Exotic Pets Medicine Basics

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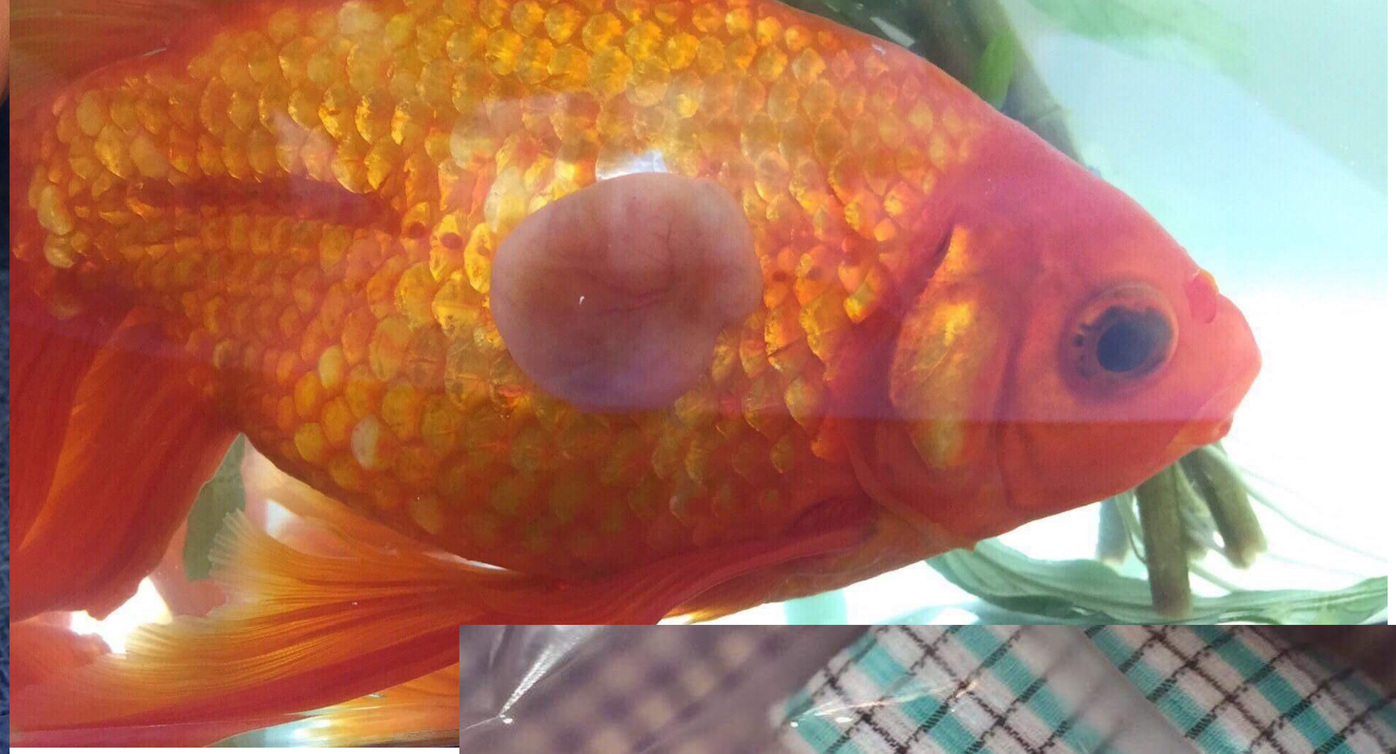
16/4/22

A little about me

- **Education**
  - Bachelors of Veterinary Science BVSc Massey University 2010
- **Work**
  - Clinical lead veterinarian with Pet Doctors St Lukes in Auckland New Zealand, with a focus on exotic pets 2013-present
- **Further studies**
  - Member of the Australian New Zealand College of Veterinary Scientists ANZCVS (Avian Medicine and Surgery) 2021


CHLOE

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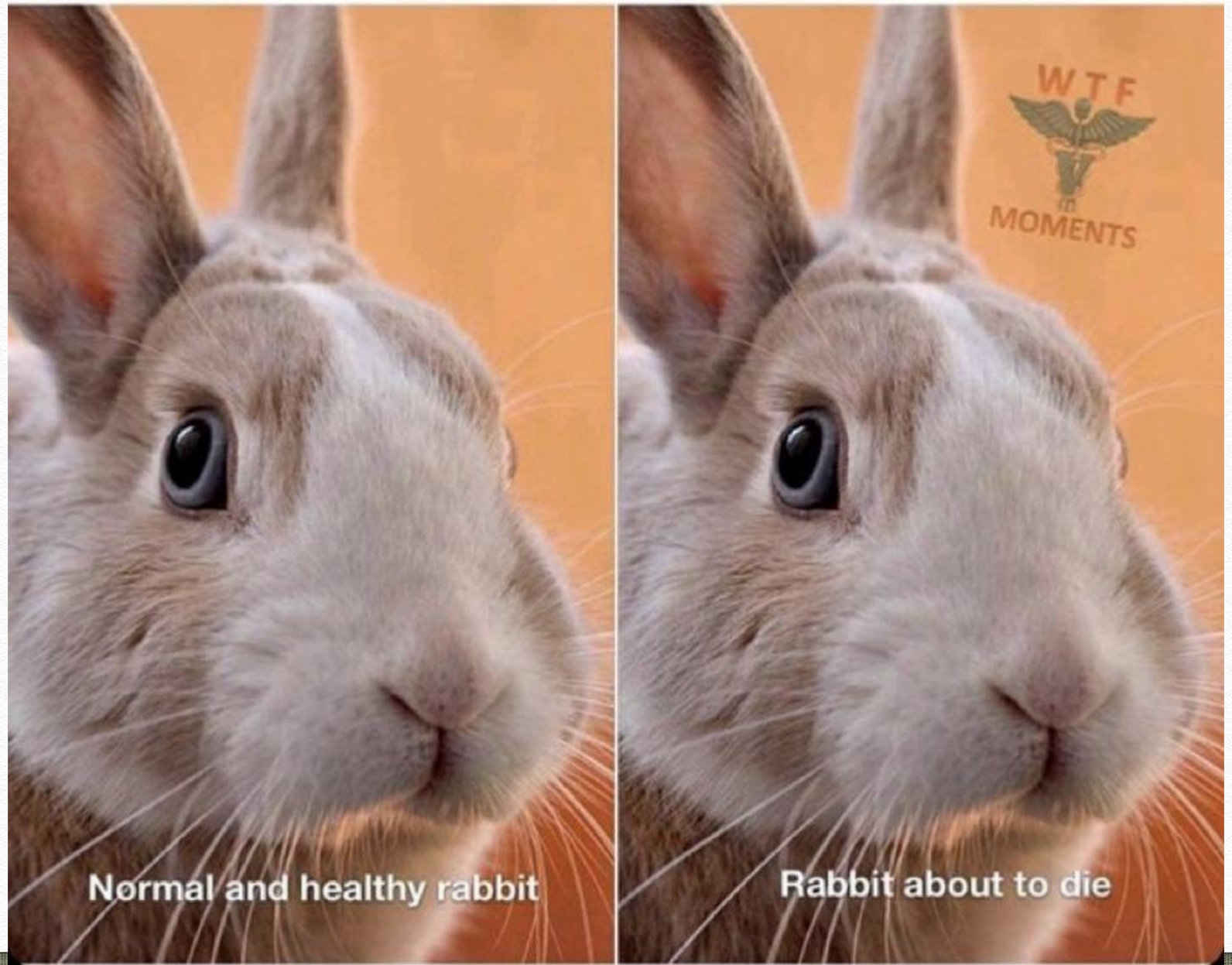
A little about me

- What do I mean by exotic pets? What animals do I see?

Now a little about you

- What exotic pets do you see?
- What is your biggest challenge with exotics?
- What do you like about exotic pets medicine?

Exotics be like



Exotic Pets Medicine Truths

- They DO show disease at a more advanced stage of illness
- They DO die more quickly
- It DOES take more effort (and $) to save the FEWER that make it

…even till it is rewarding

Exotic Pets Medicine Truths

- It is rewarding because
  - The variety keeps you on your toes, it’s never boring
  - When the animals do well you really feel the difference
  - With the right client expectations, the clients are truly appreciative for someone willing and able to see their extraordinary pets

- The meme is not true, to the discerning eye

…so how do we discern? Focused on rabbits and birds

Frequently Asked Questions

1. Variety is challenging and fun!

2. Anything other than cats & dogs is called exotic in NZ…

3. The diagnostic approach…

The Diagnostic Approach

Diagnostic Approach

- **Definition**
  a systematic approach to diagnose any medical conditions

- Be diligent with the thinking process

  - signalment, history, clinical exam, diagnosis, prognosis, treatment, prevention

Diagnostic Approach

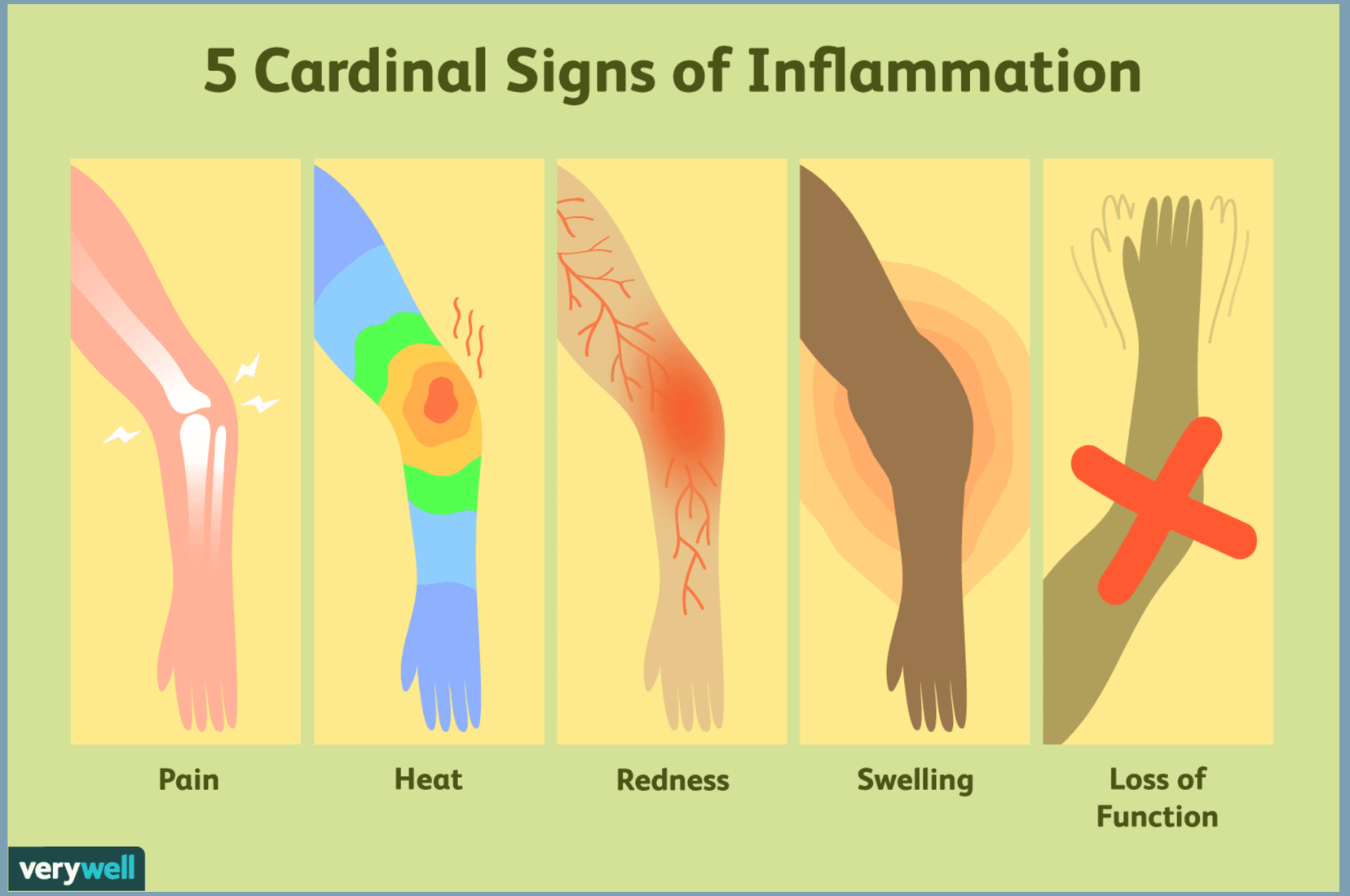
- **Signalment** - Species, breed, gender, age
- **History** - Primary, secondary, **tertiary (husbandry, diet, social, reproductive, medical, preventative)**
- **Clinical exam** - **Distance** and physical exam (signs of inflammation)

