Physical Development for the Hockey Athlete

Kevin Neeld, MS, CSCS, USAW

About Me

Endeavor Sports Performance (Pitman, NJ)
- Team Comcast Tier I Youth Organization
- New England Prep
- EJHL, USHL, BCHL, OHL, etc.
- NCAA Div III & I
- ECHL, AHL, NHL

San Jose Sharks (Prospect & Pre-Season Camps)
USA Women’s National Team

The Importance of Training

Primary Goal 1: Performance Enhancement

A quality training program will help players improve:
- Linear and transitional speed
- Multi-directional power
- Lower, upper, and total body strength
- Core strength and function
- Conditioning/Endurance
The Importance of Training

Primary Goal 2: Injury Resistance
A quality training program will minimize your risk to:
- All non-contact or “overuse” injuries
- “Groin” and hip flexor strains
- Contact injuries (Body Armor)
- Shoulder separations/dislocations, knee ligament injuries (ACL & MCL, tears, meniscus tears, etc.), and concussions

Player Outcomes
Win more races to lose pucks
Create more time and space
Give and accept harder passes
Take harder shots
Win physical battles
Perform at a high level from 1st through the 3rd period
Stay healthy throughout entire season
Close “Performance Gap”/Maximize Development!

Athletic Performance Pyramid
Establishing proper movement patterns is the key to efficient performance and injury risk reduction
Movement 101

Two Major Movement Concepts:

1) Neutral Spine
   - Maximizes range of motion
   - Allows efficient force transfer
   - Loss of neutral spine is a major reason why people get hurt squatting and deadlifting
   - Push-up example

Movement 101

Two Major Movement Concepts:

2) Dynamic Hip Control
   - Control at the hip influences position at the knee and foot (and vice versa)
   - Poor control results in players riding their inside edges
   - Important to maximize power and force transfer

PROPER MOVEMENT IS THE FOUNDATION

MOVE WELL BEFORE YOU MOVE MORE, FASTER OR UNDER LOAD!

Comprehensive Program “Menu”

All of these stressors should be present in a player’s program...year-round!

1. Soft-tissue quality
2. Mobility/Flexibility
3. Speed/Acceleration
4. Lower body, full body, and rotational power
5. Lower and upper body strength
6. Multi-directional core strength/endurance
7. Conditioning/Endurance
Soft-Tissue Quality

Foam Rollers/Med Balls/Lacrosse Balls
- Soft-tissue refers to your muscles, tendons, ligaments, and surrounding tissue
- Rubber Band Analogy (Is stretching the answer?)
- Decrease tension and troubleshoot trigger points
- Improve local circulation and nutrition
- Areas to focus on: front thigh, outside thigh, back thigh, inside thigh, outside hips, inner shoulder blades, outer shoulder blades

TIME: ~5-8 minutes/day

Foam Roll Circuit

Dynamic Warm-Up

Benefits of a quality warm-up
- Improve range of motion, especially in commonly restricted areas
- Increase heart rate and circulation
- Increase respiratory rate
- Increase excitation to working muscles
- Improve coordination in specific movement patterns
- Prepare the body for high intensity work!
Dynamic Warm-Up

Speed Training

Are we after “Quick Feet”? 

The Myth of Quick Feet

What happens when these two meet?
REAL Speed Training

Relocate quickly by moving center of mass!

Linear Speed (breakaway and back-checking speed)
- Straight line acceleration and max speed

Transitional Speed (everything else)
- Changes in speed, position and/or direction
- Initial movement of shuffle, back pedal, or sprint, followed by transition of 90° or 180°

10-15 Yard max effort sprints with complete rest!

