Oregon

Multi-Directional Speed & Agility: Concepts, Methodologies, & Programming

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Three Movement Constants

1.) The Body
- Produces & reduces force in all 3 planes
- Involves synergists, stabilizers, agonists, & antagonists.

2.) The Ground
- Gives back the force we put into it to move.
- Ground reaction forces.
  - *Where the rubber meets the road*

3.) Gravity
- Effects all bodies the same, constant resistance.
- Body designed to move with & against it.
Ground Negotiation

1.) Hip “Hinge”
   - Ability to set the hips
   - Flatten or arch the back
   - Push the tail back

2.) Hip “Projection”
   - Directional projection of the hips
   - Maximal ground reaction forces
   - \textit{PUSH} mechanics

3.) Hip “Whip”
   - Tall posture to enhance a cyclic leg action
   - Maximize force, minimize contact time
   - “Swing & Scissor” stretch tension and re-acceleration
   (Frans Bosch, 2005).
Qualities for Agility

- Functional Strength
  - Agility must go hand in hand with strength, power, reactive/elastic strength, general fitness, and mobility
  - Stretch-shortening cycle development (elasticity)
  - Better force application = faster speeds

- Cognitive abilities

- Posture, Balance, Stability, & Mobility (greater ROM)

- Relaxed efforts

- Power angles and movement mechanics
Programming Guidelines

■ Agility is an acquired fine motor skill
  ➢ Teachable and trainable
  ➢ One of most difficult attributes to improve
    ✷ Dependent on many other bio-motor qualities

■ Goals:
  ➢ Optimize ground reaction forces (GRF)
  ➢ Optimal efficiency
    ✷ biomechanical
    ✷ physiological
Programming Guidelines

- Basic Technical Progression Model:
  - Master sound start & acceleration mechanics and gradually extend to longer sprinting distances i.e. spurts of 20-30yds, extending to dashes of 30-50yds, moving out to sprints of 50+yds

- Minimize fatigue
  - Fatigue inhibits CNS
    - Skill Development vs. Conditioning
  - Most optimal learning
  - Train fast to be fast
Programming Guidelines

■ Be systematic and have a plan of action
  ➢ daily, weekly, monthly, annually

■ Be intense

■ Quality over quantity (less can be more)

■ Learn, teach, and practice sound mechanics
  ➢ Poor movement can exist anywhere in the body, but poor movement patterns can only exist in the brain.

■ Perform drills for a purpose
  ➢ A drill should never be an end unto itself, but rather a means to an end result
3 Stage Model of Motor Learning

1. Verbal – Cognitive Stage
   - Unconscious incompetence
     - Numerous errors, lack of consistency, don’t know what to do to improve

2. Associative Stage
   - Conscious incompetence
     - Knows what to do but the skill is still not mastered
   - Conscious competence
     - Skill requires little conscious effort, but not automatic

3. Autonomous Stage
   - Unconscious competence
     - Skill can be performed automatically
     - May take 500+ hours of practice to achieve
Performance Characteristics

■ 1. Improvement
  ➢ New behaviors & reduce errors.

■ 2. Consistency
  ➢ Reduce variability

■ 3. Stability
  ➢ Return to response after perturbation

■ 4. Persistence
  ➢ Retention after period of no practice

■ 5. Adaptability
  ➢ Context & skill
Starting & First Step Development

- The more efficient the start the sooner an athlete can accelerate to top speed
  - Multiple Stances & Starts
  - Stationary, moving, or combination starts
  - Posture, arm action, leg action (PAL)
Starting Skills: Coaching Cues

- Starting skills & first step quickness
  - Mechanically correct postural positions
  - Neutral head position (focus on destination)
  - Relaxed shoulders, tight stomach, hips & back set with full foot contact on ground
  - Arm action
    - relaxed but vigorous
  - Active foot placement (push off with both feet!!!)
Starting & First Step Development

 Efficient stances for quick starts require setting the hips with the back arched and full foot contact with the ground as to assure the ability to push off with both feet and project the hips in the desired direction without a false step (for ever action there is an equal and opposite reaction).

