

PANDEMIC INFLUENZA

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AVIAN INFLUENZA

- Influenza A viruses
- Birds are the reservoir
- Low pathogenicity strains (LPAI)
- High pathogenicity strains (HPAI)
- Domestic birds infected by wild birds
- Outbreaks in domestic birds lead to exposure of humans

AVIAN INFLUENZA

ORIGIN OF THE DISEASE

- H5N1, Hong Kong, 1997
- H9N2, China and Hong Kong, 1999
- H7N2, Virginia, 2002
- H5N1, China and Hong Kong, 2003
- H7N7, Netherlands, 2003
- H9N2, Hong Kong, 2003
- H7N2, New York, 2003
- H7N3, Canada, 2004
- H5N2, Texas, 2004

AVIAN INFLUENZA

Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1)
Reported to WHO

12 May 2006

Country	2003		2004		2005		2006		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Azerbaijan	0	0	0	0	0	0	8	5	8	5
Cambodia	0	0	0	0	4	4	2	2	6	6
China	0	0	0	0	8	5	10	7	18	12
Djibouti	0	0	0	0	0	0	1	0	1	0
Egypt	0	0	0	0	0	0	13	5	13	5
Indonesia	0	0	0	0	17	11	16	14	33	25
Iraq	0	0	0	0	0	0	2	2	2	2
Thailand	0	0	17	12	5	2	0	0	22	14
Turkey	0	0	0	0	0	0	12	4	12	4
Viet Nam	3	3	29	20	61	19	0	0	93	42
Total	3	3	46	32	95	41	64	39	208	115

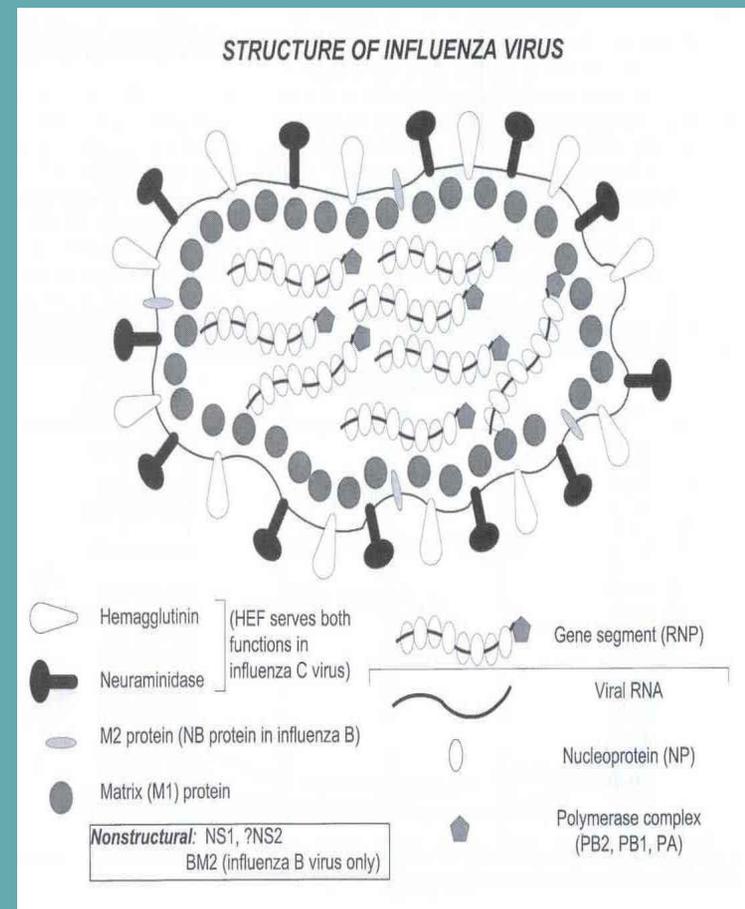
Total number of cases includes number of deaths.

