



One Step at a Time

Walking Through Equine Soft Tissue Injury and
Rehabilitation

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About NLEP

- Established in 2019 when Lake County Equine and County Line Equine Practices merged
- 3 Doctor Ambulatory Practice
- Internship for New Grads – 2024
- New Construction of Haul-In Facility – 2024
- Focuses
 - Wellness/Preventative Care
 - Lameness/Sports Medicine
 - Upper Airway Endoscopy/Gastroscopy
 - Chiropractic/Acupuncture
 - ER Services



*Horses are your passion; caring for them
is ours*



About Dr. Laurel

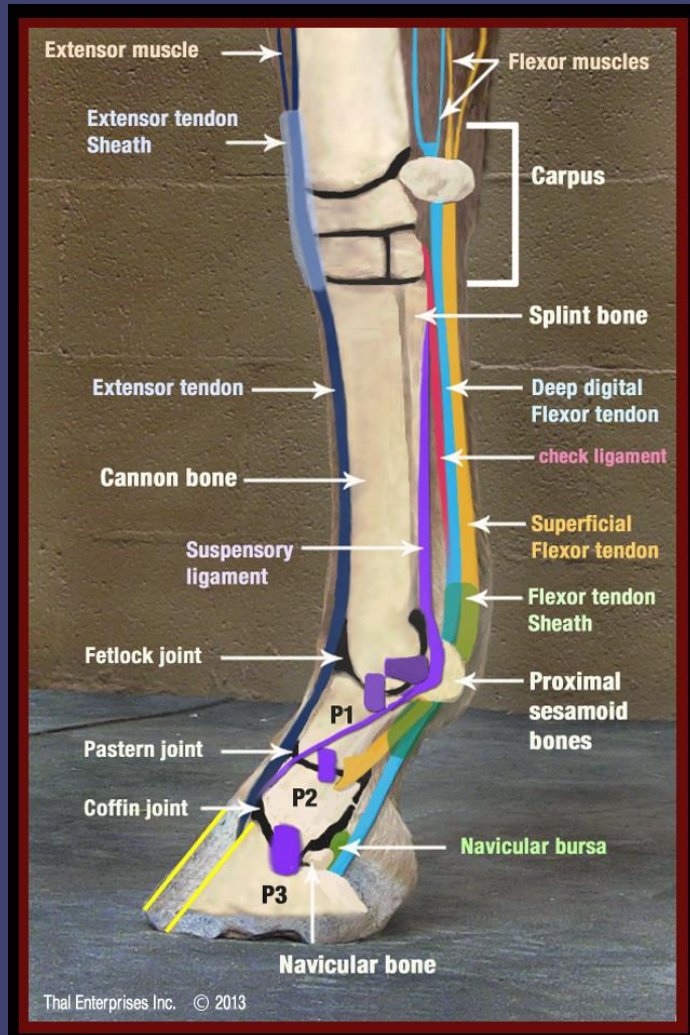
- 2013 Graduate of Iowa State University College of Veterinary Medicine
- Hospital Internship at Kendall Road Equine Hospital 2013-2014
- Co-owner of NLEP (est. 2019)
- CVMMP (Chiropractic) Certification in 2019
- Professional Interests: sports medicine/rehabilitation, ultrasonography, dentistry, general wellness care
- Personal: hunter/jumper background, mom/professional chauffeur, dog mom



Agenda

- Defining “Soft Tissue Injury,” Terminology, Anatomy
- Causes of Soft Tissue Injury
- Injury Diagnosis
- Developing the Rehab Plan
- Adjunct Therapies
- Evaluating the Whole Horse
- Injury Prevention
- FAQs

What is Soft Tissue?



- Tendons
- Ligaments
- Muscle
- Fat
- Synovial (joint/bursa) Tissue
- Nerves
- Blood/Lymph Vessels

Terminology

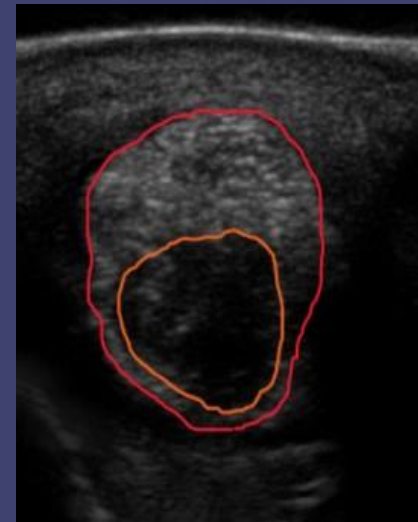
LESION

The injured spot or area



CORE LESION

A concentric lesion (injury) visible within a tendon or ligament, marked by lack of tendon/ligament fibers



CORNER/EDGE LESION

A lesion (injury) visible at the edge/margin of a tendon or ligament, marked by lack of tendon/ligament fibers



Ultrasound Terminology

CROSS-SECTIONAL AREA (CSA)

The area of the sliced portion of a 3-D object (the area of the circle)



