MIND GAMES

60-SECOND SUMMARY

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DIRECTORY

OLYMPIC COACH

SPRING 2006 • VOLUME 18 • NUMBER 1

Message from the
CHIEF OF SPORT PERFORMANCE

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PRACTICE LIKE A GIRL, COMPETE LIKE A BOY:
Training the Total Athlete

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Coaching Women:
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OLYMPIC COACH is a publication of the United States Olympic Committee Coaching Division. Readers are encouraged to submit items of interest for possible inclusion. Submitted materials will be acknowledged but cannot be returned, and inclusion cannot be guaranteed.

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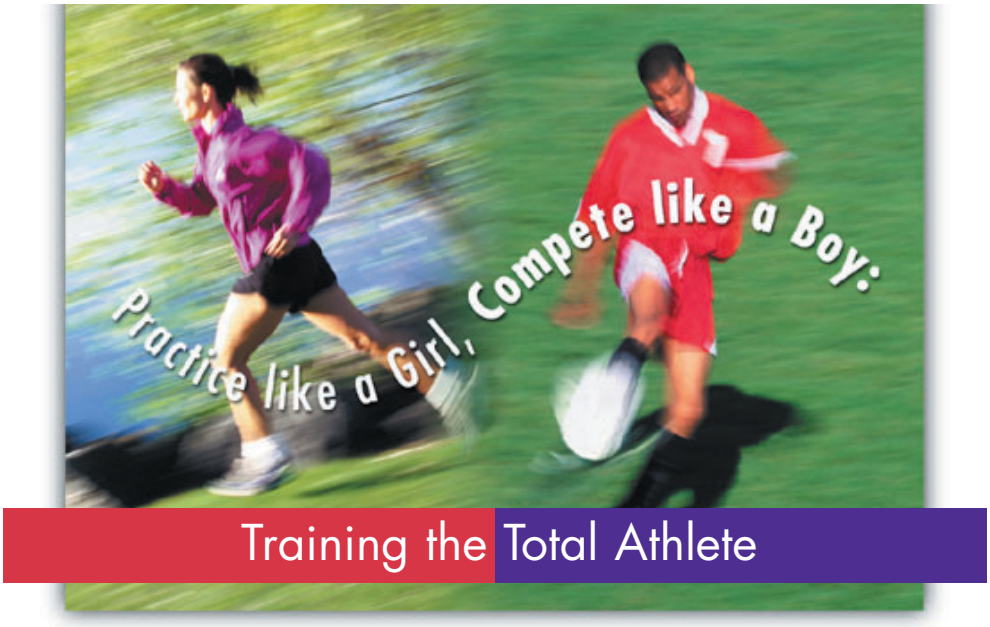
ON THE COVER
Gold medalist Hannah Teter of USA practices during snowboard training. Photo by Clive Mason/Getty Images.

Message from the
USOC's
CHIEF OF SPORTS PERFORMANCE
by
STEVE ROUSH

This issue of Olympic Coach focuses on the coaching of women athletes. We have all heard statements that it is different coaching women as compared to men. In this issue of Olympic Coach we explore that difference. We ask two coaches to provide their thoughts on the topic. We have the anecdotal thoughts of a female coaching women and a male coaching women. Our authors are two notable coaches of women's teams — Kathleen DeBoer is a former Volleyball coach at Kentucky and now the Director of the American Volleyball Coaches Association. Our other coach is Anson Dorrance of the University of North Carolina, whom ESPN named as one of the best coaches in the past 25 years. Two exceptional coaches coming at the same task from different perspectives.

We also have an article that address a women-only issue — Pregnancy. The research is showing with some levels of caution, training can be done throughout a woman's pregnancy. We have tried to provide the most current information in dealing with pregnant athletes.

Finally, Dawn Weatherwax has provided us with some insight into additional nutritional concerns that face women athletes and how coaches can help their athletes with those concerns. Meg Stone, a world renown authority on strength training, was provided us with her insights on working with female athletes.



By Kathleen J. DeBoer

"I'd rather coach women in practice settings any day, but if we are talking about coaching in competition, I'd prefer coaching men." I have heard this statement or a variation of it from many coaches who have worked with both female and male teams in a wide variety of sports. This pattern in preferences for different genders in different situations, while not universal, is certainly common enough that it cannot be attributed to isolated coaching idiosyncrasies.

When I question those making the statements, the responses are again very similar. The preference for females in practice settings stems from the observations by these coaches that the female athletes listen better, are more interested in learning technique and in knowing specifically what their role is in different situations. Since most coaches find the details of technique and strategy fascinating, the attention of their athletes to these areas is naturally affirming.

The stated preference for males in competitive situations is that male athletes can block out extraneous concerns and "just play," that they take initiative in making things happen, and that the goal of winning is never questioned and always shared, if not always accomplished. For coaches, who are universally competitive people, these responses in contests are viewed as natural and normal, and any other response perplexing, if not utterly incomprehensible.

So what causes these differences? Do our athletes come to the gym with the predisposed characteristics to battle or to bond already hard wired into them? Or, are we training them to respond differently to practice and competition? I believe the answer is a combination of both factors.

One way to unpack the issue of predisposition is to look at how athletes choose to behave when they are not being lead or coached. A friend of mine has taught eighth-graders how to play volleyball in co-ed physical education classes for over twenty-five years. He describes these patterns of behavior when the students enter the gym. The first boy who comes into the gym grabs a volleyball off the rack and either shoots baskets with it or tosses it up and hits it against the wall. The first girl who enters the gym sits down on a bleacher to wait for her friends. The next boy who enters the gym generally engages with the first boy. They start playing short court over the volleyball net or engage in a game of one-on-one at the basketball goal. The second girl who enters the gym may get a ball off the rack and sit down next to the first girl or she may sit down in a different place on the bleachers. As more boys enter the gym, the games they are playing either expand or multiply. After a number of girls are in the gym they will get in a circle and pass and set the ball around the circle, laughing and talking as they exchange the ball.

This differentiation is not universal, meaning there are girls that will display the characteristics typical for boys and boys who sit rather than engage, but they are the rare exceptions. The teacher reported to me that this pattern of gendered behavior has not changed for the twenty-five years he has been teaching volleyball to his classes. When choosing unsupervised interaction, the males choose competitive play, the females choose cooperative play.

What happens when athletes are being coached? The 1990 Olympic Sports Festival was held in Chapel Hill, North Carolina. The 8 men's and women's volleyball teams

trained at Carmichael Gymnasium and an auxiliary facility. Bill Neville, a veteran coach with broad experience working with both males and females at both the elite and beginning levels, was the head of the volleyball delegation. In that role he spent considerable time observing the practices of the various coaching staffs.

He made the following generalization about the training: the women's teams, regardless of the gender of the coaching staff, spent a lot more time on technique and positioning drills than the men's team; the men's teams spent a lot more time in competitive, game-like drills than the women's teams.

