Women's Training *vs.* Men's Training

Mary Pier-Gaudet photo by Karim Ghonem, ©Poliquin Performance.

Important findings on how to coach women to achieve physical superiority

BY **PAUL GAGNÉ, STRENGTH COACH AND POSTUROLOGIST**

Those of us who watched the televised gymnastics competitions of the London Olympics got to see a side-by-side comparison of a vault by silver medalist McKayla Maroney of the US and the same vault by her male counterpart, gold medalist Kohei Uchimura of Japan. The slow-motion video clearly showed that Maroney vaulted significantly higher than Uchimura! To most viewers this was shocking, but as a strength coach, I wasn't surprised.

Women who train correctly can reach amazingly high levels of strength and power. Of course there are differences between male and female physiology that account for men's generally greater potential for maximal muscle mass. It's also true that power sports historically have been pursued by men, more so than by women, and therefore we're accustomed to hearing about men's lifting records. So how do the strength performances of highly trained women actually compare with those of

highly trained men?

In weightlifting, considered a power sport, the women's world records are about 80 percent of the men's. The current absolute women's world record in the snatch is 332 pounds, and in the clean and jerk it's 413 pounds. Think about it: How many NFL linemen can match those lifts? Further, many elite women weightlifters have clean and jerked double bodyweight and have even snatched double bodyweight. At the National High School Power Clean Championships, it wasn't until 2009, the fifth year that the event was held, that a male competitor cleaned double bodyweight.

What about comparing absolute strength? Surely in a pure strength sport such as powerlifting men are significantly stronger than women? Not so. Although the rules and use of supportive equipment vary with the federation (of which there are dozens), generally the squat and deadlift records of the women are about 75 percent of the men's records (the bench press is about 70 percent). However, remember that only a fraction of powerlifting competitors are women, and I believe the strength gap will close considerably in the near future as more women become involved in the sport.

Gagné believes that correcting postural issues is a key to preventing injuries and achieving maximal performance.

In terms of upper body muscular endurance, women's capacities match up very well with men's. If you look at the world records in chin-ups, you'll find that the strength ratios are consistent with weightlifting and powerlifting records. For example, the world record for pull-ups in 1 minute for males is 50, and for women it's 39 – a strength ratio of 78 percent. For a duration of 3 minutes the records are 100 for men versus 74 for women – a strength ratio of 74 percent. By the way, my observation is that the strength training programs in the US seldom prescribe basic upper body exercises such as dips and chin-ups. This is disappointing, considering the benefits of such training, and it suggests that these coaches underestimate the strength capabilities of their athletes.

Although these results prove that women can get strong, very strong, there are differences to consider. Let's look at a few that affect program design.

Intensity, the Surprising Female Advantage

What I've found is that in many areas of athletics women can handle higher intensity levels better than men. For example, a female 800-meter runner will be able to handle repeat maximal-effect runs better than her male equivalent. One possible explanation for this phenomenon is that men, due to higher levels of testosterone, generally are able to recruit more fast-twitch muscle fibers. These fibers produce greater peak power, but they fatigue quicker. In other words, the relatively lower level of muscle tension that women produce in athletics enables them to perform more work at relatively higher intensity levels than men. This theory also applies to strength training.

In strength training, *volume* relates to the total number of reps and sets performed by an athlete in a workout, and *intensity* relates to how much weight is lifted in relation to an athlete's maximum performance for one repetition (1RM). So even though 3 sets of 10 repetitions in the bench press may seem much more intense than 3 sets of 5 reps, because the amount of weight that can be used with 5 reps is greater than it is with 10 reps, the intensity of performing a set of 5 reps is greater.

If you look at the success of Chinese female weightlifters, you might realize that women can train at equal or even higher overall intensities compared to men. For example, compare a 150-pound female weightlifter who clean and jerks 150 pounds and a 150-pound male lifter who clean and jerks 250 pounds. In a workout the male lifter might be able to lift 225 pounds (90 percent of 1-repetition maximum, or 1RM) for 3 sets of 2 reps, whereas the female lifter, due to the lower level of muscle tension she produces, might be able to do 135 pounds (also 90 percent of 1RM) for 6 sets of 2 reps.

"In many areas of athletics women can handle higher intensity levels better than men." —Paul Gagné

Bud Charniga has studied the Chinese weightlifting system and has watched the workouts of these athletes in person. In an article he published in 2010, Charniga wrote about the warm-up protocols of Chinese weightlifters. In comparing the warm-up protocols of two Chinese athletes who won gold, he said that the female champion did 22 warm-up sets in the snatch, whereas her male counterpart did 14. Further, the woman lifted the weight she was opening with in the snatch competition (264 pounds) three times in the warm-up room, whereas the male lifted 11 pounds less than his opening attempt and completed this weight only once. Charniga, who has written extensively on this subject, proposes that one explanation is that the female lifter is able to achieve a greater relaxation of muscles between sets.

