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Human Performance Lab Newsletter

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Human Performance Lab Newsletter, February 2003

St. Cloud State University

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HUMAN PERFORMANCE LAB

DEPARTMENT OF HEALTH,
PHYSICAL EDUCATION,
RECREATION & SPORT SCIENCE

February 2003

And in the end, it's not the
years in your life that count.

It's the life in your years.

— Abraham Lincoln



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

Kelly's Corner

— Dave Bacharach



Each year I collect ideas to share with everyone, and each year I keep thinking about our future. As I ride my bicycle (most days) throughout the year, I pass congested roadways, full parking lots and mostly empty playgrounds, and I wonder to myself, "Where are all the kids?" Healthy People 2010 reported a 27% increase in participation of organized activity for kids ages 6-9 and a 39% increase for kids ages 10-14. The hidden message is in the word "organized." We adults often think we can do or make things better for our kids. I guess that's why so many kids are in Mom or Dad's SUV on their way to fitness centers around town or to a remote sports complex positioned on the edge of the community. They certainly are not playing in the neighborhood parks or school grounds. I often ask myself, "Am I that old and has our world changed that much that kids just are not safe outside alone?" Statistics on child abductions suggest otherwise. I was very surprised to find the risk of child abduction hasn't really changed over the past four decades. So, what's changed? Has the media influenced our actions as parents?

Every day one can find something in the media about how obese our society is

becoming. But that news doesn't appear to alarm anyone. Healthy People 2010 reports 10 leading health indicators and the top two are fitness level and overweight risk or obesity. The cumulative effects of inactivity are beginning to show across our nation. Of our population, 25% are completely sedentary and within that group there are about 20 million kids age 17 and under.

I fear many kids have lost the ability to engage in unorganized physical play. Perhaps, just like teaching kids to read, we need to encourage their desire for unorganized physical play. It may come with some increased fears, but can the risk be greater than the path we are currently following? I don't think so. Success has been shown in studies that focus on both kids and adults reducing sedentary activity time throughout the day versus encouraging or rewarding physical activity. My sense is that we need to do both. In an effort to relay an idea put forth by the late John Sawhill of The Nature Conservancy, Richard Rothaus, SCSU's Director of Sponsored Programs wrote "Our generation is in the unique position that our greatness will be determined not by what we **did**, but by what we **did not** do." So as always, let us be the doers. Let's live the best we can, be active and encourage others to **do** the same.

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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: \$115.00

SCSU Faculty/Staff/Alumni: \$75.00

Reevaluation fee: \$55.00

We look forward to seeing you at the lab.

Call Barb at 320-255-3105 for more information or to schedule your appointment.



Eating the Proper Portions – Brianne Olson

There is no question that maintaining a healthy weight is important to overall health, but it seems that maintaining a healthy weight is no easy feat. One of the most effective ways to keep off the extra pounds is to control your portion sizes. With the advent of “super-sizing”, most of us aren’t even aware what a proper serving of food actually looks like. When eating at a restaurant, it is not uncommon for portions to be three or even four times the size of “normal” servings. As an example, a plateful of spaghetti is actually four servings of pasta. A 12 ounce steak is really four servings of meat. It is no wonder that, now more than ever, Americans are struggling with excess weight; we are constantly being exposed to an overdose of food.

One of the easiest ways to control portion sizes is to have a visual picture of what a portion size should look like.

Use the list below as a reference for a recommended serving size.

- 1 cup of potatoes, rice, pasta, cereal is the size of a tennis ball
- 1 pancake is the size of a compact disc
- 1/2 cup cooked rice is about a cupcake wrapper full
- 1 slice of bread is the size of an audiocassette tape
- 3 ounces of meat is the size and thickness of a deck of cards
- 1 medium apple or peach is about the size of a tennis ball
- 1 ounce of cheese is about the size of four dice
- 1 cup of cooked vegetables is about the size of a tennis ball
- ½ cup of ice cream is the size of a racquetball
- 1 pat of butter is about one teaspoon.

Here are some ways to control portion sizes.

- Serve food in appropriate portions
- Restrict yourself from going back for seconds.
- Serve foods on smaller dishes
- Never eat out of the bag; always portion snack foods into a bowl or on a plate
- Choose foods packaged in individual serving sizes
- Share your dessert
- When eating out, ask for a doggie bag at the beginning of a meal and portion your meal right away

Taking control of portion sizes is about taking control of calorie intake. Consuming the right amount of calories, along with regular exercise, is ultimately what will keep off the excess pounds and help you maintain a healthy weight.

I merely took the energy it takes to pout and wrote some blues.