Ultrasound Terminology

TRANSVERSE

Short Axis

Parallel to the ground, perpendicular to the tendon/ligament fibers



LONGITUDINAL

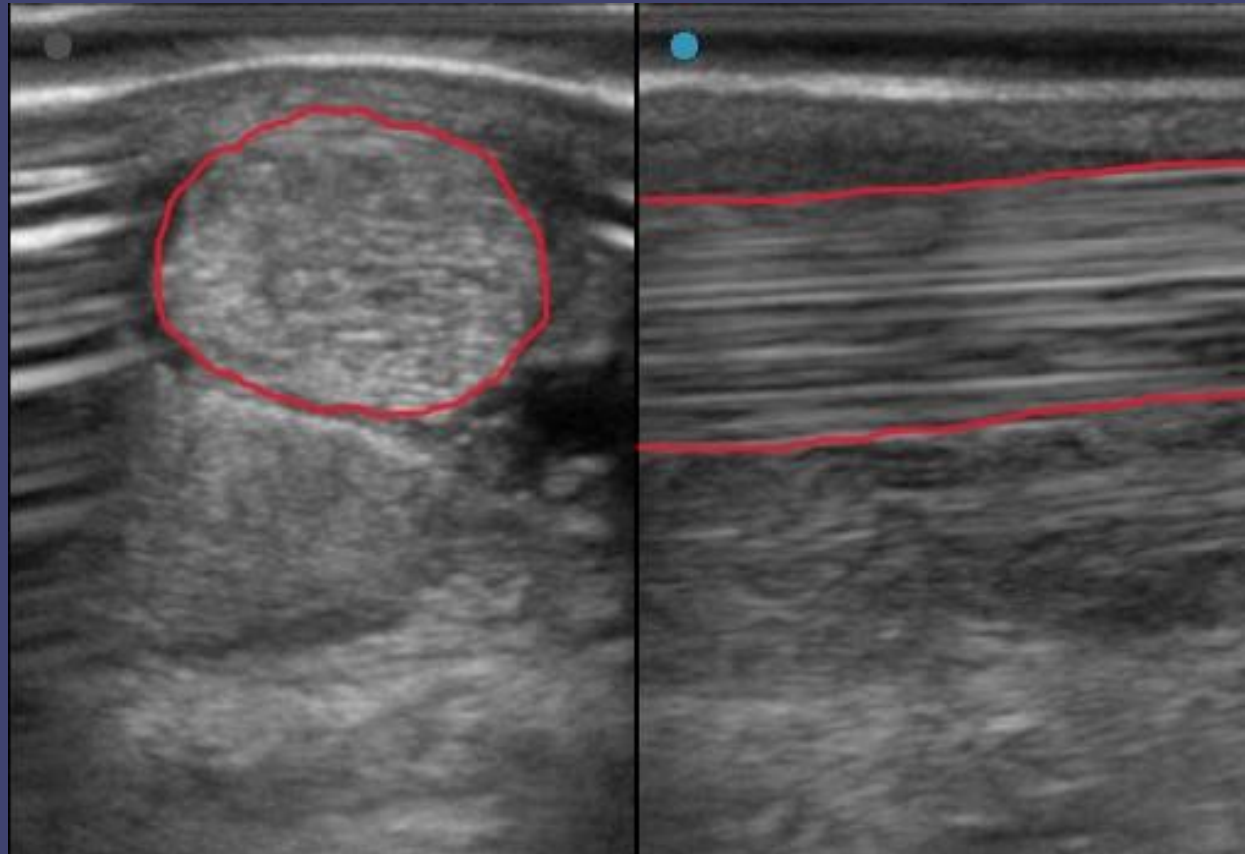
Long Axis

Perpendicular to the ground, parallel to the tendon/ligament fibers

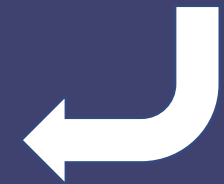


Ultrasound Terminology

TRANSVERSE



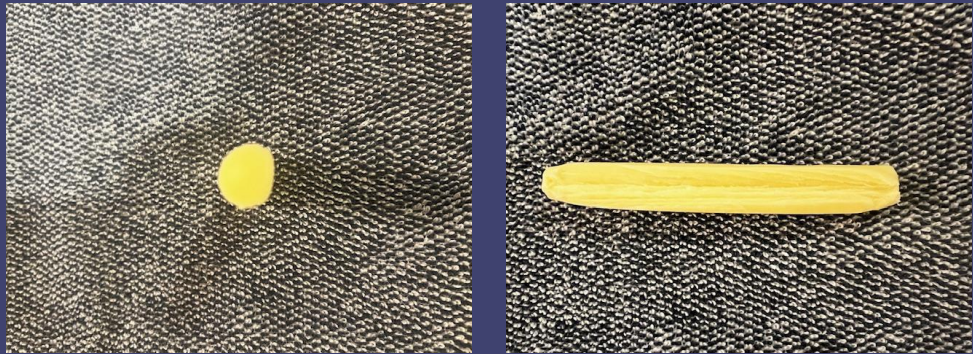
LONGITUDINAL



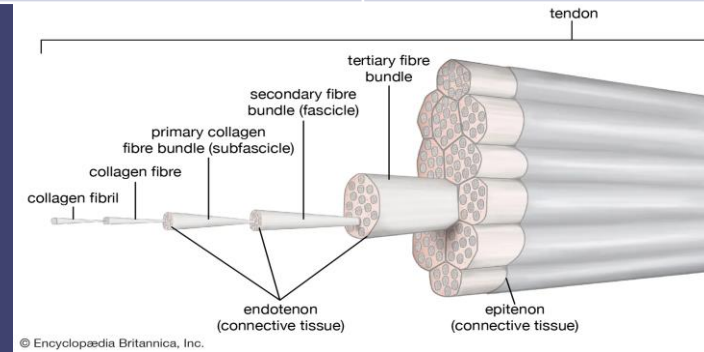
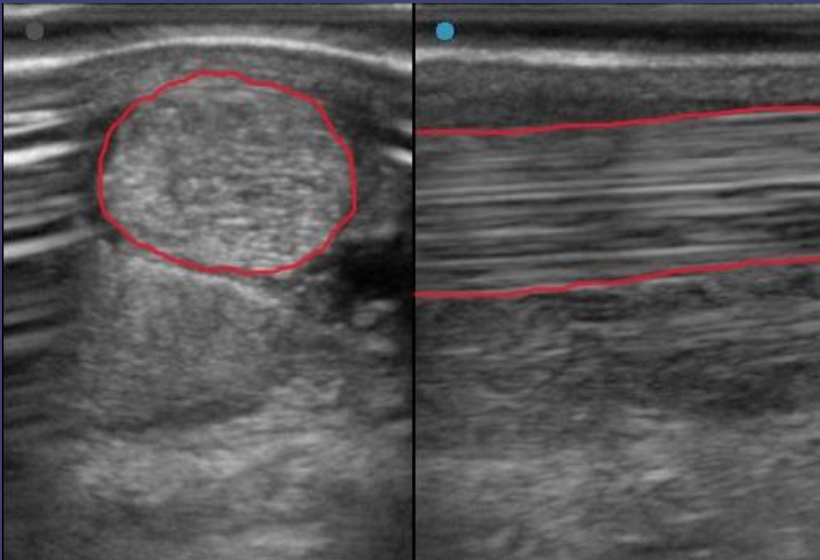
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Tendon/Ligament Anatomy



Tendons	Ligaments
Muscle to Bone	Bone to Bone
Movement, Shock Absorption	Stabilization
Collagen (Type I), Elastin	Collagen (Type I), Elastin, Some Fat



Tendon/Ligament Anatomy

Type I Collagen

- Biggest fibrils
- Stiff
- Provides tendon/ligament with mechanical durability and strength
- Parallel-linear pattern

Type III Collagen

- Thinner fibrils than Type I
- Predominate in early injury (4 weeks post injury)
- Randomly-oriented
- Associated with scar tissue

Tendon/Ligament Anatomy

Viscoelasticity

Tendons and ligaments exhibit a time-dependent behavior under loading. Increased strain results in stiffer tendon/ligament.

However, with repeated cyclic loading, the stiffness will reduce until a steady state is reached and the tendon/ligament is better able to withstand higher loads.

KEY POINT: Warm Up Matters!



