



TRENDS IN VETERINARY MEDICINE

What Veterinary Nurses Need to Know About Avian Influenza

Sarah Kolb, JD, BAS, CVT, LAT, VTS Clinical Practice (Exotic Companion Animals)
VCA Veterinary Emergency Service & Veterinary Specialty Center, Middleton, Wisconsin

Avian influenza has become an increasingly urgent concern in veterinary medicine, especially with the ongoing spread of the highly pathogenic H5N1 strain across North America. While this virus has long been recognized as a threat to poultry, it now poses risks to a broader range of species—including wild birds; domestic mammals; and, in rare cases, humans. It is critical for veterinary nurses to stay informed about this evolving disease.



Not only are veterinary nurses often the first to recognize clinical signs or potential exposures in patients, but they are also key players in educating clients and supporting biosecurity protocols in clinical and farm settings. As avian influenza continues to shift in scope and behavior, veterinary nurses must be equipped with current information on how it spreads, which patients are most at risk, what precautions to take, and how to communicate these issues effectively with the public.

UNDERSTANDING AVIAN INFLUENZA

Avian influenza, commonly known as “bird flu,” is caused by influenza A viruses that primarily infect birds.¹ These viruses are classified based on 2 surface proteins: hemagglutinin (H) and neuraminidase (N).¹ In birds, 16 H subtypes (H1 through H16) and 9 N subtypes (N1 through N9) have been identified, resulting in various combinations such as H5N1 or H7N9.¹ These combinations are used to identify the specific strain of the virus.

Avian influenza viruses are further categorized by their pathogenicity in poultry, which refers to the severity of disease—highly pathogenic avian influenza (HPAI) or low pathogenic avian influenza—they cause in chickens (**TABLE 1**).¹

Of particular concern is the HPAI H5N1 strain, which has evolved over the past few decades and is now considered enzootic in some bird populations.² The current virus affecting North America belongs to clade 2.3.4.4b, a genetic subgroup of this H5N1 strain. This clade has demonstrated the ability to³:

- Spread rapidly among wild and domestic birds
- Cause mass mortality in poultry flocks

- Spill over into mammals (including humans, seals, foxes, cats, and cattle)
- Persist in the environment, particularly in water and organic material like feces and litter

Because wild birds often carry the virus without obvious illness, they play a key role in its long-distance spread.¹ In contrast, domestic poultry and mammals are highly susceptible and may suffer devastating losses—whether from sudden mortality, production decline, or mass depopulation.⁴ Understanding how this virus has emerged, spread, and adapted across species and regions is essential context for the role veterinary nurses play in biosecurity and disease prevention.

EPIDEMIOLOGY OF HPAI H5N1 IN NORTH AMERICA

Since the emergence of clade 2.3.4.4b HPAI in Africa, Asia, and Europe during 2020, the virus has become firmly established across North America.⁵ In late 2021, clade 2.3.4.4b A(H5N1) viruses were first detected in Canada, where the virus has since caused a significant epizootic.

Transmission of HPAI H5N1 from birds occurs primarily through direct contact with secretions from infected birds (e.g., saliva, nasal discharge, and feces) as well as exposure to virus-contaminated environments, equipment, feed, or animal by-products. The virus can also spread via aerosolized particles, including respiratory droplets and fine dust, which are especially problematic in enclosed poultry facilities where ventilation systems may circulate virus-laden air between barns. In open-air settings, migratory birds can shed virus midflight, contaminating feed, water sources, or surfaces via droppings or aerosolized

TABLE 1 Key Differences Between LPAI and HPAI

FEATURE	LPAI	HPAI
Severity in poultry	Mild or no illness	Severe illness and high mortality
Common subtypes	H5, H7 (initially low pathogenic)	H5, H7 (after mutation to high pathogenicity)
Reservoir species	Wild waterfowl	Wild waterfowl, but highly fatal in poultry
Transmission speed	Slower	Rapid within flocks
Clinical signs in birds	Often subclinical	Sudden death, neurologic signs, hemorrhage
Zoonotic potential	Low	Moderate (especially H5N1 and H7N9)
Reportable disease?	Not always	Always reportable to World Organisation for Animal Health and USDA

HPAI=highly pathogenic avian influenza; LPAI=low pathogenic avian influenza



particles. Combined with the virus's environmental stability in cool, moist conditions, this creates ample opportunity for indirect transmission—even without bird-to-bird contact. Waterfowl, especially migratory species, are therefore key vectors for long-distance spread, while localized outbreaks are frequently driven by contaminated fomites and human activity.⁶

The virus then spread rapidly southward. In the United States alone, between January 2022 and June 2025, HPAI H5N1 was confirmed in more than 13 200 wild birds and over 1700 commercial or backyard poultry flocks.⁷ These outbreaks have resulted in the loss of over 174 million domestic birds across all 50 states.⁷ Seasonal spikes in virus detection have aligned with

spring and autumn waterfowl migrations, highlighting how important these birds are in spreading the virus over long distances.

