



## Influenza (Flu)

# Highly Pathogenic Avian Influenza A(H5N1) Virus in Animals: Interim Recommendations for Prevention, Monitoring, and Public Health Investigations

## Summary

The purpose of this guidance is to outline CDC's recommendations for preventing exposures to [highly pathogenic avian influenza \(HPAI\) A\(H5N1\)](#) viruses, infection prevention and control measures including the use of personal protective equipment, testing, antiviral treatment, patient investigations, monitoring of exposed persons, including persons exposed to sick or dead wild and domesticated animals and livestock with suspected or confirmed infection with highly pathogenic avian influenza (HPAI) A(H5N1) virus, and [antiviral chemoprophylaxis](#) of exposed persons. These recommendations are based on information available as of March 2024 and will be updated as needed when new information becomes available.

## Background

Although human infections with HPAI A(H5N1) virus are rare, having [unprotected exposure](#) to any infected animal or to an environment in which infected birds or other animals are or have been present can pose a risk of infection. Therefore, people with work or recreational exposures to H5N1 virus-infected animals may be at increased risk of infection and should follow recommended precautions.

The [pandemic](#) of HPAI A(H5N1) viruses in wild birds has resulted in outbreaks among commercial poultry, backyard bird flocks, and spread to infect wild [terrestrial](#) and [marine mammals](#), as well as domesticated animals. Sporadic human infections with HPAI A(H5N1) virus have been reported in 23 countries since 1997 with a [case fatality proportion](#) of >50%, but only a small number of H5N1 cases have been reported in humans since 2022. Most human infections with H5N1 virus have occurred after unprotected exposures to sick or dead infected poultry. There is no evidence of sustained human-to-human H5N1 virus transmission, and limited, non-sustained human-to-human H5N1 virus transmission has not been reported worldwide since 2007.

Influenza A viruses infect the [respiratory](#) and [gastrointestinal](#) tracts of birds causing birds to shed the virus in their saliva, mucous, and feces. Influenza A viruses can also infect the respiratory tract of mammals and cause [systemic](#) infection in other organ tissues. Human infections with [avian influenza A viruses](#) can happen when enough virus gets into a person's eyes, nose, or mouth or is inhaled. People with [close or prolonged unprotected contact](#) with infected birds or animals or their contaminated environments are at greater risk of infection. Illnesses in people from HPAI A(H5N1) virus infections have ranged from mild (e.g., upper respiratory symptoms) to severe illness (e.g., pneumonia, multi-organ failure) resulting in death.

Since 2022, many different wild bird species have been reported with HPAI A(H5N1) virus infection, including terrestrial, seabird, shorebird, and migratory species. In the United States, HPAI A(H5N1) virus detections in wild birds have been reported in 50 states or territories, and outbreaks in commercial poultry or backyard bird flocks associated with high mortality have been reported in 48 states since February 2022.

A wide range of terrestrial and marine mammals have been reported with HPAI A(H5N1) virus infection in multiple countries, typically resulting in neurologic signs of disease and death. HPAI A(H5N1) virus infection has been reported in wild mammals such as foxes, bears, seals, and sea lions, and in domesticated animals, including pets such as cats and dogs, farmed mink and foxes, and livestock such as goats and cows. In the United States, HPAI A(H5N1) virus detections in mammals have been reported in more than 20 states.

At this time, CDC considers the human health risk to the U.S. public from HPAI A(H5N1) viruses to be low; however, people with close or prolonged, unprotected exposures to infected birds or other animals, or to environments contaminated by infected birds or other animals, are at greater risk of infection. CDC considers HPAI A(H5N1) viruses to have the potential to cause severe disease in infected humans and recommends the following:

## Recommendations for the Public

People should avoid unprotected (not using respiratory or eye protection) exposures to sick or dead animals including wild birds, poultry, other domesticated birds, and other wild or domesticated animals, as well as with animal feces, litter, or materials contaminated by birds or other animals with suspected or confirmed HPAI A(H5N1) virus infection. People should not prepare or eat uncooked or undercooked food or related uncooked food products, such as unpasteurized (raw) milk, or raw cheeses, from animals with suspected or confirmed HPAI A(H5N1) virus infection (avian influenza or bird flu).

[Personal protective equipment \(PPE\)](#) should be worn when in direct or close contact (within about six feet) with sick or dead animals including poultry, wild birds, backyard bird flocks, or other animals, animal feces, litter, or materials potentially contaminated with HPAI A(H5N1) viruses. PPE includes a properly fitted unvented or indirectly vented safety goggles, disposable gloves, boots or boot covers, a NIOSH-Approved particulate respirator (e.g., N95® filtering facepiece respirator, ideally fit-tested), disposable fluid-resistant coveralls, and disposable head cover or hair cover.