Front 1/2 Kneeling Start

Side 1/2 Kneeling Start
Hockey Specific

Transitional Speed
Lateral Back Pedal to Sprint

Transitional Speed
5-Yard Sprint to 5-yard Back, Back Pedal to Sprint
Power Training

Divisions of Power Training

Lower Body Plyometrics
- Skating speed

Olympic Lifting Variations (High Load/Low Velocity)
- Skating speed, shot power, 1-on-1 battles

Med Ball Throws (Low Load/High Velocity)
- Skating speed, shot power

Lower Body Plyometrics

Lateral Bound

Olympic Lifting Variations

Hang Clean
Med Ball Throws

Med Ball Shotput w/ Rapid Step Behind & Partner Toss

Strength Training

Become brilliant at the basics!

Master the foundational movements
- Lower body push (squatting variations)
- Lower body pull (deadlifting variations)
- Lower body hybrids (lunging variations)
- Upper body push (push-up and overhead press variations)
- Upper body pull (row and chin-up variations)

Strength Training Rules

1) Master the movement before you add load
2) Technical Failure: When form breaks down, the set is over
3) Balance lower and upper body pushing and pulling exercises (or err toward more pulling)
   - e.g. 3 sets of 8 DB Chest Press = 3 sets of 8 1-Arm DB Rows
Reverse Lunge (Front Squat Grip)

DB 1-Leg Stiff-Legged Deadlift

Core Training

Two Primary Functions
Create a stable platform for leg and arm movement
- "Can’t shoot a cannon from a canoe"
Create stiffness for efficient force transfer between the lower and upper body
- Shooting/skating stride power

The "core" includes every muscle that attaches to the hips or spine
Front/Side Planks

Start here and progress to more difficult variations (e.g. 1-leg, marching, dynamic movements)

Wall March Hold

Lateral MiniBand Walk
Conditioning

Interval-Based Conditioning
Preferred Modalities
- Shuttle Runs/Slideboards (NOT bikes!)
  - 12-15 x :10/:50
  - 10-12 x :15/:45
  - 8-10 x :30/:60
- IsoHolds
  - 20-60s

Split Squat IsoHold to Slideboard (Advanced)

Long-Term Athletic Development

The key to making it work...
Player Development Stages

<table>
<thead>
<tr>
<th>Sensitivity Periods</th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suppleness</td>
<td>5-10</td>
<td>6-10</td>
</tr>
<tr>
<td>Speed 1</td>
<td>6-9</td>
<td>7-9</td>
</tr>
<tr>
<td>Skills</td>
<td>8-11</td>
<td>9-12</td>
</tr>
<tr>
<td>Stamina</td>
<td>10-13</td>
<td>13-16</td>
</tr>
<tr>
<td>Speed 2</td>
<td>11-14</td>
<td>13-16</td>
</tr>
<tr>
<td>Strength</td>
<td>12-16</td>
<td>17-20+</td>
</tr>
</tbody>
</table>

Players at every age and level can improve all of these qualities, but development can be accelerated during these windows.

Why Not JUST Speed & Conditioning?

Most physical qualities compliment each other

Strength-Speed Example:

Speed = Putting Force into Ice

Force = Strength

Improve Strength = Improve Speed

Strength Training = Speed Training

Organization Application

<table>
<thead>
<tr>
<th>Birthyear</th>
<th>Age</th>
<th>Group</th>
<th>Focus</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>12-13</td>
<td>Group 2</td>
<td>Speed/Power</td>
<td>Accountability</td>
</tr>
<tr>
<td>1998</td>
<td>13-14</td>
<td>Group 3</td>
<td>Anaerobic/Anaerobic Conditioning</td>
<td>Intensity</td>
</tr>
<tr>
<td>16U</td>
<td>14-16</td>
<td></td>
<td>Speed/Power</td>
<td></td>
</tr>
<tr>
<td>18U</td>
<td>15-17</td>
<td></td>
<td>Recovery</td>
<td></td>
</tr>
</tbody>
</table>

Players/teams grouped by age based on sensitive periods (and scheduling)
Identify training focus for each group and design program accordingly
Sample Training Day: '03-'01

1) Basic Dynamic Warm-Up (Embrace the chaos!)
2) Training Session (Below)
3) Static Stretch

Sample Training Days: '00-'98

1) Dynamic Warm-Up
2) Training Session
3) Static Stretch

Sample Training Days: 16U-18U

1) Foam Roll
2) Dynamic Warm-Up
3) Training Session
4) Static Stretch
In-Season Considerations

- In-season training should differ significantly from the off-season
  - Young kids are an exception (not as much wear/tear)
- In-Season Training is “Anti-Hockey-Specific”
  - What qualities are trained on the ice?
    - Speed, low load/high velocity power, lactic conditioning
  - Train complimentary qualities off the ice
    - Mobility, high load power, strength, stability

What About Goalies?