I tucked the comment away for further reflection and observation because I was curious as to whether this tendency was peculiar to volleyball or held true across various team sports. When I returned to my college administrative post, I watched a variety of teams in practices to evaluate Neville's hypothesis. The pattern he had observed in the volleyball practices held true for our basketball teams, our baseball/softball teams, and our soccer teams. Like the volleyball team practices, the women's teams spent more time drilling on positioning, and repetitive technique-oriented sequences; the men's teams spent more time in head-to-head, competitive, results-oriented sequences.

Since most of those coaching at the collegiate level had spent all of their time coaching either men or women, the coaches were unaware that this difference in training methods was so prevalent. At our institution only men coached the men's teams but both men and women were in head and assistant positions with the women's teams. As with the Olympic Sports Festival, only the gender of the athletes had an impact on the nature of the practice activities, not the gender of the coach.

When I asked our coaches to reflect on the difference, the most common speculation was that the female athletes did not have the same physical skills in terms of movement, jumping ability and power as the male athletes, and, therefore, good technique was more critical to their success in playing the game.

Shortly after these conversations I went to watch a friend coach his son's six-year-old basketball team. When we

entered the gym the boys were engaged in a variety of activities, some competing with each other by shooting long shots from outside the three point line, others playing H O R S E, still others trying to dribble without having another child steal the ball.

The coach started the organized part of the practice with a few dribbling drills. The boys engaged in these exercises so lackadaisically that the coach stopped the drill and scolded them harshly, pointing out that dribbling was an essential skill to playing the game and they should pay attention to their method.

Next he introduced a shooting drill. My friend began by explaining to his charges how to hold the ball in their hands, where to position it in relation to their bodies and how their hands should look on follow-through. During this explanation the boys fiddled and nudged each other, rarely looking at the coach. As soon as he gave them the go-ahead to practice this technique, they ran to the baskets and immediately started playing a game to see who could make the most baskets in the shortest period of time.

Shortly thereafter, about fifteen minutes into the sixty minute workout, the coach divided the boys into teams for competitive drills, scrimmaging first in three-on-two fast break situations and progressing to five-on-five drills. These six-year-olds had no skills or movement abilities whatsoever, yet they spent most of their practice time in competitive, game-like progressions.

My next opportunity for observation was at the Women's Volleyball World Championships in Sao Paolo, Brazil, when I accompanied our national team as an advisor. Our practice times frequently overlapped with those of the other women's teams. During the course of the two weeks I watched the silver medalist Brazilian team and several of the Asian teams in training sessions.

These were the best women's volleyball teams in the world, full of elite athletes with 15-20 years of high-level training and competition. They were, for the most part, above average jumpers with great body control and movement skills. Their practices, however, were amazingly technique oriented. They worked for long periods of time on footwork drills for blocking and transitioning from defense to offense. They spend considerable time on serving and passing drills. Only occasionally, for a few minutes at the end of a training session, did I observe anything that resembled a scrimmage or competitive exchange.

These back-to-back observations of a beginning boy's team engaged mostly in game-like activity and elite level women's teams engaged mainly in technique training made me question the rationalizing lore I had been given by my peers as to the reasons for the gender differences in training regiments.

The truth is that we as coaches are training our teams to their strengths because they are more cooperative and easy to deal with when engaged in activities in which they are comfortable. By our methods we reinforce what they already do well—teach females cooperative play, teach males competitive play.

To make a female team more competitive, we must practice competing. We must accept that the "me versus you" nature of a contest can be difficult for those who choose cooperative play when left to their own devices.

What we must realize, however, is that by our focus on technique, positioning and tactics we short-change our female athletes. We don't subject them regularly to the uncomfortable stresses of competition. In the same vein, by our focus on battle, rivalry and proving oneself in training males, we leave them under-prepared also. They don't get exposed to the difficult discipline needed to learn stress-proof technique or the repetition necessary to refine integrated tactics.

To make a female team more competitive, we must practice competing. We must accept that the "me versus you" nature of a contest can be difficult for those who choose cooperative play when left to their own devices. For females, then, competitiveness must be taught and rehearsed. On the other hand, the male worldview grounded in proving ones self in opposition to others does not lend itself to the restraint of repetitive drilling. For males, then, the discipline to train, to learn proper technique must be taught and rehearsed.

Each of you at this point can cite examples of elite athletes in your sport who are exceptions to these stereotypes-athletes who are both rigidly disciplined and insanely competitive. Yet I venture you could make a much longer list of those who didn't quite make it because they were accomplished in only one half of the equation.

The unanswered question for coaches is: how much competing do you put into your training if you are coaching women, or how much drilling do you demand if you are coaching men? It's a tricky question. Each coach must evaluate the capacity for anxiety-producing activity among his or her athletes.

My observation is that the younger the athletes the lower their tolerance for unpleasant experiences. Their primary motivation for engaging in the sport is to "have fun." More mature athletes realize that periods of stress in training are part of the process in pursuing athletic excellence.

I've also seen that, in most cases, a major jump shift from current practice does not work. Radical shifts make athletes edgy and confused about the goals of training. They quickly lose the sense of enjoyment they get from participation.

The coaches of female teams who have the most success with teaching competitiveness are verbal and straightforward about what they are doing and why. Instead of assuming their athletes know how to compete, they make the practice of competing a regular, disciplined, and evaluated part of a workout. They also verbally deconstruct the inevitable conflicts that result from forcing their athletes into the uncomfortable situation of battling against each other. They accept the strife as part of the learning process. Finally and very importantly, they are attuned to the level of anxiety on their team so they can quickly revert to calming, process-oriented drills when necessary.

Those who failed at teaching competitiveness plunged their teams into a mano-a-mano struggle without explanation or debriefing. The resultant fretfulness and disruption of team chemistry is generally disastrous to relationships among the players themselves and with the coach. The feminine ability to put emotions into words and the penchant to problem-solve verbally makes authentic communication between coach and athletes, and among the athletes themselves a prerequisite for success in training a female team to compete.

Basketball's Rick Pitino is the coach I have observed who had the most success with training males in repetitive, technique-specific, non-competitive sequences. He did this by separating his technical training from his team training. His morning sessions were individual-one or two athletes at a time, short-20 minutes, and frequent-four times per week. The focus was completely on technique-shooting the three, cross over dribble, stutter step and accelerate, head/ball fake and shoot, free throws, etc. The athlete was corrected each time he performed a technique incorrectly regardless of the result of his efforts.

I observed a session one day in which a player missed 90% of his shots. The coach running the drill stood where he could only see the player's form, not whether he made the basket or not. His comments were directed at the prescribed shooting form, which was correct most of the time. The coach said nothing about the misses.