Pop Quiz Time!

Question 1

What are the 5 signs of inflammation?

Answer


5 Cardinal Signs of Inflammation
Pain
Heat
Redness
Swelling
Loss of Function
verywell

At the end of the clinical exam
a body system of interest should be established

Diagnostic Approach

- **Diagnostic tests** - focused on the body system of interest
- **Diagnosis/ses** (differential… then tentative, definitive)

If you don’t have a body system of interest…
its never wrong to obtain the minimum database
(bloods, urinalysis, (crop) faecal cytology, radiographs)

1. DAMNIT scheme

D - developmental/congenital, degenerative

A - allergic

M - metabolic

N - **nutritional**, neoplastic

I - **infectious**, immune-mediated, ischaemic, idiopathic

T - toxic, traumatic

- Where in cats and dogs we deal with developmental/congenital conditions, allergic conditions

… in exotics many things are **husbandry/dietary** and are thus preventable

Pop Quiz Time!

Question 2

What are the 4 types of infections and
which two are most common in exotic pets?

Answer

Parasitic
Fungal
Bacterial
Viral

Basically there is a lack of detection and treatment of parasitic conditions in exotic pets, worsened by poor husbandry…

Diagnostic Approach

- **Prognosis**
- **Treatment** (often trial treatment that is revisited)
- **Prevention**

Gear useful for exotic pets veterinary care

- **For consult** - Towels, small scales, weight box/stand
- **For diagnostics** - Insulin syringe/needles, crop needles
- **For therapeutics** - Incubator, fluid pump/warmers, special diets (eg. Oxbow critical care, Harrisons recovery, Hill's A/D)


QBLEEV


INTRAG
MEDICAL TECHS


LYON
CARE
LYONVET.COM

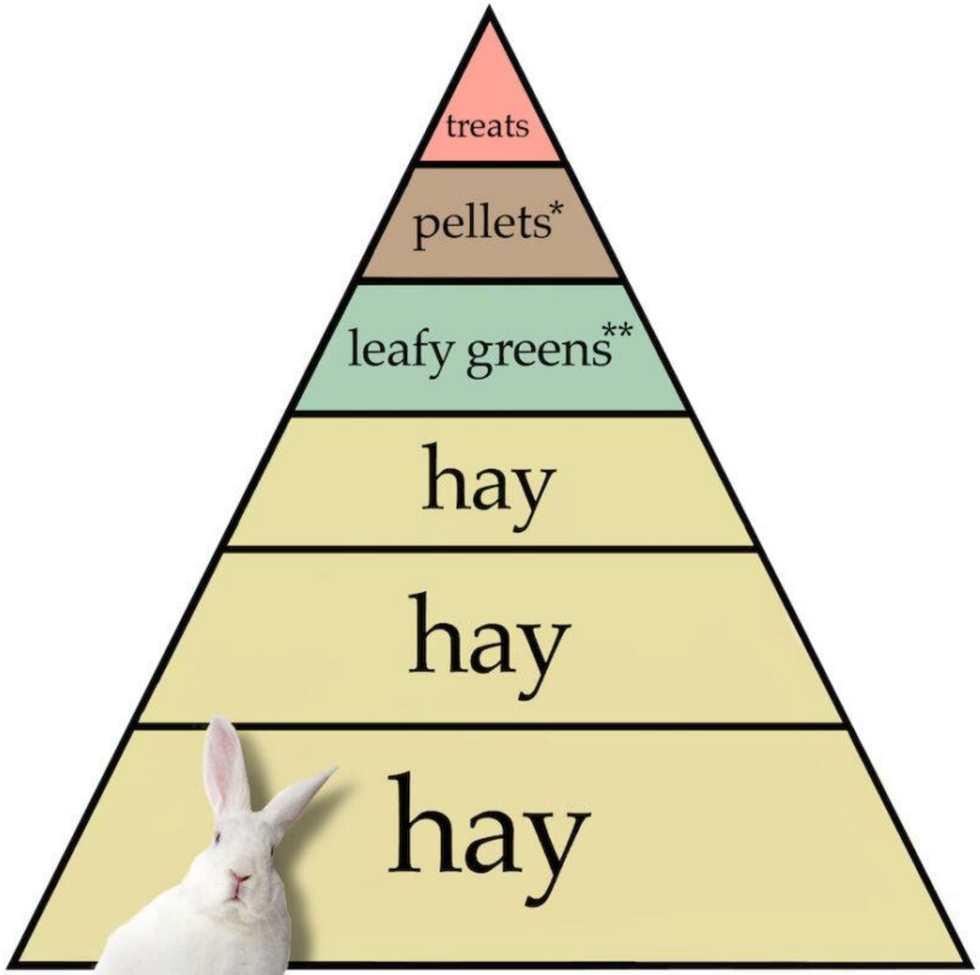

SCOOP INSIDE!
Pelle à l'intérieur
#1 Ingredient High Fiber Timothy Hay
Ingrédient principal : Foin de fléole des près riche en fibres
OXBOW
ANIMAL HEALTH
Critical Care®
HERBIVORE
A nutritionally-complete, versatile assist-feeding formula
Une formule nutritionnelle complète et polyvalente pour l'alimentation assistée
NATURAL ANISE FLAVOR
SAVEUR ANISÉE NATURELLE
For rabbits, guinea pigs, chinchillas, tortoises, iguanas, and other herbivorous species
Pour lapins, cochons d'Inde, chinchillas, tortues, iguanes et autres espèces herbivores
NET WT / POIDS NET : 16.01 OZ / 454 G


HARRISON'S
RECOVERY
PREMIUM HAND-FEEDING FORMULA
COMPLETE NUTRITIONAL SUPPORT FOR SICK OR INJURED ANIMALS
Net Wt. 350g

Rabbits conditions

Basic husbandry and diet

- **Social bonding** - one is ok, two is better (desexed)
- **Space** - as big as possible, at least 2x1m per rabbit with roaming
- **Substrate** - uneven substrate ideally, padded surfaces preferred
- **Hygiene** - at least once daily cleaning, weekly deep cleaning
- **Diet** - 80% fibre (grass/hay), 10% leafy veges, 5% carrots/fruits, 5% high quality pellets (Oxbow/Burgess)



2021 Revised Rabbit Food Pyramid

*1/4 to 1/3 cup pellets per 5 lbs. of body weight per day.
Dietary changes should be made gradually.

Basic preventative care

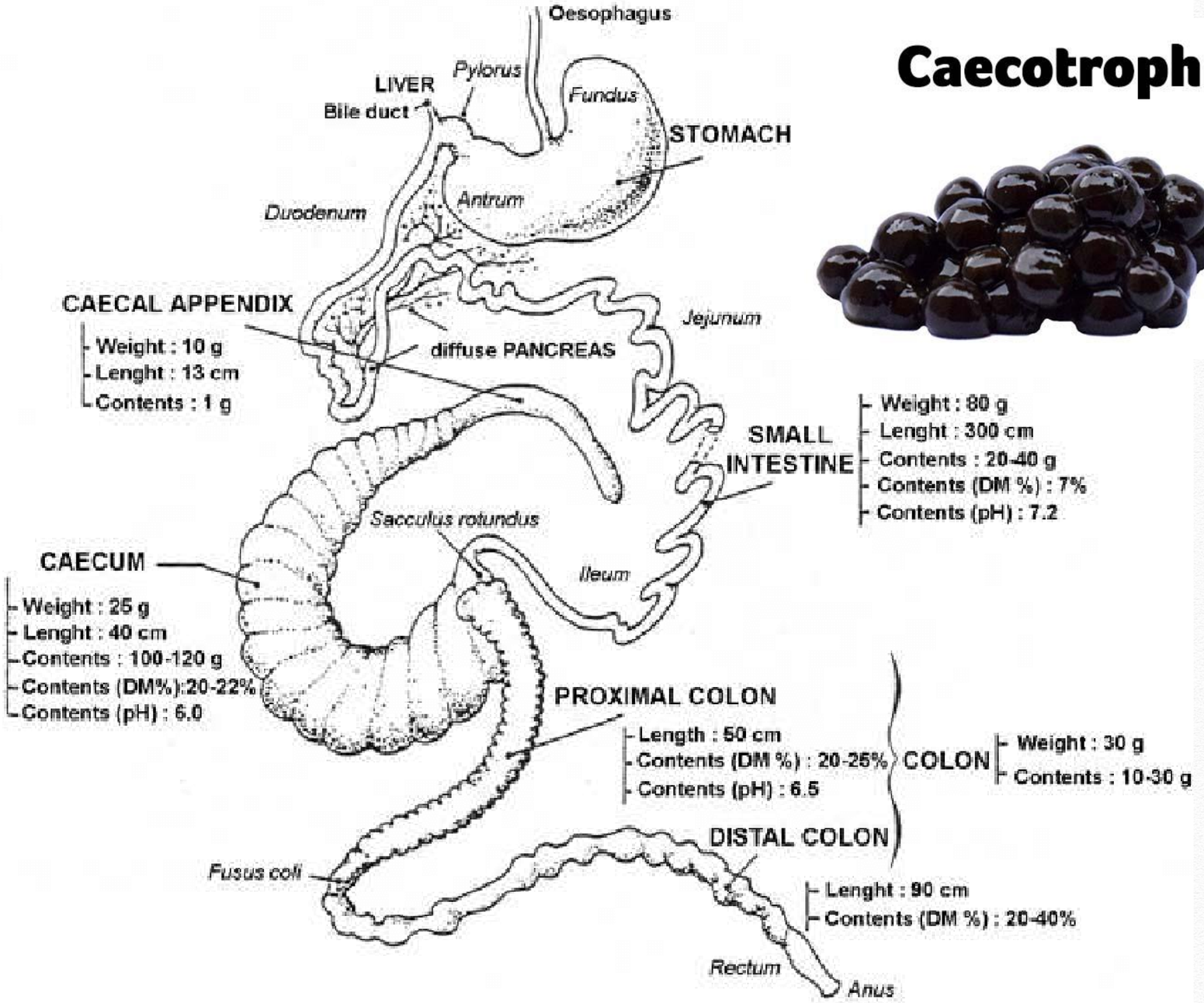
- **Microchipping** - they DO go missing
- **Desexing** - ideally at ~6 months, remember males are fertile 4 weeks post desexing, remember females have a very high >50% incidence of uterine cancer when over 5 yo.
- **Vaccinations** - calicivirus, myxomavirus (DEADLY)
- **Regular check ups** - 6 to 12 monthly