WHO reports only laboratory-confirmed cases.

AVIAN INFLUENZA

ETIOLOGY

- Influenza virus, types A, B and C
 - Single stranded RNA virus
 - Genome is segmented
 - Surface glycoproteins
 - Hemagglutinin (H), 16 antigenically distinct types
 - Neuraminidase (N), 9 antigenically distinct types



AVIAN INFLUENZA

○ ETIOLOGY

● Avian influenza

○ H5, H7, H9

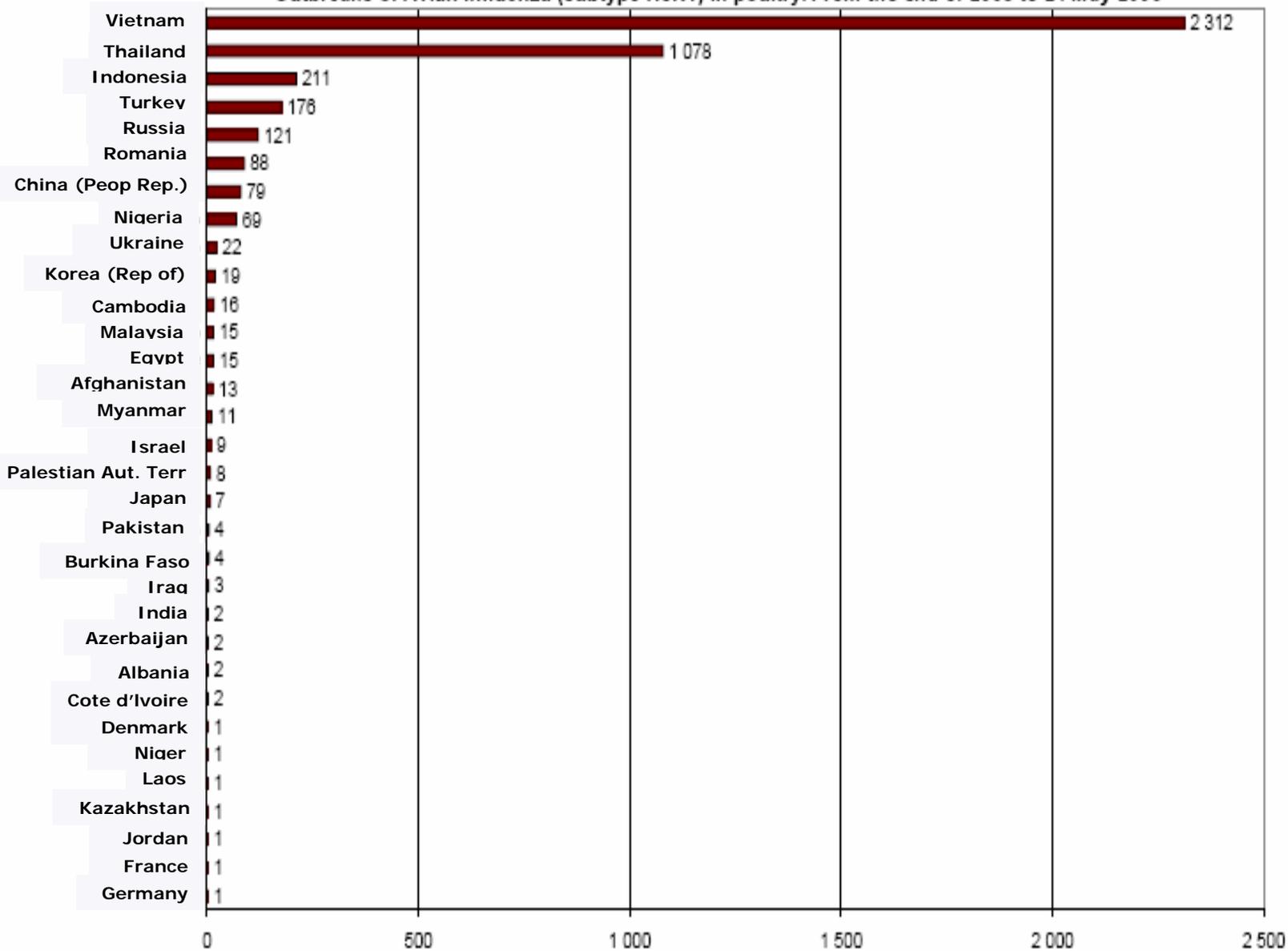
○ Transmission to humans

- Close contact with fowl or excreta is necessary for infection of humans
- Disease severity in humans is related to the pathogenicity of the avian virus
- Humans have no immunity to these avian viruses

○ Pandemic influenza A

- When a human or an animal is infected with a human and an avian influenza virus, the segmented genome allows for reassortment of genes
- Reassortment of genes between strains may produce a new strain which is readily transmitted among humans

Outbreaks of Avian Influenza (subtype H5N1) in poultry. From the end of 2003 to 24 May 2006