Canadian Horse Journal

Causes of Soft Tissue Injury

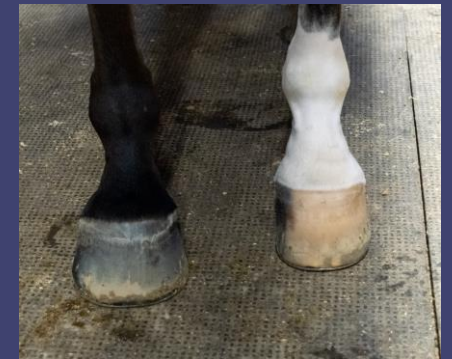
- Trauma
 - Kick
 - Laceration
 - Cast in stall
- Mechanical Overload
 - Tendon/ligament stretched beyond normal capacity
 - Chronic repetitive use
 - Poor footing
 - Poor conformation/fitness
 - Genetics



Atlanta Equine Clinic

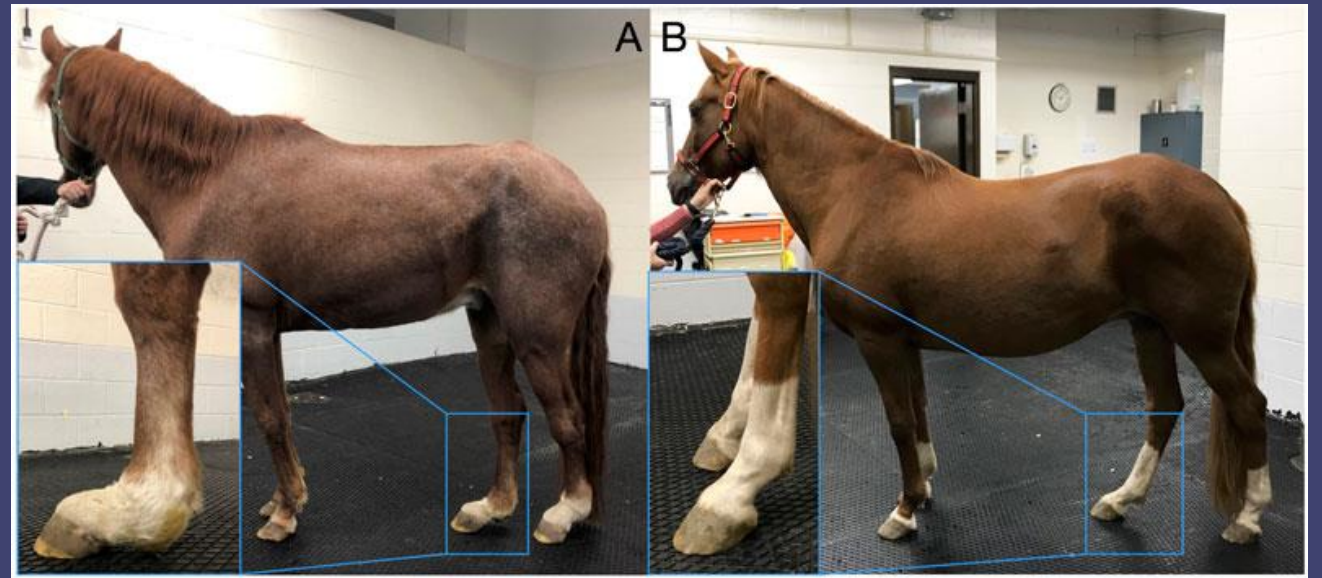


AQHA



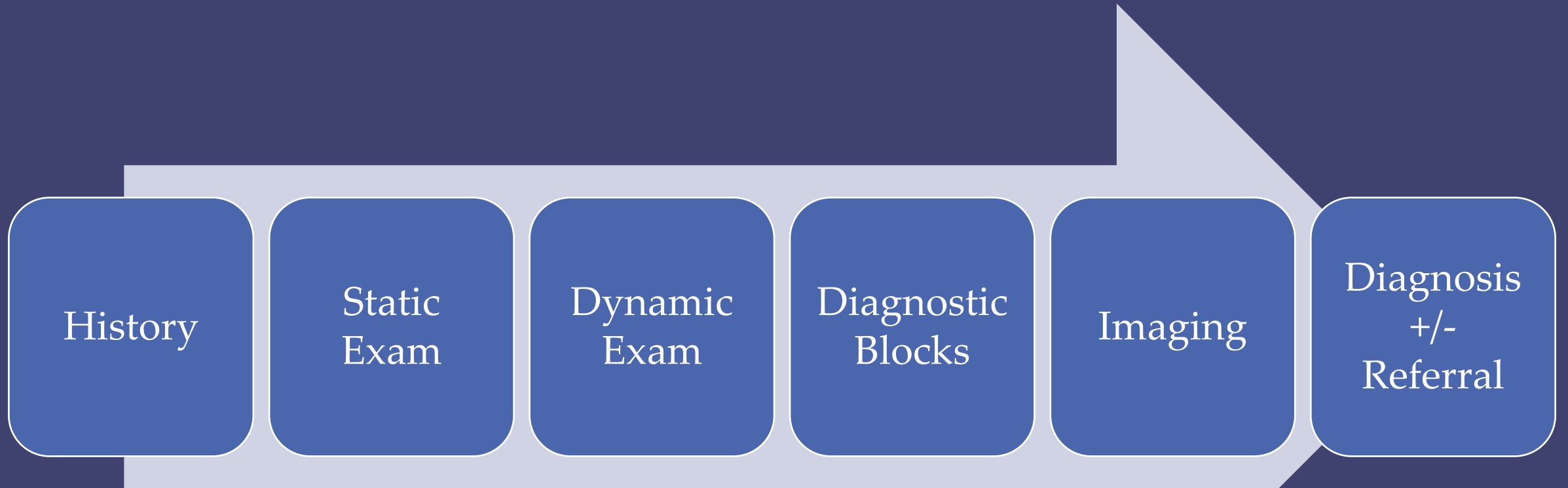
Diagnosis

- History
 - Age
 - Use of Horse
 - Duration of Clinical Signs
 - Response to Exercise/Rest
 - Response to Previous Treatments
 - Prior History of Injury
 - Breed Predispositions
 - DSLD
 - Underlying Conditions
 - PPID (Cushing's)