Spillover of HPAI H5N1 into mammals has also become increasingly common, including in a wide range of mammals such as seals, skunks, foxes, raccoons, cats, and dogs.^{8,9} These cases are typically linked to scavenging infected birds or consuming contaminated poultry waste, which increases opportunities for cross-species transmission.⁶

A major epidemiologic turning point occurred in March 2024 with the first detection of H5N1 in U.S. dairy cattle.¹⁰ By May 2025, the virus had been confirmed in over 760 herds across 17 states, characterized by extraordinarily high viral loads in raw milk but relatively minimal clinical illness in the cows themselves.¹⁰ However, the virus's adaptation to a new livestock host has increased both the number of exposed workers and the geographic spread of the outbreak.¹⁰ Detection of H5N1 in mammary tissue and raw milk is particularly concerning due to the potential for mucosal or oral exposure among farm workers and the theoretical risk of further mammalian adaptation.^{11,12} While pasteurization eliminates this risk in commercial milk supplies, the presence of virus in a widely consumed livestock product has prompted new biosecurity and surveillance measures.^{11,12}

Human infections remain rare and mild but are now directly linked to exposures from both cattle and poultry. The first U.S. cow-associated H5N1 case—a dairy worker in Texas who developed conjunctivitis—was reported on April 1, 2024, followed by sporadic cases in Michigan and Colorado.¹² To date, no human-to-human transmission has been documented.^{11,12} According to the CDC, the risk to the general public remains low; however, this unprecedented spillover from cattle has expanded the occupational health risks that veterinary nurses and other animal workers must anticipate.^{11,12}

With an understanding of where and how HPAI H5N1 is spreading, veterinary nurses can better anticipate what to look for across different species in clinical settings (**BOX 1**).

CLINICAL SIGNS

Avian influenza can cause a wide range of clinical signs that vary by species, viral strain, and pathogenicity.

BOX 1

Stay Informed: Trusted Resources for Avian Influenza Information

Bookmark and regularly check these sources for real-time updates and accurate information about avian influenza:

United States

- **CDC** H5 Bird Flu: Current Situation. Updates on U.S. human cases, animal outbreaks, and public health risk assessments.
go.navc.com/3UXonjJ
- **USDA** Animal and Plant Health Inspection Service (APHIS) H5N1 Influenza. Central hub for official HPAI updates in poultry, mammals, and cattle.
go.navc.com/46Wt58G
- **USDA** APHIS Confirmations of Highly Pathogenic Avian Influenza in Commercial and Backyard Flocks. Ongoing reporting of confirmed HPAI cases and response actions.
go.navc.com/4lks7qd

International

- **World Health Organization** Avian Influenza Situation Reports. Weekly global summaries, including zoonotic cases and risks.
go.navc.com/417Qfp0
- **Food and Agriculture Organization of the United Nations** Global Avian Influenza Viruses With Zoonotic Potential Situation Update. Global situation updates on avian influenza viruses that can infect humans.
go.navc.com/4ouF1EV

HPAI = highly pathogenic avian influenza



In poultry, highly pathogenic strains like H5N1 frequently cause¹³⁻¹⁵:

- Sudden death with no premonitory signs
- Neurologic signs such as head tilt, tremors, and incoordination
- Respiratory distress, including coughing, sneezing, and nasal discharge
- Cyanosis (bluish discoloration) of the combs and wattles
- Greenish diarrhea
- Drop in egg production or misshapen, soft-shelled eggs

In wild birds, signs can vary widely. Some infected birds—particularly waterfowl—may show no outward signs while actively shedding virus, while many species are often asymptomatic. Others may develop severe disease, including^{15,16}:

- Weakness, circling, head tremors, or swimming in circles
- Inability to fly or stand
- Neurologic signs (most common in affected raptors and scavengers)

In mammals (e.g., cats, foxes, seals, cattle), clinical signs depend on species and route of exposure.^{13,15}

- Neurologic signs, such as stumbling, seizures, or disorientation
- Respiratory signs in some species, most notably in seals and cattle
- Fever, lethargy, and anorexia
- In dairy cattle, illness may be subtle but can include:
 - Decreased milk production
 - Thickened, discolored, or colostrum-like milk
 - Mild fever, with otherwise minimal clinical signs

DIAGNOSIS

Because HPAI is a reportable disease, any confirmed or suspected case must be reported to appropriate regulatory authorities.¹³ While some veterinary clinics may conduct or submit initial testing, confirmation and official response involve state, provincial, or federal animal health agencies.

