3-2004

Human Performance Lab Newsletter, March 2004

St. Cloud State University

HUMAN PERFORMANCE LAB

When the only tool
you ever use is a hammer,
every problem begins
to resemble a nail.

~ ABRAHAM MASLOW

DEPARTMENT OF HEALTH,
PHYSICAL EDUCATION,
RECREATION & SPORT SCIENCE

MARCH 2004

Pictured: HPL Staff John Seifert, Glenn Street, Barb Kunze, Dave Bacharach

Kelly's Corner

– Dave Bacharach

Greetings to everyone. I hope your year has been as interesting and rewarding as mine. I had the good fortune of receiving an invitation to give a talk about the physiology of alpine skiing in Austria this past summer. Imagine a Midwestern flatlander talking about skiing in Olympic Downhill Champion Hermann Maier's backyard. Needless to say, I was thrilled. To add to the fun, John Seifert from our lab and I rode his tandem bike in a big loop from Munich to the Czech Republic to Salzburg and back. The folks in Salzburg really know how to put on a meeting. We were treated to daily cultural events mixed in with science of the European community.

What surprised me was not the dissimilarities but rather the similarities of our cultures. Most Americans recognize that obesity is a huge risk factor of CVD (cardiovascular disease), and it has become a major topic of many conversations. One can't pick up a newspaper anymore without reading something related directly or indirectly to obesity. One of the keynote speakers at this meeting addressed issues of health from a global perspective. He gave lots of interesting facts like; "Only 50% of people who have undergone angioplasty comply with post-surgical regimens for diet and exercise recommended by their physicians." His thesis statement, however, was concrete: Recent increase in the prevalence of obesity in most population groups cannot be ascribed to genetic changes but rather to the cumulative effects of inactivity, increased caloric intake, and environmental changes in the activities of daily living, all of which in combination create an imbalance in energy expenditure. This is a fancy way of saying we eat too much, and we sit too much.

The presenter went on to show a map of the USA and the increases in obesity per state over the last four decades. It was alarming to say the least. But what was even more interesting was the fact that the European Union is headed in the same direction we now are, just 10 years behind us. People in the audience laughed, implying it would not happen here. We are smarter than that. But are they? John and I then engaged in our own small unscientific research observing behavior and listening to conversations throughout the week. We observed and talked with people from 20+ countries and our conclusions were that people in Europe smoke too much, eat too much, and sit too much. I guess that is why life insurance companies will reduce premiums to customers who succeed n lowering their blood pressure. Perhaps in 10 years we will really know. I hope you all are eating well, exercising and I hope you all will still be with us in 10 years so I can provide everyone with an update on Global Health.

What's a Parent to do?

– John Haws

With parents fighting at under twelve soccer games and ESPN touting seventeen-year-old athletes, what can we do to lessen the pressure and burnout rates in our young athletes? As parents we can help insulate our children from unnecessary pressure and embarrassment if we focus on six major areas.

- Support all of your children's endeavors. Go to their games and visibly show your enjoy watching them compete ... ***no matter how they do!***
- Be a role model. If everyone heard what you were saying or saw what you were doing would you be embarrassing yourself or your child?
- Make a point to know the rules and understand any sport your undertakes. This will help give you perspective when a referee or coach makes a decision that is not in the favor of your child.
- Allow our young athletes to make their own decisions. I know you could have been a state champ if you would have worked harder, but this is not your second chance to excel.
- Understand that, as a parent, you are a facilitator for ***your children's*** interests. If you feel you need a bigger role, you may be able to plan a team banquet or be a manager.
- Understand college scholarships. The vast majority of college scholarships are academic not athletic. If you need to drive your children, drive them to the library.

It is becoming increasingly popular for coaches to ask parents to sign a contract stating they will adhere to similar suggestions. If this is something you feel a youth team could benefit from, give your coach a call and set a time to get together. It can be a great tool for creating a healthy environment for young athletes to succeed.

Develop Core Strength Without Doing More Sit-Ups

– Travis Zins

Many people think that the only way to develop trunk ("core") strength is by doing sit-ups. This is not necessarily true. Not only can you develop core strength while weight training, but the core strength that you can develop is possibly more functional for everyday life than doing sit-ups. Two questions are why do we need core strength, and how do we achieve core strength?

