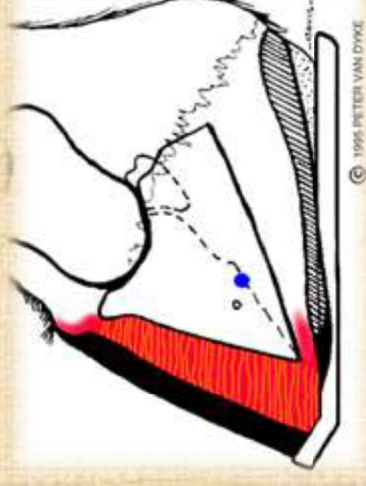
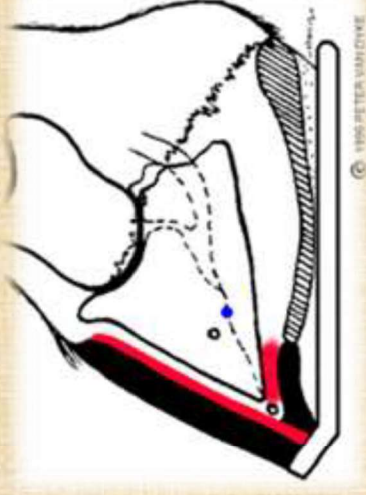


Equine Hoof Affections

Laminitis

INTRODUCTION

- Laminitis is a painful condition of the sensitive laminae which attach the hoof wall to the pedal (coffin) bone.
- It can affect one foot or more and most commonly affects the front feet as they bear more weight than the hind feet.



Laminitis

INTRODUCTION

- Laminitis occurs or progresses in three phases:
 - **Acute laminitis:** initial phase of laminitis accompanied by severe pain (acute phase may recur during sub-acute or chronic phases)
 - **Sub-acute laminitis:** follows after acute phase subsides, it is a less painful phase which involves either the repair of or progressive damage to the sensitive laminae (depending upon the severity of the acute phase)
 - **Chronic laminitis:** follows incomplete resolution of laminitis, where the feet must accommodate to the rotation or sinking of the pedal bone (pain is variable)

Laminitis is a potentially-life threatening condition and requires an urgent attention from a veterinarian.

Laminitis

CAUSATIVE DISEASES OR CONDITIONS

- The primary diseases which can eventually cause laminitis are usually systemic abnormalities.
- The disease process causes toxins to be released into the blood stream, producing toxemia and, eventually, laminitis.

○ Primary conditions or diseases associated with laminitis:

Excessive Lush Grass Intake	Generalized Toxemia
Excessive Carbohydrate Intake	Retained Placenta
Excessive Weight Bearing on Leg	Thyroid Hormone Imbalance
Excessive Work on Hard Ground	Pituitary Gland Tumors
Long Toe Conformation	Adverse Reaction to Corticosteroids

Laminitis

DEVELOPMENT OF LAMINITIS

- The primary disease process results in the release of toxins into the blood stream causing toxemia.
- Toxemia produces spasm in the muscular walls of the blood vessels supplying the hoof laminae and as a result the blood supply to the hoof laminae is restricted or abolished and its cells begin to die.
- Cell death releases biochemical mediators (body chemicals) into the surrounding tissues, causing inflammation, fluid swelling and pain (**acute laminitis**).

Laminitis

DEVELOPMENT OF LAMINITIS

- Severe or persistent cases of laminitis:
 - Damaged laminae fail to support the pedal bone correctly and it rotates ('founder') or sinks within the hoof ('sinker')
 - ☐ Pedal bone separates uniformly around the hoof wall (**sinking**)
 - ☐ Pedal bone only separates at the front of the hoof wall (**Rotation**)
 - If not corrected, the tip (toe) of the pedal bone will rotate down through the sole of the foot, which often requires euthanasia of the horse on humane grounds
- Less severe, chronic cases of laminitis:
 - If neglected, these cases result in a misshapen 'Chinese slipper' foot

Laminitis

DIAGNOSES / CLINICAL EXAMINATION

- Signs include an increased heart rate, depressed appetite, sweating, trembling and rapid, shallow breathing.
- The acutely laminitis horse stands and walks with its weight shifted onto its heels and hind limbs with a typical stance or gait



