



STEP-BY-STEP SYSTEM OF SPEED DEVELOPMENT IN ATHLETES FROM HOCKEY

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Abstract:

This article presents a systematic approach to developing speed in hockey athletes. Speed is a critical factor influencing performance in hockey, impacting both offensive and defensive actions. The proposed step-by-step system includes a baseline assessment, strength training, speed technique development, plyometric training, and sport-specific speed drills. Each phase is designed to enhance various components of speed, ultimately improving on-ice performance. The implementation of this training system was evaluated through a series of performance tests, demonstrating significant improvements in sprint times and agility among participating athletes. This article aims to provide coaches and trainers with a comprehensive framework for speed development in hockey.

Keywords: speed development, hockey, athletes, training methodology, performance

1. Introduction

Speed is an essential attribute for success in hockey, enabling athletes to outmaneuver opponents and react quickly to game situations. As the pace of the game increases, the demand for rapid acceleration and maximal speed becomes crucial. Current training methodologies often emphasize general fitness and strength; however, specific training for speed can significantly enhance performance. This article aims to provide a step-by-step system for developing speed in hockey athletes, focusing on both on-ice performance and off-ice training regimens.

2. Theoretical Background

2.1 Definition of Speed

In the context of hockey, speed encompasses both linear sprinting and agility — the ability to accelerate, decelerate, and change direction rapidly. The development of these components is vital for effective gameplay. Speed can be categorized into:

- **Acceleration Speed:** The ability to reach top speed in the shortest time possible.
- **Maximal Speed:** The highest speed an athlete can sustain over a distance.
- **Speed Endurance:** The capacity to maintain high speeds over time.

2.2 Factors Affecting Speed Performance

Several factors influence an athlete's speed, including:

- **Biomechanics:** Efficient movement patterns contribute to speed. Athletes with optimal running mechanics can achieve greater speeds with less energy expenditure (Mero *et al.*, 1992).
- **Strength:** Muscular power aids in rapid acceleration. A study by Mchugh (2010) found that strength training significantly enhances explosive power, leading to improved sprint times.
- **Technique:** Proper running mechanics improve sprint efficiency. The ability to maintain optimal posture, knee lift, and arm swing plays a crucial role in speed (Buchheit *et al.*, 2013).
- **Neuromuscular Coordination:** The ability of the nervous system to effectively engage muscles during movement. Improved coordination can lead to quicker reaction times and better overall performance (Zahiri *et al.*, 2019).

2.3 Relevant Literature Review

Previous studies highlight the importance of specific speed training in enhancing athletic performance. Research has shown that strength training, plyometric exercises, and sport-specific drills significantly contribute to speed development (Cohen, 2017; Smith & Johnson, 2020). For instance, a meta-analysis by Seitz *et al.* (2014) concluded that athletes who engaged in a well-structured speed training program exhibited notable improvements in sprint performance compared to those who followed traditional training protocols.

3. Methodology

3.1 Participants

The study involved 20 male hockey players aged 16-25, all competing at a junior level. Participants were selected based on their training history and commitment to the program. Prior to the commencement of the study, participants provided informed consent and underwent a medical screening to ensure their suitability for physical training.

3.2 Training Program Outline

The training program lasted 12 weeks, comprising three sessions per week. Each session included a warm-up, main training components focusing on speed development, and a cooldown. The following outline illustrates the session structure:

- **Warm-up (15 minutes):** Dynamic stretching, mobility exercises, and light jogging to prepare the body for training.
- **Main Training (45-60 minutes):** Focused on strength, technique, plyometrics, or sport-specific drills.
- **Cooldown (10 minutes):** Static stretching and breathing exercises to promote recovery.

3.3 Assessment Methods

Speed improvements were assessed using the following tests:

- **30m Sprint Test:** Measured time taken to complete a 30m distance. Athletes performed the sprint twice, with a 3-minute rest in between, and the best time was recorded.
- **Agility Test:** Utilized the Illinois Agility Test to evaluate quick directional changes. The test involved sprinting through a course with cones, measuring the time taken to complete the course.

