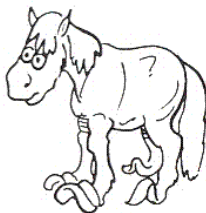
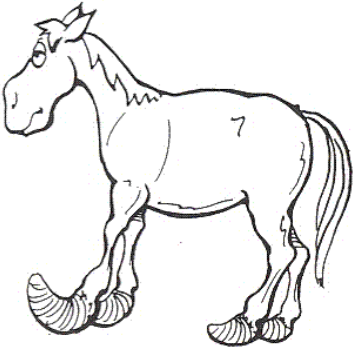
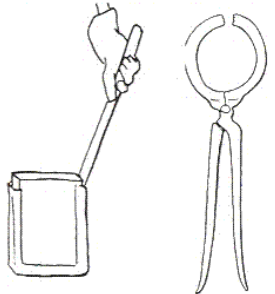
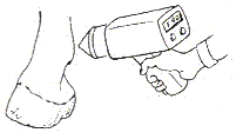





Laminitis vs. Navicular Dz (Caudal heel pain) Guide to Equine Clinics, Lameness Pasquini, 2nd ed.

54

FOOT

Laminitis

Condition	Facts/Cause	Pesentation/CS	Diagnosis	Treatment
Laminitis, Founder Mk 510; W-J 44; AL 487; M 76; IM 1158; C3T 154; C2T 277; H 669; EM&S 1354; E 1049; VC-F 73; VC-L 25, 157; S-M&T 38; S-A 989, 1102; S-W 407, 423; P 486; X-1D 39; X-T 207; Pic 226, 228; POP-M 109; POP-J 126; POP-T 142; POP-H 92, 211; POP-G 264; POP-S 208; RA p77 ***** \$ - \$\$\$	<ul style="list-style-type: none"> • Very common • Inflammation of laminae of hoof • Front feet more then hind feet <ul style="list-style-type: none"> - Single or all 4 feet • Avascular necrosis of sensitive laminae • Medical emergency!!! a threat to life <ul style="list-style-type: none"> - Quick changes w/in hrs - #1 Endotoxins of cell walls of gram neg. bact., vasoactive lipopolysaccharides <ul style="list-style-type: none"> . Incr. blood flow to foot, but less flow to laminae bec. of arteriovenous shunts - Mechanical overload, can break down connection of sensitive & insensitive laminae • Repeated attacks worsens prognosis 	<ul style="list-style-type: none"> • Types <ol style="list-style-type: none"> 1. Predisposing conditions 2. Acute laminitis 3. Refractory laminitis 4. Chronic - rotation of P3  <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> Laminitis lameness grades <ul style="list-style-type: none"> • Grade 1: Lifts feet repeatedly • Grade 2: Walks willingly, laminitic gait, doesn't resist lifting of foot • Grade 3: Reluctance to move, resists foot lifting • Grade 4: Must be forced to move, m/b recumbent </div> 	<ul style="list-style-type: none"> • Problem: usually not diagnosed until reach grade 3 • Acute <ul style="list-style-type: none"> - Hoof testers, pain all over sole, especially over toe - Alteration in digital pulse • Refractory <ul style="list-style-type: none"> - Lack of response to Tx & CS • Chronic: <ul style="list-style-type: none"> - "Dropped sole", sole flat or convex - See toe of P3 through sole • Radiographs <ul style="list-style-type: none"> - Acutely for baseline - Early: widening betw. P3 & dors. hoof wall - roughening of dors. P3 - Dist. displacement of P3 - Rotation of dist. phalanx  	<ul style="list-style-type: none"> • Medical emergency!!  <ul style="list-style-type: none"> - Be aggressive in Tx - See following pages for Tx of   <p>Prognosis:</p> <ul style="list-style-type: none"> • Always guarded <ul style="list-style-type: none"> - 30% return to soundness - 10% intermittantly lame - 10% permanent severe lameness - 50% dead (n = 202) • Lower the grade more chance of recovery • CS >10 days - poor • Rotation - poor • Infection (seedy toe) - poor • Control of pain major determining factor of outcome



Laminitis continued

Pathophysiology in laminitis

- **Uncoupling of laminae** betw. hoof & P3 (breaks down) due to ischemia, degeneration, inflammation, pain & necrosis from:

1. Vasoconstriction leading to arteriovenous shunting (from laminae to deep structures of foot due to prostaglandins of endotoxemia)
2. Coagulopathy leading to thrombosis
3. Hypoperfusion of foot

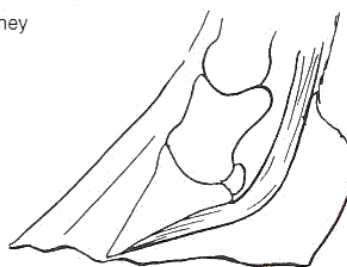
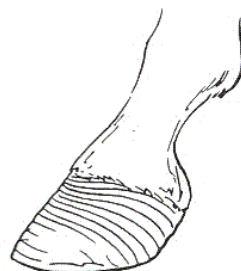
- **DDF pulls P3 away from hoof** (directly related to severity)

- **Rotation of P3** through sole ("dropped sole")

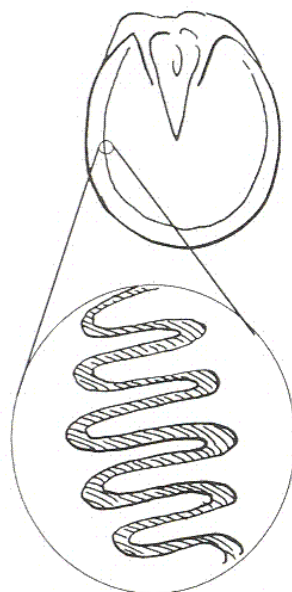
- **"Sinkers"** P3 sinks rather than rotates

