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INSURANCE

THEME: WOMEN'S HEALTH

Overuse Injuries in Women

by M. Alysia Mastrangelo, Ph.D., FACSM



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Women have been empowered to exercise since the early seventies when Title IX of the Education Amendment of 1972 increased options for girls to participate in sports and athletics. As these women reach middle-age, they are experiencing overuse injuries. Common chronic injuries include stress fracture, plantar fasciitis, patellofemoral pain syndrome, patellar tendonitis, shoulder pathology and lateral epicondylitis.

Greater risk of injury exists for women because of anatomic and physiologic differences between a woman's body and a man's body. The mechanical alignment of the hip-knee-ankle is affected with a wider pelvis. The wide pelvis can cause the hips to turn outward which then leads the knees to turn inward. Women are at greater risk for overuse injuries because of weaker quadriceps (thigh) muscles and increased joint flexibility. Medial weakness of the thigh muscles increases anterior cruciate ligament knee injury.

Aging plays a role in the increased incidence of injury. As we age, our physiologic capabilities decrease. Women experience a decline in oxygen consumption (the ability to burn oxygen when exercising) beginning in their mid-30s. In their 40s, women experience a decrease in muscle

mass that leads to reduced force production (strength). This decrease occurs in the arms first and then later in the legs; loss of muscle endurance leads to a decrease in overall physical function as women age.

Chronic injuries

Stress fractures occur from repetitive forces. Women tend to have a higher incidence of stress fractures than men. Stress fractures are more common in amenorrheic women than normally menstruating women. Osteoporosis is more common in women as they age. A woman with osteoporosis or osteopenia, will be at greater risk of stress fracture because of decreased bone density.

Plantar fasciitis is one of the most common causes of heel pain. The pain is from inflammation of a thick band of tissue, called the plantar fascia that runs across the bottom of the foot and connects the heel bone to the toes. A hallmark symptom is heel pain when first getting up in the morning or after prolonged sitting. Treatment includes stretching the plantar fascia and Achilles tendon and strengthening the lower leg muscles. A physical therapist may use kinesiology tape to support the arch. Night splints provide stretching of the calf and arch while sleeping and orthotics can be used to support the arch and help distribute pressure across the foot.

Patellofemoral pain syndrome (PFPS) is characterized by a stable, but painful knee. PFPS is more common in female athletes because of the hip-knee-ankle alignment which may cause an increased Q-angle. The Q-angle is the line of pull of the quadriceps muscle based on the pelvis and tibial tuberosity (bump below the knee cap). This results in greater force toward the front and inner aspect of the knee. Conservative treatment is most effective and should include physical therapy; core strengthening, stretching of quadriceps and hip external rotator muscles, bracing and biomechanical analysis and correction.

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Letter from the Editor

by Dixie L. Thompson, Ph.D., FACSM

Welcome to the October 2014 edition of the *ACSM Fit Society*® Page, sponsored by Liberty Mutual. Most of us wish to be physically fit or currently are striving to achieve personal health goals. Among the myriad of health programs, fitness products, gyms and training regimens, it's not always easy to determine what choices are best for promoting personal health and wellness. This issue focuses specifically on issues related to exercise and health for women.

This issue of the *ACSM Fit Society*® Page was organized by ACSM's Strategic Health Initiative for Women, Sport and Physical Activity. The committee was founded in 1994 to educate and disseminate information to the public and scientific community related to women's issues in sports and physical activity. The committee also honors ACSM's women leaders and members during the Josephine L. Rathbone Memorial Breakfast held annually at the ACSM Annual Meeting. Special thanks to Committee Chair Laura Q. Rogers, M.D., MPH, and committee authors.

After you have read this information that ACSM experts have prepared for you, please share it with friends and family. We hope these articles will help you as you pursue a healthy and active life.

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Overuse Injuries (continued from page 1)

Patellar tendinitis is characterized by anterior knee pain. Pain increases with running and jumping activities. Pain symptoms may intensify during the night and upon waking in the morning. Increased time and intensity of training increases symptoms. The symptoms decrease functional abilities. Treatment of patellar tendinitis is dependent on the severity of pain. Conservative treatment should be used first. If pain continues or increases, cortisone injections can help manage the pain and swelling, or surgical treatment may be required.

Lateral epicondylitis, often called tennis elbow, is an overuse injury to the tendons at the lateral humeral epicondyle (bands of tissue that connect the arm muscles to the outside aspect of your elbow area). Lateral epicondylitis most often occurs in women between 30-50 years of age. Activity which involves repeated wrist extension against resistance (tennis backhand stroke) increases risk. Symptoms are point-specific to the outer aspect of the elbow. Conservative treatment is most effective and should include physical therapy, bracing and biomechanical

analysis and correction of repetitive activity. In severe cases, surgical treatment may be required.