AVIAN INFLUENZA

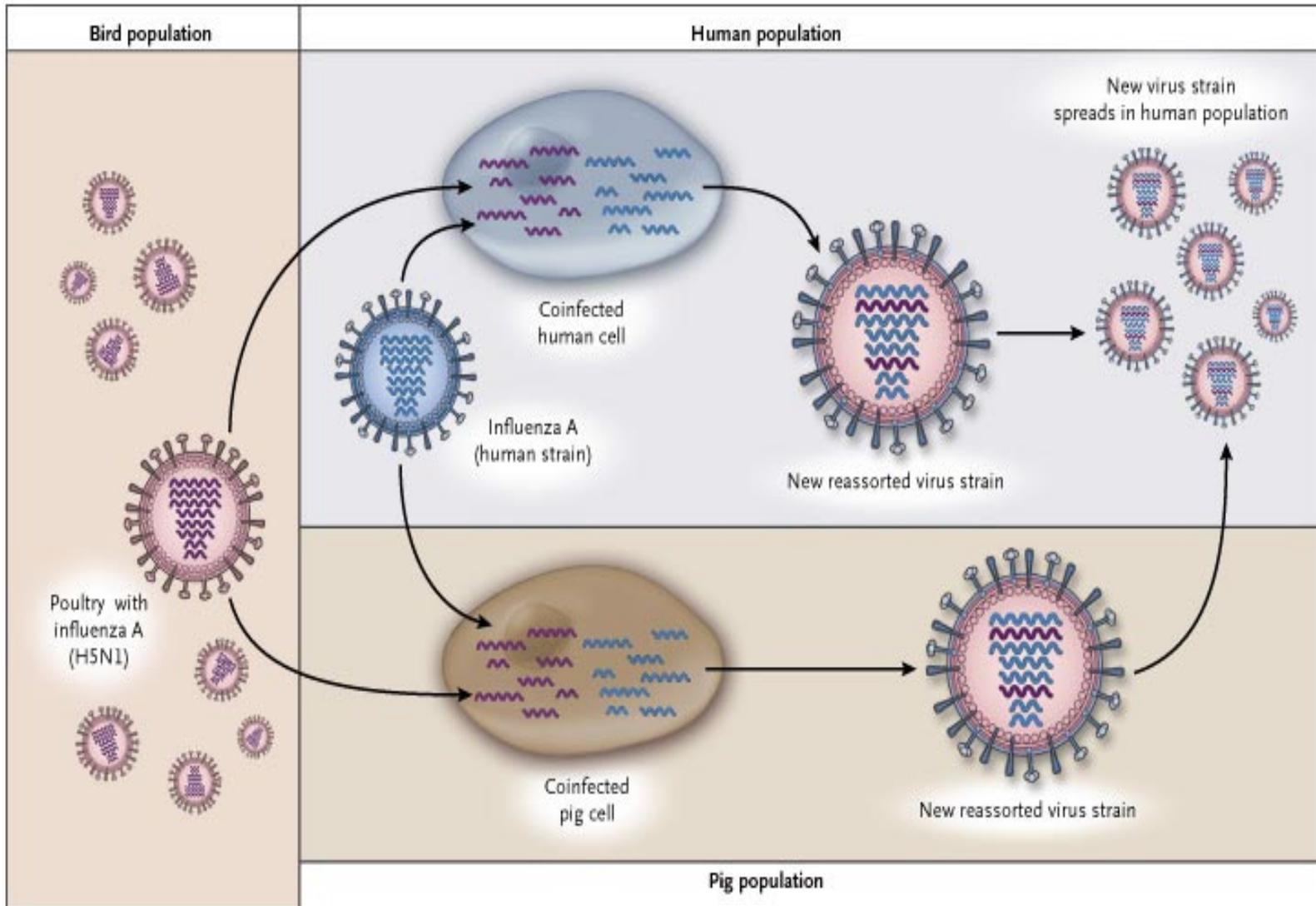
○ EPIDEMIOLOGY

- Epidemic and pandemic strains of influenza virus usually emerge in the Far East and other areas in Asia
 - Each year, the CDC identifies the likely strains of virus that may circulate in the U.S.
 - Epidemic strains emerge as the result of small changes in the antigenic make-up of influenza A viruses (drift)
 - When a major antigenic change occurs (shift), this may be due to a reassortment of genes between a human virus and an avian virus, and this may result in a pandemic

AVIAN INFLUENZA

○ EPIDEMIOLOGY

- Outbreaks of avian influenza in domestic birds in North America and Europe have led to limited transmission to humans who have usually developed conjunctivitis
- Outbreaks of influenza in domestic birds in North America and Europe have been rapidly contained
- The greatest concern is that reassortment will occur in the Far East and lead to a pandemic strain that will be rapidly transmitted around the world by air travel

