

Hamstring Injury Treatment and Prevention

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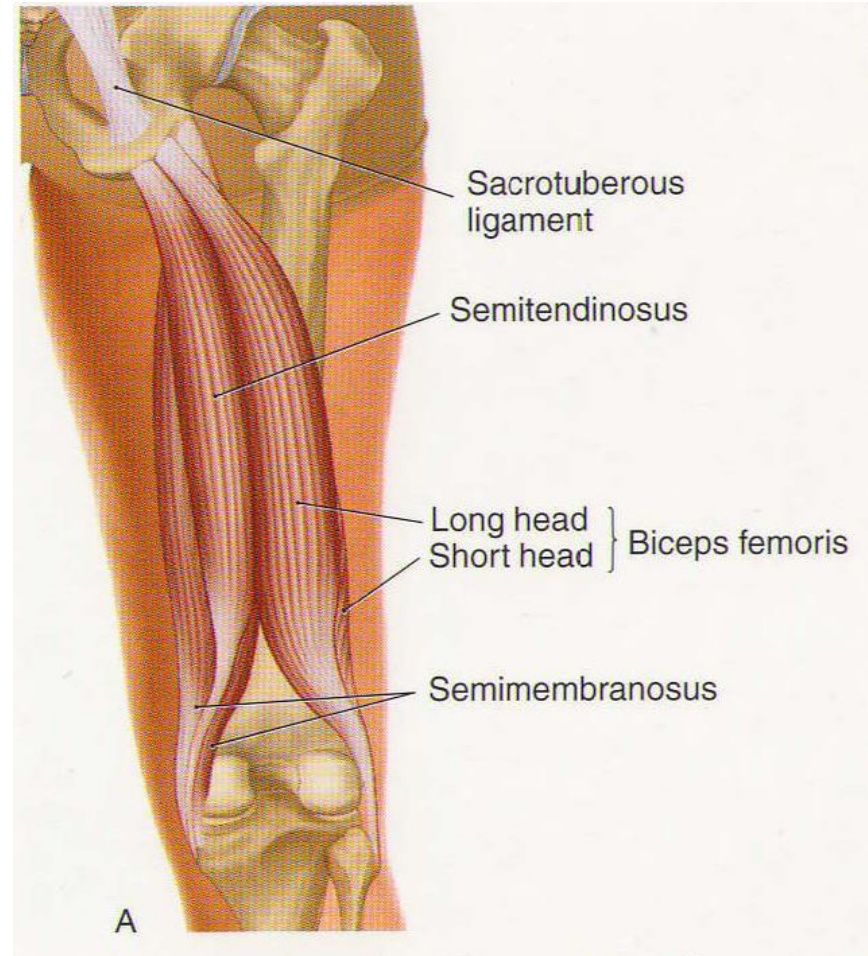
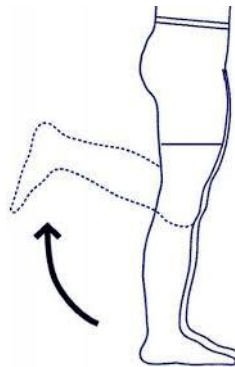
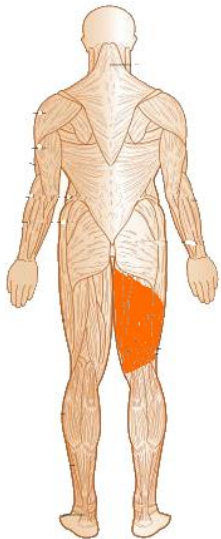
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Outline

