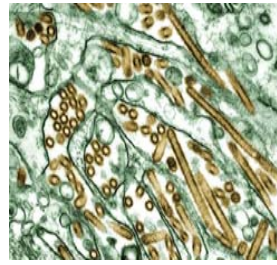
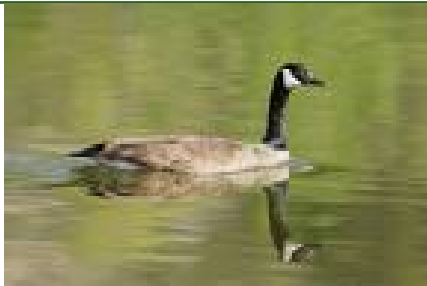


Introduction

Avian influenza (AI), also known as the Bird Flu, has in recent years become a major public health concern by establishing itself as a significant emerging infectious disease. It is a viral disease that primarily affects wild birds (ducks, shorebirds, migratory birds) and domestic birds (chickens, turkeys). The virus can also infect mammals, including humans. Due to avian influenza's zoonotic nature (its ability to transfer from animals to humans) public health officials have targeted this disease as a potential pandemic threat.

The influenza viruses that commonly infect humans are categorized into two major types, A and B. Influenza Type A is the main public health concern due to its highly infectious nature. Birds serve as the primary host of Type A influenza viruses. However, many forms of Type A can cross from species to species. Influenza type B is of lesser public health concern because it is less virulent and is not prone to genetic shifts.

Due to the high concern surrounding Type A Influenza, especially avian influenza, it is important for all laboratory personnel to be prepared and well informed about the lab techniques used to diagnose avian influenza. This brochure discusses AI signs and symptoms, lab procedures, and contact information for laboratorians should the disease surface within Rhode Island.



CDC, Courtesy of Cynthia Goldsmith

The Influenza Virus

Influenza is a virus made of proteins and nucleic acid (RNA).

Viruses can only reproduce within the body of a living host by infecting the host's cells.

Influenza outbreaks are difficult to predict because the genetic material of the virus is highly susceptible to change. Small mutations in the RNA occur consistently and at a very rapid pace.

The small change in the genetic structure of the influenza virus is known as genetic drift. This slight rearrangement in genetic material is enough to have the host's immune system not recognize the virus.

A primary concern for public health professionals is that the Avian strain of influenza will undergo a genetic shift. Genetic shift occurs when two separate viral genetic codes combine to make a different, more dangerous and radical virus.

If a genetic shift occurs, the newly produced virus may contain the genetic material that facilitates human-to-human spread of the virus. Due to this potential, public health officials are concerned that the virus could cause an influenza pandemic.

Influenza strain typing is based on genetic variation within two genes designated H (hemagglutinin) and N (neuraminidase). Currently there are 16 H types and 9 N types. Seasonal influenza is designated H3N2 and H1N1, while avian influenza is designated H5N1.

David R. Gifford, MD, MPH *Director*
Donald L. Carcieri, *Governor*



Contact information:

If you have questions pertaining to material covered in this brochure, please contact:

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Phone: (401) 222-5598

<http://www.health.ri.gov/avian/index.php>

or

<http://www.health.ri.gov/labs/index.php>

Additional Websites of Interest:

<http://www.cdc.gov/flu/>

http://www.who.int/csr/disease/avian_influenza/en/index.html

Avian Influenza Testing



influenza-pandemic.com

Information for Laboratorians

Epidemiology

Etiological Agent (H5N1 virus) Characteristics

- Type A influenza virus
- Incubation – 2-17 days
- Survives at freezing temperatures
- Inactivated by: heat (60°C for 30 minutes), acidic pH, oxidizing agents, exposure to disinfectants

Transmission

- Bird to Bird – virus shed in saliva, nasal secretions, and feces
 - Low Pathogenicity or High Pathogenicity
- Bird to Human – risk is LOW, but still a concern
 - Most cases due to contact with infected poultry or surfaces contaminated with secretion/excretions from infected birds
- Human to Human – has not been definitively documented
 - H5N1 virus has not been spread beyond the first generation of human cases