- Hoof sloughs

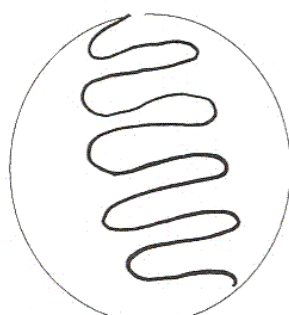
- **Founder rings** - horizontal lines on hoof wall, reflect old laminitis, they diverge on heel (heel grows faster than toe, wider at heels than toe)



Rotation of P3



Separation of laminae

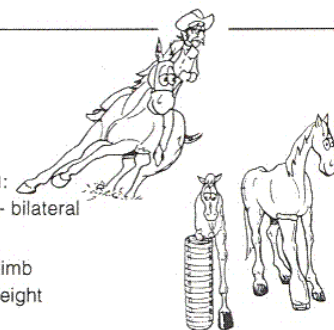


Normal laminae (schematic)

Causes:

• Mechanical

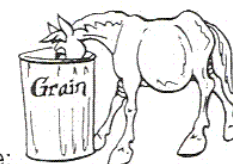
- **Road founder, mechanical trauma:** concussion, inflame or tear laminar connections - bilateral



- **Support laminitis:** weight bearing sound limb laminitis develops commonly due to excessive weight to compensate for a lame limb - unilateral

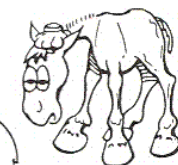
• Endotoxemia

- Grain founder

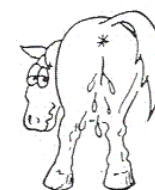


- Grass founder: obesity & lush pasture: common in summer lush pasture

- Postparturient laminitis: retained placenta (always serious)



- Water founder

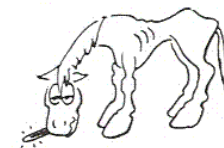


- Mastitis founder

- Enteritis/colitis: endotoxic absorption

- Postoperative colic founder

- Severe systemic diz founder



- **Corticosteroid therapy**, predisposes to more serious laminitis

- **Black walnut wood shavings:** direct exposure of ingestion (transient)

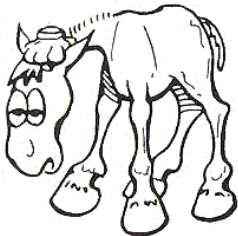
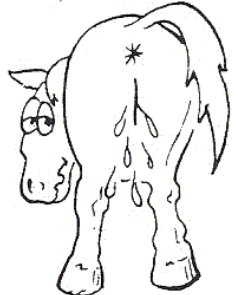
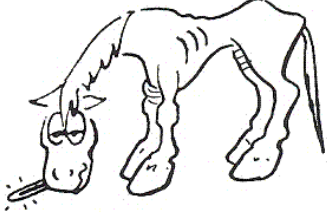
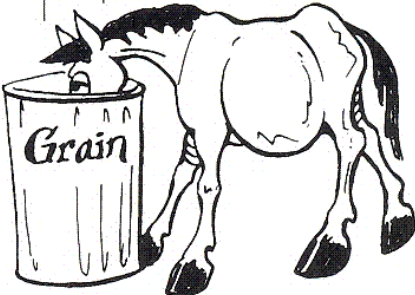
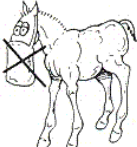


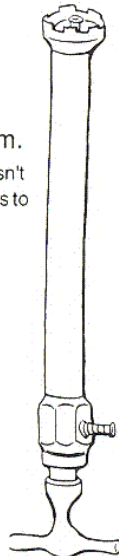


Laminitis vs. Navicular Dz (Caudal heel pain) Guide to Equine Clinics, Lameness Pasquini, 2nd ed.

56

LAMINITIS

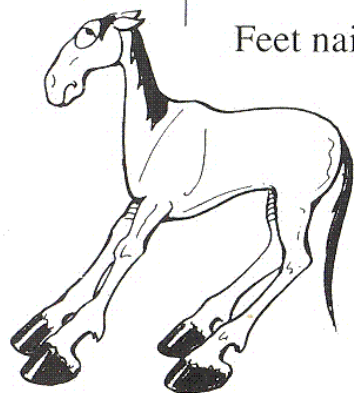
FOOT

Condition	Facts/Cause	Presentation/CS	Diagnosis	Treatment
Endotoxemia Founder Mk 510; W-J 44; AL 487; M 76; IM 1158; C3T 154; C2T 277, EM&S 1354; E 1049; VC-F 73; VC-L 25, 157; Pic 226, 228S-A 989, 1102; S-W 407, 423; POP-M 109; POP-H 211; POP-G 264; POP-S 208; RA p77 **** \$ - \$\$\$	<ul style="list-style-type: none"> • Common • Endotoxemia <ul style="list-style-type: none"> - #1 Endotoxins of cell walls of gram negative bacteria, vasoactive lipopolysaccharides . Incr. blood flow to foot, but less flow to laminae bec. of arteriovenous shunts • Avascular necrosis of sensitive laminae • Quick changes w/in hours 	<ul style="list-style-type: none"> • CS of cause 	<ul style="list-style-type: none"> • Hx, CS   	<ul style="list-style-type: none"> • Prevention for hi risk clinical condition before CS • Dx cause • Remove from environment <ul style="list-style-type: none"> - Mineral oil - nasogastric tube, minimize further absorption - Restrict diet - i.e. no grain, feed grass hay until resolves • Overweight horses or pony - diet • Tx concurrent diz <ul style="list-style-type: none"> - IV fluids - ABs, parenteral - Banamine® (flunixin meglumine) - Plasma • PBZ reduces pain, edema, inflam. • Exercise? Hand walk if horse doesn't object, do not force to walk, do not use blocks to make walk    
Endotoxemia <ul style="list-style-type: none"> • Grain founder: overload of grain (wheat, barley >> oats) Incr. lactic acid bact., low pH lyses gram neg. bact. (release of endotoxin) . CS of laminitis in 18 hours • Grass founder: obesity & lush pasture: common in summer lush pasture (clover & alfalfa) - Shetland ponies, Welsh ponies & fat horses • Postparturient laminitis: retained placenta (always serious) • Water founder: excessive water when hot (after exercise), let cool down before watering • Mastitis • Enteritis/colitis: endotoxic absorption • Postoperative colic • Severe systemic diz: pleuritis, retained placenta, viremia/fever, septicemia • Black walnut wood shavings: direct exposure of ingestion (transient) 				
Endotoxins - laminar necrosis CS & Dx of cause Tx: Mineral oil, diet, Tx concurrent diz, Hand walk				