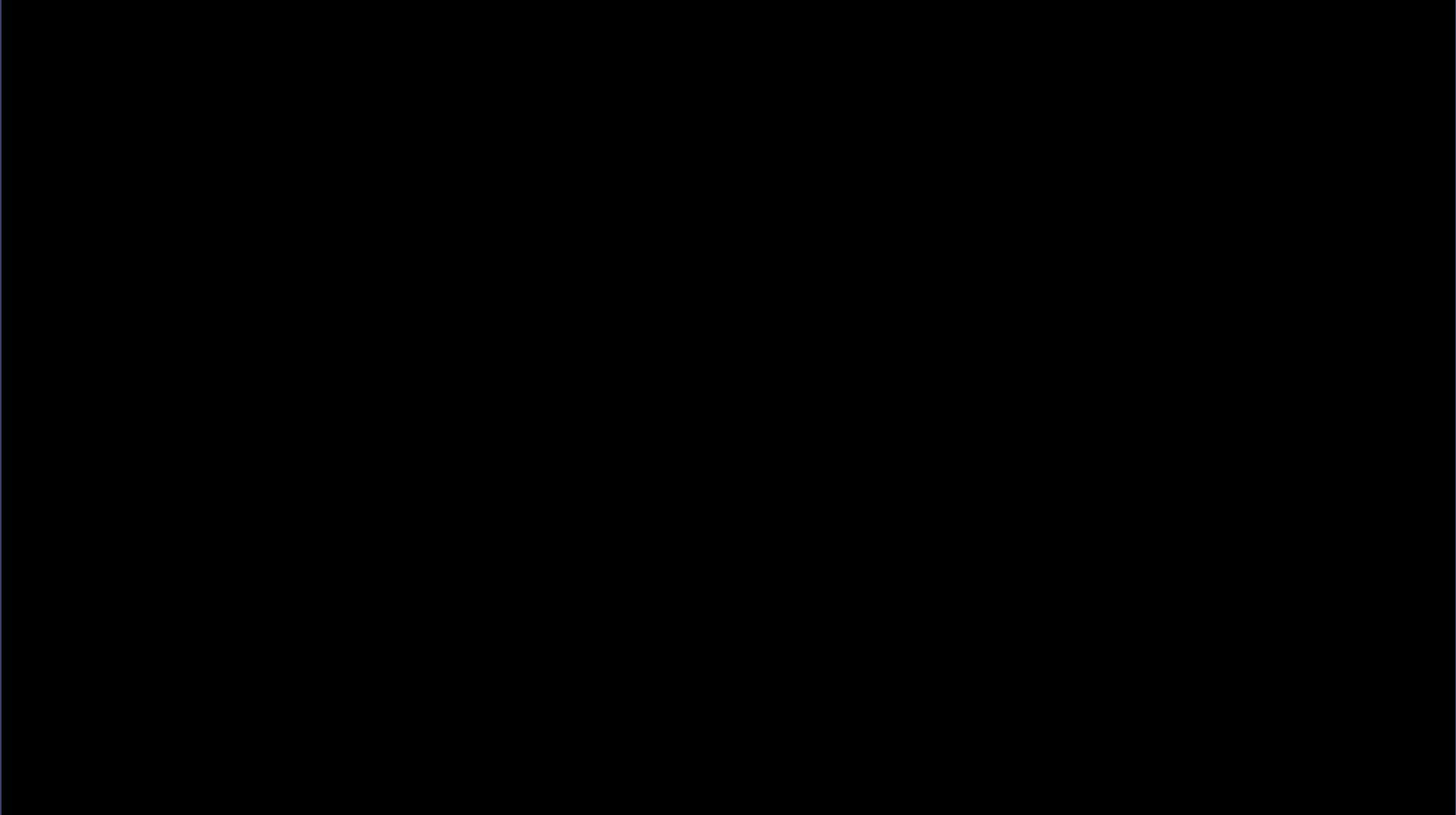


<https://www.frontiersin.org/articles/10.3389/fgene.2023.1201628/full>

Diagnosis



Diagnosis

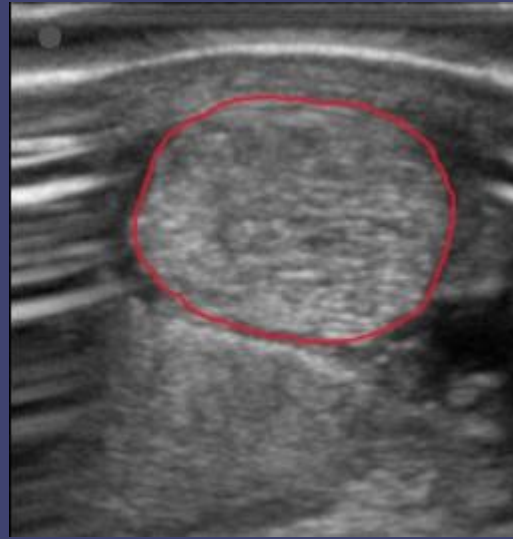


Developing the Rehab Plan

- It all starts with commitment to controlled exercise and rehabilitation



Day 0



9 Months

- 1 Image 1 is an injured tendon or ligament. The toothpicks show a disrupted fiber pattern and a lot of fluid between the fibers.
 - 2 Without structured rehab the fibers will heal in a starburst pattern (figure 2) within the first 3 months following the injury. This tendon structure is weaker and more prone to re-injury with return to work or sport.
 - 3 Figure 3 demonstrates an organized fiber pattern, which can be achieved with the use of therapeutic exercise, laser therapy, cross frictional massage, appropriate use of heat and cold therapy as well as injectable therapies such as PRP and stem cells.
- ✓ This tendon or ligament is going to be much more resilient as our patients return to work and sport.



Rehabilitation Services of Virginia

Developing the Rehab Plan

****Rehabilitation \neq 24/7 Stall Rest****



- Set Expectations Early
 - Most ST Injuries are 8-10 months of total rehabilitation to return to original level of work/competition if a controlled exercise program is followed
- Exercise is a “dose”
- Rechecks – clinical and with ultrasound, are essential

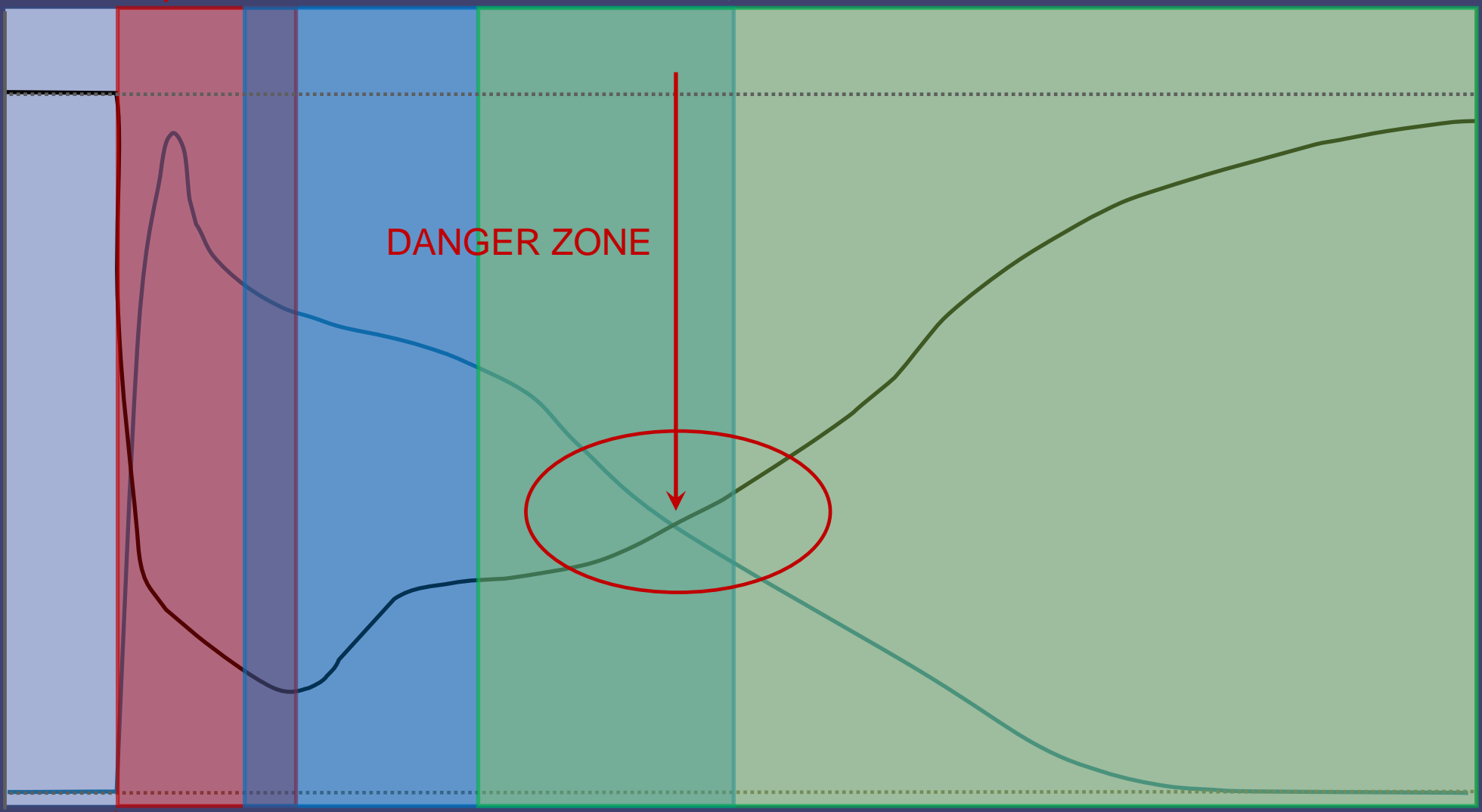
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LAKES

