Developing Work Capacity through the Teenage Years

Loren Seagrave, Director of Speed and Movement, IMG Academies
What Is Work Capacity?

» Work Capacity is Often Used Synonymously with…
   - General Endurance Capacity / Aerobic Fitness

» Work Capacity is **not** Just the Ability to Withstand Large Training Loads.
What Is Work Capacity?

» Work Capacity is the Ability Maintain the Quality and Intensity of an Activity
  - under Ever Increasing Volumetric Loads
  - and Be Able to Return to Homeostasis in Both Short Term and Long Term

» Increases in Work Capacity is Realized by Increasing the Capacity in All the Bio-motor Abilities.
Preparing for Sports Performance
Adapted from Verkhoshansky (2006)

Sports Performance

Motor System Work Capacity

Neuro-muscular Preparation

Musculo-skeletal Preparation

Bioenergetic Preparation

Psycho-Behavioural Preparation

Technical-Tactical Preparation

Genetic Predisposition

Bioenergetic Preparation

Technical-Tactical Preparation

Psycho-Behavioural Preparation

Musculo-skeletal Preparation

Neuro-muscular Preparation

Motor System Work Capacity

Sports Performance
Work Capacity: An Important Focus of Long Term Athletic Development

» A Holistic Perspective of Developing Work Capacity
  - Gives the Athlete a Comprehensive Base Upon Which to Train and Recover

» Linking General Development of Bio-Motor Abilities with Movement Skill Development Enhances the Athleticism of the Individual
Work Capacity: An Important Focus of Long Term Athletic Development

» If Properly Addressed in Training…
   - Work Capacity is Additive Over the Career of the Athlete

» Reducing Restrictions, Imbalances and Instability through a Blend of Therapeutic Exercises…
   - Has a Positive Effect on Reducing Injury Likelihood
   - Don’t Build Work Capacity on Dysfunction  

Gray Cook paraphrased
The Bio-Motor Abilities: Building Blocks of Training Goals

» The Qualities that an Individual Must Possess to Be Successful at Any Physical Endeavor

» Bio-motor Demands Vary with Nature of the Activity and Event

- Which Determines the Direction of Training as The Athlete Increases Specialization

» Early Over-Emphasis on a Bio-motor Quality May Put the Body Out of Balance with Respect to Long Term Development
Major Biomotor Abilities

- Strength & Power
- Neuromuscular Coordination
- Speed
- Flexibility
- Energy System Development
Biomotor Abilities – Strength & Power

- Strength & Power
  - Strength
  - Power
- Neuromuscular Coordination
- Speed
- Flexibility
- Energy System Development
Biomotor Abilities - Coordination

**Biomotor Abilities**

- **Strength & Power**
- **Neuromuscular Coordination**
  - Order
  - Sequence
  - Timing
  - Intermuscular
  - Intramuscular
  - Synchronization
  - Relaxability
- **Speed**
- **Flexibility**
- **Energy System Development**
Biomotor Abilities - Speed

- Strength & Power
- Neuromuscular Coordination
- Speed
  - Acceleration
  - Maximum Velocity
  - Agility
    - Multi-Direction
- Flexibility
- Energy System Development

Biomotor Abilities
Biomotor Abilities – Energy Systems

Biomotor Abilities

Strength & Power
Neuromuscular Coordination
Speed
Flexibility

Energy System Development

Anaerobic
Alactic

Anaerobic
Lactic

Aerobic
Multi-Lateral Approach to Training Program Design

» Takes a Balanced Approach to the Training of the Bio-motor Abilities

- All the Biomotor Abilities are Important to Attain High Levels of Sport Performance
- Each Bio-motor Ability is Requisite to the Other and Interdependent
- While Specialization is Necessary at Appropriate Times
- Balanced Development of General Qualities Will Lead to Better Long Term Development
General versus Specific Training Continuum

- General Training Seeks to Improve the Bio-Motor Abilities in a Manner Independent of the Sports Task and Works Toward Increased Athleticism
General to Specific Training Continuum

- Specific Training Emphasizes Development of the Bio-motor Abilities that Predominate Success in an Event
  
  …A Shift of Emphasis on the Proportion of the Training Load to One or More Biomotor Abilities Increases Specialization

  …Increasing Special Training Requires a Decrease in Other Bio-motor Qualities to Maintain Training Load

  …Specialized Training Increases through the Macrocycle and is More Appropriate as the Athlete and Their Career Matures
The Relationship between General and Specific Training

Often There is an Inverse Relationship between General & Special Training as a Macrocycle Progresses