People exposed to HPAI A(H5N1)-virus infected birds or other animals (including people wearing recommended PPE) should monitor themselves for new respiratory illness symptoms, including [conjunctivitis](#) (eye redness), beginning after their first exposure and for 10 days after their last exposure. Influenza antiviral post-exposure prophylaxis may be considered to prevent infection, particularly in those who had unprotected exposure to HPAI A(H5N1)-virus infected birds or other animals (more information below). Persons who develop any illness symptoms after exposure to HPAI A(H5N1) virus infected birds or other animals should seek prompt medical evaluation for possible influenza testing and antiviral treatment by their clinician or public health department. Symptomatic persons should isolate away from others, including household members, except for seeking medical evaluation until it is determined that they do not have HPAI A(H5N1) virus infection.

## Recommendations for Protecting Farmers and Poultry, Backyard Bird Flock, and Livestock Owners

To reduce the risk of HPAI A(H5N1) virus infection, poultry farmers and poultry workers, backyard bird flock owners, livestock farmers and workers, veterinarians and veterinary staff, and emergency responders should avoid unprotected direct physical contact or close exposure with the following animals and materials potentially infected or confirmed to be infected with HPAI A(H5N1) virus:

- Sick birds, livestock, or other animals
- Carcasses of birds, livestock, or other animals
- Feces or litter
- Raw milk
- Surfaces and water (e.g., ponds, waterers, buckets, pans, troughs) that might be contaminated with animal excretions.

Farmers, workers, and emergency responders should wear [appropriate PPE](#) when in direct or close physical contact with sick birds, livestock, or other animals; carcasses; feces; litter; raw milk; or surfaces and water that might be contaminated with animal excretions from potentially or confirmed infected birds, livestock, or other animals, and when going into not yet disinfected buildings where these animals or materials are or were. [Workers should receive training](#) 📄 [2.85 MB, 3 pages] on and demonstrate an understanding of when to use PPE; what PPE is necessary; how to properly put on, use, take off, dispose of, and maintain PPE; and PPE limitations. Employers can help by [posting signage](#) 📄 [2 MB, 1 page] that reminds workers of recommended PPE and its proper usage including how to properly put it on and take it off. Employers subject to Occupational Safety and Health Administration (OSHA) regulations should comply with applicable standards as highlighted on the OSHA [Avian Influenza – Standards](#) 🔗 page.

## Recommendations for Clinicians

Clinicians should consider the possibility of HPAI A(H5N1) virus infection in persons showing signs or symptoms of [acute respiratory illness](#) who have relevant exposure history. More information is available at [Brief summary for Clinicians](#). This includes persons who have had contact with potentially infected sick or dead birds, livestock, or other animals within 10 days before symptom onset (e.g., handling, slaughtering, defeathering, butchering, culling, preparing for consumption or consuming uncooked or undercooked food or related uncooked food products, including unpasteurized (raw) milk or other unpasteurized dairy products), direct contact with water or surfaces contaminated with feces, unpasteurized (raw) milk or unpasteurized dairy products, or parts (carcasses, internal organs, etc.) of potentially infected animals; and persons who have had prolonged exposure to potentially infected birds or other animals in a confined space. Clinicians should contact the state public health department to arrange testing for influenza A(H5N1) virus, collect recommended respiratory specimens (more information below) using PPE, consider starting empiric antiviral treatment (more information below), and encourage the patient to isolate at home away from their household members and not go to work or school until it is determined they do not have avian influenza A virus infection. Testing for other potential causes of acute respiratory illness should also be considered depending upon the local epidemiology of circulating respiratory viruses, including SARS-CoV-2.

## Recommendations for State Health Departments

State health department officials should investigate potential human cases of HPAI A(H5N1) virus infection as described below and should notify CDC within 24 hours of identifying a [case under investigation](#). Rapid detection and characterization of [novel influenza A viruses](#) in humans remain critical components of national efforts to prevent further cases, to allow for evaluation of clinical illness associated with them, and to assess the ability of these viruses to spread from human to human. State Health Department officials, including the State Public Health Veterinarian, should collaborate with State Department of Agriculture and State Wildlife officials using a One Health approach when relevant to investigate suspected HPAI A(H5N1) infections in people linked with animals.

## Recommendations for Surveillance and Testing

People exposed to HPAI A(H5N1)-infected birds or other animals (including people wearing recommended PPE) should be monitored for signs and symptoms of acute respiratory illness beginning after their first exposure and for 10 days after their last exposure.

Patients who meet Epidemiologic criteria AND either Clinical OR Public Health Response criteria below should be [tested for HPAI A\(H5N1\) virus infection](#) by reverse-transcription polymerase chain reaction (RT-PCR) assay using H5-specific primers and probes at your state or local public health department.