Scar tissue may form from chronic inflammatory conditions (e.g., plantar fasciitis, patellar tendonitis, and lateral epicondylitis). The scar tissue will limit the ability to move the joint and perform daily activities. When surgical treatment is an option, a new and minimally invasive procedure known as FAST™ (Fasciotomy and Surgical Tenotomy) may be an alternative. The FAST™ procedure removes the scarred tissue causing the pain. The technique delivers ultrasonic energy that breaks up and safely removes the pain-causing damaged tissue without disturbing surrounding healthy areas.

Adhesive capsulitis or frozen shoulder is seen most often in women between 40-70 years of age. It is often seen in combination with other shoulder conditions (e.g., rotator cuff pathology) or diabetes mellitus. The hallmark symptom of adhesive capsulitis is decreased range of motion and severe shoulder pain. The condition is often self-limited. Treatment of adhesive capsulitis is not conclusive. Conservative treatment is

common, but relief of symptoms is gradual and recovery takes a long time (12-18 months on average). Surgical options for adhesive capsulitis include joint manipulation under anesthesia and capsular release.

Overuse injuries will not recover unless use is suspended. Biomechanical analysis and correction are components to successful recovery and should be performed by sports medicine professionals. Prevention is also a key component by maintaining a fit and healthy lifestyle. If one wants to prevent chronic overuse injuries, participation in a comprehensive fitness program (one that includes aerobic, resistance, flexibility, and balance) is recommended. Check with your physician before starting an exercise program. Core training and strength training are necessary for maintaining muscular strength and endurance. The physiology of aging contributes to a loss of muscular function; strength training at all ages can minimize this loss. In addition, fitness and proper nutrition are important to maintaining a healthy lifestyle throughout the lifespan.

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Q&A

by James MacDonald, M.D., MPH

Q: I have a 16-year-old daughter who runs cross country and was just diagnosed with a stress fracture of her shin. I have read that stress fractures in girls can be a sign of 'Female Athlete Triad' (F.A.T.). Should I be worried that my daughter may have F.A.T.?

A: F.A.T. is increasingly recognized as a problem, and rightfully so: in some studies, as many as 80 percent of young female athletes have at least one component of the triad.

F.A.T. is a medical condition often seen in physically active girls and women and is comprised of three findings: 1) low bone mineral density (sometimes showing up initially as a stress fracture); 2) menstrual dysfunction (infrequent or absent periods in an adolescent or adult); 3) low energy availability (not eating enough to support one's energy needs). It's low energy availability (EA), that causes F.A.T.

Low EA refers ultimately to the difference between dietary intake and energy expenditure. An adequate amount of calories must be consumed in a day to support the normal metabolism of an individual along with what they 'burn' during exercise. If there is a mismatch between calories consumed and calories burned, low EA can develop.

Low EA sometimes shows up in an obvious fashion: we occasionally see young female athletes who also have outright eating disorders, or a very low body mass index (BMI). An older adolescent or adult woman should have a BMI > 17.5 kg/m². Most of the time, low EA shows up more subtly, and it may take a clinician and a nutritionist to diagnose the issue.

F.A.T. is a concern for many reasons. From an athlete's point of view, low EA—the cause of F.A.T.—can cause notable declines in athletic performance. More medically significant, low EA can lead to low levels of estrogen in the body; this subsequently causes menstrual disturbances and even low bone mineral density, leading eventually to osteoporosis.

So, in answer to your original question: yes, you should be worried about the possibility of F.A.T. in your daughter. Make sure the clinician taking care of the stress fracture is also inquiring about menstrual patterns, dietary intake and checking her BMI. The ultimate treatment for the stress fracture, and for her overall health, may lie in how much she eats.

Q: I am a 52-year-old masters swimmer. I am very healthy aside from having early arthritis in my right knee. I went through menopause about five years ago. My doctor just told me I have osteopenia. My mother had really bad osteoporosis before she died, and I want to do everything I can to avoid this. What is the best exercise I can do for my bones as I get older?

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State of Physical Activity in Women: A Call to Action

by Elizabeth Skidmore Edwards, Ph.D.



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Despite the well-established health benefits of regular aerobic physical activity, only half of U.S. adult women report meeting *Physical Activity Guidelines* target of 150 minutes per week of moderate to vigorous physical activity. Given that objectively measured data generally show that people overestimate physical activity levels, the percentage of women engaging in adequate physical activity is likely much less than reported. Fewer than one in five women meet the guidelines for both aerobic and strength activities (at least two days per week of muscle-strengthening exercises). Generally, women are less likely than men to achieve recommended levels of exercise.