Ask yourself these questions:
Do I want my hips and shoulders to be more mobile?
Would being faster, stronger, and more explosive be beneficial?
Would these qualities also be beneficial for forwards and defensemen?
How do I develop these qualities?

Thank You

Andy Gojdycz & Mike Lichtenberger
Jim Hunt, Joe Doyle & All of USA Hockey’s ADM Team
Mike Boyle
Mike Potenza
Staff and Athletes at Endeavor Sports Performance
Hockey Coaches
Hockey Parents
All of you!
3 Keys to Successful Nutrition

1) Eat real food
Real food can be hunted or grown
Ask yourself: “Was this accessible to a caveman?”
Most of your diet should come from lean meats, eggs, fruits, vegetables, nuts, and beans
Avoid the aisles at the grocery store

2) Eat often/eat enough
Can’t gain weight?
Cereal: ~160 calories/serving
Maintenance Calories: 16-18 x BW (lbs)
Weight Gain Calories: 20-22 x BW (lbs)
140 lbs = 2,800-3,080
150 lbs = 3,000-3,300
4 meals = ~750-850 calories/meal
3 Keys to Successful Nutrition

3) Stay hydrated

Most of you are in a mild state of dehydration at all times

- Impaired physical & mental performance

Drink WATER, 12-16 cups/day

- Buy a water bottle and drink throughout the day
- Mix in pure lemon or lime juice for taste

Pre- and Post-Game Meal

Grocery List: Proteins

1) Chicken or turkey breast, boneless and skinless
2) Lean ground beef, buffalo, chicken or turkey
3) Lean red meat (top round, sirloin, London broil)
4) Omega-3 eggs
5) Wild Alaskan salmon
6) Yogurt, plain
### Grocery List: Vegetables & Fruits

1) Asparagus
2) Baby carrots
3) Baby spinach
4) Bell peppers
5) Broccoli, cauliflower
6) Cucumbers
7) Mixed frozen vegetables
8) Onions
9) Tomatoes
10) Apples
11) Bananas
12) Berries, fresh or frozen
13) Oranges
14) Pineapple

### Grocery List: Grains & Carbs

1) Beans (black, chick peas, kidney, lentils)
2) Steel-cut/Irish oats
3) Quinoa
4) Sprouted grain breads, English muffins, wraps or cereal (Ezekiel brand)
5) Sweet potatoes

### Grocery List: Healthy Fats

1) Extra virgin olive oil
2) Guacamole
3) Mixed nuts (almonds, walnuts, pecans, cashews, pistachios, brazil)
4) Natural peanut/almond/cashew butter
5) Pesto from extra virgin olive oil
6) Seeds (chia, hemp, milled flax, pumpkin, sunflower)
The Secret to Making It Work

Make eating the right foods convenient!
- Pre-cook meals for the week on Sunday night and put them in tupperware
- Pre-bag individual snack bags with nuts, seeds, and cut up fruits/vegetables
- Make breakfast omelette or smoothie the night before, so you can sleep in

Reese’s Smoothie (2 servings)

- 16 oz organic whole milk
- 2 scoops chocolate protein
- 2 bananas
- 2 tbsp milled flax seeds
- 2 tbsp cacao nibs
- 3 tbsp natural peanut butter
- 1 cup frozen mixed berries

Nutrition Information (Total): >1200 calories, >60 g protein, >36 g fat, >90 g carbs, >20 g fiber