The sessions were also at game speed and very efficient. The athlete was breathing hard, yet aerobically, most of the time and, depending on his position, took between 250 and 400 shots per session.

The main reason for the success of this training regiment is the individual nature of the sessions. The athlete was working only to satisfy the coach and the soul focus of the coach was the technical accuracy of a particular movement. The absence of rivalry and very clear feedback patterns allowed for concentration on method rather than outcome. Unlike the successful female practices, there was no conversation and no explanation.

The mundanity of the individual training was numbing, even to me as a casual and occasional observer. But the effectiveness is also clear. Pitino's players are known at the professional level for their excellent fundamentals and healthy self-confidence in their abilities. Their technical efficiency has also been said to mask physical limitations allowing them a couple of years or a season as a professional that they might not otherwise have had.

Training complete athletes will not happen automatically. It takes purposeful attention by the coach to the part of successful competing that is difficult for them. Females must be taught, through frequent repetition, how to benefit from and be comfortable with head to head competition. Males must be taught, through daily rehearsal, how to benefit from and be comfortable with repetitive sequences focused on technique and tactics.

Without knowledge of each gender's predispositions, coaches easily gravitate toward a training regiment that reinforces that gender's strengths. The results are frustrated coaches and semi-prepared athletes. Just as we take responsibility for all other aspects of training, coaches must be accountable for teaching their athletes either the competitive fire (female) or the technical discipline (male) that is essential for athletic success.

Kathleen DeBoer is the author of the book "Gender and Competition: How Men and Women Approach Work and Play Differently" and is currently serving as the Executive Director of the American Volleyball Coaches Association.

COACHING WOMEN

Going Against the Instincts of my Gender

By Anson Dorrance, University of North Carolina

Although I was young when I was first asked to coach the University of North Carolina (UNC) men's soccer team in 1974, I was prepared. Being male, and a devoted athlete and scrappy soccer player myself, I understood training men. The shock came in 1979, when I was asked to coach the women. The feminist literature at the time was telling me there were no differences between men and women; however, I have spent nearly my entire career discovering, and appreciating, those differences.

Perhaps the best way to view coaching women is to explore how different it can be from coaching men. In fact, our program at the UNC is largely defined by the social (and yes, athletic) differences between men and women. And while we, as coaches, never want to cease learning about our sport, ultimately, coaching development ceases to be about finding newer ways to organize practice. In other words, you soon stop collecting drills. Your coaching development shifts to observing how to support and motivate your players, and how to lead them to perform at higher and higher levels.

"You basically have to drive men, but you can lead women." Women relate through an interconnected web of personal connections, as opposed to a more traditional male hierarchal style.

Equality between the sexes doesn't necessarily mean that men and women need to be **lead** the same way. In fact, I find that the way to coach women is a more civilized mode of leadership. There's a coaching cliché that states, "You basically have to drive men, but you can lead women." Women relate through an interconnected web of personal connections, as opposed to a more traditional male hierarchal style.

To that end, what is critical in coaching women is that all the players on the team have to feel like they have a personal connection with the coach, and it has to be unique. So, your effectiveness with women is not necessarily through a powerful presence and force of will; it is through your ability to relate to them.

Obviously, what I am sharing with you are generalizations-truths in my own experience. But for the sake of illustration, I will summarize the differences between coaching men and women with some specific examples.

LEADING BY THE FORCE OF YOUR PERSONALITY ISN'T EFFECTIVE. When I first began coaching women, I was the typical sideline critic. I think every coach interested in developing players has the habit of being critical. Like many coaches, I couldn't keep it to myself. In the beginning, I was continually muttering about mistakes or poor performance—some comments were quite harsh. During the beginning of one women's game, that had immediately followed a men's game that I had also coached, one of my wing midfielders, who was closest to the sideline and thus got all the abuse, said to me, "Sit down Anson; you are coaching the women now." Since I had just finished coaching the men (and was in men's coaching mode) my natural instinct was to continue aggressively coaching what my gender dictates. The great lesson was that in this environment (with our young women), it didn't work.

LEADING WITH YOUR HUMANITY. While you may successfully lead men with the force of your personality (In general, men respond to strength; burying them verbally doesn't crush them, their egos are too strong), it is more effective to lead women with your humanity. Early on, I learned you don't lead women effectively with intimidation. You have to be savvier than that. You lead by gaining their respect, being sensitive to their strengths and weaknesses, and showing that you value their contributions. You will not succeed if women feel their relationship with you is simply dependent on their soccer success.

MEN NEED VIDEOTAPE; WOMEN DON'T. If you make a general criticism of a men's team, they all think you are talking about someone else. Videotape is proof of the guilty party.

You don't need that proof with a woman. In fact, if you make a general criticism of women, everyone in the room thinks you are talking about her. If you tell a woman she made a mistake, she'll believe you. Seeing it on tape often only makes it worse. However, because I have found that a lot of women do not have the confidence to feel they are as good as they actually are, we use our videos as highlight reels to build their confidence. This doesn't mean you can't help an individual player to improve her game using negative videotape. And it doesn't mean a female player doesn't want or need criticism. It is simply that it is important to choose the appropriate method with which you deliver that critique. (On that note, coaches have a tendency to stop practice only when something goes wrong, to correct mistakes. Yet one of the best times to stop practice is to praise something particularly brilliant or noteworthy).

Men respond to a passionate or emotional rant. Women see that for what it is-my own frustration.

TONE IS CRITICAL. My greatest half time talk to men was kicking a waste basket in frustration and anger. That let them know how I felt, in no uncertain terms. "Well, what do you think?" I will ask women during a particularly tough game. I do this because I want them to be self-critical. Very rarely do male athletes take full responsibility. Men respond to a passionate or emotional rant. Women see that for what it is — my own frustration. They don't see how that benefits them. In my experience, women will criticize themselves honestly. Asking them to take responsibility eliminates the coach from the equation. Then, when they have evaluated themselves, showing the way and building confidence-positive attributes — becomes our job. (Also, when a man is criticized, he understands it's just someone taking his game apart, not taking his life apart. A woman doesn't separate the two.)

I have also learned that women listen less to what I say than to how I say it. In other words, they listen less to the language and more to the tone. They also watch your body language. If either of those are negative, that's the message, regardless of what comes out of your mouth.

PRAISE HAS TO BE DOLED OUT DIFFERENTLY. Men love public praise. But if you praise a young woman publicly, every woman in the room now hates her with a passion, and every woman in the room also hates you, because you have not praised her. To top it off, the young woman you've praised hates you for embarrassing her in front of her teammates. However, a sincere and well-timed individual comment, such as "You were awesome," can be very effective and meaningful for any player.

MAKING CONNECTIONS IS IMPORTANT. Men don't necessarily want a relationship to a coach. With women, you need to establish a different relationship with each one. Some women don't want any kind of connection, while others require a closer and more caring relationship. Some want constant feedback; some don't want any. However, whatever the relationship is, it must be a relationship of their choosing. They will let you know what they need, or don't, and it is your job to respond.

