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Letter from the Editor

by Dixie Thompson, Ph.D., FACSM

Welcome to the Spring 2009 issue of the *ACSM Fit Society* Page! In this special issue, we focus our attention on a portion of the population that comprises millions: cancer sufferers and survivors. You will find information on exercise strategies specific to cancer patients. We also include exercise and nutritional tips targeting the prevention of cancer.

Even if cancer has yet to affect your own life, we hope you use the information contained in this issue to help keep your risk low. As always, thank you for your readership!

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THEME: CANCER AND EXERCISE

Nutrition and Cancer Prevention

by Ruth MacDonald, R.D., Ph.D.



Cancer is a frightening disease that affects the lives of millions worldwide. Many of us know someone personally who has struggled with cancer or has lost a loved one to this disease – or have suffered from it ourselves.

The good news is that recent National Cancer Institute statistics show a reduction in the incidence of cancer in the United States. This may be due in part to earlier detection and better screening for cancers, or perhaps it reflects a reduction in the number of people who smoke cigarettes. Cancer is a complex disease that can occur in almost all types of cells in our body, and there is no single cause of cancer. Some factors, such as cigarette smoking, have clear links to cancer. Other strongly linked factors include exposure to radiation (including sunlight), and environmental chemicals and pollutants. For centuries, foods have been linked to cancer, in both promotion and protective capacities. More recently, we are learning that physical activity and maintaining a healthy weight are also closely linked to reducing cancer risk.

All foods, from fruits and vegetables to processed cheese and cookies, are complex mixtures of many chemicals. Foods contain known nutrients like carbohydrates, fats, proteins, vitamins and minerals; but also thousands of other chemicals such as polyphenols, tannins, catechins, sterols and flavonols. Hence, to understand the role of foods in cancer, we must understand the chemical composition of foods and the roles of these specific chemicals in the cancer process. This is a daunting task and one that may never be fully completed because of the number of chemicals and the multitude of possible interactions in a normal diet.

There are several ways to study the associations between foods and cancer. One way is to compare cancer incidence in populations with the foods they consume. This type of epidemiological study provides correlations but cannot prove cause and effect, but it does allow scientists to identify which dietary factors may be most important for further study. Over the past 50 years, many studies have been conducted to clarify the role of foods and ingredients in cancer. Some of these have been popularized in the lay press and have been promoted in the grocery store. For example, higher intakes of dietary fiber were correlated with lower risk of colon cancer. As a result of this finding, food manufacturers rushed to increase the fiber content of foods and promoted high fiber diets to reduce colon cancer risk. Subsequent large human clinical trials, however, have been ambiguous about the protective effects of fiber in colon cancer.

Another dietary component thought to play a significant role in cancer is dietary fat. Some studies found a higher incidence of breast and colon cancer in populations that consumed high amounts of fat. Many studies were done to identify the specific types of fat and the mechanisms through which these components may impact cancer risk, but as with fiber, large human studies of dietary fat related to cancer have not shown a clear relationship. This is frustrating to consumers, but reflects the complexity of the disease, the diet, and the interactions between the two that occur in the human body. As we develop better molecular

tools, it is likely that we will be able to clarify which genetic factors influence the response to dietary components in individuals. While we wait for science to reach this point, diets high in fiber and low in fat may have many positive health benefits and continue to be recommended to reduce cancer risk.

Food ingredients, including flavors, colors, preservatives and artificial sweeteners, have been widely publicized as cancer-causing. These concerns are largely unfounded. The FDA has stringent requirements to demonstrate safety before any component is added to the nation's food supply. While we may never be fully sure that a chemical will never cause cancer given the right environment in a specific individual, the U.S. food supply is very safe. However, we may not assume that the food supply is free of carcinogens, because some edible plants contain naturally occurring mutagenic compounds and environmental pollutants do contaminate plant and animal foods. In general, these are in very low concentrations.