Rabbit Gut Diseases

1. Basic anatomical/physiological differences
2. Presentation and Signs
3. Exam and Diagnostics
4. Treatment and Prevention

1. Anatomical/Physiological Differences

- Hindgut fermenters with large caecum
- Caecotrophs and caecotrophy
- Faecal pellets
- Cannot vomit



Caecotroph

Pellets

2. Presentations and Signs

- Gut inflammation in cats and dogs usually cause vomiting or diarrhoea but in rabbits…

2. Presentations and Signs

- Diarrhoea - reduction to firmness of faecal pellets NOT caecotrophs
- Gut stasis - referring to any reduction to faecal pellet size and production, the most common result of gut inflammation
- Gastric dilatation - a subset of gut stasis that is an emergency condition like the GDV

3. Exam and Diagnostics

- Exam
  - Abdominal palpation - stomach and caecum size and consistency
  - Temperature

Question 3

What is the normal temperature for rabbits (and other small mammals)?

A. 36-37C

B. 38.5-39.5C

C. 40-41C

Answer

B. 38.5-39.5C is the normal range for rabbit/small mammal

- <36C is probably a rabbit that is in shock with a poor prognosis
- 36-37C indicates a sick rabbit that is probably hypovolaemic
- 40-41C indicates a fever

Type 1

Type 2

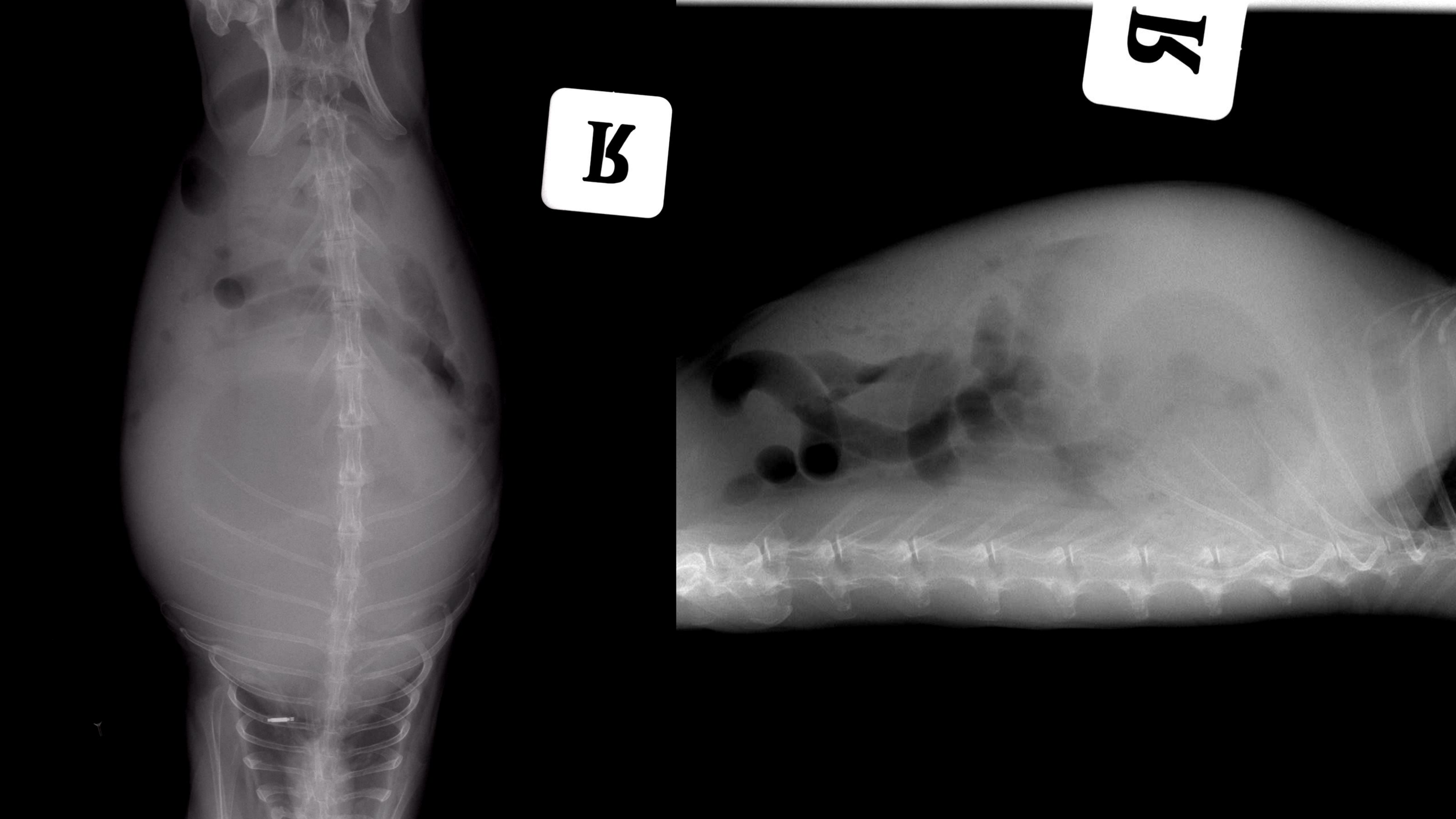
Type 3

Type 4

Type 5

Type 6

Type 7


B
B

3. Exam and Diagnostics

- Diagnostics
  - Regular faecal parasitology (direct wet mount/faecal float)
  - Bloods (CBC, biochemistry, blood glucose), radiographs for severe cases
    - BG >20mmol/L is a sign of shock and a poor prognostic indicator

4. Treatment and Prevention

- Medical treatment
  - Medications
    - Gut motility stimulants (Metoclopramide, Ranitidine, Cisapride)
    - Pain relief in acute stages (FLK CRI, methadone, buprenorphine, meloxicam)
    - Antiparasitic treatment (fenbendazole, toltrazuril/TMS)
  - Fluids IV or SQ
  - High fibre diet by syringe feeding

Question 4

What is the maintenance fluid rate for rabbits (and other small mammals)?

A. 100ml/kg/d

B. 60ml/kg/d

C. 50ml/kg/d

Answer

A. 100ml/kg/hr is the maintenance fluid rate for rabbits and other small mammals

4. Treatment and Prevention

- Surgical treatment
  - Gastric lavage tube under GA
  - Exploratory laparatomy for gastrotomy or to milk FB(trichobezoar) to caecocolon
- Prevention
  - Diet, parasite control, furball prevention (brushing, lactulose 0.5ml/kg)

Rabbit Dental Diseases

1. Basic anatomical/physiological differences
2. Presentation and Signs
3. Exam and Diagnostics
4. Treatment and Prevention

1. Anatomical/Physiological Differences

- Dental formula - I2/1, C0/0, P3/2, and M3/3, for a total of 28 teeth
- Premolars and molars simply referred to as cheek teeth, 6CTs in uppers, 5CTs in lowers
- Elondontic, hypsodontic teeth, growth rate 10mm/month

Question 5

What is the term used to describe continuously erupting teeth?

A. Hypsodontic
B. Elodontic
C. Endodontic

Answer

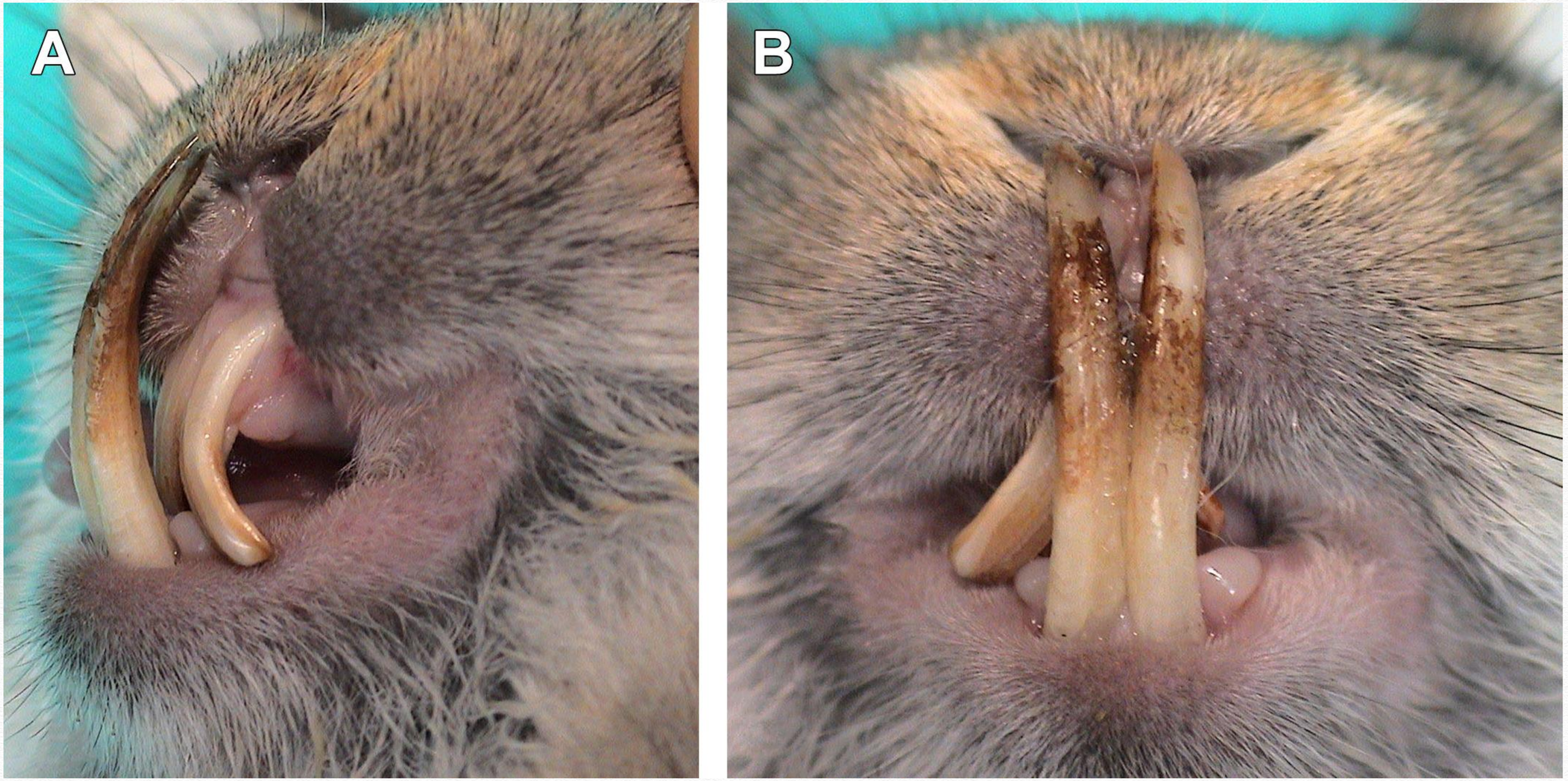
B. Elondontic means continuously erupting teeth