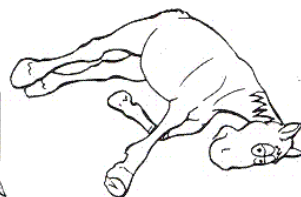


Laminitis vs. Navicular Dz (Caudal heel pain) Guide to Equine Clinics, Lameness Pasquini, 2nd ed.

Condition	Facts/Cause	Presentation/CS	Diagnosis	Treatment
Acute laminitis, Founder Mk 510; W-J 44; AL 487; M 76; IM 1158; C3T 154; C2T 277; H 669; EM&S 1354; E 1049; S-A 989; 1102; S-W 407, 423; VC-F 73; VC-L 25, 157; Pic 226, 228; POP-H 211; POP-G 264; POP-S; POP-J 129; RA p77 **** \$ - \$\$\$	<ul style="list-style-type: none"> • Common • Avascular necrosis of sensitive laminae • Medical emergency!!! a threat to life <ul style="list-style-type: none"> - Quick changes w/in hrs - - #1 Endotoxins of cell walls of gram neg. bact., vasoactive lipopolysaccharides . Incr. blood flow to foot, but less flow to laminae bec. of arteriovenous shunts • Mechanical overload, can break down connection of sensitive & insensitive laminae • Repeated attacks worsens prognosis 	<ul style="list-style-type: none"> • Rapid progression • Shortened stride, w/ each foot quickly placed back on ground • "Heel-toe" placement, land on heel followed by exaggerated toe slap • Recumbency if severe pain or all 4 feet affected • "Leaning back" - pain postures (reluctance to move, "feet nailed to floor") <ul style="list-style-type: none"> - Front & rear legs forward to take off wt. (take weight off toes) • Altered vital signs - related to predisposing clinical conditions <ul style="list-style-type: none"> - Distressed, sweating, trembling - Injected mucous membranes • Recurrence m/ occur • Subacute <ul style="list-style-type: none"> - Milder CS than acute 	<ul style="list-style-type: none"> • Hoof testers, pain all over sole, esp. toe • Incr. in digital pulse (moderate pulse can be felt in normal horses) • Incr. heat w/in foot <ul style="list-style-type: none"> - Bounding pulse - hot feet - Decr. or absent - cold feet (decr. blood to foot, decr. Px) • Pastern/foot block to eliminate pain • Radiographs <ul style="list-style-type: none"> - Lat. view acutely for baseline - Serial rads - lat. view, place a lead marker on dors. midline of hoof - Structural changes w/in 48-72 hr of CS - Watch for sinking or rotation 	<ul style="list-style-type: none"> • Medical emergency!! <ul style="list-style-type: none"> - Time critical w/ in 12 hours (Tx before rotation, rotation m/b w/in 48 hrs) - Be aggressive in Tx • Restrict diet - i.e., no grain, feed grass hay until resolves • Overweight horses or pony - diet • Tx concurrent diz <ul style="list-style-type: none"> - IV fluids, ABs parenteral, Banamine® (flunixin meglumine), Plasma • PBZ reduces pain, edema, inflam. • Aspirin (inhibit platelet aggregation) • DMSO: free radical scavenger & potent antiinflammatory drug • Vasodilators - Acepromazine®, isoxsuprine hydrochloride only if stable cardiovascular system • Heparin to prevent coagulopathy (incr. blood flow) 40 IU/kg useful esp. if disseminated intravascular coagulation • Raise heels 20° to take pull off deep digital flexor • Stall rest <ul style="list-style-type: none"> - Sand stall or deep bedding to provide support - Exercise? Hand walk if horse doesn't object, do not force to walk, do not use blocks to make walk • Pastern/foot block to make comfortable not to make walk • Cold therapy probably doesn't alter course of diz • Monitor w/ serial rads for rotation &/or sinking




