Developing Biomotor Qualities to Enhance Short Sprint Finishes - Dan Pfaff (USA)

…spoke on Speed Endurance in the short sprints and specifically focused on the need for endurance in multiple rounds in major national and world championships where a sprinter may run four rounds over two days. With respect to this, Pfaff noted the benefit of the American school and collegiate system which stresses scoring and relays, leading to long-term development of endurance through many rounds and events from the time sprinters are 14 years of age!

A topic of much concern to all sprint coaches is the ability of their athlete to maintain form and minimize the rate of deceleration during the last third of the race in question. Factors which influence this section of the race model range from distribution of biochemical substrates to elastic-power endurance parameters. The variables and their influence upon one another is complex web of science, skill and solid train theory.

The core of any training plan is that of improving the athlete's physiological state of readiness. Many forms of training exist in that sense but a synthesis of methods will lead one to classification scheme of basic biomotor qualities. While not downplaying the scope of strategy or psychological skills, this lecture will be centered towards training and physiological factors in the main.

_ Stimulus

_ Adaptation Responses

_ Stabilization

_ Actualization

Americans do first two very well - stimulus and adaptation response – but forget the last two!

Coaches don't stabilize enough after adaptation, and the injury factor goes way up as a result of too much of the first two! Actualization is the key – can they reproduce it 80+% of the time and then do it in competition under any conditions?

Pfaff also noted new research on short burst activity and applications for aerobic adaptation quality and even lactic acid tolerance. A block start ladder – 4-5 x 10m, 20m, 30m, and 40m - yields portable blood lactate values over 16mml. Without running over 40 meters! There is a more specific way to train lactate work and keep on the track for short sprint work!

One of the most important points is that speed is a skill - sprinting and acceleration skills must be rehearsed over and over, and an athlete must have a new level of skill and speed and acceleration to which the coach then adds speed and special endurance instead of the athlete just enduring last year's speed and skill! Improper mechanics can lead to soft tissue overuse, and repetitive bad mechanics increase the potential damage with more volume and repetition.

Proprioceptors must be developed – these are the organelles in the neuromuscular system that detect where we are in space and time! Nociceptors are nervous system receptors – when cortisol goes high, nociceptors go up and they feel the body more acutely. The ones that are super-wired really feel everything and may complain, but they are ready to run! Massage therapy affects all these systems and brings comfort. Therapy itself is a stressor, not necessarily a stress relief. Therapy must be part of training and allow adaptation and stabilization.

A Core Training Mesocycle Hypothesis:

Sunday
_ *Active Rest*
_ *Sleep Factors*
_ *Diet Factors*
_ *Acute Relieving Syndrome*

Monday
_ *Specific Warm-up / Prehab Routines*
_ *Acceleration Development*
  _ 10m - 40m x 9 - 18 runs(blocked format)
  _ Start Positions / Surfaces
  _ Resisted / Assisted
  _ Lactate Discussion
_ *Power Development*
  _ Multiple Jumps (contacts, distances, timed)
  _ Multiple Throws

_ *Weight Training*
    _ Olympic Lifts (heart rate /lactate)
    _ Pressing Movements
    _ Bench – varied (Swiss ball)
    _ Push Press
    _ Leg Series
    _ Squats – dumbbells and barbells
    _ *Front*
    _ *Back*
    _ *Lateral*
    _ *Jump*
_ *Weight Training Continued*
    _ Leg Series Continued
    _ Step-ups
    _ *Dynamic*
    _ *Static – postural stabilizers*
    _ Lunges
    _ Russian Twists
    _ Negative Toe Risers
_ *Cool Down*
    _ Bike
    _ Jog – Skip (vibration and lactate)
_ *Physiotherapy*
_ *Diet and Supplement Factors*

Tuesday

_ *Specific Warm-up / Prehab Routines*
_ *Technical Runs*
    _ Motor synchronization bleed runs
    _ Grass building runs
    _ Varied speed runs
_ *Elastic Endurance Block*
_ *General Strength Routines*
_ *Medicine Ball Routines*
_ *Hurdle Mobility Series (note HR duration)*
_ *Weight Training*
    _ Prehab
    _ Rehab
    _ Joint Specific Work
    _ Anatomy Train Development

_ *Cool Down*
_ *Physiotherapy*

Wednesday

_ *Specific Warm-up / Prehab Routines*
_ *Special Speed Endurance / Alactic Schemes*
  _ Up-backs (50m – 100m)
  _ 50m – 80m runs at 80, 90, 90+
  _ Sets / reps
  _ Rest to work ratios
  _ Surface / Environmental factors
_ *Power Development – Endurance Loads*
_ *Weight Training*
  _ Lactate Boost Effect
  _ Complex Leg Series
  _ Prescribed Russian Twists
_ *Cool Down – extended*
_ *Physiotherapy*
  _ Extended
  _ Baths
  _ Diet – Supplement Changes

Thursday

_ *Mirrors Tuesday*
_ *Reduction in Volume and Density*
_ *Increased Rest, Pace, and Volitional*
_ *Factors*
_ *Prolonged Therapy Session*

Friday

_ *Mirrors Monday (Ladder Format)*
_ *Reduction in Volume*
_ *Increased Rest Variables*
_ *Simplified Weight Room Schemes*

Saturday

_ *Specific Warm-up / Prehab Routines*
_ *Speed Endurance*
  _ Time of Year – volume and intensity
  _ Rest Intervals
  _ Environmental and Health Factors
  _ Race Models

    _ Round Endurance Statistics
_ *General Strength*
    _ Postural Demands
    _ Glycogen Depletion
_ *Hurdle Mobility*
_ *Vibrational Cool Downs*
_ *Extended Physiotherapy*
_ *Prolonged and Complex Baths*
_ *Diet and Nap Theories*