To begin core development, you can do a chest press on a physio ball with dumbbells. For the beginner, lay on the ball with the ball supporting you at shoulder blade level. This places the ball in the middle of your back and is good support. While lying on the ball, make sure that you are pulling your belly button to your spine to keep your abdominals tight for more support. Have your knees at a 90º angle and feet firmly on the floor with the dumbbells in your hands; have your palms facing forward. The starting position will have you lying on your back with your arms fully extended. Lower the dumbbells until the elbows reach a 90º angle and press the dumbbells up again to the starting position. During the entire movement, make sure your wrists stay directly over your elbows. When this becomes more comfortable, you can do an alternating chest press. In this lift, the arm that is not pressing is stationary at a 90º angle while you press out with the other arm.

Another lift that can develop core strength is the overhead press, like a military press, on a physio ball. To do this lift you need to sit on the ball with your back set in a good postural position by keeping your abdominals tight, pulling your belly button back to your spine. Have your knees at a 90º angle and feet firmly on the floor. Having dumbbells in your hands just above your shoulders with your wrist directly over your elbows and palms facing forward, press the dumbbells directly above your head like a normal overhead press. For a more advanced lifter, you can have your body in the same position and press the dumbbells alternately above your head. The arm that is not extending stays stationary just above the shoulder. Be sure not to have the dumbbell resting on your shoulder. This lift can also be done on a bench or standing, however, for the greatest core strength results, using the ball would be best.

Incorporating the physio ball into your current training program is an excellent way to change up your workout and get the most out of your training. The physio ball and other modalities such as bands, foam rollers and wobble boards are all great ways to kick your training up a notch and spice up the routines that you are currently doing. Using these various modalities maximizes core strength and maintains correct postural position, which decreases low back pain while minimizing the risk of low back injuries and also helps with total body strength. Remember the most important rule to follow is to HAVE FUN!!!

CONGRATULATIONS!

The faculty and staff at the Human Performance Laboratory would like to acknowledge and congratulate Julia Devonish and Christina Haukos who completed their thesis work and earned a Master of Science degree in Exercise Science in 2003.

Exercise in the Cold Weather – Come out of Hibernation!

– Erin Miller, ATC/R

Exercise can become more of a challenge during the winter months than during the warmer, more activity-friendly months of spring and summer. The added challenge of exercising in cold, windy weather can send some individuals into hibernation until the snow melts. Exercise during the winter months is no less important than during the warmer months. Individuals with preexisting medical conditions such as seasonal allergies or exercise induced asthma (EIA) (an obstruction in airflow during exercise that may be triggered by exercising in a cold, dry environment) may also find it increasingly difficult to exercise outside in such conditions. There are many alternative options for getting outside and keeping up with your exercise prescription.

A moderate warm-up period before exercise is essential for not only increasing body temperature and respiratory temperature bur for decreasing the risk of injury and increasing psychological awareness during the exercise session. Consider warming up indoors if possible with 5-10 minutes of brisk walking around the house, jogging in place or walking up and down the stairs. Follow your warm-up with light stretching and gradually acclimate your body to the outside air. Try wearing a face mask or scarf. This will facilitate a "rebreathing environment" to help warm and humidify cold, dry air. Dress in several layers that are easy to remove if you get too warm. Follow your exercise session with a thorough cool-down. This helps decrease body temperature at a rate that facilitates optimal recovery for both the muscles of the body and the respiratory tract as well. The cool-down also assists in lowering heart rate and blood pressure back to baseline. Individuals who have been diagnosed with EIA should always carry their inhaler with them and use it at the first sigh of an attack.

There are other alternatives to exercising outside during the winter. Besides walking at a shopping mall, check with your local schools and universities as they often off the use of their weight rooms, cardiovascular equipment and swimming pools to the public on certain days and times of the week for a nominal charge. These facilities will have treadmills, stair-climbers, elliptical trainers as well as resistance training equipment.

