Return to Sport After ACL in the Young Athlete

Stephanie Gould Pht, Naudira Stewart P.R.T
The ACL epidemic

- In youth aged 6-18 y.o., ACL injuries occur at a rate of 130/100,000 people per year
- Rate of ACL tears rising 2.5% yearly in teen girls, 2.2% annually in teen boys
- Incidence of injuries in young athletes:
  - Year-round competition
  - Early specialization
  - Intensive training
Reconstruction Surgery, Not a Magic Pill

- Rates of re-injury:
  - In young athletes (<20-25 y.o.) approx 23%
  - Studies report rate of re-injury of the same knee as high as 29%
  - Studies report rate of ACL tear in the contralateral knee is as high as 19%

- Rates of return to sport:
  - Only 40-65% return to previous level of sport activity
  - Despite 90% presenting with normal knee function (stability, ROM and strength) at 6-9 mos post reconstruction surgery, not a magic pill.
• How to know if/when a young athlete is ready to return to sport?
• Best way to get them there?

WHY CAN’T WE ALL JUST AGREE?
Timing isn’t everything

- Time after surgery continues to be the dominant criteria for RTS
- Recommended time before RTS varies in the literature anywhere from 3 to 12 months (Kvist, 2004)
- BUT:
  - Neuromuscular deficits can persist > 11 mos
  - 9/10 fail quad power @ 6 mos (Neeter, 2006)
  - Complete ligamentization takes 10-12 mos in humans (Li, 1993)
- Also, if magical projected return time passes, frustration mounts and this becomes mentally challenging.
Factors Affecting Athletes Return to Sport

- Pre-injury status
- Associated knee injuries
- Time to treatment / time to surgery
- Surgical technique
- Knee kinematics
- Rehab protocol
- Compliance
- Achieved level of muscle function
- Patients activity level
- Social factors (family, work, etc)
- Functional knee stability
- Knee symptomatology
- Motivation
- Level/intensity of sport
- Psychological factors
Challenges with Teenage Athletes

- Risk-taking behaviours
- Socialization/peer-pressure
- Attention span
- Motivation levels
- Physiological and mental immaturity

IMPORTANT TO WORK WITH A THERAPIST WHO HAS EXPERIENCE WITH YOUNG PATIENTS AND WHO CAN MAKE THERAPY SESSIONS ENGAGING AND BENEFICIAL!
During Rehab Process
Rehab: Pre-operative Phase

• 1 (or more) appointment to teach home program
  – Ensure full ROM, strength pre-operatively
  – Wean from knee immobilizer ASAP
  – Bike ++, ROM, stretch, strengthen (incl hips, core), proprioception
Rehab: Weeks 1-4

- Eliminate pain/swelling
- Restore full knee extension ROM
- Gradually progress knee flexion ROM
- Maintain patellar mobility
- Restore volitional quads control
- Restore independent ambulation
Rehab: Weeks 4-12

- Closed kinetic chain exercises
- Progressive hamstring strengthening
- Quadricep strengthening with emphasis on Eccentric control
- Proprioception
- Core and glute strengthening
Rehab: Weeks 12-24

- 12 weeks: start training in a gym (including leg press, leg curls)
- 20 weeks: start jogging at PT discretion
- 24 weeks: first isokinetic testing to determine readiness for plyometrics and sports-specific training in the therapeutic setting
Progressive Sports Training (starting at Month 6)

Once the athlete has passed the Isokinetic testing with favorable results RTS training begins.

1. Running/ sprinting
2. Straight line stops/starts
3. Bilateral Plyometrics
4. Lateral shuffles
5. Running figure-8s
6. Backwards running
7. Cutting/pivoting
8. Closed space agility drills
9. Cariocas
10. Single leg hops (progressing difficulty)
**Crucial Factors in RTS**
*(Barber-Westin & Noyes, 2011)*

- Time since surgery
- Knee ROM/absence of joint effusion
- Knee joint stability
- Strength
- Proprioception
- Dynamic knee function
- Neuromuscular function
- Aerobic capacity
- Sports-specific testing
- Psychological readiness

*A battery of tests is best to assess readiness for return to sport* – Noyes et al
RETURN TO SPORT
Battery of tests

1. Isokinetic testing
2. Knee ROM, effusion, stability tests
3. Single-leg hop tests
   - Triple hop for distance, Cross-over hop for distance, Fatigue side hop test
4. Star Excursion Balance Test
5. Drop jump testing (with video review)
6. Lower Extremity Function Test for agility
7. Validated patient-reported outcome measures
   A. IKDC
   B. ACL-RSI
1. Isokinetic testing
2. ROM, Stability Tests
3. Single-leg hop Tests
4. Star Excursion Balance Test
5. Drop jump Testing
6. Lower Extremity Function Test (L.E.F.T)
7. Validated Questionnaires

- **IKDC** (International Knee Documentation Committee Questionnaire)
  - Proven validity, reliability and re-test reliability (Irrgong, 2001)

- **ACL-RSI** (ACL – Return to Sport Index)
  - 12 item questionnaire
  - High sensitivity (0.97), moderate specificity (0.63) (Muller, 2014)
  - High reliability, validity and test/re-test reliability (Kvist, 2004)
• Return to sport is a PROCESS
• Games + team practice brings chaos and high speed, require quick reactions and confidence
• Start with individual skills, then partner drills, group drills, game simulation drills, practice games, partial games, then finally complete games

But wait …
Maintenance after Discharge

• Don’t neglect a program of PREVENTATIVE exercises
  – PEP program, FIFA-11 program
• Neuromuscular training decreases an adolescent female athlete’s risk of ACL injury by 72%
• Program should include plyometric training, technique training, ++ feedback about proper form, and continued strength training
"When can I go back to my sport?"

"When you can demonstrate that you are ready!"
REFERENCES


REFERENCES

• Muller, U. (2014). Predictive Parameters for Return to Pre-Injury Level of Sport 6 Months Following ACLR Surgery. KSSTA.


• Nussbaum, E. Return to Play: Evidence-based Criteria. www.UOANJ.com

REFERENCES