WOMEN COACHES HAVE IT TOUGHER THAN MEN. Women coaches have issues different to the ones I'm describing here. Women athletes have higher expectations of women coaches. A woman coaching women will not be forgiven as often for the mistakes she makes. Women will

judge each other more harshly. I think women are always surprised when a male does something right. So if a man can evolve to a certain level, can lead women well, he is respected even more for it.

THE COMPETITIVE CAULDRON

There are some aspects of coaching leadership that are expressed in more concrete terms. They are connected to the nature of our sport. For one thing, soccer is not a sport like tennis; soccer has a very large physical contact component. However, there are certain general truths to all sports, and competition is one. What probably defines our program above all else is our belief that despite the enormous gains in women's athletics, there still exists a deeply entrenched sociological drawback. It is women's lact of support to wholeheartedly compete. And competition is at the heart of the game (and, many would argue, in life). While men have been schooled to "beat each other up" in the spirit of the game (or in life), women have not completely embraced it yet. They can do it under certain conditions — against an opponent, for example. But in our experience, until that intense, no holds barred level of competition is a total part of their being, they will always be holding something back, especially in practice against teammates and friends.

Early in my career, I was inspired by the legendary UNC basketball coach Dean Smith. He used to let me come to watch his practices. They were a marvel of organization, efficiency and accountability. His assistant managers scattered around the floor, recording statistics-such as who hit or missed a shot, and whether a team won or lost a scrimmage. Statistics were tabulated, and players were ranked.

We adopted this method for our program, "soccerized it," and took it to a new level. We call it the competitive cauldron. It's a system in which we track, record and post everything. The competitive environment we foster is our attempt to inculcate it, to make female players understand that competing against each other should not jeopardize friendships. Trust me, if you want your players to get the most out of themselves, they must be re-socialized in an environment that totally supports, even more, rewards, this intense competition.

Coaching women, therefore, can be said to combine some attributes of what you know of athletics to be universally true (i.e. competition), with the more subtle, or artful, aspects of leadership. If you are capable of leading women effectively, I genuinely believe, you will have evolved to a higher level of humanity. This is because you are forced to develop a connective leadership style that is much richer and more satisfying than the hierarchal style that pervades so much of male leadership. In fact, this more connective style is the direction into which our entire culture is evolving. No doubt, the civilized man would much rather be lead this way as well.

All these concepts, plus a complete description of our program, are fully explored in my book, *The Vision of a Champion* (Huron River Press), available wherever books are sold.

MIND GAMES

The Perfect Performance Versus Trying to be Perfect

by Sean McCann, USOC Sport Psychologist

Every athlete and coach dreams of performing flawlessly at the biggest competition of their lives. It's a pleasant fantasy, but athletes who try to be perfect at major competitions often face the unpleasant reality of terrible performances. Ironically, trying to be perfect is often the worst thing an athlete can think about while performing. Why? The answer is complicated and involves personality issues such as perfectionism combined with the all too often unpredictable circumstances surrounding competition.

Researchers studying perfectionism have found that it is a label for many factors, but Dr. Randy Frost and colleagues have identified two key dimensions of perfectionist thinking: personal standards and concern over mistakes. (1) In a general sense, these two dimensions represent the good and the bad aspects of perfectionist thinking by athletes. Personal standards are related to driving towards perfection, while concern over mistakes is related to worry about messing up in competition.

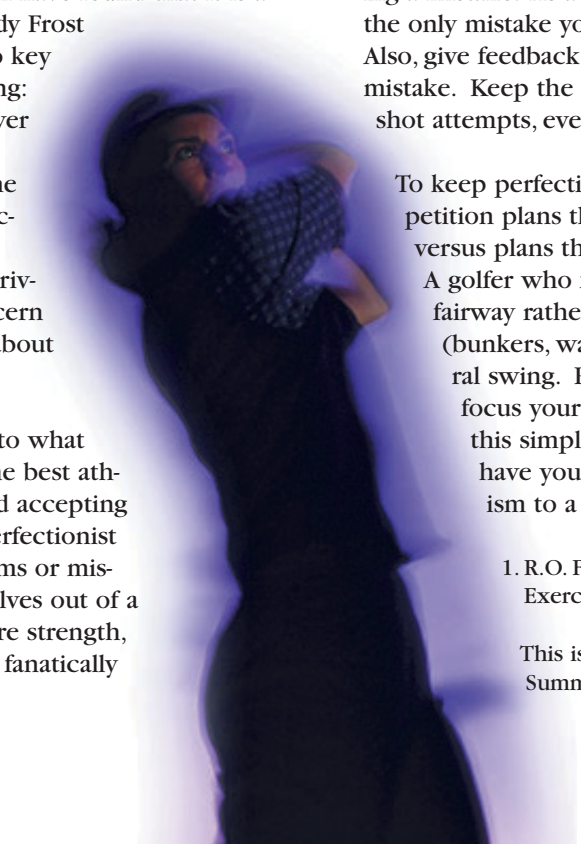
These two dimensions are similar to what coaches frequently tell us about the best athletes being driven to get better and accepting nothing less than excellence. A perfectionist athlete who cannot accept problems or mistakes, however, may worry themselves out of a competition. Personal standards are strength, but can become a weakness if too fanatically pursued. While researchers have not yet studied the effects of perfectionism on training, it is likely that these and other dimensions of perfectionism are related to the tendency of some athletes to overtrain.

A coach can get a sense of whether athletes have self-destructive perfectionist thoughts by asking about their internal language or "self-talk" during training and competition. Based on research in this area, coaches should take note when athletes seem too concerned with mistakes. The key issue is whether athletes become so focused on avoiding mistakes that they avoid taking the necessary risks associated with high-levels of success. Behavioral clues to this type of thinking might include:

1) Athletes avoiding pressure situations (such as an athlete who passes up the opportunity to take the last shot).
2) Athletes who appear to give up after an early mistake.
3) Athletes who frequently raise potential problems with a coach's training program.
4) Athletes who use too much energy devising a back-up to a back-up plan.
5) Athletes who report having recurring images of sports failure.

In sports, outcome does matter, and mistakes can be costly. At many competitions, athletes feel like a perfect performance is needed to win. Given these realities, how can you convince a perfectionist that his/her concern with mistakes is unproductive? Rather than trying to change an athlete's personality, a coach can re-focus a perfectionist's energy in a more functional way. One technique is changing an athlete's definition of a mistake. For example, the athlete who consistently avoids taking the last shot is making a mistake. As a coach, you can tell this individual that the only mistake you don't want to see is a passed up shot. Also, give feedback to the athlete when he/she makes this mistake. Keep the message consistent, and reinforce the shot attempts, even if he/she misses the shot.