Participation in physical activity for both sexes is at its highest in childhood, with levels declining as children reach adolescence. This decline often continues through an individual's young-adult life and then stabilizes around middle-age. Females begin to participate in less physical activity than males by grades four-six, despite having levels of physical activity participation on par with their male counterparts in earlier years.

The benefits of physical activity include the prevention or delay of several chronic diseases, including but not limited to heart disease, type 2 diabetes and certain types of cancer. Benefits of particular relevance for women include improved bone health, lower rates of breast cancer diagnosis and relapse, and improved maternal and fetal outcomes during pregnancy.

Regular physical activity is also associated with psychosocial benefits such as improved self-esteem and quality of life. Additional research is needed to clarify how the percentages of female participation in health-enhancing physical activity can be improved.

Recognizing barriers to participation in exercise is an important first step in determining how to help women incorporate physical activity into their lives in sustainable and meaningful ways. Both men and women report lack of time, energy and motivation as primary factors that keep them from participating in physical activity. Of these, lack of energy and motivation are reported as more important in preventing physical activity participation among women than men. Similarly, more women than men report lack of skills, safe places and fear of injury or feeling uncomfortable as barriers to their participation in physical activity. Unfortunately, less emphasis is placed on the importance and value of physical activity levels to the development of basic motor skills in young girls compared to young boys. This may set the stage for women being less likely to engage in active pursuits across the lifespan.

The greater incidence of reported lack of motivation from women (more than one-half of women say this is an important factor in their lack of physical activity participation) may indicate that current messages used to highlight the importance of physical activity don't resonate as well with women as with men. Emphasizing the importance of physical activity for overall family health may be one approach to encourage women to engage in family-focused physical activity. Using public health messaging to help identify time and cost-effective means of incorporating activity into the family unit is one promising approach to increasing overall national physical activity levels.

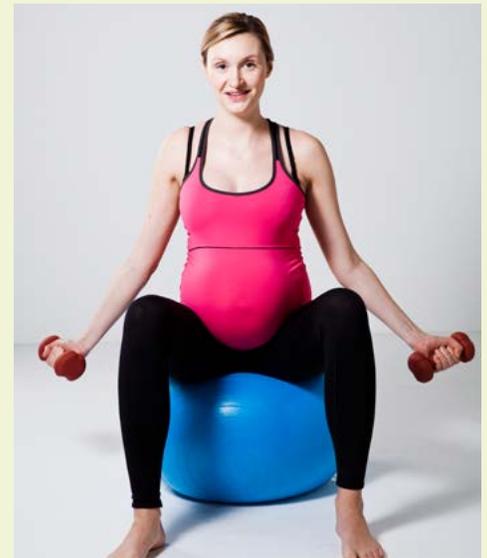
The report of lack of skills, safe spaces, fear of injury or feeling uncomfortable as more likely barriers in women than men may represent opportunities that are addressable. Physical activity, when performed properly and at moderate intensities, is both safe and beneficial. It's essential that we develop opportunities that are available and attractive to women to help them get over their initial reluctance to be active. It is also imperative that we ensure there are safe, affordable places for women to be active. There are also private business opportunities companies can develop to target the 50 percent of women who are not sufficiently active in order to help them develop the skills and confidence needed to become and remain active.

Given that barriers will likely differ based on personal experience, cultural factors and available resources, it is important that exercise and public health professionals work with the women in their communities to understand

and address the most important barriers they encounter. Physical activity can be a significant positive influence in a woman's life, but it's up to the exercise and public health professionals to help develop and implement programs that allow women to see physical activity as an asset, as opposed to a burden, across the lifespan.

Exercise During Pregnancy and Post-Partum

by Linda E. May, Ph.D.



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The American College of Sports Medicine (ACSM) and American Congress of Obstetrics and Gynecology (ACOG) have similar guidelines that encourage pregnant women to engage in health-related physical activity during pregnancy. Before beginning an exercise program, pregnant women should complete a screening questionnaire (e.g., PARmed-X; www.csep.ca/forms.asp) and discuss exercise options with their obstetric provider to ensure it is safe for her (and her baby) to exercise.