Duke Ellington (1899–1974)

Make Every Day Active – Brian Berntsen

There are many great things about the American culture that other cultures aspire to achieve. However, there are some aspects of the “American Lifestyle” that we should consider changing. One of those involves our idea about exercise. Many times we confuse being fit and healthy with only those that go to the gym, run, swim and bike. While these are all great activities, one must also see that simple things such as mowing the lawn (walking not riding) or shoveling snow can be just as beneficial. Some other simple lifestyle changes include not parking in the spot closest to the entrance but walking the extra distance from a further spot, gardening and taking the stairs versus the elevator when possible. All of these daily activities burn calories.

One phrase we have all heard is

“counting calories”. Why is this important? Well, to lose weight, one must use more calories than one consumes. Studies have clearly shown that people who burn 1000-2000 calories per week are healthier. In the Adult Fitness Program, we recommend that to maintain or improve one’s fitness level, one should expend at least 1000 weight adjusted calories per week. If a person weighing 150 pounds were to mow the lawn, s/he would burn 7.5 calories per minute while someone weighing 196 pounds would burn 10 calories per minute. Even though the total calories used by the larger person is greater, the relative caloric cost is similar. The larger person is expected to burn more calories than someone lighter. That is where the weight adjustment is applied. Walking a mile in 20 minutes, shoveling

for 15-20 minutes, gardening for 30-45 minutes or washing the windows and floors for 45-60 minutes all burn the same amount of calories, which is roughly 60-120 calories depending on your weight. Granted these things do not always seem like exercise, but they are and can improve or maintain one’s fitness level.

It isn’t always necessary to run to the gym to exercise or lift weights. Everything that we do daily adds up. Do not look for the quick and easy way to do things. Be willing to put a little elbow grease in your activities. Walk that extra 200 feet in the parking lot or bike or walk to work. Take a walk before or after dinner and try to limit your amount of inactivity to a couple hours a day. In other words: Be active and be healthy.



Making Sense of the Numbers: Cholesterol – Josh Oien

The Centers for Disease Control (CDC) reports that approximately 20% of Americans (39.4 million) have high cholesterol (greater than 200 mg/dl). The purpose of this article is to dispel myths about cholesterol and state the facts. Cholesterol can be both good and bad so it's important to learn what cholesterol is, how it affects your health and how to manage your blood cholesterol levels.

Cholesterol is a soft, waxy substance found among the lipids (fats) in the bloodstream and in all your body's cells. It's perfectly normal to have cholesterol in our body. Cholesterol is an important part of a healthy body because it's used to form cell membranes and hormones. However, too high a level of cholesterol in the blood is a major risk for coronary heart disease, which may lead to heart attack or other cardiovascular diseases (e.g. stroke). Cholesterol accumulates in two ways. Our body will produce some of it, and the rest comes from cholesterol in animal products found in our diet, such as meats, poultry, fish, eggs, butter and cheese. Food from plants like fruits, vegetables and cereals do not contain cholesterol. Foods that contain saturated fats also cause the body to make more cholesterol.

Cholesterol and other fats can't dissolve in the blood. For instance, after eating a meal the digested fats and cholesterol have to be transported from the digestive tract to the cells by special carriers called lipoproteins. The two types of cholesterol are the result of which lipoprotein carrier transports the cholesterol and fat. These protein based molecules can carry a lot of fat or just a little fat. If a lot of fat is carried, then it has low density (LDL) and if fewer fats are carried, it has high density (HDL). The more fat and cholesterol that is ingested, the greater the number of low density lipoprotein carriers needed. These LDLs do not move as freely in the blood as the HDLs, and if you have an elevated

number of LDL carriers, your arteries may become narrow and increase your risk of heart attack and stroke. It's easy to see why the high fat carrying LDLs are often referred to as the "bad" cholesterol. High-density lipoproteins (HDLs) are known as the "good" cholesterol. Studies suggest that high levels of HDL cholesterol reduce your risk of heart attack.

Remember, it is always important to first attempt to make a change in one's diet and physical activity regime rather than to rely on cholesterol lowering prescription drugs. Smoking, being overweight and being sedentary can all result in lower HDL cholesterol levels.

To increase your HDL, try not to be sedentary the whole day. You will be able to reduce the number of LDLs by eating proper portion sizes, and keeping the amount of fat in your diet to less than 30% of total daily caloric intake. In your daily diet try to eat more fruits, vegetables and whole grains and cereals. Try to choose leaner cuts of meat and low fat dairy products. Adjustments to cooking, such as using monounsaturated and polyunsaturated oils versus saturated fats can help too. All of these changes will help lower your blood cholesterol, but you must make the commitment to the changes to receive the benefit.

Taking action to prevent future health problems is better than encountering health problems and then proceeding to treat them.

