Class AVES
Order PSITTACIFORMES

Parrots, macaws, conures, lovebirds, parrots, parrotlets, lories, lorikeets, parakeets, cockatoos, cockatiels

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Diagnostic and therapeutic techniques

The Basics of Diagnosis

- History
- Physical examination

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Diagnostic and therapeutic techniques

Routine Diagnostics

- Fecal examination
- Cloacal and choanal cultures
- Baseline bloodwork
- Serology
- Radiology

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Fecal examination

- Direct (saline)
- Flotation
- Gram stain

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Routine Cultures

• Choanal cultures
• Cloacal cultures
Diagnostic and therapeutic techniques

Routine Blood Work

Sample collection

- Jugular vein
- Cutaneous Ulnar vein
- Metatarsal vein

- Volumes not to exceed 1% of body weight in grams

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Avian Blood Cells

- Red blood cells
- Heterophils
- Eosinophils
- Basophils
- Lymphocytes
- Monocytes
- Thrombocytes

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Serum Chemistry
– minimum database

- Uric acid
- Total protein
- Calcium
- Phosphorus
- Glucose
- Aspartate transaminase (AST)
- Bile acids
Diagnostic and therapeutic techniques

Serology, PCR etc.

- Viral screening
  - Poultry viruses – many!!
  - Polyomavirus
  - Psittacine Beak & Feather Disease (circovirus)
  - Environmental screening options

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Diagnostic and therapeutic techniques

Serology, PCR etc.

- Aspergillus testing
  - Serology
  - Protein electrophoresis

- Chlamydia testing
  - Antigen vs. antibody testing
  - PCR

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Sex determination

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Diagnostic and therapeutic techniques

Fluid Therapy - Hydration needs

- Daily maintenance

\[ \text{ml/day} = 78 \times \text{BW}^{0.75} \]

- Degree of dehydration
- Continuing losses
Diagnostic and therapeutic techniques

Therapeutic Administration

- Oral
- Subcutaneous
- Intramuscular
- Intravenous
- Intraosseous – distal ulna
- Nebulization
Nebulization

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# Avian Anesthesia

<table>
<thead>
<tr>
<th>Injectable</th>
<th>vs</th>
<th>Inhalation</th>
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<tbody>
<tr>
<td>Dose response variable</td>
<td></td>
<td>Predictable response</td>
</tr>
<tr>
<td>Non-reversible</td>
<td></td>
<td>Easily titratable</td>
</tr>
<tr>
<td>Difficult recovery</td>
<td></td>
<td>Rapid recovery</td>
</tr>
<tr>
<td>Higher risk</td>
<td></td>
<td>Much safer</td>
</tr>
<tr>
<td>Portable</td>
<td></td>
<td>Requires machine</td>
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</tbody>
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Avian Anesthesia
Isoflurane anesthesia

- **Mask only** procedures 15-20 minutes
- **Intubation** for longer procedures or if ventilation is needed in short procedures
- Some mechanical/manual ventilation is **always** required for longer procedures

Sevoflurane also OK, but not much better

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Principles of Avian Surgery

- Hemostasis
- Precision
- Speed
Review of Pet Bird DISEASES

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Nutrition
Seed Based Diets

Deficient in:
- Calcium
- Vitamin A
- Iodine
- Essential amino acids

High in:
- Energy
- Fat
- Carbohydrates
Nutrition

Optimal Pet Bird Diet

- Seeds (?)
- Pellets
- Fresh unprocessed foods
- Fresh water
Nutritional Diseases

• Vitamin A deficiency
  Squamous metaplasia
  • Respiratory tract
  • GI tract
  • Urinary tract
  • Reproductive tract
Vitamin A deficiency

- **Diagnosis**
  - Dietary history
  - Clinical signs
  - Biopsy?
- **Treatment**
  - Correct diet
  - Vitamin A injection
  - Surgery if necessary
- **Prevention**
  - Ensure adequate dietary sources of Vitamin A
Nutritional Diseases

- Calcium imbalance (deficiency)
  - Egg binding
  - Pathological fractures
  - Unthriftiness
  - Hypocalcemia of African Grey Parrots – need more UVB!

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Nutritional Diseases

• Iodine deficiency

Goiter in Budgerigars
Nutritional Diseases

- Obesity
  - Hepatic lipidosis
Behavior

Feather picking/self mutilation

- Rule out non-environmental causes of dermatitis
  - allergic dermititis
  - liver disease
  - intestinal irritation
  - viral diseases
  - endocrine disorders
- Diagnosis through history and comprehensive testing
- Treat underlying cause
- Control self mutilation

Appreciate natural behaviors
- Very intelligent social animals
- Travel miles between foraging sites
- Spend 3-6 hrs/day foraging for food
- Seek out huge variety
- – 58 species of indigenous plant material

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Major Psittacine Viral Diseases

Respiratory system
Paramyxovirus
Amazon tracheitis
Psittacine pox

Hepatobiliary system
Herpesvirus (Pachecos)
Polyomavirus
Adenovirus
Reovirus

Skin
Psittacine pox
Psittacine beak and feather disease
Psittacine polyomavirus
Herpesvirus

CNS
Paramyxov

Gastrointestinal system
Proventricular dilatation syndrome
Paramyxovirus
Herpesvirus (Pachecos)

Hemolymphatic system
Avian leukosis (?)