During pregnancy, the goals are to maintain/increase fitness and avoid exertion that could be harmful to mother or fetus. The intensity of exercise that is safe and appropriate varies among individuals and changes across the length of the pregnancy. ACOG recommends that women who are healthy should accumulate 30 minutes or more of activity on most days of the week. *ACSM Guidelines* suggest the following approach to safe exercise during pregnancy:

Frequency: 3-4 days per week

Intensity: For most women, moderate intensity exercise is the appropriate approach to take. Women who are unfit and/or obese should

engage in light intensity exercise during pregnancy. Using the 'talk test' (women should maintain the ability to talk without difficulty while exercising) will help women judge if their exercise intensity is too high. Similarly, women can use a subjective rating of 'moderate effort' as an indicator that they are exercising at an appropriate level. Women who were previously engaged in vigorous-intensity exercise may be able to continue with vigorous exercise into their pregnancies. For additional information from ACSM about rating your exertion level, view the [ACSM Current Comment on Perceived Exertion](#).

Time: This will be dependent on the intensity. For women who are healthy, a goal of a total of 150 minutes per week is recommended, with daily amounts of 30 minutes or more. Amounts can be shorter as needed to fit the time and fitness considerations.

Type: Large muscle group activities used in rhythmic and dynamic movement such as walking or swimming. Alternative exercises, such as yoga, are growing in popularity among pregnant women.

Pregnant women can participate in many types of physical activities. For safety, it is advised to avoid contact sports (ice hockey, ball sports, court sports, gymnastics, horseback riding, water skiing, martial arts, etc.) and modify other activities (e.g., stationary instead of road cycling). The most common aerobic exercises are walking, stationary cycling, and swimming (all low impact). High impact exercises, such as jogging, running, and aerobics are safe during pregnancy for healthy, trained women that are low risk.

Resistance exercises can also be done regardless of prior training level. Strength training should include: 5-10 minute warm-up, 20-45 minutes resistance, and 5-10 minutes cool down. Resistance should focus on major muscle groups, 1-3 sets and 10-15 repetitions. Untrained women should have direct supervision and use weight machines to control range of movement. Abdominal exercises should be done and can be safely modified by sitting at an angle, on the side, seated or standing. All women should do 100 contractions of pelvic floor muscles (i.e. Kegel exercises) per day. It is important to ensure proper breathing technique during exercises.

Once medically cleared after delivery and she feels ready (about one to six weeks post-partum), a new mother can ease back into her exercise routine without adverse effects. Gradual return to previous activities levels can be done as long as she is symptom-free (i.e., no pain or increased vaginal discharge). Exercising in the post-partum period can help reduce body weight and postpartum depression.

In pregnancy and postpartum, the workout

environment should avoid extremes of temperature and humidity. Prior to, during and after the workout, women should stay well-hydrated. Also, a healthy snack prior to exercise is recommended. To avoid injury during exercise, it is important for women to wear clothing that allows unrestricted movements, and supports the abdomen (pregnancy) and breast tissue (pregnancy/postpartum).

In summary, current guidelines recommend women with a healthy pregnancy to participate in 30 minutes or more of moderate exercise, most or all days of the week. For women who participate in exercise prior to conception, 30 or more minutes every day is safe, as long as she remains symptom-free. For women who were previously sedentary prior to pregnancy, it is recommended to start slowly at three sessions per week and progress to at least 30 minutes three times per week. Pregnant and lactating women should always exercise in a comfortable environment and stay well hydrated. Additionally, women must ensure they are wearing appropriate clothing to support their changing anatomy during pregnancy and post-partum period.

THEME: WOMEN'S HEALTH

Body Image & Health in Minority Women: Socio-Cultural Differences

by Lyndsey Hornbuckle, Ph.D., RD



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The ever-present media promotion of thin as the ideal goal for body weight in females has been the cause for considerable dialogue in recent years. Our culture in the United States, in particular, may even place an unhealthy emphasis on the importance of obtaining and/or maintaining a thinner body type. With the media as a widespread and persistent source of external pressure, it is not surprising that body dissatisfaction issues, especially among females, are a growing concern. Whereas body dissatisfaction once appeared relatively

exclusive to individuals battling some form of eating disorder, research shows that an increasing number of women of normal weight classification are also dissatisfied with their body type. Although studies show that the media influences a woman's desire to achieve the "ideal," thin body type, it is also apparent that socio-cultural influence may play a key role in a woman's response to the thin media images. Specifically, research has shown that women of different races, ethnicities and cultures have different responses to media images and influence.

