



Management and Rehabilitation of the Injured Anterior Cruciate Ligament Mini Series

Session One: Assessment and Diagnosis

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The knee joint is a complicated structure to assess due to its anatomical composition. It depends heavily on its muscular and ligamentous make up for its strength and stability as it gains very little from its bony configuration. It is therefore important for the therapist to understand the different mechanisms of the ligamentous structures at the knee joint in order to correctly diagnose the relative knee injury and the subsequent likely consequences.

Principles of Assessment

To complete a successful clinical assessment of the knee joint, a proper and systematic structure is required for the examination process. At the same time this needs to be flexible depending on various clinical and individual components the patient and their injury state may have.

This requires the examiner to have knowledge of:-

Functional Anatomy
Accurate patient history
Observation skills
Clinical signs and symptoms
Mechanism of Injury
Physical examination process
Biomechanics
Provocative and palpation tests

'SOAP'

4 part clinical assessment structure:-

Subjective
Objective
Assessment
Plan

Subjective

Key points include

- Patient's description of the mechanism of injury
- ? Trauma
- ? Direct or indirect blow
- ? weight bearing or non-weight bearing
- ? direction of force
- ? gradual onset
- Previous Injury
- ? functions that aggravate
- ? functions that ease
- ? 'click' or 'pop'
- ? acceleration or deceleration
- ? pain and its many connotations
- ? 'give way' or 'locked'

Objective

I. Observation

- Gait on entry
- Footwear
- Standing posture
- Seated posture
- Effusion and its many connotations

II. Active Movement

III. Passive Movement

IV. Muscle

- Bulk
- Girth
- Power
- Deformity
- Atrophy
- Fascial 'tightening'

Assessment

- Valgus/Varus Stress Test
- McMurrays
- Lachman
- Lachman (Prone)
- Isometric Active Anterior
- Isometric Active Posterior
- Anterior Draw
- Pivot Shift
- Single Leg Squat

Plan

Within the concept of the ACL injured patient, a complete accurate diagnosis and choice of subsequent surgical procedure is only possible via arthroscopic examination. However in the interim period between assessment/physical diagnosis and surgery, the athlete has the ideal opportunity to utilize this time to commence their 'prehabilitation' programme. In the ideal world, the early part of the functional rehabilitation programme should be taught prior to surgery so that the athlete has a full understanding of what is expected of them in that first week following surgery.

REHABILITATION PROCEDURE FOLLOWING ANTERIOR CRUCIATE LIGAMENT

RECONSTRUCTION OF THE KNEE

Time Scale	Activity Level
Immediate Post-op	-Continuous Passive Motion (0-60 degrees) increase 10 degrees per day to 90 degrees maximum. -Ice and Elevation (Avoid moisture on wound) Cryocuff -Thackeray splint/or limiting brace -Weight-bearing with crutches as tolerated -Ankle mobilising exercises -Patella mobilisations -Static quadriceps/ Trophic stimulator if inhibited due to pain,3-6 hours per day for slow oxidative fibres
Week 1-6	-Supervised knee mobilisation work, flexion and <u>full</u> extension -CPM 0-90 degrees -Prone lying, knee extended over bed (30 minutes per day) -Weight bearing as tolerated with crutches -Multi angle, submaximal isometrics (Quads/Hamstrings) -Straight leg raises (4 planes) -Mini squats (30 degrees of lumbar flexion) -Hamstring curls

Time Scale	Activity Level
	-Patella mobilisation -Calf raises -Pelvic and lower limb extensor thrust work, to simulate the mechanics of running -Hamstring/Calf flexibility work -Early balance, weight transference and proprioceptive work -Cliniband CKC order -Front Pull (137% H/Q); Cross Over (115%); Back pull (70%); Reverse Crossover (60%) (Schulthies et al,1998) -Swelling control using ice and electrotherapy modalities -Wound care
Week4	-Bicycle for ROM and compression stimulus -Pool walking programme (if wound completely healed) -Submaximal quads eccentrics (40-90 degrees) -Hip extension/flexion (Total hip machine) -Leg press,0-60 degrees (Two leg) -Mini squats (Vertical)
Brace removed if	ROM 0-115 Decreased effusion Quadriceps control of knee in lying and standing

Time Scale	Activity Level
Week 6-8	-Full weight bearing -Leg press (1 leg),Isokinetic if available -Hamstring curl (1 leg)/Hamstring re-education pattern -Skipping -Swimming programme (Crawl kick only) -Step ups, varying height and weight
Week 9-14	-Lateral step ups -Knee extension (90-40 degrees),2 leg -Hip abduction/adduction (Total hip machine) -Cycle work for aerobic exercise, using pulsemeter -Pool running -Step Machine
Week 12	-Isokinetic Test -Begin running programme if satisfactory clinical, functional and isokinetic test -Initially, increase intensity of running by time factor (15 minute plus 5 minutes, alternate days) -Submaximal eccentric quadriceps work (40-90 degrees)
Week 16	-Leg press with jump (1 leg)

Time Scale	Activity Level
Week 18	-Begin functional work, skill drills and plyometric work -Increase intensity of running programme with cutting, backward and functional patterns.
Week 24	Isokinetic Test, full ROM, 60-180-300 degrees per second
Week 28	Isokinetic Eccentrics, Sub maximal
Week 32	Isokinetic Eccentrics, maximal
Week 36	Concentric/Eccentric/Endurance/Functional Test RETURN TO PLAY
Week 52	Isokinetic Test, Concentric/Eccentric, Quads/Hamstrings
	BEWARE PATELLO FEMORAL/GRAFT SITE SYMPTOMS ADJUST PROGRAMME AS REQUIRED