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Viral Diseases
Psittacine Hepatitis

Common clinical signs

- Anorexia
- Vomiting/regurgitation
- Diarrhea
- Change in color of feces/urates

Basic treatment

- Isolation
- Fluid therapy
- Nutritional support
- Lactulose
- Antibiotics
Viral Diseases

Psittacine Hepatitis

- Herpesvirus
- Papovavirus/Polyomavirus
- Adenovirus
- Reovirus
- **Ruleout** Bacterial hepatitis
  - Parasitic hepatitis
  - Chlamydiosis
  - Toxic hepatitis
  - Hepatic lipidosis
Viral Diseases
Psittacine Herpesvirus
Hepatitis

Pacheco's disease
Viral Diseases

Psittacine Herpesvirus Hepatitis

• All psittacines susceptible
• High mortality
• Clinical signs
  Sudden death, anorexia, depression, yellow diarrhea, systemic signs
• Diagnosis
• Treatment
• Asymptomatic carriers?? Conures?
Viral Diseases

Polyomavirus

- Small psittacines  “budgie fledgling disease”
  “French molt”
- Large psittacines  hepatitis
Viral Diseases

Polyomavirus in larger psittacines

- Primarily affects young birds
- Clinical signs
  - sudden death, subQ hemorrhage, GI signs, systemic signs
- Diagnosis
  - antibody titers, PCR
- Treatment and control
  - Serology on blood
  - PCR on feces, blood, environment
Viral Diseases

Psittacine Beak and Feather Ds.

- "French molt" in Australian budgies
- Circovirus
- Exposure early in life leads to more severe disease
- Epidermal necrosis (feather dystrophy), bursal and thymic atrophy (immunosuppression)

Diagnosis and Control

- PCR on blood, environment
- Feather biopsy
Viral Diseases

Proventricular Dilatation Syndrome

“Neuropathic gastric dilatation”
“Macaw wasting disease”

• Clinical signs
  - Wasting
  - Regurgitation
  - Neurologic signs

• Diagnosis
  - Radiographs
  - Biopsy – myenteric plexis?
  - ddx. gastritis, heavy metals, foreign body

• Treatment
  - Supportive
  - NSAIDS (Celebrex)

ETIOLOGY DISCOVERED: Bornavirus

NEW fatal

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Major Psittacine Bacterial Diseases

**Respiratory Diseases**
- Spontaneous bacterial disease

**Enteric Diseases**
- Spontaneous bacterial disease

**Systemic Diseases**
- Avian chlamydiosis
- Mycobacteriosiis
Bacterial diseases

Psittacine Normal Flora

• Respiratory tract
• Gastrointestinal tract

*predominantly gram* +
Bacterial diseases

Spontaneous Bacterial Enteritis

- Stress associated disease
- Overgrowth of common commensals
Bacterial diseases

Spontaneous Bacterial Respiratory Diseases

- Stress associated disease
- Overgrowth of common commensals
- Underlying Vitamin A deficiency
Bacterial diseases

Mycobacteriosis

*M. avium*

- Ubiquitous
- *M. paratuberculosis* similarities
- Pre-mortem dx. difficult
- Treatment options
- NOT reportable

*M. tuberculosis*  ~ REPORTABLE
Bacterial diseases

Chlamydiosisis

• REPORTABLE DISEASE but
• NOT EXOTIC
• Important zoonosis
• Endemic in the U.S. in captive and wild birds

Review Compendium on Chlamydia
Chlamydiosis

Characteristics of the organism

• Chlamydophila

*Chlamydophila psittaci*

• Obligate intracellular bacteria
• Elementary body (infectious)
• Reticulate body (vegetative)

Asymptomatic carrier state
Chlamydiosis

Disease in Psittacines

Acute disease

- upper respiratory/air sacculitis
  - Anorexia
  - Dyspnea
  - Nasal discharge

- hepatitis
  - Anorexia
  - Vomiting
  - Diarrhea

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Chlamydiosis

Disease in Psittacines

Chronic disease

- poor feathers
- chronic respiratory problems
- chronic diarrhea

Asymptomatic carriers

- no clinical signs
- intermittent shedding
- may become acutely ill » sudden death

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Chlamydiosis

Diagnosis

History

Clinical signs

Basic diagnostics
  • CBC
  • Profile
  • Radiographs

Laboratory tests
  • Culture
  • Serology
  • Feces/tissue antigen
  • PCR

Postmortem

Don’t rely on lab tests alone!