Although excessive weight and obesity are more prevalent in African-American and Hispanic women in the United States, many studies have shown that these two subgroups are generally more satisfied with their body size, weight and shape when compared to both caucasian and Asian women in the United States. In fact, African-American women currently have the highest prevalence of being overweight and obese of all four groups, yet there is strong evidence that they have less disordered eating habits, report feeling less pressure to obtain a thin body type and are less affected by weight-related quality of life issues compared to other women. In contrast, Asian women are more inclined to have similar beauty ideals as caucasian women, however, Asian women have also been shown to have lower self-esteem than their caucasian counterparts. While different than body image, yet related to self-esteem, it is also noteworthy that Asian women have reported less satisfaction with their eyes and face compared to caucasian women and feel that these ethnic characteristics hinder them from achieving the mainstream ideals of beauty. Research has uncovered reasons why these attitude differences may exist.

Not surprisingly, it seems that an individual's opinion of exactly what beauty entails plays a significant role in body satisfaction. It has been suggested that strength in one's own ethnic identity contributes to body satisfaction. Studies have shown that a full, curvy body type is considered healthy and desirable among African-American and Hispanic women. Therefore, these groups often do not relate to the mainstream American media's portrayal of beauty. Although body satisfaction is encouraged and a desirable trait, it can complicate communication when health professionals attempt to point out that excess weight is a cause of many negative health risks. Acculturation, or the gradual transformation of psychological and cultural change that occurs when one culture is introduced to another, has also been shown to have an effect on eating habits, which are often linked to body satisfaction in women. Greater acculturation to the American culture has been associated with disordered eating in Hispanic women, and research has also shown that Asians who diet are more acculturated than those who **(continued on page 5)**

Body Image (continued from page 4)

do not. One should also note that Hispanic women can represent several ethnic backgrounds (Cuban, Mexican, Puerto Rican, etc.) and races. However, most research studies categorize them under this single, unspecific category. This may be significant because attitudes toward body image could differ among different groups of Hispanic women.

In conclusion, variations in social and cultural ideals do influence a woman's overall body image and body satisfaction. With the obesity epidemic still on the rise in the United States, it can be difficult to balance the weight recommendations of health care professionals with maintaining a healthy, positive psyche. There are concerns associated with any unhealthy weight status, whether it be underweight (see Female Athlete Triad article in this issue) or overweight/obese. Therefore, striving to achieve a body weight and body composition (fat versus muscle) that is realistic and healthy for each individual is often the best strategy. Obtaining that healthy balance should be the focus for all women, particularly young girls and adolescents who are beginning to shape their attitudes toward body image and ideals of beauty. Consuming a well-balanced diet containing a variety of key nutrients and obtaining regular physical activity, are certainly the most favorable approaches to achieving optimal physical health overall, which will support a healthy body image and encourage body satisfaction in women throughout the lifespan.

THEME: WOMEN'S HEALTH

Women and Osteoporosis

by Stephanie Otto, Ph.D.



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As health care, nutrition and education have improved, the average life expectancy in the U.S. has increased. With longer life, other health concerns may emerge. Osteoporosis is a disease

associated with older age characterized by low bone mineral density and breakdown of bone tissue. According to the National Osteoporosis Foundation, approximately 54 million Americans currently have osteoporosis and low bone mass. Research suggests that one in two women and one in four men over the age of 50 will break a bone due to this condition. The hip, spine, and wrist are among the major fracture sites. Height loss and changes in bone shape can also result from fractures and breaks in bone tissue. By 2025, osteoporosis will be responsible for three million fractures and \$25.3 billion in related medical costs each year.

Bone mineral density begins developing in vitro and, under normal health conditions, continues into the late twenties or early thirties. During these developmental years, exposure to healthy levels of bone-building nutrients such as calcium and vitamin D, along with adequate levels of weight-bearing activity generally result in a higher peak bone mineral density accrual. After these years, building bone becomes more difficult, so the primary goal shifts to maintaining or slowing the decline in bone mineral loss in an effort to avoid developing low bone mass or osteoporosis. There are a variety of risk factors, within and outside of our control to consider.

Osteoporosis generally develops over a long period of time and results from the combination of physical, genetic and lifestyle components. Risk factors outside of our control include being over the age of 50, female and post-menopausal. Having a family history of osteoporosis, low body weight, broken bones or height loss are also considered nonmodifiable risk factors. Approximately 80 percent of total bone mineral accrual can be attributed to genetic factors while the remaining 20 percent is the result of factors within our control. Alcohol consumption, weight loss, smoking and inadequate calcium and vitamin D intake are among some of the modifiable risk factors. Physical inactivity is also among the lifestyle factors, which can contribute to the development of osteoporosis.