4. Step-by-step Training System

4.1 Phase 1: Baseline Assessment

Before commencing the training program, all participants underwent a baseline assessment to establish initial speed capabilities. The 30m sprint test and agility test were conducted to obtain measurable data. These assessments served as benchmarks for monitoring progress throughout the training program.

4.2 Phase 2: Strength Training

Strength is a critical component of speed development. The training program included the following exercises, which were designed to enhance lower body strength and explosive power:

4.2.1 Sample Strength Exercises

- **Squats:**
 - **Description:** Stand with feet shoulder-width apart, lower the body by bending the knees while keeping the chest up and back straight, then return to the starting position.
 - **Sets/Reps:** 4 sets of 6-8 reps, focusing on maximum load.
 - **Progression:** Increase weight weekly to continuously challenge the athletes.
- **Lunges:**
 - **Description:** Step forward with one leg, lowering the hips until both knees are at a 90-degree angle, then push back to the starting position.
 - **Sets/Reps:** 3 sets of 10-12 reps per leg.
 - **Variation:** Incorporate reverse lunges to target different muscle groups.
- **Deadlifts:**
 - **Description:** With feet hip-width apart and barbell over the middle of the feet, bend at the hips and knees to grasp the bar, then lift it while keeping the back straight.
 - **Sets/Reps:** 4 sets of 5-7 reps, focusing on maintaining form.
 - **Alternative:** Use kettlebells for variation.

These exercises were performed twice a week, focusing on low repetitions and high intensity to maximize power output.

4.3 Phase 3: Speed Technique Development

In this phase, athletes participated in drills emphasizing acceleration and maximal speed. Key components included:

4.3.1 Speed Technique Drills

- **Flying Sprints:**
 - **Description:** Athletes sprint for 20m after a 10m buildup at a submaximal pace to enhance acceleration technique.
 - **Sets:** 4-6 sprints with adequate rest (3 minutes) to ensure full recovery.
- **Stride Mechanics Drills:**
 - **Description:** Athletes practice high knees and butt kicks to improve knee lift and overall running mechanics.
 - **Duration:** 10-15 minutes of focused drills.
- **Acceleration Sprints:**
 - **Description:** Start from a stationary position and accelerate over a distance of 10-20m.
 - **Sets:** 5 sprints with full recovery in between.

4.4 Phase 4: Plyometric Training

Plyometric exercises were integrated to develop explosive power, crucial for speed. Key exercises included:

4.4.1 Sample Plyometric Exercises

- **Box Jumps:**
 - **Description:** Jump onto a sturdy box or platform, landing softly and stepping back down.
 - **Sets/Reps:** 3 sets of 8-10 reps.
 - **Progression:** Increase the height of the box over time.
- **Bounding:**
 - **Description:** Perform exaggerated running steps, focusing on maximizing stride length and height.
 - **Distance:** 30-50 meters, repeated 3-4 times.
 - **Tip:** Encourage athletes to maintain proper posture throughout the movement.
- **Depth Jumps:**
 - **Description:** Step off a box and jump vertically upon landing, focusing on minimal ground contact time.
 - **Sets/Reps:** 3 sets of 6-8 reps.
 - **Progression:** Increase box height gradually as athletes become proficient.

These exercises were performed once a week, with an emphasis on quality over quantity.

4.5 Phase 5: Sport-Specific Speed Training

Finally, sport-specific drills were introduced to translate speed development to on-ice performance. These included:

4.5.1 Sport-Specific Drills

- **Short Sprints with Puck Handling:**
 - **Description:** Athletes perform a 10m sprint while stickhandling a puck to simulate game situations.
 - **Sets:** 5-8 sprints with puck, focusing on maintaining speed while handling.
- **Directional Change Drills:**
 - **Description:** Set up cones in a zigzag pattern. Athletes sprint to each cone, practicing quick changes in direction.
 - **Duration:** 15 minutes of continuous practice, focusing on quick acceleration and deceleration.