2. Presentations and Signs

- Dental abscessation
- Malocclusion
- Drooling/ underweight

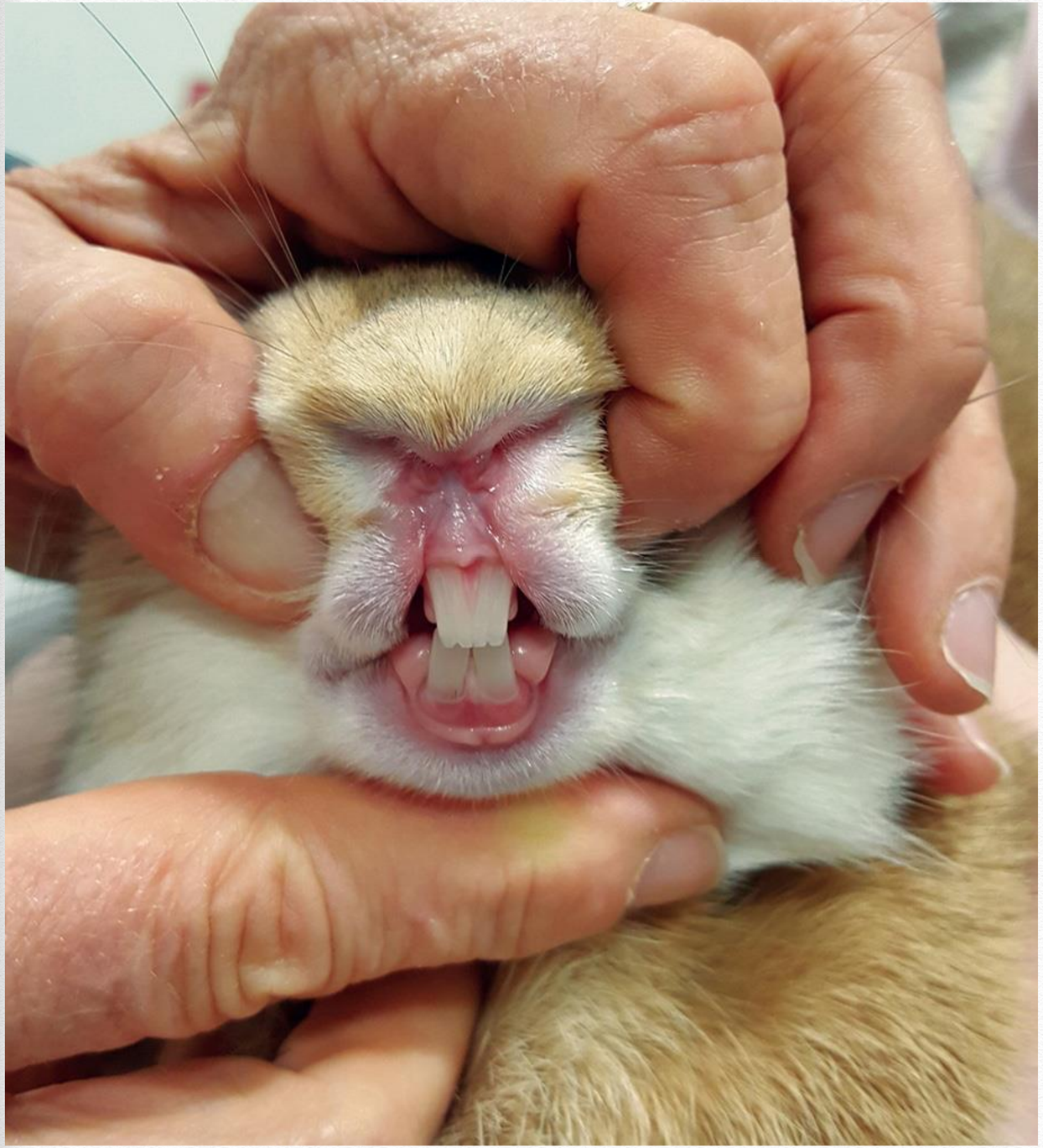
- Progressive syndrome of acquired dental disease (PSADD) encompasses such presentations