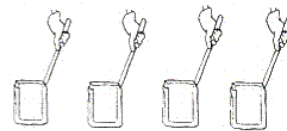
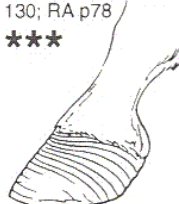
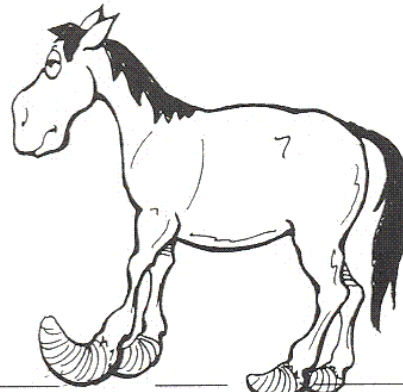
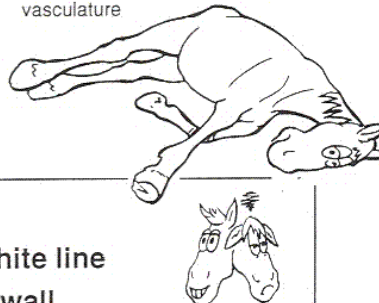
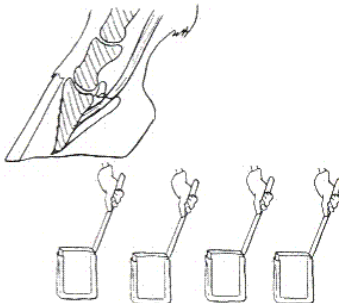
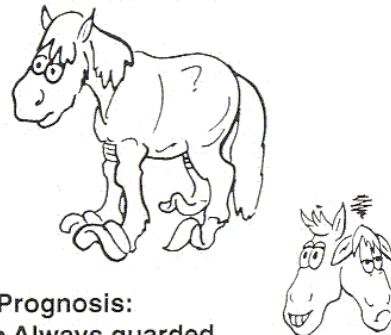

Leaning back




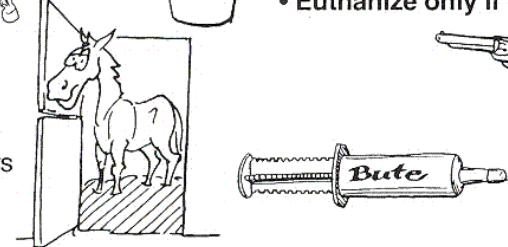
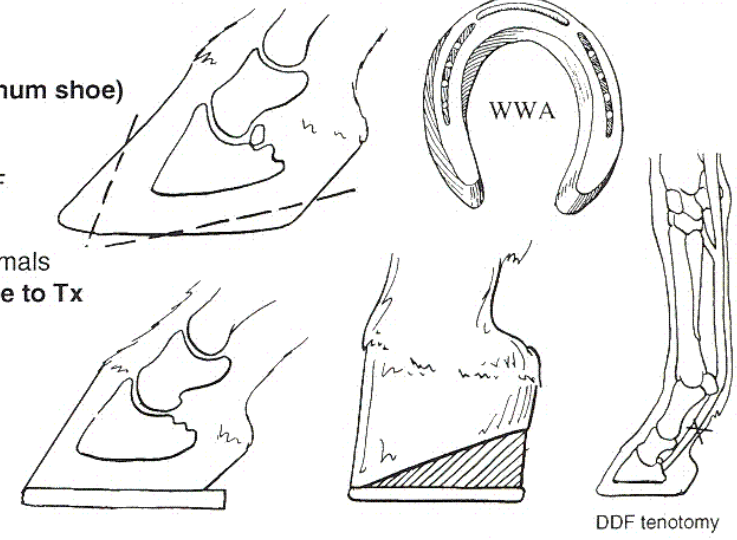
**** Quick changes! Acute - Med emergency
CS: Pain
Dx: Lat. rad. - Rotation, Sinking
Tx: Tx cause, PBZ, Sand stall, Exercise?



Laminitis vs. Navicular Dz (Caudal heel pain) Guide to Equine Clinics, Lameness Pasquini, 2nd ed.

58				FOOT
Condition	Facts/Cause	Presentation/CS	Diagnosis	Treatment
Refractory laminitis, *** \$\$\$ 	<ul style="list-style-type: none">• Laminitis w/ no response to aggressive Tx after 10-14 days or- Acute exacerbation after initial improvement• Frequent sequela to acute laminitis• Progresses to chronic laminitis	<ul style="list-style-type: none">• Refractory laminitis<ul style="list-style-type: none">- No response or worsening in face of aggressive Tx in 3 d• "Leaning back" - pain postures• Laminitic gait	<ul style="list-style-type: none">• Lack of response to Tx• Monitor rads for rotation 	<ul style="list-style-type: none">• Refractory laminitis<ul style="list-style-type: none">- Continue w/ Tx for Hi risk & acute- Deep bedding or sand- Euthanasia or DDF tenotomy• Rotation & penetration - Euthanize Prognosis: poor
Chronic laminitis, Founder Mk 510; W-J 44; AL 487; M 76; IM 1158; C3T 154; C2T 277; H 669; EM&S 1354; E 1049; VC-F 73; VC-L 25, 157; S-A 989, 1102; S-T&M 153; S-W 407, 423; X-1D 39; Pic 226, 228; POP-H 211; POP-G 267; POP-S 208; POP-J 130; RA p78 *** 	<ul style="list-style-type: none">• Rotation or distal displacement of pedal bone<ul style="list-style-type: none">- No active necrosis or inflammation• Repeated attacks worsens prognosis 	<ul style="list-style-type: none">• Rotation of P3<ul style="list-style-type: none">- "Dropped sole", sole flat or convex due to rotation (P3 pushing on sole)<ul style="list-style-type: none">. M/b crack in front of frog (m/b exudate). M/b dent or separation at coronary bandSee toe of P3 through sole• Founder lines: diverge, wider on heel• Long toes & heels overgrown• Widening of white line: separation of laminae at white line predisposes to "seedy toe"• Land on heel followed by exaggerated toe slap• Sequela:<ul style="list-style-type: none">- Subsolar abscesses common due to abnormal horn growth & changes in digital vasculature 	<ul style="list-style-type: none">• Hx, CS• Hoof testers: show little pain• Nerve blocks not needed bec. CS obvious• Radiographs<ul style="list-style-type: none">- Acutely for baseline- Serial rads - lat. view, place a lead marker on dors. midline of hoof- Rotation of P3<ul style="list-style-type: none">. Loss parallel configuration betw. P3 & hoof wall<ul style="list-style-type: none">.. Monitor progression of rotation- Air between hoof & P3- P3 through sole- Sinking of P3- "Ski run" - dors. surface of P3- Elongated toe 	<ul style="list-style-type: none">• Tx see box below  Prognosis: <ul style="list-style-type: none">• Always guarded• Grading system best prognostic indicator• Rotation - poor• Infection (seedy toe) - poor• Control of pain major determining factor of outcome <div>Prognosis - rotation<ul style="list-style-type: none">• 5° return to athletic activity• 7-12° return to activity at a lower level• >12° no return to athletic activity</div>
*** Rotation/sinking of pedal bone CS: "Dropped sole", Founder lines, Widened white line Dx: Lat. rad. - Rotation - P3 not parallel to hoof wall Tx: Abscesses, Bedding, PBZ, Trimming, DDF tenotomy, Euthanasia				

