Off-Ice Training For Figure Skaters Manual

Core, Upper, and Lower Body Functional Exercises to optimize your training and enhance your on-ice performance

Lauren Downes
MSPT

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OFF-ICE TRAINING
FOR FIGURE SKATERS MANUAL

About the Author: Lauren Downes, MSPT, received her Masters degree in physical therapy from Boston University in 1999. She began skating at age nine and continues skating competitively at the Championship Masters level at Adult Nationals, having achieved her senior moves in the field and junior freestyle tests. Lauren trained with internationally known coaches and had the opportunity to skate alongside Olympic level competitors. She has developed strength and conditioning programs for recreational to national and junior national level skaters since 2000, and focuses on functional training, the development of correct movement patterns, and injury prevention. Lauren works with skaters one on one or in group classes, and conducts off-ice training seminars on a limited basis. Currently, she also treats patients at Performance Rehabilitation in East Longmeadow, Massachusetts, a clinic that specializes in sports and orthopedic rehabilitation. She founded Sk8Strong Inc. in August of 2008, and www.sk8strong.com serves the skating world as the complete off-ice training resource for skaters, coaches, and parents.

Sk8Strong extends a special thank you to Stephen Conca for direction of the exercises in Sk8Strong DVDs and this manual.

Disclaimer: The exercises, instructions, and recommendations in this manual are intended for educational purposes and are not a substitute for medical guidelines. All forms of exercise pose some inherent risks if not performed properly. Do not perform the instructed exercises until you have been evaluated by a certified health professional to assure that you are using proper technique and correct body mechanics. Always complete your off-ice training in a safe area, and do not progress an exercise beyond your expertise level and capabilities. The instructions and progressions are meant to be followed in their entirety to avoid muscle strain or injury. It is recommended that you or your child complete a warm-up prior to strength training to avoid muscle strain. If you or your child has any pre-existing injuries, it is necessary to have a physical evaluation by a physician or physical therapist to receive clearance to complete the instructed exercises. The exercises in this manual or DVDs are not meant to be a substitute for treatment prescribed by a physician. It is the reader’s responsibility to take full responsibility for an athlete’s safety and health.

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An Introduction to Sk8Strong Off-Ice Training

Sk8Strong Inc. has produced four separate DVDs to instruct off-ice training exercises specifically for figure skaters. This manual will act as a companion to all DVDs, which include *Developing the Youth Skater, The Competitive Skater, Adult Training, and The Ultimate Dynamic Warmup*. Purchase of a Sk8Strong DVD is not required to follow the exercises in this manual, yet it is recommended. Exercises on video are more clearly pictured in regards to body mechanics and technique. It is recommended that a skater follows the progressions that pertain to his or her skill level.

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<th>Beginner-Preliminary level, age 7 or above</th>
<th>Recreational skater of any age who is new to exercise</th>
<th>Competitive skater, pre-juvenile to senior level</th>
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<th>Adult skater over age 30</th>
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<tr>
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<td>The Ultimate Dynamic Warm-Up</td>
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Each exercise included in this manual will indicate which DVDs the exercise is included in. In every DVD except *The Ultimate Dynamic Warmup*, three different circuits are given, and include three core exercises, two to three upper extremity exercises, and three to four lower extremity exercises. Each circuit should take 30-45 minutes to complete, depending on the number of repetitions and sets you choose to complete. It is recommended and important to complete a 5-10 minute dynamic warmup prior to completing strength training exercises, to avoid muscle strain. It is also recommended that you follow the exercises in each circuit and not try to interchange them, as altering the exercises may lead to overuse of a certain muscle group. Each exercise includes a progression to follow. **DO NOT** progress to the next level until you can complete the previous level without muscle fatigue or soreness. Once a level of an exercise becomes too easy, it is time for you to move to the next level.

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Sk8Strong Exercise Guidelines

The Competitive Skater: It is recommended that a skater completes an off-ice strengthening program 2-4 times per week, depending on a skater’s time, schedule, and intensity of training routine. Plyometrics can be added to any circuit, 2 times per week.

The Youth Skater: It is recommended that a skater completes an off-ice strengthening program 2-3 times per week, depending on a skater’s age, time, schedule, and intensity of training routine. Plyometrics can be added to any circuit, 2 times per week.

The Adult Skater: It is recommended that a skater completes an off-ice strengthening program 2-4 times per week, depending on a skater’s time, schedule, and intensity of training routine. Plyometrics can be added to any circuit, 2 times per week.

It is recommended to have a day off in between completing Sk8Strong workouts. Circuits should be completed on a rotating basis. A skater may complete other off-ice training routines such as ballet, cardio, or Pilates on off-days. Sk8Strong recommends no more than five days per week of any method of off-ice training, to allow for muscle recovery.

Example circuit rotation for Competitive Skater doing Sk8Strong workouts 3-4x/week:

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Monday: circuit 1/Plyos Day 1</th>
<th>Tuesday: off</th>
<th>Wednesday: circuit 2</th>
<th>Thursday: off</th>
<th>Friday: circuit 3/Plyos Day 2</th>
<th>Saturday: off</th>
<th>Sunday: circuit 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 2</td>
<td>Monday: off</td>
<td>Tuesday: circuit 2/Plyos Day 1</td>
<td>Wednesday: off</td>
<td>Thursday: circuit 3</td>
<td>Friday: off</td>
<td>Saturday: circuit 1/Plyos Day 2</td>
<td>Sunday: off</td>
</tr>
</tbody>
</table>

Example circuit rotation for Youth Skater doing Sk8Strong workouts 2x/week:

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Monday: circuit 1 + Plyos</th>
<th>Thursday: circuit 2 + Plyos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 2</td>
<td>Monday: circuit 3 + Plyos</td>
<td>Thursday: circuit 1 + Plyos</td>
</tr>
<tr>
<td>Week 3</td>
<td>Monday: circuit 2 + Plyos</td>
<td>Thursday: circuit 3 + Plyos</td>
</tr>
</tbody>
</table>

Example circuit rotation for Adult Skater doing Sk8Strong workouts 3-4x/week:

*Same as the Competitive Skater with the exception of plyometrics. For adults, the same plyometrics are completed on both plyo days.*
What Does A Skater Need to Be Successful?

1) **Core strength and stability**: Core strength originates from the abdominal and back muscles. These muscles work together to act as a ‘control center’ for the body’s balance and stability. In the sport of figure skating, skaters need exceptionally strong core muscles to maintain balance, check rotation and maintain a tight air position for jumping, control the center of spin rotation, and control the upper body position during footwork, stroking, and crossovers. A skater has to have a strong core to complete double jumps and beyond. Without sufficient core strength, a skater would not maintain consistency of these elements.

2) **Balance**: Think about how much of skating is done on one foot: almost everything! Some people are blessed with natural balance, but the majority of us need improvement through exercises. There are several factors which affect the sense of balance in our body. First, our vestibular system (the inner ear) helps us sense the body’s position while we are moving. Second, the eyes help us detect our surroundings. Third, and most important for skaters, the balance receptors in our feet and lower extremities tell us where our bodies are in relation to the ground.

3) **Strength and power**: Without muscle strength, a skater would skate very slowly, have small jumps, have shorter and slower spins, and would tire easily in a program and in practice sessions. Strength creates power and can improve endurance, and is the number one necessity for a skater to improve and become consistent. Through exercise, a muscle’s fibers become tighter and stronger, and can withstand more repetition for longer durations when asked to contract. Increases in strength can correlate with higher jumps, more stable landings, increased energy output, and increased ability to maintain a number of the spin variations required in the IJS.

4) **Flexibility**: Spirals, biellmans, donut spins, split jumps, spread eagles....... just to name a few elements that require extraordinary flexibility. Yet it may surprise you which basic elements require a certain muscle length to be performed correctly. Muscle flexibility controls the angle of the knee, hip, and ankle joint on a jump take-off and landing, and a small deficit in muscle length can affect the quality of a jump. Joint position and motion, controlled by the surrounding muscle length, also affects the angle of the joints in the lower extremity during basic stroking, crossovers, spins, and footwork. Each joint in your body needs a balance of flexibility on all sides to move in the proper range of motion. If there is an imbalance of muscle length, a skater may be more prone to injury.