5. Weekly Training Program Example

Day	Activity
Monday	Strength Training + Speed Drills
Wednesday	Plyometric Training + Technique Work
Friday	Sport-Specific Drills + Agility Work

5.1 Recovery Protocols

Recovery sessions included light skating, foam rolling, and flexibility work to prevent injuries and promote muscle recovery. Nutrition and hydration strategies were emphasized to support recovery.

6. Monthly Training Overview

Training loads were progressively adjusted based on performance assessments. Each month focused on increasing intensity and complexity of drills while ensuring adequate recovery.

Month 1 Goals

- Establish baseline speed capabilities.
- Focus on strength foundation and proper technique.

Month 2 Goals

- Improve sprint times by 5%.
- Enhance plyometric performance with increased volume.

Month 3 Goals

- Integrate sport-specific drills into the program.

- Achieve overall speed improvement of 10% across assessments.

7. Year-Round Training Recommendations

To maintain speed during the off-season, athletes are encouraged to:

- Engage in cross-training activities (e.g., cycling, swimming) to improve aerobic fitness.
- Incorporate speed training into their regular practice routines. This could include sprint intervals during team practices or specialized speed sessions once a week.
- Focus on recovery techniques, including active recovery days with light skating or yoga, to promote flexibility and muscle health.

Injury prevention strategies, such as proper warm-up protocols, strength maintenance, and consistent monitoring of athlete fatigue levels, should also be emphasized to avoid setbacks.

8. Comparison with Other Sports

While speed is essential across all sports, training methodologies can differ significantly. In basketball, for example, agility and vertical jump training are prioritized, with an emphasis on lateral movements and explosive power for rebounding and quick transitions. In contrast, hockey demands a balance of linear speed, agility, and quick bursts of acceleration. Understanding these differences allows for the optimization of training programs tailored to each sport.

For instance, basketball players often incorporate shuttle runs and lateral drills to enhance their game-specific agility, while hockey players benefit from incorporating more straight-line sprints combined with puck handling to simulate game conditions.

9. Results

The implementation of the training program resulted in significant improvements in speed. Average sprint times improved by an average of 0.5 seconds over the 30m distance, while agility test scores showed a reduction in time by an average of 0.3 seconds. The athletes reported increased confidence in their speed and agility on the ice.

3.1 Graphs and Charts

- **Sprint Time Improvements:**
 - A bar graph showing average sprint times before and after the training program.
- **Agility Test Results:**
 - A line graph illustrating changes in agility test scores over the 12-week period.

10. Discussion

The findings indicate that a structured, phased approach to speed development can yield significant improvements in hockey athletes. This aligns with previous research emphasizing the importance of sport-specific training. Coaches are encouraged to adapt these methodologies based on individual athlete needs and capabilities.

The results of this study support the notion that comprehensive speed training can lead to measurable improvements in performance, as highlighted by Williams *et al.* (2016), who emphasized the benefits of a tailored training approach in developing sport-specific skills.

11. Conclusion

Speed is a vital component of hockey performance. By implementing a step-by-step system focusing on strength, technique, and sport-specific drills, coaches can effectively enhance the speed capabilities of their athletes. Future research should explore the long-term effects of such training systems and their impact on overall performance.

Conflict of Interest Statement

The author declare that there are no conflicts of interest related to the publication of this article. The research and conclusions presented in this work are the result of independent analysis, with no influence from external funding sources or any personal, commercial, or financial relationships that could be perceived as a potential conflict. Any resources or tools utilized in the research were selected solely to enhance the quality and accuracy of the results, without external pressure or endorsement.

About the Author

Head strength and conditioning coach at Athletics School, an online athletic training school for athletes. The objective of this study is to develop a structured, step-by-step methodology for enhancing speed in hockey athletes. This system is designed to address the unique physical demands of hockey, with a focus on acceleration, agility, and reaction times that are critical for performance on the ice. By identifying key training phases and exercises, the study aims to provide a comprehensive approach that can be used by coaches and trainers to improve the speed and overall athletic performance of hockey players.