According to the *American College of Sports Medicine's (ACSM) Position Stand on Physical Activity and Bone Health*, moderate to high intensity levels of weight bearing physical activity are thought to protect bone mineral density among adults. There is some question as to the most effective types of weight-bearing activity, but suggestions include activities involving jumping such as volleyball or basketball, weight bearing endurance activity such as stair climbing or jogging, and resistance training or weight lifting. Bone mineral density is a highly responsive tissue and will react to these types of activity by becoming stronger. Recommendations suggest performing these types of activity three to five times per week

for 30-60 minutes. Finding the right type of activities to stimulate bone health and also fit the needs of the individual client may take input from a fitness professional. Without adequate stimulus, bone mineral density will decline, eventually resulting in weak bone structure and possibly osteoporosis.

Osteoporosis is an increasing concern among aging adults. There are a wide variety of risk factors within and outside of our control that contribute to the development of this condition. According to the ACSM and National Osteoporosis Foundation, participation in weight bearing physical activity is one of the important steps individuals can take in an effort to prevent the development of this serious condition.

THE ATHLETE'S KITCHEN

Fueling on a Budget

by Nancy Clark, MS, RD, CSSD



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“When we travel as a team, we eat at fast food places because they fit with our small budget. What's the best fast food for athletes?”

“After my workout, the last thing I want to do is cook dinner. Where can I buy affordable, but healthy, sports meals?”

A limited food budget creates a fueling challenge for many athletes, including college teams traveling to games, students responsible for their own meals, parents of active kids and semi-pro players hoping to get to the next level. The name of the fueling game is: How can you buy enough healthy calories with the least amount of money? These practical tips can help optimize a low-budget sports diet.

1. Encourage the team bus (or your car) to stop at a large supermarket.

Everyone can find something they like: vegetarians, gluten-free eaters, picky eaters who want to lose weight and chowhounds who need lots of calories. By walking around the inside perimeter of the store, you will find the makings for a balanced meal—even hot meals, if desired.

Shop for:

Fresh fruit: Banana, apple, pear, grapes. Buy what's on sale.

Fresh veggies: While you can easily create a colorful salad at the salad bar area, it might be a bit pricey. The simpler option is to buy a green or red pepper (eat it whole, as you might eat an apple), a bag of baby carrots (along with a container of hummus), or a container of cherry tomatoes. Enjoy the whole thing; a hefty dose of veggies on one day can help compensate for another day when you have none.

(To clean the fresh produce, plan ahead. Pack extra water to rinse the produce before getting on the bus. Or nicely ask an employee in the store's produce area if he or she could help you by giving the fresh produce a quick rinse.)

Protein: Buy a quarter-pound of deli turkey, roast beef or ham along with a few whole-wheat rolls to make sandwiches. Small or large tubs of cottage cheese, tuna packets and peanut butter are other popular protein options. Share a rotisserie chicken with friends (or save the leftovers if you can refrigerate them within an hour.)

Grains and other carbs: Pita, wraps, baked chips, whole-grain crackers and pretzels are carb-based options that refuel your muscles. Look for freshly baked whole-wheat rolls, hearty breads and whole-grain bagels. You might be able to find a plastic knife at the salad bar so you can slice the rolls to make a nice sandwich with deli meat and low-fat cheese. Pop a few cherry tomatoes between bites, and you'll have a balanced meal with all four food groups: 1) lean meats/beans/nuts, 2) low-fat dairy or calcium-alternative, 3) fruit/vegetable and 4) grain.

Calcium-rich foods: You can easily buy a small or large tub of low-fat yogurt, a single milk chug—or even a whole quart of chocolate milk if you are really hungry. For athletes who are dairy-free, soy milk is a fine alternative. Pick up some pre-sliced, low-fat cheese in the dairy or deli area. (Note: Hard cheese, such as cheddar, is lactose-free and comes in convenient single portions.) Add an apple and whole grain crackers—voila, a balanced sports meal! While it may not be the hot meal your mom had in mind, it will do the job of contributing needed nutrients to refuel from the day's event, fuel-up for tomorrow and invest in future good health.

Beverages: You can save a lot of money (plus save space in landfills) by packing your own gallon jug of water. To spend money on plain water (void of calories, carbs and vitamins) seems wasteful when tap water is free.

Instead, buy 100 percent juice (orange, grape, carrot, V-8) to boost your fruit/veggie intake and simultaneously boost your immune system with anti-inflammatory phytochemicals. Plus, 100 percent juice is a strong source of carbohydrate to refuel depleted muscles, as well as fluid to replace sweat losses. Chocolate milk is another winning beverage, with protein to build and repair exhausted muscles, as well as carbs to refuel them.

