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## Assessment & Manual Physical Therapy for the Sporting Dog

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## Assessment of Sports Injuries

\* **Components of Evaluation:**

- \* History
- \* Stance/Gait
- \* Palpation
- \* Muscle strength
- \* ROM
- \* Girth
- \* Mobility
- \* Flexibility
- \* Neuro Screen
- \* Special Tests



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## Assessment Objectives

\* Focus will be on forelimb and hindlimb assessment

- \* Special Tests
- \* Flexibility
- \* Palpation
- \* Strength



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## Assessment of Injury

- To make assessment of soft tissue injury one needs:
- **Excellent** Palpation skills knowledge of Anatomy

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## History

- \* Living situation, inside, outside, stairs, surfaces.
- \* Other animals/humans (puppy/child)
- \* playing/exercise
- \* Bedding/Crate
- \* Jumping (car, bed, ottoman)
  - \* Daily Routine
  - \* Type of Sport

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## History

- \* Type of exercise, frequency, duration.
- \* Leash/free
- \* Playing with other dogs
- \* Collar/harness
- \* Toys or chase animals



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## Observation/Gait

- \* **Stance**- WB, posture, Atrophy, wide or narrow based, weight. Any deviation from norm should be noted.
- \* **Gait**- fluidity of movement, transitions (lying to stand), symmetry, WB, walk, trot, circles. On lead or off lead?
- \* Observe from different angles.



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## Palpation

- \* **Take caution** while palpating painful dogs
- \* Pain response can be to bite
- \* Watch for: pupil dilation, head turning
  - \* Licking lips
  - \* Panting
  - \* Whining/vocalization



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## Palpation

- \* Standing or lateral recumbency
- \* Work proximal to distal on the limbs and head to tail for the spine
- \* Use a flat hand first with light pressure then progress to digital palpation of specific muscles.



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## Palpation

**\* Make Note of:**

- \* Muscle definition
- \* Atrophy
- \* Soft tissue swelling
- \* Bony anomalies
- \* Temperature and pain response
- \* Compare sides



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## Flexibility/Muscle Length Test

**\* Very important!!**

- \* Muscle length can determine the difference between muscle and ligament injury
- \* Determine muscle imbalance



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## Flexibility



- \* Should be done in lateral recumbency
- \* Can also be done in standing/sitting
- \* Dog should be relaxed
- \* Movement into end range should be slow
- \* Observe any twitching
- \* NEVER force the limb
- \* Stop at point of discomfort
- \* Compare both sides



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## Flexibility

- \* To test flexibility of a muscle you must put the muscle in a lengthened position
- \* Origin and insertion of muscle should be lengthened **away** from one another



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## Flexibility

- \* Check muscle length of forelimb, hindlimb, & spine.
- \* Forelimb:
  - \* Shoulder flexion & extension
  - \* Shoulder IR & ER
  - \* Shoulder Abduction/Adduction
  - \* Elbow extension/flexion
  - \* Carpus Extension/flexion
  - \* Carpus supination/pronation
  - \* Toes



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## Flexibility

- \* Hindlimb:
  - \* Hip extension/flexion/abd/add
  - \* Hip IR/ER
  - \* Stifle Flexion/extension
  - \* Hock flexion/extension
  - \* Toes



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**Flexibility:**  
Spine

- CS/TS/LS
- Lateral flexion
- Extension
- Flexion
- Rotation

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**Assessment of strained muscle & ligament injuries**  
Done through muscle length and special tests

**Muscle strain:**

- Tender to palpation (deep cross-fiber)
- Combined with specific irritability upon stretch to that same tender muscle.

**Ligament injuries** are assessed using direct palpation and ligamentous stress/provocation tests.



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**Special Tests/Provocation**  
**Stifle**

- \* **Valgus/Varus Stress Test:**
- \* Tests integrity of med/lat collateral ligaments
- \* Lateral Recumbency
- \* Apply medial and lateral stress with stifle in neutral and various degrees of flexion/extension



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## Stifle Special Test

- \* **Anterior Draw Test:**
- \* Tests integrity of CCL
- \* Flex stifle 120°
- \* Grasp distal femur with thumb locked behind lateral femoral condyle
- \* Other hand grasps proximal tibia thumb behind lateral tibial condyle and index finger at joint line to palpate joint movement.