 Types of stances & steps:

- Forward – Squared & Staggered
- Lateral – Open & Cross-Over
- Backward – Drop & Reverse Pivot
Starts & Stances

- Squared & Staggered Starts

  - Efficiency Check:
    - 1. Hips set high, balanced with knees over instep.
    - 3. Elbows cocked, opposite of lead leg.
    - 4. Rear leg approximate to drive leg for immediate push off effectiveness.
Starts & Stances

- Open & Drop Step Starts
  - Efficiency Check:
    - 1. Hips set, balanced with knees over instep.
    - 2. Arched back, shoulders will dip to desired direction.
    - 3. Upon push-off the lead toe, knee, elbow, & shoulder is driven in desired direction.
    - 4. Resume acceleration steps.
Starts & Stances

- Squared, staggered, open, & drop step
  - 1, 2, 3, or 4 point stances
  - Progress from 2 & 3 point stances to balanced (1 point) stances on 1 leg.

- Balanced (1 point) stances develop 3 components:
  - 1. Stability with hips set, back arched, tension in the thigh, & full foot contact with weight over the instep.
  - 2. Ability to get the other foot in position (with the toe and heel up) to be immediately accelerated back down onto the ground with positive shin angles.
  - 3. The ability to push off with both feet when needed.
Starts & Stances

- Resisted Starts
  - Efficiency Check:
    - 1. Resistance is placed at the hip bones.
    - 3. Fosters push-off with both feet & the limb drive necessary for proper hip projection.
    - 4. Resistance is either consistent or released upon transition to acceleration (e.g. medicine ball take-offs, partner resist & release).
Starts & Stances

**SQUARED**

**STAGGERED**

**OPEN**

**DROP STEP**
Starts & Stances

Dilemma Positions

- Efficiency Check:
  - 1. Position is a relaxed yet ready state (kneeling, seated, lying prone, supine, side).
  - 2. Emphasis on summation of prime movers of the body to project the hips/torso in the desired direction.
  - 3. Proper posture and mechanics are employed as soon as possible.
  - 4. The distance covered is short, with reaction and technique the primary goals.
Multi-Directional Speed & Agility

What is it?

- Fluid movement throughout great ranges of motion in all directions;
- Ability to maintain posture, balance, stability, & increased range of flexibility involved in flexion, extension, & rotation of the body at the most efficient speeds possible;
- Efficient movement transitions during changes in direction;
- The ability to make reactive speed & power cuts.
- May or may not create movement in a particular direction.
  - Mobility or Agility?
- Consist of both motor & cognitive skills
Goals of MDSA Training

1) Improve stimulus recognition, reactive abilities, & movement quickness

2) Improve body control
   - Control center of gravity (C.O.G. vs. B.O.S.)
   - Keeping the hips over the feet

3) Injury prevention through the teaching of proper movement mechanics
Acceleration, Deceleration, & Change of Direction

- Increasing ability to accelerate, decelerate, and re-accelerate will enhance ability to perform at lower game velocities (speed reserve).

- Ability to decelerate and accelerate is critical!

Velocity Comparison – 40 yard linear sprint vs. 40 yard run play in a football game. (Source: Vermeil, A.)
Components of MDSA

- Stimulus recognition
- Movement perception & decision making factors
- Posture, balance, stability, & mobility (flexibility)
- Coordination
- Maximum strength / power
- Elastic strength (reactive abilities)
- Acceleration
- Deceleration (yielding strength)
Movement Curriculum Considerations

**Acceleration Mechanics**
- Bilateral ground based strength progressions
- Triple extension power progressions
- Triple flexion power progressions
- Horizontal trunk strength progressions

**Deceleration Mechanics**
- Contralateral ground based strength progressions
- Unilateral ground based strength progressions
- Postural mobility progressions

**Postural Mobility**
- Transfer of weight efficiency
- Range of motion efficiency
- Double-leg efficiency
- Single-leg efficiency

**Postural Stability**
- Multiplane stability

**Postural Strength**
- Multiplane rate of force production
- Multiplane rate of force reduction

**Change of Direction Mechanics**

(Ack: Brewer, C.; Athletic Movement Skills)
Factors to consider when analyzing change of direction movements:

- Velocity of movement prior to the change of direction maneuver,
- Angle of change in direction,
- Planned or unplanned action

Basic movement pattern for change of direction maneuvers:

- Deceleration of the body by pivot leg,
- Rotation of the torso towards desired direction,
- Rotation of pivot leg towards desired direction.
Analysis of Cutting Maneuvers

- Primary goal during changes of direction:
  - Minimize deceleration as much as possible

- Effects of anticipation during change of direction
  - Planned (closed skills)
  - Unplanned (open skills)

- Summary of change in direction maneuvers:
  - Velocity of movement
  - Angle of the directional change
  - Amount of anticipation prior to change in direction
Motor Learning for MDSA

- Sport Skill Classification:
  - Cognitive
  - Fundamentally open

- Perceptual Motor Abilities:
  - Multi-limb coordination
  - Response orientation
  - Reaction time
  - Rate control
  - Manual dexterity

- Blueprinting motor patterns
Specificity of training
- The only movement that is truly sport specific is the sport itself.

Establish teaching progressions / drill development

Program variables

Factor in body mechanics and movement patterns
MDSA Program Design

- Fundamental movement mechanics:
  - Stances/starts, acceleration, & deceleration

- Add complexity:
  - Speed cuts, power cuts, & combinations advancing to more specific drills

- Progress from planned to reactive environments:
  - Develop motor & cognitive abilities
  - Key to enhancing performance & injury prevention

- Incorporate metabolic conditioning only after skill mastery
MDSA Drill Development

**Speed Irrelevant:**
- Allow slower movement speeds while stressing the learning of appropriate movement mechanics.

**Speed Incorporated:**
- Technical precision combined with increasing speeds in movement.

**Unpredictable Environments:**
- Addition of unanticipated (reactive) circumstances enhances the ability to respond with fast postural adjustments to the constantly changing demands of the environment.
- Key role in injury prevention (Besier, T.F., 2001)
Coaching MDSA

- **Cue the athlete**
  - Open communication
  - Focus attention

- **Coach the skill during the drill**
  - Reinforce key body positions and movement mechanics

- **Upon completion give immediate feedback**
  - Critique mechanics not subjective measures
  - Correct one error at a time (Paralysis by Analysis)
## MDSA Criteria and Assessment

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Assessment Cues</th>
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<tbody>
<tr>
<td>Location of C.O.G</td>
<td>C.O.G. over B.O.S.</td>
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<tr>
<td>Base of Support</td>
<td>Feet beneath hips</td>
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<tr>
<td>Upper Limb Movement</td>
<td>Elbows remain close</td>
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<tr>
<td>Lower Limb Movement</td>
<td>Sit, Shift, and Drive</td>
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<tr>
<td>Task Criteria Execution</td>
<td>Successful: Y/N</td>
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(Ack. Barnes, M.)
MDSA Levels of Mastery

- Progressive overload based on motor learning & biomechanical principles in a sport specific manner.
  - Level 1 – Fundamental:
    - Basic motor skills & coordinative abilities related to the skill to be mastered.
  - Level 2 – Developmental:
    - Movements taught in component parts while progressing to mastery of the whole movement.
  - Level 3 – Mastery:
    - Movements performed at game speeds in reactive environments.
### C.O.D. & Agility Training Progression

The Oregon model of periodization for change of direction and agility development:

<table>
<thead>
<tr>
<th>AGILITY TRAINING PHASES</th>
<th>SUMMER (June - August)</th>
<th>FALL (September - November)</th>
<th>WINTER (December - February)</th>
<th>SPRING (March – May)</th>
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<tr>
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<td>PRE-SEASON</td>
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Progression Sequence For Change of Direction & Agility

**BODY CONTROL**
- Postural Positioning and Control, Balance (Center of Gravity vs Base of Support)
- Stance and Starting Capabilities
- Proper Force Application and Absorption
- **EXAMPLES** – Agility Progression (Sway Drill)

**PLANNED**
- Simple Pre-Planned Movements
- Closed Skills
- Angular/Curvilinear Speed Cut Skills, Power Cut Skills, Transitional/Combination Skills
- **EXAMPLES** – Speed Weave (S figures), Power Cut (Zig-Zag)

