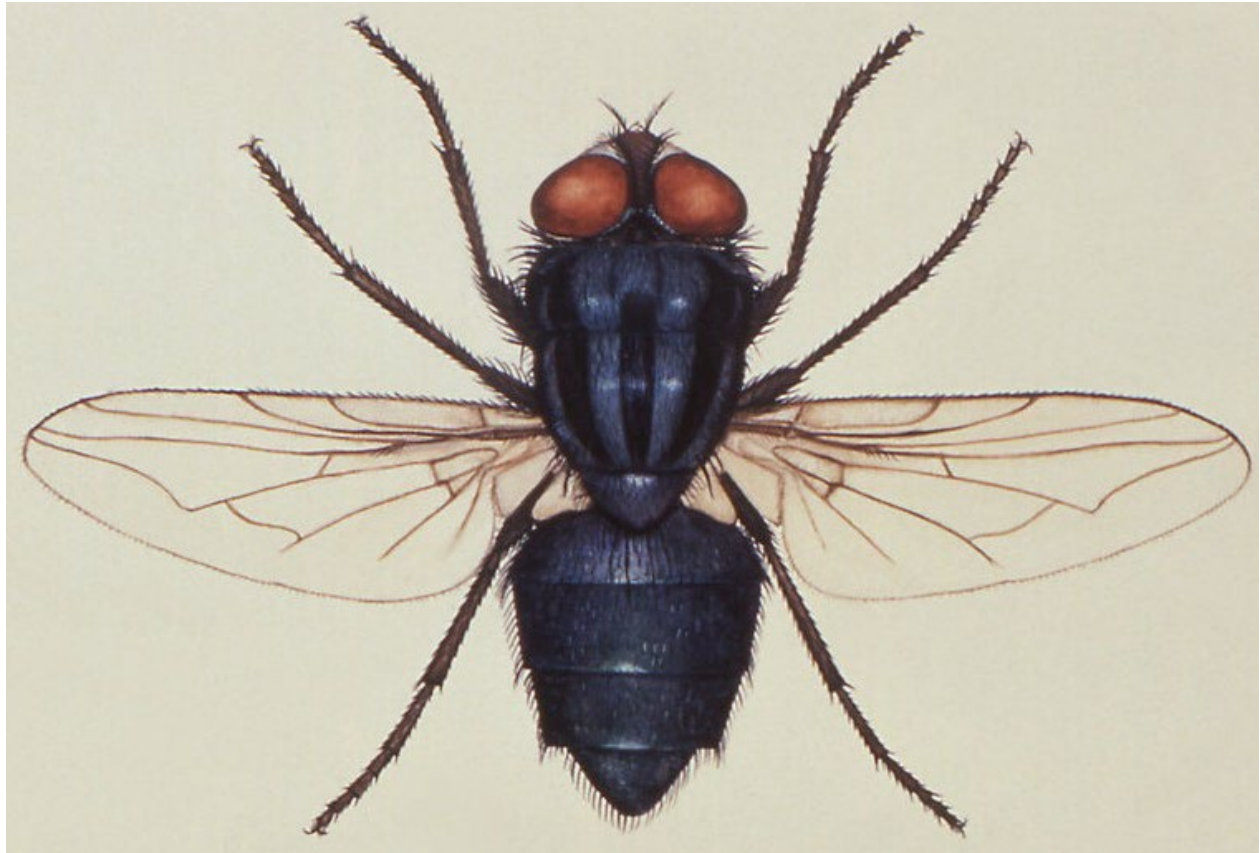


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## Introduction

This document explores the re-emergence of New World screwworm (NWS) parasitism in humans. The NWS (*Cochliomyia hominivorax*) is a species of blow fly that causes myiasis, a disease in which fly larvae or maggots feed on a host's living tissue. The NWS is primarily a parasite of livestock such as cattle and sheep, and to a lesser extent wildlife, pets, and humans. Since 2023, there has been a re-emergence of the NWS in Central America and Mexico, regions previously declared NWS-free following eradication.

Public Health Ontario (PHO) developed this Focus On to raise awareness of NWS among Ontario public health partners and healthcare providers. This resource is both timely and essential, given the recent re-emergence of the NWS in the Americas.