\* Apply cranial pressure on tibia upon the femur, this exerts a cranial translation of the tibia to stress the CCL.



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### ANTERIOR DRAW

Cranial translation of the tibia upon the femur.




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## Patellar Testing

- \* Used for mobility testing and stability of patella (luxating patella)
- \* Grasp patella between index and thumb



- \* Mobility test patella medial, lateral, dorsal and ventral
- \* COMPARE both sides to determine translation/luxation
- \* Test in various degrees of flexion/extension

**Luxating Patella Test**

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### “Slipped” Hock

- \* Determines stability of the hock
- \* Tester places index finger and thumb on hock< dog is in standing (limb must be WB)
- \* Pressure is placed in a cranial direction
- \* Hock should “bounce” back if stability is good
- \* Hock will stay forward and tarsus will “slip” forward if unstable



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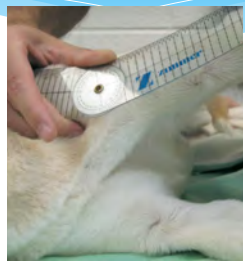
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### Measuring Abduction Angle

- \* Lateral recumbency or sitting
- \* Goniometer: one arm parallel to spine of the scap and the other along the humerus
- \* Elbow/shoulder in extension
- \* Stabilize scapula
- \* Then abduct to tissue limit



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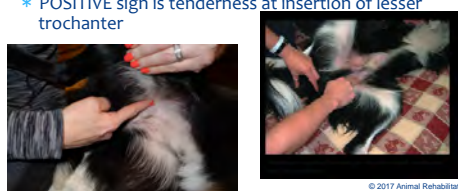
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### Palpation of Iliopsoas

- \* **Palpation:** of the Iliopsoas m. can be very tender (lesser trochanter medial thigh), other areas of tenderness: paraspinals, quadratus lumborum, sartorius, quads, piriformis, gracilis.
- \* **POSITIVE** sign is tenderness at insertion of lesser trochanter



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## Iliopsoas Special Test



- \* Determines strain of Iliopsoas
- \* Extend, IR hip to end range or to point of discomfort, then extend spine
- \* POSITIVE sign is pulling forward, pain response, & decreased m. length

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## LAB

Quick demo of eval/assessment  
Perform special tests  
if time then review muscle length




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## Subjective complaints for MSI



Figure 3:

- \* History is variable
- \* May be subtle to severe complaints
  - \* "He missed his weave pole entry"
  - \* "He just will not turn to the right"
  - \* "She is dead lame"
- \* Chronic conditions c/o
  - \* "I have rested him for 8wks and he still comes up lame after working"
  - \* "We rested him for 6 wks and he was on NSAIDS, why isn't he better?"

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### Objective findings

- \* Gait: mild shortened stride length at both walk and trot or significant lameness.
- \* Girth measurement deficits
- \* Visible Atrophy
- \* Decreased ROM: shoulder extension
- \* Increased Abduction angle
- \* With severe cases subluxation can be felt during abduction
- \* Flexibility: biceps, supraspinatus and subscapularis can be involved, decreased flexibility can be noted.

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### Objective findings: cont.

- \* Abduction angle
- \* 3 categories:
  - \* Mild- 35-45 degrees (conservative management)
  - \* Moderate- 45-60 degrees (arthroscopic sx)
  - \* Severe >65 degrees (sx)

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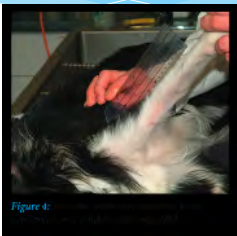
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### Measuring Abduction Angle

- \* Lateral recumbency or sitting
- \* Goniometer: one arm parallel to spine of the scap and the other along the humerus
- \* Elbow/shoulder in extension
- \* Then abduct to tissue limit



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Objective: cont.