How Can I Learn More?

- Talk to your doctor, nurse or health care professional. Or call your local American Heart Association at: 1-800-242-8721.
- Or visit:
<http://www.americanheart.org>
- Centers for Disease Control Website:
<http://www.cdc.gov>

Optimal Cholesterol Numbers

	Age	Male	Female
Total	20-29	<152	<152
	30-39	<166	<166
	40+	<190	<190
HDL	20-29	>50	>60
	30-39	>50	>64
	40+	>50	>70
LDL	20-29	<88	<88
	30-39	<100	<100
	40+	<118	<118

CLOSE TO HOME By John McPherson





Take Action to Prevent Osteoporosis – Sara Stewart

Most people know that exercise is good for them. Staying physically active and exercising regularly is a great way to prevent or delay some diseases such as osteoporosis. Older people have much to gain from staying physically active, however, they have much to lose if they become physically *inactive*.

Osteoporosis is a disease that can steal the strength from your bones. The bone strength decreases as it slowly loses mineral content and the internal support structure.

Exercise may slow bone mineral loss, help maintain posture and improve overall fitness. Often a combination of

activities and lifestyle changes are recommended to help prevent or treat osteoporosis.

Weight-bearing activities like walking, jogging and stair climbing work directly on the bones in your legs, hips and spine to slow mineral loss.

Resistance training uses various means of resistance, such as free weights, weight machines and elastic bands, to strengthen the muscles and bones in your arms, legs and spine. This type of training can also work directly on your bones to slow mineral loss.

Back-strengthening exercises primarily work on muscles rather than bone.

Research indicates that strengthening your back muscles may help treat osteoporosis by maintaining or improving posture. These exercises help strengthen back and abdominal muscles to maintain or improve posture which is important in avoiding fractures due to osteoporosis.

Other lifestyle changes include consuming adequate calcium and vitamins A and D, cutting down on alcohol, caffeine and soda, and not smoking. Combining exercise with lifestyle changes will markedly help slow the deterioration of the bones and keep you dancing the night away.

Lab Research Assists Amputees – Glenn Street

Each morning an amputee rolls a ¼" thick, soft gel liner onto the limb for cushioning before sliding into a custom fit socket. This socket is slightly *undersized* to ensure a snug fit and provide good control over the artificial leg. Unfortunately, the desirable snug fit deteriorates within the first hour of the day as the limb loses volume. This causes excessive friction and impact forces as the limb slides in and out ("pistons") in the now loose-fitting socket and in some cases causing skin damage.

Carl Caspers, amputee and an owner of a local prosthetics company called TEC Interface Systems, along with the Human Performance Lab and the Manufacturing Engineering Department at St. Cloud State University have developed a new socket. This socket prevents volume loss by using an elevated vacuum. This new vacuum-assisted socket (TEC Harmony™) has greatly improved the quality of life for

amputees. Amputees now *gain* about 3% in limb volume, rather than losing an average 7%, thereby maintaining a good socket fit throughout the day. Most amputees express surprise and delight over the immediate improvement in linkage and the long-term improvement in skin health. Amputees with chronic open sores on their limbs heal completely within a few months. TEC Harmony™ users also report healthy, warm, flush and uniformly colored limbs at the end of the day, as compared to a stressed limb that is often cool, clammy and pale in complexion with the normal socket system.

Several groups have recognized the technological breakthrough of the new TEC Harmony™ socket system. The American Orthotics and Prosthetics Association featured it as a keynote lecture at its national meeting in 2001. TEC Harmony™ has been featured in numerous newspaper and television reports. Wayne Board, a former Human

Performance Lab graduate assistant, was also recognized for his pioneering work on the vacuum-assisted technology by receiving the St. Cloud State University Distinguished Thesis Award of 2001. Several graduate students; Wayne Board, Tracy Beil, Marie Harlander, Joy Goswami and Tony Duerr, received educational funding in return for their research on TEC Harmony™, and presented their findings at national meetings and published them in scientific journals. This year, Tony Duerr is documenting changes that occur to the limbs of amputees when they switch from a traditional socket system to the new TEC Harmony™ system.

Otto Bock of Germany purchased TEC, along with rights to the Harmony™ technology, in January 2003. Otto Bock is the world's largest prosthetics manufacturer.



Congratulations

The faculty and staff at the Human Performance Laboratory would like to acknowledge and congratulate Tal Amasay and Danielle Birkeland who completed their thesis work and earned a Master of Science degree in Exercise Science in 2002.