**TENDON
STRENGTH**

PAIN LEVEL



INFLAMMATION

GRANULATION

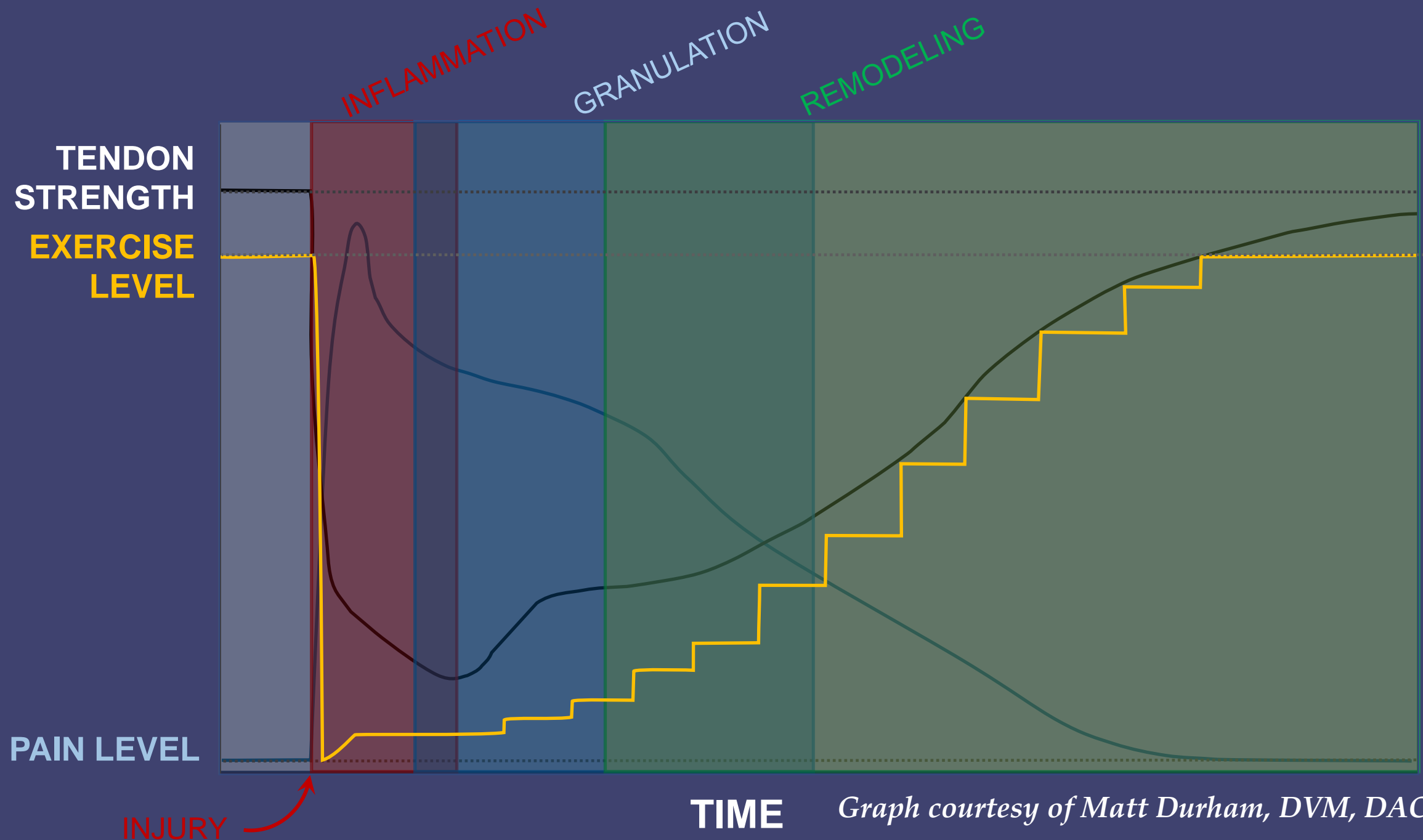
REMODELING

DANGER ZONE

INJURY

TIME

Graph courtesy of Matt Durham, DVM, DACVSMR



Graph courtesy of Matt Durham, DVM, DACVSMR

Developing the Rehab Plan

	<u>Month 0-2</u>	<u>Month 3-4</u>	<u>Month 5-6</u>	<u>Month 7-8</u>	<u>Month 9-10</u>
<u>Rehab Instructions</u>	Hand walk twice daily for 15 minutes, adding 5 minutes of time to each session every 2 weeks.	Ride at the walk for 25 minutes daily (5 days/week), adding 5 minutes of time to each session every 2 weeks *Also hand walk once daily on ridden days, twice on non-ridden days*	Continue total walk time and add 5 minutes trot. Additional 5 minute trot sets added every 2 weeks. *15 minute walk warm up is essential.* *Also hand walk once daily on ridden days, twice on non-ridden days*	Continue to walk/trot for 30 minutes total time (*15 minute walk warm up*). Add 3 minute canter sets, adding an additional set every 2 weeks up to 4 sets. *Begin quiet turnout after 4 weeks of canter. Discontinue walks once turnout started*	Begin discipline-specific training (jumping, dressage movements, barrels, etc.). Add 5% to workload weekly until competition-ready. *Continue turnout. ALWAYS 15 minute walk warmup*
<u>Recheck Plan</u>	Recheck at 2 months (8 weeks) clinically and with ultrasound	Recheck at 4 months (16 weeks) clinically and with ultrasound	Recheck at 6 months (24 weeks) clinically and with ultrasound	Recheck at 8 months (32 weeks) clinically and with ultrasound	Recheck at 10 months (40 weeks) clinically and with ultrasound
<u>Recheck Expectation</u>	Lameness, pain, swelling gone; Ultrasound shows early filling of defect, but still visible.	Clinical signs resolved; Ultrasound shows continued filling of defect so that it is faintly visible or no longer visible.	Clinical signs resolved; no defect visible on ultrasound, CSA normal range and fiber pattern good	Clinical signs resolved; no defect visible on ultrasound, CSA normal range and fiber pattern good; tendon/ligament strength increasing	Sound on exam. Achieve 95% healing on ultrasound, which is considered normal strength range.