To reduce the risk of exposure to these compounds, one should consume a wide variety of foods from reputable sources.

The American Institute for Cancer Research has undertaken an extensive evaluation of the scientific research of the relationships among foods and cancer. They have identified the following foods as being helpful in reducing the risk of the main forms of cancer in the United States, to include breast, prostate and colon cancers. These foods should be part of one's everyday diet, because they are rich in vitamins, minerals, fiber and many beneficial compounds such as polyphenols, flavonoids and catechins, which have a variety of positive effects on the body.

- Citrus fruits, grapes and berries
- Cruciferous vegetables (broccoli, cauliflower)
- Dark green leafy vegetables (spinach, kale)
- Colorful vegetables (tomatoes, squash, pumpkin)
- Beans
- Whole grains

- Fish and flaxseed
- Dairy foods (yogurt, skim milk)
- Nuts (walnuts, almonds)
- Green and black tea

While a healthy diet is critically important to lowering cancer risk, many other lifestyle features are also important. Here are ways to improve overall health and protect yourself from cancer:

- Avoid smoked, salted or burnt meats
- Seek a balanced diet, adequate in protein, fat and carbohydrates
- Maintain a healthy weight
- Perform regular exercise
- Avoid sugary drinks and high-fat foods
- Get routine screenings and checkups
- Don't smoke
- Get enough sleep
- Use household and farm chemicals properly
- Enjoy life and manage stress

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Q&A

By Anthony Luke, M.D., MPH, FACSM

Q: I've heard that exercise is helpful even though I am undergoing chemotherapy treatment for cancer. I've never exercised regularly and my doctor hasn't explicitly recommended it. What kind of exercise should I do? Should I just get started?

A: It's always a good idea to let your physician know you're starting an exercise program if you're being actively treated for a medical condition. He or she can provide advice and monitor you during your treatment. There are clear benefits for exercise in general for cancer patients before, during and after treatment. A recent survey of oncologists and cancer patients suggested that patients and physicians both feel it's important to exercise, with a trained professional supervising if possible. Exercise programs for cancer patients can be found at some hospitals, or an experienced physical therapist or an exercise physiologist certified to work with cancer patients may be helpful in putting a program together. You can take Yoga, tai chi, Pilates and dancing classes.

In terms of suggestions on exercises to select, it helps to take into account one's own interests and experience with exercises. Aerobic activities are helpful to maintain good endurance. Approximately 70 percent of patients experience fatigue during chemotherapy and radiation. For beginners, start with an exercise program that introduces activity for a few minutes a day. This can involve going for a brisk walk, doing chores around the house, playing with your kids or pets, or walking to work. Always begin with a light warm-up for two to three minutes before doing any exercise with more vigorous intensity. You can exercise briefly several times a day to start, to allow a chance to rest and recover; for example, try exercising three times a day for 10 minutes at a time. If you tire easily, gradually work your way up. You can increase the amount you exercise weekly as your cardiovascular endurance improves.

To keep the musculoskeletal system in shape, try to pick physical activity that uses the large muscle groups. Stretching exercises can be helpful to stay flexible. Resistance training, like weightlifting, is useful in maintaining muscle mass and strengthening bones through weight loading. If you have a catheter, be careful not to do exercises using muscles near the catheter, which may cause it to dislodge. Exercise can be a great way to feel better about your health, keep yourself energized, and have fun.

(continued on page 4)

Exercise During Cancer Treatment

By Kerry Courneya, Ph.D., and Margaret McNeely, Ph.D.



What is cancer?

According to the American Cancer Society (ACS), there are more than 100 different diseases that are classified as “cancer.” The common thread among these different types of cancers is that they all start as abnormal cells that grow out of control in some part of the body. The ACS estimates that more than 1.4 million Americans were newly diagnosed with cancer and more than a half million were expected to die of the disease in 2008. The three most common cancers occurring in men are prostate, lung and colorectal cancers; in women, breast, lung and colorectal cancers are the three most common. Cancer may be treated by a number of methods, either alone or in combination. These treatments include surgery, radiation, chemotherapy, hormonal therapy and biological therapy.