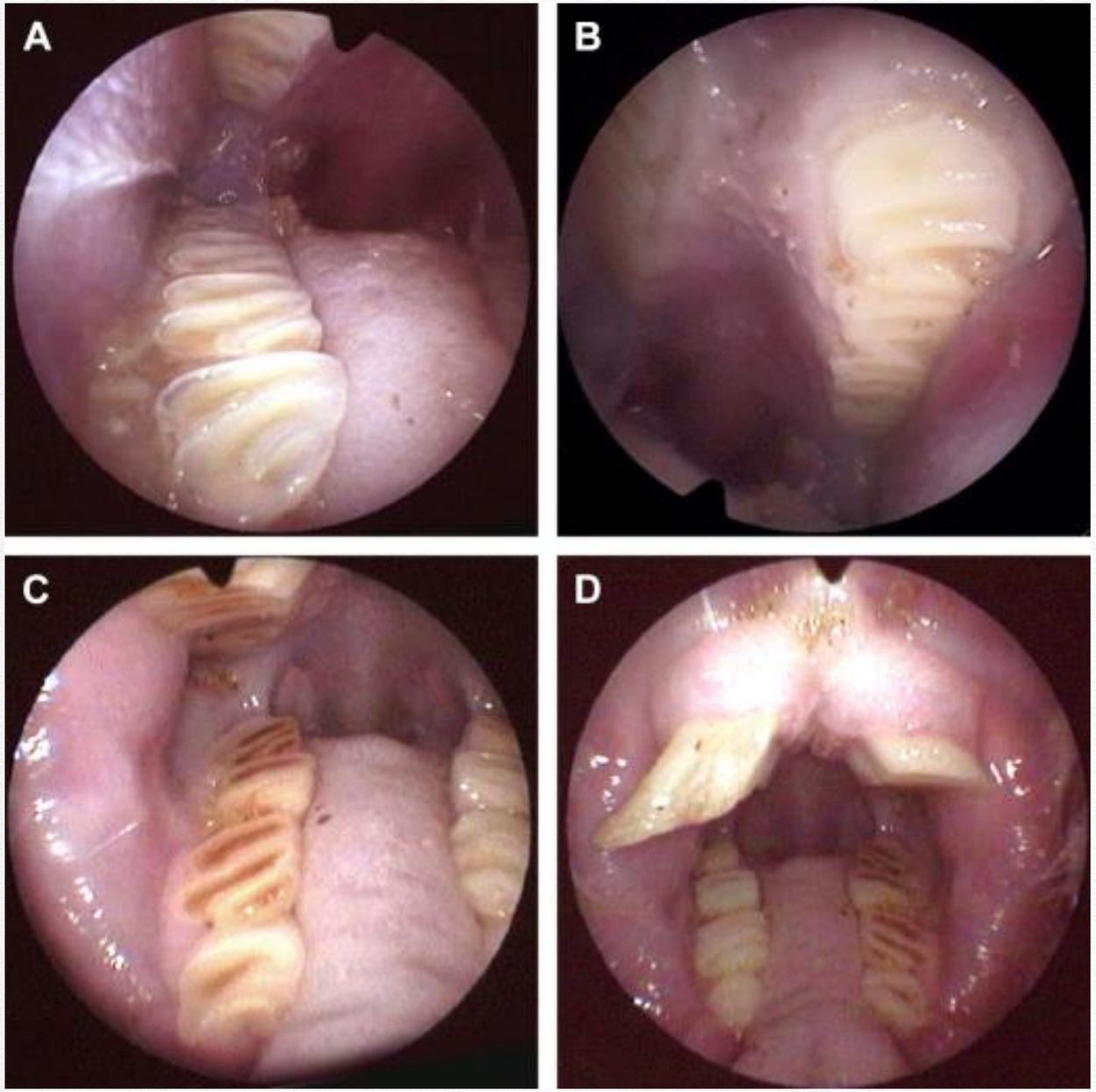

A

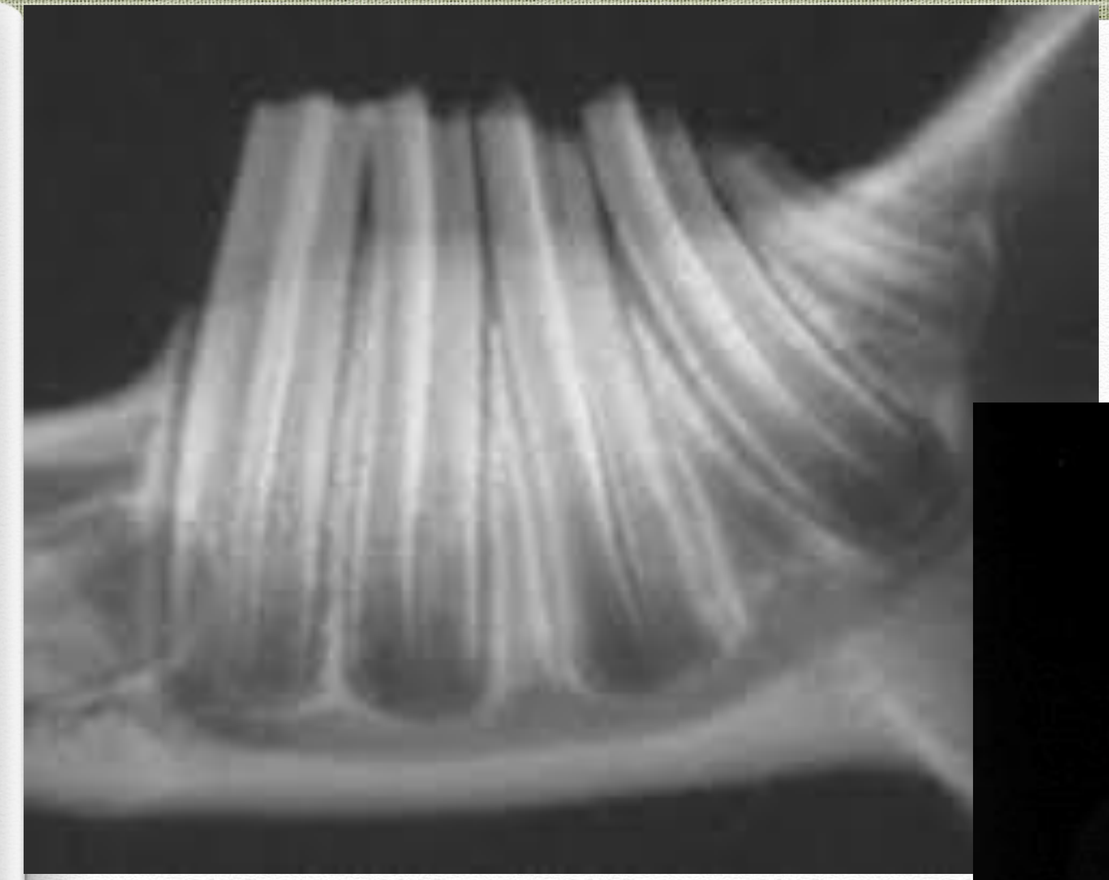

A
B

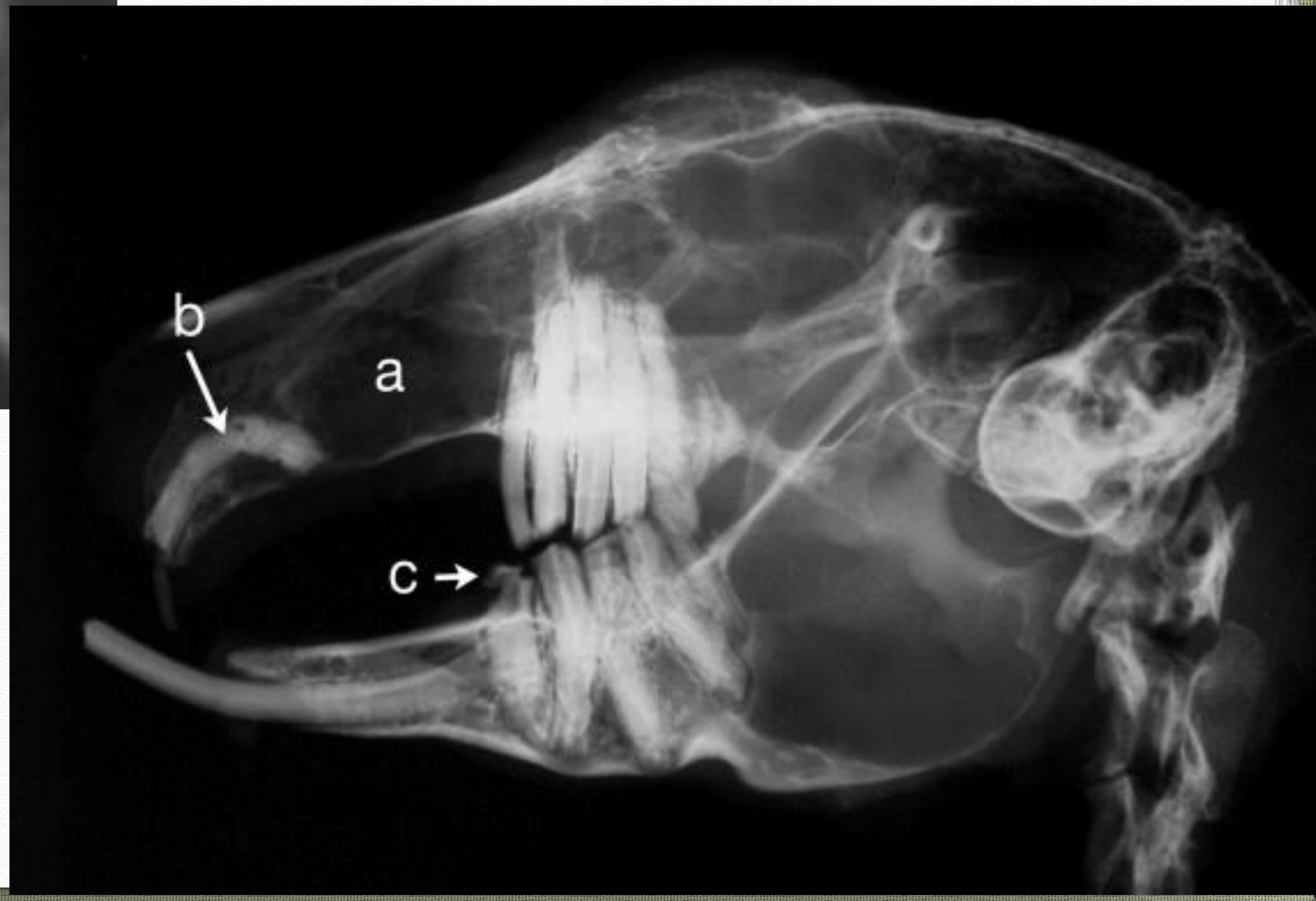
3. Exam and Diagnostics

- Exam
  - Incisor appearance and facial palpation
  - Intraoral examination for suspicious cases at minimum
- Diagnostics
  - GA intraoral exam - dental spurs, soft tissue ulcerations, impacted food/fur
  - 4 view head xrays (DV, LL, L oblique, R oblique) - oral malocclusion, root elongation/deviation, osteomyelitis




A
B
C
D




b
a
c

4. Treatment and Prevention

- Dental treatment
  - Dental crown trimming by burring under GA (usually longterm)
  - Dental abscess marsupialisation
- Medications
  - Antibiotics based on culture and sensitivity
  - Pain relief (usually longterm) (meloxicam, tramadol, gabapentin)

4. Treatment and Prevention

- Prevention
  - Diet
  - Regular check ups

Pop Quiz Time!

Question 6

What antibiotics should NOT be used in rabbits (small mammals)?

Answer

Do NOT use
P - penicillins (orally)
L - lincomycins
A - aminoglycosides
C - cephalosporins
E - erythromycin

Do use sulfonamides, tetracyclines, fluroquinolones, metronidazole, penicillin by injections

Rabbit Urinary Diseases

1. Basic anatomical/physiological differences
2. Presentation and Signs
3. Exam and Diagnostics
4. Treatment and Prevention

1. Anatomical/Physiological Differences

- Excrete calcium predominantly through the urinary system in the form of calcium carbonate crystals

2. Presentations and Signs

- Urine scalding
- Soiling
- Flystrike
- Worsened by obesity

3. Exam and Diagnostics

- Exam
  - Abdominal palpation
  - Urogenital exam
- Diagnostics
  - UA - normal results include USG is 1.010-1.030, pH 8.5, some protein, abundant crystals
  - 2 view xrays to look for urinary calculus, bladder crystal sedimentation (sludge), spondylosis
  - Bloods for CBC/biochemistry to assess renal parameters


R


CM 1 2 3 4 5

4. Treatment and Prevention

- Medications
  - Pain relief - meloxicam, tramadol, gabapentin
  - Antibiotics - TMS
  - Fluids
- Grooming
- Bladder flush
- Urinary calculus removal

4. Treatment and Prevention

- Prevention
  - Low Ca diet
  - Weightloss for the obese

Bird conditions

Basic husbandry and diet

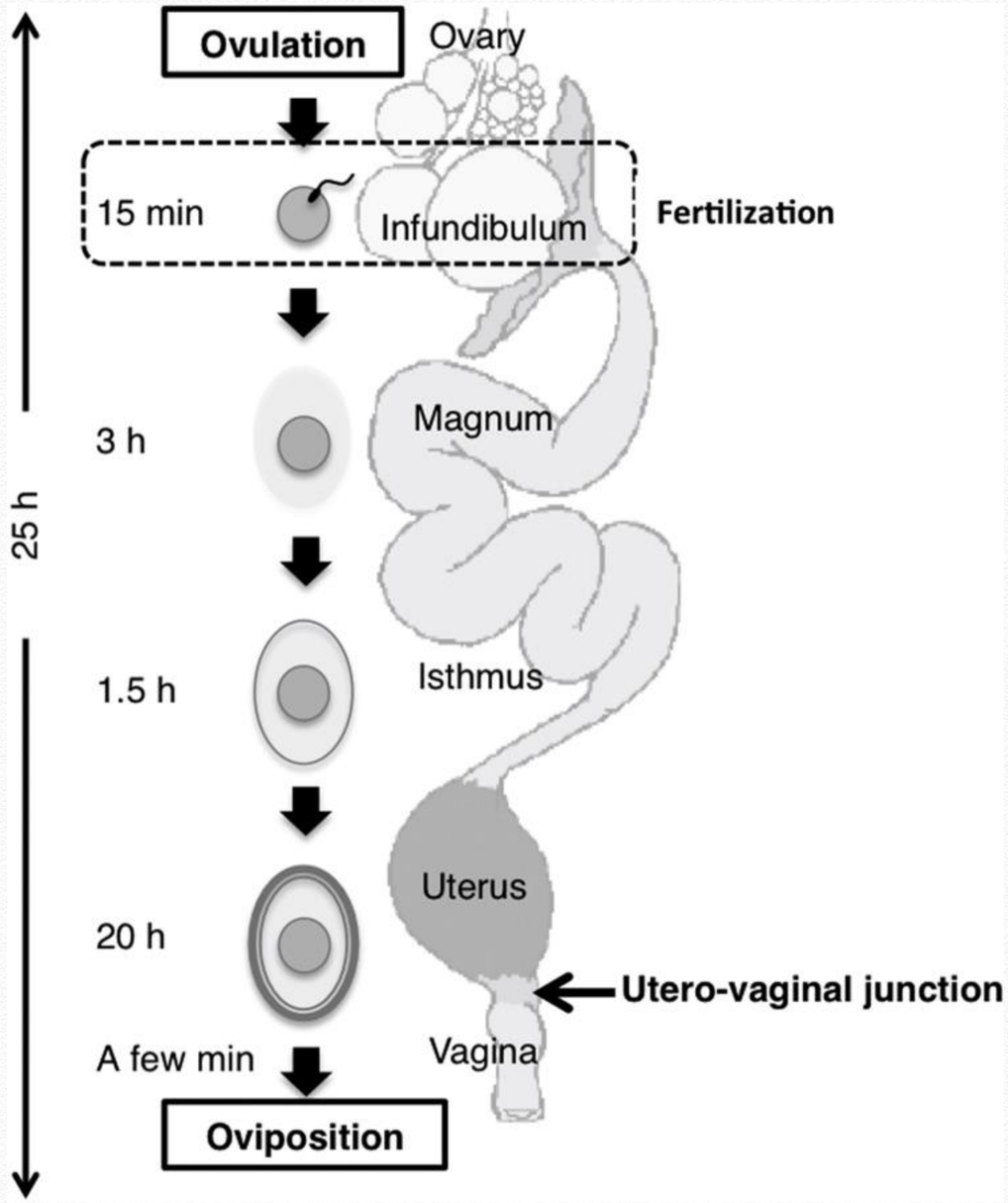
- **Social bonding** - pairs are ideal*
- **Space** - as big as possible, cage wide better than tall, can utilise stands, be allowed to roam/fly
- **Substrate** - perch with uneven diameters
- **Hygiene** - at least daily cleaning, weekly deep clean
- **Diet** - 80% bird pellets (eg. Harrisons diet), 10% veges, 5% fruits, 5% seeds (seeds are excessive in fats, yet deficient in proteins, Ca, Vit ADEK)

