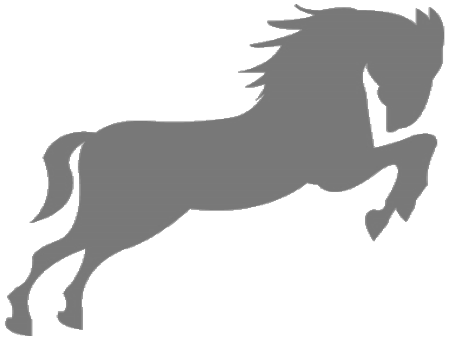
Management of the aging horse in practice

Dr Laureline Lecoq, ACVIM

Specialist in equine internal medicine



12th TWYDIL® Scientific Equine Clinics

What is an old horse?

- Guinness Book, Google,...
  - 62 years old
- Old for working…
  - Thoroughbreds
  - Standardbreds
  - CSO/dressage
  - Pleasure
- Old for reproduction
- Never old if family member

Cushing's disease *epidemiology*

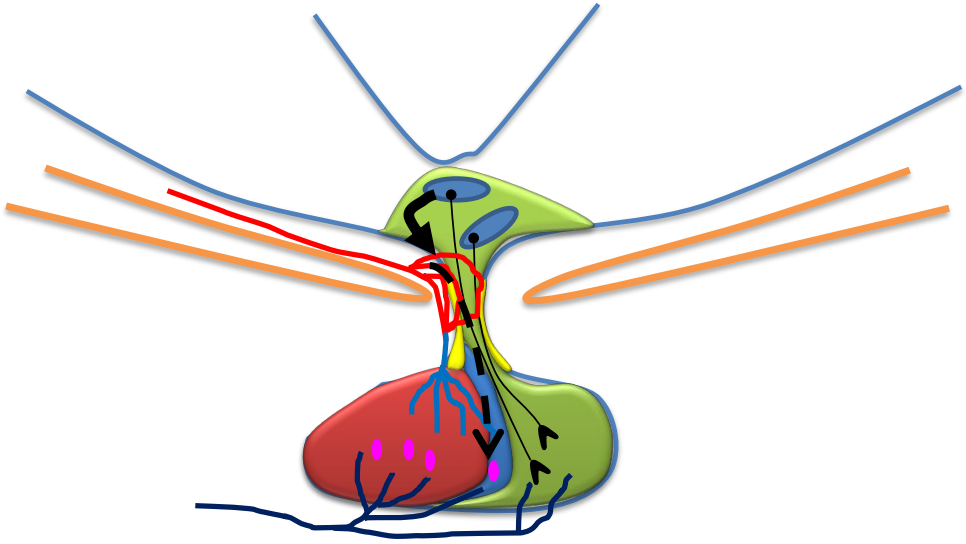
- PPID, Pituitary Pars Intermedia Dysfunction
  - N°1 endocrine disorder
    - Prevalence 9-25 %
  - Horses > 15 years old
  - Younger horses too…

    « Talk About Laminitis Campaign »
  - No breed, species or sex predisposition

J.L. Ireland, C.M. McGowan. Vet J 235 (2018) 22–33
Mc Farlane et al. JVIM 25 (2011) 872–881

Cushing's disease *pathophysiology*

- Neurodegenerative disease of *pars intermedia*
  - Lack of Dopamine's negative feedback
- Increased secretion of POMC
  - Pro-opiomelanocortine
    - Précursor of
      - α-MSH
      - β-endorphine
      - CLIP
      - ACTH
- Increased cortisol sensitivity



Wilson et al. Endocrinology 110 (1982) 941–954.
Mc Farlane et al. Ageing Res Rev 6 *(2007)* 54–63
Mc Farlane et al. J Neuroendocrinol 17 (2005) 73–80

Cushing's disease *clinical signs*

- Behavioral changes
- Hirsutism
- Weight loss/ muscle wastage
- Fat desposits
  - Eyes, tail base
- Laminitis
- Secondary infections
- PU/PD hyperhidrosis
- Suspensory ligament degeneration