**REACTIVE**
- Unplanned Movements
- Consist of a Visual, Kinesthetic, or Auditory Cue
- Improve Stimulus Recognition and Reactive Abilities
- Open Skills
- **EXAMPLE** – Command Drills

**RANDOM / CHAOTIC**
- Complex Skills (linking together multiple movement patterns)
- Open Situations; Unpredictable; Involves Multiple Cues
- Sport Specific; Competitive (1vs1, 2vs2, etc.)
- **EXAMPLES** – Wall Ball, Tag Games, 1-on-1 Drills
Progression Sequence For Change of Direction & Agility

Specific, Random, Read & React Skills

Motor Program Autonomics

Motor Pattern Development

FUNdamental Movement Foundation

Posture, Balance, Stability, Mobility

Efficiently Combined / Grafted Movement Patterns

Programmed → Random → Combined Patterns

Starts & Stances; Elimination of False Steps
MDSA Teaching Progression

- Starts & Acceleration/Deceleration
  - Acceleration to deceleration
  - Acceleration to deceleration to acceleration

- Unidirectional drills
  - Basic loco-motor movements
    - Lateral shuffle, carioca, bkwd skip, backpedal, etc.
  - Loco-motor movement combinations

- Changes in direction:
  - Speed cut angles
  - Power cut angles

- Grafting & Sequencing
  - Loco-motor movement combination drills
  - Planned to reactive environments
MDSA Teaching Progression

- Stances & Starts:
  - Squared, staggered, open, drop step
  - Situational / Dilemma starts

- Acceleration to deceleration:
  - Spurt (5-10yds) & stop drill

- Acceleration, deceleration, to reacceleration:
  - Spurt – stop - spurt drill
MDSA Teaching Progression

- **Unidirectional Transition Drills:**
  - **Forward movements**
    - A’ skip into a sprint
    - Slide kick into a sprint
  - **Lateral movements**
    - Lateral shuffle into a sprint
    - Carioca into a sprint
    - Lateral skip into a sprint
  - **Backward movements**
    - Backpedal into a sprint
    - Backward skip into a sprint
    - Backward shuffle into a sprint
    - Crossover run into a sprint
MDSA Teaching Progression

- **Speed Cut: (Angular Speed)**
  - Consist of a rolling cross-over pivot action off of the inside leg at angles usually exceeding 90° while maintaining more of a sprinting position
  - Speed weaves (cones/barrels), hoop sprint drills, figure 8’s
  - Progress from planned to reactive environments
Speed Cut Drills

- Speed Weave
- Barrel Weave
- Hoop Sprints
- Figure 8’s
- Figure 8’s
MDSA Teaching Progression

**Power Cut:** (Power Angles)

- Involves sitting the hips, dipping the lead shoulder in desired direction, and a driving action of the lead knee towards the desired direction while pushing with the outside (trail) foot; usually at angle changes of less than 90° with no false step.

- Zig-zag drill, Star drill, & shuttle drills (20 yd & 5/10/5 shuttles, & jingle-jangles)

- Progress from planned to reactive environments

**Teaching Cues**

- Plant ➔ Transfer ➔ Accelerate

- Plant Step – Break down and decelerate body.


- Acceleration Step – Push off trail leg while driving knee of lead leg in desired direction.
MDSA Teaching Progression

- Agility Progression (Sway Drill)
  - Improves posture, balance, stability, and power over the planted foot, enhances the cut mechanics used in sports involving change of direction.
Power Cut Drills

Wall Shuttle

Star Drill (left cone)

Star Drill (middle cone)

Star Drill (right cone)

Bag Power Cut
MDSA Teaching Progression

**Combinations & Sequencing:**

- Develops correct timing & usage of speed & power cuts & other forms of loco-motor movements within same environment
- Perform in reactive environments
- 3-cone drill, change-ups, shuttle variations, reactive drills
Sport Specific Movement Analysis

- Consider two fundamental aspects
  - Movement patterns
  - Body mechanics
Sport Specific Agilities

Sport Specific Agility Drills:

- Develops correct timing & usage of speed & power cuts within same environment
- Planned: touch & go, spin sprints, figure 8’s w/ slides, etc...
- Perform in reactive/unpredictable environments
- Reactive: ball drop, wall ball, pickle run down, fielding fetch, etc...
<table>
<thead>
<tr>
<th>Emphasis</th>
<th><strong>DAY 1</strong> [Acceleration / Agility]</th>
<th><strong>DAY 2</strong> [Speed Maintenance]</th>
<th><strong>DAY 3</strong> [Speed / Agility]</th>
<th><strong>DAY 4</strong> [Speed Maintenance]</th>
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<tbody>
<tr>
<td>General Warm-Up</td>
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<td>Plyo/Slack Reduction:</td>
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<tr>
<td>- Jump, Hop, Combos</td>
<td>- Tempo Sprints</td>
<td>- Skip, Bound, Combos</td>
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<td>- Interval Sprints</td>
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<td>- Hill and/or Sled Tow</td>
<td>- Position Pattern Sprints</td>
<td>- Acceleration and/or Top</td>
<td>- Homers the Hard Way</td>
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<tr>
<td>- Cycles</td>
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<td>Speed</td>
<td>- 2-Base Intervals</td>
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<tr>
<td>Change of Direction / Agility</td>
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<td>- Base Running Tech.</td>
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<td>- Pitcher Stride Sled Tow</td>
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<tr>
<td>Barefoot Weaves &amp; Cuts w/ Backward Strides</td>
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# 4-Day Weekly Training Template: Summer Off-Season - Speed / Agility / Conditioning

<table>
<thead>
<tr>
<th>DAY &gt;&gt;</th>
<th>PERIOD</th>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
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| Tech:  |        | - Postural Wall Sprint Drills | Form Movements: | - Agility Progression (Sway Series) | Hash Mark Stride Routine: |
|        |        | - Arm Action Drill (mini-band or elbow tap) | - Fast Paw & Wall Slide Strides | - Deceleration Skills | - Heel Walk |
|        |        | - Starts & Stances [square/stagger/open/drop/dilemas] | - Stick Strides | - Agility Progression (Sway Series) | - Every Other Mark |
|        |        | - Acceleration Ladders | - Acceleration Ladders | - Agility Progression (Sway Series) | - Agility Progression (Sway Series) |
|        |        | - Box Lean Acceleration | - Box Lean Acceleration | - Agility Progression (Sway Series) | - Agility Progression (Sway Series) |

| Developmental: |        | Muscle Slack Reduction Development | Speed Maintenance: | Muscle Slack Reduction Development: | Speed Maintenance (early summer): |
|                |        | - Static & small amplitude jumps | - Tempo Sprints | - Static & small amplitude jumps | - Tempo Sprints |
|                |        | - Jump, Leap, & Hop Progressions | - Sprint Intervals | - Skip, Bound & Hop Progressions | - Specific Speed Maintenance (late summer): |
|                |        | Start & Acceleration Development: | - Sprint Intervals | Acceleration Development: | - C.O.D. Intervals |
|                |        | - Hills Sprints (6-8 x 10-30yds) | - Sprint Intervals | - Sled Tow Sprints (6-8 x 20-30yds) | - 2-Base Intervals |
|                |        | Change of Direction: | - Sprint Intervals | - Pitch Stride Sled Tows | - Homers the Hard Way |
|                |        | - Speed Weave Drills | - Sprint Intervals | - Max Velocity Development: | - Speed Maintenance (early summer): |
|                |        |                                | - Sprint Intervals | - Fly 10’s – 20’s (field players only) | - Tempo Sprints |
|                |        |                                | - Power Cut Drills | Change of Direction: | - Interval Sprints |
|                |        |                                | - Grafting Drills (weave & cut) | - Power Cut Drills | - Specific Speed Maintenance (late summer): |
|                |        |                                | - Grafting Drills (weave & cut) | - Grafting Drills (weave & cut) | - C.O.D. Intervals |
|                |        |                                | - Grafting Drills (weave & cut) | - Grafting Drills (weave & cut) | - 2-Base Intervals |
|                |        |                                | - Grafting Drills (weave & cut) | - Grafting Drills (weave & cut) | - Homers the Hard Way |

| Trans: |        | Base Running Specifics: | Specifics | Recovery Barefoot Work: | Recovery Barefoot Work: |
|        |        | - Base Stance, Starts, & Turns | - Position Pattern Sprints | - Weaves & Cuts w/ Bkwd Strides | - Backward + Forward Strides |
|        |        | Recovery Barefoot Work: | - Cycles | Recovery Barefoot Work: | Recovery Barefoot Work: |
|        |        | - Backward + Forward Strides | Recovery Barefoot Work: | - Backward + Forward Strides | - Backward + Forward Strides |
|        |        |                                | Recovery Barefoot Work: | - Backward + Forward Strides | - Backward + Forward Strides |