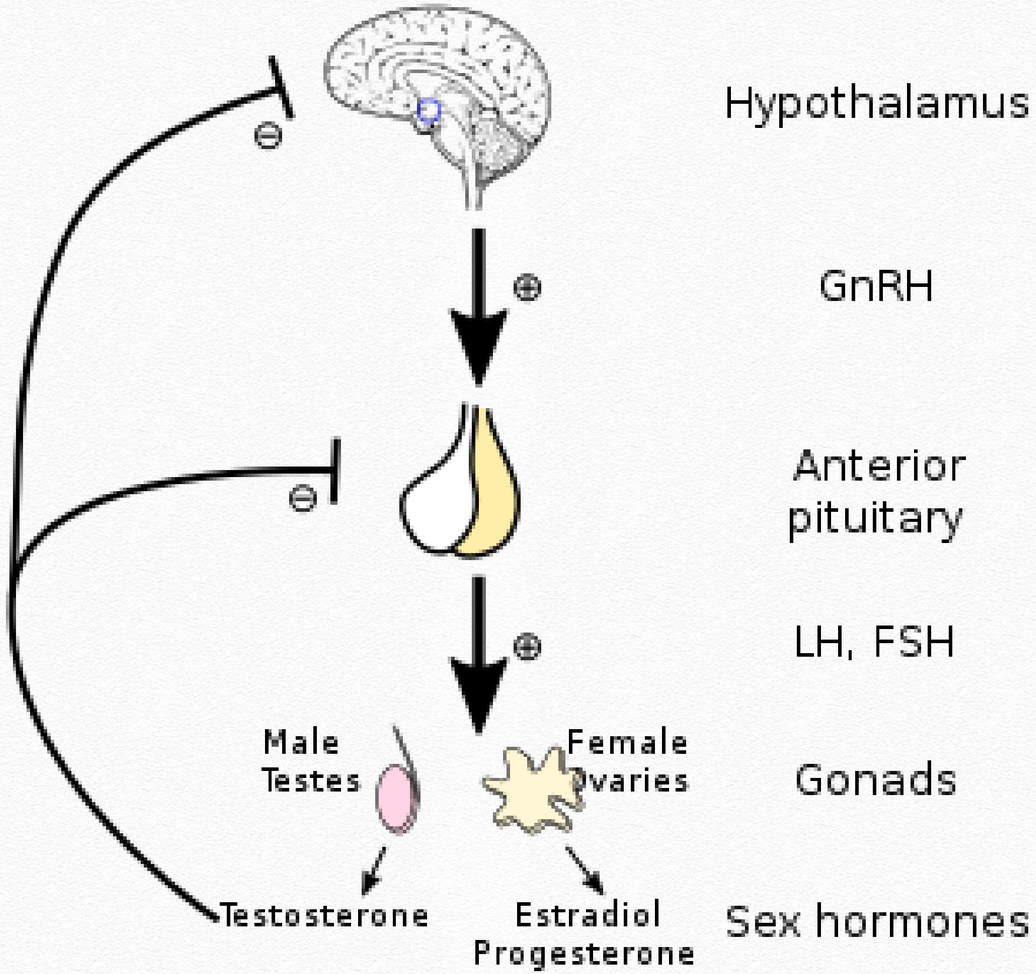
Basic preventative care

- **Microchipping** - Left breast muscle under GA
- **Regular check ups** - 6-12 monthly

Bird Female Reproductive Diseases

1. Basic anatomical/physiological differences
2. Presentation and Signs
3. Exam and Diagnostics
4. Treatment and Prevention


Ovulation
Ovary
15 min
Infundibulum
Fertilization
3 h
Magnum
25 h
1.5 h
Isthmus
Uterus
20 h
Utero-vaginal junction
A few min
Vagina
Oviposition


Hypothalamus
GnRH
Anterior pituitary
LH, FSH
Male Testes
Female Ovaries
Gonads
Testosterone
Estradiol Progesterone
Sex hormones

1. Anatomical/Physiological Differences

- Females only have left sided reproductive anatomy
- Ovulation to oviposition (egg laying) is rapid ~24 hours
- 1 egg requires 10% total body calcium
- Hypothalamus GnRH stimulation due to
  - Environmental cues (Increasing daylight lengths, increasing nutritional planes, provision of nest boxes/areas)
  - Social cues (inappropriate handling by owner, courtship behaviour of companion)

2. Presentations and Signs

- Egg binding
- Cloacal prolapse
- Egg coelomitis

- Excessive reproductive behaviours incompasses it all

3. Exam and Diagnostics

- Exam
  - Abdominal palpation
- Diagnostics
  - Bloods (CBC, biochemistry) - high blood total Ca, low iCa, high AST
  - 2 view xrays - egg number, size, position, hyperostotic polyostosis

Question 7

What is maintenance fluid rate for birds?

A. 100ml/kg/d

B. 50ml/kg/d

C. 25ml/kg/d

Answer

B. 50ml/kg/d, which is also the volume of nutritional support that should be fed to a bird

100ml/kg/d small mammals
50ml/kg/d birds
25ml/kg/d reptiles

4. Treatment and Prevention

- Treatment for egg binding
  - phase 1 - calcium borogluconate 10mg/kg IM q1hr, pain relief (meloxicam, butorphanol), fluids, nutrition, incubator, darkness
  - phase 2 - PGE2 (0.1mg/kg) gel intracloacally, can repeat after 2 hours
  - phase 3 - ovicentesis under GA then allow the bird to pass the egg shell within 48 hours
  - phase 4 - ventral coeliotomy to remove all entirety of bound egg

4. Treatment and Prevention

- For prolapse - add antibiotics (enrofloxacin)
- For coelomitis - poor prognosis, may try abdominocentesis, hormonal treatment, antiinflammatories (meloxicam), antibiotics (enrofloxacin)

4. Treatment and Prevention

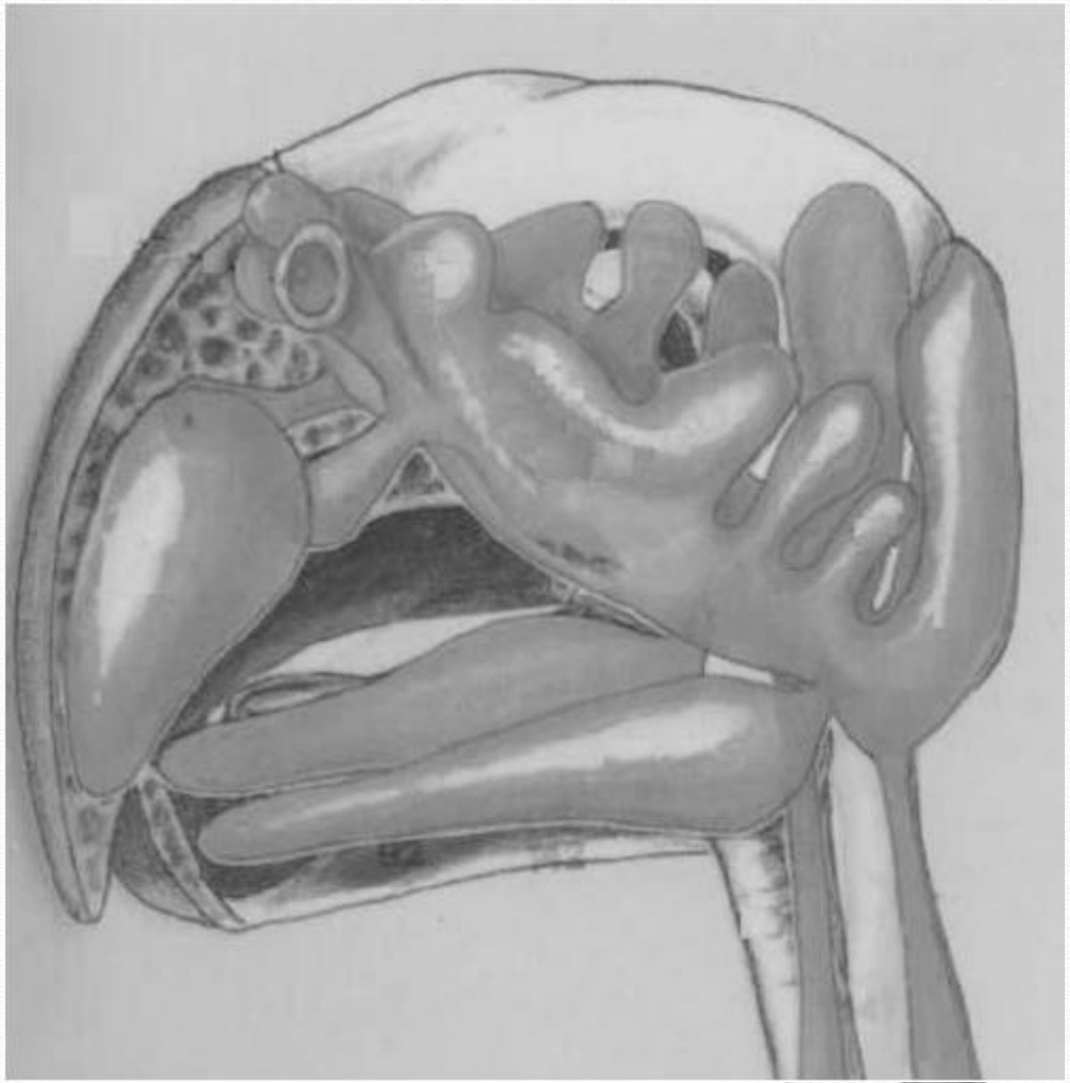
- Prevention
  - Hormonal treatment (deslorelin implant, leuprolide injections)
  - High quality, complete, balanced diet
  - Remedy of environmental/social cues (cover cage 1 hour earlier at night, reduce amount of food in cage, remove nest boxes, touch head of bird only)