- \* Palpation:
  - \* tenderness is usually noted along the subscapularis tendon and muscle, some thickening of the tendon
  - \* Teres major tenderness upon palpation
  - \* Biceps and triceps discomfort/ trigger points
  - \* CS, TS and LS

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OBJ. cont.

- \* Mobility
  - \* Decreased posterior (caudal) glide of GH jt.
  - \* Increased medial glide of the GH jt.
  - \* Lower CS & upper TS decreased mobility
  - \* Decreased scapular mobility



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Iliopsoas Strain



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### Subjective complaints for Iliopsoas Strain

- \* "My dog is knocking bars and he never does that"
- \* "He missed his weave pole entry and sometimes pops out"
- \* "Her a-frame is slow and she missed her contact"
- \* "She is not showing much but I know there is something wrong"



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### Objective findings

- \* **Gait:** Shortened stride length, stance phase, effected limb. Hip hiking or hop during lead changes or gait transitions (walk to trot).
- \* **ROM:** Decreased hip extension
- \* **Flexibility:** Decreased felxibility can be noted in the iliopsoas(hip extension, abduction, IR, & lumbar ext.), quads, sartorius, piriformis, hamstrings, adductors (gracilis), and gastroc.

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### Objective cont.

- \* **Girth Measurements:** Can vary depending on acute or chronic condition. Atrophy can be seen along glut region.
- \* **Palpation:** of the iliopsoas m. can be very tender (lesser trochanter inside thigh), tender paraspinals, quadratus lumborum, sartorius, quads, piriformis, gracilis. Opposite front teres mj, lats, traps, infraspinatus and supraspinatus.



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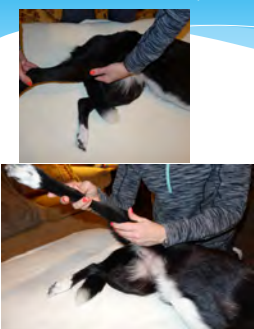
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Objective cont.



- \* **Flexibility & Mobility:** Decreased mobility is usually noted in the pelvis, hip capsule (cranially/medially), patella(ventrally), LS, TS.
- \* Flexibility is decreased into extension and IR of hip. Sartorius and gracilis may have some decreased flexibility as well.

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Goal Setting and Rehab Planning



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### Goal Setting & Rehab Plan for Each Stage of Healing

**Acute Stage:** (week 1-3)

- Decrease pain and inflammation Increase Joint ROM
- Increase tissue healing
- Preserve muscle mass
- Prevent compensatory dysfunction



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### GS & RP cont.


**Owner education-** reduce risk of injury, stress lifestyle changes and precautions. On lead walks for 5 min and up to 10 min by end of 3rd week.

**Inflammation management-** modalities (US, Laser, PEMF pulsed electromagnetic field, Cryotherapy, NMES).

**ROM exercises-**  
 PROM (increase circulation/proprioception & ROM)  
 AROM (easy WB/weight shifting activities, verbal commands)

**Proprioception-** Grade 1 mobilizations/Jt. compression, massage, weight shifting activities, NMES with functional movement.

**Compensatory Dysfunction-** address all restrictions found when evaluating whole animal. Especially, spinal/pelvic dysfunction. Mobility, flexibility, ROM, soft tissue dysfunction.



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### GS & RP cont.

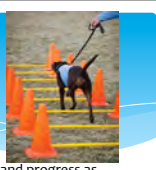
**Sub-Acute (4-6 weeks)**


**Strengthening-**

- Build muscular strength/support of affected joint
- Utilize closed and open-chain exercises, begin slowly and progress as tolerated. No signs of lameness, decreased pain upon palpation, swelling, pain with stretching or mobilizations.
- Weight bearing & stabilization exercises begin
- Muscular endurance is also increased ie, increase walking times to 20min. Use of UWTM or Pool can be utilized at this point if indicated.
- Soft tissue stretching and ROM

**Proprioception-**

- Increase difficulty. balance boards, un-even surfaces, walking over obstacles (ladder, grass, cones) Manual perturbations is progressed.





