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Human Performance Lab Newsletter, March 2002

St. Cloud State University

HUMAN PERFORMANCE LAB
ST. CLOUD STATE UNIVERSITY

NEWS

ST. CLOUD STATE UNIVERSITY
A tradition of excellence and opportunity

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March 2002

Kelly's Corner

In my travels this summer, I had a chance to visit with some people on the east coast. They commented on my being from MN saying that's where your idea of a traffic jam is 10 cars waiting to pass a tractor on the highway and stores don't have bags; they have sacks. Additional comments such as you end your sentences with an unnecessary preposition like, "Do you want to go with?" and you install security lights on your house and garage and leave both unlocked. They were right on some of those but I perceive those things to be good.

After the events of September I 11th life as we know it, has changed forever. But some things have not changed. The late Charles Schultz, a native Minnesotan, created this quiz. You don't actually have to take the quiz. Just read it and you'll get the point.

1. Name the five wealthiest people in the world.
2. Name the last five Heisman trophy winners.
3. Name the last five winners of the Miss America contest.
4. Name 10 Nobel or Pulitzer prize winners.
5. Name the last half dozen Academy Award winners for best actor and/or actress.
6. Name the last 10 World Series winners.

How did you do? If you didn't do very well, it's ok. I didn't either. None of us remember many headlines even though these folks are the best in their fields. But the applause dies. Awards tarnish. Achievements are forgotten. Accolades and certificates are buried with their owners.

Now, here's another quiz.

1. List a few teachers who aided your journey through school.
2. Name three friends who have helped you through a difficult time.
3. Name five people who have taught you something worth-while.
4. Think of a few people who have made you feel appreciated and special.
5. Think of five people you enjoy spending time with. (Here's the Minnesotan in Mr. Schultz.)
6. Name half a dozen heroes whose stories have inspired you.

Easier? It was for me. The lesson: People who make a difference in your life are not the ones with the most credentials, the most money, or the most awards. They are the ones that care. So as always, lets try and live the best we can, take care of ourselves and be thankful for everything we <u>can</u> do in our lives.

-Dr. Bacharach

Warming Up and Stretching

Warming up and stretching are two important components of a workout that are usually not given enough time and attention. Without proper warm-up, a person may be likely to experience muscle strains or pulls, cramps, decreased range of motion in joints, along with several other muscle, joint, and cardiovascular problems.

Warming up prepares the body for physical action. The process of warming up involves physical activities that gradually increases blood flow to the working muscles and elevates heart rate. Without warming up, you are forcing your muscles into high gear before they are ready. For all types of exercise, your warm-up activities should take each of the joints through a normal range of motion, increase body temperature, and get you psychologically tuned to what your body will be doing. The suggested time allotted for warming up should be somewhere between five and 25 minutes. However, even if you only spare two minutes of your workout time to warm-up, it will be beneficial.

There are several physiological reasons for warming-up. These include: 1) increases in body and muscle temperatures, which cause an increase in enzyme activity and thus the metabolic reactions associated with the energy systems, 2) increases in blood flow and oxygen availability, and 3) decreases in time to contract and relax the muscle.

Stretching is another important component of a proper warm-up. Stretching helps maintain flexibility and range of motion, eases muscle soreness and improves recovery time. It is seldom advised to stretch a "cold" muscle as it could result in muscle damage. It is important to know how to stretch effectively to get the full benefit. Most exercise experts recommend holding a stretch for approximately 15 to 60 seconds and not bouncing. Also, never over stretch an injured muscle unless instructed to do so by your doctor, physical therapist, or trainer. Most importantly, stretch to a level of slight discomfort, not pain!

Ultimately, warming up and stretching are very important aspects of a workout and adequate time should be allotted to perform both activities.

- Josh Oien & Karen Walzcak

WHO'S NEW IN THE LAB THIS YEAR?

Anthony (Tony) Duerr
Tony is a first year graduate student in exercise physiology. Originally from Fosston, MN, Tony now resides in Waite Park, MN. Tony is a 2001 graduate from the Minnesota State University, Moorhead (MSUM) with a double major in biology and exercise science. While attending MSUM, Tony played collegiate football and met his wife. He has been married since July and is very much enjoying married life. Currently he is working with TEC Interface Systems on documenting blood flow improvements in their vacuum socket system. Besides graduate school and research, Tony enjoys anything to do with the outdoors and is a big sports fan.

