

Speed Training - Orono

Speed is the body's ability to go from point A to point B in the shortest time

Keys to Speed:

1. Stride Length
2. Stride Frequency

Speed is a critical component of the game of hockey. Players must react to certain stimulus, accelerate to maximum speed, change directions, decelerate, reaccelerate, and maintain maximum speed.

Hockey is a game of short explosive bursts lasting on an average of 5 seconds.

Phases of Speed

1. **Starts (Reaction):** The ability to respond to certain stimulus and to get the body moving.
2. **Acceleration:** The ability to reach maximum speed as fast as possible.
40% of maximum velocity is achieved in 5 yards.
75% is achieved in 1st 10 yards, and
90% within 25-30 yards
3. **Maximum Speed:** Maximum speed is achieved 40-60 yards.
4. **Speed Endurance:** The ability to maintain true speed over a period of time.

Training Variables that affect speed improvement

1. **Strength** – improvement in strength will help improve force capability. Arm drill, knee drive and starts will all be improved
2. **Flexibility** – increases in flexibility will help to improve the stride length and help to prevent injuries
3. **Power** – increases in power will help develop the start and the acceleration
4. **Conditioning** – increases in anaerobic conditioning will help the speed endurance phase

Speed Program - Orono

- A. **General Warm-up**
- B. **Dynamic Flexibility**
- C. **Speed Improvement Drills/Technique**
- D. **Phase Workout**
 1. **Starts**
 2. **Acceleration**
 3. **Maximum Speed**
 4. **Speed Endurance**
- E. **Cool Down**

Speed Training

A. General Warm-up/Static Flexibility (10-20 minutes)

The body must be properly warmed-up before high intense exercise is performed. Light jogging, easy movement runs (carioca, back pedal, etc.).

B. Dynamic Flexibility/Static Flexibility

These exercises are to be performed before the speed workout. These drills are designed to promote flexibility.

- Movement Drills for 10 yards
- 5 – 10 sec. Rest Interval

See Dynamic Flexibility Section for Drills.

Make sure to include the following drills:

High Knees
Butt Kicks
Skipping
High Knees into Quick Pace Run
Back Pedal

Static flexibility exercises may be performed after the body's core temperature is elevated.

See Static Flexibility Section for Drills

Focus on...

Calves
Hamstrings
Quadriceps
Hip Flexors

C. Speed Improvement Drills/Technique

- 2 sets of 15 reps
- 5-10 sec Rest Interval

1. Stationary Arm Action

Sit on the ground or stand in place. With the elbows locked at 90°, hands relaxed, and good posture, drive the elbows back so the hands go past the butt. On the upswing of the arms, the hands should not go above the shoulders.

2. Speed Skips

In a skipping motion drive knees up and out while maintaining good running form. Keep elbows and knees bent at a 90° angle. Be sure to keep an upright position.

3. Lateral Speed Skips

Same skipping motion as speed skips, except drive knee out to the side.

4. Backward Skipping

Same skipping motion as speed skips, except backward.

5. Ankle Flips

Bounce upward and forward on the toes, while keeping the legs straight. Do not lock the knees.

Speed Training

D. Phase Workout

1. Starts

- 4 sets of 20 yards
- 15 – 30 sec Rest Interval
- Alternate different types of starts within workout or from one workout to another.

a. Lean Falls (straight, 90°, laterally)

- Start standing, torso erect, hands down along side.
- lean forward as far as possible
- first step should be short and powerful
- think about driving the ground down and back
- try to avoid reaching with first step
- finish by sprinting 10 yards
- 90° - start same way, bend at the hips 90°



b. Ready Position Sprint Start

c. Ball Drop Starts

A partner stands 5-10 yards away holding two tennis balls out away from their body. The other athlete is in ready position start. On the action of the partner's hand releasing one of the balls, sprint as fast as possible and try to catch it before it bounces twice.