Laminitis

DIAGNOSES / CLINICAL EXAMINATION

- The horse is reluctant to move, feeling footy (prefer soft ground) and may prefer to lie down to keep weight off the feet.
- Affected feet are often warm to the touch



Laminitis

DIAGNOSES / CLINICAL EXAMINATION

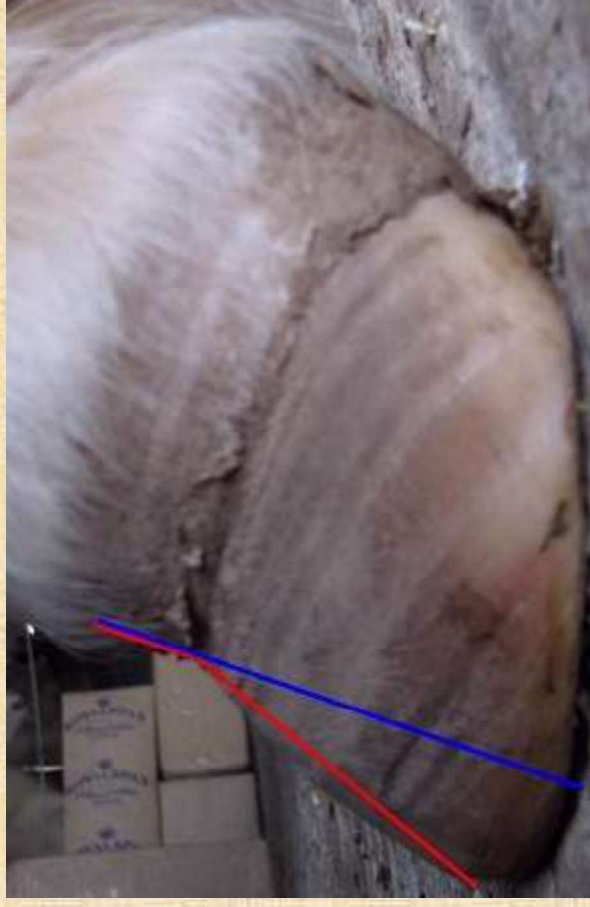
- In chronic laminitis
 - Abnormal hoof growth
 - long curled-up toes and collapsed heels
 - Hoof rings (laminitic rings) sometimes thickened sole
 - Gas shadows at the toe may signify infection.



Laminitis

DIAGNOSES / CLINICAL EXAMINATION

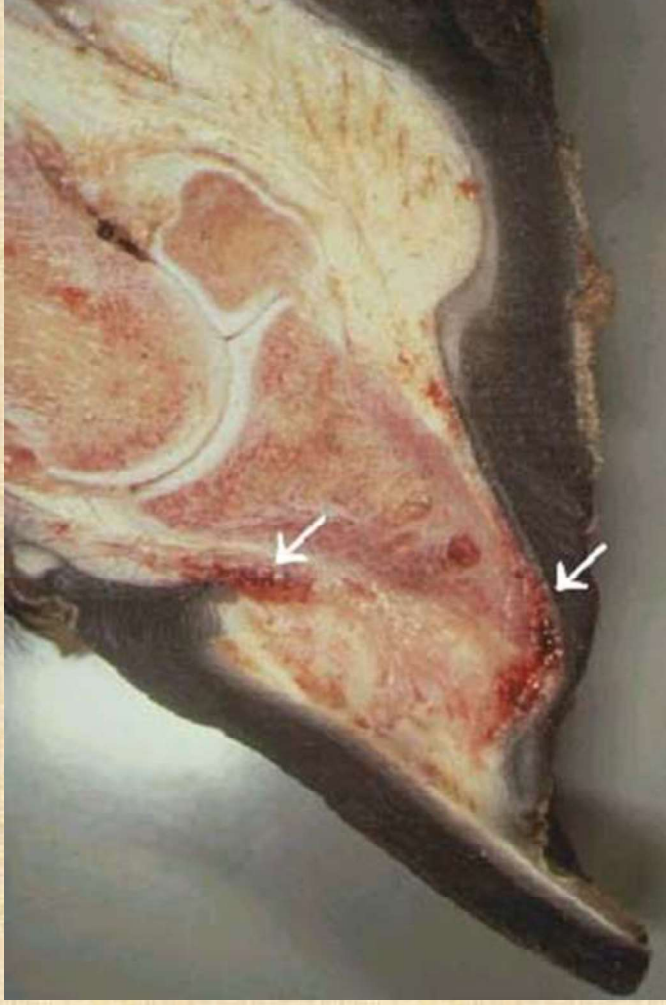
- In chronic laminitis
 - Wall cracks
 - Changing in hoof angle
 - Bruising (red) on the wall