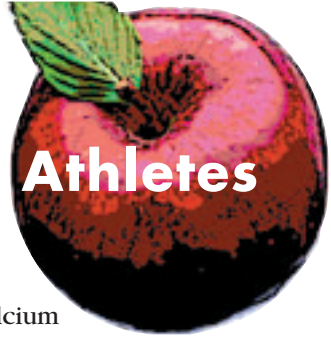
To keep perfectionist athletes productive, develop competition plans that focus on specific positive behaviors versus plans that primarily focus on avoiding mistakes. A golfer who focuses upon a specific target on the fairway rather than listing all the things not to aim at (bunkers, water hazard, trees) will have a more natural swing. Picking a specific positive target can focus your mind and clear it of worry. Remember this simple concept if, like many coaches, you have your own moments of carrying perfectionism to a fault!



1. R.O. Frost & K.J. Henderson (1991) Journal of Exercise Psychology, 13, 323-335.

This is a reprint from Olympic Coach magazine-Summer 1998, Vol. 8, No. 3, p.9

Specific Nutritional Needs for Female Athletes



by Dawn Weatherax, R.D.

As a Dietitian who specializes in sports nutrition, it is evident that females have specific needs. To begin, the majority of female athletes eat too little or too much of the wrong kinds of food. Eating too little could be stemmed from the coach putting emphasis on weight and performance, other female athletes trying to "lose weight" because of poor body image, family dynamics at home or advertising efforts to be thin. If the athlete loves to eat, but the foods are high in saturated fat (fat that is solid at room temperature—butter or margarine) and/or high in simple sugar, they will be missing important nutrients as well. The average American consumes one whole fruit or vegetable a day and the average athlete that comes into our office consumes at least three to five freebies a day (chips, donuts, sugary cereals, pop tarts, candy, fried foods, soda and fast food etc). When you don't get enough nutrients the body will have trouble recovering, healing, preventing fatigue, and fighting off illnesses. Up to a 15% decrease in performance can be contributed to poor eating habits.

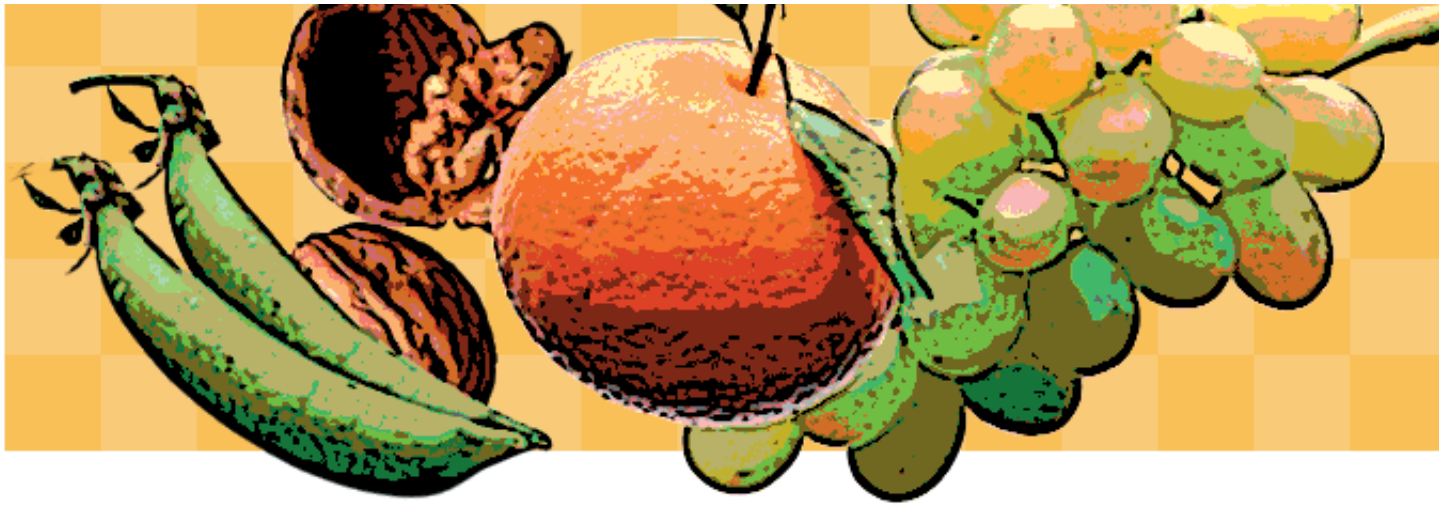
As far as nutrients that are important to the female athlete, calcium comes to the top of the list. A research study was done that showed if preadolescent girls (age 12 years, Tanner Stage 2) took a daily calcium supplement for 12 months, the percent gains in trabecular (one of the two types of bone) bone mineral content increased by 5.83% versus the placebo group (0.69% respectively).

This means a 40% decrease in osteoporosis as an adult. The average female between ages 9-18 is only getting in 60% of the RDA. This may also be the reason why stress fractures are increasing among female athletes.

The one nutrient that many put too much emphasis on is iron. If the female athlete is consuming enough high quality protein a day, extra iron in not needed. In fact, extra iron is only needed if a medical reason suggests extra supplementation.

Protein is very important to maintain, repair and grow tissue. The goal is to get 7-20g of protein every three to four hours to optimize its function. If an athlete is a vegetarian, it is very important they know how to get enough protein from meatless sources. (Please see a Dietitian for specific needs)

Population Group		Calcium RDA, milligrams (mg)
Children	ages 1-3	500 mg
	ages 4-8	800 mg
Females	ages 9-18	1300 mg
	ages 19-50	1000 mg
	ages 51+	1200 mg
Pregnancy, Lactation	<19	1300 mg
	19+	1000 mg



Other factors to consider are calorie needs, macronutrient breakdown (fat, carbohydrate, protein) and body composition. Calorie and macronutrient needs vary between females. Again, I personally suggest seeing a Dietitian who specializes in sports nutrition to figure these specific needs. Many female athletes go by magazines, TV, radio, parents and coaches for their nutritional needs; however, I have found that some of the information they receive is incorrect and not specific to their requirements.

Keeping track of body fat to lean weight can help monitor growth, training, and nutrition outcomes in a more positive manner. For the serious athlete, I recommend measuring body composition every three to four months. This will help monitor if the athlete is overtraining, gaining or dropping body fat too quickly and puts a positive spin on performance not weight.

Overall, the specific nutritional needs of a female athlete start with the basics. A female athlete needs plenty of fruits and vegetables, whole grains, lean meats (or vegetarian options), healthy fats (examples: nuts, seeds, natural peanut butter, avocado, olives, fish and flax) low fat dairy options and five to seven freebies a week. Eating enough calories, in the right mix, at the right time to meet the demands of competing at elite levels is a close second. Follow this with proper hydration, a high quality multivitamin, and possible calcium supplementation and the athlete is on their way to optimizing performance up to 15% with sports nutrition. Lastly monitoring body composition can help the coach monitor training and how the athlete's body is responding to the demands.