<p>|        |        |                                | Recovery Barefoot Work: | - Backward + Forward Strides | Recovery Barefoot Work: |
|        |        |                                | - Backward + Forward Strides | - Backward + Forward Strides | - Backward + Forward Strides |</p>
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<td>- Position pattern sprints, base running techniques/routines, pitcher stride sled tow, etc.</td>
<td>- Tempo/Repeat Sprints</td>
<td></td>
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<tr>
<td>1v1 / small sided competitions</td>
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<td>1v1 / small sided competitions</td>
<td></td>
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<tr>
<td>Fwd+Bkwd Barefoot Strides</td>
<td>Barefoot Weave+Cut w/ Bkwd Strides</td>
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</tbody>
</table>
### 3-Day Weekly Training Template:
**Fall / Winter Off-Season - Speed / Agility / Conditioning**

<table>
<thead>
<tr>
<th>DAY &gt;&gt;</th>
<th>TUESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
</tr>
</thead>
</table>
| **PERIOD** | **Preparation:** General warm-up to stimulate neuromuscular / musculoskeletal systems. | **Dynamic Warm-Up: Square Routine**  
- Activation Work  
- Mobility (Ankle/MTP, Hip, T-Spine / Shoulder)  
- Potentiation Activities | **Dynamic Warm-Up**  
- Activation Work  
- Mobility (Ankle/MTP, Hip, T-Spine / Shoulder)  
- Core / Pillar  
- Potentiation Activities |
| **Technical:** Specific warm-up to ensure optimal preparation & technique for quality work. | **Postural Wall Sprint Progressions**  
- Arm Action Drill (mini-band or elbow tap)  
- ‘A’ & ‘B’ Series [march / skip / run]  
- Starts & Stances [square/stagger/open/drop/dilema positions]  
- Acceleration Ladders  
- Box Lean Acceleration | **Agility Progression (Sway Series).**  
- Deceleration Skill Work | ‘A’ & ‘B’ Series Progression:  
- March / Skip / Run  
Hash Mark Stride Routine:  
- Every Mark  
- Every Other Mark |
| **Developmental:** Primary workload of the training session, introduction of overload. | **Muscle Slack Reduction Development**  
- Static/concentric only & small amplitude jumps  
- Possible unstable surfaces  
Elastic-Reactive (SSC) Development  
- Jump, Leap, & Hop Progressions  
Start & Acceleration Development:  
- Hills Sprints (10-30yds)  
Change of Direction / Agility Progressions  
- Speed Weave & Power Cut Technique  
- Grafting Combinations (weave & cut)  
- Reactionary / Competitive | **Change of Direction Routines:**  
- Speed Weave, Power Cut, Sprint-Backpedal-Sprint, Touch-n-Go, Cross-Over Sprint, Spin Sprint.  
Start & Acceleration Development:  
- Partner and/or Sled Tow Sprints  
- Contrast Sprints  
- Pitching Stride Sled Tows (pitchers only)  
Max Velocity Development: (field players only)  
- Wicket Sprints  
- Fly 10’s – 30’s (across paper)  
- Ins & Outs (Floating) Sprints | **Muscle Slack Reduction Development:**  
- Static/Concentric only & small amplitude jumps  
- Possible unstable surfaces  
Elastic-Reactive (SSC) Development:  
- Skip, Bound & Hop Progressions  
Speed Maintenance:  
- Tempo Sprints  
- Interval Sprints  
- C.O.D. Intervals |
| **Transitional:** Work to promote coordination, synchronization, spatial awareness, and transitional mobility. | **Recovery Barefoot Work:**  
- Backward + Forward Strides | **Recovery Barefoot Work:**  
- Backward Strides | **Recovery Barefoot Work:**  
- Backward Strides |
# 2-Day Weekly Training Template: In-Season - Speed / Agility / Conditioning