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Periodization

It is important for a skater to organize his or her skating season into time periods, such as off-season, pre-season, in-season, and a rest period. A skater’s off-ice training program may differ in each phase of the season. It is impossible to develop the same training season for every level of skater, as some skaters’ seasons peak at regionals, others peak at nationals, others skate recreationally, and others may compete in open competitions year round. Below are some recommended off-ice training periodization schedules for different types of skaters. You may also refer to sample periodization schedules on the US Figure Skating website (www.usfigureskating.org)

*Please note that every skater, no matter what level, should perform flexibility exercises year round at least four times a week to maximize muscle elasticity and flexibility. Taper your workouts in the 1 ½ weeks before a competition. Do not perform plyometrics 1 week before a competition.

**Competitive Skater, National caliber**
1. Rest phase: January-February: Rotate strengthening circuits 2x/week. Plyometrics completed every other week, 1x/week. Cardio/aerobic exercise 20-30 minutes, 1-2x/week
2. Off season: March-June: Rotate strengthening circuits 3-4x/week. Plyometrics 1-2x/week. Cardio/aerobic exercise 20-30 minutes, 2-3x/week
3. Pre-season/summer training through September: Rotate strengthening circuits 2-3x/week. Plyometrics 1-2x/week. Cardio/aerobic exercise 20-30 minutes 1-2x/week.
4. In-season: October-Nationals: Rotate circuits 2x/week. Plyometrics 1x/week. Cardio: none off-ice. Complete program run-throughs per training program

**Competitive Skater, training for regionals**
Instructions for circuit rotation, plyometrics, and cardio remain the same as above.
Training seasons differ as follows:
1. Rest phase: November-December
2. Off season: January-May/June
3. Pre-season: May/June- August
4. In-season: August-October

**Adult Skater, training for regionals/nationals**
Instructions for circuit rotation, plyometrics, and cardio remain the same as above.
Training seasons differ as follows:
1. Rest phase: April-May/June
2. Off season: June-December
3. Pre-season: January-February
4. In-season: March-April

**Lower level skater or recreational skater**
Follow instructions of circuit rotation for “Developing the Youth Skater.” Since a developing skater does not have a set training season, it is important to continuously build strength to reach possible goals of becoming a regional or national skater. Cardio recommendation: 1-2x/week of 15-20 minutes.

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Dynamic Warmup Exercises

The following exercises are included in “The Ultimate Dynamic Warmup.” Try all of the exercises a few times, and then you may pick and choose which exercises suit your body the best. Keep in mind that the psoas, quads, hamstrings, hip rotators, and adductors are very important to keep mobile prior to skating. Prior to competing or practicing, it is recommended that you complete 15-20 minutes of dynamic warmup. If you are pressed for time, fit in at least 10 minutes, as dynamic warmup will significantly reduce injury occurrence.

Muscle Activation

**Single Leg Bridge:** This exercise will activate your gluts and hamstrings. Lie on your back with one knee bent and the other leg hugged into your chest. Lift your buttocks about 5-6 inches off of the ground as you maintain a flat back with tight abdominals. Repeat 5-6 times on each side.

**Band Walk:** This exercise will activate your hip abductors, or outer thighs. Place a loop of theraband around your ankles and slightly bend your knees. Step laterally about ten steps, maintaining tension in the band the entire time. Repeat ten steps in the opposite direction, leading with the opposite foot.

**Quadruped Diagonals:** Get down on the ground with your hands and knees directly under your shoulders and hips. Maintain tightness of your abdominals and a flat spine as you lift one leg and the opposite arm. As you lift, maintain a flat back, as it should not arch. Hold for 3-5 seconds then repeat on the other side. Repeat 5 times on each side.

**Deep Squat:** Stand with your feet a bit wider than shoulder width apart, with your arms overhead. Squat down by sitting your buttocks back. The back should remain flat as the shoulders come forward. Place hands on the ground, then reach one to the sky and rotate toward that hand. Reach with the opposite hand. Repeat sequence 3-4 times.
Lunge: The lunge will activate your glut and quad muscles. Stand with one leg in front of the other, about one leg length apart. Lower the back knee toward the ground, and then return to the start position. It is important that the front knee does not go in front of the toes. Maintain good posture, and repeat 5 times on each side.

Mobility

Sleeper Stretch: Lie on your side with your knees bent to hip level. Keep your arms one on top of the other outstretched in front of you. Lift the top arm and rotate your torso to the opposite side, until the arm is touching the ground, or as close to the ground as you can. Hold for 3-5 seconds, then return to the start position. Repeat 5-6 times on each side.

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Dynamic Supine Hamstring Stretch: Lie on your back with your arms at your sides and your legs straight. Keeping a flat back and tight abdominals, raise one leg straight in the air, then lower it at a moderate speed. If it is more comfortable, bend the opposite knee. Only raise your leg to a comfortable level and do not let your back arch off of the ground. Repeat 5-6 times on each side. You may also raise the leg, then bring it slightly out to the side about 10-12 inches and back inwards 5-6 times. Do not allow the torso to rotate or the hip to lift off of the ground. Skip this last step if you have any hip problems.

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Hip Swings: Stand with your hands on a chair or pole in front of you. Begin by swinging one leg across the body with your toes turning inward, then swing the leg away from your body as the toes turn outward. Your hips should remain relatively square to the pole, and your torso should not rotate. Swing the leg 6-8 times on each side.

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**Side Lunge:** Begin standing with your arms stretched out in front of you, feet wide apart. Shift your weight laterally as you bend the knee, and the other leg straightens. You should also bend at your hips while maintaining a flat back. The knee should not pass in front of the toes. Return to standing, then repeat on the other side. Repeat 5 times on each side.

![Side Lunge Images]

**Quadruped Hip Circles:** Get down on the ground with your knees and hands directly under your hips and shoulders. Maintain tight abdominals and a flat back as you raise one leg with the knee bent to ninety degrees. Rotate the leg in a counterclockwise circle 10 times, then reverse 10 times in the clockwise direction. Repeat on the other side. Additionally, you may lift the leg directly out to the side for 5-6 repetitions.

**Traveling Mobility**

This next series of exercises should cover an area of about a 15 yard distance.

**Glut Stretches:** Stand up and lift one knee to your chest. Hug it tight towards your torso with your hands to stretch your gluts (buttocks muscles) while simultaneously raising on to your toes. Lower the leg, step forward about 2 feet, and repeat on the opposite side. Stand tall and maintain good posture as you continue to alternate legs for the 15 yard distance, repeated twice.

**Piriformis Stretches:** Stand up and lift your leg up towards your torso with the knee turned outwards. With your hands, grab the leg on the side of your knee and across your shin to further stretch the piriformis, a hip rotator muscle. As you pull the leg up, raise up onto your toes. Step forward about 2 feet and repeat on the other side. Stand tall and maintain good posture as you continue to alternate sides for the 15 yard distance, repeated twice.

**Hamstring Kicks:** Maintain a straight back throughout this exercise. Kick one leg in front of you to a comfortable level, and bring it down quickly to the start position. Step forward about 2 feet and repeat with the other leg. Continue to alternate sides for the 15 yard distance, and repeat twice. There should be no rounding of the spine as the leg kicks forward.
Quick Hamstring Kicks: This exercise is the same motion as the previous exercise, yet it is performed at a higher speed and the opposite arm raises in front of the body simultaneously with the leg. Continue the 15 yard distance, and repeat twice.

Quadricep Stretches: Stand tall and bend your knee to bring your heel towards you buttocks, keeping the legs parallel to each other. Grab your foot with the hand on the same side, hold for about 3 seconds, then lower the leg. Step forward about 2 feet and repeat with the other side. Feel a stretch in front of your thigh. Continue the 15 yard distance. When you return in the opposite direction, you may stretch the front of your hip by leaning forward and reaching the opposite hand forward. Hold for about 3 seconds. Continue the 15 yard distance.