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**GS & RP cont.**

**Mid-Stage (7-9 weeks)**  
**Strengthening & Proprioception**- Increase duration, time, distance and speed. Terrain changes with walks. Hills, Stairs, trotting could be utilized at this time.  
 Compensatory management- should be decreasing at this time. Mobilizations and soft tissue treatment still necessary but only as needed.  
**Core stabilization**- Ball, disc, pad, balance board, narrow planks.  
 Progress slowly, start at beginners level.

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**GS & RP cont.**

**End-Stage (10 weeks plus)**  
 \* **Strengthening and Proprioception**- If progress has been normal then you may progress to advanced strengthening techniques. Endurance/ cardiovascular training increases 30-min, walking/ trotting, UWTM, swimming. Initiate off lead hikes after 12 weeks. **Jumping 14 weeks.**  
 \* **Owner Education**- no frisbee, ball playing, proper warm-up and cool-down. Maintain non-slip surfaces in home if necessary.

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**GS & RP cont.**

**Return to Sports (14 weeks+)**  
 Advanced training and rehab is essential.  
 Endurance  
 Plyometrics/Jumping  
 agility training (tunnels, A-frames, dog walks, tires, tables, broad jumps) sport-specific training  
 sprints  
 lateral training (pivot, figure of 8, turning/cutting) advanced  
 trunk stabilization  
 strength training




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### Rehab Protocol Post-op MSI

**Acute Stage: (week 1-3)**  
 Conservative management is critical to maintain integrity of tightened structures

**Contraindications:** No sh. ROM! No laser over jt. capsule  
 Modalities: Laser (except over shoulder Jt.) Cryotherapy



2-3x's/day for the first 3 days then done as needed and post-rx. NMES.

Exercise choices should be geared towards stabilization of the shoulder complex

All exercises are done in Hobbles except ROM

**Treatment:** PROM, Jt. compressions, Jt. mobilizations (avoid shoulder), and manual treatment to reduce compensatory effects of sx and Hobble use.

HEP: Lateral raises, PROM, 3x's/day and CS stretches. Torso stabilization and slow leash walks. Owner Education!

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### MSI Protocol Cont.

**Sub-Acute Stage: (4-6 weeks)**  
 Continue to protect healing structures



**Contraindications:** Avoid ER, ABD, & EXT of the shoulder. No laser, No UWTM. All exercises done in hobbles

Increase leash walks by 3-5min every 3-5days work up to 30min, stabilization exercises of shoulder and torso.

**Treatment:** Manual Rx., Stretching, Jt. mobilizations, begin GENTLE Flexion PROM of involved shoulder. Jt. Compressions if needed, jt. mobilizations, PNF.

**Modalities:** Laser, not over surgical site. NMES, Ice, US.

HEP: PROM 2-3x's/day, All 4's rocking, 3 leg stand, sit-stand, lying to stand.

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### MSI Protocol Cont.

**Sub-Acute Stage: (4-6 weeks)**  
 Continue to protect healing structures



**Contraindications:** Avoid ER, ABD, & EXT of the shoulder. No laser, No UWTM. All exercises done in hobbles

Increase leash walks by 3-5min every 3-5days work up to 30min, stabilization exercises of shoulder and torso.

**Treatment:** Manual Rx., Stretching, Jt. mobilizations, begin GENTLE Flexion PROM of involved shoulder. Jt. Compressions if needed, jt. mobilizations, PNF.

**Modalities:** Laser, not over surgical site. NMES, Ice, US.

HEP: PROM 2-3x's/day, All 4's rocking, 3 leg stand, sit-stand, lying to stand.

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### MSI Protocol Cont.