Cushing's disease *clinical signs*

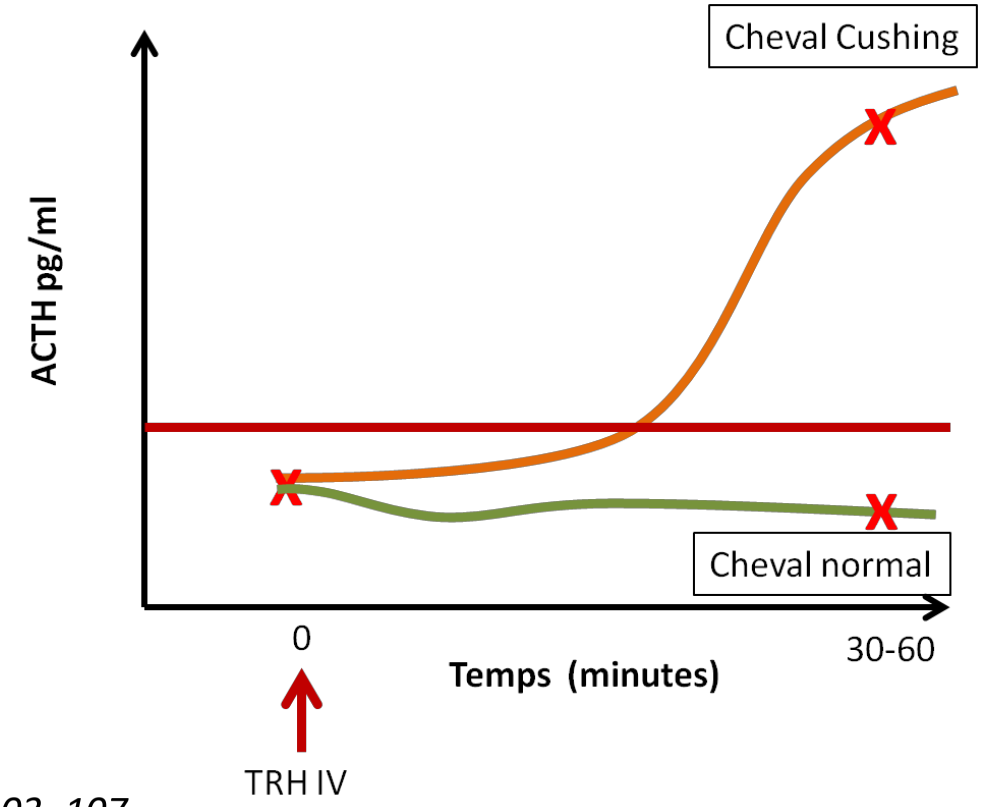
Table 1. Clinical signs in a group of horses and ponies (n = 34) with equine Cushing's disease.

Sign	No. (%)
Hirsutism	37 (84)
Laminitis	22 (50)
Muscle atrophy	10 (23)
Hyperhydrosis	9 (20)
Weight Loss	9 (20)
Polydipsia	9 (20)
Polyuria	7 (16)
Lethargy	6 (14)
Pendulous abdomen	5 (11)
Supraorbital fat	3 (7)
Other signs	<2%

Rohrbach et al. JVIM 26 (2012) 1027–1034

Cushing's disease *diagnosis*

- Plasma ACTH concentration
  - Circadian variations
  - Seasonal variations
  - Geographical variations
  - Response to pain, stress
- TRH stimulation test



Ayala et al. Res Vet Sci 93 (2012) 103–107
Mc Farlane et al. JVIM 25 (2011) 872–881
Mc Farlane et al. J Neuroendocrinol 17 (2005) 73–80

Cushing's disease *treatments*

- Dopamine agonists
  - Pergolide
    - 0,002 mg/kg to 0,01 mg/kg, PO, q24h
  - Bromocryptine
    - 0,1 mg/Kg PO q12h
  - Cyproheptadine
    - 0,25 mg/Kg PO, q12-24h
- Adrenal corticosteroid synthesis inhibitors
  - Trylostane
    - No rationale for use

Kienzle et al. Tierarztl Prax Ausg G Grosstiere Nutztiere 2018 Aug;46(4):249-256.
Durham. Vet Clin North Am 33(2017)127-139.

Cushing's disease *treatments*

- Treatment of secondary infection
  - Antibiotherapy/ NSAIDS
- Nutritional support +++
  - Caloric intake
    - Frequent underestimation
  - Minerals and vitamins
    - Cooper/Zinc/selenium
    - Vitamins E and A
  - Insulin levels

Kienzle et al. Tierarztl Prax Ausg G Grosstiere Nutztiere 2018 Aug;46(4):249-256.
Durham. Vet Clin North Am 33(2017)127-139.