You can train, train and train but if the nutritional needs are sub-optimal, performance outcomes will suffer eventually.

COACHES TIPS:

- Team up with a Dietitian that specializes in sports nutrition to promote healthy eating for performance.
- Have monthly presentations on nutrition related topics.
- Promote a healthy environment and avoid continuously putting emphasis on weight and performance, especially if you coach a sport that appearance is half the score. This could backfire and escalate disordered eating issues and increase injury rates.
- Any athletes with special nutritional needs must see the Sports Nutritionist. This allows the Coach to be a Coach.
- Have biweekly or monthly meetings on athletes' progress and how to address new nutritional issues as they arise.
- Must work as a team and have the same philosophy.
- Promote five to nine servings of fruit and vegetable servings a day (At least three to five servings of vegetables)
- Limit the freebies to one a day.
- Take a pharmaceutical grade calcium supplement starting around age 12 (Consult Dietitian for earlier ages). Recommend four tablets per day that provides 800 mg/d elemental calcium (as calcium citrate and carbonate), 400mg/d elemental magnesium (as magnesium citrate and oxide), 400 IU/d vitamin D3, boron and silicon, (two additional minerals thought to be essential for bone health, in trace amounts) 1.33 mg/d and 9 mg/d respectively.
- Take a pharmaceutical grade multivitamin/mineral supplement specific to age.
- Measure body composition using a Bod Pod, DEXA scanning or hydrostatic weighing method at least twice. a year. (Three to four times a year if elite athlete).

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Coaching the Female Athlete — Specifically in the Weight Room

By Meg Stone, East Tennessee State University

INTRODUCTION

On several occasions I have been approached to offer advice as to how the female athlete should be coached in the weight room. Several years ago, the attitude of both coach and athlete to weight training would have been my first priority for discussion. However, I believe with the increase in awareness of the benefit of strength and conditioning, attitudes have changed and both coach and athlete welcome and understand the benefits that can be derived from a sound strength and conditioning program.

First, both coach and athlete must understand that the weight room and/or strength and conditioning is simply one piece of a puzzle. Strength and Conditioning, Biomechanics, Physiology, Nutrition, Psychology, Performance Technology, and Sports Medicine are all combined and are crucial parts of an overall training program, none of which should be overlooked. When developing a program questions to be considered are as follows:

- What muscle groups are being worked?
- What are the time-motion analysis characteristics to be trained? (Understanding this approach will go along way to addressing the energy systems involved in the specific sport)?
- What muscle actions are involved (concentric eccentric etc)?
- What are the primary sites of injury for that activity?

All of the above discussions can be relevant for either gender. Once some of these issues have been identified then the appropriate training regime in the weight room can be established with respect to exercise selection, volume and intensity etc.

In considering the differences between males and females and their approach to strength work it becomes apparent that there are more similarities than differences. It is those differences the strength coach needs to address in program design and application.

When considering the weight program for the beginning female athlete it would be wise to understand the research done on the potential female athlete, remembering that there is no difference in the distribution of fiber type between males and females, but female have a smaller muscle mass with fewer fibers and a smaller cross section of muscle. Based on absolute values the average male is 30% - 40% stronger than the average female, this finding is not consistent for all muscle groups. Further research indicates the beginning female athlete is anywhere from 40% to 60 % weaker in her upper body than her beginner male counter part, and approximately 25% weaker in the lower body. However, when strength is expressed relative to lean body mass, in some cases there are no gender differences. The primary reason for differences in upper to lower body strength levels is muscle distribution; the greater proportion of the women's lean body mass is in the lower body.

It must be emphasized that strength and conditioning training is just as beneficial to women as it is to men. Women can gain strength at the same rate or faster than men with the result being an increase in lean body mass and a

decrease in percent body fat, both having implications for the enhancement of performance. In a study done by Hakkinen in 1989, it was noted that women in a heavy strength- gaining program (loads over 80%) tended to plateau after three to five months. Several methods of manipulation within the training program can potentially offset this plateau. For example, variation in the training program is paramount for continued improvement in performance. Variation can be attained in several ways: intensity, volume, exercise selection etc.

It is possible that the female athlete may need more work with 80% or more loadings than her male counterpart, in order to maintain near maximum strength levels and optimum power output throughout the train process.

It is possible that the female athlete may need more work with 80% or more loadings than her male counterpart, in order to maintain near maximum strength levels and optimum power output throughout the train process. These programs have been referred to as "topping up" programs. These types of programs require the coach to pay close attention to the planning of the program.

With the younger female athlete, a return to base level conditioning program with high volume and low intensity exercise loadings may be appropriate to raise their level of fitness for a sport. This could be best done in the weight room using stage- training methodology with appropriate loading to cause the desired adaptation to the training load.

The skeletal system-the female is generally shorter with a wider pelvis and the thigh slanting inwards towards the knees leading to a marked Q-angle. This position is referred to as a valgus position, or in general terms a knock knee type of position. This position can present a challenge to the strength coach in that squatting technique requires the knees to turn slightly out tracking in line with the toes which generally speaking are also turned slightly outwards. The female athletes with this marked Q-angle and valgus position during the squatting movement may need more detailed attention paid to the correct squatting position. This can lead to working and maintaining the athlete with lighter working loads in the squat until the correct position in established. Of course, this position would present the same challenge in the squat clean and squat snatch, particularly in the recovery phase of the lift, and any other exercise where a full squatting movement is required.

In producing a program for the female athlete, it is interesting to note that in the USA research shows that the female athlete is six times more likely to tear an ACL (anterior cruciate ligament) than their male counterpart competing in the same sport. This would suggest the need for additional preparation. There is probably no single factor, but rather a number of contributing factors such as anatomical, environmental, hormonal and biomechanical. Generally, these injuries occur in non-contact situations in activities such as cutting, pivoting, and deceleration. There a several potential causes which are worthy of attention. First, the female athlete may generally lack of strength in the lower body both absolutely and relatively due to a relatively untrained status compared to men. Secondly the female athlete may take longer to develop the same relative force level as her male counter part (Rate of Force development is slower than the male). Thirdly, hamstring co-activation maybe important in the maintenance of the integrity of the knee. A quadriceps dominant knee can lead to a greater anterior translation and therefore more susceptible to injury. Lastly, women do not position themselves during single leg squatting movements the same as men, there is a greater ankle-dorsiflexion, and the hip externally rotates, both of these issues maybe contributory factors in ACL injuries.