**End-stage (10-12 weeks)**  
 Increase all exercises as tolerated by patient. Endurance, proprioception, strength (eccentric and concentric), endurance and speed should be addressed.  
**Full ROM** of Shoulder, no palpable tenderness of surrounding soft tissue, prepare for return to normal activities. UWTM & swimming can be introduced.  
 Hobbles still in use during daily activities, begin exercises without hobbles.  
**Modalities:** Laser unlimited, NMES, US. Treatment: continues as necessary




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### MSI Protocol Cont



**Return-to-Sports (14-16 weeks)**

- ★ This stage can begin if normal healing times were consistent and progress within each stage was without complication
- ★ Limb circumference/muscle mass should be **equal** or within 1/2cm of each limb. Confirmation of full healing from Surgeon, minimal to no soft tissue dysfunctions, full flexibility, normal gait.
- ★ This stage is **essential** to safely return to sport due to the many stresses placed on the shoulder complex with specific sports. Each program should be specialized to the particular sport being returned to.





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### Elbow Treatment Plan

**Phase I Immediate Motion stage (week 1-3)**

**Goals:**  
 Improve ROM  
 Decrease pain and inflammation  
 Restore WB and retard muscle atrophy

**Contraindications:** no stairs, uneven surfaces, or slippery surfaces





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## Elbow Phase I



\* **Exercises:**

- \* 1. Manual Therapy- PROM, stretching, jt.mobilizations (grade 1-2), soft tissue mobilization/massage
- \* 2. Therapeutic exercise- leash walking, rhythmic stabilization and WB exercises
- \* 3. Modalities- cryotherapy, laser therapy, US, TENS- electrical stimulation, and whirlpool



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## Elbow Phase II



\* **Phase II Intermediate stage (week 4-6)**  
Initiate once full ROM, minimal pain/tenderness, and improved lameness have been obtained

**Goals:**  
Normalize motion  
Improve muscular strength and endurance



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## Elbow Phase II

\* **Exercises-**

- \* 1. Stretching to joints of the entire forelimb and CS
- \* 2. Longer leash walks- include up/down hills, stepping over objects and uneven surfaces, circles and figure 8's, ladder, wheelbarrow, play bow.
- \* 3. Hydrotherapy- UWTM or swimming may be initiated if criteria is met.
- \* 4. Proprioceptive exercises begin for neuromusc. Control and stabilization. PNF.



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### Elbow Phase III

**\* Phase III Advanced Strengthening stage (wk 7-11)**  
Initiate when full non-painful ROM, no pain or tenderness, and strength and muscle mass that is 70% of the contralateral forelimb.

**Goals:**  
Increase strength, power, and endurance  
Increase neuromuscular control  
Prepare for gradual return to sport



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### Elbow Phase III

**\* Exercises-**

- 1.** Advanced strengthening emphasizing high speed, eccentric contraction, theraband and plyometric exercises
- 2.** Leash walks include increase time, distance, speed and terrain. The addition of steeper hills and stair work aid in strengthening.
- 3.** Advanced proprioception and stabilization exercises.



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### Elbow Phase IV

**\* Phase IV Return to Activity Stage (week 12+)**  
Initiate when equal forelimb muscle symmetry, no lameness at walk or trot, or circles/tight turns are performed. Satisfactory clinical exam.

**Goals:**  
Return progressively to full off-lead activity and competition.



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## Elbow Phase IV



- \* **Exercises:**
- \* 1. Gradual off lead activities
- \* 2. Longer walking/trotting sessions to increase endurance
- \* 3. Advancement of duration and puturbations of stabilization exercises
- \* 4. Sprinting, jumping, and advanced plyometric training. Sports specific training begins.



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## Hip Treatment Plan



- \* **Phase I week 1-3**
- \* **Goals:**
- \* Decrease pain and inflammation
- \* If chronic then break up scar tissue to initiate healing
- \* Increase ROM if necessary.



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## Hip Phase I



- \* **Treatment:**
- \* **Manual Therapy-** PROM, gentle light stretching if appropriate (Strain/sprain should avoid stretching for the first 2 weeks). Jt. Mobilizations (grd. 1-2), soft tissue mobilization and massage.
- \* **Modalities-** Laser, Heat, US, NMES, whirlpool.
- \* **Exercise:** Leash walking, static/rhythmic stabilization exercises, Extension exercises on the stairs, sit/stand ex. Hills lengthwise at the end of week 2.