Reservoir

- Primary reservoirs are domestic and migratory birds

Occurrence (As of December, 2007)

- 211 deaths out of 342 cases since 2003
- 60.3% case fatality rate documented

Distribution

- Human cases have occurred in Azerbaijan, Cambodia, China, Djibouti, Egypt, Indonesia, Iraq, Lao People's Democratic Republic, Myanmar, Nigeria, Thailand, Turkey, Vietnam (December 2007)
- Human deaths primarily associated with proximity to poultry

Risk Factors

- Poor hygiene (lack of hand washing, not cooking poultry meat properly, cross contamination with cooking utensils, etc.)
- Close contact with poultry
- Living in high risk areas for AI
- Travel, import/export of poultry meat

Travel History

People who have recently traveled to high risk areas have a greater risk of avian influenza infection. It is also important to realize that because birds and people travel from country to country, the virus could be found virtually anywhere in the world causing concern for a potential pandemic. Visit the CDC website for an updated list of the distribution of avian influenza.

Signs and Symptoms

The symptoms of Avian Influenza are similar to those of the typical flu or other related viruses. These include:

- Fever, cough, sore throat, muscle aches
- Other more severe symptoms may include:
- Eye Infection, pneumonia, severe respiratory distress

Symptoms vary from case to case, and often depend on which type of Avian Flu virus the individual has acquired. Travel history is essential when these signs and symptoms persist.

Diagnosis

There are three specific diagnostic techniques used to diagnose Influenza. The first test is performed at Point of Care labs:

1. Rapid Test

A rapid influenza test usually yields results within minutes. This test can detect Type A and Type B influenza.

Additionally, two confirmatory tests are performed at the State Health Laboratory to confirm the results.

2. PCR

The PCR test is an RNA amplification procedure. This test is used to determine flu types, A or B, and subtypes, H1, H3, and H5.

3. Viral Culture

Viral culture is an additional test used to amplify the virus and confirm the diagnosis. The culture technique also enables genotyping. However, suspected cases of H5N1 influenza will not be cultured. They will instead be shipped to the CDC.

Prevention

Although avian influenza has not historically passed from person to person, there is a serious concern that the virus will develop the ability to do so. Thus, preventing the spread of disease is extremely important, and certain steps can be taken to minimize the possibility of infection:

- Eliminate contact with wild birds.
- Minimize contact with domestic birds, wash hands after each encounter.
- Note possible signs and symptoms of avian influenza in birds and report immediately if they occur.
- Cook poultry at proper temperatures and practice good kitchen hygiene.

A person infected or possibly infected with avian influenza must:

- Contact health provider immediately.
- Stay confined and keep contact with others to a minimum.
- Wash hands frequently.
- Disinfect all household products used by others (thermometers, cups, telephone, etc.)

Preventing contamination also pertains to the lab:

- Clearly label all lab equipment in contact with avian influenza (or potential avian influenza specimens)
- Frequently sterilize all lab equipment.
- Use disposable equipment whenever possible.
- Properly dispose of equipment and specimens.
- ALWAYS wear personal protective equipment (gloves, goggles, etc.) when in the lab.
- Wash hands frequently.

AI Specimen Collection and Shipping Information

Prior to Specimen Collection:

Consult with Dept. of Health
Center for Epidemiology

Phone: 222-2577 (weekdays)
272-5952 (after hours)

Important:

Wash specimen min. vol. 200 µl.
Swabs – Dacron tipped, submit in
viral transport medium.

Specimens must be refrigerated or
frozen, and shipped on ice to Lab.

Acceptable Specimens:

Oropharyngeal aspirates/washes
(preferred specimen!)

Nasopharyngeal swabs/aspirates
Throat Swabs

Sputum

Tracheal aspirates

Bronchoalveolar lavage