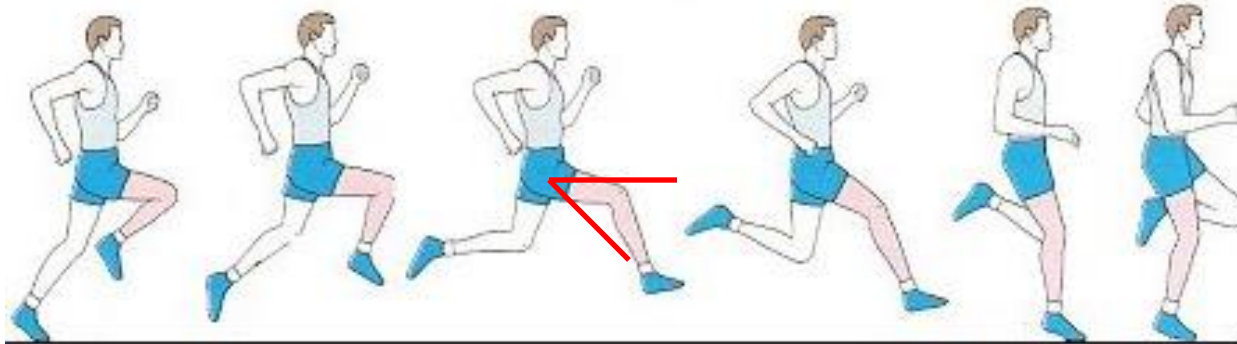
- Anatomy of hamstrings muscle group
- Causes of injury
- Treatment
- Prevention
- Q & A

Anatomy (hamstrings)

- 3 muscles
- Crosses 2 joints
 - Knee flexion
 - Hip extension



Causes of Injury



How does it happen?

- “Late forward swing” during a sprint
- Deceleration Hip flexion and Knee extension
 - Puts on the “brakes”
 - Rapid switch to hip extension

Causes of Injury

- Poor lumbar posture (lower back)
- Lack of hamstring flexibility
- Fatigue
- Strength imbalance between quadriceps (top of thigh, knee extension, “kick”) and hamstrings
- Improper warm-up
- Previous injury