If the team bus (or your car) is pulling into a fast food restaurant, at least choose one that will support the nutritional needs of athletes. Here are a few suggestions:

- At a Mexican restaurant, you can get healthy calories for a bargain price when you order a bean burrito. Some chains offer bean burritos for as low as \$2.00.
- At a burger place, choose a grilled chicken sandwich (no fries). It will be more expensive and offer fewer calories than a burger, so plan to supplement the sandwich with some healthy snack (e.g., pretzels or raisins) that you pre-packed from home.
- At a pizza place, order the cheese pizza, preferably with veggie toppings like mushroom, pepper and/or onion. To avoid fat-loading, nix the pepperoni, sausage and other greasy meat options, as well as the double cheese. It would fill your stomach but leave your muscles poorly fueled. Remember: muscles need carbs (such as thick pizza crust) to replenish glycogen stores.
- Be cautious of super salads. While they have a seemingly healthy glow, they can be unfriendly for many sports diets, particularly if you are weight-conscious. Making a substantial salad with not only colorful veggies but also grated cheese, chopped egg, diced chicken, slivered almonds, pumpkin seeds and olives offers you a hefty dose of calories, but not enough grains/carbs to refuel your muscles. Adding even a little bit of dressing to a big salad often adds 400 or more calories. Making wise decisions in building a super salad is key. A sandwich can have fewer calories.
- Hungry athletes who need lots of inexpensive calories can do well by packing sandwiches made with peanut butter & jelly (or PB & jam, honey, raisins, banana, pickles or even cottage cheese—whatever tastes good to you). Peanut butter is versatile and a great sports food because it offers protein, B-vitamins, and good fats that knock down inflammation. It's inexpensive, travels well without refrigeration, is good for you and tastes great! It's even good for dieters because it keeps you feeling fed, and curbs the urge to eat cookies. It will cost about \$2 to slap together a hefty 600-calorie PB&J (made with two slices of bread, three tablespoons all-natural peanut butter, and two tablespoons grape jelly). Shop wisely and fuel well!

THEME: WOMEN'S HEALTH

What Do Active Women Need to Know About the Female Athlete Triad?

by Jay Lieberman, MA, and Nancy I. Williams, Sc.D.



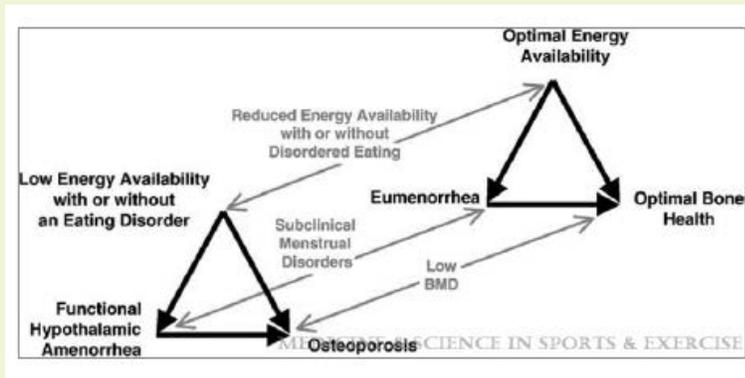
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Female Athlete Triad Overview

Female participation in sport and exercise has substantially increased over the last 50 years, resulting in benefits to women's health. However, for some highly active females, there can be negative health consequences associated with exercise training that can affect reproductive, skeletal and metabolic health. The identification of a clinical syndrome referred to as the Female Athlete Triad has helped to explain these effects and prompt research on prevention and treatment. The triad involves three interrelated components: low energy availability (EA) with or without disordered eating, menstrual disturbances and low bone mineral density (BMD). A recent consensus statement provides the latest information on prevention and treatment of the triad.

Low Energy Availability is the Cause of the Triad

The cause of menstrual disturbances and low BMD in women with the triad is likely low EA. EA is quantitatively defined as the difference between caloric intake (i.e., how many calories you eat) and exercise energy expenditure (i.e., how many calories you burn



when exercising), relative to lean body mass (LBM; the nonfat part of your body). When EA is reduced beneath a threshold of 30 kcal/kg/LBM, there appears to be a repartitioning of energy in the body, so that essential physiologic functions can be maintained, while non-essential functions such as reproduction are diminished or suspended (e.g., estrogen levels decrease). For example, disruptions in the menstrual cycle can occur when daily intake falls below 2000 calories in a young woman who weighs 145 pounds, has 117 pounds of lean mass, and expends 450 calories per day through exercise. When both energy intake and estrogen are low for a prolonged period, bones thin (low BMD) and stress fractures can occur. Too often women who train heavily have insufficient caloric intake to match high exercise expenditures resulting in low EA. Factors that can make this worse include eating disorders (e.g., anorexia, bulimia), disordered eating practices (e.g., skipping meals, fasting, using diet pills), undereating for practical reasons or inability to experience adequate hunger cues.