How exercise helps

An increasing number of studies have examined the benefits of exercising during cancer treatment. Although the majority of studies have examined women with early-stage breast cancer, research evidence suggests that exercise can have a positive impact on body weight, overall fitness, muscle strength, flexibility and quality of life, as well as on symptoms such as pain and fatigue. A recent study by Kerry Courneya, Ph.D., and colleagues found benefits from exercise for chemotherapy completion. In the study, women with breast cancer participating in a resistance training program during

chemotherapy had dose reductions and fewer delays in their chemotherapy treatments.

Physical activity recommendations

The optimal form of exercise training for cancer patients undergoing treatment still remains unclear. Research studies have generally examined moderate-intensity aerobic exercise, resistance exercise, and/or combined programs. Further research is needed to determine the best type, timing and intensity of exercise for the different types and stages of cancer. Despite these limitations, for the most part, exercise prescriptions have closely followed the published guidelines of the American College of Sports Medicine.

Special considerations

Individuals are potentially different in their responses to cancer treatment. Exercise programs may need to be modified to allow for “down” days in the treatment cycle. In the case of chemotherapy or biological therapy, this may mean avoiding or scaling back exercise on days when side effects from treatment are more pronounced. In the case of radiation therapy, exercise may need to be reduced, or in some cases avoided, toward the end of treatment and/or in the early weeks following treatment.

If an individual is not regularly active and wishes to start an exercise program during cancer treatment, they may need to start with low-intensity exercise, consisting of slow walks, and gradually progress exercise over time. If they will be receiving chemotherapy, it may be wise to wait one chemotherapy cycle to see the response to treatment prior to starting an exercise program.

Individuals undergoing cancer treatment should:

- Obtain approval from their oncologist (cancer doctor) before starting an exercise program.
- Have vital signs (temperature, pulse/ heart rate, blood pressure, respiration rate) monitored regularly. If participating in moderate-to-vigorous exercise, have their blood pressure and heart rate monitored before, during and after exercise to ensure that participation in exercise is appropriate and safe.
- Exercise with a partner, caregiver or exercise professional for safety reasons.
- Avoid public fitness facilities and activities (e.g., swimming), where there may be an increased risk of exposure to viral and/or bacterial infection.
- Avoid swimming if undergoing radiation therapy treatments or if they have an indwelling catheter (a tube that goes in the

- body), such as a central venous catheter or peripherally inserted central catheter.
- Stop exercise and contact their doctor if they have any of the following symptoms during exercise or after an exercise session:
 - Disorientation, dizziness, blurred vision or fainting
 - Sudden onset of nausea, vomiting
 - Unusual or sudden shortness of breath
 - Irregular heart beat, palpitations, chest pain
 - Leg/calf pain, bone pain, unusual joint pain or pain not caused by injury
 - Muscle cramps or sudden onset of muscular weakness or fatigue

Exercise precautions

Although exercise may be an effective intervention for cancer patients undergoing treatment, it is important to recognize there may be factors that make it unwise to exercise. In these cases, exercise may be still beneficial; however, the risks may be higher, and close medical supervision may be required.

According to the ACS, the following are specific precautions to be aware of during cancer treatment:

- Anemia (low red blood cell count): If the red blood cell count is low, the body’s ability to carry oxygen to the tissues is reduced. Exercise may need to be scaled back and possibly avoided.
- Neutropenia (low white blood cell count): If the white blood cell count is low, the body’s ability to fight infection is reduced. Exercise should be avoided if there is a fever above 100.4°F (>38°C).
- Thrombocytopenia (low platelet count): If platelet count is low, there is an increased risk of bruising and bleeding. Avoid contact sports or activities with high risk of injury or falling. Report any unusual bruising or symptoms, such as nose bleeds, to a doctor.
- Side effects such as vomiting and diarrhea, and symptoms such as swollen ankles, unexplained weight loss/gain, or shortness of breath with low levels of exertion may make exercise unsafe. Check with a doctor before exercising.

