

Respiratory Diseases of Poultry

- Acknowledgements:

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Note: chickens = chooks

- Disclaimer

- Disease strains and vaccination protocols may differ significantly between Australia and USA



Anatomic Features

- Turbinates – 3
- Paranasal sinuses – infraorbital sinus covered laterally by skin flap – not bone – sinusitis may be mistaken for subcutaneous abscess
- Palatine cleft – where nasal passages open into oral cavity
- Many species differences
- Trachea – tracheal rings can overlap
 - Syrinx at bifurcation – tympanic membrane
 - In emus, slit at base of trachea opens into subcutaneous pouch
- Subcutaneous air pouches in some e.g. pelican
- Lungs
- Air sacs - 8
- Pneumatic bones



Conjunctivitis / Rhinitis

- Clinical signs
 - Exudate
 - Photophobia
 - Closure of eye
- Causes
 - Traumatic
 - Toxic – ammonia
 - Infectious



Conjunctivitis / Rhinitis

- Infectious Causes
 - Infectious Bronchitis – respiratory form
 - Renal form most common in Australia currently
 - Infectious Laryngotracheitis (ILT)
 - “Wet” pox
 - Chlamydiosis – a zoonotic disease
 - Aspergillosis
 - Cryptosporidiosis – is this pathogenic?



Sinusitis

- Can lead to exophthalmia
- Differentiate from subcutaneous abscesses
- Specific diseases
 - Mycoplasmosis
 - Fowl coryza (*Avibacterium* sp)
 - Fowl cholera (Pasteurellosis)
 - TRT, SHS, *Ornithobacterium* – not in Australia
 - Vitamin A deficiency



Tracheitis

■ Viruses

- ILT – also with vaccine strain
- Pigeon herpes virus disease
- Newcastle Disease
- Pox viruses

■ Parasites

- *Cryptosporidia* sp
- Flukes, leeches, gapeworm (*Syngamus* sp), mites (*Strenostoma trachealotum*)



Diseases of the Lung

- Infectious
 - Septicemic diseases
 - Colibacillosis
 - Pasteurellosis
 - Salmonellosis
 - Mycoplasmosis
 - ILT
- Tumors – eg Marek's disease



Airsacculitis

- Often no clinical signs
- Chlamydiosis
- Mycoplasmosis
- Mycosis



Respiratory Diseases of Poultry

■ Viral

- Avian Influenza (Fowl Plague, HPAI) – orthomyxovirus – see separate AAHL presentation
- Newcastle Disease – rubulavirus, subfamily paramyxovirinae, family paramyxoviridae
- Infectious Laryngotracheitis – herpes virus
- Infectious Bronchitis Virus – coronavirus
- Avian Pneumovirus - paramyxovirus – not in Australia



Respiratory Diseases of Poultry

■ Bacterial

- Fowl Cholera - *Pasteurella multocida*
- Mycoplasmosis
- Chlamydiosis
- Infectious Coryza – *Avibacterium* sp
- Turkey Coryza - *Bordetella avium* - not in Australia

■ Fungal

- Aspergillosis



Newcastle Disease (ND)

- Highly contagious disease of chickens, turkeys, & various other bird species
- Causative agent is a rubulavirus, subfamily paramyxovirinae, family paramyxoviridae
- Clinical signs – dependent on strain – respiratory, neurologic, viscerotropic
- 1971 – an outbreak in California resulted in the slaughter of 12 million birds (\$56 million)
- In NSW, outbreaks of neurotropic strain



Newcastle Disease (ND)

- Traditionally, 3 pathotypes of ND virus
 - Lentogenic – mildly pathogenic
 - Mesogenic – moderately pathogenic
 - Velogenic – highly pathogenic



Newcastle Disease (ND)

- Transmission
 - inhalation or ingestion of contaminated particles
 - fomites (contaminated shoes, equipment, etc.)
- Most species of birds (domestic & wild) susceptible
 - chickens - most susceptible poultry species
 - ducks & geese - least susceptible poultry species



Newcastle Disease (ND)

- carrier state in psittacine and wild birds
- live mesogenic or lentogenic virus vaccines may induce clinical disease and mortality
 - referred to as “hard reaction”
 - chickens may shed vaccine virus
- major source of velogenic ND in U.S. is imported &/or smuggled cage birds and fighting cocks



Newcastle Disease (ND)

■ Clinical signs

- vary markedly with pathogenic type of virus
- lentogenic - most common form used in vaccines
 - young birds
 - mild respiratory disease
 - subclinical enteric infections
 - adults
 - usually subclinical



Newcastle Disease (ND)

- Clinical signs, cont.