### Epidemiological Criteria

Persons with recent exposure (within 10 days) to HPAI A(H5N1) virus through one of the following:

- Exposure to HPAI A(H5N1) virus infected birds or other animals defined as follows:
  - Close exposure (within six feet) to birds or other animals, with confirmed avian influenza A(H5N1) virus infection. Bird or other animal exposures can include, but are not limited to handling, slaughtering, defeathering, butchering, culling, or preparing birds or other animals for consumption, or consuming uncooked or undercooked food or related uncooked food products, including unpasteurized (raw) milk, OR
  - [Direct contact](#) with surfaces contaminated with feces, unpasteurized (raw) milk or other unpasteurized dairy products, or bird or animal parts (e.g., carcasses, internal organs) from infected birds or other animals, OR
  - Visiting a live bird market with confirmed bird infections or associated with a case of human infection with HPAI A(H5N1) virus.
- Exposure to an infected person – Close (within six feet) unprotected (without use of respiratory and eye protection) exposure to a person who is a confirmed, probable, or symptomatic suspected case of human infection with HPAI A(H5N1) virus (e.g., in a household or healthcare facility).
- Laboratory exposure (unprotected exposure to HPAI A(H5N1) virus in a laboratory)

### Clinical Criteria

Persons with signs and symptoms consistent with acute upper or lower respiratory tract infection, or complications of acute respiratory illness without an identified cause. In addition, gastrointestinal symptoms such as diarrhea are often reported with HPAI A(H5N1) virus infection. Examples include but are not limited to:

- Mild illness (e.g., cough, sore throat, eye redness or eye discharge such as conjunctivitis, fever or feeling feverish, rhinorrhea, fatigue, myalgia, arthralgia, headache)
- Moderate to severe illness: (e.g., shortness of breath or difficulty breathing, altered mental status, seizures)
- Complications: pneumonia, respiratory failure, acute respiratory distress syndrome, multi-organ failure (respiratory and kidney failure), sepsis, meningoencephalitis

## Public Health Response Criteria

Testing of asymptomatic persons for HPAI A(H5N1) virus infection is not routinely recommended. As part of public health investigations, asymptomatic persons, such as close contacts of a confirmed case of HPAI A(H5N1) virus infection, might be tested after consultation with CDC.

## Preferred Clinical Specimens

For persons with suspected HPAI A(H5N1) virus infection, [the following specimens](#) should be collected as soon as possible after illness onset or when deemed necessary: a nasopharyngeal swab and a nasal swab combined with an oropharyngeal swab (e.g., two swabs combined into one viral transport media vial). The nasopharyngeal swab and the combined nasal-throat swabs should be tested separately. If these specimens cannot be collected, a single nasal or oropharyngeal swab is acceptable. **If the person has conjunctivitis (with or without respiratory symptoms), both a conjunctival swab and nasopharyngeal swab should be collected.** Patients with severe respiratory disease also should have lower respiratory tract specimens (e.g., an endotracheal aspirate or bronchoalveolar lavage fluid) collected, if possible. For severely ill persons, multiple respiratory tract specimens from different sites should be obtained to increase the potential for HPAI A(H5N1) virus detection.

## Recommendations for Infection Prevention and Control

Standard, contact, and airborne precautions are recommended for patients presenting for medical care or evaluation who have illness consistent with influenza and recent exposure to birds or other animals potentially infected with HPAI A(H5N1) virus. For additional guidance on infection prevention and control precautions for patients who might be infected with HPAI A(H5N1) virus, please refer to [guidance for infections with novel influenza A viruses associated with severe disease](#).

## Recommendations for Influenza Antiviral Treatment and Chemoprophylaxis

### Treating Symptomatic Persons with Bird or Other Animal Exposures

Outpatients meeting epidemiologic exposure criteria who develop signs and symptoms compatible with influenza should be referred for prompt medical evaluation, testing, and empiric initiation of antiviral treatment with oseltamivir as soon as possible. Clinical benefit is greatest when antiviral treatment is administered early, especially within 48 hours of illness onset.

Hospitalized patients who are confirmed, probable, or [suspected cases](#) of human infection with HPAI A(H5N1) virus, regardless of time since illness onset are recommended to initiate antiviral treatment with oral or enterically administered [oseltamivir](#) as soon as possible. Antiviral treatment should not be delayed while waiting for laboratory testing results.

Detailed guidance on dosing and treatment duration is available at [Interim Guidance of the Use of Antiviral Medications for the Treatment of Human Infection with Novel Influenza A Viruses Associated with Severe Human Disease](#).