## Key Messages

- The New World screwworm is a parasitic blow fly with maggots that invade and feed upon a host's living tissue. NWS myiasis is not a Disease of Public Health Significance (DoPHS) in Ontario. While imported cases of NWS myiasis are possible among Ontario residents after travel, cool temperatures in the province prevent sustained establishment of local NWS populations.
- NWS myiasis is characterized by a tingling sensation at infestation sites, followed by pain and swelling accompanied by unhealing, bleeding, and foul-smelling lesions. Permanent tissue damage and disfigurement can be prevented by timely removal of maggots and thorough cleaning of wounds.
- Travellers to affected regions should take appropriate precautions to avoid the NWS, including the use of insect repellent, sleeping indoors with screened windows and doors, cleaning and covering wounds, and avoiding areas with livestock.

## Background

The NWS is primarily a parasite of livestock such as cattle, sheep, and goats in tropical and subtropical regions of the Americas (Neotropics), causing substantial losses to producers (e.g., animal deaths, decreased animal production, veterinary care). In 1976, Texas livestock producers lost an estimated \$733 million in 2024 United States dollars (USD) to the NWS, with a total economic loss for the state estimated at \$1.8 billion 2024 USD.<sup>1</sup> The NWS was eradicated in North America by 1991 using the sterile insect technique (SIT), a method developed in the 1950s to combat the NWS in the southern US.<sup>2-4</sup> The SIT involves the release of millions of laboratory-reared sterile males, which mate with wild females, leading to a decline and eventual collapse of the wild NWS population.<sup>5</sup> Recently, the SIT was used to eliminate the re-emergence of NWS myiasis among the endangered Florida Key deer (2016–17) in Big Pine Key, Florida.<sup>6,7</sup>

Central America was declared NWS-free following use of the SIT in the early 2000s. Since 2023, the NWS has re-emerged in Central America and Mexico, not only among livestock but humans as well. Recently, a case of NWS myiasis was reported in a patient that returned to Ontario from Costa Rica, highlighting a risk of NWS myiasis among travellers to Neotropical areas of the Americas.<sup>8</sup> Given the re-emergence of NWS, we describe the eco-epidemiology, clinical presentation, disease severity, treatment, prevention, and laboratory diagnostics of NWS myiasis.

## Methods

A literature search was conducted on January 21, 2026, in PubMed using the key words “screwworm”, “New World screwworm”, and “hominivorax”. The exposure of interest was the NWS, and the outcome of interest was myiasis. English-language peer-reviewed and non-peer-reviewed records that described NWS and its epidemiology were included. Out-of-scope for this document was the pathophysiology and immunology of myiasis caused by the NWS. The search concentrated on the epidemiological information relevant to Ontario and on parasitism in humans.

# Results

## Eco-epidemiology

The NWS is adapted to hot and humid climates, with an optimal survival temperature of 27°C (range: 14.5–43.5°C for development).<sup>9,10</sup> Adult NWS are a little larger than a house fly at approximately 8–10 mm long, with orange eyes, a blue-green metallic body, and three black stripes on the back.<sup>11</sup> The NWS life cycle begins when an adult female fly lays hundreds of eggs (≈1 mm long) on the edge of a wound or natural body opening such as the mouth or nostrils.<sup>12</sup> In Ecuador, the most common sites of NWS myiasis in humans were the nasal passages, followed by the face, ears, and eyes.<sup>13</sup> In Rio de Janeiro, Brazil, the most common sites of infection were the legs and feet, followed by the head.<sup>14</sup> Within 24 hours, the eggs hatch into cream-coloured/white maggots, which burrow into the host's living tissue and feed. The odour of the wound becomes attractive to additional flies, which may lay more eggs on the same wound.<sup>15</sup> After about a week, maggots (≈15 mm long) cease feeding and drop from a host and pupate in the upper layer of soil or in leaf litter, emerging into adult flies in as little as a week. The NWS can complete its life cycle in as little as 18 days at 29°C and 24 days at 22°C.<sup>16</sup>

The NWS must reproduce year-round to maintain local populations and lack a dormant stage capable of surviving cool temperatures. Continual propagation occurs at a mean minimum temperature >9°C during the coldest month and a mean annual temperature >19°C (e.g., Houston, Texas; Jacksonville, Florida).<sup>10</sup> Year-round propagation and establishment of local NWS populations is not possible in Ontario due to Ontario's relatively cool climate. Given Ontario's relatively high temperatures and humidity during the summer, theoretically, importation of maggots on animals or humans could seed a locally reproducing NWS population; however, this local NWS population would die off in the fall with cooler temperatures.