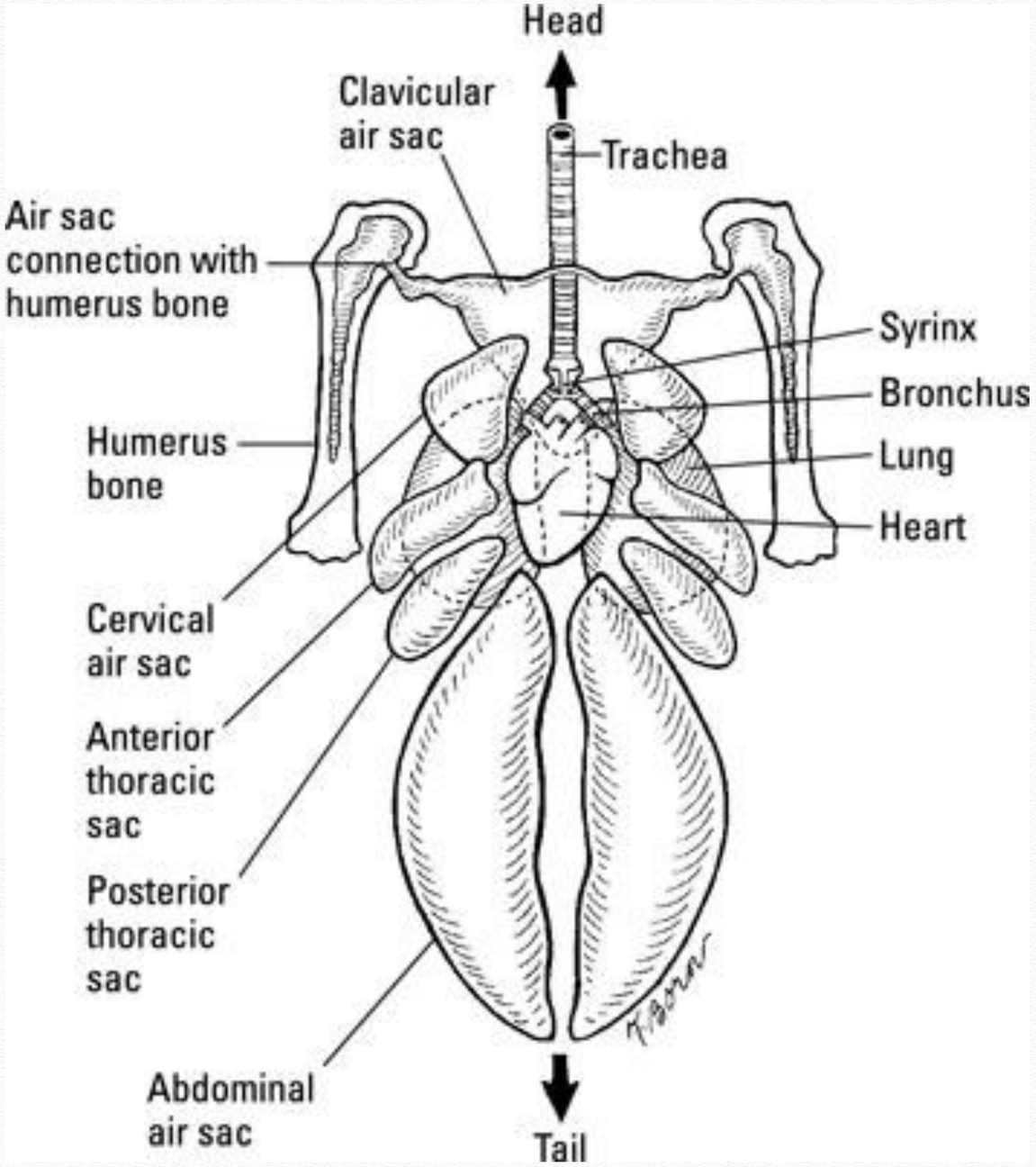
Bird Respiratory Diseases

1. Basic anatomical/physiological differences
2. Presentation and Signs
3. Exam and Diagnostics
4. Treatment and Prevention

1. Anatomical/Physiological Differences

- 90% airway deadspace (vs 10% deadspace in mammals)
  - URT owing to extensive sinus systems
  - LRT owing to air sacs
- Sound produced from syrinx at tracheal bifurcation




Head
Clavicular air sac
Trachea
Air sac connection with humerus bone
Syrinx
Bronchus
Humerus bone
Lung
Heart
Cervical air sac
Anterior thoracic sac
Posterior thoracic sac
Abdominal air sac
Tail

2. Presentations and Signs

- URT infection - conjuncitivis, swollen face, sneezing, congestion
- Tracheal/syrinx blockage and acute dyspnoea/whistling and tail bobbing, change in voice
- LRT dz - tail bobbing, heavy breathing, raspy breathing, gaping

3. Exam and Diagnostics

- Exam
  - Distance exam
  - Nares and choana exam
- Diagnostics
  - Nasal flush cytology and culture
  - 2 view xrays - for abdominal disease or granulomas
  - Chlamydia psittaci PCR test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4. Treatment and Prevention

- Oxygen, incubation
- Antibiotics (enrofloxacin, doxycycline) often prolonged, delivered IM, SQ, PO or by nebulisation QID
- Antiinflammatories (meloxicam)
- Cases of tracheal obstruction…

4. Treatment and Prevention

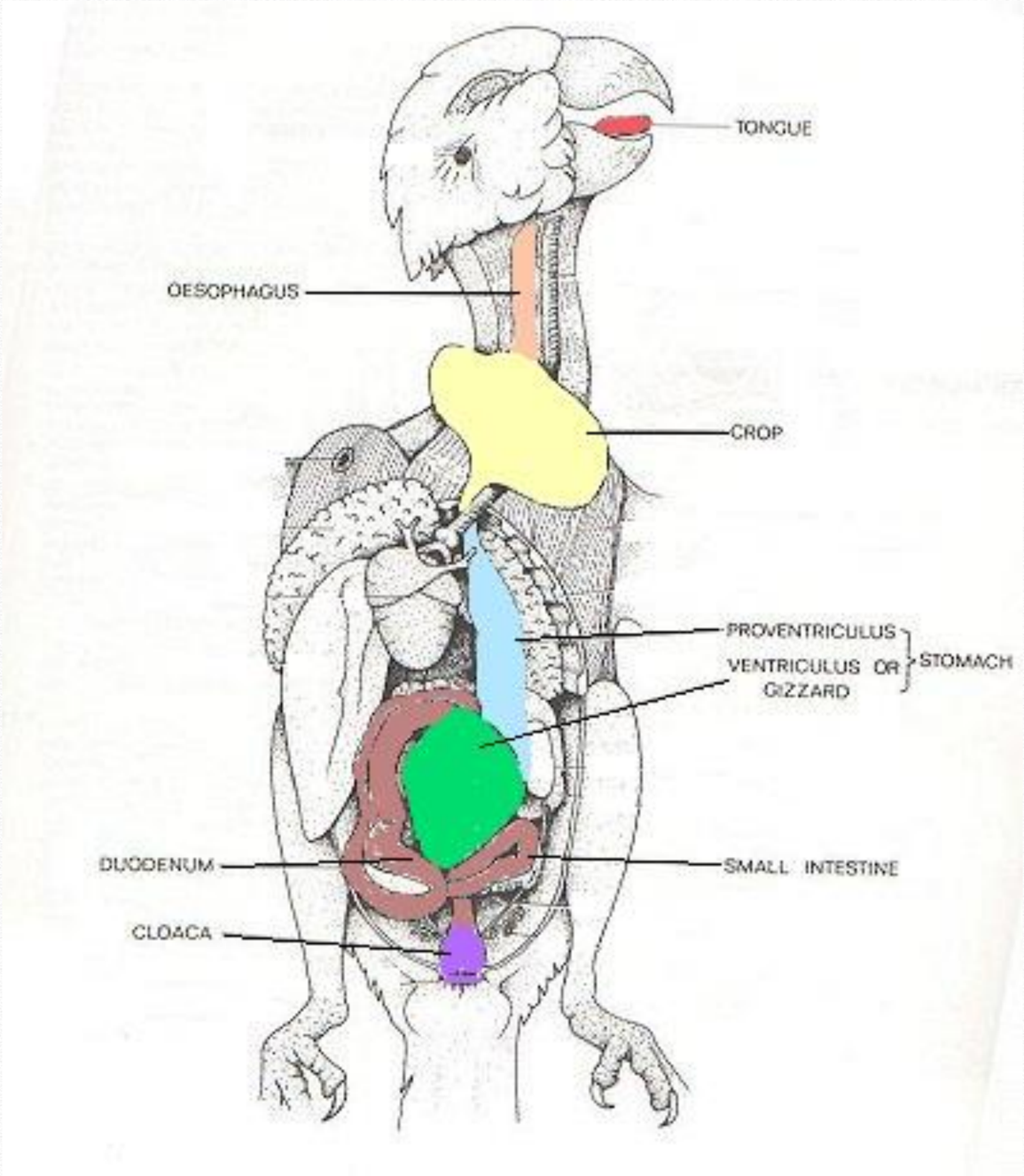
- Prevention
  - High quality, complete, balanced diet with no vitamin A deficiencies
  - Regular health checks, New bird checks, Quarantining of new birds

Bird Gut Diseases

1. Basic anatomical/physiological differences
2. Presentation and Signs
3. Exam and Diagnostics
4. Treatment and Prevention

1. Anatomical/Physiological Differences

- Anatomical differences
  - Ingluves/Crop
  - Proventriculus/glandular stomach
  - Ventriculus/muscular stomach
- Most bird ventriculus contains grit (small stones)