Works on reaction and first step explosion and is also great for hand eye coordination.

d. Resistive Starts

One athlete holds a towel or band around the other athlete's waist. The working athlete is in a ready position stance and begins driving out of the stance against the resistance for about 3-5 yards. At that point, the partner releases the towel and the athlete sprints to the finish.

e. Lying Starts

- Face Down (prone)
- On Side (lateral)
- On Back (supine)

Speed Training

2. Acceleration

Perform 2-3 sets of **a**

a. Stick Drill

The athlete begins in a speed stance. Sticks are laid out in front of the body with the first stick 12” from the start, the next stick is 18” from the first stick, the third stick is 24” from the second stick... add 6” to each successive space between sticks up to 10 yards (12”, 30, 54, 84, 120, 162, 210, 264, 324, 390”)

Select 5 – 6 sets of **b** or **c** or follow outline of **d**

b. Sled/Tire Pull

With a sled or tire connected to a harness or belt, the athlete will accelerate 10-25 yards. The weight of the tire/sled should be no more than 15% of body weight.

c. Harness Running

With a speed harness the athlete will perform a perfect technique run of 10-25 yards. The partner will apply enough resistance to get work, but not too much to hinder the technique.

d. Sprint Loading

Resisted Running/Uphill Running/Stadium Steps/Sand Running

Week	Reps	Distance (yd)	Rest Interval (RI)
9	5	10	Walk Back
10	6	10	Walk Back
11	5	15	Full Recovery
12	6	15	Full Recovery
13	3	10	Walk Back
	3	20	Full Recovery
14	4	10	Walk Back
	4	20	Full Recovery
15	3	20	Full Recovery
	3	40	Full Recovery
16	4	20	Full Recovery
	4	40	Full Recovery

MSU 2004

Wall Drills

3 sets of 10 repetitions for each leg (**e**, **f**, **g** and **h**)

5-10 second Rest Interval between sets

e. Knee Drive

Drive the knee towards chest as high as possible and as quickly as possible
Stick the movement at the top and hold for 1-2 seconds
Slowly return foot to floor and pause to reset, then repeat

f. Heel Drop and Drive

With weight on toes, quickly drive heel to ground to initiate the knee drive
Drive the knee towards chest as high as possible and as quickly as possible
Stick the movement at the top and hold for 1-2 seconds
Slowly return foot to floor and pause to reset, then repeat

Speed Training

g. Foot Contacts

Drive the knee towards chest as high as possible and as quickly as possible
Stick the movement at the top and hold for 1-2 seconds
Drive the foot towards the floor in a powerful manner
Quickly touch floor and drive knee towards chest
Be sure that the foot always lands under the hips and not in front
Always contact floor with the balls of the feet and not flat footed

h. Cycle

Drive the knee towards chest as high as possible and as quickly as possible
Stick movement at top and hold for 1-2 seconds
Drive the foot towards the floor in a powerful manner
On contact, drag foot for 1-2 inches
Recycle foot under hips and drive knee towards chest
Be sure that first contact with the ground occurs under the hips, not in front
Always contact floor with the balls of the feet and not flat footed

3. Maximum Speed

3 sets (a, b, c, d and e)
1 minute Rest Interval

a. Build-ups

Gradually increase acceleration for 20-30 yards, until full speed is achieved – 40 yards total

b. Straight Sprints

Full speed sprinting 10-60 yards

c. In-Outs

Gradually accelerate for 20-30 yards to full speed, then decelerate for 20-30 yards. Sprint full speed for 20-30 yards, then decelerate for 20-30 yards, then reaccelerate for 20-30 yards

d. Fly's

Gradual build-up to maximum speed, then maintenance of maximal velocity for designated distance usually 20-30 yards

e. Overspeed

Downhill Running

Level	Reps	Acceleration Dist (yd) (Flat)	Overspeed Dist. (yd) (3 - 7 °decline)	RI
1	3	10	20	2:00
2	5	10	20	2:00
3	5	15	20	2:00
4	6	20	20	2:00
5	3	10	20	2:30
6	5	10	20	2:30
7	5	15	20	3:00
8	6	20	20	3:00

MSU 2004

Speed Training

4. Speed Endurance

Perform 3 sets of either **a**, **b** or **c** (over the off-season progress from **a** to **c**)

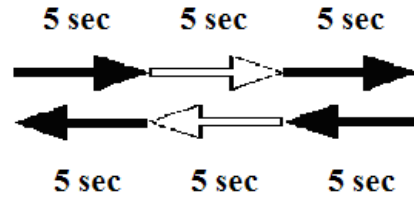
a. Series of Sprints

Perform a series of sprints with 20-25 seconds rest. The goal is to build up maintenance of speed for a period of time.

