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RMACSM 2013 Annual Meeting**April 5-6, 2013****Marriott Springhill Suites****1190 Auraria Parkway, Denver, CO****Phone: 303-705-7300****Toll Free: 888-236-2427**

A limited number of rooms are being held at the rate of \$119/room. Call now to make reservations—to receive the special rate, let them know you are with RMACSM.

Registration Fees:

- Professional ACSM Members: \$80.00
- Professional Non-ACSM Members: \$130.00
- Student ACSM Members: \$40.00
- Student Non-ACSM: \$60.00

Register by March 15th and receive a t-shirt!

To register, go to www.RMACSM.org and click on the 2013 RMACSM Annual Meeting tab on the right hand side of the home screen

See Page 5 for the full schedule of the conference

Based on recommendations from evaluations of 2012 meeting, the following changes have been made to this year's meeting. Thank you for your input.

- Attendees will receive a ticket for one drink during the Friday evening poster session
- 2 tracks on Saturday format remains
- Additional time built in for moving between sessions and Q&A
- Last session on Saturday will be a general session

EFFICACY OF POST EXERCISE CRYOTHERAPY TO REDUCE RECOVERY TIME AFTER TRAINING AND COMPETITION

By Ryan Weatherwax, BS, CSCS—Graduate Student in Exercise Science at Northern Michigan University in Marquette, MI - Department of Health, Physical Education and Recreation

Many athletes and coaches adopt a variety of recovery modalities to help achieve optimal performance. Post exercise cryotherapy (PEC), the use of any cold treatment as therapeutic aid after training or performance, has become a popular addition to recovery methods. Ice baths (5-20 minutes with temperatures between 5-15° C), the most common PEC method, have been used in sport and exercise as a means to reduce recovery time, decrease the effects of delayed onset muscle soreness (DOMS), and improve performance after training and competition (5). It has been suggested that the physiological changes that occur during PEC include the reduction of muscle edema and increased cardiac output, thus, leading to increased blood flow and transportation of nutrient and waste products (5, 6). Based on anecdotal reports, PEC may also elicit improvements in exercise induced muscle soreness and fatigue. However, even with the proposed and seemingly positive physiological mechanisms of PEC mentioned prior, research is limited and inconclusive.

There are two main rationales for PEC: 1) reduce recovery time needed to train/compete at high levels over multiple weeks and 2) reduce recovery time between multiple events in a short period of time, as seen in tournaments. When evaluating the use of PEC over a period of 4 weeks during a competitive rugby season, ice baths did not improve performance in comparison to contrast baths (alternating cold and warm baths) or to a control group (1). The PEC utilized in this study was only performed for 5 minutes, which may be an insufficient amount of time at lower temperatures to elicit the PEC benefits. However, similar results were found when evaluating a 4 to 6 week intervention training leg and forearm flexor muscles in healthy college age students (7). Even with a PEC protocol of 20 minutes with $10 \pm 1^\circ$ C and $5 \pm 1^\circ$ C for forearm and leg flexors, respectively, training effects were three times more significant in the control group. It was suggested hyperthermia after exercise is needed to promote physiological adaptations and PEC would be disadvantageous for training (7).

Therefore, PEC for extended periods of time may not be beneficial and potentially cause decre-

ments in training. On the other hand, PEC used to reduce recovery for repeated events or games may be advantageous. When evaluating simulated team sport exercise consisting of 4 x 20 minute running intervals followed by exhaustive sprinting, 10 minutes (2 min immersion with 2.5 min rest x 5 sets) in 10° C water was found to be beneficial in improving recovery during a 3 day period when compared to contrast baths or to the control (2). Reductions in muscle soreness, reduced decrements of isometric leg extension and flexion, and a more rapid return to baseline sprint performances were seen in the cooling group. Similar results were found when evaluating competitive basketball players during tournament play completing five, 1 min immersions in 11° C water (3) after games. However, these improvements in performance after PEC during tournament play are not always seen. For instance, over a 4 day period, high-performance junior soccer players did not exhibit any improvements in performance after PEC (4). However, improvements in self-perceived fatigue and leg soreness after PEC were found.