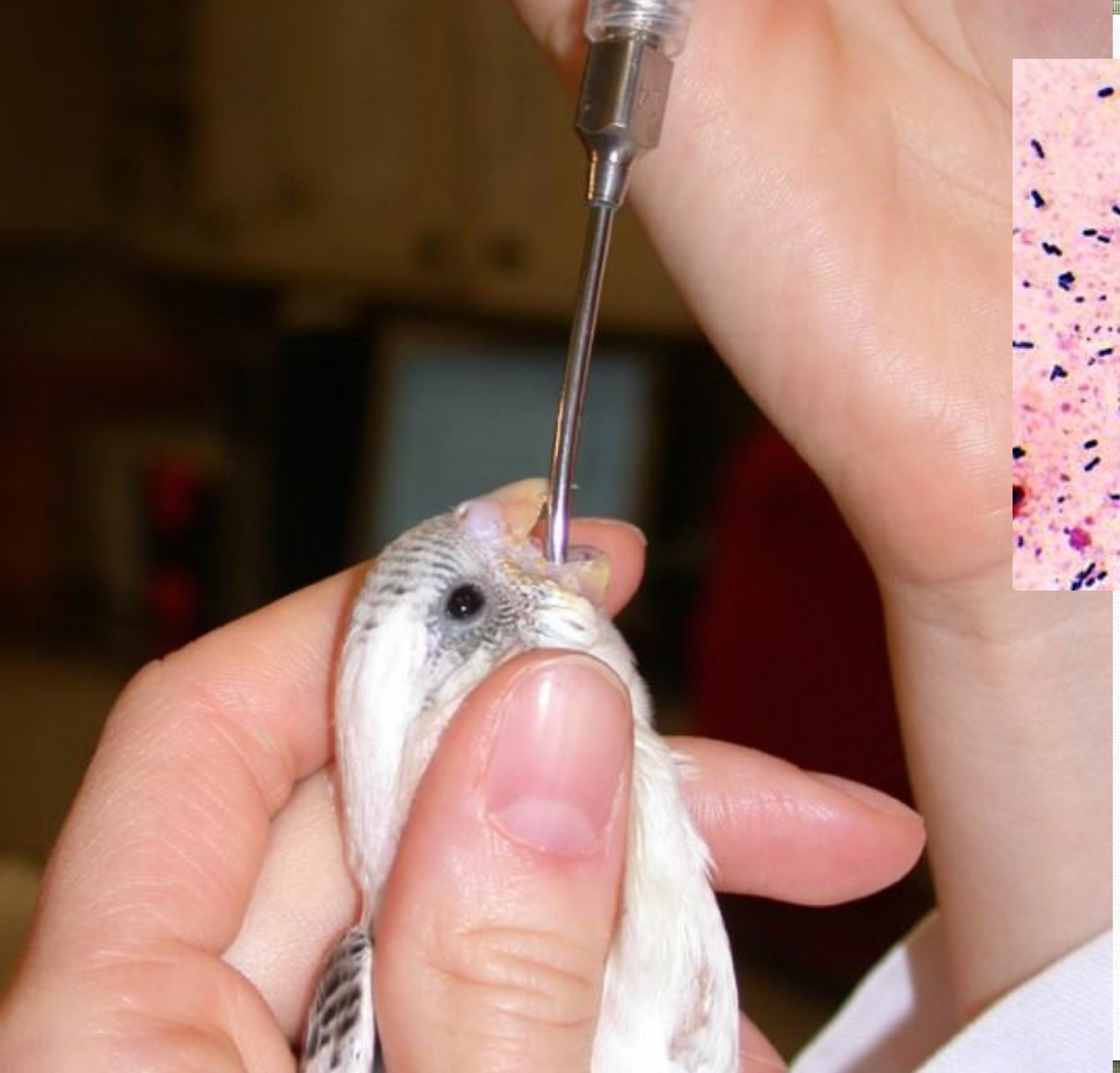

TONGUE
OESOPHAGUS
CROP
PROVENTRICULUS
VENTRICULUS OR GIZZARD
STOMACH
DUODENUM
SMALL INTESTINE
CLOACA

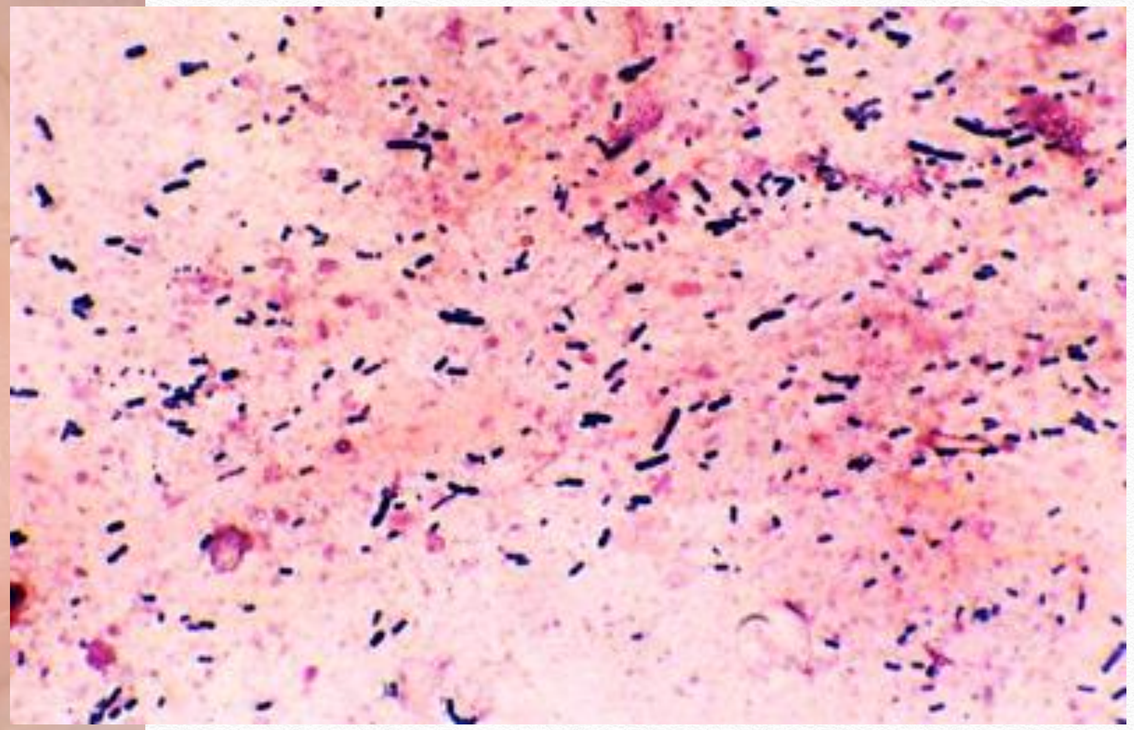
2. Presentations and Signs

- Crop stasis - infection, FB, juvenile
- Vomiting/Diarrhoea - infection, FB

3. Exam and Diagnostics

- Exam
  - Facial exam
  - Crop exam
  - Abdominal palpation
- Diagnostics
  - Crop and faecal cytology and gram staining (90% gram positive bacteria for parrots is normal)
  - 2 view xrays - for stomach size





4. Treatment and Prevention

- Warmth, fluids, nutrition
- Crop emptying and refeeding with liquid diet
- Medications
  - Antibiotics (enrofloxacin)
  - Antiparasitic (fenbendazole/ivermectin, toltrazuril, metronidazole)
- Cases of FB in crop/ventriculus require surgical removal

4. Treatment and Prevention

- Prevention
  - High quality, complete, balanced diet
  - Regular health checks, New bird checks, Quarantining of new birds
  - Vigilance about chewing of fibre toys/clothing

Questions?

Pet Doctors St Lukes Exotics Formulary

Rabbit Anaesthesia

Drug	Dose Rate	Frequency	Route
Midazolam	1mg/kg	Premed	IM,SQ
Methadone	0.3mg/kg	Premed	IM,SQ
Medetomidine	0.1mg/kg	5min prior induction	IM
Lidocaine	2mg/kg	Intraop	SQ op site
Isoflurane	2-4%	Maintenance	By mask/tube
Atipamezole	1mg/kg OR 5 times medetomidine volume	Post op reversal	IM
Flumazenil	0.1mg/kg	Post op reversal	IM,SQ

Rabbit Drugs

Drug	Dose Rate	Frequency	Route
Meloxicam	0.5mg/kg	SID-BID	IM,SQ,PO
Tramadol	10mg/kg	BID	PO
Gabapentin	10mg/kg	BID	PO
Buprenorphine	0.03mg/kg	BID-TID	IV,IM,SQ
Methadone	0.3mg/kg	q4-6h	IV,IM,SQ

Drug	Dose Rate	Frequency	Route
Enrofloxacin	10mg/kg	BID	IM,SQ,PO
TMS	30mg/kg	BID	PO
Penicillin	40,000IU/kg (duplocillin 0.25ml/kg SID-EOD)	SID	SQ
Metronidazole	20mg/kg	BID	IV,IM,SQ, PO
Doxycycline	2.5mg/kg	BID	PO

Rabbit Drugs

Drug	Dose Rate	Frequency	Route
Buscopan compositum	65mg/kg	BID-TID	IV,IM,SQ,PO
Metoclopramide	0.5mg/kg	BID-TID	IV,IM,SQ,PO
Ranitidine	5mg/kg	BID-TID	IV,IM,SQ,PO
Cisapride	0.5mg/kg	BID-TID	PO

Drug	Dose Rate	Frequency	Route
Ivermectin	0.2mg/kg	Q14d for 2 doses	SQ
Fenbendazole	20mg/kg	SID	PO
Toltrazuril	10mg/kg	SID for 5 doses	PO
Metronidazole	20mg/kg	BID for 7 days	IV,IM,SQ, PO

Bird Anaesthesia

Drug	Dose Rate	Frequency	Route
Butorphanol	1-2mg/kg	Premed	IM
Midazolam (optional)	0.5-1mg/kg	Premed	IM
Isoflurane	By mask or ET tube	Maintenance	
Flumazenil (optional)	0.1mg/kg	Post op reversal	IM,SQ
Meloxicam	1mg/kg	BID	IM,SQ,PO
Tramadol	10mg/kg	BID as needed	PO

Bird Drugs

Drug	Dose Rate	Frequency	Route
Meloxicam	1mg/kg	BID	IM,SQ,PO
Tramadol	10mg/kg	BID	PO
Gabapentin	10mg/kg	BID	PO
Butorphanol	1mg/kg	Q2-4h	IM,SQ

Drug	Dose Rate	Frequency	Route
Enrofloxacin	10mg/kg	BID	IM,SQ,PO
TMS	100mg/kg	BID	PO
Amoxiclav	125mg/kg	BID	IM,SQ,PO
Metronidazole	50mg/kg	BID	IV,IM,SQ, PO
Doxycycline	50mg/kg	q7d	IM,SQ, PO

Bird Drugs

Drug	Dose Rate	Frequency	Route
Ivermectin	0.2mg/kg	Q14d for 2 doses	SQ
Levamazole	20mg/kg	Q10d for 2 doses	PO
Fenbendazole	50mg/kg	SID for 7 doses	PO
Toltrazuril	10mg/kg	SID for 5 doses	PO
Metronidazole	50mg/kg	BID for 7 days	IV,IM,SQ, PO

Drug	Dose Rate	Frequency	Route
Nystatin	300,000IU/kg	BID	PO
Terbinafine	15mg/kg	SID	PO
Itraconazole	20mg/kg	BID	PO
Fluconazole	5mg/kg	SID	IM,SQ
Amphotericin B	100mg/kg (7g powder in 4ml water Give 0.04ml/50g every 12 hours for 30-60d)	BID	PO