- Mesogenic

- young

- marked depression & prostration

- marked respiratory disease (gasping, coughing, nasal discharge)

- +/- CNS signs (abnormal head/neck positions)

- paralysis with trampling by pen-mates

- adults

- sudden onset of mild depression & anorexia

- mild respiratory disease

- abrupt and almost complete cessation of laying



Newcastle Disease (ND)

- Velogenic (similar to HPAI)
 - viscerotropic velogenic ND (VVND) - gut hemorrhages
 - neurotropic velogenic ND (NVND) - nervous signs
 - young and adults
 - Rapid onset with high mortality
 - Respiratory disease (gaspings, coughing)
 - Nervous signs (paralysis, torticollis, opisthotonus)
 - Edema of face (periocular) and neck (paratracheal)
- *mortality may reach 100% in susceptible birds*



Newcastle Disease (ND)

- Viscerotropic velogenic (VVND) in psittacines
 - respiratory disease
 - wheezing / sneezing
 - depression
 - head shaking
 - neurologic disease
 - leg paralysis
 - wing droop
 - *infected (yet clinically normal) birds may shed virus actively*



Newcastle Disease (ND)

■ Lesions:

- Lentogenic – mild conjunctivitis, air sacculitis
- Mesogenic – moderate/marked conjunctivitis and air sacculitis
- Viscerotropic velogenic
 - *No pathognomonic lesions*
 - hemorrhages in mucosa of proventriculus and ventriculus, GALT, cecal tonsils, & cloaca
 - edema
 - periocular & paratracheal



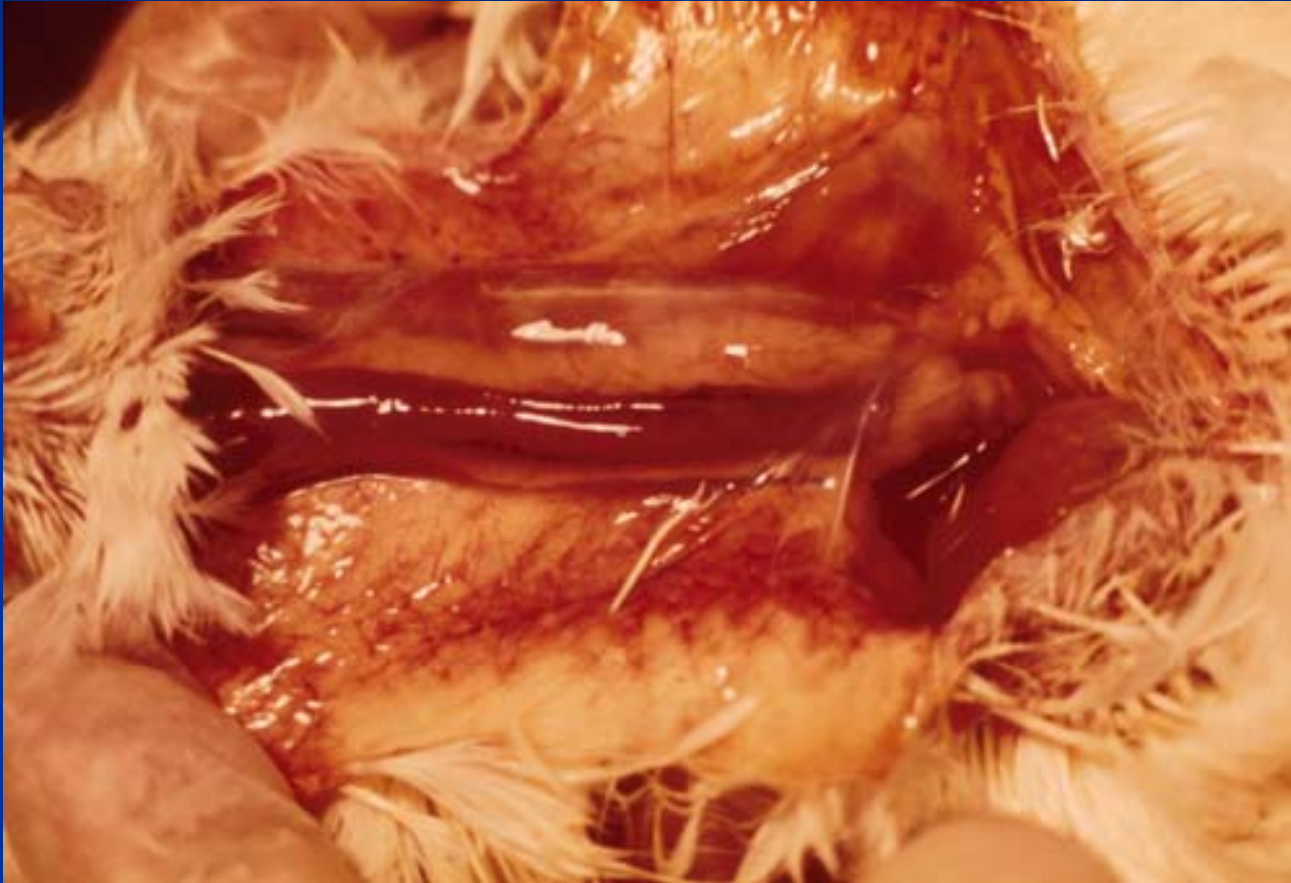
Newcastle Disease (ND)