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<p>• Initial Tx</p> <ul style="list-style-type: none"> - Remove underrun sole - Debride abscesses <ul style="list-style-type: none"> Soak foot in Betadine-Epsom salt (povidone-iodine & magn. sulfate) Systemic ABs  <p>• Bandage</p> <p>• Deep bedding - soft sand</p> <p>• Monitor w/ rads every 48 hours</p> <p>• PBZ as needed for pain</p> 	<p>• Trimming - align P3 & hoof wall</p> <ul style="list-style-type: none"> - Trim toe - WWA (wide web wedge aluminum shoe) full pad (no direct pressure on sole) - Reshoe at 4-6 week intervals - Raise heel to reduce pull of DDF - Heart bar shoe or dorsal wall resection, not advocated • DDF tenotomy salvage brood animals • Euthanize only if not responsive to Tx 
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Widened white line, "Seedy toe",

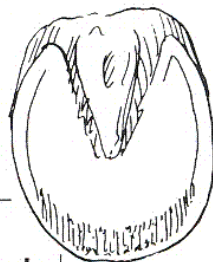
Hollow wall, Dystrophia unguis

Mk515; M81; AL491; C3T 155; W-J 45; Pic 229; POP-H 96, 276; POP-G 261; POP-S 215; POP-J 127; POP-T 144; RA p78

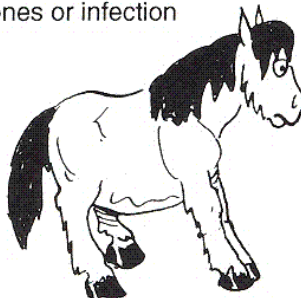
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Sequela to laminitis
Separation of wall from sole

- **Widening at white line**
 - Separation of hoof from sensitive laminae usu. at the toe
- **Sequelae to mild, chronic laminitis, esp. in ponies**
- **Puncture wound of white line** ("gravel") predisposes to infection under hoof wall

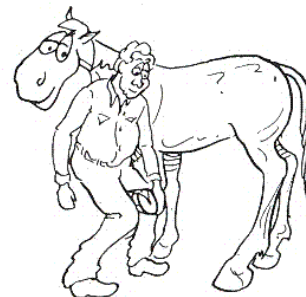


- Outer wall appears sound
- Separation of wall over toe seen on ground surface
- **Lameness infrequent**, low grade or acute
 - Lameness if packed w/ dirt, small stones or infection



59

- CS - separation of wall
- **Tap on wall, sounds hollow**



DDx:

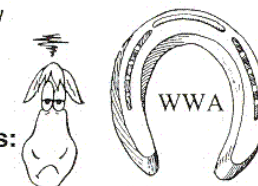
- Chronic laminitis
- Foot abscesses

- **Tx unrewarding, recurrence common**

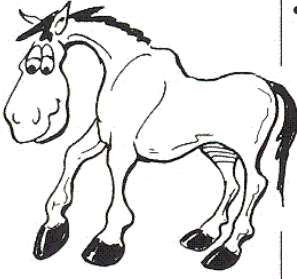
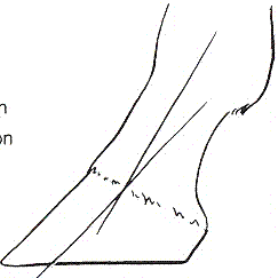
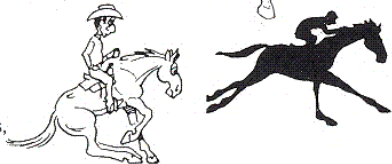
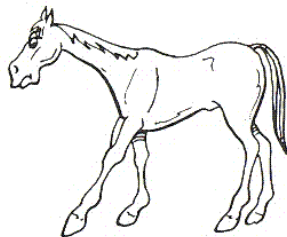
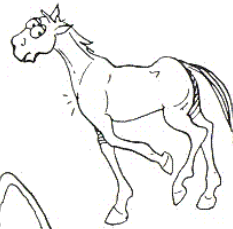
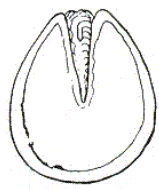
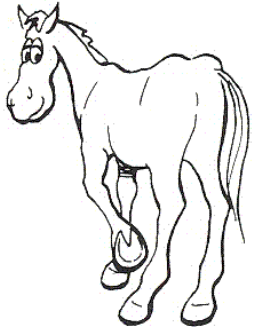
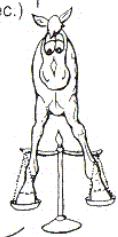
- Difficult to re-establish connection of wall to laminae

- **Clean**
- **Pack w/ juniper tar & oakum**
- **WWA shoes** (wide web aluminum shoes) to protect
- If sound, shoe & work OK
- **Extensive lesion - remove wall** over affected area - up to 12 months to regrow

Prognosis:
• **Poor**



Laminitis vs. Navicular Dz (Caudal heel pain) Guide to Equine Clinics, Lameness Pasquini, 2nd ed.