Reach Downs (Hamstring stretch): Step forward and reach your opposite hand down towards the ground, as your leg extends behind you. You should move like a seesaw, bending at your hips, not your spine. It is not necessary to touch the ground if you do not have the flexibility. Return to standing, then reach both arms forward as you extend the same leg behind you into a spiral like position. Lower the leg, step forward, then repeat on the opposite side. Continue to alternate sides for the 15 yard distance, and repeat twice. You should feel a stretch behind your leg.

Spiderman Stretch: Stand tall, bend at your waist, then walk your hands forward into a prone bridge position. Step one foot forward to your hands, then reach your arm high as you rotate your torso to that side. Hold for 3 seconds. Lower your hand to the ground, walk your feet towards your hands, then repeat on the opposite side. Each side should be completed 3 times. This will stretch in your groin and hip flexor area.
IT Band Stretches: Stand with your hands on your hips. If moving to the right, cross your left leg behind your right leg, then lean to the right while shifting your hips laterally to the left. You should feel a stretch on the side of your left hip or leg. Hold for 5 seconds, step to the right, and continue to repeat for 15 yards. Do the same as you go the other way, stretching the right hip. If you can’t feel the stretch, re-position your foot and work on the hip shifting motion until you feel a stretch.

Inchworm: This is a hamstring stretch for the back of your thigh. Bend over to reach your hands to the floor, then walk your hands forward as far as you can. Maintain a flat back. Next, walk your feet forward with straight knees as close to your hands as you can. Don’t worry if you cannot bring your feet all the way to your hands. It will improve with practice. Repeat for the 15 yard distance twice.

Dynamic Mobility

The next series of exercises cover a distance of about 15 yards. They are performed at a fast pace to increase blood flow and increase muscle tissue temperature.

High Knee Run: Begin to run forward by bringing your knees up towards your chest at a fast pace. Get your arms moving in opposition to the knees. For example, right knee with left arm. Repeat the 15 yard distance 3 times.

Heel to Butt Run: Begin to run forward by kicking your heels towards your buttocks, also moving your arms in opposition to your legs. Continue at a fast pace for the 15 yard distance and repeat 3 times.

Lateral High Knee Run: Repeat the high knee run, yet face sideways and run in a lateral direction. Repeat the 15 yard distance 3 times.

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**Side Skips:** This exercise involves a slower lateral movement than the lateral high knee run. Skip by lifting one knee at a time with the opposite arm, moving sideways. Do not twist the torso and keep your hips square. Repeat the 15 yard distance 2 times.

**2 Foot Squat Jumps:** Begin standing and bend into a squat position with the knees not past the toes and the buttocks back. As you jump, feel yourself pushing through the quad muscle and rolling through the balls of your feet. Spring into the air, and when you land, you want to achieve that same squat position. Make as little noise as possible. For a warmup, jump with about 75% effort. Repeat 5 times.

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**½ and Full Turn Jumps:** To warmup rotation, first complete ½ turn jumps. If you jump counterclockwise, start with the left arm in front and right arm to the side or behind you, depending on the technique you are taught. Bend to a semi-squat position and jump 180 degrees. The arms should pull in as you jump. Try to land with the knees and hips slightly bent. Repeat 3 times. Now do the same with a 360 degree turn for 3 repetitions.

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**Static Stretching**

Static stretching can be used as a cool down following a practice or competition, especially if you have tight muscles that respond well to this type of stretching. Static stretching is not the method of choice for a warmup.

**IT Band Stretch:** Stand with your hands on your hips. Cross one leg behind the other as you lean towards the foot that is behind you. Shift your hips laterally to the other side to feel a stretch on the side of your leg or hip. If you have difficulty feeling a stretch, re-position your foot and work on the hip shifting motion until you feel it. Hold for 30 seconds, and repeat 3 times.
**Hamstring Stretch:** Lie on your back with one knee bent and a towel or strap around the bottom of the other foot. Pull on the strap as you straighten that leg to stretch the back of your thigh. Try to slowly point and flex the toes if comfortable. Hold for 30 seconds, and repeat 3 times on each side. You may also complete this stretch with the opposite leg straight.

**Quadricep Stretch:** Lie on your side with your knees bent to about hip level. Lift your top leg and grab at your ankle with your hand. Pull the leg back behind you to feel a stretch in the front of your thigh and hip. Keep your abdominals tight and legs parallel. Avoid arching your back. Hold for 30 seconds and repeat 3 times. If you feel any discomfort around your kneecap, raise the leg an inch or two to alleviate discomfort.

**Psoas (Hip Flexor) Stretch:** Get down on the floor with the front knee bent and the knee not moving past the toe. The leg you are stretching is behind you. Keep your back straight and abdominals tight as you shift your hips forward. You should feel a stretch in front of your hip and slightly in the front of your thigh. If you do not feel a stretch, re-tighten your abdominals to stabilize the spine. Hold for 30 seconds and repeat 3 times on each side. You may also complete this stretch with the arms overhead.

**Piriformis Stretch (two ways):** Get down on the floor with one leg bent in front of you, and the other leg bent behind you. Slowly shift your weight over the front leg as you straighten the back leg. Adjust your front foot position until it is comfortable. With your hands in front of you, lean forward and support your weight with your arms. Hold for 30 seconds and repeat 3 times. If that position is too difficult or uncomfortable, lie on your back with one knee bent. Cross the opposite ankle over that knee. Grab behind your thigh to pull your legs toward you. Hold for 30 seconds, and repeat 3 times. You should feel both of these stretches in the buttocks and hip region.
**Adductor Split Stretch:** This stretch falls somewhere in between the dynamic and static categories, as it can be done either way. Sit on the ground in a split position. Place both hands behind your head. Lean to the right and try to touch your elbow behind your knee. Hold for 3 seconds, then repeat to the other side. Continue this motion 10 times on each side. Now do the same motion, trying to touch your elbow in front of your knee. You will feel a stretch in your groin and inner thigh area. You may also perform this as a static stretch by holding for 20-30 seconds on either side, in each position.

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**Foam Roll Warmup**

This next series of exercises has several purposes. These exercises require the use of a 6 inch diameter cylinder foam roll, and are an optional addition to your off-ice training routine. Use of the foam roll will massage a muscle, increase tissue temperature, and improve muscle mobility prior to a strengthening program. It is also useful for rehabilitation purposes to alleviate muscle soreness and spasm. For warmup, each muscle can be rolled 10-15 times. For a self muscle massage, roll a muscle for 1-2 minutes. Expect some discomfort if you have a significantly tight muscle.

**Hamstring Roll:** Sit with the back of your thighs on the roller, with your hands behind you. Use your upper body to push your legs back and forth over the roller from behind your knee to below your buttocks. Maintain tight abdominals to support your lower back. You may also roll one hamstring at a time.

**Quadricep Roll:** Lie with one or both of your thighs on the roller, with your weight supported on your forearms. Push back and forth by using your arms, rolling the front of your thigh from your hip to just above your knee. You also roll one quad at a time.

**Psoas (Hip flexor) Roll:** Lie with the front of your hip on the roller, and your weight on your forearms. Use your arms to move your body forwards and backwards over the front of your hip. Maintain a flat back. You may roll one or both psoas muscles at a time.
**Gluts and Piriformis Roll:** Sit on the roller with one knee bent and the opposite ankle resting on the knee. Lean to the side onto your buttocks. With your hands behind the roller, use your foot to roll back and forth over your buttocks. Repeat on the other side.

**Gastroc (calf) Roll:** Sit with the back of your lower legs on the roller. Place your hands behind you, and use your upper body to roll the roller back and forth under your calves. It is usually easier to roll both sides at the same time.

**Adductor Roll:** Place your inner thigh on the roller with your knee turned out and the foot on the ground. The opposite leg is slightly bent with the knee on the ground on the other side of the roller. Guide the roller from your groin area to above your knee, rolling the inner thigh. You will complete this by shifting your weight side to side. Repeat on the other side.