Identifying low EA can be difficult outside of a laboratory, but signs of low EA include fatigue, low body mass index (BMI <18.5), and (or) low body weight. Also, athletes who are seeking to lose weight, and (or) dieting should be aware of, and avoid, low EA. Once an individual has been identified as having low EA, EA is best increased by seeking consultation from a registered dietician in order to increase caloric intake and (or) decrease exercise expenditure. Consultation from a mental health professional is critical if there is an underlying eating disorder. The primary goals to measure the success of increasing EA include reversing recent weight loss, achieving a BMI \geq 18.5, and returning to a weight that was associated with menses (if the individual has previously menstruated).

Changes in the Menstrual Cycle

Triad associated menstrual cycle disturbances appear to progress on a continuum. Specifically, luteal phase defects (luteal phase < 11 days in length and (or) insufficient luteal phase progesterone concentrations) and anovulation (failure to ovulate) are less severe menstrual disturbances associated with the triad. More severe menstrual cycle disturbances include

oligomenorrhea, menstrual cycle that lasts 36-89 days and amenorrhea (absence of menses for 90 or more days or lacking menstruation beyond 15 years of age). Amenorrhea can occur in as many as 65 percent of women engaged in high energy expenditure and (or) lean build sports such as long distance running, cycling or gymnastics; therefore, it is important to screen for this condition in these sports. Subclinical menstrual disturbances are unlikely to be detected in a field setting; however, oligomenorrhea and amenorrhea can be detected through questionnaires or verbal questioning by a practitioner. Menstrual disturbances are best treated by increasing EA, where the goal should be to achieve regular menstrual cyclicality.

Low Bone Mineral Density

When amenorrhea or possibly less severe menstrual disturbances occur over a prolonged period of time, there can be a loss of BMD due to decreased estrogen exposure and decreased energy and micronutrient intake. As a result of these alterations in bone, there is an increased risk for stress fractures in the short-term and potentially increased risk for osteoporotic fractures later in life.

Decrements in BMD are assessed with dual-energy X-ray absorptiometry (DXA; “bone scan”). But in nonclinical settings, DXA is often not available; therefore, variables correlated with low BMD such as BMI (<18.5), body weight, menstrual history and history of stress fractures are most useful as clues that low BMD may be present. Low BMD is best treated by increasing EA which increases body weight and reverses menstrual disturbances. Medications can treat severely low BMD when other, more conservative, interventions have failed. If low BMD is suspected, a physician should be consulted.

In conclusion, the triad is an interrelated clinical condition affecting reproductive and bone health that is caused by low EA, which often results from an eating disorder. The optimal treatment for this condition involves increasing energy intake and (or) decreasing exercise expenditure such that EA increases. Ideally, consultation with a multidisciplinary sports medicine team should be done in order to provide a comprehensive approach to client/patient care.

Q&A (continued from page 2)

A: Your doctor will probably prescribe or recommend several treatments to prevent your osteopenia from advancing to osteoporosis. Exercise should definitely be part of the regimen.

The ‘best’ exercise for someone always involves taking into consideration their individual goals, individual preferences and individual medical needs. The physician taking care of you should approach your ‘exercise prescription’ with the same rigor that he/she may when prescribing a drug. As an example, swimming—which can be a great, whole body workout—can definitely be something you continue to do. Swimming can be an excellent exercise for someone with knee arthritis. It sounds like you enjoy it as well! But you should not rely solely on swimming to help you with your individual goal and individual need for improving your bone health.

Why not swimming? Because it is not an impact or weight-bearing exercise. Dancing, jogging, playing tennis are all weight-bearing, impact exercises; it is these sorts of exercises that help build bones and keep them strong.

Some people may find such higher impact exercises hard on their joints. For an individual with osteopenia, jogging may be good for the bones but bad for the joint. In that case, one may consider walking or using exercise equipment such as stair-step machines.

Finally, as you work on bone strength, you will also want to work on minimizing your risk of falls. Osteopenic or osteoporotic bones are more vulnerable to breaking; older individuals with these conditions are more apt to break a hip or their wrist with a fall doing yard work, for instance. Studies have demonstrated that exercises which build muscle strength and overall balance can lower your chance of falls. Be sure to add some resistance training—using exercise bands, dumbbells or weight machines—to your workout routine. And, add as well exercises that emphasize balance, such as yoga or Tai Chi.

So check in with your doctor and get an individualized exercise prescription!



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