<table>
<thead>
<tr>
<th>Emphasis</th>
<th><strong>DAY 2</strong> [Speed Maintenance]</th>
<th><strong>DAY 3</strong> [Speed / Agility]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPEED MENU:</strong></td>
<td>General Warm-Up</td>
<td>General Warm-Up</td>
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<td></td>
<td>Technical Warm-Up</td>
<td>Technical Warm-Up</td>
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<tr>
<td></td>
<td>Speed Maintenance:</td>
<td>Plyometrics / Muscle Slack Reduction:</td>
</tr>
<tr>
<td></td>
<td>- Tempo Sprints</td>
<td>- Multi-Jump/Hop/Bound Routines &amp; Combos</td>
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<tr>
<td></td>
<td>- Interval Sprints</td>
<td>- Med Ball Pass/Throw/Toss Routines</td>
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<td></td>
<td>Forward + Backward Barefoot Strides</td>
<td>Sprint Development:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Acceleration and/or Top Speed</td>
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<tr>
<td></td>
<td></td>
<td>Change of Direction / Agility:</td>
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<tr>
<td></td>
<td></td>
<td>- Grafting Drills</td>
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<tr>
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<td></td>
<td>- Reactive / Unplanned / Competitive</td>
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<tr>
<td></td>
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<td>Forward + Backward Barefoot Strides</td>
</tr>
</tbody>
</table>
Conclusions

- For power sport athletes limit jogging / distance running (slow-continuous) as much as possible!
  - Sprint Interval Training
    - Sprint Interval Training – “It’s a HIIT!” (Mark J. Smith, Ph.D)

- For young athlete’s speed & agility work should be playful & game like. No formal drill work before age 10
  - Youth – General (tag games, short relays, etc.)
  - High School – Directed (formal)
  - Collegiate / Professional – Specialized (specific)

- Apply a systematic approach to improvement
  - Coach concepts not drills
Conclusions

- Mobility is a key aspect for improving stride length and ability to move laterally
  - Inadequate ROM for a specific task can result in improper foot placement, longer ground contact times, and higher braking forces
  - Identify limitations due to mobility, and address in training
  - During sprint drill work stress movement at the hip
    - Ex. Hurdle hip clearance activities

- Starting ability is due to the synchronized rapid extension of the ankle/knee/hip
  - Triple extension highly related to work performed in weight room
1. Over / Unders:
   - Linear stepping
   - Angled Stepping

2. Walk-Overs:
   - Bent Leg Forward
   - Straight Leg Forward
   - Bent Leg backward
   - Straight Leg backward
   - Bent Leg Lateral
   - Straight Leg Lateral (behind)

3. Skip-Overs:
   - Bent Leg Forward
   - Straight Leg Forward
   - Bent Leg backward
   - Straight Leg backward
   - Bent Leg Lateral
Prioritize strength training tasks by their dynamic correspondence with the target activity

- SSC actions (elastic/reactive strength) & muscle slack reduction development usually deserve high priority in speed and agility training.

Maximal strength & the ability to accelerate are highly correlated

- Develop maximal strength through traditional means
- Squat & lunge variations
- Derivates of Olympic lifting movements

6-8 reps is optimum number for speed & agility development work
Conclusions

- Vary speed training methods & intensities to avoid creating speed barriers/plateaus
- Develop speed before speed maintenance
  - Micro-cycle & macro-cycle
- Coach them up!!!
  - Coaching not training
  - Coaching for you......Coaching for them???
- Be prepared to help athletes unlearn old bad habits & relearn proper patterns from scratch!
  - Sometimes you have to go back to go forward
  - Re-educate and re-emphasize
Conclusions

http://training-conditioning.com/content/perfectly-positioned

http://training-conditioning.com/_ezines/tc2804de/#p=42
References & Thank You’s

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- The Ohio High School Fastpitch Softball Coaches Association
- YOU!!!
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