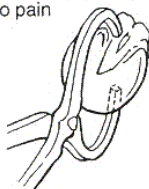
Navicular disease	62	FOOT
Condition	Facts/Cause	Presentation/CS
<p>Navicular syndrome, Navicular diz, Podotrochleosis, Podotrochleitis</p> <p>MK 501, C2T 282; W-J 54; AL 499; M77; H678; E1042; EM&S 1346; TAH 263, 292, 363; VC-F 109; VC-L 173; VC-EP 131; VC-Dx 213; S-A 580; S-T&M 161; S-W 413, 424; X-1D 25; X-B 53; X-T 214; X-M 87; P-J 63; Pic 225; POP-M 125; POP-H 241; POP-G 225; POP-S 204; POP-J 135; POP-T 143; RA p79</p> <p>*** \$\$</p> 	<ul style="list-style-type: none"> • Chronic, progressive, painful, syndrome due to problems of navicular bone, navicular bursa, coffin joint, hoof, DDF tendon &/or associated structures • 1/3 of all forelimb lamenesses • 6-8 yr-olds (4-15 yr) • 1° forelimbs (reported in hindlimbs) • Bilateral (lameness varies from leg to leg) • Diz of athletes <ul style="list-style-type: none"> - Quarterhorses - Thoroughbreds - Warmbloods (especially geldings); rare in Standardbreds, ponies, Arabians or donkeys • Predisposing factors <ul style="list-style-type: none"> - Unbalanced foot, med. to lat. - Concussion (racing & working horses) - Conformation <ul style="list-style-type: none"> • Break in foot/pastern axis <ul style="list-style-type: none"> ..Short heel: puts pressure on DDF tendon ..Long toe: upright pastern incr. concussion • Small feet (Quarter horses) less area to distribute concussion • Large, heavy bodies • Inadequate heel support (underrun) - Poor conditioning • Etiology - controversy <ul style="list-style-type: none"> - Concussion causes navicular bursitis due to pressure of DDF, resulting in pathological changes - Disrupted blood flow - Arterial thrombosis & ischemic necrosis w/in navicular bone <div data-bbox="436 1230 1087 1333" style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center;"> <p>1/3rd of all forelimb lamenesses #1 chronic, intermittent forelimb lameness</p> </div>  	<ul style="list-style-type: none"> • Hx - owner often believes pain in shoulder, "tied up in the shoulders" • Chronic, low grade shifting leg lameness • Insidious onset (not picked up early) • Pointing: foot flexed w/ heel off ground, if 1 foot more affected (takes pressure of DDF tendon off bone) <ul style="list-style-type: none"> - Bilateral: alternate pointing, or "camped" in front (both feet far in front) • Intermittent lameness early in diz, after workout (better at rest), lame & then appears sound, then lame • Stiff gait <ul style="list-style-type: none"> - Lands on toe (pressure off middle 1/3 of sole over navicular bone) - Shortened stride & stumble - Worse on rocks or when lunging (circling) • Sequela: <ul style="list-style-type: none"> - Contracted heels & incr. concavity to sole (bec. not bearing weight on heels) - Toe bruises from landing on toe <ul style="list-style-type: none"> .. Foot changes - wears down toe, grows at heel    <div data-bbox="1470 1039 1837 1323" style="border: 1px solid black; border-radius: 15px; padding: 10px;"> <p>DDx:</p> <ul style="list-style-type: none"> • Puncture wounds (navicular bursa infec.) • Fxs of nav. or dist. phalanx • Laminitis • Toe bruising • Low ringbone • Shoulder lameness • Arthritis of coffin joint or fetlock • Corns • Sheared heels - sore heels • Pedal osteitis </div>  

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DIAGNOSIS

• Diagnosis difficult, insidious course

- **Hoof testers** - pain over center 1/3 of frog (m/b subtle, compare to opposite & rear limbs) \pm , m/b no pain



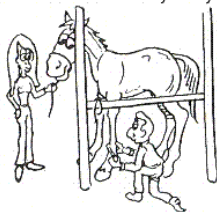
• **Trotting:** rigid head bilat., nodding on inside limb when lunging

- Flexion test (pull on toe for 1-2 min) trotted off, 80% aggravation of condition
- Wedge test: hyperextension test, place toe on end of plank to raise off ground for 30 sec & trot off



• **"Heel" block** (PD) partially or totally eliminates lameness

- Watch for lameness on opposite foot after blocking
- Pastern/foot block (ASNB) m/b necessary to completely eliminate lameness
- Navicular bursa block - very risky procedure



• Radiographs

- Positive radiographic findings are supportive of Dx, but not diagnostic

- 5 views - standard navicular series:

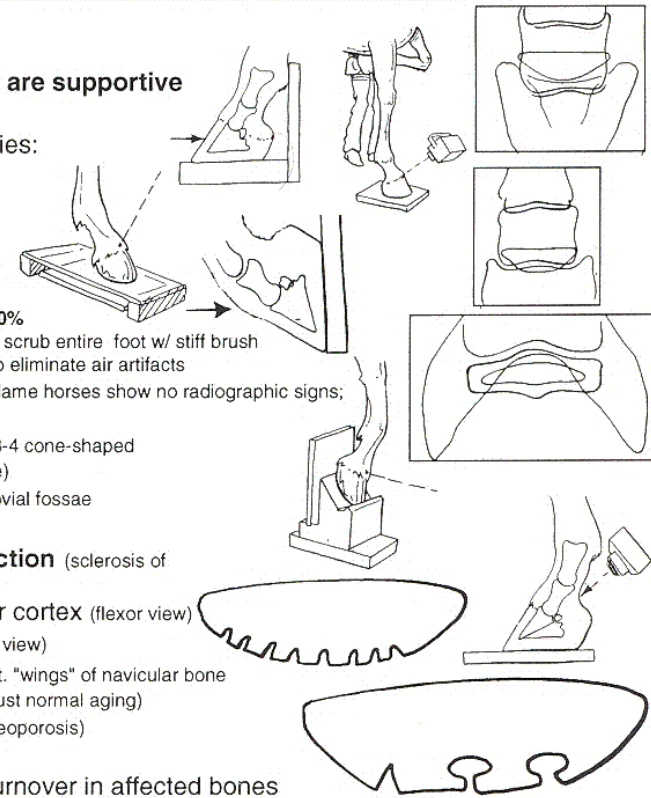
1. 60° DP (dorsopalmar)
2. Lat.
3. "Flexor view"
- 4-5. 2 obliques 60° to horizontal

- Bilateral, so usually radiograph both feet
- Radiographic signs m/ be present in **only 50%**
- Foot prep. (very important) - remove shoes, scrub entire foot w/ stiff brush & water, clean pack sole w/ Play Dough® to eliminate air artifacts

- **Findings:** interpret in light of CS, some lame horses show no radiographic signs; others showing changes have no pain

- **Over 7 synovial fossae** (norm. 3-4 cone-shaped structures in dist. border of navicular bone)
- **"Lollipops"**, mushroom-shaped synovial fossae
- **Cysts** in medullary cavity m/ heal
- **Loss of corticomedullary junction** (sclerosis of navicular medullary cavity) flexor view
- **Thinning or roughening of flexor cortex** (flexor view)
- **Flattening of sagittal ridge** (flexor view)
- **Enthesiophytes:** osteophytes on lat. "wings" of navicular bone (mineralization of suspensory lig.) (m/b just normal aging)
- **Fractures** (from enlarged fossae & osteoporosis)

• Nuclear scintigraphy: incr. bone turnover in affected bones



Radiographic findings

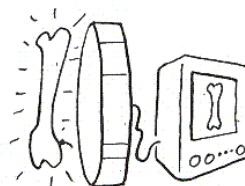
1. Over 7 synovial fossae
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6. Flattening of sagittal ridge
7. Enthesiophytes: osteophytes on lat. "wings"

*** #1 chronic, intermittent forelimb lameness, Etiology?

CS: Pain - caud. foot: Point - land on toe - short stride

Dx: "Heel block" - "Lollipops"

Tx? No cure, palliative: PBZ, shoeing, Neurectomy



Treatment - Navicular diz

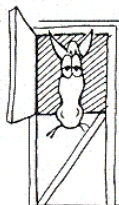
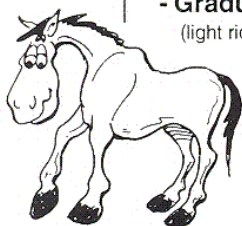
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Treatment of Navicular Disease

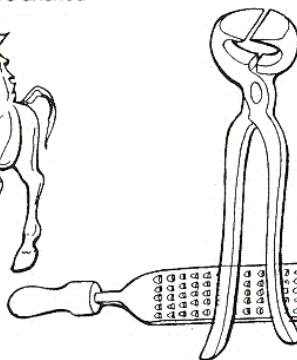
- Goal: to manage, impossible to cure

MEDICAL

- **Stall rest - CEP** (controlled exercise program)
 - Walk & jog 2 miles SID in a straight line down & back a dirt road
 - Gradually incr. over several weeks to 6 miles/day in a straight line (light rider on horse)

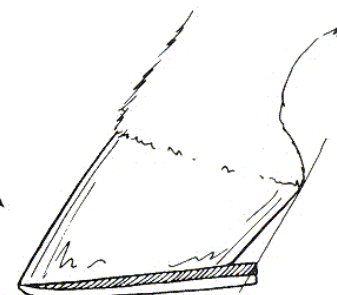
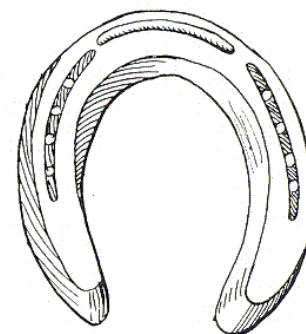
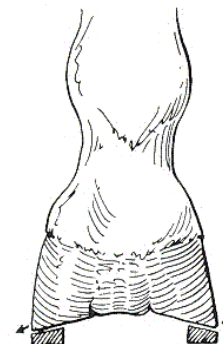
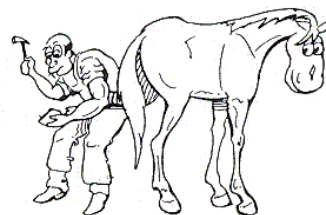


- **Corrective trimming** important & helpful in all cases
 - Balance foot side to side (relieves stress on DDF)
 - Hoof/pastern axis corrected
 - 55-60° hoof angle
 - Shorten toe (so "breaks over" easier)
 - If on soft pasture, leave unshod



• Corrective shoeing

- **WWA** (wide webbed aluminum) wedge (3°) shoes
- **Shoe full in heel:** correct underrun heels, end of shoe under palmar end of heel, 1/4" (5 cm) palmar to ground surface of hoof. Problem w/ hind feet pulling off shoes, but still important
- **Raise heel** (quick breakover, decr. tension off DDF & pressure on navicular b.)
 - Wedge pads 3°, 6°, 8° w/ silicon under pad if necessary
- **Slipper shoe**

