

Speed, Agility and Quickness Training Concepts

Objectives

After studying this chapter, you will be able to:

- Describe speed, agility and quickness training and its purpose.
- Rationalize the importance of speed, agility and quickness training.
- Design a speed, agility and quickness-training program for clients at any level of training.
- Perform, describe and instruct various speed, agility and quickness training exercises.

Key Terms

- Speed
- Agility
- Quickness

MODULE 11-1: Concepts in Speed, Agility and Quickness (SAQ) Training

The programming component of speed, agility and quickness (SAQ) training is similar to reactive training and follows the same concepts of the integrated performance paradigm. *Speed* in this text essentially refers to straight-ahead speed. *Agility* refers to short bursts of movement that involve change of direction. *Quickness* refers to the ability to react to a stimulus and change the motion of the body.

This form of training is often viewed as being beneficial only for the athlete. However, by using the proper progression as seen in the OPT™ model, the health and fitness professional can effectively use SAQ training to add intensity and complexity, increase the cardiorespiratory demand and provide a simple and exciting variety to a routine workout.

SAQ training allows a client to enhance his/her ability to accelerate, decelerate and dynamically stabilize the entire body during higher velocity, acceleration and deceleration movements, in all planes of motion (such as

running, cutting and changing direction). It may further help the nervous system to respond or react more efficiently to demands placed upon it and enhance muscular recruitment and coordination, when performed with correct mechanics.¹

Speed

SPEED:
The ability to move the body in one intended direction as fast as possible.

Speed is the ability to move the body in one intended direction as fast as possible. It is the product of stride rate and stride length.^{2,3} *Stride rate* is the number of strides taken in a given amount of time (or distance). It may be improved with proper core strength, reactive training and technique. *Stride length* is the distance covered in one stride, during running. Research has found that optimum stride length at maximum velocity has a high correlation to leg length. It is approximately 2.1 to 2.5 times leg length.^{1,3,4} Speed is an ability that can be learned and trained for by following in integrated training program seen in the OPT™ model.⁵

Proper Sprint Mechanics

Proper running mechanics allow the client to maximize forces generated by muscles, so that maximum velocity can be achieved in the shortest possible time.

This includes frontside and backside mechanics. *Frontside mechanics* is the emphasis on triple flexion of the front leg. Triple flexion includes the actions of:

- Ankle dorsiflexion,
- Knee flexion,
- Hip flexion and
- Keeping the lumbar spine neutral.

Backside mechanics is the emphasis on triple extension of the back leg. Triple extension includes the actions of:

- Ankle plantarflexion,
- Knee extension,
- Hip extension and
- Keeping the lumbar spine neutral.

Agility

Agility is the ability to start (or accelerate), stop (or decelerate and stabilize) and change direction quickly, while maintaining proper posture.⁶ This requires high levels of neuromuscular efficiency because the client is constantly regaining a center of gravity over his/her base of support, while changing directions, at various speeds.

Agility training can enhance eccentric neuromuscular control, dynamic flexibility, dynamic postural control, functional core strength and proprioception. Proper agility training can also help to prevent injury by enhancing the body’s ability to effectively control eccentric forces in all planes of motion as well as by improving the structural integrity of the connective tissue. Proper technique for agility drills should follow the guidelines seen in Table 11-1.

Quickness

Quickness (or reaction time) is the ability to react and change body position with maximum rate of force production, in all planes of motion and from all body positions, during functional activities. Quickness involves the ability to react to visual, auditory, and kinesthetic feedback during functional activities with minimal hesitation. Proper technique for quickness drills should follow the guidelines seen in Table 11-1.

AGILITY:
The ability to accelerate, decelerate, stabilize and change direction quickly, while maintaining proper posture.

QUICKNESS:
The ability to react and change body position with maximum rate of force production, in all planes of motion, from all body positions, during functional activities.

Table 11-1: Kinetic Chain Checkpoints during Running Movements	
Body Position	Comments
Foot/Ankle Complex	The foot/ankle should be pointing straight ahead in a dorsiflexed position when it hits the ground. Excessive flattening or external rotation of the foot will create abnormal stress throughout the rest of the kinetic chain and decrease overall performance.
Knee Complex	The knees must remain straight ahead. If the athlete demonstrates excessive adduction and internal rotation of the femur during the stance phase, it decreases force production and lead to overuse injuries.
Lumbo-pelvic-hip Complex	The body should have a slight lean during acceleration. During maximum velocity, the lumbo-pelvic-hip complex should be fairly neutral, without excessive extension or flexion, unless to reach for an object.
Head	The head should remain in line with the lumbo-pelvic-hip complex and the lumbo-pelvic-hip complex should be in line with the legs. The head/neck should not compensate and move into extension, unless necessary to track an object (such as a ball) as this can affect the position of the lumbo-pelvic-hip complex (pelvo-ocular reflex).