Cushing's disease *treatments*

- Nutritional support +++
  - Forages of good quality
    - 2% BW
  - High fat low starch diet
    - Gastric ulcers feed
    - Rice bran
    - Vegetable oil

Constituants analytiques

Constituants analytiques	
Proteine brutes	14,10%
Matières grasses brutes	9,40%
Sucre	5,10%
Amidon	5,90%
Cendres brutes	11,30%
Cellulose brutes	18,80%
Calcium	1,50%
Phosphore total	0,69%
Magnésium	0,60%
Sodium	0,41%

Kienzle et al. Tierarztl Prax Ausg G Grosstiere Nutztiere 2018 Aug;46(4):249-256.
Durham. Vet Clin North Am 33(2017)127-139.

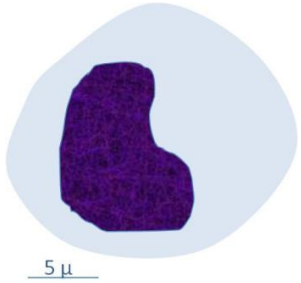
Cushing's disease *prognosis*

- Survival
  - Survival time after diagnosis and treatment
    - Median 4,6 years
  - > 70% of horses euthanized because of the Cushing's disease
  - Negative prognosis factors
    - Secondary infections
    - Laminitis
    - Hyperinsulinemia
  - Positive prognosis factors
    - Pony, good body condition score, treatment with pergolide

Rohrbach et al. JVIM 26 (2012) 1027–1034
Horn et al. EVJ 2019 Jul;51(4):440-445

The immune system of the old horse

- Immunosenescence
  - Aging of the immune system
    - Increased sensitivity to pathogens
    - Decreased vaccination response
      - Humans, horses, ...
  - Inflamm-aging
    - Increased pro-inflammatory cytokines
      - IL-1β, TNF-α, IFN-γ
  - Non specific immune system
    - Decreased neutrophil and macrophage functions
  - Specific immune system
    - decreased Lympho-T, dysfunctional T-cells, shift Th1 → Th2, ...
    - decreased Lympho-B, antibody less effective



The immune system of the old horse

- Response to vaccination
  - Primo vaccination
    - Rabbies vaccine
    - Same response as younger horses (4-15 ans)
  - Memory response to vaccination
    - Influenza vaccine
    - Antibody pre-vaccination Old > Young
    - Least effective response to vaccination compare to younger horses

Muirhead TL et al. J Comp Pathol. 2010. The effect of age on the immune response of horses to vaccination.

Dentition problems in aged horses

- N°1 cause of weight loss
- Hyspodonthe
  - Continuous growth
  - Wear during mastication
- Reduction of the size of teeth starts 3 years post eruption

Dentition problems in aged horses

- Increase of interdental space with time
  - Decrease of cementum
  - Upside-down cone shape of the teeth
    - Narrower at the base
  - Food accumulation → risk factor for parodontal diseases

Dentition problems in aged horses

- Wear anomalies
  - Enamel very hard
    - Progressive wear until nothing left
    - Not present at the level of roots
  - Dentine and cement softer
    - Wear out quickly
    - Smooth and less sharp

- Malocclusions
  - Wave mouth, shear mouth
  - Hooks (106, 206, 311, 411)
  - Missing/broken tooth, super eruption on opposite side

Dentition problems in aged horses

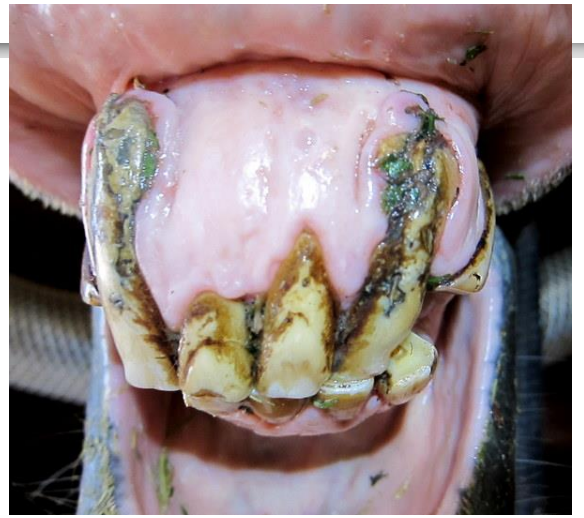
- Equine Odontoclastic Tooth Resorption and Hypercementosis (EORTH)

Dentition problems in aged horses

- EORTH
  - Incisors and canines
    - Destruction of the tooth
    - Destruction of the alveolar bone
    - Hypercementosis
    - Horse > 15 years old
    - Centripetal evolution