**Lat Roll:** Lie on your side with your armpit over the roller. Your bottom leg should be bent and the top hand supporting your arm on the floor. Use your legs to push your body back and forth, rolling from your armpit to your upper rib cage. Repeat on the other side.

**Thoracic Spine Roll and Mobilization:** Lie with your thoracic (mid) spine on the roller, with your knees bent, buttocks lifted off of the ground, and hands behind your head to support the neck. You will use your feet and knees to push yourself back and forth, rolling the mid back over the roller. Maintain tight abdominals. To self mobilize a tight area or level of the spine, keep that area directly over the roller and extend back over the roller about 5 times. Avoid extension of the neck, and avoid this step if you have any neck problems.

*This concludes the warmup section*
# Strength Training

The next series of exercises are included in the *Adult Training, The Competitive Skater*, and *Developing the Youth Skater* DVDs. Different progressions are included with each DVD. Please refer to these charts when completing your exercise program. Circuits for each DVD are as follows:

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<th>The Competitive Skater</th>
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<td>Physioball Alt. Marching</td>
<td>Prone Plank</td>
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<tr>
<td>Crab Walk</td>
<td>Physioball Opp. arm/leg</td>
<td>Diagonal Ball Reach</td>
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<tr>
<td>Crab alternating Leg</td>
<td>Physioball Prone Plank</td>
<td>Ball toss</td>
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<tr>
<td>Upper: Lateral Raises</td>
<td>ITY</td>
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<tr>
<td>Front Raises</td>
<td>Row</td>
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<tr>
<td>Lower: Lunge</td>
<td>Band Walk</td>
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<tr>
<td>Squat</td>
<td>Reach Pull</td>
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<tr>
<td>Hip Extension</td>
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<td>Single Leg Diagonal Reach</td>
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<td>Physioball Prone Plank</td>
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<td>Quadruped Diagonals</td>
<td>Physioball Prone Plank</td>
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<tr>
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<td>Lateral Raises</td>
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**Plyometrics**

- 2 Foot Squat Jumps
- 2 Foot Squat Jumps
- 2 Foot Squat Jumps
- 1 Foot Squat Jumps
- 1 Foot Lateral Jumps
- Lateral Bounding

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Core Exercises

Quadruped Diagonals (Youth/Adult): Get down on the ground with your hands and knees directly under your shoulders and hips. Maintain tightness of your abdominals and a flat spine as you lift one leg and the opposite arm. As you lift, do not let your back arch. The leg should not be raised higher than your buttocks. Hold for 3 seconds, then repeat on the other side.

Progression:
1. 10 reps each side with 3-5 second hold
2. 10 reps each side with 5-7 second hold

Crab Walk (Youth): Begin sitting with your hands behind you and knees bent in front of you. Lift your buttocks and begin to walk forward about 5 yards, using your hands and feet. Then, walk backwards the same distance. Repeat this twice, always maintaining tight abdominals. The goal is to keep your hips level with your knees, but you may start lower and progress to that level. Progress to repeat 3 times.

Crab Alternating Leg (Youth): Start in the position of the previous exercise, with your buttocks lifted. Slowly lift one knee as if you are marching, and hold it for 2-3 seconds as your hips remain level. Do not let your hip drop. Lower the leg; repeat on the other side. Do not lower your buttocks between repetitions.

Progression:
1. Alternate marching 10 times on each side
2. Alternate extending the leg straight 10 times each side
3. Alternate extending the leg, then lift it 6-8 inches, 10 times each side

Bridge with Alternating Marching (Youth): Lie on your back with your feet flat on the ground and knees bent. Tighten your abdominals as you raise your hips 5-6 inches off of the ground. Keeping your hips level, alternate lifting one knee and then the other. Complete 10 repetitions on each side, and progress the hold for each repetition from 3-5 seconds as you get stronger. There should be no movement in the hips and spine as you maintain each position.

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Curl-Up (Youth): Lie on your back with your knees bent. Tighten your abdominals throughout the entire exercise. Slowly roll your chin to your chest as you reach your arms towards your knee. Lift your body only as high as you are able to, then slowly roll down, vertebra by vertebra. As you get stronger, you will be able to lift higher. Begin with 10 repetitions, then progress to 20 repetitions as your endurance and strength increase.

Toe Taps (Youth): Lie on your back with your knees bent in the air. Tighten your abdominals toward your spine to maintain a flat back. Slowly lower one foot to the ground, then return to the start position. You will continue to alternate sides for 10 repetitions on each side. If you have trouble supporting your spine, only lower the foot halfway down, as the spine should maintain contact with the floor.

Progression: 1: 10 repetitions  2: 20 repetitions  3: Raise arms overhead

Dying Bug (Youth/Competitive): Lie flat on your back with the legs and arms straight in the air. Tighten your abdominals as you slowly lower one leg and the opposite arm a few inches. Continue to alternate sides for 10 repetitions on each side. Make sure the lower back does not lift off of the ground, by maintaining tight abdominals. Please note that the legs should never touch the ground.

Progression: (Competitive): 1: 10 repetitions each side  
2: 20 repetitions each side  
3: Lower the arms and legs slightly lower

Physioball Alternating Arm/Leg (Youth/Adult): Lie on a physioball with your stomach over the ball. Maintain contact with the floor with your hands and toes. Tightening your abdominals, slowly lift one leg to hip level and the opposite arm to shoulder level. Hold for 3-5 seconds. Repeat on the other side, and continue to alternate. Complete 10 repetitions on each side.

Progression: 1: 10 repetitions each side, 3-5 second holds  
2: 10 repetitions each side, 5-7 second holds

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**Diagonal Ball Reach (All):** This exercise will improve both your balance and core strength. Stand on 1 foot, at first starting without weight. Reach diagonally across your body as high as you can while maintaining your balance and tight abdominals, then return to the start position. Next, reach across your body at shoulder level. Finally, reach diagonally downward. Repeat each reach 8x standing on the left foot, then 8x on the right foot.

![Diagonal Ball Reach](image1)

**Progression:**
1. Add 2-4 lb. weight or medicine ball, 10 reps
2. Competitive/Adult: stand on ½ foam roll, 10 reps

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**Physioball Alternating Marching (Adult/Competitive):**
Begin sitting on a physioball. Walk your feet forward until your shoulder blades are on the ball. Maintain tight abdominals and a flat back, and keep your hips almost level with your knees. Slowly lift one knee 3-4 inches. Hold for 3-5 seconds, then lower. Repeat on the other side. The goal is to maintain level hips throughout the exercise.

![Physioball Alternating Marching](image2)

**Progression:**
1. 8-10 repetitions each side, 3-5 second holds
2. 10 repetitions each side, 5-7 second holds

---

**Physioball Prone Plank (Adult/Competitive):** Place your forearms on a physioball. Your body should resemble a straight line from your shoulders to your toes. Maintain tightness of your abdominals, and do not allow your buttocks to lift in the air. Start with a 10 second hold.

![Physioball Prone Plank](image3)

**Progression:**
1. 10 seconds to a maximum of 30 seconds, then repeat 2x
2. Alternate bringing one knee in toward the chest, 5x on each side, 2-3 sec.

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Physioball Prone Leg Plank (Competitive): Start by lying on your stomach on the ball. Walk your hands forward on the ground until your shins are centered on the ball. It is very important that your abdominals remain tight and your back stays flat and level with your legs. No sagging! Begin with a 15-20 hold.

![Physioball Prone Leg Plank](image1.png)

Progression: 1: 15-20 second hold, progressing to 30 second hold. 2: Repeat twice 3: After the 30 second hold, roll the ball in towards you by bending your knees. As you do this, your upper body should remain stationary. Repeat 10x

Sport Cord Abdominals (Competitive/Adult): Attach a sport cord or theraband to a pole or bar at chest level. Stand laterally several feet away to maintain resistance throughout the exercise. Keep your abdominals tight as you pull the cord across your body with both hands. Your hands should be about 1 foot in front of you. Your shoulders should not move or turn, as the only part of your body moving is your arms. You should be standing on one foot. Repeat 10-15 times on the right foot, then the same on the left foot. Turn and face the other direction and repeat the same repetitions. Progress to standing on a ½ foam roll or air filled disc.