Laminitis

DIAGNOSIS / CLINICAL EXAMINATION

- The sole, particularly at the toe, is painful to examination with hoof testers
- A palpable depression at the coronary band at the front of the hoof and a convex and painful sole ('dropped sole') suggests rotation of the pedal bone and the risk of sole penetration by the tip of the pedal bone



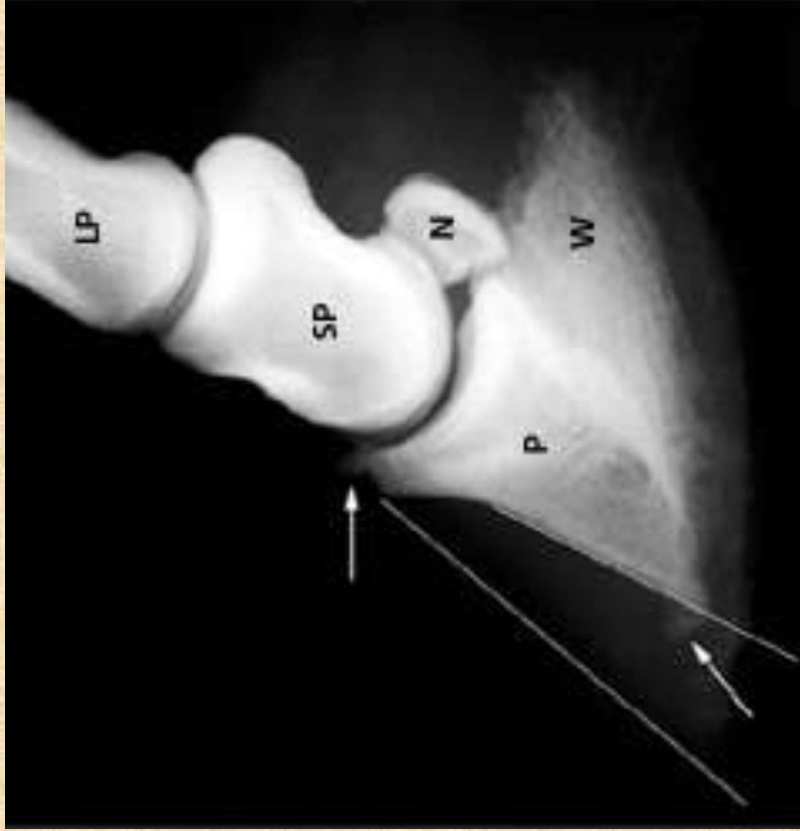
Laminitis

DIAGNOSIS / RADIOGRAPHY

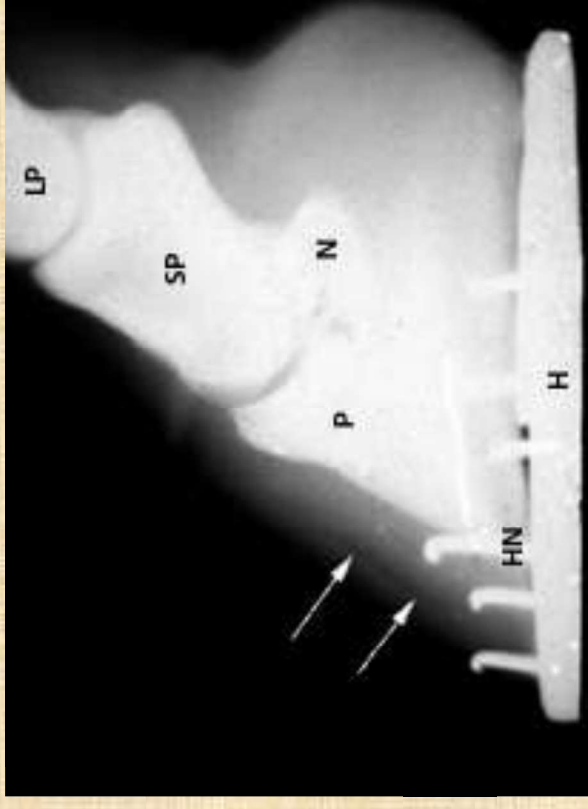
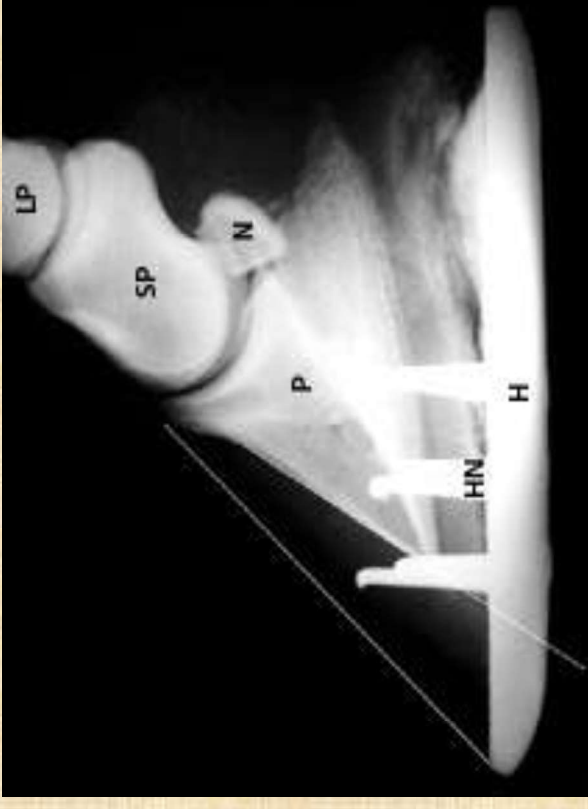
- Used to determine whether the pedal bone has rotated or not, and to what degree it has rotated.
- A wire taped to the front of the hoof helps to clarify the relationship between the hoof wall and the pedal bone.
 - In normal hoof anatomy, the hoof wall is parallel to that of the pedal bone
 - Pedal bone rotation with $< 5.5^\circ$ between the hoof wall and pedal bone
 - favorable prognosis for athletic use, if the horse responds well to treatment
 - Pedal bone rotation with $> 11.5^\circ$ between the hoof wall and pedal bone
 - poor prognosis

Laminitis

DIAGNOSIS / RADIOGRAPHY



Gas shadows at the toe may signify infection.



Laminitis

TREATMENT

- Complete stable rest is required in acute laminitis to prevent further damage to the laminar support structures.
- Radiographs:
 - Radiographic examinations of the feet will determine to what degree the pedal bones have rotated and, therefore, guide treatment