Dentition problems in aged horses

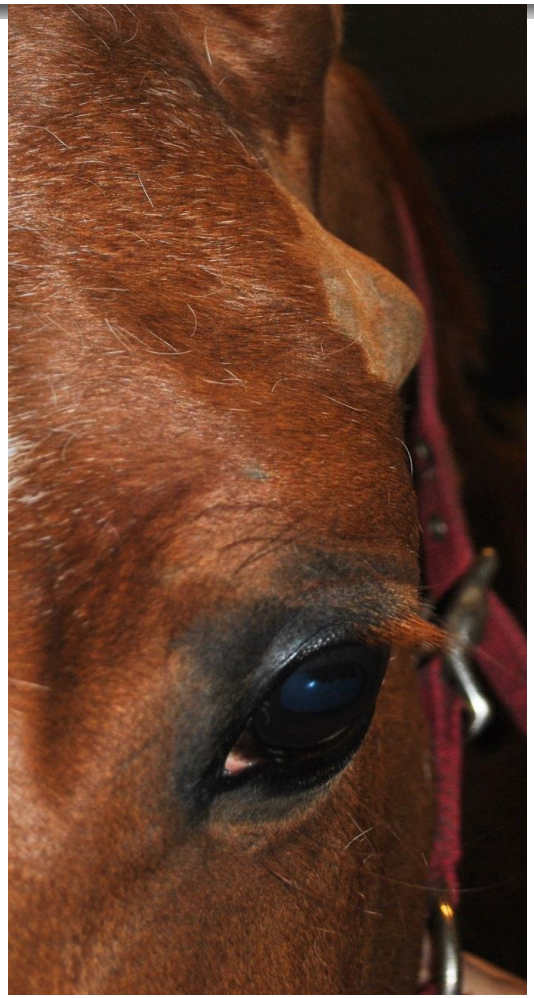
- EORTH
  - Clinical signs
    - Irregular gums
    - Swelling of the jaw
    - Gingival retraction
    - Roots infection
      - Fistula
    - Mobile tooth/teeth, fractures
    - Pain, anorexia, depression



Dentition problems in aged horses

- Treatment
  - Tooth/teeth extraction
  - Adapted feeding
    - Soups
    - Extruded feed
      - Better digestibility
    - High fiber content
      - Alfalfa pellets
      - Beet pulps

Dentition problems in aged horses



- Temporo-mandibular joins arthropathy
  - Decreased lateral excursion of the jaws
  - Secondary wear abnormality

Dentition problems in aged horses

- Squamous cell carcinoma

Tumoral process in aged horses

- Increased frequency with age?

  NO!!!!!

- Mean age 6-15 years old
- Exceptions
  - Lipomas
  - PPI adenomas, thyroïd adenomas

Tumoral process in aged horses

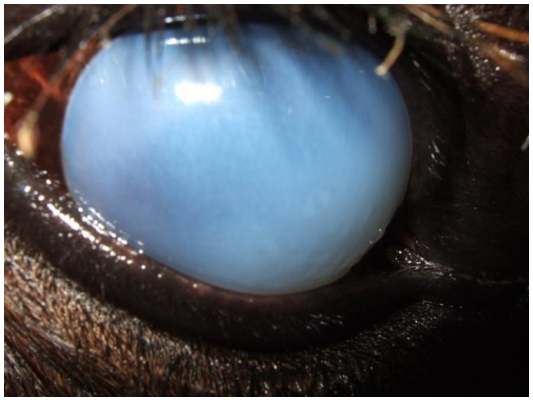
- Skin /mucus membranes
  - Sarcoides, melanomas (> 6 yo)
  - Genital SCC
    - 10,6 yo Males +++
    - 12,8 yo Females
  - Ocular SCC
    - 11 yo
  - Lymphosarcomas
    - < 6 yo

Eye diseases in aged horses

- Very frequent in older horses
  - Age-related???
- Nictalopia
  - Decreased night vision
  - Retinal senile degenerative process
    - Hypo-/hyperpigmentation
    - Smaller retinal blood vessels