![Sport Cord Abdominals](image2.png)

Side Bridge (Adult/Competitive): Lie on your side, supported by your forearm. The knees are slightly bent. Tighten the abdominals as you raise your torso and hips about 6 inches off of the floor, then lower. If this is too easy, try it with the legs straight. Repeat 10x on each side. You may also try to hold at the top in a 2nd side bridge exercise, holding for 10 seconds and progressing to a 20 second hold.

![Side Bridge](image3.png)
Prone Plank (Competitive/Adult):  Your body is supported on your forearms and your toes, with your feet close together. Maintain tight abdominals throughout the exercise, as you keep your body in a straight line. The buttocks should be level with your back. Begin with a 15 second hold.

Progression: 1: 15 second hold> 20-30 second hold  
   2: Alternate lifting one leg 2-3 inches off ground, 5x each side, 2-3 sec. holds  
   3: 10 leg lifts each side, 3-5 second holds  
   4: (Competitive): alternate lifting arm as shown in picture #3, 5x each side. Feet should be in a wider stance.

Ball Toss (Competitive):  This exercise is done with a partner. Stand on one foot, maintaining tight abdominals. Have your partner toss a 2-4 lb. medicine ball towards you, trying to challenge your balance. Pass the ball back and forth up to 20 times each person. To challenge your balance, stand on a balance board or ½ foam roll, and toss slightly to the right or left of the person you are throwing to.

This concludes the core exercise section of this manual. Please follow all progressions and do not progress onto the next level until you can complete the previous level without difficulty.
Upper Body Exercises

Row (All): Stand with your feet together or staggered and bend forward at your hips, maintaining a flat back. Holding a dumbbell, squeeze your shoulder blades toward your middle spine as you bend your elbows toward your side. You may do both sides together or one at a time. Begin with 10 repetitions. Weight recommendations are as follows:
*Youth: 3-5 lbs.  *Competitive and Adult: 5-10 lbs. Use a weight that you feel challenges you by the time you reach 8 repetitions.

1.  

2.  

Progression: 1: 10 repetitions> 2 sets of 10 repetitions> 2 sets of 15 repetitions
2: Add weight at 1 lb. increments, then follow same set progression

ITY Exercise (All): This exercise is very important to improve your posture, as the muscles that hold your shoulder blades together help to keep your shoulders back. Lie with your stomach on a physioball with your knees bent or straight. If you choose, you can complete this exercise standing, with the feet in a staggered stance, hips bent, and back straight. Keep your arms at shoulder level and raise them against gravity as you squeeze your shoulder blades toward your middle spine. This is the ‘T’ position. To complete the ‘I’ position, do the same with the arms at you sides. The ‘Y’ position is the most difficult, as it is controlled by the lower trap muscle, which is generally weak. The arms should go overhead to form the ‘Y’. Do not forget to squeeze the shoulder blades together with each repetition. Repeat each letter 10-15x.

‘I’  

‘T’  

‘Y’  

Progression: 1: 10-15 repetitions each letter
2: 10 x 2 sets each
3: 15 x 2 sets each
4: Add weight at 1 lb. increments. Do not add weight if you feel you cannot maintain the correct shoulder blade position

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**Lateral Raises (All):** Stand on 2 feet. Raise your arms to the side up to shoulder level, holding a dumbbell in each hand. Slowly lower both arms, keeping the shoulder blades squeezed together towards your middle spine. Point the thumbs upward. Begin with a set of 10 repetitions. Weight recommendations are as follows: *Youth: 2-5 lb. weight *Competitive/Adult: 3-5 lb. weight. Use a weight that you feel challenges you at 8 repetitions.

Progression: 1: 10 repetitions> 10 x 2 sets> 15 x 2 sets
2: Add weight at 1 lb. increments and follow same set progression
3. (Competitive/Adult) Stand on one foot, then stand on a ½ foam roll or balance board

**Front Raises (All):** Using the same weight as in the previous exercise, raise your arms in front of you to shoulder level, with the thumbs pointing upward. Squeeze the shoulder blades together. Follow the same progression as the previous exercise. In both exercises, do not raise your shoulders up towards your ear, which indicates that you are using too much weight.

**Crab Bridge (Youth):** Begin sitting with your hands behind you and knees bent in front of you. Lift your buttocks to knee level, bearing your body weight on the hands and feet. Slowly lower your hips to the ground. Repeat 8-10 times, progressing to 2 sets. Don’t forget to tighten your abdominals.

**PNF Pattern (Adult/Competitive):** Stand with your left foot on a theraband or sport cord at a distance that will give you appropriate resistance. Hold the end of the cord in your right hand, bend the elbow up towards the right, then extend the elbow to straighten your arm on a diagonal. Turn your thumb up and out at the top. Repeat 10 repetitions, then repeat on the other side.

Progression: 1: 10 repetitions> 10 x 2 sets> 15 x 2 sets
2: Increase cord resistance, follow same set progression
Push-Up (All): A beginning push-up should be done with the knees on the floor. Place your hands on a set of weights or on the floor, a little wider than shoulder width apart. Tighten your abdominals and make sure your buttocks are not lifted in the air. Lower your chest to the ground and try to keep your elbows in towards your side, instead of pointing away from the body. Repeat 8-10 repetitions.

Progression: 1: Knees 8-10 repetitions> 10 x 2 sets> 15 x 2 sets
2: Feet 10 repetitions> 10 x 2 sets> 15 x 2 sets

This concludes the upper body exercise section of this manual. Please follow all progressions and do not progress onto the next level until you can complete the previous level without difficulty.
Lower Body Exercises

Hip Abduction (Youth): Lie on your side with your top leg directly on top of the other leg. Stabilize your upper body with your hand in front of you, and tighten the abdominals. Raise your top leg 6-8 inches off of the ground, leading with your heel. Make sure the leg remains directly over the other leg, and you do not kick forward. The ankle hips, and shoulders should be in line with each other. Repeat 10 repetitions for 2 sets, progressing to 2 sets of 15.

Hip Adduction (Youth): Lie on your side with the bottom leg straight and the top leg crossed over it, foot resting on the ground. Support your upper body with your hand in front of you, and tighten the abdominals. Lift the lower leg 3-4 inches off of the ground, squeezing your inner thigh muscle. Repeat 10x for 2 sets, progressing to 2 sets of 15.

Hip Extension (Youth): Get down on the ground with your hands and knees directly under your hips and shoulders. Maintain tight abdominals and a flat back as you straighten one leg behind you. Lift the leg to hip level without arching the lower back, then lower. Squeeze your buttocks with each repetition. Complete 10 repetitions for 2 sets, then progress to 3 sets. Add an ankle weight at 1 lb. increments for further challenge.

Lateral Step Down (Youth/Adult): This exercise improves your hip stability, quad strength, and lower extremity alignment. Stand laterally on a 6-8 inch step with your hands on your hips. Lower your heel towards the ground while maintaining level hips and the knee in line with the toes. Do not let the knee turn inward, and don’t let the knee go past the toes. Repeat 10 repetitions on each side.

Progression: 1: 10 repetitions> 10 x 2 sets> 15 x 2 sets
2: (Adult) Add a dumbbell, 3-5 lbs. in your hands, same set progression
3: Progress weight according to your strength

Band Walk (All): Place a resistance band around your ankles. Keep your hands on your hips or your arms at shoulder level. Step to the side against the resistance, always maintaining some distance between your feet. Try to keep your hips level with each other. Take 15-20 steps in one direction, then repeat to the other side. You should feel this exercise in your outer thigh and hip region. Progress by increasing the number of steps to 30, then try a more difficult band.

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Squat (Youth/Adult): Stand with your feet a bit wider than shoulder width apart, with arms overhead. Squat down by sitting your buttocks back. The back should remain flat as the shoulders come forward to balance your weight. The knees should never pass in front of the toes. You may challenge yourself by keeping your arms overhead, holding a stick or cane. Repeat 10 repetitions.