b. 30 Second Shift

30 second shift

Sprint away for 5 seconds
Jog away for 5 seconds
Sprint away for 5 seconds
Sprint back for 5 seconds
Jog back for 5 seconds
Sprint across line (approx. 5 seconds)



Next player starts when previous player crosses the line

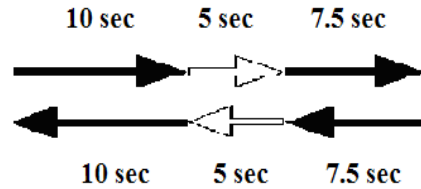
Gradually increase total time

Rest period should be 1:00 minimum

c. 45 Second Shift

45 second shift

Sprint away for 10 seconds
Jog away for 5 seconds
Sprint away for 7.5 seconds
Sprint back for 7.5 seconds
Jog back for 5 seconds
Sprint across line (approx. 10 seconds)



Next player starts when previous player crosses the line

Rest period should be 1:30 minimum

E. Cool Down/Stretching

1. Jogging

Minimum of 5 minute jog

2. Static Stretching

See Static Stretching Section

Quickness CAN Be Improved

Training and Skill Development

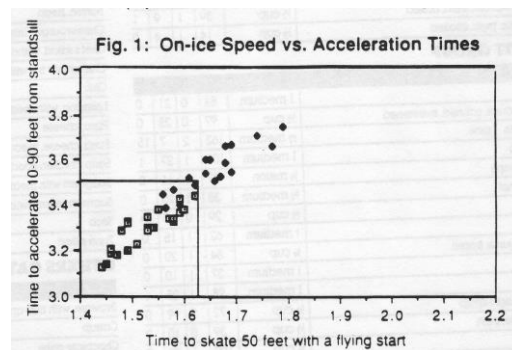
By John Bazzachini - Minnesota Hockey, November 1988

(Editors Note: John Bazzachini assistant coach at Totino-Grace High School and Irondale's Youth Coordinator, presents the insights of Jack Blatherwick, noted physiologist and assistant coach at the University of Minnesota.)

Hockey is "the world's fastest sport." With players moving, making plays and colliding at high speeds, the game demands one thing of its players – outstanding skating ability. How important an ingredient, then is quickness (short explosive sprinting) in a hockey player's skating?

It is essential to achieving excellence at the game.

While it is not the only factor, most great players, and great teams, have superior quickness. Physiologist Jack Blatherwick has tested hockey players from bantams to the NHL, and the results are clear. As Fig. 1 illustrates, for the five professional, three National and five Division I college teams measure, all of their times fall within an elite level of acceleration and speed (quickness).



While other skills and emotional/psychological factors are also vital, quickness appears to be *required* for competing at elite levels. With this insight into the importance of quickness, what can we in youth hockey do to develop quickness in young hockey players?

Can we hope our peewees and bantams gain quickness by playing 60 one-hour games? Will another 14 spring league games develop it? In practice, is our emphasis on systems or skills? Are those systems and skill practice at game tempo? Can quickness, in fact, be developed or is it inherited by a lucky few?

We need look no further than Florence Griffith-Joyner to see what a great training program can do in this area. She rewrote her sport's record book, proving, as track continually does, that speed (quickness plus acceleration) can be improved through proper training.

Quickness *can* be improved in hockey players, and should be a priority for *everyone* playing the game. Blatherwick places this importance, and offers this warning, on quickness, acceleration and agility training: "Quickness should be a top priority for you *and* older players. The younger a player begins quickness training, the greater his potential for development.

"The growth of the neuromuscular system, the activity of anabolic hormones and the ability to learn are factors working synergistically at young ages to enhance development.

Speed Training

“With older players we often hear that the first thing an athlete loses is his quickness. The fact is, the first aspect of athleticism to deteriorate is that which is ignored. If we stop training for endurance or strength or flexibility, we lose these qualities. Many athletes ignore quickness training, and lose this first.”

How can speed be improved?

