Influenza – People, Poultry, Pets
Dr. Corrie Brown, University of Georgia
A Webber Training Teleclass

Influenza viruses
- Family Orthomyxoviridae
- Type A, B, C
- Based on NP and M antigens
- Type A occurs in humans, pigs, horses, seals, many birds
- Types B and C occur in humans only

Type A influenzas
- Classified according to Hemagglutinin (16) and Neuraminidase (9) types
- Hemagglutinin – responsible for attachment to cell surface
- Neuraminidase – responsible for release from cell
- All human influenzas are H1, H2, H3
- All serious avian viruses are H5 and H7

Type A influenza in humans
- 30,000 – 50,000 deaths per year in the US

Type A influenza in swine
- Economically important respiratory disease of swine
- Present globally
- Main types: H1N1, H3N2, H1N2

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Type A influenza in birds

All H and all N types have been isolated from birds

Hemagglutinin binds to sialic acid with alpha2,3 linkage to galactose

Host Range

Many birds, especially aquatic

Waterfowl have sialic acid with alpha2,3 linkage to galactose throughout their GI tract

“Highly pathogenic” avian influenza (HPAI)

- Lethal after i-v inoculation of chicks
- OR specific amino acid sequence of hemagglutinin cleavage site

HPAI – Clinical Disease

high morbidity, high mortality

HPAI – Gross Lesions

shank hemorrhage subQ edema

Virus infects endothelium throughout the body.
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**HPAI – Transmission**
- Body fluids loaded with virus
- Fomites
- Aerosol
- Waterfowl

**Influenza pandemics**
- 1918 – “Spanish” flu – H1N1
  - Killed 40M people
- 1957 – “Asian” flu – H2N2
- 1968 – “Hong Kong” flu – H3N2

How have pandemics happened?
Can avian influenzas infect humans? YES

World Health Organization
Cumulative Number of Confirmed Human Cases of Avian Influenza A/H5N1 Reported to WHO
23 January 2007

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Numerous tigers and leopards at SE Asian zoos have been infected with H5N1. Other species have also been infected, such as pigs in Asia, where serologic evidence of H5N1 infection has been found. Experimental studies have shown limited replication but no pig-to-pig transmission. The next pandemic? It remains uncertain but monitoring and research are crucial.
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Avian 'flu hemagglutinin binds to sialic acid with alpha2,3 linkage to galactose

Human 'flu hemagglutinin binds to sialic acid with alpha2,6 linkage to galactose


Green = alpha 2,6
Red = alpha 2,3

Control in poultry is essential

World Health Organization
Cumulative Number of Confirmed Human Cases of Avian Influenza A/H5N1) Reported to WHO
20 January 2007

Control in poultry is essential

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Live Bird Markets

Role of migratory birds

Vaccination?

Antivirals
Neuraminidase inhibitors
• Oseltamivir - TAMIFLU
• Zanamivir
Ion channel inhibitors
• Rimantidine
• Amantadine

The Next Few Teleclasses

February 15  Fresh Produce and Human Pathogenicity
  … with Prof. Keith Warriner, Guelph University
February 21  Infection Control in the Endoscopy Clinic
  … with Dr. Richard Everts, Nelson Marlborough Health Service
February 22  Best Practice for Hospital Construction Management
  … with Andrew Streifel, University of Minnesota
March 6  Tuberculosis in the Modern Age
  … with Evonne Curran, Health Protection Scotland
March 8  Voices of CHICA
  … with CHICA-Canada Board Members & Guests
March 22  A Year of Cleaner, Safer Care – A Worldwide Experience
  … with Dr. Didier Pittet, World Health Organization, Geneva

For the full teleclass schedule – www.webbertraining.com
For registration information  www.webbertraining.com/howto8.php

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