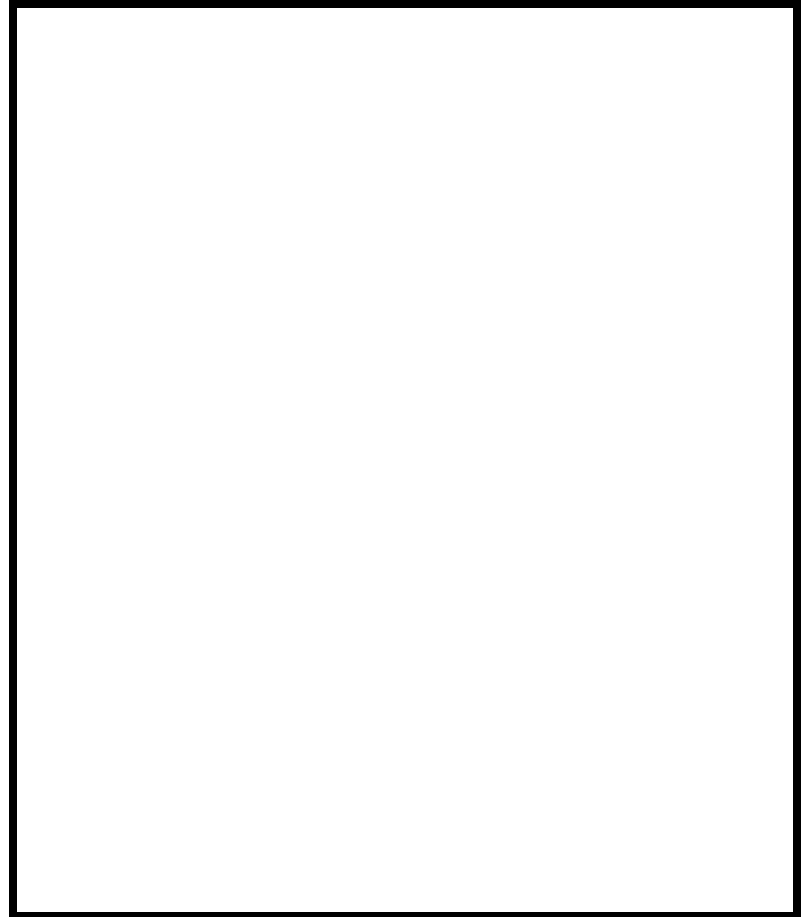


Treatment

Tissue healing stage

- Inflammation
- Repair
- Remodeling

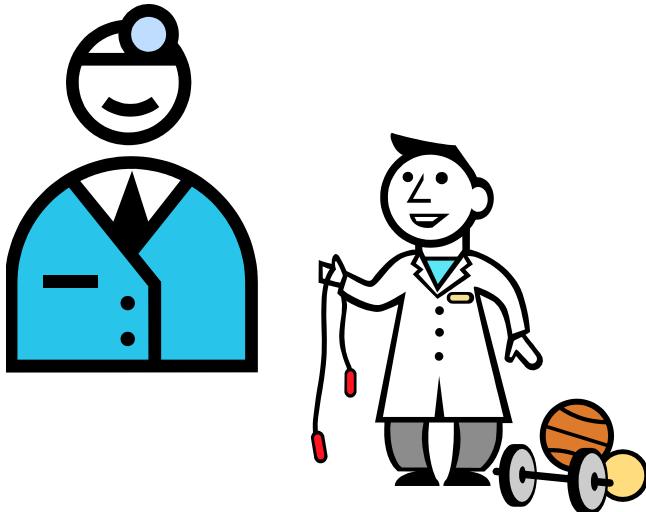
Treatment phase



Treatment

Tissue healing stage

- Inflammation
- Repair
- Remodeling



Treatment phase

- Diagnosis
- PRICE
 - Protection
 - Rest
 - Ice
 - Compression
 - Elevation

Treatment

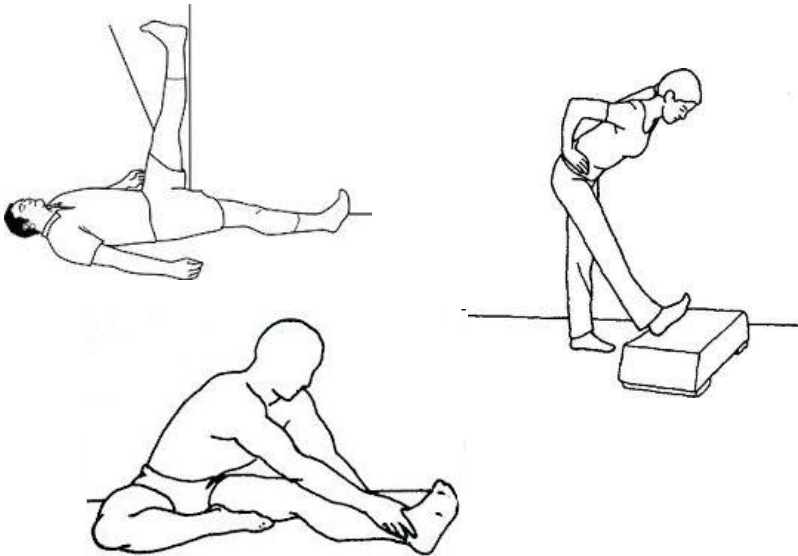
Tissue healing stage

- Inflammation
- **Repair**
- Remodeling

Treatment phase

- **Restoring range of motion (ROM)**
 - **Daily stretching**
 - 3-4x/d,
 - 30s+,
 - repeat 4x
 - **Weight bearing activity**
 - Walking

3



Treatment

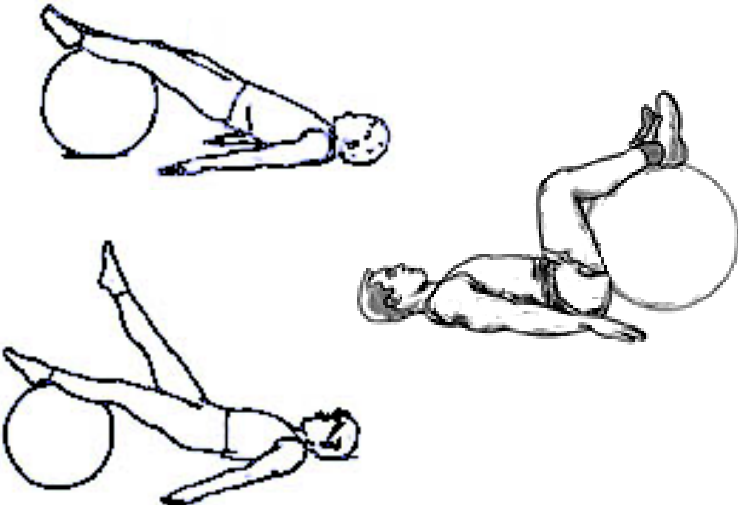
Tissue healing stage

- Inflammation
- R€
- R€

Treatment phase

- Restoring range of

**Avoid overstressing
injured tissue!**



- repeat 4x
 - Weight bearing activity
 - Walking
- Initial strengthening
 - Isometrics