Conclusion

Research evidence suggests that individuals with cancer who follow recommended guidelines and observe specific precautions can safely exercise during cancer treatment.

Did you know...

The American College of Sports Medicine and the American Cancer Society recently launched a specialty certification for fitness professionals, enabling to work with patients suffering or recovering from cancer. Visit www.acsm.org/certification for more details.

Cancer Prevention: Lifestyle Changes

By Rebecca M. Speck, M.P.H., and Kathryn H. Schmitz, Ph.D., M.P.H.



More than 500,000 cancer deaths occur in the United States each year. It is estimated that one-third of these deaths can be attributed to diet and physical activity habits, including the roles of overweight and obesity. In the interest of avoiding cancer, behavior choices that focus on achieving and maintaining a healthy weight through physical activity and healthy diet can greatly reduce a person's lifetime risk of developing cancer.

We know that being overweight or obese is clearly associated with an increased risk of developing certain cancers, including breast (in post-menopausal women), colon, endometrium (uterus), esophagus and kidney. Obesity also likely raises the risk of other cancers, including cervix, gallbladder, Hodgkin's lymphoma, multiple myeloma, ovary, pancreas, thyroid, and certain types of prostate cancer. There is also ample evidence that regular physical activity is useful for cancer prevention regardless of your body weight.

Achieving and maintaining a healthy weight can be very challenging over a lifetime. We cope with demanding schedules, hectic lifestyles, an abundance of choice, and conflicting information. This is why weight loss or maintenance cannot be based solely on one approach. The best available

research indicates that weight loss is most likely to occur by restricting calorie intake and increasing physical activity. Physical activity is essential to weight maintenance and avoiding weight gain (before and after weight loss). The amount of physical activity required for meaningful weight loss is 250 minutes or more per week.

It is understood that weight gain is the result of a combination of eating too much and moving too little. Therefore, weight loss and/or maintenance of a healthy weight should be approached with the goal of reversing both trends, through eating less and moving more.

Eating a healthy diet means making choices that pay attention to what type of calories you are eating and the amount of calories going into your body. A great way to start paying more attention to what you eat is to write down everything you consume for a week and review it. If you notice servings of fried foods, sweets, and soft drinks on a daily basis, note that these have little to no nutritional benefit and are high in calories. Alternative food options might be whole grain pretzels, yogurt, and 100-percent vegetable or fruit juice, which have higher nutritional value. For most adults, a reduction of just 50-100 calories per day may prevent gradual weight gain, making daily food choices very important.

A healthy diet should focus on obtaining a majority of your calories from plant sources. Eat five or more servings of a variety (different colors and textures) of fruits and vegetables each day. Choose breads and cereals that are made with whole grains, as opposed to processed or refined grains. Limit your consumption of processed red meats by choosing poultry, fish or vegetarian options. Finally, if you drink alcohol, limit your consumption to no more than one drink per day for women and two for men.

In regard to physical activity, ACSM recommends adults get 30 minutes of moderate to vigorous aerobic physical activity (brisk walking, cycling, water aerobics, doubles tennis, mowing the lawn) five times a week and muscle strengthening on two or more days a week. If you are trying to lose weight and keep weight off, build to 60 to 90 minutes of moderate to vigorous activity five times per week. Moderate-intensity aerobic activity requires you to work hard enough to raise your heart rate and break a sweat. One good way to judge if you are in this range is if you can talk, but not sing sustained notes. During vigorous-intensity aerobic activity, your heart rate will be very fast and you will not be able to hold a conversation.

