

Boo Schexnayder

Speed Based Knee Rehabilitation & Return to Play Protocols

Perspectives

Perspectives

- Perspectives and Disclaimers
- Starting Points

Basic Principles of Joint Rehabilitation

Adaptation as a Process

- Adaptation Time Frames
 - Healthy Athletic Populations
 - 90%-95% in 21-28 Days
- Rehabilitation Situations
 - The Starting Point and Adaptations Occur Much Quicker
 - Retraced Steps
 - The Healing Process

Adaptation as a Process

- Implications for Rehabilitations
 - Daily Changes Must be Made to the Training Program
 - Microsteps and Microtests
 - Canned Rehab Programs Waste Time and Effort

Intensity

- Valuing Intensity
 - The Overload Principle
 - Intensity as the Overload Variable
 - Mistakes in Volume Based Loading
- Highs and Lows - Valuing Intensity and Rest

Intensity

- Implications for Rehabilitations
 - A Body of Work is Necessary... But
 - Excessive Volumes Produce Training Baggage
 - Volume Increases are False Progress
 - Training Densities
 - Must Support Needed Intensity
 - Typical Loading Patterns in ACL Return to Play - Every 3 Days
 - Work Below the Intensity Threshold is Unnecessary Baggage

Pain and Discomfort

- The Rule - Pain Free Rehabilitation
- Distinguishing Between Pain and Discomfort
- Coaxing Through Tough Points
- Hypercommunication is a Must

Philosophical Approaches to Rehab / Return to Play

- Find Science-Based Methods to Accelerate the Reacquisition of Strength and Speed
- Design the Rehabilitation Process in a Way That Functionally Retraces Athlete's Steps to Previous Levels of Fitness
- Eliminating or Delaying Implementation of Training that Decelerates the Reacquisition of Strength and Speed

Accelerating Reacquisition of Strength & Speed

Understanding Neuromuscular Integration

- Neural Strength Training Adaptations
 - Improved Recruitment
 - Improved Rate Coding
 - Improved Synchronization
- Speed / Power Training Produces These Adaptations

Understanding Neuromuscular Integration

- Neuromuscular Integration - Implications for Rehabilitations
 - Train Speed/ Power Aggressively with Healthy Body Parts
 - Direct Speed / Power Training Carefully to Injury Site

Understanding Elastic Responses

- Eccentric Work
 - Elastic Responses in Sport
 - Eccentric Activity in Rehabilitations
- Elastic Responses- Implications for Rehabilitations
 - Employ Jumping / Modified Jumping In Earliest Stages of Training
 - Progressively Increase Intensities

Understanding Lactate Responses

- Creating a Good Biochemical Environment
- Mild / Moderate Lactate and GH Responses
- Employing Glycolytic Training
 - Circuit Training
 - Using Healthy Body Parts
 - Avoiding Knee Involvement

Eliminating Interference

Basic Tenets of Joint Rehabilitation

- Proprioception is Precious
 - Quality Proprioception is Prerequisite to Reintegration of Speed/Power Abilities
 - Training Produced Proprioceptive Dysfunction – Long Time Under Tension
- Implications for Rehabilitations
 - Avoid Static, Slow Moving Strengthening Activities
 - Delay Implementation of Those Activities as Long as Possible

Glycolytic Training

- High Level Glycolytic Training Produces Neural Shock
- Implications for Training
 - Avoiding High Level Glycolytic Training
 - Delaying the Onset of High Level Glycolytic Fitness Training
 - Patient Reintroduction of Sports Specific Fitness

Aerobic Training

- Aerobic Training Harms Fast Fibers and the Biochemical Climate
- Implications for Training
 - Avoiding Purely Aerobic Training Environments
 - Train Aerobic in an Anaerobic Context
 - Avoiding/Delaying Onset of High Level Aerobic Training (If Needed)

Knee Flexion/Extension

- Flexion / Extension - as a Necessity
- Flexion / Extension - as an Irritant
- The Goal ...
 - Maximizing Power Output
 - Achieving Appropriate Levels of Local Tension
 - Limiting Flexion / Extension