ACL Pitfalls

Men and women are both susceptible to ACL injuries, but in sports such as volleyball and soccer, women can be up to eight times as likely as men to injure the ACL. Some may attribute this to female anatomy, such that with their wider pelvis a woman's upper thighs angle inward more than a man's and therefore make the knee less stable than a man's. Maybe not.

One of the keys to preventing ACL injuries is to look at what is going on with the feet. If the arches of the feet are fallen (a condition we call *valgus*), that will cause an unnatural internal rotation of the foot, ankle, knee and hips that increases tension on the ACL. The problem is compounded if a woman wears shoes with elevated heels, as this causes the knees to hyperextend, which also increases tension on the ACL. If the wearing of shoes with elevated heels was restricted to only special occasions, I believe there would

Photo:Karim Ghonem, ©Poliquin Performance.

Decreased risk of ACL injuries is one benefit of doing full-range lower body exercises, such as the dumbbell lunge shown here by personal trainer and movie stuntwoman Mary Pier-Gaudet.

be a significant reduction in the number of ACL injuries in young women in North America.

Another common cause of ACL injuries is poor conditioning – many female athletes don't devote as much time to strength training as male athletes do. If I had to pick the two best strength training exercises for preventing ACL injuries, I would say full squats and glute-ham raises – with the stipulation that they are performed correctly.

With the squat you must squat low enough or you will create excessive shearing forces on the knee. If you don't squat low enough, you will not effectively work the glutes and the vastus medialis oblique, a quadriceps muscle that crosses the knee joint and plays an important role in stabilizing the knee. The wide-stance, high squats used by many powerlifters have value in emphasizing the adductor muscles of the legs, but do little for improving knee stability.

Regarding the glute-ham raise, the hamstrings assist the functions of the ACL, so it's especially important for women athletes to perform additional hamstring exercises in their workouts. I like the glute-ham exercise because it involves the knee at the same time as the hip – you might say it is a more *functional* exercise because this is how the lower body works in athletics.

Before leaving this subject I'll mention that I recently purchased an Optojump™ system, and found that this equipment can be helpful in determining an athlete's risk of an ACL injury. One example is the system's "drift protocol," which measures the displacement, or drift, axis during repeated jumps. Poor scores on this test suggest that the athlete has poor lower body stability, and as such they may have a much higher risk of tearing an ACL during practice or competition.

Cardio: at Odds with Strength

One of the problems with many strength and conditioning programs for female athletes is improper use of energy system training. Rather than thinking in terms of aerobic or anaerobic, we need to look at the energy systems of the body as being divided into not two but three basic categories: *short-term, intermediate,* and *long-term* or *aerobic energy system* (although there are many subcategories of each of these).

Sports in which activities last less than 30 seconds primarily use the short-term energy system, events lasting about 90-120 seconds use the intermediate energy system, and events lasting longer than 120 seconds primarily use the long-term system. It's also important to understand that these energy systems

fall on a continuum, gradually progressing from the short-term system to the intermediate and the long-term. Your body doesn't just flip a switch after two minutes of running and immediately become completely dependent upon the long-term system. Everything is interrelated.

Many woman athletes, as well as their coaches, place too much emphasis on the long-term energy system. Working the long-term energy system excessively will decrease power by making the fast-twitch muscle fibers behave like slow-twitch fibers. If a sprinter – female or male – started adding three 45-minute aerobic sessions a week to their training, they would quickly notice an increase in their sprint times. In fact, the effects of aerobic training are not localized. If you train the upper body aerobically, your upper body muscles will get slower but so will your lower body muscles. If you were to row or swim for long distances, for example, your vertical jump would decrease.

Aerobic training places excessive stress on the adrenal glands and negatively affects the testosterone/cortisol hormone ratio, factors that reduce the ability to gain muscle and increase the likelihood of gaining fat. In fact, there are studies that show that the female aerobic instructors in the studies who taught an average of three hours a day averaged about 24 percent body fat.

If an athlete's sport involves both the short-term energy system and the intermediate energy system, I recommend using an interval-training approach. Interval training involves alternating bouts of high-intensity exercise with low-intensity exercise. For example, if you were to sprint the straightaways on a track and walk the curves, this would be a form of interval training. One advantage of interval training, besides working the appropriate energy system, is that it is a superior method of fat loss.

Athletes such as Olympian McKayla Maroney are certainly the exception in terms of athletic performance, but with the appropriate strength and conditioning programs, women can perform at extremely high levels. In fact, the results may surprise you. BFS

Optimal performance is achievable through rigorous strength training, such as demonstrated here by girls from Hunter High School in Salt Lake City, Utah.