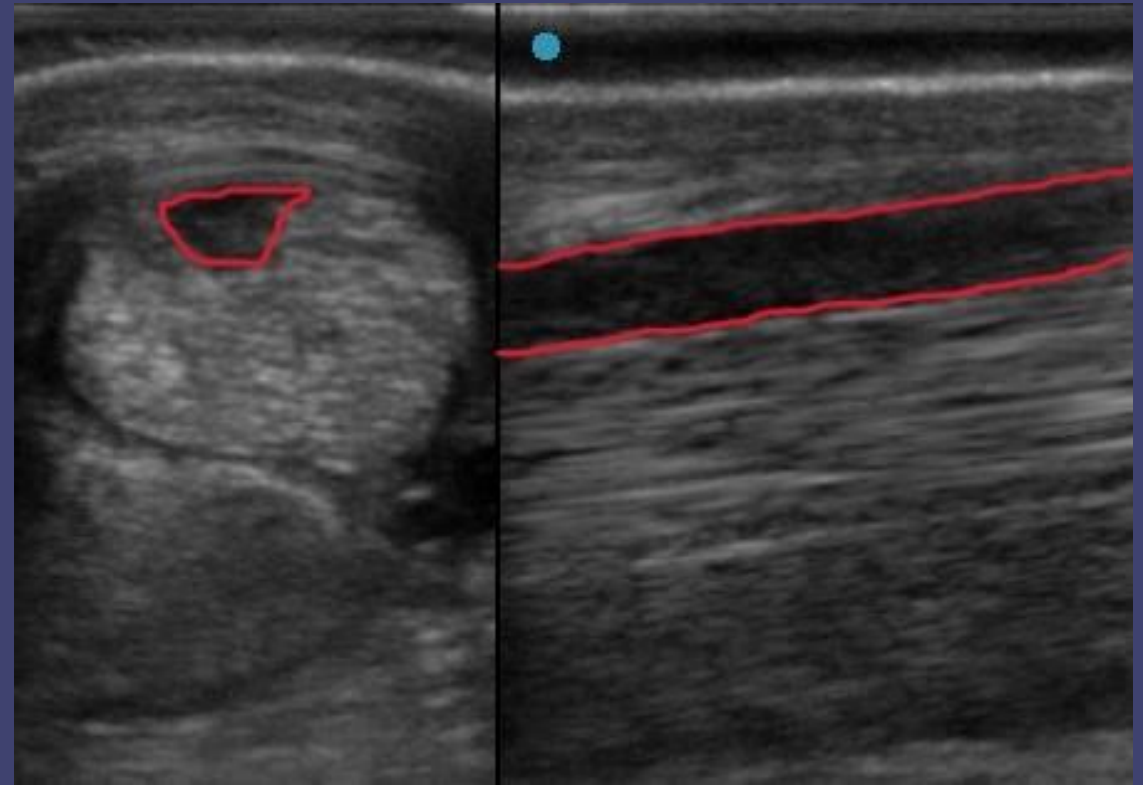
Additional Considerations in the Rehab Plan

- Topical Surpass (Voltaren)
 - Apply 30 minutes before first exercise session of the day
 - Important in the first few weeks of any change to the exercise plan
 - Don't wrap over Surpass!
- Ice Therapy
 - Ice boots preferred (dry cold therapy vs. wet)
 - 20 minutes following each exercise session for the first few weeks of any change to the exercise plan
- +/- Wrapping
- Shoeing

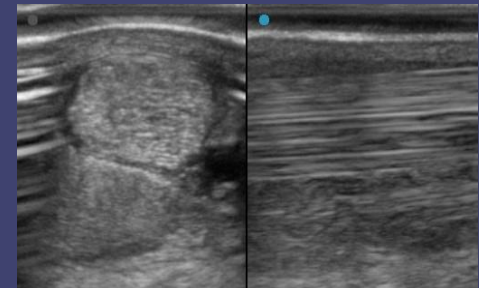
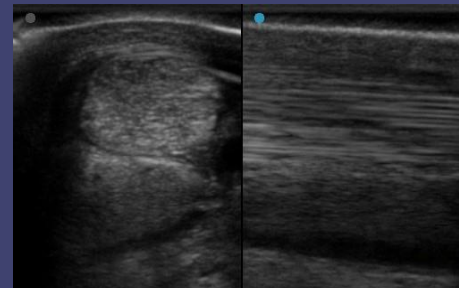
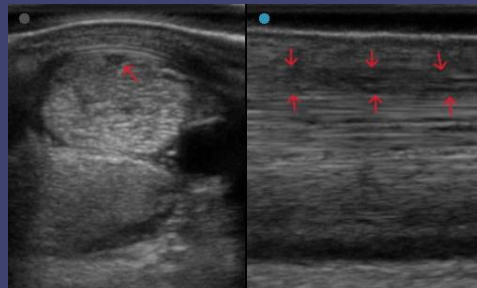
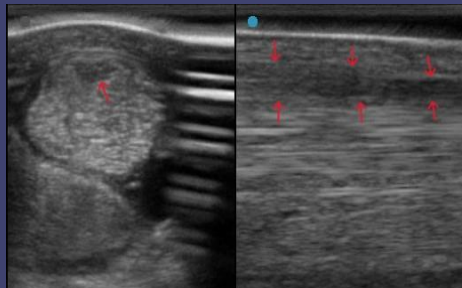
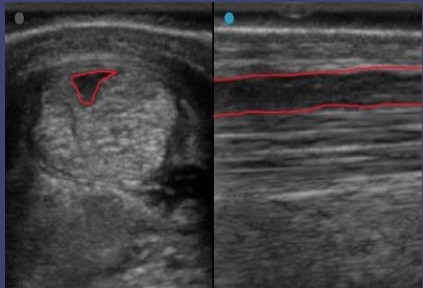
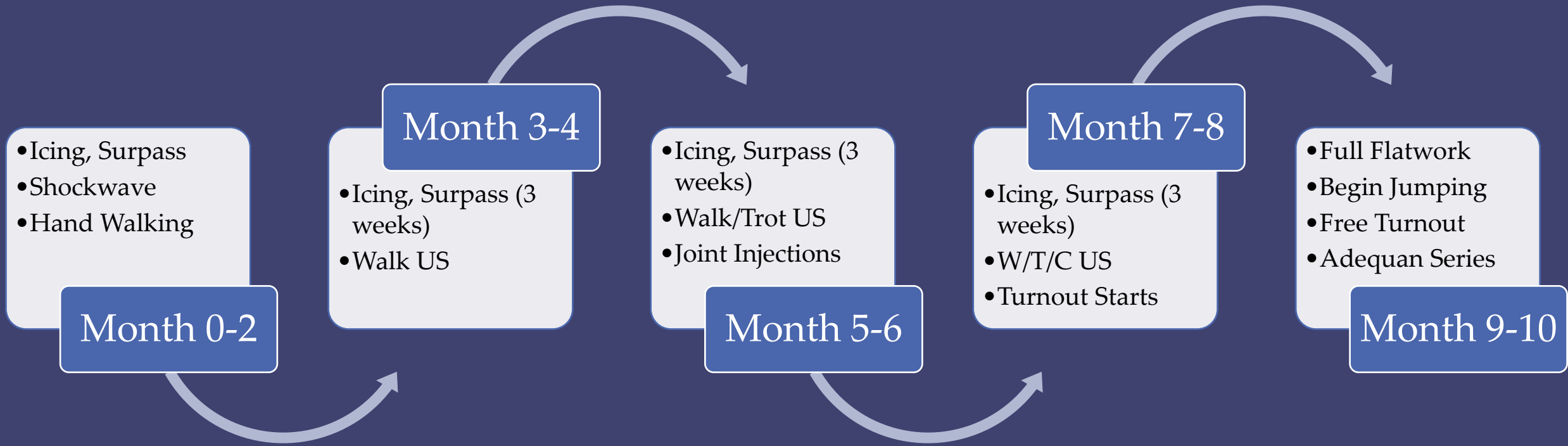