When changing your lifestyle to adopt or increase physical activity behaviors, it is important to think about how active you are currently. If you are not physically active, a gradual increase to 30 minutes a day of moderate-intensity aerobic

activity will be beneficial and more realistic. A great place to start would be to get a pedometer and write down how many steps you take per day for a week before starting to increase your activity level. Then, increase your daily step count by 10 percent per week until you are doing 30 minutes of some type of aerobic activity on most days of the week. Remember, an initial increase to any amount of physical activity from previously doing none is an improvement! If, on the other hand, you are already achieving 30 minutes on most days, consider elevating your goal to 60 to 90 minutes of moderate or more intense aerobic activity on most days. Just remember – make those increases gradual and realistic for your lifestyle.

Whatever changes you feel ready to make, be assured that even small steps will eventually take you a long way toward preventing cancer!

Q&A (continued from page 2)

Q: My 16-year-old son is a volleyball player and has been experiencing lower-back pain for three weeks. He's pretty sore and has to lie in bed after a long practice. Our friend's son was diagnosed with a back tumor when he was 14 and we do have a family history of cancer. How do I know if my son has cancer?

A: Certainly, a diagnosis of cancer is something you don't want to miss, especially with a young person. Though anything is possible, the likelihood of this diagnosis is minimal. The most common cause of lower-back pain in a young athlete is a stress fracture, which usually hurts when the athlete extends the back. Musculoskeletal issues are by far the most likely causes of the majority of back pain. One characteristic of musculoskeletal pain is that it's usually related to physical activity. Maneuvers that stress the back typically hurt, and rest usually makes things better. Concerning symptoms for more ominous causes of back pain would be pain at rest or at night. The description of the pain is often deep, boring, throbbing pain. The pain may not be related to exercise. Cancer pain associated with a bone tumor may have pressure features, since it is expanding in the bone, similar to toothache-type pain. The pain can be worse when you are laying down, since more blood flow may be directed toward the tumor. If there are any other symptoms such as fever, fatigue or weight loss, or if the pain is persistent despite even a week of rest, it's good to let your physician know. Fortunately, most complaints of back pain with young people will be musculoskeletal, and are rarely due to a cancer.

Protein and Athletes

By Nancy Clark, R.D., FACS M



Protein is a hot topic among athletes of all sports. They want to know how much protein they need, when they should eat it, what the best kind of protein is, and if they should buy sports drinks with protein. The purpose of this article to answer some of these questions and leave you with this message: While adequate protein is important in your sports diet, protein should take its place as the accompaniment to carbs (grains, fruits, vegetables) in each meal and snack.

Q: I've been eating egg whites for breakfast. I've heard they are an excellent source of high quality protein, right?

A: Yes, egg whites offer high-quality, muscle-building protein. But take note: egg whites are mostly water, and are not "packed with protein." A three-egg white omelet has only about 10 grams of protein. You could more easily swig 10 ounces skim milk and skip the cooking and dishwashing.

A whole egg has about six grams of protein, and is rich in vitamins and minerals. The yolk is cholesterol-rich; the debate continues whether or not the cholesterol you eat affects your blood cholesterol and heart-health — not likely.

Better than eggs or egg whites, choose to fuel your muscles with carb-rich and health-protective oatmeal for breakfast. Cook it with skim milk (instead of water). If you want more protein, add almonds, walnuts and/or 1/4 cup of powdered milk.

Q: I've been lifting weights for several years. Do I need a high-protein diet?

A: In the early stages of training, your protein needs are higher than when you have established a stable muscle mass. Once you have built muscle, your protein needs return to the standard requirements. Yet, most strength-trained athletes habitually eat a high-protein diet, and this becomes a moot point. Research suggests

resistance exercise enhances the way your body uses the protein you eat, and this actually results in greater efficiency and a reduced protein requirement.

Q: How many protein bars per day are too many?

A: To start, you need to determine how much protein your body needs and then assess how much protein you eat via your standard diet. Most athletes eat more than enough protein without supplements! To estimate your daily needs, multiply your weight by 0.5-0.75 grams of protein per pound (1.0-1.5 g/kg). If you are restricting calories or are a novice exerciser who is building new muscles, your protein needs are a little higher, but 1 gram of protein per pound of body weight (2 g/kg) is more than enough!