Training Components and Progressions

Basic Phases of Knee Rehabilitation

- Phase 1 - Introduction and Establishment of Jumping, Establishing the Biochemical Climate
- Phase 2 - Establishing the Sprint Program, Advancing the Jump Program, Backfill with Sports Skills and Change of Direction
- Phase 3 - Removal of CNS Inhibitions, Advancement of Backfill Components
- Phase 4 - Return to Play and Monitoring of Play

Warming Up

- Dynamic Flexibility Work
 - The Leg Swing Series
 - Training Nonsupport and the Swing Phase
- Movement Drills
 - Forwards, Backwards, Lateral
 - Eventual Introduction of Change of Direction at Low Levels

Starting with Jumping

- Why Not Jogging?
- Preparation for Impact
- Tools
 - Vibrations
 - Double Leg Stiffness Jumps
 - Single Leg Stiffness Jumps

Starting with Jumping

- Patterns
 - RRR..., LLL..., RRLL ...
 - Medials, Laterals, Backwards
 - +2-1 – A Special Case
- Neural Based Rehab - Nuances and Potentiation

Pluto Jump Series



Introducing Sprinting

- Components - Sprinting and Resisted Sprinting
- Why Sprint Work?
 - Power Output
 - Functionality
 - Value per Meter
- The Sled – the Value of Resistance
 - High Power Outputs Are Enabled
 - Decreased Angular Velocities at the Joint

Progressing the Sprint Program

- Progressions
 - Sled to Flat, Repeat
 - Constant Lengthening to Increase Intensity Levels
 - Using the Sled as a Test and Safety Device
 - Progress to 40 Meters In Most Cases
- Deceleration
 - Key Observations
 - Stopping Distances
 - Start at 1:2

Typical Sprint Progression

- Session 1: 10 x 10m Resisted Sprint
- Session 2: 10 x 10 m Unresisted
- Session 3: 10 x 15 m Resisted Sprint
- Session 4: 10 x 15 m Unresisted
- Continue.....
- Notes:
 - Progress to 40 Meters in Most Cases
 - 5 Meter Increments are Conservative
 - 10 Meter Increments are Often Possible
 - May Need to Decrease to 8 Runs when 30 Meter Mark is Reached

The Drop Jump Series

- Why Drop Jumps?
 - Intensity
 - Quantification
- Choosing a Height
 - Starting Points
 - Progression
- Tools
 - Drop – Land
 - Drop – Bounce
 - Drop – Squat
- Continuing +2-1

The Drop Jump Series



The Weight Training Program

- Reintroduction of Olympic Lifting
- Reintroduction of Ballistic Lifting
- Reintroduction of Static Lifting

The Backfill Philosophy

- Using Day 2 of the 3 Day Cycle
- Capping the Intensity - Making Wise Choices
- Training Types
 - Sports Specific Skills
 - Change of Direction

Phase 1 Example

- Day 1
 - Warmup, Stiffness Jump Training
- Day 2
 - Lactate Based Circuits
- Day 3
 - Off or Restoration Modalities

Phase 2 Example

- Day 1
 - Warmup, Sprinting, Drop Jump and +2-1 Training, Weight Training
- Day 2
 - Sports Specific Skills, CoD - Intensities Less than Day 1
 - Lactate Based Circuits
- Day 3
 - Off or Additional Lactate Based Circuits

So the Knee is Good... Now What?

Dealing with Inhibitions

- CNS Inhibitions - The Final Hurdle
- The Inhibitory Response & Breakthroughs
- Intensity Tools
 - Sprints – Accelerations, Sprint-Float-Sprint Constructs to Touch Max Velocity
 - Jumps- Depth Jumping as a Continuation of the Drop Jump Series
 - Lifts - Olympics @ 90% +
- Typical Time Frames – 3-4 Sessions, 2-3 Days Between Them

Finishing Touches

- Hypertrophy Needs
 - The Heavy Sled
 - Timing is Everything
- The Value of Testing
- Sports Specific Fitness
 - Budgeting Playing Time
 - Serpentine Approaches
 - Beware the 3's



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