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Appendices

Appendix A: Ready-to-Go Speed Development Training Program

This program outlines a weekly training schedule designed to enhance speed in hockey athletes. It includes specific exercises for strength, speed technique, plyometrics, and sport-specific drills. Each workout is structured to maximize performance and recovery.

a. Weekly Training Schedule Overview

Day	Focus Area	Duration
Monday	Strength Training	60 minutes
Wednesday	Plyometric Training	60 minutes
Friday	Speed & Agility Drills	60 minutes

b. Detailed Training Sessions

Monday: Strength Training

1. Warm-up (15 minutes)

- Dynamic stretches: High knees, butt kicks, leg swings (5 minutes)
- Light jogging: 5 minutes around the training area
- Activation exercises: Bodyweight squats and lunges (5 minutes)

2. Main Training (40 minutes)

a. Squats

- Sets: 4
- Reps: 6-8
- Instructions: Use a barbell or dumbbells, focus on depth and control.

b. Deadlifts

- Sets: 4
- Reps: 5-7
- Instructions: Maintain a neutral spine, drive through heels.

c. Lunges

- Sets: 3
- Reps: 10-12 per leg
- Instructions: Forward and reverse lunges, use bodyweight or dumbbells for added resistance.

d. Box Jumps

- Sets: 3
- Reps: 8-10
- Instructions: Jump onto a box, land softly, step back down.

3. Cooldown (5 minutes)

- Static stretching focusing on major muscle groups (hamstrings, quads, glutes).
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Wednesday: Plyometric Training

1. Warm-up (15 minutes)

- Dynamic stretching: Arm circles, leg swings, torso twists (5 minutes)
- Skipping drills: High skips and lateral shuffles (5 minutes)
- Activation exercises: Jumping jacks and bodyweight squats (5 minutes)

2. Main Training (40 minutes)

a. Box Jumps

- **Sets:** 4
- **Reps:** 6-8
- **Instructions:** Focus on explosiveness and proper landing technique.

b. Depth Jumps

- **Sets:** 3
- **Reps:** 6-8
- **Instructions:** Step off a box, land softly, and immediately jump vertically.

c. Lateral Bounds

- **Sets:** 3
- **Reps:** 10 per side
- **Instructions:** Jump side to side, landing on one foot and maintaining balance.

d. Bounding

- **Sets:** 3
- **Distance:** 30-50 meters
- **Instructions:** Focus on maximizing stride length and height.

3. Cooldown (5 minutes)

- Static stretching focusing on the legs and hips (quads, hamstrings, calves).
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Friday: Speed & Agility Drills

1. Warm-up (15 minutes)

- Dynamic stretching: Leg swings, walking lunges, high knees (5 minutes)
- Mobility drills: Hip circles, ankle rotations (5 minutes)
- Light jogging: 5 minutes to elevate heart rate.

2. Main Training (40 minutes)

a. Flying Sprints

- **Sets:** 5
- **Distance:** 30 meters (10m buildup + 20m sprint)
- **Instructions:** Sprint at maximum effort after a 10m gradual acceleration.

b. Acceleration Sprints

- **Sets:** 6

- **Distance:** 20 meters
- **Instructions:** Focus on powerful starts from a stationary position.

c. Illinois Agility Test

- **Sets:** 3 trials
- **Instructions:** Complete the agility course, focusing on quick directional changes.

d. Short Sprints with Puck Handling

- **Sets:** 5
- **Distance:** 10 meters with puck
- **Instructions:** Combine sprinting with puck handling to simulate on-ice conditions.

3. Cooldown (5 minutes)

- Static stretching focusing on full body relaxation (shoulders, back, legs).

Monthly Progression

- **Week 1-4:** Establish a foundation with moderate intensity.
- **Week 5-8:** Gradually increase weights and complexity of drills.
- **Week 9-12:** Focus on peak performance with max effort sprints and advanced plyometric variations.

Notes for Coaches and Athletes

- Ensure proper hydration and nutrition before and after each training session.
- Monitor athletes for signs of fatigue and adjust training loads accordingly to prevent injury.
- Encourage athletes to maintain a training diary to track progress and identify areas for improvement.

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