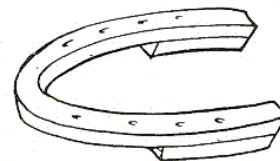
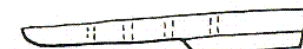


• PBZ (phenylbutazone) 10 days:

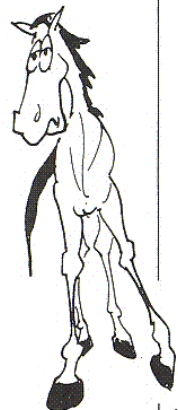
- 2 g BID PO 5 days, 1 g BID PO 5 days
- NSAIDs: relief of pain (phenylbutazone, Meclofenamic acid, Naproxen®, Banamine® [flunixin meglumine]) (used for years w/o problems). Prolongs usefulness of horse, especially weekend horses

• Other treatments reported

- Anticoagulant drugs - Warfarin to thin blood, DO NOT use w/ "Bute"
- Isoxsuprine HCl (Naviculux®) vasodilators, β-blocker not very effective
- Forbidden by American Horse Show Assoc. (so withdraw 96 hours prior to competition)



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"Nerve" horse, digital neurectomy - eliminates pain, not disease; do if no improvement from medical therapy in 6-12 weeks

- **Contraindicated if severe radiographic findings**
- **Last ditch measure to lengthen athletic life**

• Procedure

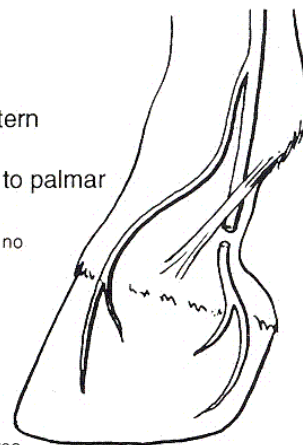
- . Incise skin on dors. border of SDF tendon at midpastern
- . **Locate palmar digital nerve under lig. of ergot**
- .. VAN orientation of digital v., a, & nerve from dors. to palmar
- . **Sharply cut out a 1" (2 cm) section of nerve**
- . **Do NOT cut dors. branches** of digital nn. or results in no feeling in foot, resulting in stumbling & danger to riders

. 6 weeks postoperative rest

- . Careful bandaging & atraumatic Sx keys to success

- Complications

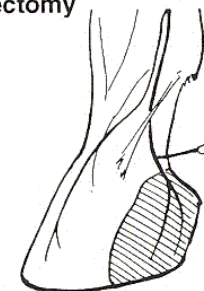
- . May cause rapid degeneration of navicular bone
- . Painful neuroma
- . Rupture of DDF tendon
- . Heel wounds will not be felt by horse, frequently clean & check heel area
- . Loss of hoof wall: esp if 2nd surgery done (neuroma), caused by scarring shutting off digital artery supply
- . Incomplete desensitization of heel
- . Regeneration of nerve (redo neurectomy)



Navicular suspensory desmotomy rarely done

• "Heel block" predicts effect of a neurectomy

- Horse should show improvement if navicular problem
- Reasons for little response to heel block
 - Fibrosis/adhesions betw. navicular bone & DDF: mechanical lameness
 - Arthritis of coffin joints
 - Accessory nerve branches from dors. branch or palmar nn. not blocked
 - Toe bruising, check w/ hoof testers, supplied by dors. branches so not affected
 - Improper or incomplete block, do again



Prognosis:

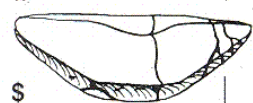
- **Guarded** because progressive degeneration & chronic
- But can prolong usefulness
- 50% usably sound for 1 year following Tx
- All eventually retired due to lameness
- More favorable: early Tx, strict shoeing
- Less favorable: prolonged CS, marked radiographic changes, inappropriate shoeing
- Neurectomy last ditch effort, alternate to euthanasia, 74% sound 1 year, 63% after 2 years



Dist. sesamoid/Navicular fxs

M79; AL 514; W-J241; E 1048; C2T 285; VC-F 224; H 684; TAH 278; S-A 992; S-E 1048; S-W 602; X-1D 15; X-B 38; X-T 222; Pic 234; POP-H 258; POP-G 244; POP-J 138, RA p80

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Facts/cause

• Rare

• Cause

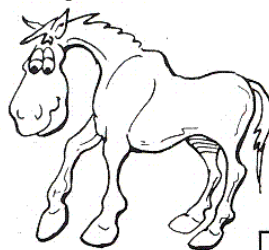
- Sequela to navicular diz (demineralization)
- Trauma - racing

• Types

- Chip fx (dist. border, m/b mineralization (incomplete enthesiophytes) of impar lig. [dist. sesamoidean lig])
- Complete simple fx (sagittal or oblique)
- Comminuted
- Multipartite sesamoid bone: multiple ossification centers

Presentation/CS

- Identical to navicular diz
- More acute
 - Acute, severe non-weight bearing, unilat. foreleg lameness



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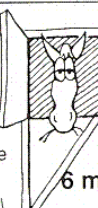
Diagnosis

- Hx, CS
- Hoof testers across heels
- Palmar digital NB ("Heel block")
- Radiology
 - Fx line contained in bone (if extends outside bone not fx. If unsure, take another view)
 - Lat. grooves (sulci) of frog m/ appear as fx lines (artifact)



Treatment

- Stall rest 6 months
- Small paddock 12 months
- Bar shoes w/ quarter clips
- Other reported Tx
 - Digital neurectomy
 - Bone screw - Surgical challenge



Prognosis:

- Guarded to poor (bone heals poorly)