 - Follow-up radiographic examinations of the feet will assess the response to treatment and determine requirements for further treatment
- Euthanasia
 - may be indicated in the following instances:
 - Severe, acute cases where the horse is suffering uncontrollable pain
 - Severe, chronic cases where the horse is suffering incurably
 - Cases where the pedal bone has penetrated the sole of the foot or where the hoof wall completely separates from the foot (sloughing, exungulation, shedding or casting of the hoof)

Laminitis

TREATMENT

- **Primary Goals of Treatment are:**
 - Eliminate the initiating cause
 - Relieve the pain
 - Improve the blood circulation in the foot
 - Provide support for the foot through
 - trimming and shoeing and corrective surgery

Laminitis

TREATMENT

- **Primary Goals of Treatment are:**
 - Eliminate the initiating cause
 - **Excessive lush grass or grain intake:** Horse is removed from grass or grain source and laxatives (liquid paraffin, mineral oil) are administered to remove intestinal toxins. Small quantities of hay and plenty of drinking water are provided
 - **Excessive weight bearing on leg:** Lameness affecting other leg is treated.
 - **Long toe conformation:** Feet are trimmed and shod correctly
 - **Generalized toxæmia, pituitary gland tumours:** Diarrhoea, liver disease, or other initiating cause of toxin production are treated
 - **Retained placenta:** Retained placenta and associated inflammatory uterine fluids are removed and uterine infection is treated