Treatment

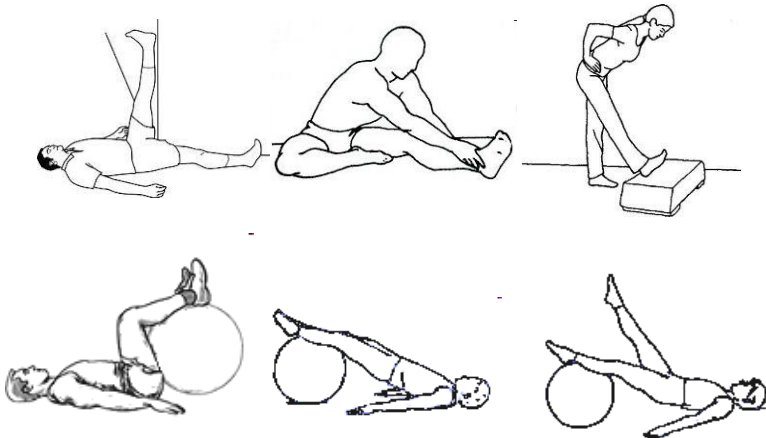
Tissue healing stage

- Inflammation
- Repair
- Remodeling

3

Treatment phase

- Restoring (ROM)
- Initial strengthening
- Dynamic strengthening
 - Nordic eccentric hamstring
 - Stiff-leg deadlift
 - Hamstring ball rolls



Nordic Eccentric Hamstring

- Progress by:
 - Extending farther
 - Increasing reps
 - Increasing sessions/wk(do not exceed 3/wk)



- Can also be done with a partner holding feet
- Start with 1-2 sets, 5 reps, per week
- Minimum 48 hrs between sessions

Stiff-leg Deadlift

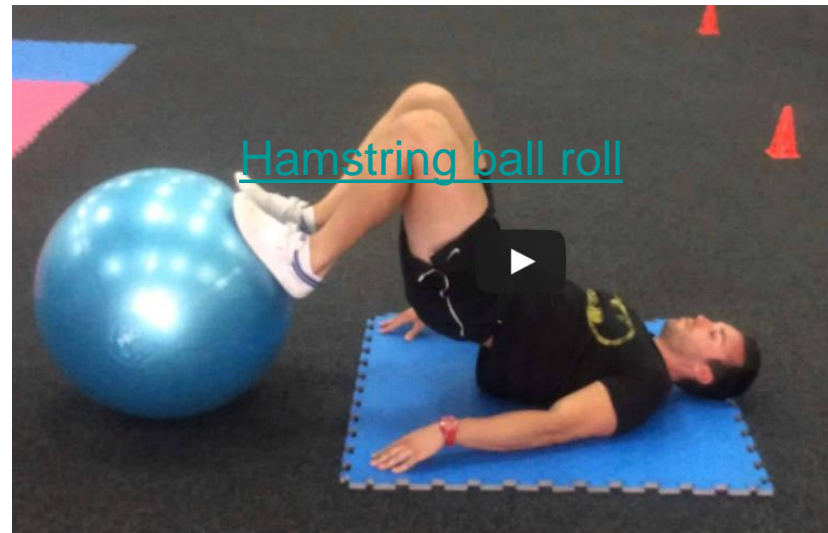
- Progress by:
 - Increasing weight
 - Increasing sets
 - Increasing sessions/wk ($\leq 3/\text{wk}$)
 - Single leg



- Beginners start with: 1 set, 10 reps, 1x/wk
- Intermediate/advanced: 2 sets, 10 reps, 2x/wk
- Can also be done with barbell or kettle bells
- Lower to a tolerable stretch. DO NOT sacrifice form!