**Chemoprophylaxis of Persons with [Exposure to HPAI A\(H5N1\) Virus](#):** Chemoprophylaxis with influenza antiviral medications can be considered for any person meeting epidemiologic exposure criteria. Decisions to initiate post-exposure antiviral chemoprophylaxis should be based on clinical judgment, with consideration given to the type of exposure, duration of exposure, time since exposure, and known infection status of the birds or animals the person was exposed to.



Antiviral chemoprophylaxis is not routinely recommended for personnel who used proper PPE and experienced no breaches while handling sick or potentially infected birds or other animals or decontaminating infected environments (including animal disposal).

If antiviral chemoprophylaxis is initiated, oseltamivir treatment dosing (one dose twice daily) is recommended instead of the antiviral chemoprophylaxis regimen for seasonal influenza. Specific dosage recommendations for treatment by age group is available at [Influenza Antiviral Medications: Summary for Clinicians](#). Physicians should consult the manufacturer’s package insert for dosing, limitations of populations studied, contraindications, and adverse effects. If exposure was time-limited and not ongoing, five days of medication (one dose twice daily) from the last known exposure is recommended.

**Monitoring and Antiviral Chemoprophylaxis of Close Contacts of Persons with HPAI A(H5N1) virus infection:**  
Recommendations for monitoring and chemoprophylaxis of close contacts of infected persons are different than those that apply to persons who meet bird or other animal exposure criteria. Post-exposure prophylaxis of close contacts of a person with HPAI A(H5N1) virus infection is recommended with oseltamivir twice daily (treatment dosing) instead of the once daily pre-exposure prophylaxis dosing. Detailed guidance is available at [Interim Guidance on Follow-up of Close Contacts of Persons Infected with Novel Influenza A Viruses and Use of Antiviral Medications for Chemoprophylaxis](#).

## Vaccination

No human vaccines for prevention of HPAI A(H5N1) virus infection are currently available in the United States. Seasonal influenza vaccines do not provide any protection against human infection with HPAI A(H5N1) viruses.

| Related Links                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Information on Bird Flu</a>                                                                                                                                                                                                      |
| <a href="#">Human Infection with Avian Influenza A Virus: Information for Health Professionals and Laboratorians</a>                                                                                                                         |
| <a href="#">Case Definitions for Investigations of Human Infection with Avian Influenza A Viruses in the United States</a>                                                                                                                   |
| <a href="#">Interim Guidance on Testing and Specimen Collection for Patients with Suspected Infection with Novel Influenza A Viruses with the Potential to Cause Severe Disease in Humans</a>                                                |
| <a href="#">Brief Summary for Clinicians: Evaluating and Managing Patients Exposed to Birds Infected with Avian Influenza A Viruses of Public Health Concern</a>                                                                             |
| <a href="#">Interim Guidance for Infection Control Within Healthcare Settings When Caring for Confirmed Cases, Probable Cases, and Cases Under Investigation for Infection with Novel Influenza A Viruses Associated with Severe Disease</a> |
| <a href="#">Interim Guidance on the Use of Antiviral Medications for Treatment of Human Infections with Novel Influenza A Viruses Associated with Severe Human Disease</a>                                                                   |
| <a href="#">Interim Guidance on Influenza Antiviral Chemoprophylaxis of Persons Exposed to Birds with Avian Influenza A Viruses Associated with Severe Human Disease or with the Potential to Cause Severe Human Disease</a>                 |
| <a href="#">Interim Guidance on Follow-up of Close Contacts of Persons Infected with Novel Influenza A Viruses and Use of Antiviral Medications for Chemoprophylaxis</a>                                                                     |
| <a href="#">General information about avian influenza viruses and how they spread</a>                                                                                                                                                        |
| <a href="#">Recommendations for Worker Protection and Use of Personal Protective Equipment (PPE) to Reduce Exposure to Novel Influenza A Viruses Associated with Severe Disease in Humans</a>                                                |
| <a href="#">Past Outbreaks of Avian Influenza in North America</a>                                                                                                                                                                           |
| <a href="#">Transmission of Avian Influenza A Viruses Between Animals and People</a>                                                                                                                                                         |

[H5 Viruses in the United States](#)

[General information about Avian Influenza viruses in birds](#)

[Avian Influenza: Information for Health Professionals and Laboratorians](#)

[Reported Human Infections with Avian Influenza A Viruses](#)

[Guidance on Testing and Specimen Collection for Patients with Suspected Infection with Novel Influenza A Viruses with the Potential to Cause Severe Disease in Humans](#)

[CDC Healthy Pets, Healthy People](#)

[Farm Animals | Healthy Pets, Healthy People](#)

[Backyard Poultry | Healthy Pets, Healthy People](#)

[Stay Healthy When Working with Farm Animals !\[\]\(3211b5d1d968fc1665909b34f9f16010\_img.jpg\) \[253 KB, 1 page\]](#)

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