Swimming and water aerobics are popular modes of exercise and very beneficial ones as well. By the increased buoyancy of the water, less stress is placed on the joints of the body. While in the water, the body also has to work against an increased resistance, which provides you with an intense workout that is not as stressful on your body. An added advantage is the combination of warm air and increased humidity around a swimming pool. This presents a controlled environment that is optimal for exercise, making it a popular form of exercise for asthmatics.

This winter make it a priority to continue your exercise goals. There are plenty of alternatives to exercising outside when the temperature is below zero. Always remember to drink plenty of fluids during exercise, even in the cold weather. Replace fluids by drinking 16 ounces for every pound of weight lost during all types of exercise. Following these tips will help you have an enjoyable workout even during the cold winter months of Minnesota.

Making Sense of the Numbers: Glucose – *Jill French*

Glucose obtained from the foods we eat is the body's most usable form of carbohydrate. The concentration of glucose in the blood, also known as blood sugar, is regulated by insulin. Insulin is a hormone produced and secreted by your pancreas to maintain blood glucose and to help your cells take up glucose for energy. When you have insufficient insulin, or when your body is unable to use the insulin you manufacture, levels of blood glucose (blood sugar) increase.

In diagnosing diabetes, physicians depend primarily upon the results of specific glucose tests. However, test results are just part of the information that goes into the diagnosis of diabetes. Doctors also take into account your physical exam, presence or absence of symptoms, and medical history. The two main tests used to measure the presence of blood sugar problems are the direct measurement of blood glucose levels after an overnight fast (Fasting Blood Glucose Level), and measurement of the body's ability to appropriately handle the excess sugar presented after drinking a high glucose drink (The Oral Glucose Tolerance Test).

The **Fasting Blood Glucose (Blood Sugar) Test** is referred to as the "gold standard" for diagnosing diabetes. You avoid drinking and eating anywhere between 6-12 hours, after which your blood sugar level is measured from a blood sample. An elevated blood sugar level after a overnight fast (not eating anything after midnight), above 126 mg/dL on at least two occasions typically means a person has Type II adult-onset diabetes. Normal fasting blood sugar levels generally run from 64 to 100 mg/dL, and if your blood sugar levels are in the range of 100-126 mg/dL, you have a condition called pre-diabetes (glucose intolerance). The other test that may be administered for the diagnosis of diabetes is an Oral Glucose Tolerance Test (OGTT). After an overnight fast, you drink a solution containing a known amount of glucose. Blood is obtained before you drink the glucose solution and every 30 to 60 minutes after you consume the glucose for up to 3 hours. Blood glucose values under 140 mg/dL are considered normal and greater than 200 mg/dL is diagnostic of Type II adult-onset diabetes.

Between 140-200 mg/dL is considered an impaired glucose tolerance. If you are within this range, you have an increased risk for developing Type II (adult-onset) diabetes. These kinds of results may indicate a condition called pre-diabetes (glucose intolerance). Pre-diabetes is simply the point when a person's blood sugar levels are higher than normal, but not high enough to be diagnosed with Type II diabetes. If dealt with immediately, one may delay the onset of diabetes, or even prevent Type II diabetes from ever developing. If your blood sugar levels indicate glucose intolerance, there are many options for control. Working toward and maintaining an ideal body weight is extremely important. Eating a healthy diet is also critical. By eating well-balanced meals in the correct amounts, you can keep your blood glucose level as close to normal (non-diabetes level) as possible. Exercise can also help control blood glucose by increasing the amount of blood glucose that is taken up by active cells without a need for extra insulin.

It is important to take action if you have recently been diagnosed or just to prevent future health problems. It is better to prevent now, rather than encountering health problems down the road.

To learn more about diabetes, you may talk to your physician or another health care professional by calling the American Diabetes Association at 1-800-342-2383), or visit them on the web at http://www.diabetes.org.

UNDERSTANDING BLOOD GLUCOSE NUMBERS

	Normal
Fasting	64-100 mg/dL
OGTT	<140 mg/dL
	Pre-diabetes
Fasting	100-126 mg/dL
OGTT	140-200 mg/dL
	Type II adult-onset diabetes
Fasting	>126 mg/dL
OGTT	>200 mg/dL

WE WISH YOU GOOD HEALTH!