Progression:
1: 10 repetitions > 10 x 2 sets > 15 x 2 sets
2: (Adult) Add a 5-8 lb. hand weight, follow same set progression
3: Add weight as you feel comfortable

Lunge (All): This exercise will strengthen your glut and quad muscles. Stand with one leg in front of the other, about 1 leg length apart. Lower the back knee towards the ground, then return to the start position. It is important that the front knee does not go in front of your toes, as it will put stress on the kneecap. Your weight should be evenly distributed between both legs, not too far forward. Maintain good posture, and place your hands on your hips to begin.

Progression:
1: Hands on hips, 10 repetitions > 10 x 2 sets > 10 x 3 sets
2: Hands behind head or overhead, follow same set progression
3: (Competitive/Adult): Place the back foot on a 8 inch step or chair, add a slight bend at the hips. Follow same set progression.
4: (Competitive/Adult): Place front foot on a balance board or air filled disc and follow same set progression
5: (Competitive/Adult): Add hand weights, starting with 5 lb. dumbbells.

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Single Leg Bridge (All): This exercise targets your glut and hamstring muscles. Lie on your back with one leg straight in the air and the other leg bent. Lift your buttocks 5-6 inches off of the ground as you guide the bottom of your foot towards the ceiling. Hold for 2 seconds, then lower. Maintain a flat back with tight abdominals. Start with 10 repetitions.

Progression: 1: 10 repetitions > 10 x 2 sets > 15 x 2 sets
2: (All): Place foot on 4-6 inch step. Follow same set progression.
3: (Competitive/Adult): Place foot on medicine ball. Follow same progression.
4: (Competitive): Place foot on physioball. Follow same set progression.

Single Leg Dead Lift (All): This exercise targets the hamstring muscle. Stand on one foot with the knee slightly bent. The ankle, knee, and hip should be lined up. With a flat back, reach your hands toward the ground as the freeleg raises behind you, like a seesaw. It is important that the standing knee stays stationary and does not bend up and down. Do not feel that you have to touch the ground; only go as far as you can comfortably go while maintaining a flat back. You can complete 10 repetitions reaching straight down in front of you, or alternate reaching to the middle, then left, then right.

Progression: 1: 10 repetitions > 10 x 2 sets > 15 x 2 sets
2: (Adult/Competitive): Stand on ½ foam roll or balance board. Follow same set progression.
3: (Adult/Competitive): Add 5-8 lb. hand weights. Follow same progression.
4: (Competitive): Stand on air filled balance disc. Follow same progression.

Single Leg Diagonal Reach (Competitive/Adult): Stand on one leg. Slowly bend that knee and your hips as you reach the opposite arm across your body towards the floor. It is important to maintain a flat back and tighten your abdominals. Your freeleg should remain slightly bent, toes pointing to the ground. It is not necessary to touch the ground; reach as far as your body will comfortably allow you to go. Repeat 10 repetitions.

Progression: 1: 10 repetitions > 10 x 2 sets > 15 x 2 sets
2: Stand on ½ foam roll or balance board. Follow same set progression.
Reach Pull (All): This exercise is important for hip stability and balance. Stand on one leg with the knee slightly bent, and hold the end of a sport cord or theraband with the opposite hand. Pull the band back with your shoulder blade and elbow as you rotate away from the planted foot. Tighten your abdominalms to maintain balance. Repeat 10 times on each foot. Always maintain the same amount of knee bend; do not bend up and down.

Progression: 1: (All) 10 repetitions> 10 x 2 sets> 15 x 2 sets
2: (All) Reach forward by bending at hips, maintaining your knee bend and a flat back. The freeleg should extend behind you. Return to standing straight by pulling on the band. Follow same set progression.
3: Increase cord resistance
4: (Adult/Competitive): Stand on ½ foam roll or balance board. Follow same set progression
5: Increase cord resistance

Single Leg Squat (Competitive): This is one of the most challenging exercises for your lower body. Stand on one foot on a step. Start to bend your knee as you extend the freeleg and arms in front of you. Flex forward from your hips. Go as low as you comfortably can, then return to standing. Going too low may cause muscle strain. Don’t expect to go all the way to the ground when you start. If you feel like you are falling backwards or off balance, this may indicate calf tightness. Place your heel on a towel roll to correct this. Repeat 5x on each side, progressing to 10 repetitions.

Side Lunge with Slide (Competitive): Stand with your toes pointing straight ahead and one foot on a sliding disc or furniture mover. Slide the disc laterally with a straight leg as you bend forward from the knee and hips on the other side. Make sure the knee does not go past the toe. Sit your buttocks back and squeeze the inner thighs to bring the legs together. Repeat 10x, progressing to 2 sets.
**Disc Hamstring Curl (Competitive/Adult):** Lie on your back with your knees bent and both feet on sliding discs or furniture movers. Squeeze a towel or 1/2 foam roll between your thighs. Lift your buttocks 6-8 inches, then slowly slide your legs to an extended position. Lower your buttocks and slide your feet back to the start position. Your feet should not lose contact with the slider. Repeat 10x.

![Start](image1) ![Legs Extended](image2)

You may also complete single leg hamstring curls with the sliding discs. Keep one foot on a disc with the knee bent, and the other knee bent and lifted in the air. Lift your buttocks 6-8 inches, then slowly slide the one leg to an extended position. Lower your buttocks and slide your foot back to the start position. Repeat 10x.

![Start](image3) ![Leg Extended](image4)

**Progression:**

1: Double leg, 10 repetitions > 10 x 2 sets
2: Double leg in and out without lowering buttocks, 10 x 2 sets
3: Single leg, 10 repetitions > 10 x 2 sets > 15 x 2 sets

**Disc Lunge:** Stand with one foot slightly behind the other with the toes of the back foot on a sliding disc or furniture mover. Slide the slider back as you bend the back knee to the ground into a lunge position. Your front knee should not pass in front of the toes, and you should slightly bend forward at your hips, maintaining a straight back. Slide to a standing position. Repeat 10x on each side. Progress to 2 sets of 10, then 2 sets of 15. Your foot should not lose contact with the slider. Further increase difficulty by raising the arms over your head.

![Disc Lunge](image5)
Plyometrics

This next series of exercises will improve your overall jumping strength and height. Since plyometrics involve the highest degree of strength and energy, they should only be repeated 1-2 times per week. Plyometrics should always be performed on a rug or soft surface to decrease force on the lower extremity joints. Always try to make your landings soft and hold them for 2-3 seconds.

**Plyometric Off box (Youth):** An introduction to jump landing control begins with stepping off of a 10-12 inch box or step. Lead down with one foot, then land with 2 feet in a semi squat position with the knees not extending past the toes. Upon landing, the buttocks should go back slightly as the shoulders move forward. Maintain good posture as you would while landing a skating jump. Start with 8-10 repetitions, then progress to 2 sets.

**2 Foot Squat Jump (All/Competitive plyo day 1):** Begin standing and bend into a squat position with the knees not past the toes and the buttocks back. As you jump, feel yourself pushing through your quad muscle and rolling through the balls of your feet. When you land, you want to achieve that same squat position, and create little noise for the best shock absorption. Start with ¼ squat, then progress to a full squat. Start with 5 repetitions.

1 Foot Squat Jump (Competitive plyo day 1): Stand on 1 foot and bend at the knee and hips while maintaining a straight back. Jump forward by pushing through your quad muscles and rolling through the ball of your foot to your toes. You should jump about 1 and ½ feet forward, landing softly with your knee and hips bent for best shock absorption. Hold for 2-3 seconds. Begin with 1-2 sets of 5 repetitions on each foot.

Progression: 1: 1-2 sets of 5 repetitions
2: Jump over a 6 inch hurdle or onto a 6 inch box or step
3: Jump over a 12 inch hurdle or onto a 12 inch box or step

1 Foot Lateral Squat Jump (Competitive plyo day 2): This exercise requires the same technique as the 1 foot squat jumps, except you are jumping directly to the side. Begin on your right foot, and jump laterally without any forward movement. In the same direction, repeat with your left foot. On one foot, you are gaining power from your outer thighs, and on the other foot, you are gaining power from your inner thighs. Repeat in the opposite direction from each foot. Always land on the foot you jumped from.