In summary, PEC has become a common practice among many elite and amateur athletes. Depending on the rationale behind the PEC, there seems to be some merit to the protocol, but there may also be various detrimental effects. It appears that PEC may be an acceptable recovery method during tournament or multi-event activities to help return performers to healthy baseline levels and promote better subsequent performance. Even if there is not a physiological mechanism, PEC may serve as a psychological promoter in reducing self-perceived fatigue and soreness or by acting as a placebo, but research is needed to substantiate this. Despite potential positive effects, PEC utilized over extended periods of time during in season training seems to be disadvantageous. If PEC has a physiological effect and promotes a shorter recovery period, then potentially there could be an attenuation of the physiological factors necessary to facilitate improved performance. Ultimately, the risks and benefits should be evaluated by athlete, coach, and clinician prior to implementation of PEC. (see page 4 for references)

Risk of Exertional Rhabdomyolysis during CrossFit®: A Thesis Proposal

By: Bryanne Bellovary | email: bbellova@nmu.edu | Northern Michigan University

CrossFit® has widely gained popularity since starting in 2002. It is a core strength and conditioning program that is designed to elicit a broad adaptational response (Glassman, 2010). CrossFit® mixes a variety of exercises such as Olympic lifting, powerlifting, sprints, plyometrics, calisthenics, gymnastics and a few hard-to-categorize exercises like rope climbing into short, intense sessions (Glassman, 2010; Stoddard, 2011). The program typically demands a training cycle of three days on and one day off followed by two days on and one day off routine. Participants incorporate high intensity anaerobic and aerobic capacity exercises together in each CrossFit® (Glassman, 2010). CrossFit® instructors look to encompass three standards that are meant to be accomplished throughout their sessions. The first is based on improving skills in the 10 fitness domains: cardiovascular and respiratory endurance, stamina, strength, flexibility, power, speed, coordination, agility, balance and accuracy. The second model is based on the ability to perform athletic tasks. Lastly, the third is based on involving the 3 biological energy systems that drive human action (Glassman, 2010). Currently, only the third standard of fitness has been validated, which was by a Master's thesis study (Jeffery, 2012). Ultimately, due to the nature of these intense sessions without much recovery during or in between, there is a potential risk of developing exertional rhabdomyolysis (ER).

ER involves the breakdown of striated muscle tissue causing myoglobin, creatine kinase, and other intra cellular proteins and electrolytes to leak into circulation disrupting cell homeostasis (Bagley et al., 2007; Hannah-Shmouni et al., 2012; Line & Rust, 1995; O'Connor et al., 2008). This disruption could potentially cause life threatening conditions such as metabolic acidosis, compartment syndrome, and renal failure (O'Connor et al., 2008). The most common cause of ER is extremely rigorous/intense physical training typically involving high amounts of strenuous eccentric exercise in individuals who are unprepared or underprepared for such over stimulation (Cleary et al., 2011). This may include a novice doing too much too soon, those who have improperly warmed up, or starting off already dehydrated. Signs and symptoms of ER can result in a diagnosis of delayed-onset muscle soreness initially

but serum creatine kinase levels are currently the most reliable clinical indicator for detecting ER (Cleary et al., 2011; Line & Rust, 1995). Treatment generally involves rest and aggressive re-hydration with intravenous fluids, as much as four to ten liters, while monitoring creatine kinase levels and muscle soreness (Line & Rust, 1995; O'Connor et al., 2008). Currently, however, only isolated cases of ER have been reported due to participating in CrossFit® (Leahy, 2012).

For example, Hadeed et al. (2011) reported, as part of a case study, ER from a CrossFit® session in a 33 year-old male who was previously healthy and a physically fit law enforcement officer. The authors reported that the participant had five previous days of exercise that did not involve CrossFit® like training. The participant then completed a prolonged and extreme CrossFit® exertional program. He visited the emergency department three days later complaining of fatigue, muscle soreness and swelling. Examination showed upper extremity muscle tenderness to light palpation, bicep/tricep compartment swelling, pectoralis major swelling, and difficulty performing elbow flexion and extension due to pain. Serum creatine kinase levels of 26000 U/L, the normal range being 58 – 280 U/L (Cleary et al., 2011), and a positive urine dipstick analysis for blood without the presence of red blood cells lead to the diagnosis of ER. The participant was admitted to the hospital for intravenous fluids and monitoring of creatine kinase levels. He returned to high intensity training after four months of mild to moderate aerobic training with added instruction about high intensity workout recovery and hydration techniques (Hadeed et al., 2011). Interestingly, CrossFit® inventors are well aware that their program can cause ER. They have even created an ER abatement program for newcomers offering element classes where the pace and power output is lowered to allow for novice participants to adapt (Glassman, 2005). This is as far as any sort of periodization goes for CrossFit®.

