13th Annual Congress on Sports Medicine and Sports Science of Figure Skating
In conjunction with the 2008 U.S. Figure Skating Championships

Sunday, January 27, 2008, 7:30-11:15 am
Hilton Garden Inn City Center, St. Paul, MN

7:30 am – 8:00 am  Registration/ View Posters/ Breakfast

Posters:
Linda Ross, Ph.D., CSCS
Yoga conditioning for figure skaters

Bryan Ryndak, PT, MHS, OCS
Using the vertimax to train quick rotation

Bryan Ryndak, PT, MHS, OCS
A skater’s year long off-ice plan; A framework

Thomas R. Johnson, Ph.D., Britt T. Johnson MA, and Cathy O. Johnson.
The long and short of it

8:00 am  Welcome
Cynthia M. Ferrara, Ph.D.
Vice-Chair, Research and Education subcommittee, Sports Sciences and Medicine Committee

8:05 am – 8:30 am  Sports Sciences and Medicine Committee Report
Christine Lawless, M.D.
Chair, Sports Sciences and Medicine Committee

8:30 am – 9:00 am  High Performance testing Report
Mitch Moyer
Senior Director of Athlete High Performance
U.S. Figure Skating

Charlene Boudreau
Director of Sports Sciences and Medicine
U.S. Figure Skating

9:00 am – 9:30 am  Ralph Bovard, M.D.
Skating (legally) with exercise-induced respiratory problems: Inhalers and TUE’s

9:30 am – 9:50 am  Lisa Sheehan-Smith, Ed.D., R.D., L.D.N.
Nutrition practices of adult figure skaters

9:50 am – 10:05 am  Break and View Posters

10:05 am – 10:25 am  Steve Goldman, D.O., FAAO
An unusual case of heel pain in a senior level skater

10:25 am - 10:45 am  Melinda Couch, PT
Lumbopelvic and dural tension dysfunctions common in figure skaters

10:45 am – 11:05 am  Gemmie S. Devera, PA-C, MPH
Groin injuries in figure skating

11:05 am – 11:15 am  Congress Wrap up and questions
Congress Presenters and contact information:

Ralph Bovard, M.D.
Ralph.s.bovard@healthpartners.com

Lisa Sheehan-Smith, EdD, RD, LDN
Department of Human Sciences
Middle Tennessee State University
P.O. Box 86
Murfreesboro, TN 37132
615-898-2090
lsheehan@mtsu.edu

Stephen Goldman, DO, FAAO
23995 Novi Rd., Ste C103
Novi, MI 48375
248-380-1900
noviomm@mac.com

Melinda Couch, PT
Peak Performance Physical Therapy, Inc.
239 E. Fountain Blvd. Ste 100
Colorado Spring, CO 80903
719-632-2970
peakperformancephysicaltherapy@yahoo.com

Gemmie S. Devera, PA-C, MPH
Vaca Valley Figure Skating Club
P.O. Box 2936
Vacaville, CA 95696-2036
619-920-4788
gsdevera@hotmail.com

Thomas R. Johnson, Ph.D.
Britt T. Johnson, M.A.
Cathy O. Johnson
P.O. Box 86
Gobles, MI 49055
269-628-4321
drrjohnson@worldnet.att.net

Linda Ross, Ph.D., CSCS
29640 188th SE
Kent, WA 98042
253-670-1152
lindaross@mindspring.com

Bryan Ryndak
Ryndak Physical Therapy Ltd.
136 W. Lake St., Ste A
Bloomingdale, IL 60108
630-295-9990
ptmhs@comcast.net
Abstract Review Committee

Linda Haack-Rogers, Ph.D. (lhaackrogers@agrowingchild.com)
Mary Raine, Ph.D. (mfraine@optonline.com)
Maureen Brooks (moebrooks1@yahoo.com)

This meeting has been approved by Professional Skaters Association for 3-4 PSA educational credits.

This meeting would not be possible without the organizational skills, help, and patience of Juliet Newcomer and Kevin Leonardo at U.S. Figure Skating. Thank you!
ABSTRACT: The purpose of this study was to establish a nutritional profile database of adult figure skaters who competed in the 2007 United States Adult Figure Skating Championships. One hundred and eighty-three figure skaters completed an online questionnaire examining their height and weight, skating experiences, and nutrition practices. The mean age was 42.2 years for females ($n = 147$) and 47.8 years for males ($n = 36$). Study participants included skaters from all competitive categories and levels; however, 155 (85%) of the participants competed as a single skater. The mean time participants had been skating and competing was 14.7 years (range 1-67 years) and 8.0 years (range of 1-30 years), respectively. The mean number of hours spent skating each week was 6.7 (range 1-20); the mean number of hours spent training off the ice each week was 3.0 (range 0-10).