Hamstring Ball Roll

- Progress by:
 - Increase sets
 - Increase sessions
 - Single leg



- Beginner start with: 1-2 sets, 8-10 reps, 1x/wk
- Intermediate/advanced: 2 sets, 10 reps, 2x/wk
- Strict form, use arms for balance.

Treatment

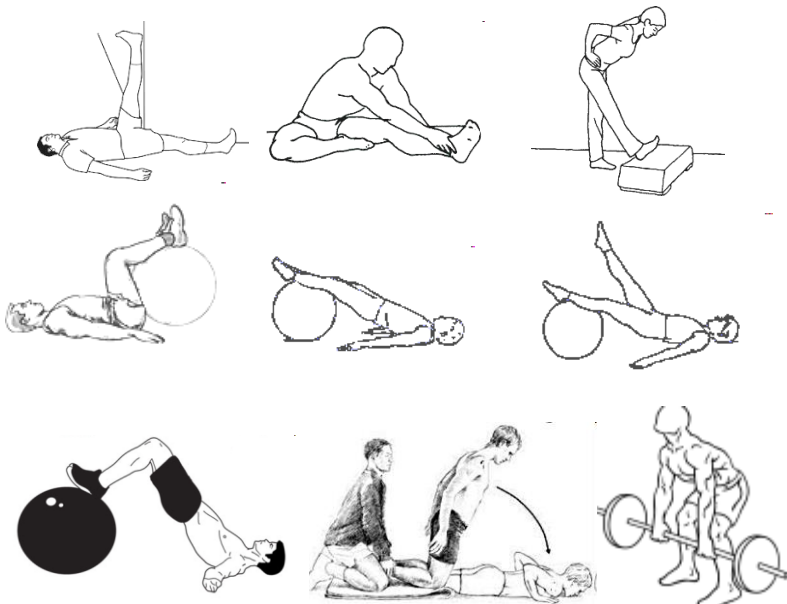
Tissue healing stage

- Inflammation
- Repair
- Remodeling

3

Treatment phase

- Restoring ROM
- Initial strengthening
- Dynamic strengthening
- High-velocity strengthening
 - Squat/Split squat jump
 - Bounding
 - Power skips



High-Velocity Strengthening

Sets of 10, 2-3 min rest

Minimal ground contact

Proper footwear

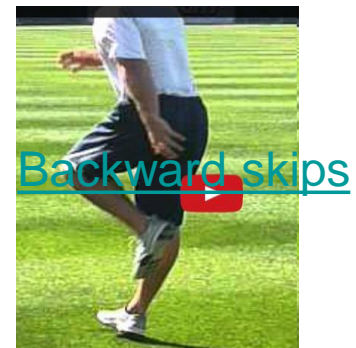
Beginners limit total jumps to
80/d, 1x/wk

Intermediate/advanced: 100/d,
2x/wk, 72 hr between sessions.



High-Velocity Strengthening

- 30-60 m/set
 - (~10 jumps)
- 2-3 minutes rest
- Proper footwear
- Remember:
 - Beginners jump limit 80/d, 1x/wk
 - Intermediate/advanced: 100/d, 2x/wk, 72 hr between sessions