Brian Berntsen
Brian is from Hermantown, MN. He graduated from St. John's University with a degree in biology. He is a first year graduate student working toward a degree in exercise physiology. While at St. John's, he participated in track and field as a long, high, and triple juniper. Brian loves any kind of sporting activity and has an avid love of the outdoors.

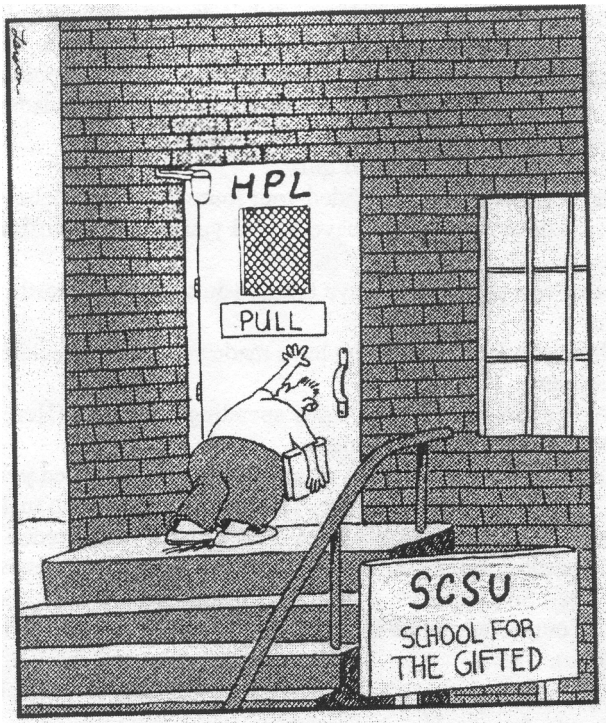
Jeff John
Jeff is a first year graduate student studying exercise physiology. He grew up in St. Paul, MN. Jeff earned his undergraduate degree in molecular biology and genetics at the University of Minnesota. After graduation, Jeff hopes to work with people to help them improve their fitness level. Jeff especially enjoys spending time with his children. Jeff 's family loves to fish, ski and relax at the lake.

Congratulations

The faculty and staff at the Human Performance Laboratory would like to acknowledge and congratulate Tracy Beil and Jeremy Frost who completed their thesis work and earned a Master of Science degree in Exercise Science.

Josh Oien
Josh Oien is a first year student studying exercise physiology. Josh is from Fargo, ND, and recently graduated from Concordia College in Moorhead, MN, with a double major in exercise science and health. Josh played four years of football at Concordia and has also coached high school and legion baseball in Fargo. Josh is a NSCA certified strength and conditioning specialist and enjoys working with athletes. In his spare time, Josh enjoys hunting, watching football, and spending time with family and friends.

Karen Walczak
Karen is a first year graduate student in exercise physiology. She received her B.S. degree in biochemistry and molecular biology from the University of Minnesota Duluth, UMD. Karen competed in cross country running and track and field while attending UMD. During the last three years she worked at a biomedical company in Eden Prairie called SurModics and coached high school cross country. She currently lives in Sauk Centre and continues to enjoy running, rock climbing, and yoga.



Investigating the SCVJ

A static squat countermovement vertical jump (SCVJ) is a vertical jump from a squat position with preliminary downward movement followed by an upward movement. The SCVJ is usually performed when a person needs to execute a quick vertical jump.

The SCVJ is common in sports such as soccer, basketball and volleyball. For example, in soccer, the goalkeeper uses the SCVJ while trying to catch or block a ball. In basketball, the SCVJ is performed when a player rebounds, blocks or makes a quick shot over a defender. In volleyball, the SCVJ is mainly performed during a fast spike or a block jump.

For my thesis, I will be researching the way volleyball players use the SCVJ. During a volleyball game, the players use the static block jump, which is similar to the SCVJ, many times. There are a few critical elements in performing a block jump in volleyball. The jump should be high enough to allow the hands to clear the net. The jump should be quick enough to bring the blocker's hands towards the ball at the same time or a little bit before the spike. It appears that each player has his/her own preferred starting position. Some players stand nearly erect while waiting to block. Others get in a low, crouched position. We wonder which position will allow the volleyball player to jump highest and get up to block a spike the quickest.

In my thesis I am trying to determine which starting position during the volleyball static block jump will result in the highest jump height and shortest time to get above the net to block a spiked ball.