New Faces in the Lab

Brianne Olson (top left)

Bri is a first year graduate student in exercise physiology from Grand Rapids, MN. She is a 2002 graduate from the College of St. Benedict where she majored in nutrition science and minored in athletic training. She worked as a student athletic trainer for the soccer and basketball teams at St. Bens as well as the men's hockey team at St. John's. Her main interests include hydration and nutrition and she enjoys running, the outdoors, and music.

Alissa Vann (top right)

Alissa is also from Grand Rapids, MN, in the exercise physiology program. She recently graduated from SCSU with a B.S. degree in exercise science and Spanish. Alissa spent the first semester completing her internship at the Olympic Training Center in Puerto Rico. Her interests include the Spanish language, fitness and travel.

Sara Stewart (bottom left)

Sara is a first year graduate student from Fargo, ND, in the exercise physiology program. Sara graduated from the University of Wisconsin La Crosse with a B.S. degree in exercise and sport science with emphasis in fitness and a minor in business administration. Sara is a NSCA certified strength and conditioning specialist. She enjoys

weight lifting, yoga and being outdoors.

Kristen Thompson (bottom right)

Kristen is a second semester graduate student working toward a degree in biomechanics. Originally from Buffalo, MN, Kristen is a Dec. 2000 graduate from the University of Southern

California with a major in exercise science. While attending USC, Kristen was on the varsity rowing team and the club softball team. Kristen has coached fast pitch softball and is currently a graduate assistant coach with the SCSU women's softball team. She hopes to be a head coach at the college level. Outside of the classroom, Kristen enjoys playing and watching many sports, spending time outdoors...especially in the sun and is planning her upcoming wedding.

Education's purpose is to replace an empty mind with an open one.

– Malcolm Forbes

Missing occasional workouts or exercising less intensely won't undo all your progress. Just don't stop altogether.



Free Radicals are more than Just People – John Seifert

Free radical compounds are being implicated as the cause to a wide array of clinical diseases from prolonged recovery following exercise to certain cancers. These compounds are produced continuously through metabolic reactions and lead to further reactions in which the body has to defend.

But, what is a free radical? Free radicals, chemically speaking, have an unpaired electron (negatively charged particle) within their structure. It's this unpaired electron that creates the reactivity. I attended a free radical

conference this past summer and was treated to some very interesting discussions and research results. Studies were presented on the role of free radicals and the development of pre-eclampsia in expectant mothers, changes to DNA (the genetic code), heart disease formation and prolonging the recovery processes following surgeries. The big surprise was that high intakes of Vitamin C may actually lead to cancer development. These researchers presented results that indicated when individuals ingested more than 1500 mg/day of Vitamin C continuously for one year the risk of

cancer increased significantly. The recommended daily allowance (RDA) for Vitamin C is 60-75 mg/day.

The body's defense system against free radicals is through antioxidant systems. Common antioxidants include vitamin A, C, and E. Antioxidants serve to neutralize free radical reactivity. By increasing antioxidant concentration, damage caused by free radicals is minimized. How can we improve antioxidant capacity? Quite simply, by staying active, improving our fitness level and eating a well balanced diet.



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Email: brkunze@stcloudstate.edu



Our Gratitude

The staff and students at the HPL would like to thank the following people for their contributions to the Adult Fitness Program during 2002.

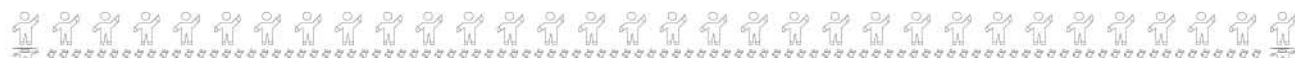
David and Nancy Bacharach
Linda Bettison
Mary Beth and Ron Cochran
Ray and Phyllis Collins
Dennis and Anne Fields
James and Marcella Gammell
Curtis and Betty Ghylin
Earleen and Abdalla Hanafy
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William and Phyllis Lacroix
Thomas and Mille Lembeck
Mary McKenzie
Ruth Nearing
Harry Olson, Jr.
John and Carol Pike
Sid and Pat Prom
Sherwood Reid
Glenn and Nancy Street
Stephen and Elaine Thrune

Because of your generous donations, the HPL is now able to purchase a second treadmill. This is very exciting as the current treadmill was purchased in 1979.

Should you be in a position to continue making contributions 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
720 Fourth Ave. S.
St. Cloud, MN 56301-4498



Subjects Wanted

If you have symptoms of high blood pressure or mildly elevated blood pressure and would like to participate in a research study, please contact Karen Riska in the Human Performance Lab of SCSU at 320-255-2373.

If you have impaired glucose intolerance or mild type II diabetes and would like to participate in a research study, please contact Megan McNair in the Human Performance Lab of SCSU at 320-255-2373.