Four factors contribute to it: 1) Proper technique: Power skating (use of edges and techniques) has led the way, now we need to expand to using these techniques at faster speeds: 2) Powerful skating muscles: Off-ice overload training can include weight lifting, running up hills, weighted jumps, rollerblading, slide board workouts or plyometric (recoil) bounding. ON ice skating drills can be designed to overload skating muscles, but risk developing poor habits if fatigue sets in: 3) Quick feet: Sprint interval training on and off the ice is the basis for developing quick feet, dispelling the cliché ‘no pain, no gain’: 4) Reduced body fat: Canadian scientists showed that when players skated with a weighted vest carrying 5% of their body weight they were slowed by 6%! Excess body fat has the same effect on a player.

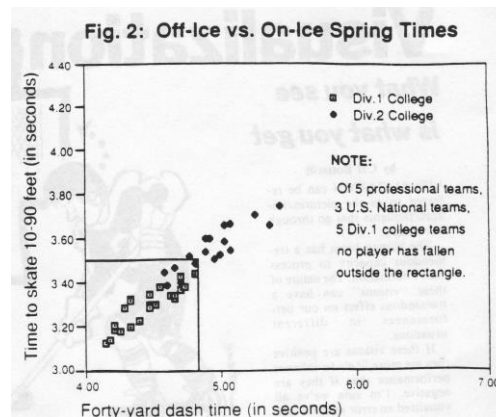
In developing quickness, we need to understand that it can only be improved by combining underload (sprint intervals) *and* overload (plyometric) training, both on and off the ice. We cannot afford to concentrate on just one phase because we then lose the benefits of the whole program.

We must understand the benefits of off-ice training, and where and how it fits into a player’s development. Maybe young players need a break after six months of hockey? How beneficial is a spring league where the players never practice their skills? Maybe young hockey players would gain more from playing a spring sport and then, in summer, beginning an off-ice quickness/strength workout program. This could be run three times a week, and go through summer *and* fall.

From high speed film analysis of skaters’ and sprinters’ acceleration (pictured below), Blatherwick noted two key points. First, acceleration on the ice is virtually identical to a sprint off the ice. And second, the most important factor in a skater’s acceleration is the quickness (movement of his feet), not the length of his stride.

By examining the photos below, we see the body lean, arm movement and knee bend are similar, but most importantly, the leg muscles are used in the same range of motion.

This is why off-ice sprinting is so valuable. We must concentrate on a quick start. By improving foot speed off the ice, on-ice speed will be improved. Fig. 2 refers to bantams Blatherwick tested this summer off and on the ice, and shows indisputably that the faster sprinters are also the faster skaters!



The second phase in developing quickness is off-ice overload training. This type of conditioning (rollerblading, plyometrics) concentrates on building leg power and strength. This type of work will produce results similar to Florence Griffith-Joyner’s. Plyometric hops and squat workouts have made her

Speed Training

legs so strong that not only are her starts quicker, but she has enough power in each stride to keep accelerating throughout the race.

Since power is the product of force times speed, it is incomplete to limit training to either strength *or* speed alone. If we increase leg strength, players will be able to bend their knees more, drawing more force from each stride. Skating with deeply bent knees also lowers the center of gravity, allowing more effective cornering.

In conclusion, tests prove that quickness is critical to improving hockey performance. It is also shown that quickness can be improved by running sprints (underload training) *with the proper rest* (5:55 sec. work:rest ratio). In addition to sprinting, a plyometric and weight lifting (overload training) program strengthens legs and increases power. These workouts should be done three times a week (the U of M Gophers do this year round).

In the next issue, we will address quickness development through on-ice sprint intervals. By combining on and off ice workouts, hockey players of all ages can become faster and stronger. Skills can then be developed at top speeds, making team systems more efficient.

Hockey is “the world’s fastest sport,” and to play it as well as possible, we should heed Jack Blatherwick’s remarks: “In order to improve acceleration, we train the neuromuscular system through habitual quickness. Consider how often the rhythm of our conditioning and competition is at a fairly slow pace – walking, jogging, weight lifting, biking, hockey *games and practices*.”

What sprint intervals (underload training) do is create a workout with one simple, but critical, goal... the quickest rhythm.”