- Elite Athletes’ Training Progresses to Become either Special or More Special

...Principle of Reversibility Applies such that Over-Emphasis on Special Training Results in Diminished Capacities in Some Bio-motor areas
Methods of Developing Work Capacity in Speed – Power Athletes

» Active-Dynamic Warm Up

» Circuit-type Training Involving Multi-Lateral Loading

» Jump-Run

» Strategies Integrating Strength and Power Training (Weight Room) with Speed and Extensive Repetition Training

» Integration of New Interval Training Principles into Other Aspects of Bioenergetic Training
Active-Dynamic Warm-up
Monday, November 22, 2010

» 1 X 30 sec Pillar Bridge Series (Prone, Right, Left, Supine), 5 X Pillar Opposites, 5 X Shoulder Rotations, 1 X Circle Hand-Walk (Clockwise and Counterclockwise), 20m Hand Walk

» 5 X Truck Circle, Hip Circle (each direction)

» 30m Low Skip (Arm Circles Forward), 30m Long Backward Skip (Arm Circles Backward), 10 X Prisoner Squat (Thigh Parallel) 10 X Front to Back Lunge, 10 X Leg Raise Series (Supine, Inside, Outside, Prone Opposites, Tin Soldier)

» 30m Low Skip (Arm Windmill Forward), 30m Long Backward Skip (Arm Windmill Backward), 10 X Wind Outs, 10 X Alternate Thrusts

» 30m Side Slide Turn-In, Side Slide Turn-Out, 10 X Hip Pops, 5 X Russian Hamstrings, Single Leg Prone Hip Lifts

» 30m Gallop Alternate, 30m Gallop Alternate, 10 X Jumping Jacks (Long Arms), Split Jacks, Highland Fling, Long Striders
Active-Dynamic Warm-up
Monday, November 22, 2010

» 2 X 30m Power Gallop, Low Skip and Scoop Back
» 2 X 30m Power Gallop, Back Skip and Scoop Back
» 10 X Quadruped Series (Kneeling Knee Circle Forward and Backward, Kneeling Scorpion, Kneeling Lateral Ham Reach)
» 10 X Supine Leg Swings, Supine Leg Swings Alternate, Prone Scorpion 5 X Mountain Climbers, Groinners
» 5 X Leg Swing Series (Frontal and Saggital Leg Swings, Trail Leg Windmill Forward & Backward)
» 10 X Horizontal Scissors (Cut-the-Grass), Long Scissors, Rockers, Hurdle Seat Change
Movement Skill & Vmax Development
Monday, November 22, 2010

» 3 X 10m Ankling with single Leg Thigh Pop (Rt and Lt)
» 3 X 10m Ankling with Alternate Thigh Pop
» 3 X 30m Long Backward Strides
» 3 X 10m Butt Kicks with Alternate Thigh Pop
» 3 X Butt Kick into Step-Over Run
» 3 X 30m Alt Fast Leg
» 3 X 30m Shake ups
» 3 X 30m Long Backward Strides
» 3 X 30m Straight Leg Bound
» 3 X 30m Straight Leg Bound - Fast Leg (Rt & Lt)
Movement Skill & Vmax Development
Monday, November 22, 2010

» Vmax Session
  - Joice and Alie: 4-6 X Ins and Outs (20m In – 15m Out – 20m In) In Spikes

» Speed Tech Session
  - Angelo: 6 X (90m Fast-Float-Fast) in Flats

» Two Laps Jog Cool Down with 5 X 50m Build-Ups

» Weight Training

» Full Static Stretch: (Supine Knee Hugs, Supine Hamstrings, Side Lying Stork Stretch, Butterfly, Inverted Butterfly, Chair Stretch, Pretzel Stretch (No Twist), Sit on Your Heels, Prone Butterfly, Cradle the Baby, Plough Stretch)
Jump-Run: Friday, November 26, 2010

» Weight Lifting Session

» Active-Dynamics Warm Up with Circuit Warm-up

» Jump Run X 6
  - 30 sec/ 30 sec Jump (Rocket, Split Squat, Drop Squats, Djerabakis, Drop Lunge Alternate, Tuck Jumps)
  - [30 sec]
  - 6 X 15 sec-[15 sec] (Butt Kickers, Speed Skate Cross-Overs, SLB, Speed Skater Shift Foot, Step-Over Run, Exploding Harvards
  - 2 min Recovery Run then [1 min Rest]

» 5 X 50-meter Build-Ups with Skip Back

» Static Stretch after session
“BUILD UP YOUR WEAKNESSES UNTIL THEY BECOME YOUR STRONG POINTS.”

— KNUTE ROCKNE THE PROVERBIAL SPORTS QUOTE.