Participants’ self-reported weights and heights were used to calculate body mass index (BMI). Females weighed a mean of 61.8 kg (range 43.2 kg-113.6 kg) and men were 78.2 kg (range 61.8 kg-109.1 kg). Both females and males had mean BMIs (kg/m²) within normal ranges, 23.2 (range 17.8-34.4) and 24.5 (range 20.4-34.0), respectively. Approximately 74% of female skaters fell into the normal BMI range, 4% were identified as underweight, 16% were overweight, and 6% were obese. Of the male skaters, 67% fell into the normal range, 28% were overweight and 5% were obese. Despite the acceptance of using BMI as an approximation of total body fat in population-based studies, it overestimates body fat percentage in individuals who are very muscular; therefore, the BMI values for some of these skaters may not be a true reflection of their total body fat.

A mean score of 4.3 ± .9 (5-point scale) indicated that this group of adult figure skaters felt that a nutritious diet positively affects their skating performance. The mean score of 4.0 ± .9 (5-point scale) indicated that they also were committed to following a nutritious diet. Participants consumed a mean of 43.2 ounces of water daily (range 1 ounce – 200 ounces). During a 45-minute skating practice, 78% of the skaters indicated they drink 12 ounces or less of water, which does not meet the recommended minimum of 5 ounces fluid every 15 minutes; 18% of the participants consumed no water. Results indicated that 67 % of these skaters take vitamin and/or mineral supplements, 44 % take other dietary supplements, and 29 % use meal replacement products. Multivitamins, often in combination with a single vitamin or mineral, were the supplement most commonly taken by the skaters. Glucosamine and chondroitin were the most common other dietary supplements used by the skaters. Protein bars or shakes were the meal replacement products most commonly consumed.

The results indicate that the nutrition practices of these adult skaters may be contributing to excess body weight, impairing athletic performance and leading to the over consumption of dietary supplements. This highlights the importance of educational programs designed to address the role of food, fluids, and supplements in athletic performance and in the overall health of adult figure skaters.
A senior level pairs skater presented with left posterior and lateral heel pain. She recently had started using new boots and two months previously had diagnosis of peroneal tendonitis earlier in the year. Orthotics had previously been adjusted to increase medial heel posting to correct the peroneal tendonitis. She complained of pain in the heel region with dorsiflexion and plantarflexion of the foot and ankle. Physical examination revealed tenderness of the retrocalcaneal bursa, posterior calcaneofibular ligament and peroneal tendons. Diagnoses were made of retrocalcaneal bursitis and peroneal tendinopathy secondary to poor boot fit. Presentation will discuss causes of retrocalcaneal bursitis and peroneal tendinopathy, their treatment and problems with poor boot fit contributes to their development.
Abstract: In recent years, several elite figure skaters have suffered from groin injuries, a relatively common overuse injury. This study provides a review of current medical literature to discuss the etiology, signs, symptoms, diagnosis, treatment, and prevention strategies of the most common groin injury, the adductor muscle strain. Two types of adductor muscle strain exist, acute and chronic injury. Both result from the same mechanism of action, the forced adduction or internal rotation of the adductor muscles of the thigh from attempting multi-revolution jumps, falling, running, quickly changing directions, or doing the splits. Most commonly, the skater will feel pain in the medial thigh, and the clinician will find tenderness to palpation in this area. Often, the diagnosis can be made without imaging studies. The mainstay of treatment initially is rest, ice, elevation, and refraining from activities that exacerbate pain. After initial treatment of one to two weeks, the skater may gradually begin strength, flexibility, and endurance exercises. The skater should be able to resume full skating activities within eight to twelve weeks. While the skater can fully rehabilitate this injury, re-injury can reoccur especially if the skater does not allow an adequate period of rest to allow the muscle strain to heal. Groin injuries can be prevented by proper conditioning activities that include warming up and cooling down, working on core strength, strengthening the hip and thigh muscles, and building flexibility and endurance. Because minimal research has been performed on groin injuries among figure skaters, more studies can be performed in this area to maximize figure skating performance.
Abstract: Several musculoskeletal patterns occurring in the pelvis and lumbar spine can be observed in figure skaters.

