A New Way To Look At An Old Issue: A Paradigm Shift in ACL Rehabilitation

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Financial Disclosure Statement

• I have no financial relationships or relevant nonfinancial relationships.

• However
My issues with current protocols

• Not a cookbook. It IS a GUIDE!
• Many Therapists, AT’s and M.D.’s just follow
• Why do we x-ray fractures at 6 wks?
• Not all run at 12, jump at 16-20 and go full at 20-26 weeks post-op.
Genesis of this “new” idea

• My time working for Dr. Lowe
• Kingwood Park
• Memorial Hermann
Normal Progression

- 6 months: A. Peterson
- 9 months: The “normal” rehabbers (Gronk)
- 12 months +: Navarro Bowman and FTT, P3
Old School

- Just like education used to be:
- Do the work satisfactorily, you advance a grade.
- Don’t do the work, repeat the grade
- No seat time
- We do not advance just because we are at that week post-op.
150-200K ACL Surgeries a Year

• Are we doing those patients a disservice with current protocols?
• Are we harming our profession(s)?
• What is best for the patients as far as Rehab and RTP?
• “You’re ready when you’re ready”
Criteria Based Protocol

- Paulos, 1981 weeks. Based on Min time & specific goals at each phase.
- Adams, et al (Delaware), 1996/2012 not true criteria- weeks
- Wilk, 1999/2012: weeks. Only criteria is for RTP.
Criteria Based Protocol

• Each phase has criteria that must be met before advancing.
• Criteria based on published research
• Biological healing is taken into consideration – M.D.
What determines “normal” knee rehab progression?

- Tissue Healing
- WB restrictions
- ROM restrictions
- How hard are YOU willing to work?
Biology

- Tissue healing matters!
- Graft type
- Fixation
- Other Ligament Injury
- Meniscal Repair
- Microfracture
Use This Protocol For:

- ACL
- Multi-Ligament
- Meniscus
- PF
- Collaterals
- Chondral Defects
Looking at Specific Criteria

• Published
• Validated
• Widespread in use and understanding
Criteria Phases

• 1: Acute Phase*
• 2: Functional Phase*
• 3: Unilateral Strength
• 4: Return to Sport(s)
• 5: Return to Play
Phase Goals

• 1*: Full Ambulation w/o assistive device
• 2: Initiate Jogging Program
• 3: Initiate Agility Training
• 4: Full Return to Sports
Phase 1 Goal: Full Ambulation w/o Assistive Device

- NPRS ≤ 5
- IKDC ≥ 30
- Knee EXT PROM ≥ 0°
- Knee FLX PROM ≥ 90° *110°
- ≥ 30 SLR w/o Quad lag
- BESS (SL-Firm) ≤ 5
- MD APPROVAL*
Numeric Pain Rating Scale (NPRS)

- Pain Scale 0 (None) – 10 (Worst)
IKDC

- International Knee Documentation Committee
- Identify Athletes who fail to RTP up to 1 year after ACLR.

Logerstad JOSPT 2014
Knee ROM

- Loss of 3 to 5° of knee extension/hyper adversely affected the subjective and objective post surgical results.

  Shelbourne AJSM 2009

- Osteoarthritis is lower in those who achieve and maintain normal ROM.

  Shelbourne AJSM 2012
Phase 2 Goal: Unilateral Strength
Initiate Jogging

- NPRS ≤ 3
- IKDC ≥ 60
- Knee Extension PROM ≥ 0° or symmetry*
- Knee Flexion PROM ≥ 120°
- Overhead Squat (FMS) ≥ 2
- ≥ 1 Minute of Single Leg Squats (Vail)
- MD APPROVAL
Overhead Squat - FMS

- From the Functional Movement Screen
- Graded from 0-3 based off of Technique
- Any pain, athlete gets a 0
Single Leg Squat Test
VAIL Sport Test

• Reliable measure of physical performance following ACLR.

Garrison IJSPT 2012
Phase 3 Goal: Return to Sport(s)
Agility Training / Off-Season

- NPRS ≤ 2
- IKDC ≥ 70
- Tampa Kinesiophobia Scale < 20
- Heel-Height Difference ≤ 1 CM
- Quad Strength Symmetry ≥ 80% Inv/Uninv
- Y-Balance deficits < 4cm (each dir)
- Landing Error Scoring System ≤ 5
- MD APPROVAL
Tampa Kineiophobia Scale

• Comparison of Physical Impairement, Functional and Psychosocial Measures based on fear of reinjury/lack of confidence and return to sport status after ACLR

Lentz AJSM 2014
Quad & Ham Strength Ratios

• Individuals Post-ACLR w/ weak QF demonstrated altered landing patterns. Schmitt Med Sci 2014

• QF strength >90% demonstrated functional performance similar to uninjured. Schmitt JOSPT 2012
Y- Balance Test

- Players with an anterior right/left reach distance difference greater than 4cm were 2.5 times more likely to sustain a LE injury. Girls w/ a composite reach distance less than 94.0% of their limb length were ↑6.5 X

Plisky JOSPT 2006
Landing Error Scoring System

• Valid for identifying high risk movement patterns during a jump-landing task.
  Padua AJSM 2009

• Altered control of the hip and knee during a dynamic landing task after ACLR are a predictor of a second ACL injury.
  Paterno AJSM 2010

• ACLR patients had worse landing mechanics.
  Bell JAT 2014
Phase 4 Goal: Full Return to Sport

- NPRS ≤ 2
- IKDC ≥ 80
- Tampa Kinesiophobia Scale ≤ 20
- Heel-Height Difference ≤ 1 cm
- Quad Strength Symmetry ≥ 90% Inv/Uninv
- Ham/Quad Strength Symmetry ≥ 55%
- Symmetry for Hop Testing ≥ 90%
- Agility Tests: T-Test / Figure of 8 Test
- Complete Sports Metrics
- MD APPROVAL
Single-Leg Hop Tests

• Tests conducted 6 months after ACLR can predict likelihood of successful and unsuccessful outcome 1 year after ACLR.

Longerstad AJSM 2012
Agility Tests

- Reliable tests for use with subjects in a team sport environment. ≥ 90%.

Munro JOSCR 2011
Agility Tests

[Diagram showing a 3x3 grid with 5m distances between points and a circular path for agility testing]
Sports Metrics

• Only Sports Metrics and PEP intervention training programs had a positive influence on injury reduction and athletic performance tests.

Noyes IJSPT 2012
Knee Alignment

Hyperextension

Pre-Landing (P.L.)

Prelanding

Landing

Prelanding

Hip Sep. 40.0 cm 100%
Knee Sep. 23.7 cm 59%
Ankle Sep. 38.9 cm 97%

Landing

40.5 cm 100%
Hip Sep. 12.6 cm 31%
Knee Sep. 13.9 cm 34%
Ankle Sep. 33.7 cm 83%

Take Off

Take Off (T.O.)

41.3 cm 100%
Hip Sep. 13.9 cm 34%
Knee Sep. 13.9 cm 34%
Ankle Sep. 33.4 cm 81%

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What is your plan for this?

- Publish
- Have UT physicians utilize protocol
- Have MH Clinics use
- Collect Data
- Teach to other therapist
- Publish Data
Flaws

- Start to Finish
- MMT
- Biodex
- Poor Data collection at sites
- NOT the norm
Thank You