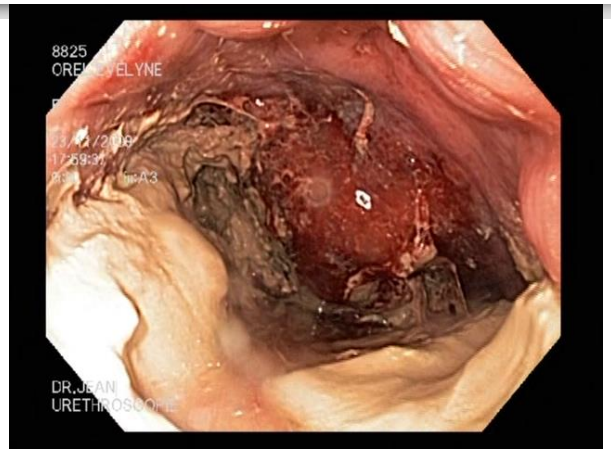
Eye diseases in aged horses

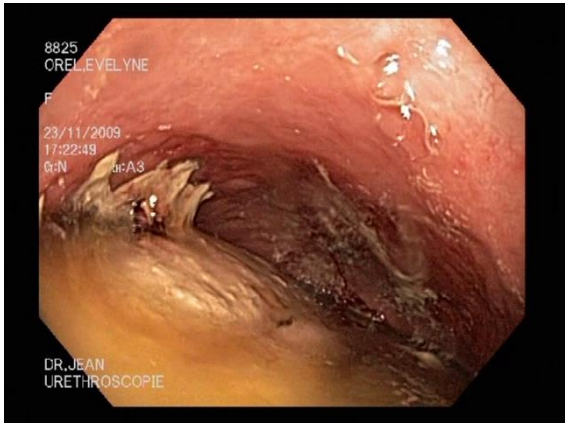
- Cataract
  - ↑↑ prevalence with age +++
    - Degenerative process?
    - Pathological process?
- Glaucoma
  - ↑ prevalence with age
  - Secondary to pathological process +++
    - Anterior uveitis



Urinary tract disease of the aged horse

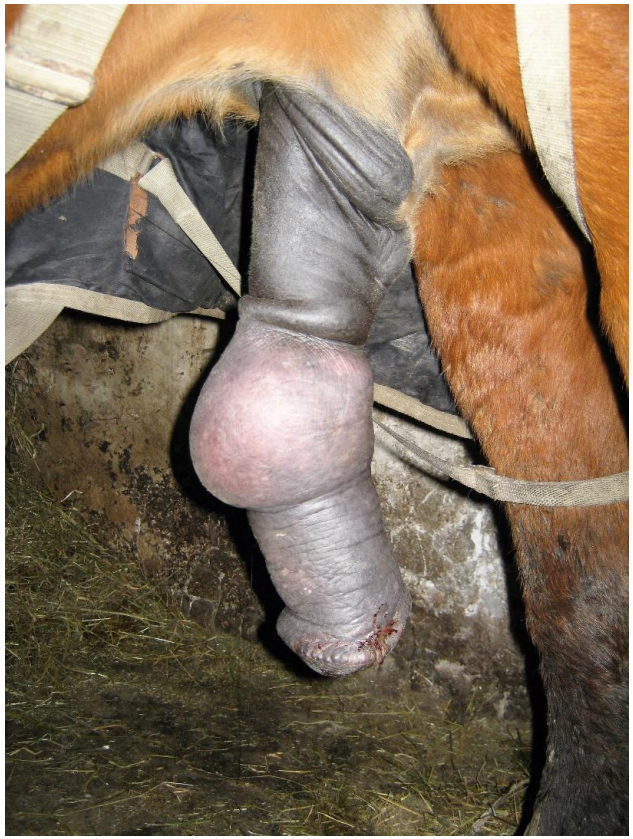
- Sabulous cystitis
  - Older gelding +++
  - Decreased emptying of the bladder
  - Accumulation of sediments
  - Irritation of the bladder
  - Decreased muscle tone of the *detrusor* muscle
  - Vicious cercle





Urinary tract disease of the aged horse

- Sabulous cystitis
  - Urinary incontinence
  - Dermatitis
  - Stranguria
  - Hematuria
  - Colic
  - Paraphymosis
  - ...