periorbital edema



Newcastle Disease (ND)



paratracheal
edema



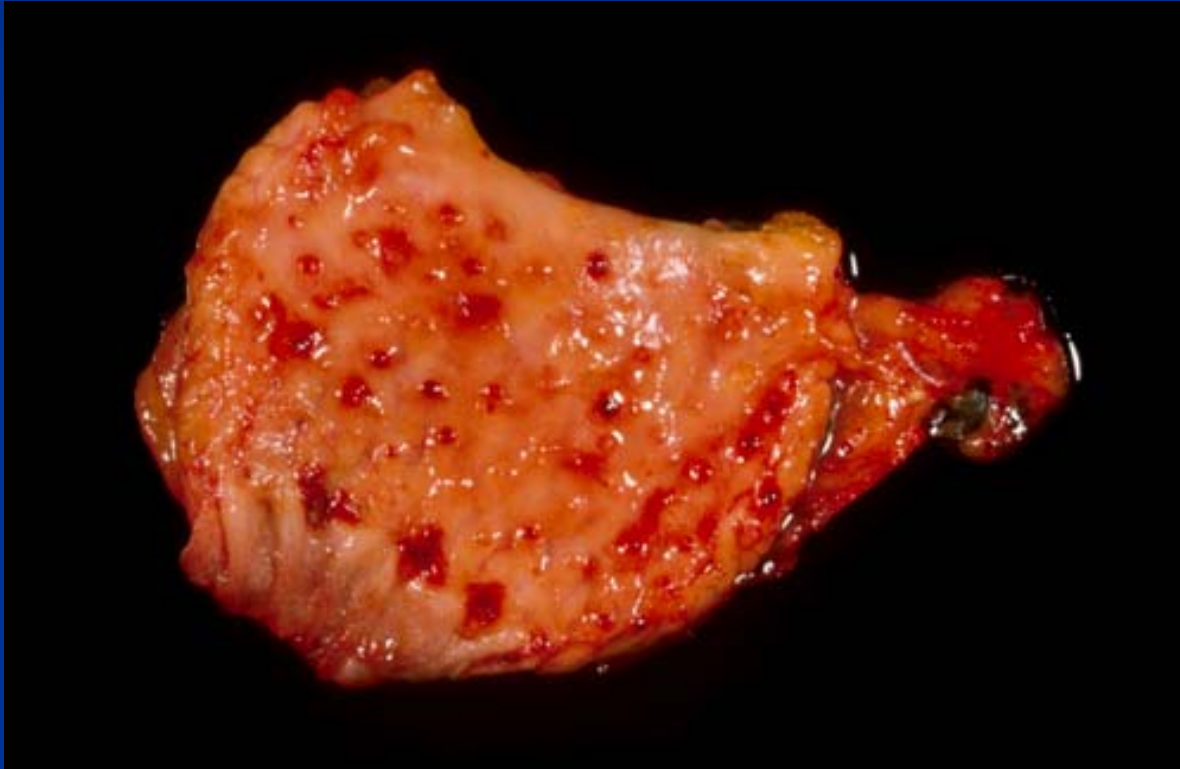
Newcastle Disease (ND)



proventricular
hemorrhage



Newcastle Disease (ND)