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## Hip Phase II

**\* Phase II Intermediate Stage (Week 4-6)**

Initiate once full ROM or pain has decreased with flexibility and palpation. Decreased lameness score during walk/trot.

**Goals:**

- Increase flexibility and mobility
- Normalize motion
- Decrease pain



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## Hip Phase II

**\* Treatment:**

1. *Manual Therapy*- Jt. Mobilizations (grade 2-3), Manual stretching, myofascial release, soft tissue mobilization. Make sure to address all compensatory issues, VERY IMPORTANT.
2. *Modalities*: Continue as needed from Phase I



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## Hip Phase II

**\* Exercises:**

- \* Longer leash walks, across hills, up/down hills, large circles, playbow, increase difficulty of stabilization ex but maintain even surfaces.
- \* Hydrotherapy: **NOT for Iliopsoas strain!!** Any other hip issues may begin UWTM or swimming if appropriate.



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## Hip Phase III

**Phase III - Advanced Strengthening Stage (wk 7-11)**

**Initiate** when no pain to palpation, full flexibility and no pain end range. Joint mobility and alignment is WNL. Muscle mass is 70%-80% of contralateral limb.

**Goals:**

- Increase Strength and power/endurance
- Increase proprioception and trunk strength
- Prepare for gradual return to sport



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## Hip Phase III

**Treatment:**

- \* Continue appropriate jt. Mobilizations , stretching, soft tissue techniques.
- \* **Modalities:** Utilize as appropriate
- \* **Exercises:**
- \* Begin higher level activities, BOSU, Wobble board, eccentric activities, Lateral movement exercises (side stepping, circles on disc, steep hills, lumbar stabilization, peanut/doughnut work.

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## Hip Phase IV

**Phase IV - Return to Sport/Activity (week 12+)**

**Initiate** when equal limb circumference, NO lameness during gait. Body alignment is satisfactory, No pain end range ROM or flexibility.

**Goals:**

- Return to full function.




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## Hip Phase IV

- \* **Exercises:**
- \* Off leash activities, gradual return
- \* Longer walking/trotting
- \* Stabilization exercises
- \* Speed, plyometrics
- \* Sports specific training



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## Return to Sport

- \* Tissue healing from Trauma/surgery can result in proprioceptive deficits that can effect neuromuscular control.
- \* This stage of advanced training is imperative for athletes to safely return to sport.



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## Return to Sport

- \* **Agility Specific:**
- \* **Hills:**  
Varying steepness, off-lead sprints, trot/walk interval training. Hills up/down, zig/zag. Weighted vests and weights.
- \* **Gait:**  
Different surfaces (tall grass, sand, dirt)
- \* **Jumping:**  
Different directions (pinwheel, serpentine, threadles, figure 8's, circles, straight line bounce jumps and jump grids)



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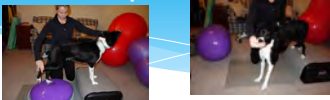
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**Return to Sport**



- \* **Eccentrics:**  
12" tunnel work, reverse squats, pushups, backward walking and up stairs, hindlimb awareness exercises, ladder with weights
- \* **Concentrics:**  
Weights, theraband, pulling with harness, swimming, treadmill, hiking, ladder
- \* **Endurance:**  
Walk, trot, run, interval training, UWTM, increase intensity, and duration.

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**Return to Sport**

- \* **Balance/Proprioception:**  
Physioball/Peanut/Doughnut/Discs/Pods  
BOSU, mini trampoline, narrow planks with disc under plank. See-saw, & weave poles.
- \* **Flexibility:**  
Continue stretching at least 2-3x's/week to maintain flexibility/mobility/optimum function and performance



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**Lab**

Demo manual techniques  
Hands-on for participants



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REHABILITATION CENTER

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