Urinary tract disease of the aged horse

- Sabulous cystitis
  - Bladder catheterisations
    - Decrease pressure
    - Lavages
  - Treatment of the secondary bacterial infection
    - Antibiotics (TMS)
    - Anti-inflammatories
  - Avoid re-accumulation of sediments
  - Treatment of primary cause when possible

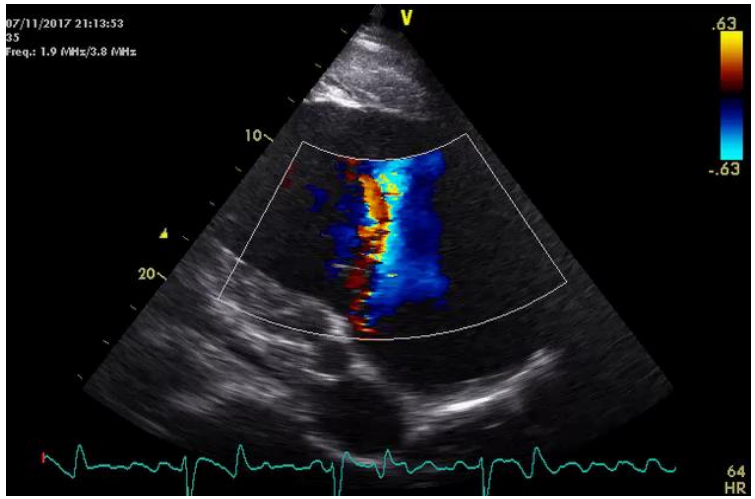
Urinary tract disease of the aged horse

- Renal insufficiency
  - Acute
  - Chronic
- Urolithiasis

No difference in prevalence between old and young

Cardiovascular diseases of the aged horse

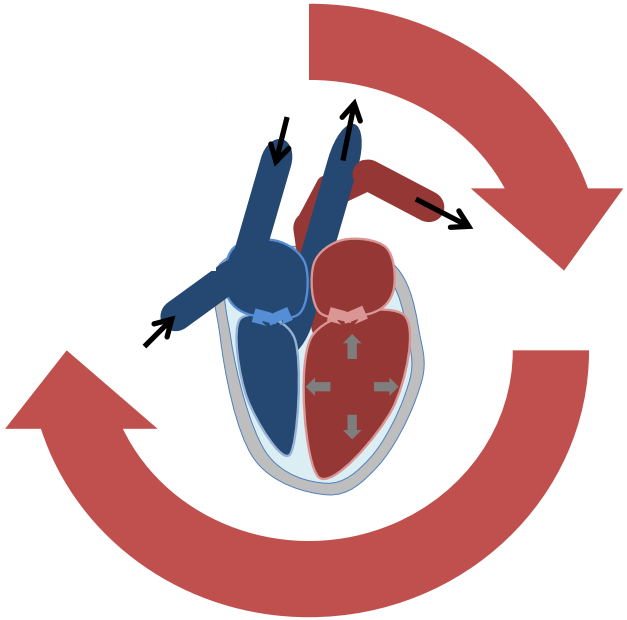
- In The United-Kingdom
  - 1153 horses
  - 1 to 45 years old
  - Increased prevalence of murmurs with ages
- Aortic insufficiency
  - 15-20 yo then decreased after 20 yo
- Mitral, tricuspid, pulmonary insufficiency
  - No incidence of age on the prevalence



Cardiovascular diseases of the aged horse

- Congestive heart failure
  - Volume overload
    - Valvular insufficiency
  - Myopathies (nutritional, atypical, ...)
  - Intoxications (ionophores)
  - Infections (viral, bacterial)