proventricular
hemorrhage



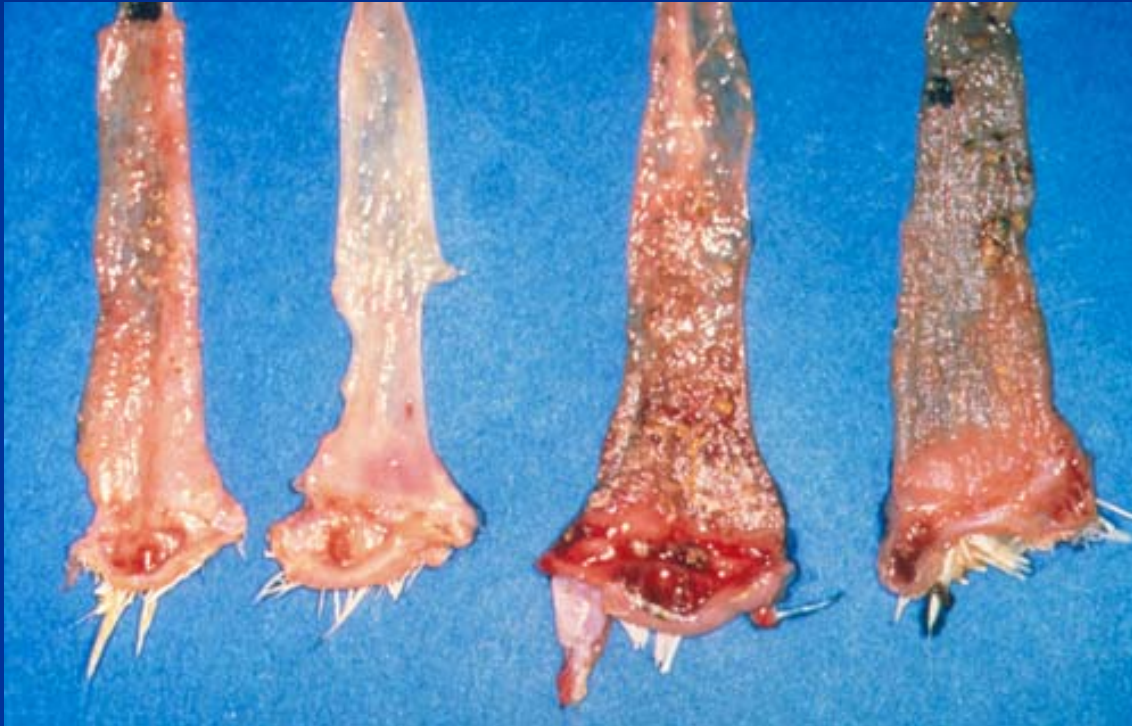
Newcastle Disease (ND)



hemorrhagic
cecal tonsils &
GALT



Newcastle Disease (ND)



hemorrhage,
necrosis &
pseudomembrane
formation in
cloaca



Newcastle Disease (ND)

- Diagnosis:
 - Serology
 - Fluorescent antibody
 - Virus isolation
 - PCR
- Differentials include Avian Influenza



Newcastle Disease (ND)

- Velogenic strains
 - Zoonotic potential – conjunctivitis in man
- Exotic Newcastle disease in California - 2002
 - backyard game fowl flocks
 - >4 million birds culled, \$160 million to control



Infectious Laryngotracheitis (ILT, LT)

- Classically - acute respiratory disease of chickens, pheasants, & peafowl - severe dyspnea (mouth breathing and “snicking”), gasping, and expectoration of bloody exudate
- Causative agent is herpesvirus, also vaccine strain
- Occurrence:
 - worldwide
 - chickens primary natural hosts
 - most outbreaks in mature/near mature chickens
 - viral replication limited to respiratory tissues



Infectious Laryngotracheitis (ILT)

■ Transmission

- primary via upper respiratory tract & ocular tissues
- ingestion via exposure of nasal epithelium
- fomites (mechanical transmission)
- recovered & vaccinated chickens can shed virus for extended periods of time



Infectious Laryngotracheitis (ILT)

- Morbidity / mortality:
 - clinical signs 6 - 12 days after exposure
 - clinical disease in flock - 2-6 weeks
 - in epizootics
 - morbidity = 90-100%
 - mortality = 5-70% (average of 10-20%)



Infectious Laryngotracheitis (ILT)

- Clinical signs:
 - Variable (depends on pathogenicity of strain)
 - Highly pathogenic
 - acute dyspnea, gasping
 - head shaking
 - expectoration of blood-stained mucus
 - Low pathogenic
 - None to conjunctivitis, lacrimation, nasal discharge, decreased egg production



Infectious Laryngotracheitis (ILT)

