PARROTS
• Class AVES
• Order PSITTACIFORMES

Parrot Conservation - Laws and Regulations governing pet birds
• CITES
• Wild Bird Conservation Act
• State and local laws

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 foods

Nutritional Diseases - Vitamin A deficiency
• Squamous metaplasia

Nutritional Diseases - Calcium imbalance (deficiency)
• Egg binding
• Pathological fractures
• Unthriftiness
• Hypocalcemia of African Grey Parrots

Nutritional Diseases - Iodine deficiency
• Goiter in Budgerigars

Nutritional Diseases - Obesity

Preventative Medicine - Routine Grooming
Behavior - Feather picking/self mutilation
- Rule out non-environmental causes of dermatitis
  - liver disease
  - intestinal irritation
  - viral diseases
  - endocrine disorders
- Diagnosis through history and comprehensive testing
- Treat underlying cause
- Control self mutilation

Diagnostic and therapeutic techniques - The Basics of Diagnosis
- History
- Physical examination

Diagnostic and therapeutic technique - Routine Diagnostics
- Fecal examination
- Cloacal and choanal cultures
- Baseline bloodwork
- Serology
- Radiology

Diagnostic and therapeutic techniques - Fecal examination
- Direct (saline)
- Flotation
- Gram stain

Diagnostic and therapeutic techniques - Routine Cultures
- Choanal
- Cloacal cultures

Diagnostic and therapeutic techniques - Routine Blood Work
- Sample collection
- Jugular vein
- Cutaneous Ulnar vein
- Metatarsal vein

Diagnostic and therapeutic techniques - Avian Blood Cells
- Red blood cells
- Heterophils
- Eosinophils
- Basophils
- Lymphocytes
- Monocytes
- Thrombocytes
Diagnostic and therapeutic techniques - Serum Chemistry
- Uric acid
- Total protein
- Calcium
- Phosphorus
- Glucose
- Aspartate transaminase (AST)
- Bile Acids

Diagnostic and therapeutic techniques - Sex determination

Diagnostic and therapeutic techniques - Fluid Therapy/Hydration needs
- Daily maintenance
- Degree of dehydration
- Continuing losses

Diagnostic and therapeutic techniques - Fluid Therapy/Methods
- Oral - Passive or Gavage
- Subcutaneous
- Intravenous
- Intraosseous – distal ulna

Diagnostic and therapeutic techniques - Nebulization

AVIAN RADIOLOGY review powerpoint file and images on TUSK
http://tusk.tufts.edu/hsdb4/content/V1177C/26859/26864/12231

AVIAN ANESTHESIA AND SURGERY

Avian Anesthesia
- Injectable vs.
  - Inhalation

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

Principles of Avian Surgery
- Hemostasis
- Precision
- Speed
DISEASES

<table>
<thead>
<tr>
<th>Major Psittacine Viral Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respiratory system</strong></td>
</tr>
<tr>
<td>Paramyxovirus</td>
</tr>
<tr>
<td>Amazon tracheitis</td>
</tr>
<tr>
<td>Psittacine pox</td>
</tr>
<tr>
<td><strong>Hepatobiliary system</strong></td>
</tr>
<tr>
<td>Herpesvirus (Pachecos)</td>
</tr>
<tr>
<td>Polyomavirus</td>
</tr>
<tr>
<td>Adenovirus</td>
</tr>
<tr>
<td>Reovirus</td>
</tr>
<tr>
<td><strong>Skin</strong></td>
</tr>
<tr>
<td>Psittacine pox</td>
</tr>
<tr>
<td>Psittacine beak and feather disease</td>
</tr>
<tr>
<td>Psittacine polyomavirus</td>
</tr>
<tr>
<td>Herpesvirus</td>
</tr>
</tbody>
</table>

Viral Diseases - Psittacine Hepatitis
Common clinical signs
- Anorexia
- vomiting/regurgitation
- Diarrhea
- Change in color of feces/urates

Viral Diseases - Psittacine Hepatitis
Basic treatment
- Isolation
- Fluid therapy
- Nutritional support
- Lactulose
- Antibiotics

Viral Diseases - Psittacine Viral Hepatitis
- Inclusion Body Hepatitis
- Reovirus
- Ruleout Bacterial hepatitis
  - Parasitic hepatitis
  - Chlamydiosis
  - Toxic hepatitis
  - Hepatic lipidosis
Viral Diseases - Inclusion Body Hepatitis
  • Herpesvirus
  • Papovavirous
  • Adenovirus

Viral Diseases - Psittacine Herpesvirus Hepatitis
  • Pacheco’s disease
  • All psittacines susceptible
  • High mortality
  • Clinical signs
  • Sudden death, anorexia, depression, yellow diarrhea, systemic signs
  • Diagnosis
  • Treatment
  • Asymptomatic carriers?? Conures?