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Chlamydirosis

Treatment

• Antibiotics
  x 45 days
• Supportive care
• Isolation for at least 5 days

Tetracyclines:
  Chlortetracycline
  Oxytetracycline
  Doxycycline
Fluoroquinalones
Azithromycin
Chlamydiosis

Disease in people

- Incubation 5-14 days
- Fever, cough headache, weakness, fatigue, chills, myalgia, etc.
- Dx. with radiographs, serology
- Antibiotic therapy 7-10 days
- IMPORTANT to alert physician!!
Fungal diseases
Candidiasis

- Young unweaned birds “sour crop”
- 2nd to antimicrobial therapy
- Diagnosis
  - history & clinical signs
  - cytology/culture
- Treatment
  - nystatin, ketoconazole, fluconazole

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Fungal diseases

Avian Gastric yeast

- Budgies (other psittacines), canaries, finches, ostrich
- Chronic wasting and death
- Attacks koilin layer in gizzard
- Tx. With ORAL amphotericin B
- Prognosis guarded

Macrorhabdus ornithogaster

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Fungal diseases

Avian Gastric yeast

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Fungal diseases

Aspergillosis

• Sensitive species
  raptors, penguins, waterfowl, psittacines, poultry
• Secondary to immunosuppression (e.g. other chronic conditions)
• Secondary to antibiotic usage
• Exposure to high concentrations in the environment
Aspergillosis
Clinical signs

- Air sacculitis, granulomatous pneumonia, rhinitis
- Weakness, anorexia, weight loss
- Dyspnea/exercise intolerance
- +/- Nasal discharge
- Sudden death
Aspergillosis

Diagnosis

• History and clinical signs
• Radiographs
• Laparoscopy
• Serology/protein electrophoresis
  • interpretation problematic
• Cytology/culture
Aspergillosis

Treatment

• EARLY DIAGNOSIS!
• Amphotericin B + flucytosine
• Itraconazole
• Enilconazole, fluconazole, etc.
• Supportive care
• Prevention?

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Parasitic diseases
External Parasites

- Knemidokoptes mites
Parasitic diseases

Other Parasites

Air sac/tracheal mites in Canaries

• *Sternastoma tracheocolum*
Parasitic diseases

Other Parasites

Hemoparasites in wild caught or outdoor birds

- Leukocytozoon
- Hemoproteus
- Plasmodium "avian malaria“ in penguins
Toxic diseases

Lead Poisoning

Clinical signs
- anorexia
- diarrhea or GI stasis
- vomiting
- PU/PD
- hematuria
- muscle weakness
- paralysis
- ataxia
- blindness
- seizures
- death

→ Amazons ONLY

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Toxic diseases
Lead Poisoning

**Diagnosis**
- history
- clinical signs
- CBC
- radiographs
- blood lead levels

**Treatment**
- eliminate source
- CaEDTA
- Penicillamine
- Succimer
- Prognosis?
Toxic diseases

Zinc toxicosis

- New wire disease
- Galvanized metals
- Clinical signs similar to lead
- Diagnosis
- Treatment - CaEDTA
Toxic diseases

Teflon

polytetrafluoroethylene
Metabolic diseases

Gout

- Uric acid metabolism
- Hyperuricemia
- Visceral gout
- Articular gout
Metabolic diseases

Diabetes Mellitus

- Budgies, toucans, ducks, others
- Glucagon dependent (++) α cells
- Clinical signs typical
- Diagnosis - blood/urine glucose
- Treatment?
Reproductive disorders

Chronic egg laying

• Common in cockatiels/finches

• Consequences
  • Calcium depletion
  • Egg binding
  • Prolapse

• Treatment
  – Environmental
  – Hormonal
  – Surgical

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Reproductive Disorders

Egg binding

• Common in cockatiels/finches
• Calcium deficiency?
• Diagnosis
• Treatment
  • Heat and moisture
  • Medical – Ca, Oxytocin, PGE, lubrication
  • Surgical

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Neoplastic diseases

- Renal & Gonadal Tumors
  - Budgies
  - Unilateral lameness
- Many others….
Passeriformes
(Finches and Canaries)

- Feather cysts
- Egg-binding
- Trauma

- Pox
- Chlamydia resistant?
- Atoxoplasma
- Air Sac mites

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Toucans (Ramphastids)

- Dietary management important
- Beak fractures/problems for captive birds
- Hemochromatosis
- Diabetes Mellitus
- *Yersinia pseudotuberculosis*
Pigeons

- Pigeon pox
- Pigeon paramyxovirus (PMV-1)
- Chlamydia
- Candida
- Trichomonas

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RATITES
(ostrich, emu, rheas)

- Trauma
- Angular limb deformities
- Foreign body ingestion/impaction
- Eastern encephalitis
- Avian influenza
Waterfowl

- Duck plague, DVE, herpes **REPORTABLE**
- Duck viral hepatitis
- Avian cholera - *Pasteurellosis*
- Botulism
- Aspergillosis
- Lead poisoning
- Bumblefoot
Raptors

- Trauma
- Starvation
- Bumblefoot
- Aspergillosis
- Trichomonas
- Capillaria