Rehab In Action

- 18 Year Old Oldenburg Gelding
- Used for hunter/jumper (up to 3')
- 7 Day history of left fore lameness that progressively worsened with work
- Diagnostic blocks localized to cannon region
- X-rays were unremarkable

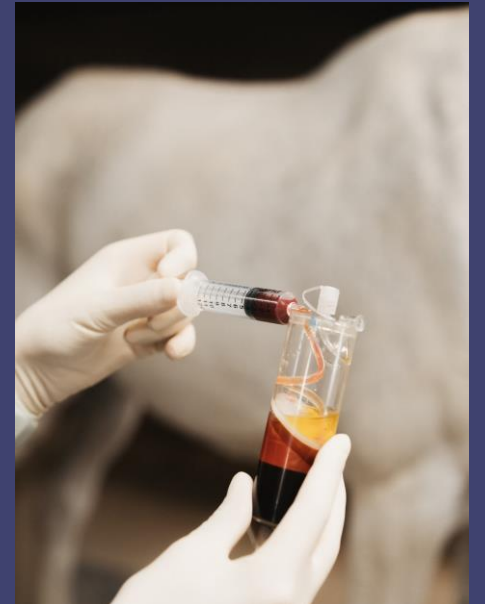


Rehab In Action



Adjunct Therapies

- Shockwave
 - Scar tissue reduction
 - Breaks down calcium deposits
- Laser
 - Improves circulation
- Intra-lesional injections
 - ProStride
 - Renovo
 - Stem Cells
 - PRP – possible pro-adhesion (scar tissue)



Key Point – Adjunct Therapies

ADJUNCT THERAPIES CAN ASSIST WITH THE QUALITY OF HEALING BUT DO NOT GREATLY REDUCE THE AMOUNT OF TIME FOR REHAB

Type III Collagen → Type I Collagen takes 4 - 8 months



Rehabilitation Services of Virginia

Adjunct Therapies – Rehabilitation Centers

- Assist with early rehab and can continue to completion if desired
- Often offer adjunct therapies and work with client's regular veterinarian
- Can alleviate time commitment on client/farm for rehab
- Option for excitable horses



EquiManagement



Wikipedia

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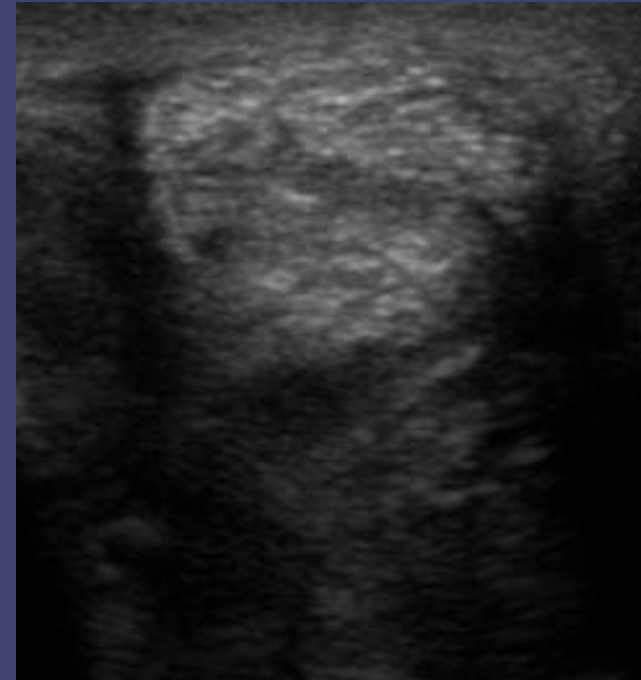
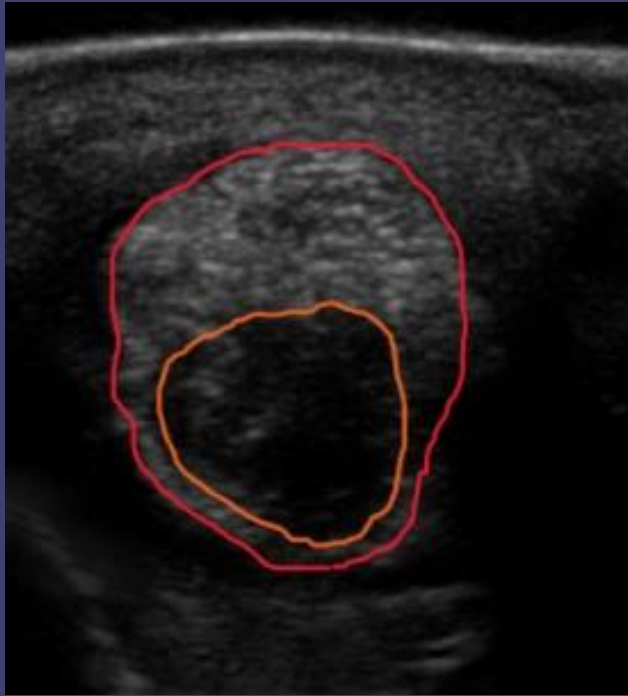
Injury Type, Location, Size May Affect Timeline