Viral Diseases - Papovavirus
  • Papillomavirus
  • Polyomavirus
    - Small psittacines
    - Large psittacines

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
    - PCR on blood, feces, environment
    - Serology

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”
**Viral diseases** - West Nile Virus
- Psittacines seem to be susceptible

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### Major Psittacine Bacterial Diseases

<table>
<thead>
<tr>
<th><strong>Respiratory diseases</strong></th>
<th><strong>Enteric diseases</strong></th>
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<tbody>
<tr>
<td>Spontaneous bacterial disease</td>
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</tr>
<tr>
<td>Avian mycoplasmosis</td>
<td></td>
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</tbody>
</table>

**Systemic diseases**
- Mycobacteriosis
- Avian chlamydiosis

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**Bacterial diseases** - Psittacine Normal Flora
- Respiratory tract
- Gastrointestinal tract

**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** - Chlamydiosis
- REPORTABLE DISEASE but
- NOT EXOTIC
- Important zoonosis
- *Endemic* in the U.S. in captive and wild birds
**Chlamydiosis - Characteristics of the organism**
- Reclassification - *Chlamydophila psittaci*
- Obligate intracellular bacteria
- Elementary body (infectious)
- Reticulate body (vegetative)

**Chlamydiosis - Disease in Psittacines**
- Acute disease
  - upper respiratory/air saccultitis
    - anorexia, dyspnea, nasal discharge
  - hepatitis - anorexia, vomiting, diarrhea

**Chlamydiosis - Disease in Psittacines**
- Chronic disease
  - poor feathers
  - chronic respiratory problems
  - chronic diarrhea

**Chlamydiosis - Disease in Psittacines**
- Asymptomatic carriers
  - no clinical signs
  - intermittent shedding
  - may become acutely ill >>sudden death

**Chlamydiosis - Diagnosis**
- History
- Clinical signs
- Basic diagnostics
  - CBC
  - Profile
  - Radiographs
- Laboratory Tests
  - Culture
  - Serology (many)
  - Feces/tissue antigen
  - PCR
- Postmortem

**Chlamydiosis - Postmortem diagnosis**
- Zoonotic precautions
- Gross lesions
- Imprints from air sac, liver, spleen
- Histologic lesions
**Chlamydiosis - Treatment**
- Antibiotics – tetracyclines, Doxycycline* x 45 days
- Supportive care
- Isolation for at least 5 days

**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

**Fungal diseases – Avian Gastric Yeast/Cryptococcus magnus**
- formerly Megabacteriosis
- Budgies (other psittacines), canaries, finches, ostrich
- Chronic wasting and death
- Attacks koilin layer in gizzard
- Diagnosis based on clinical signs, fecal gram stain
- Treatment with amphotericin B, others
- Prognosis poor

**Fungal diseases - Aspergillosis**
- Sensitive species
- raptors, penguins, waterfowl, psittacines, poultry
- Secondary to immunosuppression
- Exposure to high concentrations in the environment

**Aspergillosis - Clinical signs**
- Air sacculitits, 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
- Cytology/culture

Aspergillosis - Treatment
- EARLY DIAGNOSIS!
- Amphotericin B + flucytosine
- Itraconazole, enilconazole, fluconazole, etc.
- Terbinafine (Lamisil)
- Supportive care
- Prevention?

Parasitic diseases - External Parasites
- Knemidokoptes mites

Parasitic diseases - Intestinal Parasites
- Protozoa
  - Coccidia
  - Trichomonas gallinae
  - Giardia lamblia
  - Toxoplasma, sarcocystis, cryptosporidium
  - Atoxoplasma - canaries

Parasitic diseases - Other Parasites
- Air sac/tracheal mites
- *Sternastoma tracheocolum*
- Gapeworms
- *Syngamus trachea*

Parasitic diseases - Other Parasites
- Hemoparasites
- Leukocytozoon
- Hemoproteus
- Plasmodium "avian malaria"

Toxic diseases - Lead Poisoning -Clinical signs
- anorexia
- diarrhea or GI stasis
- vomiting
- PU/PD
- Hematuria
- Muscle weakness
- Paralysis
- Ataxia
- Blindness
- Seizures
- death
**Toxic diseases - Lead Poisoning - Diagnosis**
- history
- clinical signs
- CBC
- radiographs
- blood lead levels

**Toxic diseases - Lead Poisoning - 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?

**Metabolic diseases - Hemochromatosis**
- Mynah birds, birds of paradise, questzals, ramphastids (toucans)

**Reproductive disorders – Chronic egg laying**
- Common in cockatiels/finches
- Consequences - Calcium depletion, egg binding, prolapse
- Treatment – Environmental, hormonal, surgical
Reproductive disorders – Egg binding
- Common in cockatiels/finches
- Calcium deficiency?
- Diagnosis
- Treatment
  - Heat and moisture
  - Medical – Ca, Oxytocin, PGE, lubrication
  - Surgical

Neoplastic Diseases – Renal and gonadal tumors
- Budgies
- Unilateral lameness

NON-PSITTACINES

Passeriformes
(Finches and Canaries)
- Feather cysts
- Egg binding
- Trauma
- Air sac Mites
- Pox
- Atoxoplasma
- Chlamydia resistant

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
**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*
- *P. riemerella*
- Botulism
- Aspergillosis
- Lead poisoning
- Bumblefoot

**Raptors**
- Trauma
- Starvation
- Bumblefoot
- Aspergillosis
- Trichomonas
- Capillaria