Example:

- If you weigh ~120 lbs., the suggested intake is ~60-90 grams protein per day; 90-120 grams if dieting or starting to lift weights seriously.
- If you weigh ~160 lbs., the suggested intake is ~80-120 grams protein per day; 120-180 if dieting or starting to lift weights seriously.

To determine how much protein you eat at meals, use the information on food labels and/or analyze your diet through Web sites such as www.fitday.com or www.sparkpeople.com.

Once you know how much protein you eat at meals and snacks, you can then determine how many protein bars you need (probably none!).

That is, if your diet offers 100 grams protein and you need only 90 grams, there's no need to buy a protein bar other than for calories to curb hunger. The athletes most likely to benefit from protein bars are dieters who restrict calories (including dancers, runners, wrestlers, gymnasts), vegetarians, and picky eaters.

Q: I'm a vegetarian and try to eat some plant protein at each meal. I still wonder if I am getting enough protein to support my training for a half-Ironman event.

A: Many vegetarians who think they eat well are surprised to learn how little protein plant foods offer. For example, a petite vegetarian athlete who needs at least 55 grams protein per day might base her meals on these plant-proteins for the day:

- Breakfast: a dollop of hummus (4 g protein) on toast
- Lunch: a Boca burger (13 g)
- Dinner: a quarter-cake of tofu (9 g)

That totals only 26 of the recommended 55 grams of protein! Yes, she gets a bit more protein from the grain foods and veggies that round out her meals, but she would be wise to double those protein portions.

Getting enough protein is particularly important if you are restricting your calories to lose weight. Protein needs to jump when calories are low,

because the protein is used for fuel rather than for building or repairing muscle. If you are concerned about your protein intake, meet with a certified specialist in sports dietetics for personalized advice. To find your local CSSD, use the referral network at www.SCANDpg.org.

Q: Should I use a sports drink with protein during my endurance runs that last longer than an hour?

A: If your goal of taking a sports drink with protein during an endurance event is to enhance your performance, don't bother. Endurance is largely affected by how many calories you consume while you exercise. Studies that have examined protein + carbs during endurance exercise indicate when the total calorie intake is similar, the proposed endurance benefits are not there.

A good tactic is to eat a tried-and-true, well-tolerated carb-protein snack or light meal within the hour or two before you embark on a long run or other form of endurance exercise. That is, enjoy some pre-exercise cereal with milk, a bagel with an egg, or a few swigs of low-fat chocolate milk. This gets protein into your system, so it's ready to be used. Then after the first hour of endurance exercise, target ~200 to 300 calories of carbs/hour. Choose the sports beverage that tastes best to you. Soon after you've finished training, have a wholesome protein + carb snack or meal to help reduce muscle soreness.

Q: I know I should eat a 3- or 4-to-1 ratio of carbs to protein right after I exercise, but I don't know what that looks like in terms of food, so I buy a recovery drink to be sure I get the right ratio. Are there other options?

A: Commercial recovery drinks are more about convenience than necessity. You can enjoyably refuel with chocolate milk, yogurt, a sandwich or pasta with meat sauce. The ratio need not be exact; you just don't want to consume a heavy amount of protein that sits in the stomach and slows digestion.

Also, whether or not a protein-carb sports beverage is superior to a carb-only beverage remains debated. In a recent study where athletes drank either a carb or a carb-protein recovery drink immediately after muscle-damaging downhill running, both beverages offered a similar recovery process over the course of three days. The authors conclude the meals in those post-exercise days supplied the protein and carbs needed to recover. Yet, in a six-day study with college cross-county runners, those who took a carb + protein supplement reported less soreness than those who took only carbs.

You won't go wrong by refueling soon after exercise with a carb-protein combination!

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