The first is a pelvic dysfunction resulting in an outflare, a posterior rotation, and an upslip of the ilium on the landing leg side. Probable cause is direct trauma during falls or over-use of certain muscle groups around the pelvis. The result can be lower back pain and decreased flexibility at the L5-S1 (lower spine) level. This pattern can be corrected with different manual therapy techniques.

Another typical pattern is a rotation in the lumbar spine usually at the 3rd lumbar level (FRSL dysfunction in a skater who lands on the right leg). This can also be in combination with a tight or over-fascilitated psoas muscle. If the psoas remains tight, it will keep the vertebrae in this rotated position since it attaches to the front of the 3rd lumbar vertebrae and runs down to the hip. The result is pain and difficulty extending the spine which could limit performing a layback or Bielman position. The probable causes are falling or landing while in an over-rotated position, straining the psoas/hip flexor muscles, and perhaps over-training. Treatment of this problem can again be achieved with different manual therapy techniques to resolve the rotation of the 3rd lumbar segment. Special attention should be placed on releasing the psoas muscle if it is tight or the rotation will likely return. Neuromuscular stimulation to fatigue and release this muscle has proven quite effective, perhaps more so than manual soft tissue release.

Another issue is excessive tension in the spinal tissue or “dural tissue.” This can be very subtle yet have a distinct effect of decreasing range of motion in the spine and extremities. It can often be mistaken for muscular tightness. For example, while a skater is in a spiral position, assess if the weight-bearing leg is bent instead of completely straight. The hamstrings may not be tight, but if there is too much tension in the spinal tissue, the weight-bearing knee will not straighten and the free leg will not be able to go as high. The Slump Test can be utilized to assess for dural tension: while in a seated position the skater should slump down with the chin pulled towards the chest. Then one leg should be straightened with the foot pulled back into full dorsiflexion. If the skater feels any pain or tension in the leg or along the spine there is too much tension in the nervous system. Manual therapy techniques can be utilized to release this tension and thus provide increased flexibility in the entire system. The skater can also perform gentle nerve gliding exercises.

Off-ice training is key to preventing the above mentioned dysfunctions. Core stability training is crucial as is proper stretching. Dynamic stretching is an excellent way to increase flexibility in muscle and nerve tissue since it acts to inhibit nervous system reflexes.
ABSTRACT:
Our local up and coming skaters’ seemed to have a less than ideal approach to off – ice training. Some were seeing a trainer, some were not, and others took classes when they were offered, while still others tried to use what they learned at seminars on their own. There is a plethora of information regarding warm-ups, periodization, independent exercise ideas, and general off – ice training especially via the USFS website.
A program was developed for pre-juvenile through intermediate level competitive figure skaters out of the concern of parents and coaches that all of this excellent information appeared confusing and wasn’t being used to its full value. This program was called “Off – Ice: Have a Plan.” The purposes were to increase participation and compliance in a safe and effective year long periodization schedule of off – ice training, to screen for potential injury, to improve performance, and to educate the skater, parents, and coaches throughout the process.
“Off – Ice: Have a Plan” involved several components: assessments, education, periodization of training, re-assessments and entire season monitoring. This presentation describes the framework and how it was used with the local competitive pre-juvenile through intermediate skaters this past year. A brief description of the assessment process, the topics of education, how periodization fits, and what is monitored is included in this presentation. Also described is case study tracking numbers from this past year’s program describing changes in off – ice training hours, injury rates, compliance, and strength test result changes.
“Off – Ice: Have a Plan” does not involve a new concept of periodization or new exercises. It is a systematic approach to the skaters’ off – ice season with the intent of keeping the skaters’ safe and skating successfully for a long time. Perhaps with a framework in place, we can begin to define and measure the effectiveness of off - ice training and assessment programs.
ABSTRACT:
There are many ways to improve strength and quickness. As identified by previous research, successful multi revolution jumps involve a combination of components that are often addressed by off–ice training. The quickness of the take–off and the speed of rotation are identified as influencing the successful execution of multi-revolution jumps. The Vertimax is a training platform with various elastic cords and pulleys designed to work on improving vertical jump capability and to improve quickness in the general athletic population. With skaters the Vertimax is most often applied to vertical jump improvement. This poster presentation describes how the Vertimax was used to train rotation quickness in pre–juvenile through novice skaters. The rationale for such training, specific progressions, and anecdotal evidence from skaters’ and their coaches are presented.
Skaters put in many long hours for the short period of time spent on the ice demonstrating their talents. The hours of practice include many aspects necessary to put together a good performance. Skaters and coaches work on skating techniques and ballet. They listen to and interpret the music. They stretch, warm up and cool down. They agonize over costumes, makeup, and presentation, but they might be missing a key element in taking the good performance to a great performance.