Observation of several strength programs suggests that women (and perhaps men) tend to drop or reduce their strength and conditioning programs during the competitive season. This reduction is often justified by a reduction in the loading because of tapering or peaking considerations. The strength and conditioning coach may have a challenge convincing the coach that a calculated reduction is desirable, but if the strength and conditioning program is not carefully planned all the way into the minor and major competitions, then there is a detraining result that can lead to a reduction in performance and an increase in injury potential. Other conditioning factors can contribute to injury such as poor running technique, invariably caused by neglecting a sound strengthening protocol.

Again, generally the limbs of the female are shorter and the shoulders narrower. The strength coach is dealing with a lighter body frame and a lower center of gravity. All of the above can have implications for running and lifting and mechanics both key element of a sound strength and conditioning program.

The strength coach should also look for a marked carrying angle at the elbow another factor to consider when trying to strength the upper body This structural issue may require extra attention to strengthen the ligaments and tendons surrounding the wrist, elbow and shoulder particularly as a prerequisite for overhead lifts such as the snatch, commonly used in many sports to strength overhead movements.

Shoulders size in comparison with the wide pelvis can lead to a marked rotation of the upper body as seen in some young female sprinters. This can be somewhat rectified by emphasizing upper body strengthening exercises early in the development of the female sprinter, during the first general preparation phase of training. Hypertrophy and strengthening work can help alleviate the problem of over-rotation of the upper body and enhance good sprints mechanics.

Many female athletes tend to perform a high volume of work with fewer calories than would be expected. This restricted calorie intake results in reduced intake of essential nutrients important for optimal performance. The strength and conditioning coach should carefully observe and monitor the behavior of the athlete for signs of fatigue in general but directly related to restricted calorie intake and refer the athlete for nutritional counseling.

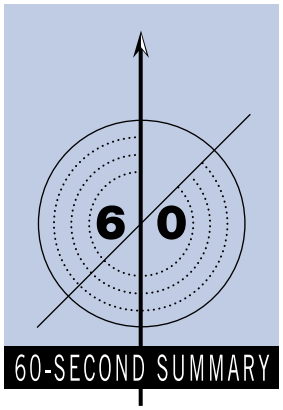
Hormonal Considerations – The menstrual cycle of the female athlete has not been well studied for various reasons primarily because of the variation in the structure of the cycle. Conflicting reports have placed the optimum time for strength gains at various time lines through both the luteal and follicular phases. What we do know is that there is a spike in the release of testosterone during ovulation between these two phases but how to use this increase in testosterone in strength development is as yet uncertain.

The training program of the female should consist of the following elements:

- Olympic Lift to enhance explosiveness - taught safely and correctly
- Multi-set structure to the workout
- Predominant use of free weight machine used in supplementary work
- Over head or free body weight exercise to enhance trunk strengthening work
- All program should involve the three key elements of a training program: **Specificity, Variation and Overload**

CONCLUSION

In summary, there should be few differences in the weight programs for women compared to men. Individual differences are more determined by sport specific training than gender. The beginning female athlete may need a longer general preparation period to elevate fitness levels. It maybe necessary to conduct more upper body strength work with the female athlete. Variation does play a key part in the continued improvement of the female athlete. Much more study is needed in order to understand the potential benefits and pitfalls of the menstrual cycle in the female athlete.



"Coach, I think I'm pregnant" What Research Says About Exercise During Pregnancy

By Catherine Sellers, USOC Manager of Coaching and Randall Wilber, Ph.D, USOC Senior Physiologist

Pregnancy has traditionally been treated almost as an illness. There are many old-time beliefs about exercise and pregnancy, but the current research literature along with the Guidelines of the American College of Obstetricians and Gynecologists (ACOG), the Joint Guidelines of the Canadian Society of Obstetricians and Gynaecologists (SOGC), Society for Exercise Physiology (CSEP) and the Sports Medicine- Australia (SMA) Guidelines will dispel a lot of those beliefs. The key factors, as discussed in this article, are the contraindications and concerns to exercise and what physiological changes that the athlete and coach can expect that will cause alterations in training.

CONTRAINDICATIONS TO EXERCISE DURING PREGNANCY

As a coach, you may have a lot of questions about training an athlete who is pregnant.
The athlete and you (as the coach) should seek the advice of the athlete's qualified medical provider to first determine if it is safe for the athlete to continue participating in the sport. (1) "Current research suggests that healthy pregnant women can begin or maintain moderate intensity aerobic exercise programs with little fear of adverse effects on their unborn fetus." (2) However, before the athlete and the coach develop a program all risks (health, obstetric and medical) should be reviewed and taken into account. (3)

Table 1 and 2 based on ACOG and SOGC/CSEP Guidelines list symptoms or conditions that would prevent an athlete from training while pregnant. "There are contraindications to exercise because of pre-existing or developing medical conditions, and pregnancy is not different. Certain obstetric complications may develop in pregnant women regardless of the previous level of fitness, which could preclude them from continuing to exercise safely during pregnancy." (3)

Table 1. Absolute Contraindications to Exercise in Pregnancy (3,4)

- Ruptured membranes
- Pre-term labor
- Hypertensive disorders of pregnancy
- Incompetent cervix
- Growth restricted fetus
- Multiple gestations at risk for pre-mature labor
- Placenta previa after 28th week
- Persistent 2nd or 3rd trimester bleeding
- Uncontrolled Type I diabetes, thyroid disease, or other serious cardiovascular, respiratory or systemic disorder

Table 2. Relative Contraindications to Exercise in Pregnancy (4)

- Previous spontaneous abortion
- Previous pre-term birth
- Mild/moderate cardiovascular disorder
- Mild/moderate respiratory disorder
- Anemia (hemoglobin below 100g/L)
- Malnutrition or eating disorder
- Twin pregnancy after 28th week
- Other significant medical conditions

There are sports and activities that are not recommended for pregnant women: scuba diving, mountain climbing, ice hockey, gymnastics, weight lifting (particularly in the third trimester due to Valsalva mechanism), water skiing, horseback riding, cycling and contact sports. (2, 4, 5, 8,) The risk increases later in pregnancy and "when there is a risk of high-speed blunt trauma (e.g. road cycling and downhill skiing)." (2)

The ACOG Guidelines developed an additional listing of signs to stop exercise and seek medical advice, if the athlete shows any of the signs in Table 3.

Table 3. Warning Signs to Terminate Exercise While Pregnant (4)

- Vaginal bleeding
- Pre-term labor
- Dyspnoea before exertion (difficult or labored breathing)
- Dizziness
- Headache
- Chest pains
- Muscle weakness
- Calf pain or swelling (need to rule out thrombophlebitis)
- Decreased fetal movement
- Amniotic fluid leakage

"The Physical Activity Readiness Medical Examination for Pregnancy (PARmed-X for Pregnancy) is a tool developed by the Canadian Society for Exercise Physiology and endorsed by the Society of Obstetricians and Gynaecologists of Canada and Health Canada (and available through CSEP's website http:"www.csep.ca/forms.asp) for screening women interested in participating in physical activity during pregnancy." (4) This form should be given to your doctor as it provides information on your levels of activity and medical history.