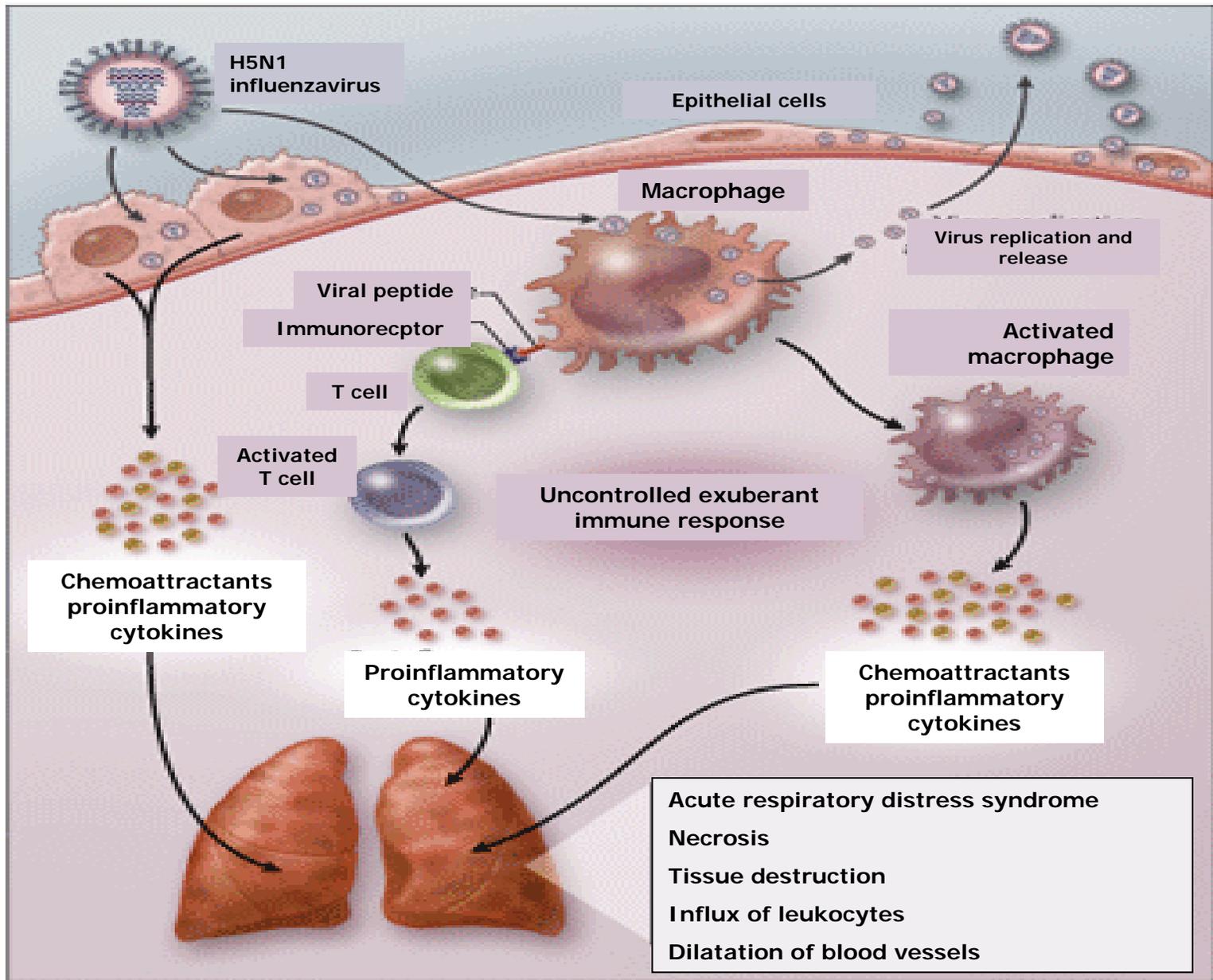


AVIAN INFLUENZA

- Epidemiology
 - Reservoir – birds
 - Source – infected people
 - Persons with clinical manifestations
 - Persons in late incubation period not yet manifesting signs and symptoms

AVIAN INFLUENZA

- EPIDEMIOLOGY
 - Modes of transmission
 - Large droplets
 - Direct contact with infectious secretions
 - Airborne (droplet nuclei) transmission may occur but is less common than the other 2 modes of transmission
 - Portals of entry
 - Nose
 - Mouth
 - Conjunctivae
 - Risk factors
 - No data



AVIAN INFLUENZA

○ CLINICAL MANIFESTATIONS

- Fever most common first symptom
- Dyspnea occurs at a median of 5 days (range 1-16 days)
- All patients have fever, cough and dyspnea during the initial evaluation
- Almost half have diarrhea and myalgia
- Intermittent high fevers and persistent cough productive of thick sputum during hospital course
- Later course
 - Respiratory failure (75%)
 - Cardiac failure (42%)
 - Renal dysfunction (33%)

AVIAN INFLUENZA

○ LABORATORY TESTS

- Leukopenia (58%)
- Lymphopenia (58%)
- Thrombocytopenia (33%)
- Serum Creatinine rise to > 1.5 mg/dL (33%)

○ CHEST X-RAYS

- All patients had abnormal chest x-rays
- Progressed to ARDS in two thirds of patients, all of whom died

AVIAN INFLUENZA

○ DIAGNOSIS

- Culture of nasopharyngeal specimen obtained by swab or wash
- Detection of antibodies to influenza virus
- Detection of influenza in nasopharyngeal specimen by rapid antigen test
- New real-time RT-PCR test recently approved by the FDA
 - Test distributed to the Laboratory Response Network (LRN) laboratories
 - Results available in 4 hours