Volume overload of
the ventricule



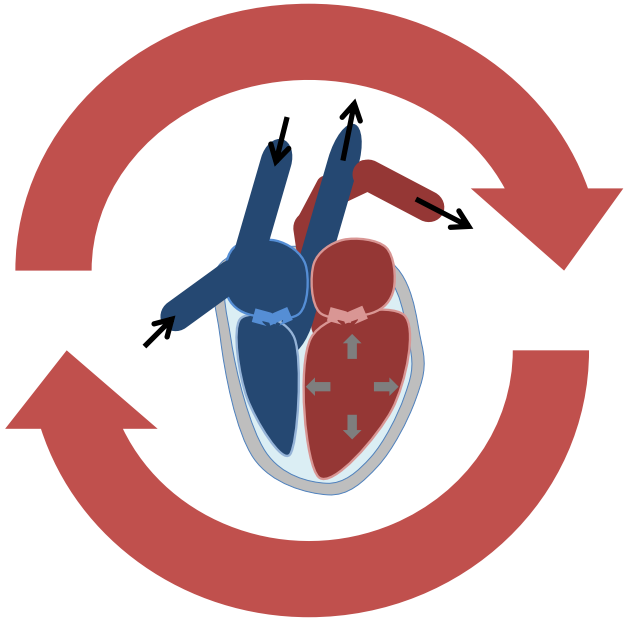
↓ Cardiac output

↑Ffilling P°

↓ Systolic ejection volume

↑ Filling P°
↓ Cardiac output

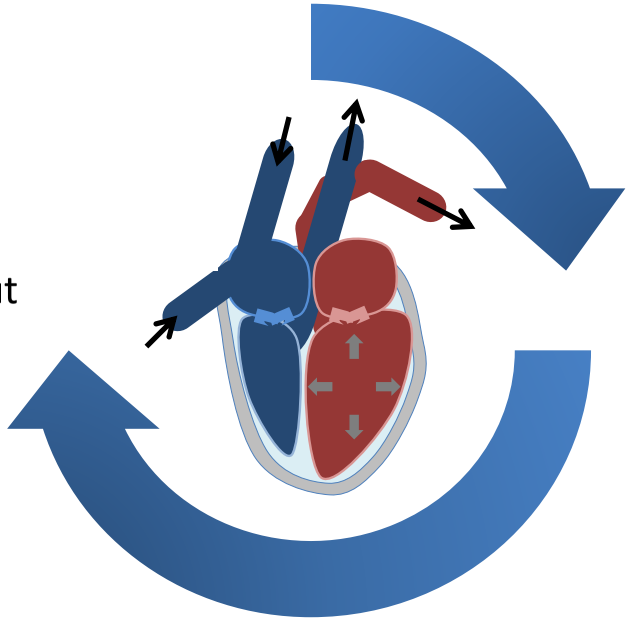
↑ADH and AT II
- •Sodium retention
- •↓ Diuresis
- •Venoconstriction
- •↑ arterial resistance



Activation SNS
Inhibition SNPS

Activation RAA system

↑ Filling P°
↓ Cardiac output



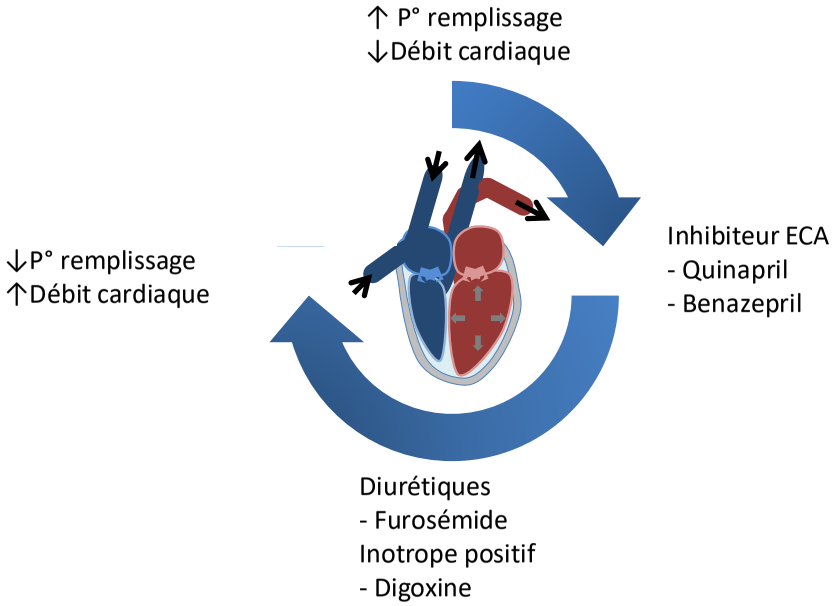
↓ Filling P°
↑ Cardiac output

Baroreceptors activation
- Inhibition SNS
- activation SNPS

Secretion of ANP, BNP, PG, NO,…
- RAA system antogonists
- Renal vasodilation
- Peripheral vasodilation

Cardiovascular diseases of the aged horse

- Treatments
  - ACE inhibitors
    - Quinapril
    - Ramipril
  - Positive inotropes
    - Digoxine
  - Diuretics
    - Furosemide
      - Oedema