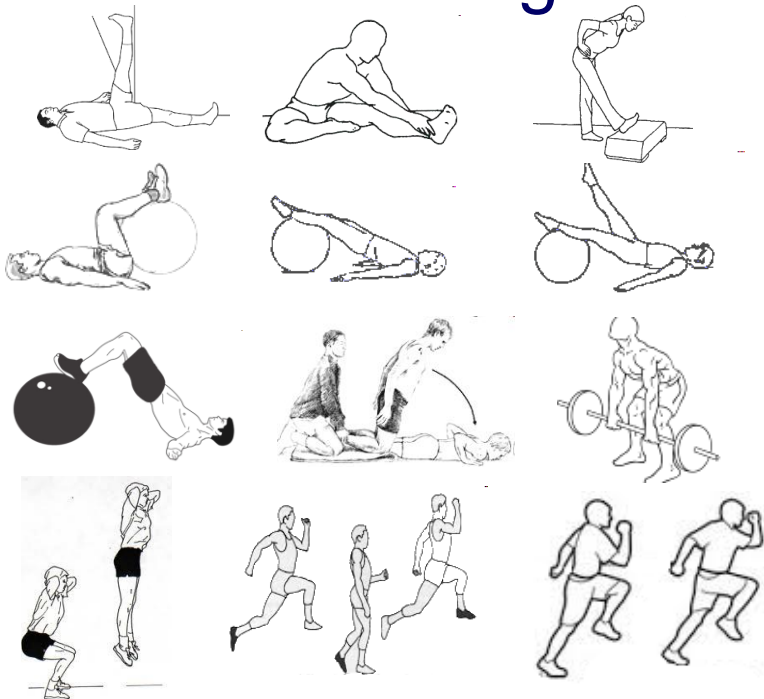


Treatment

Tissue healing stage

- Inflammation
- Repair
- **Remodeling**

3



Treatment phase

- Restoring ROM
- Initial strengthening
- Dynamic strengthening
- **High-velocity strengthening**
- **Sport-specific Progressions**
 - Jog → Run → Sprint
 - Lateral shuffling

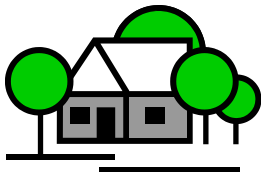
Prevention

- Poor lumbar posture (lower back)
- Lack of hamstring flexibility
- Fatigue
- Strength imbalance between quadriceps and hamstrings
- Improper warm-up
- Previous injury
- Warm -up
- Dynamic strengthening
 - Hips, lower back, legs
 - 2 d/wk, 48 hr rest
- Plyometrics
 - Jumps, skips, bounds
 - 1-2 d/wk
 - 80,100 jumps
- Stretching
 - Legs, hips, back
 - 2-3 d/wk, 30s, 2-4x

Prevention

Sun	Mon	Tue	Wed	Thu	Fri	Sat
Game Day!	Rest	Strength Plyo Stretch	Rest	Practice Stretch	Strength Stretch	Rest

- Warm-up
- Strength: **30-35**
 - 6-7 exercises (2x10, 2 min rest)



- 1-2 lower back, hip flexors
- 2 hamstring
- 2 jumping/bounding

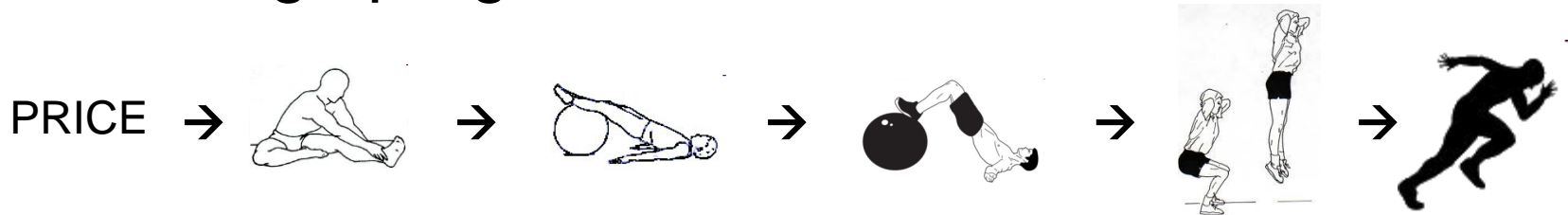
- Stretching: **8-10**
 - 4-5 stretches, 30s, 2x

On game day:

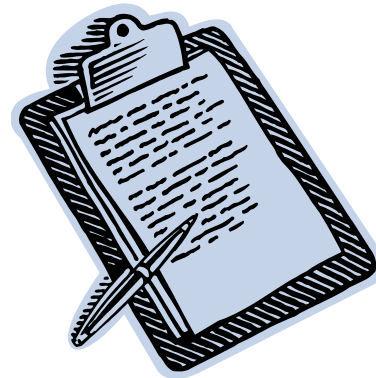
- Warm-up! **15**
 - Marching
 - Jogging
 - Stretching*
 - Skipping
 - Running

Summary

- Sprinting → hamstrings → intense forces
- Unprepared hamstrings → injury
- Multi-stage progressive treatment



- Prevention
 - Warm up
 - Eccentric hamstring strength
 - Lower back strength
 - Sport specific



Questions?