"All women without contraindications should be encouraged to participate in aerobic and strength-conditioning exercises as part of a healthy lifestyle during their pregnancy." (4) The research was quite clear of the benefits to being active during pregnancy.

PHYSIOLOGICAL CHANGES THAT AFFECT TRAINING

CARDIOVASCULAR

"The heart adapts to the increased demands placed on it by the enlarging uterus and growing fetus by increasing cardiac output 30% to 50% over the pre-pregnancy levels." (5) The stroke volume (amount of blood pumped by the left ventricle of the heart in one contraction) "increases by 10% by the end of the first trimester." (3). Clapp and Capeless (1997) showed that this postpartum stroke volume "gradually returned toward baseline, but remained significantly higher from pre-pregnancy values at one year after labor." (6)

"Several investigations also show a drop in the resting heart rate from late in the third trimester to postpartum." (6)

Noting the above physiological benefits, an endurance athlete may actually see improvements in performance during the first 12-15 weeks. After the 15th week, the increase in body weight and fetus weight will become a countering factor along with the increase in demand for oxygen which will begin "limiting the ability to perform high-intensity tasks." (5,8) There have not been a lot of studies done on elite female athletes and while moderate exercise is encouraged for the general population, "some highly conditioned women appear able to train safely at considerably more demanding levels." (8)

CARDIOVASCULAR CONCERNS

The literature notes three areas of concern. The first concern deals with training in the supine position, the second is training at altitude and the third is anemia.

When training an athlete should avoid laying face up (supine) and standing still during an activity or rest, as both positions have been shown to cause a decrease in cardiac output. (3,5)

Training at altitudes greater than 5280 ft may be of some concern. The impact of altitude makes training challenging for most athletes, but it has the potential to impact the oxygen delivered to the fetus. "The combined reduction in arterial oxygen content and uterine artery flow suggest that fetal oxygen delivery is compromised during exercise at altitude". (7)

As the case with all women, anemia is an issue. Anemia affects the ability of the blood to carry oxygen and can impact both mother and the fetus. (7)

METABOLIC

Overheating in the first trimester is a major concern. The increase in the body core temperature through exercise and environmental considerations of heat and humidity add to the difficulty of the pregnant woman to dissipate heat. "During pregnancy, basal metabolic rate, and therefore heat production, is increased above non-pregnant levels." (3)

"In animal studies, an increase in maternal core temperature of more than 1.5 o C during embryogenesis has been observed to cause major congenital malformations. These data coupled with the results of human studies suggest that hyperthermia (heat-related illnesses) in excess of 39o C (102.6o F) during the first 45-60 days of gestation may also be teratogenic (can cause malformations of an embryo or fetus) in humans. *However, there have been no reports that hyperthermia associated with exercise is teratogenic in humans". (3)*

The key is to hydrate, hydrate, hydrate and not participate in training during the heat of the day or when it is hot and humid. The coach should use the same precautions that guide them with other athletes, however, the pregnant athlete must be monitored daily and their hydration encouraged constantly. (2, 3, 5, 8) "Despite the fact that pregnancy adversely affects performance in the competitive athlete, most elite athletes prefer to continue to train during pregnancy. The relatively high intensity, long duration, and frequent workout schedules of most competitive athletes may place them at greater risk of thermoregulatory complications during pregnancy. Particular attention should be paid to maintaining proper hydration during and between these exercise sessions. Fluid balance during an exercise session can be monitored by weighing before and after the session. Any loss of weight is fluid loss that should be made up before the next exercise session (1 lb. weight loss = 1 pint of fluid)." (3)

MUSCULOSKELETAL

One of the obvious changes that take place is the increase in weight that occurs as the pregnancy progresses. The changes that occur alter balance and have an effect on the joints, particularly hips and knees. (3, 5) "The increase in hormone levels, especially progesterone, promotes ligament and joint laxity...The enlarging breasts also affect the woman's center of gravity, and their increased weight can contribute to upper back and shoulder pain." (5)

"Relatively light weights and moderate repetitions will maintain flexibility and muscle tone while minimizing the risk of ligament and joint injury." (8) Athlete and coach must remember that the hormones will cause the increase in joint laxity and to be aware that there are increased risk of ligament strains and boney trauma. (5)

NUTRITIONAL CONCERNS

"Pregnancy increases the calorie requirements by approximately 150 kcal per day in the first two trimesters, and by 300 kcal per day in the third trimester." (3, 5) Folic acid is highly recommended in the first trimester; vitamins and iron are generally recommended.

"The exercising pregnant woman should be encouraged to follow a diet that emphasizes complex carbohydrates to replace muscle glycogen lost during exercise, thereby minimizing the risk of fetal ketosis."(5) It is important to remember that exercise in itself burns calories in addition to the calories needed for the pregnancy.

INTENSITY OF TRAINING

There is a lot of variance in the recommendations for exercise intensity. One study which had five world-class athletes involved stated that "high fitness levels are maintained during pregnancy when appropriately strenuous training is maintained." (6) Kardel's study defined the work of the high intensity group as two 2.5 hour endurance bouts weekly while the moderate workout was 1.5 hours. The two groups also did a minimal amount of aerobic intervals (heart rate at 170-180 b.p.m.) and body weight muscle strengthening exercises. (6)

"Participation in competitive team sports is acceptable in the first 15 weeks of pregnancy, if the woman understands that there are potential, but unproven risks for fetal loss from pelvic trauma, abdominal trauma or both". (5)

Conclusion

Training for women without complicated pregnancies is possible within limits and those limits are continued to be defined. Concerns are:

1. Proper monitoring by qualified medical provider.
2. Hydration and regulation of heat production to protect mother and fetus.
3. Proper nutrition and caloric intake for the fetus, mother with consideration of exercise level.
4. The types of sports involved: contact, altitude, possibility of high speed trauma, etc.
5. Knowing the warning signs to stop exercise and seek medical advice.

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http://www.womenshealth.org/a/nutirition_eat_female_athlete.htm

Olympic Physicians Document Therapy for Female Athlete Disorder
http://www.medpagetoday.com/Psychiatry/GeneralPsychiatry/tb2/2658

Knee Injuries and the Female Athlete
http://www.nismat.org/ptcor/female_knee/index.html

Women's Sports Foundation
http://www.womenssportsfoundation.org

"Menstrual Dysfunction- the "Energy Drain" for Female Athletes-
http://www.pponline.co.uk/encyc/1027.htm

"Collegiate female athletes do not exhibit more disordered-eating symptoms than their non-athletic peers"
http://www.nata.org/newsrelease/archives/000248.html

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