祝你健康

Health in China

– Jixiang Zheng

People in China are influenced by a 23-century long tradition of Chinese medicine. In this new century, health in China is more respected and the forms become varied. Early in the last century, it would be common to have two separate pharmacies in all kinds of hospitals. One is Traditional Chinese Medicines, and the other is called "Western Pharmacy". Surprise?! Chinese people have learned a lot from the West, but the health habits that Chinese people keep are still continued from their ancestors.

Simple tips for diet in China: Eat a better breakfast; eat a full lunch; eat less in dinner. Eating a good breakfast guarantees your work efficiency in the morning and nutrition for a whole day. Make sure to eat a full lunch. How full? The feeling you have when you are about to get full is the key. Then, if you can spend a half hour taking a short break after lunch, it will make you feel good and energetic. And if you have time, do exercise two hours before your dinner. Eating less at dinner is also very important. It makes sure you don't have too many calories around for your body to store as fat later in the evening. If you can walk around 10-20 minutes outside after dinner, it will be wonderful!

Chinese people have their own ways to prolong life. Early morning exercise is the most important. The most frequent activities are "Tai Chi" and/or "Qi Gong". There are two different ways to practice Tai Chi. One is "Tai Chi Quan", with nothing in your hand. The other is "Tai Chi Chian", with a long sword in your hands. Doing "Tai Chi" in the morning is thought to not only promote your physical condition, but also improve your mental health. Another activity Chinese people use to improve mood and character is to practice Handwriting. "Qi Gong" is thought to improve both physcial and mental health. But you must practice Qi Gong for a long time before it can actually bring you any benefit.

These Chinese forms used to promote health are based on combining the physical with the spiritual. Although different, physical and spiritual are relative factors concerning health. If you are weak in any area, it will affect all others. This is the basic theory of Chinese life-prolonging science.

Protein or Carbohydrate Before Competition? – *Alissa Vann*

With so much emphasis on "high protein diets', people forget about the importance of carbohydrates and their effects on performance. Some reasons in favor of meals high in carbohydrates before competition include:

- Carbohydrates are the main energy nutrient for both short-term anaerobic activity (short sprints and weight lifting) and high-intensity endurance exercise (prolonged running and cross-country skiing).
- Dietary carbohydrates replenish liver and muscle glycogen that serve as the predominate carbohydrate energy source in the early stages of exercise and as exercise intensity increases.
- Carbohydrates are digested and absorbed faster than proteins and fats, providing energy at a faster rate.
- A meal high in protein elevates your resting metabolism considerably more than a diet high in carbohydrates because more energy is required for digestion and absorption. This can stress the body's mechanisms for dissipating heat, which can impair performance on hot days.

When and how much?
Two to four hours before competition is sufficient for digestion and absorption of pre-competition meals. Some good sources of carbohydrates include fruits, bread-type foods (bran muffins, bagels, whole wheat breads), cereals (oatmeal, raisin bran, corn flakes), and pastas. Pre-competition meals should include between 150-300 grams of carbohydrate, in either a solid or liquid form. A general rule to help determine the right amount for you specifically is 3-5 grams per kilogram (1-2 g/pound) of body mass.

It is also important to understand that pre competition meals cannot correct for inadequate nutritional intake during the week before competition. An athlete should be nutritionally sound throughout training for optimal performance.

Is Fitness More Important than Fatness? – *Sarah Nardi*

This summer I read an article titled "Exercise and Cardiovascular Health," by Johnathon Myers, Ph.D., in which he quoted that more than 25,000 deaths each year are due to a lack of regular physical exercise. Perhaps part of this can be attributed to misconceptions about fitness and fatness. Recently I had the opportunity to complete an internship in the Exercise Physiology Lab at the Cooper Institute in Texas. Along the way, I picked up some interesting information about he studies being conducted at the Cooper Institute.

One of the more interesting studies examined whether fitness or fatness is a better indicator for mortality. Stephan Farrell, Ph.D., reported research that high Body Mass Index (BMI) and being over weight have often been associated with an increased risk of mortality. Farrell believed fitness level was the missing ink in the previous studies. Perhaps this thought lead to the study that was recently completed by the Cooper Institute assessing the relationship between BMI, cardiorespiratory fitness and mortality.