MODULE 11-1 Summary

Similar to reactive training, the programming component of speed, agility and quickness (SAQ) training follows the same concepts of the integrated performance paradigm. It can add intensity, complexity, cardiorespiratory demand and variety to a routine workout for regular clients as well as athletes. It enhances proprioceptive acceleration, deceleration and dynamic stabilization of the entire body, during higher velocity movements.

Speed is the ability to move the body in one intended direction as fast as possible. It is the product of stride rate and stride length. It can be learned and trained for. Proper running mechanics (including frontside and backside mechanics) allow an athlete to maximize forces generated by muscles, so that maximum velocity can be achieved in the shortest possible time.

Agility refers to short bursts of movement that involve change of direction. It is the ability to start, stop and change direction quickly, while maintaining proper posture. High levels of neuromuscular efficiency are required. It can help to prevent injury by enhancing control of eccentric forces in all planes of motion.

Quickness is the ability to react to a stimulus and change the motion of the body, with maximum rate of force production, in all planes of motion and from all body positions, during functional activities. Reactions are based on visual, auditory and kinesthetic feedback and require minimal hesitation.

MODULE 11-1 Quiz

1. Research has found that optimum stride length at maximum velocity is approximately how many times leg length?
 1.1 - 1.5
 2.1 - 2.5
 3.1 - 3.5
 4.1 - 4.5
2. Proper agility training can help to prevent injury by improving the structural integrity of connective tissue.
 True False
3. _____ include the actions of ankle plantarflexion, knee extension, hip extension and keeping the lumbar spine neutral.
 Frontside mechanics
 Backside mechanics

MODULE 11-2: SAQ Drills and Programming Strategies

It must be stressed that the programming guidelines presented in Table 11-2 are only suggestions and should be gauged on the total volume of training for all components (core, balance, reactive and resistance) in a workout. The success of a SAQ program is also dependent upon the client's core, balance and reactive capabilities. The higher these capabilities, the better and safer results a client will enjoy from his/her program. All exercises should be performed with precise technique and kinetic chain control, to minimize risk of injury.

SAQ Speed Ladder Drills

- One-ins
- Two-ins
- Side shuffle
- In-in/Out-out
- Side In-in/Out-out
- In-in-out (Zigzag)
- Ali Shuffle
- Ali Crossover
- W Weave





In-in/Out-out Start



In-in/Out-out Movement



Side In-in/Side Out-out



In-in-out (Zigzag)