ER still occurs but the incidence in CrossFit® has yet to be reported other than in individual case studies (Leahy, 2012). The primary purpose of my proposed thesis research is to determine the incidence of exertional rhabdomyolysis from CrossFit® training compared to training with NSCA or ACSM certified personal trainers. Stay tuned! (see page 4 for references)

(cont from page 2) Efficacy of PEC

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Thanks to the following for their support of this year's meeting:

Tekscan—will have a booth at the meeting

Acli-Mate—will be providing product samples for attendees

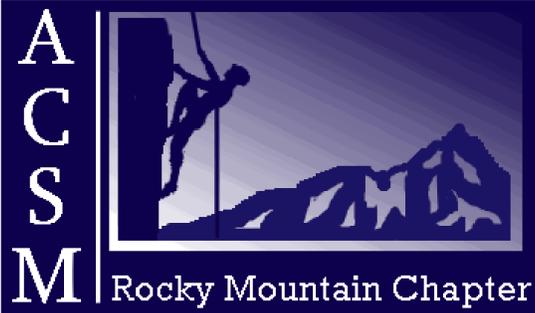
GSSI—speaker support

(cont from page 3) Risk of Exertional Rhabdomyolysis

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See page 5 for full schedule of events for the 2013 Annual Meeting



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**Please contact me if you have ideas for
articles in future Newsletters.**

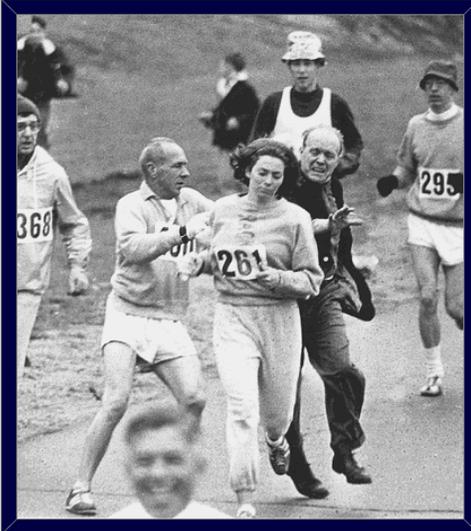
Upcoming Events

Location	Event	Date
Broomfield	Frank Shorter's RACE4Kids' Health	4/14/2013
Denver	2013 Cherry Creek Sneak	4/28/2013
Ft Lupton	May Day 5K	5/4/2013
Fort Collins	Colorado Marathon	5/5/2013
Loveland	Crazy Legs 10K—Devils Backbone Open Space	5/12/2013
Fort Collins	Front Range Relay	6/2/2013
Ft Collins	1st Annual Half Marathon/34th 5 K	9/2/2013
Westminster	Westminster Trail Half Marathon and 10K	10/13/2013

This is just a small sample of events listed on active.com. For more information on any of the above or to register, go to active.com

How Things Have Changed...This Was Only 45 Years Ago!

By Rose Steen, Executive Director, RMACSM



I received the above picture recently—one of those “can you believe this?” e-mails that people send around. It really made me stop and think about how things have changed since I was in high school.

Back then, I only ran when forced to in PE class so I don't remember any national news about this.

But in receiving the picture and reading the story of how Kathryn Switzer entered the Boston Marathon—there were no rules specifying that women couldn't register—it was merely thought that women couldn't run that distance and so there was no need to have a prohibition. Women had run the race before, but only unofficially – no numbers were assigned to them.

Switzer, her boyfriend, Tom Miller, and her coach Arnie Briggs were two miles into the marathon when officials tried to evict her from the course. Their tactics were terrify-

ing. In a rage, race director Jock Semple came lunging at her. He got his hands on her shoulders and screamed "Give me those numbers and get the hell out of my race!" The wild look in his eyes still haunts Switzer. Her boyfriend blocked Semple from getting to Switzer and she completed the race in 4 hours and 20 minutes.

Women were officially welcomed to the Boston Marathon in 1972, the same year Title IX became law. In 1984, a women's marathon was included in the Olympics for the first time.

Once again I am struck by how much one person can do to change accepted practices.