The results indicate that subjects with moderate to high levels of fitness had a significant decrease in the risk of mortality when compared to their sedentary counterparts, regardless of BMI. What does this mean? Risk of mortality for obese and normal weight individuals was found to be similar when fitness was taken into account. Therefore, we must realize that not all overweight people are unfit and not all thin people are fit. Fitness may provide a better indication of risk for mortality than BMI or obesity. Researchers also found that overweight men who were fit have significantly lower rates of mortality then normal weight individuals who were unfit. I guess you really can't judge a book by its cover.

Protein or Carbohydrate Before Competition?

– Brianne Olson

According to the National Institutes of Health, over 12.5 million Americans have coronary heart disease, making it the leading cause of death in the United States. That's more than 700,000 deaths in 2001 alone. Scientific evidence shows that high levels of saturated fat, dietary cholesterol, and trans fat in one's diet are major contributors to coronary heart disease. We have been educated about saturated fat and cholesterol for decades. But what about trans fat? What is trans fat? Where does it come from? How much is in the foods we eat?

Trans fat is made when manufacturers add hydrogen to vegetable oil — a process called hydrogenation. This process increases the shelf and flavor stability of foods made with trans fat. Hydrogenation turns what is otherwise a liquid unsaturated fat into a solid trans fat. Trans fat can be found in vegetable shortenings, margarines, snack foods, commercially baked goods, and foods fried in partially hydrogenated vegetable oils. For over a decade we have been able to make our food choices in part by reading the nutrition facts label and seeing how much saturated fat and dietary cholesterol are in the foods we eat. However, trans fat labeling has been excluded. This could be a very dangerous omission. In fact, the FDA has already estimated that 2,100-5,600 lives are lost each year due to lack of trans fat labeling. Because of the dangers associated with trans fat, the FDA recently announced that food manufacturers have until July 1, 2006 to list trans fat on nutrition labels. It must be listed on a separate line, immediately under saturated fat on the nutrition label. Dietary supplement manufacturers, such as PowerBar and Slim Fast, must also list trans fat on the Supplement Facts panel when their products contain at least 0.5 grams of trans fat. However, until then you can find trans fat by looking for anything in the ingredients listed as partially hydrogenated, or vegetable shortening. These terms are all giveaways that trans fat is in the product.

ANOTHER WAY TO LOOK AT TV

Source: Hope Health Letter Dec. 2001

We burn just over 90 calories an hour while watching TV — not many more calories than we'd burn doing absolutely nothing (lying in bed burns about 77 calories an hour).

If we take a brisk walk, on the other hand, we burn between 300 and 400 calories an hour.

So if you replace just five hours of TV time (of the 25 to 40 hours a week most of us sit in front of the TV) with five hours of brisk walking, you'd burn a minimum of 1,100 more calories per week.

At this rate, you'd lose nearly one-and-a-half pounds of fat each month.

TIP: If you can't bear to give up any TV time, try using an exercise bike, stair-climber, etc. while you watch your favorite programs. Don't have an exercise machine? Do a few calisthenics.

New Faces in the Lab

It often takes more courage to change ones opinion than to keep it.

~ WALLY BRANDT

Experience is a hard teacher because she gives the test first, the lesson afterward.

~ VERNON ZAW

Sarah Nardi *(not pictured)* is originally from Norway, Maine. She graduated with a bachelors degree in exercise science from High Point University, North Carolina. Sarah is currently studying biomechanics, with interests in exercise equipment design. Other interests include weight lifting, karate, and kayaking.

Jill French *(pictured front right)* is a first year exercise physiology graduate student from Berea, OH. She is a 2003 graduate from Mount Union College where she majored in exercise science and minored in health. While at Mount Union, she played on the varsity soccer team for three years. She has also coached soccer and is currently a volunteer assistant coach with the SCSU women's soccer team. She hopes to be a head coach at he collegiate level someday. Her interests include playing soccer, learning how to ski, collecting Monet and penguins (not the real ones), and supporting the Mount Union Purple Raiders football team.