Progression: 1: 5 repetitions on each foot, each direction
2: 2 sets of 5 repetitions on each foot, each direction.
3: Jump over 6 inch hurdle or onto step, same progression
4: Jump over 12 inch hurdle or onto step, same progression

LateralBounding (Competitive plyo day 2): Start on one foot with the knees and hips bent, buttocks back. Using maximum power, jump laterally unto the other foot, landing in the same position. Repeat with the opposite side. Go back and forth between feet 5 times, then progress to 10 repetitions. Stabilize your balance for 2-3 seconds between jumps.
## Sk8Strong Training Log

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The Lower Extremity: Takeoff leg: When a skater steps onto the left outside edge, the left knee, ankle, and hip both bend to a certain degree. The ankle needs to have sufficient dorsiflexion (toes lifting up) mobility to achieve the correct angle for force generation. If a skater has a tight gastroc muscle (calf), the ankle will not achieve the proper bending angle to create a rolling motion through the rocker of the blade. At the knee, a skater must have sufficient eccentric control of the quad and hamstring muscles. During takeoff, the left quad muscle must produce sufficient force to vault into the jump. The gluteus muscles also achieve this at the hip. Also in the left lower extremity, the hip abductors and small rotatory stabilizers co-contract to help keep the hip and knee in line over the ankle. If hip weakness is present, the valgus angle of the knee increases, meaning that the knee turns inward and the hip juts out laterally. This alteration of alignment will affect the takeoff more than in any other jump. The excessive valgus of the knee may block the freeleg as it passes through, not allowing it to ‘step up’ properly to achieve height and distance.

The Lower Extremity: Freeleg: When a skater first steps onto the left outside edge, the right freeleg requires extension of the hip. If the anterior hip muscle (the iliopsoas) is tight, the leg will not extend enough to produce momentum as it passes through. Also, the skater may be forced to lunge forward too much at the trunk to compensate for a tight iliopsoas, using a see-saw effect upon takeoff: As the freeleg goes back, the trunk leans forward; then as the freeleg passes through, the trunk swings back and causes the skater to takeoff from the heel instead of the front of the blade. In the axel takeoff, the freeleg generates power from the iliopsoas and the quadriceps muscle groups. The iliopsoas lifts the thigh to achieve a proper ‘step-up,’ and the quadriceps assists with hip flexion and control of the knee.

The Upper Extremities: Both shoulders need sufficient flexibility from the anterior shoulder muscles, yet this is rarely an issue for figure skaters. To generate proper force to bring the arms through, a skater requires strength from the deltoid and bicep muscles. The deltoid elevates the arm and the bicep bends the elbow. Also needing sufficient strength are the muscles which control the shoulder blade motion: the rhomboids and the lower and middle trapezius muscles. If these muscles are strong, a skater should have good shoulder posture, as these muscles retract the shoulder blade towards the spine. Weakness results in rounded shoulders and less efficient use of the deltoids. Good posture is important for both balance and alignment.

The Core: Always assume that a skater should have excellent core strength to maintain balance, alignment, and stability for every jump!
The majority of figure skaters have experienced some type of pain in their foot or ankle at one point in their skating career. Often, the skater deals with the pain or it is misdiagnosed and treated improperly. In both of these situations, the injury can linger for months, causing technique adjustments and further injury. When the initial injury occurs, it is important to be evaluated by an orthopedist or physical therapist if it does not improve with rest and ice in the first 2-3 days. The faster a skater receives treatment for an injury; it is more likely to heal in a reasonable amount of time. This article will discuss the various types of ankle injuries, how to recognize their nature, and the appropriate treatment plans for each injury.

**Ankle Sprains**

A ligament is fibrous tissue that connects bone to bone. A sprain occurs when a ligament is stretched beyond its limits of range of motion, causing the fibers to tear or become inflamed. The way to categorize an ankle sprain is by grade I, II, or III, with grade III being the most severe. A grade I sprain involves a stretch or small tear of the ligament without laxity. Grade II sprains involve a tear of the ligament with laxity, and a grade III sprain represents a complete tear and severe loosening of the joint.

Typically, a sprain occurs when the ankle is rolled in either direction with excessive force. Figure skaters commonly sprain an ankle while catching a toepick or an edge during footwork or a jump landing, as the boot remains fixed and the rest of the body continues to move. Even though the ankle is supported by a stiff boot, the ankle can move to a degree to cause ligament damage. Grade III sprains are unlikely in top level skates because of the boot’s support, yet can occur.

There are several ligaments that support the foot and ankle, with the anterior talofibular ligament being the most commonly injured. A sprain occurs when the foot is forced into inversion, with the foot rotated inward. The ATFL is located anteriorly in front of the ankle, and medial to the lateral ankle bone, which is the endpoint of the fibula. The deltoid, or medial collateral ligament, is a group of ligaments located on the medial side of the ankle, connecting the tibia to several smaller bones in the ankle. A sprain, which is less common, occurs when the foot is forced into eversion, as the foot rolls outwards.

A sprain is diagnosed by recognizing several factors. Most sprains are accompanied by immediate or delayed swelling, and some injuries cause bruising at the sprain site and in the lateral or medial part of the foot. A skater may or may not be able to bear weight on the joint, depending on the severity of the injury. Acutely, pain will be associated with any movement due to the inflammatory response. As swelling decreases, pain will likely occur with passive (stretching) vs. active movement. This is one way to decipher between ligament damage and tendonitis, which will be discussed later. The appropriate treatment involves “RICE,” which is rest, ice, compression, and elevation. A skater may have diagnostic tests such as an x-ray or MRI, depending on the severity of the injury. The quickest way to recover from a sprain involves treatment from an athletic trainer or physical therapist. The longer an athlete waits to receive treatment, he or she prolongs recovery. In physical therapy, phase one treatment may
consist of ultrasound (depending on the skater’s age), massage, stretching, taping, and electric stimulation. These methods of treatment promote healing and decrease swelling. Once swelling subsides and the healing process accelerates, therapy includes proprioceptive balance exercises and strengthening for the muscles surrounding the ankle. A good physical therapist may also include exercises for the knee and hip if necessary. A return to skating is recommended once the skater can perform plyometric (jumping) and agility exercises without pain. If a skater returns to the sport too soon, the weakened ligament will not heal properly and can lead to possible problems in the future. Exact rehabilitation time frame recommendations cannot be given, as each person heals differently and the grades of a sprain vary. Upon return to the ice, the skater may continue to tape the ankle for support, as a brace will not fit in a skate.

**Tendonitis**

A tendon is a tough band of fibrous connective tissue which connects muscle to bone. It is an extension of the muscle, often pictured as a ‘white cord’ at the end of a red muscle. Each muscle in the body becomes a tendon at its insertion on a bone. Tendonitis occurs when the tendon has become inflamed from overuse, poor biomechanics, a forceful contraction, or overstretching (rarely). It may develop acutely or over time. It is very common for a skater to develop tendonitis in one or more of the tendons which cross the ankle, as skaters are constantly contracting the muscles to accelerate or decelerate movement at that joint. Ill-fitting skates, lack of stretching, or weakness can contribute to a tendon’s inflammation, and tendonitis also may develop from repetitive performance of a new skill or excessive jumping.

The achilles tendon is an extension of the gastroc and soleus muscles in the back of the lower leg. Achilles tendonitis may result from lack of calf stretching, or skates that are too big. Larger than normal skates cause the heel to loosen, resulting in excessive stabilization by the achilles. The peroneal muscle spans the lateral lower leg, with its tendon traveling behind the ankle bone and attaching to the 5th metatarsal of the foot. The peroneal muscle stabilizes the foot and ankle and assists in prevention of ankle sprains. Peroneal tendonitis is common for a figure skater, and originates from the causes mentioned above. There are several tendons in the anterior compartment of the ankle, including the tendons of the extensor hallucis, which extends the big toe, the anterior tibialis, which lifts the foot, and the extensor digitorum longus, which lifts the four smaller toes. Though not commonly injured by figure skaters, these tendons can become inflamed with repetitive motion or improper biomechanical motion of the foot.