The primary risk factor for acquiring NWS myiasis in affected regions is the presence of wounds, but generally, cases of myiasis are more common in those living in rural areas near livestock, working with livestock, and/or of low socio-economic status.<sup>14</sup> Additionally, risk factors associated with myiasis include a person's inability to maintain personal hygiene and wound care; for example, those experiencing alcohol use disorder, mental illness, and homelessness, or patients who are hospitalized with impaired consciousness or intubation.<sup>14,17,18</sup> NWS myiasis is considered a neglected tropical disease, for which the incidence of disease in humans is unknown.

Pre-1966, the distribution of the NWS included the southern US, south to northern Argentina.<sup>4,15</sup> In North America, the SIT was used to eradicate the NWS by 1991 and in Central America by the early 2000s. Until the 2023 re-emergence in Central America and Mexico, the distribution of the NWS was restricted to the Caribbean (i.e., Cuba, Dominican Republic, Haiti) and much of South America. In 2023, the NWS was again identified as the cause of myiasis and deaths among humans in Costa Rica.<sup>19</sup> Since 2023, NWS myiasis among humans and livestock has been reported throughout the rest of Central America (i.e., Belize, El Salvador, Guatemala, Honduras, Nicaragua, and Panama) and Mexico.<sup>20–22</sup> In addition, imported cases among travellers have been reported from Canada (exposure in Costa Rica) and the US (exposure in El Salvador).<sup>8,23</sup> Illegal livestock trade, interrupted SIT and surveillance programs, and expanding areas of farming have all contributed to the return of the NWS in Central America and Mexico.<sup>17,24</sup>

## Clinical Manifestations and Disease Severity

Initial symptoms of NWS myiasis includes tingling at infestation sites, followed by local swelling and pain that is accompanied by unhealing, bleeding, and foul-smelling wounds.<sup>25</sup> Symptoms may vary depending where on the body the infestation takes place. Secondary bacterial infections are possible in NWS myiasis, which may cause fever or chills. NWS myiasis is treatable if detected early; however, a lack of, or delay in, treatment can lead to soft tissue and bone damage, disfigurement, and/or death.

An early description of human infection with *Cochliomyia hominivorax* was made in 1858 from French Guiana, in which >300 larvae infected a patient's nasal cavities and sinuses, invading the eyes and mouth, leading to death of the patient.<sup>26</sup> Coquerel (1858) implicated the NWS as a contributing factor in the deaths of 100s of prisoners on Devil's Island, French Guiana in the early 1800s.

## Treatment and Personal Protection

Treating NWS myiasis involves manual and/or surgical removal of maggots, debridement of necrotic tissue, and cleaning the wound using antiseptics.<sup>17</sup> Individuals who see maggots or feel them in a wound or body opening should contact their healthcare provider and not attempt to remove the maggots. Secondary infections may require antimicrobial therapy. In patients with suspected NWS, all visible eggs and larvae should be removed and killed to prevent the introduction and spread of NWS in the local environment.<sup>25</sup>

Limiting exposure to the NWS during travel is the primary means of preventing myiasis, which includes:<sup>25</sup>

- Sleeping indoors and ensuring windows and doors have screens.
- Using an insect repellent containing DEET or icaridin.
- Avoiding rural areas with livestock.
- Wearing loose-fitting, long-sleeved clothing and socks to limit exposed skin.
- Cleaning and covering wounds (even small ones).

## Laboratory Diagnostics

NWS maggots and eggs extracted from patients should be placed in a sterile container and covered with 70% ethanol; do not put maggots in garbage or toss the maggots outside to avoid potential environmental introduction. Where possible, all maggots should be removed, collected, and submitted to the reference public health laboratory for identification. *Cochliomyia hominivorax* (formerly called *Callitroga americana*) are morphologically distinguished from other blow flies (family *Calliphoridae*) by examining the posterior spiracles and dorsal tracheal trunks of late instar larvae.<sup>27</sup>

For more information, please refer to PHO's testing webpage: [Arthropods \(e.g. Mites, Lice, Fleas, Maggots, and Ticks\) – Microscopy](#).<sup>28</sup>

## Implications for Public Health

- There is a low risk of NWS myiasis while travelling to areas where NWS flies are present, including the Caribbean, Mexico, Central America, and South America.
- NWS myiasis is not a DoPHS in Ontario. While imported cases of NWS myiasis are possible among Ontario residents after travel, these infections cannot seed local NWS populations in the province due to unsuitable climatic conditions.
- Travellers to affected regions should take appropriate precautions to avoid the NWS. Preventive measures include using insect repellent, sleeping indoors with screened windows and doors, cleaning and covering wounds, and avoiding areas with livestock.

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