Physical Training Effects in the Throwing Events
Training Throwers

• Technical vs Non-technical training

• Non-technical training outcomes
Physical Training Effects

• Somatic Response

• Neurological Response
Somatic Effects of Training
Somatic Training Effect

ENDOCRINE RESPONSE
Somatic Training Effect: Endocrine

- Endocrine System Defined
- Anabolic vs Catabolic Hormones
- Favorable endocrine response for throwers
- Don’t Do Drugs!
Anabolic Hormones

• 2 Categories of Anabolic Hormones
  – Steroids
  – Polypeptide Hormones
Anabolic Hormone Secretion

• Exercise Selection:
  – High intensity
  – High volume
  – Multi joint lifting

• Rest
  – When secreted/used
  – Stagger workouts
Endocrine/Hypertrophy Connection

• Hypertrophy as a goal:
  – Increased lean mass

• Classical Hypertrophy Training Model
  – Temporally not same event (energy used)
  – Fatigue
  – Some benefit- musculoskeletal injury prevention
    • If any, Transition/Early GP
Endocrine/Hypertrophy Continued

• Hypertrophy via Endocrine response
  – Anabolic effect

• Comprehensive effect of training
  – Increased density
  – Increased frequency
  – NOT increased duration
Anabolics and Catabolics

- Inverse relationship in the bloodstream and at receptor site
  - Why people do PED

- Catabolic state
  - Overtraining, long duration
  - Loss of muscle mass
  - College Athletes
Weight Room Protocol Review

• Weight room-
  – Squat/Deadlift/Olympics
  – 75-95%
  – 3-5 days per week (2-4 restoration/GS)
Endocrine Training Implications

• Integration throughout annual plan
  – Volumes and intensities

• Increased focus GP, SP

• Somewhat present PC

• Limited in Competitive Phase
Lactate and HGH

• Lactate /HGH connection

• Protocol:
  – Longer duration sprints
    • 75m-100m
  – Long Stadium Runs
  – Friday workout
Lactate Training Implications

- Integration Preparation Phases
- Increased focus GP, SP
- Limited to none PC
- Comp NONE
Somatic Training Effect

BODY COMPOSITION
Somatic Training Effect: Body Composition

• Decrease adipose tissue

• Classical fat burning training
  – Aerobic 120-140 bpm

• Non Specific
Anaerobic Training for Body Composition

• Caloric equation

• Time in target heart rate zone
  – Alter rest periods
Working and Resting Heart Rates

![Bar chart showing working and resting heart rates for six sets.](chart.png)
Anaerobic Training for Body Composition

• Anaerobic activities
  – Weight Room—alter rest between sets/exercises
  – Non weight room circuit training
    » Bodyweight Circuit
    » Jumps Circuits
  – Multi jumps/Multi throws
  – Jump rope

• Placement in Annual Plan- GP, SP, PC (limited)
Jumps Circuit
Somatic Training Effect: Work Capacity

- Byproduct of training
- Progressive overload
- Tire flips, stadiums
Somatic Training Effect

FLEXIBILITY
Static Flexibility

• Range of motion, not utilizing movement

• Static Stretching—Use Gravity

• PNF Stretching—Assistance/resistance
Static Stretching Implementation

• Utilized both pre and post workout

  – Pre workout—GS day, non ballistic weight room
    • Decreases force production
  – Post workout—Daily

• 10-15 seconds, 2-3 sets ~ 10-15 min
PNF Stretching Implementation

- Primarily post workout
- Partner/bands/ropes
- 15-20 seconds, 1-2 sets, ~ 10 min
Dynamic Flexibility

• Utilize movement
  – Large ranges of motion

• Pre exercise
  – Hurdle mobility, leg swings, ground exercises, Mach drills

• ~10 reps/ 5-10 exercises/ ~10-12 min
Neurological Training Effects
Nervous System

- Motor Unit
- Action Potential
- Specific and efficient
Neurological Training Effect

SPEED
Components of Speed Development

- Development on track
- Acceleration
  - Sprints up to 40m
  - Resisted runs to 40m (Multi Directional)
  - Up to 400m work
- Maximal Speed
  - Sprints 40-70m
  - Variable speed runs
    - Sprint/float/sprint
    - Flying 30’s
  - Up to 400m work
Neurological Training Effect:

STRENGTH
Types of Strength

• Absolute Strength
  – Static Lifts
  – Periodize—sets of $8 \rightarrow 1RM$
Types of Strength Continued

• Power
  – Speed element added
  – Olympic Lifts
  – Ballistic Lifts
Strength in the Annual Plan

• Both strength and power used throughout

• Conventional training theory

• Maximized neurological training
  – Power $\rightarrow$ Absolute strength
  – Rate Coding
ABSOLUTE STRENGTH
ABSOLUTE STRENGTH

POWER
Neurological Training Effect:

PROPRIORCEPTION
AGILITY

- Ability to move rapidly and change direction
- Ladders, jump rope, multi jumps
- Utilized in Neuromuscular workout sessions
Agility
STABILITY

• Balance and Core Strength

• Balance
  – Single support lifts
  – Only after double support proficient

• Core Strength
  – Weighted Abdominal work
  – Rotational movements
  – Frequency due to striation type
Overhead movements

- Fosters both core strength and balance
- Not gimmick
Questions?

Thank You & Happy Holidays

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