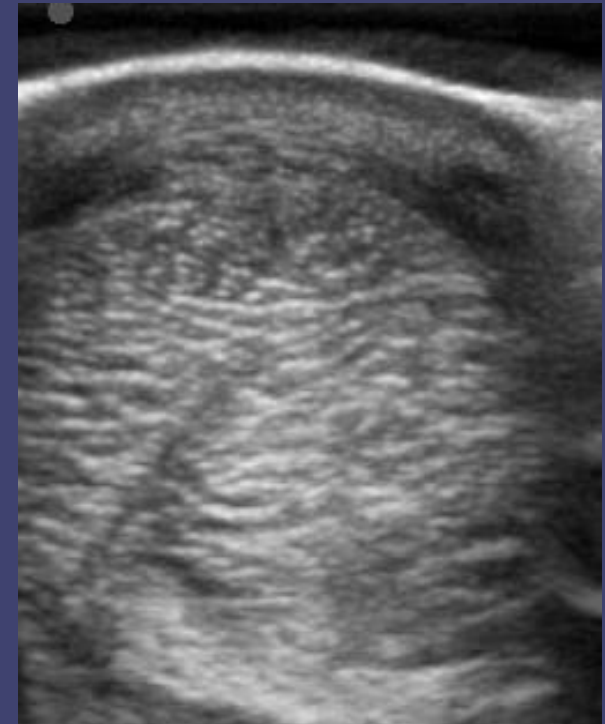
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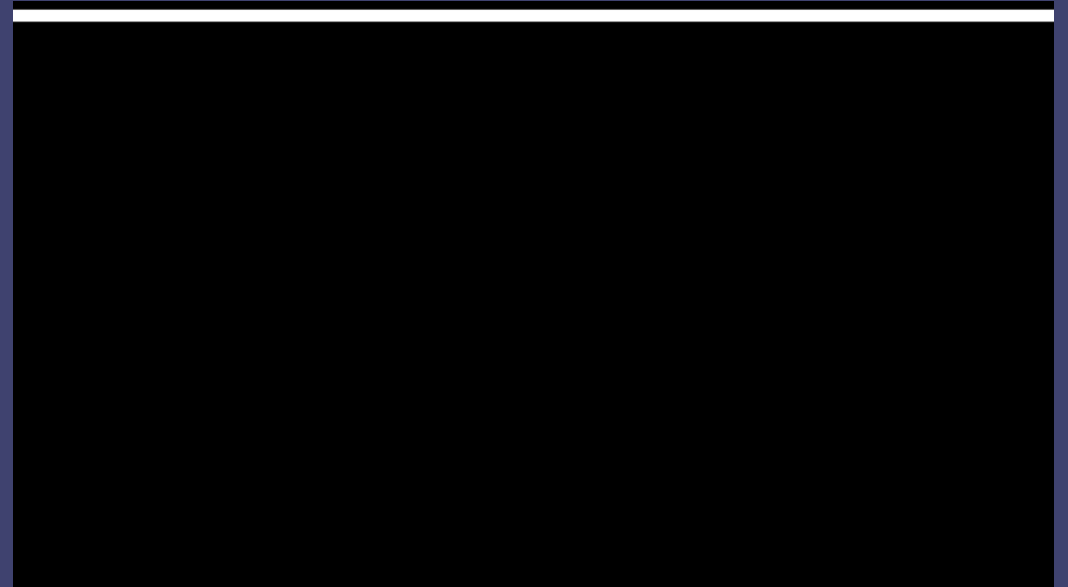
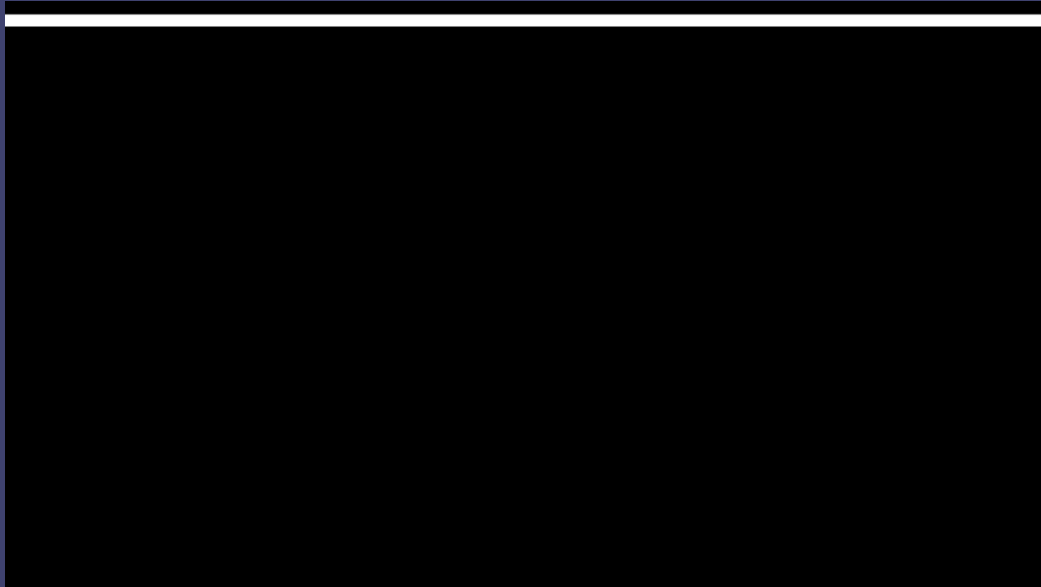
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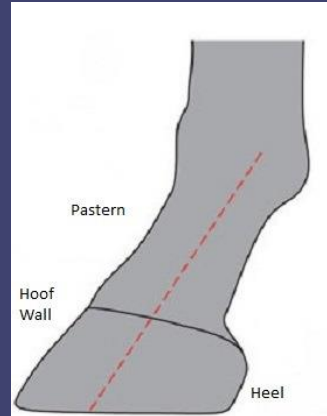


Injury Type, Location, Size May Affect Timeline



The Whole Horse Assessment

- Identify other areas of discomfort that could lead to compensatory overload
 - e.g. hock pain causing forelimb overload onto an injured or healing tendon/ligament
- Hoof angles matter
 - Suspensory strain
 - Stifle pain
 - Suspect SI pain



Injury Prevention

- Walk warm up – ALWAYS
- Whole horse assessment
 - Soundness
 - Nutrition
 - Muscle tone
 - Discipline-specific training
- Shoeing/Foot Balance
- Footing
- Early Attention/Intervention



FAQs – Will Boots/Wraps Prevent Injury?



FAQs – Can I Just Turn My Horse Out for 6 Months?



FAQs – Can I Only Trot in Straight Lines?



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FAQs – My Horse Won't Stall Rest – Help!

- Buddy in sight at all times
- Small aperture hay net – 24/7 occupation
- Stall-size outdoor “recovery pen”
- Medications if necessary
- Safety of horse and handler come first



Equus

Snook

QH Mare – Barrel Racing

- Injury: LH fetlock (ankle)
- 15 years old at time of injury
- Controlled rehab program (October 2020 – April 2021)



- Video: August 2023
- Wisconsin NBHA State Finals
- 5th out of 449
- Personal Best



Optimist: Someone who figures that taking a step backwards after taking a step forwards is not a disaster. It's a cha-cha.

Robert Breault

“ quotezofancy

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Questions?