Ali Shuffle



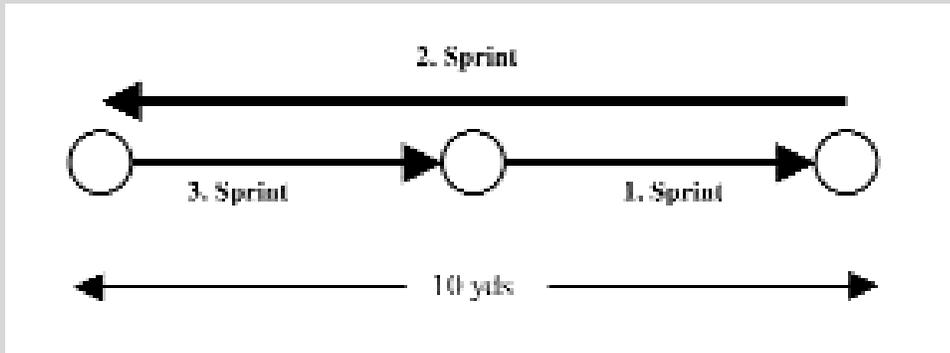
Ali Crossover



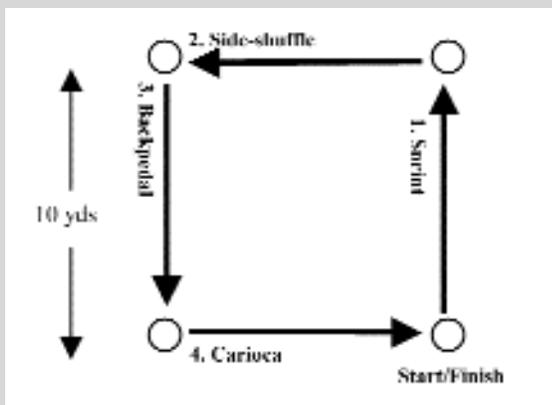
W Weave

SAQ Cone Drills

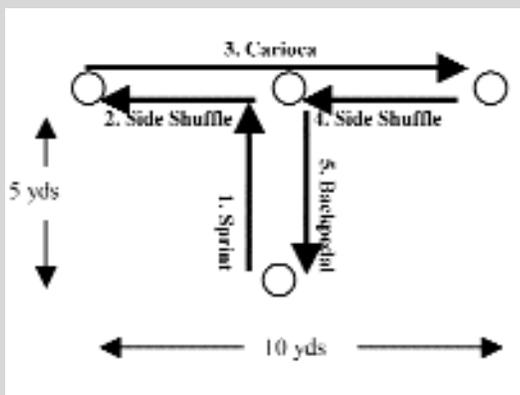
5-10-5 Drill



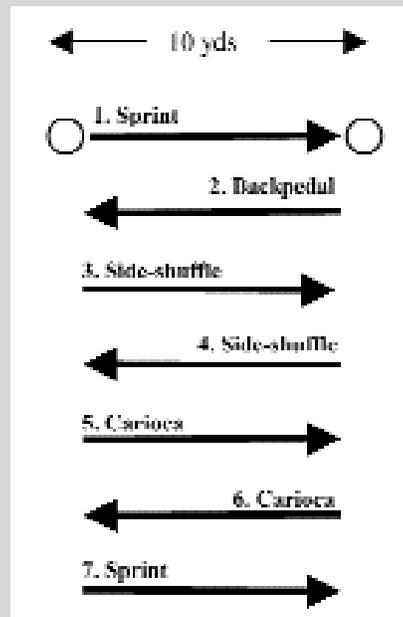
Box Drill



T-Drill



L.E.F.T. Drill



OPT™ Level	Phase(s)	Exercise	Sets	Reps	Rest
Stabilization	1	None	n/a	n/a	n/a
	2	4-6 Speed ladder drills	1-2	Half ladder*	0-60 sec.
Strength		1-2 cone drills	1-2		0-90 sec.
	3	6-9 Speed ladder drills	3-4	Half ladder*	0-60 sec.
	4				
Power	5	1-2 cone drills	2-3		0-90 sec.
	6	6-9 Speed ladder drills	3-6	Half ladder*	0-60 sec.
	7	2-4 cone drills	3-6		0-90 sec.

* Most speed ladders come in two sections that snap together. Half of a speed ladder consists of using only one section.

Filling in the Template

To fill in the program template (Figure 11-1), go to the section labeled Speed, Agility and Quickness. You will then refer to Table 11-2 for the appropriate type of exercises (ladder and/or cones), the appropriate number of exercises and the appropriate acute variables specific to the phase of training your client will be working in (1-7).



Optimum Performance Training™

NAME: JOHN SMITH

DATE: March 10, 2004

TRAINER: CHERE

PHASE: 2: Integrated Stabilization Training

DAYS/WEEK: 3

GOAL: Fat Loss

CARDIO TRAINING: Stage 1	TIME: 20 min	EQUIPMENT: Elliptical Trainer
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WARMUP/FLEXIBILITY	Sets	Reps	Duration	Rest	Notes
1. SMR: Calves, IT band, adductors	1				Hold tender spots 20-30 sec.
2. Cardio: Elliptical trainer			5 min.		
3. Static Stretching: Calves, hip flexors, lats	1		30 sec.		

CORE & BALANCE	Sets	Reps	Tempo	Rest	Notes
1. Quadruped Arm Opposite Leg Raise	1-3	12-20	3-10 sec. hold	0	Circuit training
2. Floor bridge	1-3	12-20	3-10 sec. hold	0	
3. Single-leg Hip Flexion/Extension	1-3	6-10/leg	3-10 sec. hold	60 sec.	

REACTIVE	Sets	Reps	Tempo	Rest	Notes
1. Jump with Stabilization	1-3	5-8	3 sec. hold	60 sec.	
2.					

SPEED, AGILITY, QUICKNESS	Sets	Reps	Time	Rest	Notes
1. Speed Ladder	1-2			60 sec.	4 exercises
2. Box Drill	1-2			60 sec.	1-2 drills

STRENGTH	Exercise	Sets	Reps	Intensity	Tempo	Rest	Notes
TOTAL BODY							
CHEST							
BACK							
SHOULDERS							
BICEPS							
TRICEPS							
LEGS							

COOL-DOWN	
POST-WORKOUT FLEXIBILITY	Static Stretching: Calves, adductors, hip flexors, pectorals

Figure 11-1: OPT™ Template

MODULE 11-2 Summary

Programming guidelines must be gauged on the total volume of training for all components in a workout. A client's core, balance and reactive capabilities will determine the success and safety of the program. Precise technique and kinetic chain control are required to minimize risk of injury. Various speed ladder and cone drills may be used in programming.

MODULE 11-2 Quiz

1. What kind of SAQ exercises would you choose for a client in Phase I of the OPT™ model?

2. What is the recommended rest period for ladder drills?

References

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