Jixiang Zheng *(pictured back center)* is a first year graduate student in exercise physiology form Shandong Province, China. He is a 2003 graduate from Beijing Sport University of China where he majored in sport science and minored in basketball and massage. His interests include Chinese acupuncture, massage, adult fitness, and coaching. Jixiang hasn't had any experience in the United States until now, but he hopes to be an exercise physiology specialist in adult fitness and coaching.

Calisa Schouweiler *(pictured back right)* is a first year graduate student from Tomahawk, WI, in the exercise physiology program. Calisa recently graduated from SCSU with a B.S. degree in exercise science and a minor in community health. Calisa spent the first semester completing her internship at the University of Maastricht, Netherlands. Her interests include travel, music, art, watching most sports and participating in silent sports.

John Haws *(pictured back left)* is a first year graduate student from Avon, MN. He is in pursuit of a degree in sports management. He graduated from St. John's University in 1999 and has since been an assistant coach with the SJU soccer team. Armed with his masters from SCSU, John plans to settle in as a head coach at the collegiate level. He is an active sportsman, a music aficionado, and has recently rediscovered his love for writing papers.

Jessie Pelzel *(pictured front left)* is a special studies graduate student originally form Heron Lake, MN. She graduated in 200 from Southwest Minnesota State University in Marshall with a B.S. in exercise science and a minor in coaching. While at SMSU, Jessie played four years of basketball. While at St. Cloud State, she is a graduate assistant with the women's basketball team. In the future, Jessie would like to teach and coach at a university.

Travis Zins *(not pictured)* is a biomechanics graduate student from Nicollet, MN. He completed his undergraduate studies at SCSU and earned a degree n physical education. He is the strength and conditioning coach at SCSU and spends his time working with many of the athletic teams. His post-school ambition at this time is to become a full-time strength coach at the university level, however, his dream job is to do nothing; he just wants to play!

ADULT FITNESS PROGRAM HALF PRICE PROMOTION

Are you enjoying the benefits of your exercise prescription or the motivation of having a yearly exercise evaluation at the Human Performance Lab? Many of you have answered "yes" to that question. So to encourage more participation, the HPL is offering a half price promotion. When you suggest our program to others and they follow up with an exercise evaluation at the lab, you both will only pay half price for your evaluation. See the program fees outlined below.

Program entry fee:
Community: $115
SCSU Faculty/Staff/Alumni: $75

Reevaluation fee: $55

Call Barb at 320-308-3105 for more information or to schedule your appointment.

We look forward to seeing you at the lab!

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Please contact Barb Kunze if your address has changed.
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Our Gratitude

The HPL staff and students would like to thank the following people for their contributions to the Adult Fitness Program in 2003.

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Ruth Nearing
Harry Olson, Jr.
John and Carol Pike
Sid and Pat Prom
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Glenn and Nancy Street
Stephen and Elaine Thrune

Should you be in a position to make a contribution to the HPL, please make checks payable to the SCSU Foundation-Adult Fitness and mail them to: David Bacharach, St. Cloud State University, Halenbeck Hall 111, 720 Fourth Ave. S., St. Cloud, MN 56301-4498

ICSS HERE WE COME!

Faculty and graduate students of the Human Performance Lab will be in attendance at he 3rd International Congress on Skiing and Science. The Congress will be held in Aspen, CO, on March 29th-April 2nd, 2004. Dr. Bacharach is serving as co-chair, while Dr. Seifert is on the organizing committee. Approximately 200 participants are expected to attend and come from such places as Austria, France, Germany, Italy, Japan, Norway, Solvenia, and Switzerland. Presentations will encompass alpine and Nordic skiing, snowboarding, and ski jump. Topics will include: biomechanics, physiology, training and rehabilitation, pedagogy (teaching), psychology, and sports medicine. In fact, graduate students Alissa Vann and Jill French will be delivering a poster presentation on balance and muscle activation during skiing, while Dr. Seifert will be presenting data from a dehydration, fluid balance, and skiing study. The Congress is held every four years to provide time for only new topics to be presented at each meeting. This will be the first time for the Congress to be held in the United States, and the university sponsor of this Congress is none other than SCSU!