Several diagnostic tools may be used depending on the species, the clinical presentation, and whether an outbreak is ongoing. Testing methods include rapid antigen tests (antigen capture immunoassay) for initial screening, which are highly specific but require confirmation by molecular tests; real-time PCR, the primary and sensitive test used by official labs to detect



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and subtype the virus with results in hours; and virus isolation, a slower, more complex confirmatory method involving growing the virus for detailed analysis.¹³

Testing protocols vary depending on whether you're sampling poultry, wild birds, or mammals and on the specific signs observed. For poultry, samples might include oropharyngeal and cloacal swabs. In mammals, nasal, oral, or milk samples may be needed. In suspected flock outbreaks, necropsy—conducted at an approved lab—is often recommended to guide diagnosis and control efforts.¹³

Even though diagnostic confirmation typically happens off-site, veterinary nurses play a key role in recognizing clinical signs, assisting with sample collection, and supporting biosecurity measures throughout the diagnostic process.

TREATMENT AND CONTROL

There is no specific treatment for HPAI in animals.¹³ Recovery in poultry is extremely rare; infected birds are typically euthanized and their products destroyed to prevent further spread.¹³ The AVMA Guidelines for the Depopulation of Animals provide valuable resources to assist with difficult culling decisions.^{13,17} If HPAI is suspected in any animal, contact federal and state authorities before initiating treatment.¹³ For commercial poultry flocks, quarantine the premises immediately and limit exposure until you receive official guidance.¹³ When supportive care is appropriate—for example, in companion animals or livestock—it may include fluids and anti-inflammatory medications, but strict isolation and infection control measures are essential.^{13,15} Note that the FDA prohibits extra-label use of certain antiviral drugs (adamantine and neuraminidase inhibitors) in poultry species.^{13,15}



Staying informed about the latest developments and communicating them clearly to clients are critical components of the job.



Veterinary nurses can help control infection by¹⁶:

- Using appropriate personal protective equipment (e.g., gloves, gowns, face shields or goggles, N95 respirators) when handling suspect cases or cleaning contaminated areas
- Following strict cleaning protocols—disinfect exam areas, carriers, floors, and tools with EPA-approved disinfectants effective against influenza viruses
- Designating avian-only zones and equipment to reduce cross-contamination
- Practicing excellent hand hygiene, washing thoroughly before and after handling birds or contaminated surfaces
- Controlling clinic traffic flow to limit movement between isolation and other areas, and using footbaths or changing footwear as needed
- Educating staff and clients about avian influenza risks and clinic protocols

Having a clear plan protects your team, clients, and animals—and supports One Health by helping prevent spread during outbreaks.

CLIENT COMMUNICATION: TALKING ABOUT AVIAN INFLUENZA

During outbreaks of avian influenza—especially when it affects backyard poultry, wild birds, or even dairy cattle—clients are likely to have concerns (see [CLINIC RESOURCE](#)). For the veterinary nurse, the ability to provide calm, fact-based guidance helps maintain trust



CLINIC RESOURCE

Download this resource on client FAQs and answers related to avian influenza for easy clinic use.

and prevent panic. Communication should be:

- **Clear:** Avoid technical jargon unless the client is knowledgeable.
- **Accurate:** Stay up to date with CDC, USDA, or Canadian Food Inspection Agency updates.
- **Balanced:** Acknowledge the risks but emphasize prevention and perspective.
- **Empathetic:** Many clients see their birds as family; others may be worried about zoonotic transmission or food safety.

SUMMARY

The ongoing HPAI H5N1 outbreak presents significant challenges to both animal and public health, and veterinary nurses are at the heart of the response. The veterinary nurse's role extends beyond the exam room—encompassing disease surveillance, infection control, client education, and everyday biosecurity. Staying informed about the latest developments and communicating them clearly to clients are critical components of the job. This outbreak is a clear reminder that One Health is not just a theory but a practical, daily responsibility—linking animal, human, and environmental health. Through vigilance, education, and teamwork, veterinary nurses are an essential line of defense in protecting patients and the community. **TVN**

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Sarah Kolb

Sarah is a VTS in exotic companion animal medicine. With over 20 years of clinical experience, Sarah has dedicated her career to the care of exotic pets and wildlife. She spent 14 years at Iowa State University's Lloyd Veterinary Medical Center before joining the University of Wisconsin-Madison's National Primate Research Center, where she gained extensive experience in primate medicine, research support, and specialized husbandry. She now serves as a specialty supervisor with VCA, overseeing clinical teams, implementing best practices, and supporting the growth of specialty services. Sarah has served as the 2022-2023 Academy of Veterinary Technicians in Clinical Practice president. A Veterinary Support Personnel Network instructor, national conference speaker, and published author, she is committed to advancing exotic animal medicine and technician education through teaching, writing, and professional leadership.



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