A tendon injury is typically diagnosed by testing the strength of its muscle. When resistance is applied against the muscle’s contraction, it should illicit pain. If a skater tries to actively move the foot using the force of the muscle, it will be painful. The tendon and its surrounding area will likely be tender to touch. If the injury is acute, there may be swelling present, but not a great degree. There may be no evidence of swelling or bruising at all. Usually, the pain is localized to a small area on the tendon, and may possibly radiate towards the muscle belly. Treatment for tendonitis involves ice and rest, but not necessarily compression and elevation, unless swelling is present. Once again, a skater may require physical therapy to speed up the healing process. Treatment could involve cross friction massage to the tendon, taping of the tendon and/or muscle, ultrasound if age appropriate, stretching, electric stimulation,
iontophoresis (a method of applying a liquid anti-inflammatory), and a progression of strengthening and proprioceptive exercise. A return to skating is recommended once the skater has a pain free resisted contraction, demonstrates appropriate strength, and can perform agility and plyometric exercises without pain. Specific taping techniques for muscle protection may be recommended upon discharge from therapy.

**Differential Diagnosis**

Pain in the foot or ankle is often misdiagnosed, and the healing process can be delayed if a skater receives inappropriate treatment. Health professionals that properly diagnose injuries include orthopedic doctors and physical therapists. It is recommended to consult a health professional if a skater requires treatment.

A skater with a ligament sprain should not experience pain with resisted muscle contraction, unless a muscle injury has occurred in conjunction with the sprain. Passive motion to the ligament should be painful as soon as the ligament fibers are stretched into a range which elongates a tear. In the case of tendonitis, stretching should usually feel good, and pain occurs with resisted contraction. Both a ligament and tendon will present as tender, but a sprain may cause more swelling than tendonitis. Tendonitis may also cause a radiating pain and tenderness in the associated muscle belly.

In conclusion, there are both similarities and differences in sprains and tendonitis. Both injuries will affect a skater’s performance on the ice. A skater’s injury must be properly diagnosed to receive the best possible care, and the appropriate rehabilitation will lead to a faster return to the ice.
The Importance of Stretching  
By Lauren Downes, MSPT

The majority of skaters have completed the ‘jump out of the car and put the skates on in two minutes to be in time for a lesson’ maneuver at some point in their career. Even the two minute ‘throw the leg up on the boards and stretch for 30 seconds’ move falls by the wayside in order to be on time. While proud to have made it on the ice before the clock hits 5:01, a skater has unfortunately increased her risk for injury. How?

In the majority of ice rinks, the temperature of the air is not ideal for exercising. Sometimes it can be downright frigid and you can see your breath! Cold temperatures do not make for happy and healthy muscles. A warm temperature will help to keep sufficient blood flow and nutrient exchange in a muscle, improving its elasticity. The looser and warmer a muscle is, there is a decrease in chance for a muscle strain if that muscle is put under stress. Now think about the amount of stress placed on your muscles during a jump or spin: a lot! Many skating moves also require a great deal of flexibility (darn biellmans and spirals!), and a tight muscle can be unforgiving in those extreme positions.

Picture a muscle as a bunch of thick fibers lined up parallel to each other, each with a certain amount of elasticity, like a rubber band. If you overstretch a rubber band, eventually it will tear or snap. The same is true of muscle fibers. A muscle strain occurs when it is not properly warmed up and its fibers become inflamed or partially torn, resulting in pain with a stretch or contraction of the muscle. A significant tear is more serious and may result in immobilization of a joint to allow for healing. No skater wants to take time off to heal. The solution is to always stretch before skating, or at least perform five minutes of warm-up exercises on the ice if you are running late for a session. Prevention is the key!

There are several methods of stretching: static, dynamic, and ballistic. Static stretching involves lengthening a muscle by holding it in an elongated position for a set period of time, typically 30 seconds. Dynamic stretching brings the muscle into its lengthened position, but is repeated 10-20 times and held for a much shorter duration. This method lengthens the muscle while simultaneously bringing blood flow to its fibers. In both static and dynamic stretching, greater range of motion should be gained with each repetition. Ballistic stretching involves bouncing movement at the end range of motion, and is not a recommended stretching technique.

Prior to stepping on the ice, it is ideal for a skater to complete at least ten minutes of dynamic stretching, using both the lower and upper extremities. If time allows, fifteen to twenty minutes will properly warm-up every muscle used while skating. Static stretching is not as beneficial prior to skating, due to the lack of blood flow to a muscle. A fan of dynamic vs. static stretching once said, “Do we stretch to become statues, or do we stretch to move?” It makes sense! Static stretching is highly recommended after skating or exercising, to cool down a muscle and lengthen it after many contractions have made it tighter.

The moral of this story is: a skater needs to stretch! Taking those extra minutes to take care of your muscles will result in a happier, healthier skater, with less injuries!

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Functional Training vs. Gym Machines: Which is better?

Back in the ‘old days’ of training, almost every athlete could be found in the gym using weight machines to build strength and muscle mass, no matter which sport he or she played. They used the traditional leg press, leg curl, and leg extension machines to bulk up their thighs, and the calf press for their lower legs. There is no question that these machines increase muscle mass and make these athletes stronger, but how did this type of training carry over to their sports? Unless the athlete was a power lifter, it didn’t!

Most weight machines isolate one muscle or muscle group at a time, by following the action that muscle controls. Repetitive contraction against resistance will strengthen a muscle’s fibers and make it bigger and more defined. If a person wants to tone or target a certain area of the body, using a weight machine can accomplish that goal, but it will not maximize training benefits for an athlete. In the majority of sports, using figure skating as an example, athletes are constantly required to recruit power and speed from several muscle groups at once. Figure skaters’ muscles need the ability to accelerate and decelerate with significant force and strength to complete jumps, change speeds and directions, and hold spin positions. A single muscle cannot accomplish this on its’ own; synergistic contractions of muscles are needed to create such forces. The most beneficial way to train muscles to co-contract is through functional training.

The official definition of functional training is ‘the classification of exercises which involves training the body for the activities performed in everyday life.’ These exercises use the body’s weight as resistance, with one of more extremities planted on the ground or stable surface. Examples include lunges, single leg dead lifts, hip strengthening while standing on one leg, bridging, and one-legged squats. Such exercises mimic actions that we perform every day, whether it be reaching to pick a pencil off of the floor or loading a dishwasher. Humans are constantly balancing their body while bending over or on one foot; we are exercising when we don’t even realize it!

Figure skaters are perpetually in motion, bending the knees, hips, and ankles. Ninety percent of the actions skaters perform require a certain degree of core stability, balance, and strength, using several muscle groups at once. With many functional based exercises, the body is forced to use the core, balance receptors, and lower extremity muscles together to complete a motion. Performing functional exercises, a skater can accomplish much more in a shorter time frame than using a weight machine, by condensing the strengthening of several areas into one exercise.

Besides saving time, functional training can be safer than using weight machines for exercises. Most of our bodies are not entirely symmetrical, referring to joint movements, muscle flexibility, and muscle strength. Many machines are moved by both the upper extremities or lower extremities simultaneously, requiring symmetrical movement of the joints and muscles. By using asymmetrical movement, there is a greater chance for injury or increase in joint dysfunction. Machines also should be adjusted properly according to one’s height, and injury can occur if the machine is not set up properly. In an exercise such as a lunge, the body follows its natural path of
movement, instead of being controlled by the movement of a machine. The body activates muscle memory in regards to the positioning and control of a joint, which can carry over to functional movement in our everyday life.

Using weight machines can be helpful to a skater, by increasing muscle mass and strength, yet functional training will prove to be more beneficial for balance and stability. Figure skating is one of the most technical and demanding sports on the body, and skaters need the best off-ice training available to them to accomplish their goals. Functional training is the answer!

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