Many athletes, coaches, and parents believe that great performance is due either to innate ability or to the practice of the skills necessary to the sport. Current brain research indicates that, while those things are important, the brain connections must be developed beyond the sport-specific activities to include skills which challenge the brain to learn “new and novel tasks.” In other words, skaters must develop the connections in the brain that cause long term memory to develop properly. The long term memory for balance, for instance, begins when the baby first learns to hold up his/her head, sit up, stand up and walk. If it weren’t for those connections, you wouldn’t be able to even stand on that thin blade, let alone skate, turn, jump or land on it.

Short term memory is a by product of long term memory. It is the ability that the coach and skater have to be able to develop the program using all of the stored memory to choreograph all of the parts/skills into a fluid program. The first cells in our brains to develop are those of movement, but internalizing the movement so that you don’t have to think about what you are doing is different than learning something for the moment.

This session will provide off-ice activities which will promote the internalization of the fundamental physical skills (balance, general coordination, body image, hand-eye coordination, laterality, tactile touch and audio-expressive/audio receptive language) needed to perform at your optimal level. Acquisition of these skills will help skaters to focus on the program rather than concentrating on items which could adversely impact their performance. Hand outs will be available with off-ice activities and directions for their use. Skaters and coaches who have used these techniques indicate that the activities are fun to perform and help the coaches identify skills that need improvement. Coaches comment that they never even thought, for instance, that the tugging at the costume could be a physical problem that could be addressed through simple exercises or that the skaters needed to visualize their instructions rather than just hearing them. The seven fundamental physical skills are intertwined and work together in most of the activities. Balance, Body Image, and Laterality are also directly linked to academic achievement.
The Lakewood Winter Club, located in Tacoma, WA, is among those few competitive figure skating clubs that have been nationally recognized as a progressive training facility and awarded the Excellence on Ice designation by the PSA. As part of its summer training program, the Lakewood Winter Club offers several off-ice conditioning classes, including off-ice jump, off-ice artistry, Pilates and yoga. Yoga Conditioning for Figure Skaters is an off-ice program designed to enhance flexibility, balance and total body muscular endurance. The poses take their inspiration from traditional vinyasa flow yoga practice and figure skating elements and are appropriate for skaters of all ages. The program begins with a warm-up consisting of breathing exercises, rhythmic limbering and dynamic stretching, with an emphasis on balancing the spinal joint actions of flexion, extension, lateral flexion and rotation. Large muscle groups are incorporated into warm-up movements through flowing traditional yoga poses and sequences, such as Chair Pose and Sun Salutations, resulting in elevated core body temperature and heart rate. Once the warm-up is complete, the program continues with standing balance poses that mimic the elements performed on the ice, including Standing Big Toe Hold (spiral variation), and Dancer Pose (catch-foot or Biellmann position). Next, skaters perform a series of standing strength poses from the dominant side of the body, utilizing the principles of dynamic tension and isometric contraction, thereby producing increases in the total body muscular endurance necessary for figure skating. Another series of balance poses is introduced prior to completing the standing strength poses on the opposing side of the body. These balance poses are more challenging and mimic advanced skating elements such as the layover and other creative spin and spiral positions. The program concludes with targeted core strengthening exercises and deep static stretches. In addition to the physical benefits, the breathing exercises included in this program enhance relaxation, psychological well-being and the development of an effective competitive mindset. The club has implemented the program for the past two competitive seasons. Skaters who participate in the program enjoy the experience as well as notice measurable increases in extension, balance and core strength. Due to its popularity and effectiveness, both an introductory level and an advanced level were included in the summer training program for the 2008 competitive season. A DVD version of the program has been produced so that members of the Lakewood Winter Club and other figure skaters may practice the program at their own convenience.