AVIAN INFLUENZA

- TREATMENT
- Adamantanes
 - Amantadine
 - Rimantadine
 - Effective only against influenza A viruses
 - Many strains of avian influenza virus are resistant to the Adamantanes
- Neuraminidase inhibitors
 - Effective against both influenza A and B
 - Effective against strains of avian influenza

AVIAN INFLUENZA

- TREATMENT
- Neuraminidase inhibitors
 - Zanamivir
 - Administered by inhalation
 - Recently approved for prophylaxis (March 29, 2006)
 - Oseltamivir
 - Administered orally
 - Approved for prophylaxis

AVIAN INFLUENZA

PREVENTION

- Emerging Infectious Diseases Response Program:
 - Patients who present with fever, cough and dyspnea will be queried about travel to a country or exposure to a person who traveled to a country with known avian influenza activity in the 10 days before onset of symptoms
 - Patients will remain on isolation for 14 days

AVIAN INFLUENZA

PREVENTION

- Emerging Infectious Diseases (EID) Response Program:
 - Healthcare workers will be under surveillance for 7 days after last contact with a patient with avian influenza
 - Healthcare workers will be immunized against epidemic influenza
 - Oseltamivir may be used for prophylaxis of patients and healthcare workers

AVIAN INFLUENZA

PREVENTION

Emerging Infectious Disease Policies (EIDs)

- 3.1 – Screening Policy for Persons with a Possible Emerging Infectious Disease (EID)
- 3.2 – Isolation of Patients with an Emerging Infectious Disease (EID) or Possible EID
- 3.3 – Transportation of Patients with an Emerging Infectious Disease (EID) or Possible EID
- 3.4 – Imaging Studies for Emerging Infectious Disease (EID) Patients

AVIAN INFLUENZA

PREVENTION

Emerging Infectious Disease Policies (EIDs)

- 3.5 – Emerging Infectious Diseases (EID) Protocol for Pediatrics
- 3.6 – Admission of Patients with an Emerging Infectious Disease (EID) to the Hospital
- 3.7 – Visitation Policy for Patients with an Emerging Infectious Disease (EID)
- 3.8 – Protection During the conduct of High-Risk Respiratory Procedures in Patients with an Emerging Infectious Disease (EID)

AVIAN INFLUENZA

PREVENTION

Emerging Infectious Disease Policies (EIDs)

- 3.9 – Post Exposure Monitoring of UTMB Employees for an Emerging Infectious Disease (EID)
- 3.10 – Communication on Emerging Infectious Diseases (EIDs) Between the Department of Healthcare Epidemiology and the Galveston County Health District
- 3.11 – Communications with the Media and the Public About an Emerging Infectious Disease (EID)

AVIAN INFLUENZA

PREVENTION

Emerging Infectious Disease Policies (EIDs)

- 3.12 – Environmental Cleaning and Disinfection of Rooms Where Patients with an Emerging Infectious disease (EID) Have Been Hospitalized or Treated
- 3.13 – Detection and Disposition of Outpatients with a Suspected Emerging Infectious Disease (EID)
- 3.14 – Processing Equipment and Instruments Contaminated by an Emerging Infectious Disease (EID) Agent in the Sterile Processing Department

AVIAN INFLUENZA

PREVENTION

Emerging Infectious Disease Policies (EIDs)

- 3.15 – Laundry Protocol for Washing Linens Contaminated with an Emerging Infectious Disease (EID)
- 3.16 – Protection Against an Emerging Infectious Disease (EID) in the Dietary Service
- 3.17 – Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Emerging Infectious Diseases (EIDs)
- 3.18 – Investigation and Management of Incidents of Unprotected Exposure to Cases of an Emerging Infectious Disease (EID)
- 3.19 - Preparation and Transport of Deceased Patients with an Emerging Infectious Disease (EID)

























Exit Room & Wash Hands

(or alcohol gel)











Wash Hands

(or alcohol gel)