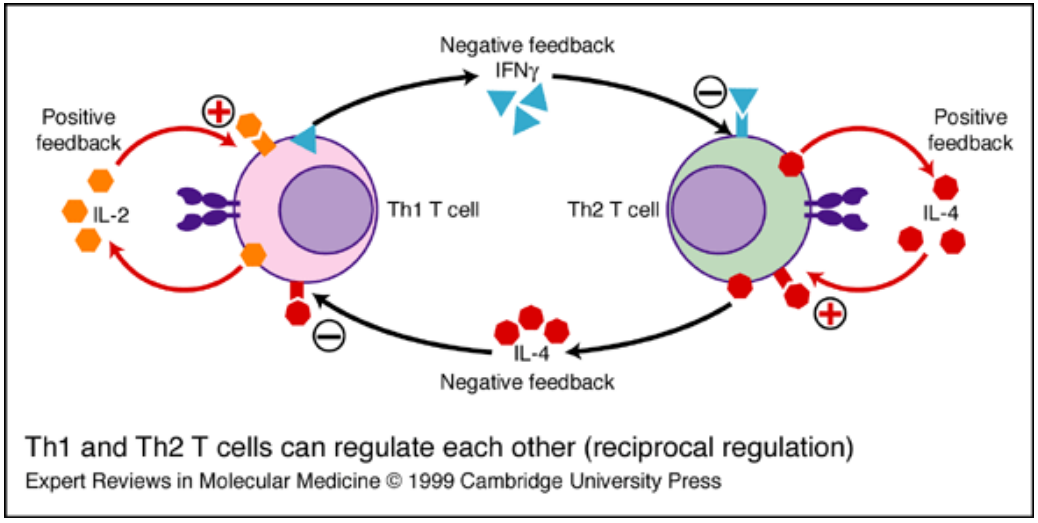


Respiratory disease of the aged horse

- Severe equine asthma
  - Respiratory destress at rest
  - Tachypnea, cough
  - Exercise intolerance
  - No fever, no systemical sign of illness

Respiratory disease of the aged horse

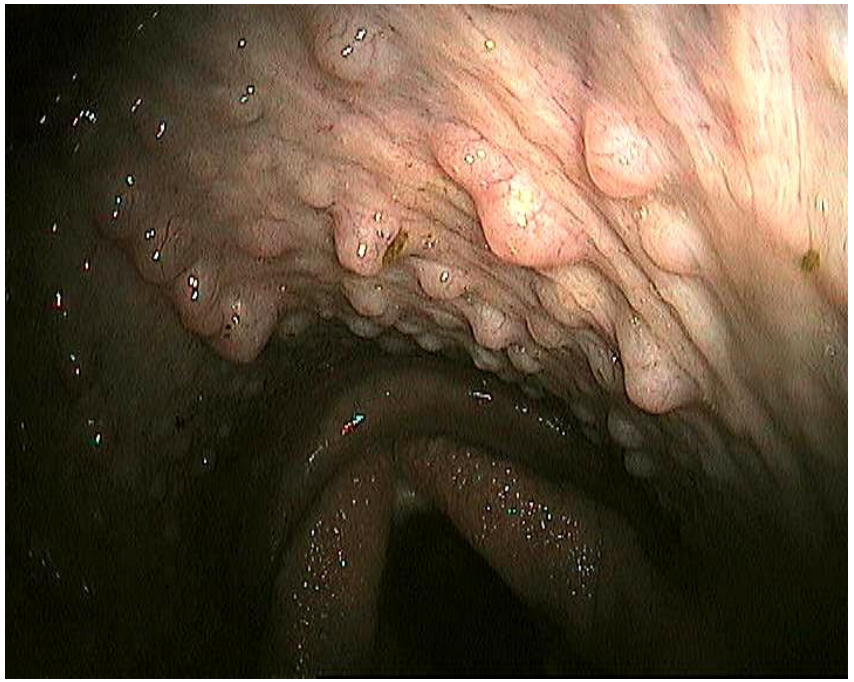
- Severe equine asthma
  - Environmental disease
  - > 5 yo
  - Increased prevalence with age



Th1 and Th2 T cells can regulate each other (reciprocal regulation)

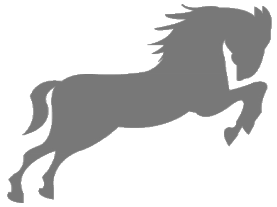
Respiratory disease of the aged horse

- Diagnosis
  - Blood work
    - WNL
  - Pulmonary ultrasound
    - WNL
  - Endoscopy
  - Broncho alveolar lavage



Respiratory disease of the aged horse

- Treatments
  - Corticosteroids
    - Systemically
    - Inhalation
      - MDI or nebulisation
      - Ciclesonide
        - » NO systemical effects
  - Watch for comorbidities!!!



Take home message

- Real difference between old and young horses
- Sick old horses ≠ Tumor on legs
- Need to adapt prophylactic treatments
  - Vaccination, deworming, dental care
- Need to adapt environment

Merci pour votre attention