- Tal Amasay

Internship Experience

This summer I had the fortunate experience to intern at Fairview University Medical Center in Minneapolis, MN. My internship was in the Cardiac Rehabilitation Department at the hospital. This was a great experience to sharpen my skills as a clinician and researcher. The goal of my internship, as is the goal of any internship, was to learn as much as possible in a three month period. The internship consisted of two parts, research and clinical experience.

My research project was to establish the groundwork for a pedometer program. The goal of the project was to investigate if walking while doing things such as laundry, cleaning, and other household chores was beneficial to minimizing heart disease. My clinical experience was also a great opportunity. I was able to test my skills and learn how to handle different situations that present themselves during the day. In addition I was able to experience all phases of cardiac rehab as well as the cardiac catheterization lab, the stress testing lab, and a coronary bypass surgery.

This was a very fulfilling summer and a great internship experience. I believe I gained a better sense of how to handle myself professionally and develop creative ways to get unwilling patients to their rehab sessions. I hope I was able to give back to Fairview University as much as I received.

- Steve Vierze

Simple Science On Yet Another Supplement: Hydroxycut

You may have seen articles in various fitness magazines about a supplement called Hydroxycut. Hydroxycut is billed as "clinically proven" and "burning 613% more fat" but are these claims believable?

How safe is a product like this? Does this product work? Questions like these can be hard to answer when many different claims are being made. Another important point to consider is that each person's body will respond differently to Hydroxycut so it is difficult to make generalizations.

There are a few things you should consider when deciding whether or not to take such a product for increased energy and/or weight loss. Hydroxycut contains Ma Huang, which is an herbal form of ephedrine. Ephedrine is a stimulant most commonly used in cold medicines. Hydroxycut also contains a guarana extract, which is the herbal form of caffeine, another stimulant. Stimulants will increase your heart rate, breathing rate, and metabolism. It is easy to see why Hydroxycut might give you extra energy and potentially help you lose weight. Hydroxycut has been called a legal "speed" pill. If you are thinking about taking Hydroxycut, I would recommend trying other options first. Increasing your workout time and intensity, or lowering your caloric intake will allow you to safely achieve the same results you might achieve with Hydroxycut.

Although you may see more rapid results while taking a product such as Hydroxycut, serious side effects may occur. Hydroxycut or any such supplement needs to be taken with caution, and you should consult a physician before you start any supplement that contains multiple stimulants.

EXERCISE .....

... is a great way to enjoy the outdoors

... DETERS HEART DISEASE

... invigorates the mind and body

... helps you use calories more efficiently

... **strengthens your bones**

...REDUCES BOREDOM

... **improves your circulation**

... helps you sleep better (zzzzzzzz)

MAKING SENSE OF THE NUMBERS-BLOOD PRESSURE

Chronic high blood pressure or hypertension increases the risk of stroke, heart attack, and kidney or heart failure. Many of us measure our blood pressures at a doctor's office, local pharmacy, or clinical setting yet few of us really understand what blood pressure represents.

The average adult has approximately 5000mL of blood. Blood flows in the body in two circulatory systems that share one common pump, the heart. The pulmonary circuit transports blood to and from the lungs. The systemic circuit transports blood and nutrients to the rest of the body. The systemic circuit holds 79 percent of the total blood volume of the body. Veins hold 59 percent of our total blood volume and arteries 15 percent. Surprisingly, the capillaries, which have the important role of supplying blood and nutrients to muscles, tissues, and organs, hold only 5 percent of our total blood volume. Blood circulates throughout the body as a result of a pressure gradient. As blood flows from the arteries to the veins, pressure progressively falls from an average of 100 mmHg to 10 mmHg. By the time blood reaches the right atrium, pressure is barely above zero. Decreasing pressure from arteries to veins prevents blood from flowing in the wrong direction.

Blood pressure can be defined as the force exerted by the blood against the arterial wall. Arterial pressure at rest varies between approximately 120 mmHg during the contraction phase of the heart (systole) and approximately 80 mmHg during the relaxation phase of the heart (diastole). When blood pressure is taken, a cuff is placed on the upper arm and is inflated enough so that the pressure of the cuff is greater than the pressure inside the arteries. This temporarily stops blood flow. The air is slowly let out of the cuff reducing its external pressure. When the pressure within the arteries exceeds that of the cuff, blood flow resumes restoring the sound of blood pulsing through the arteries. The pressure at which the first sound is heard is your systolic blood pressure. Pulses will continue to be heard until the pressure within the arteries is greater than the pressure exerted by the cuff. The pressure at which the last pulse is heard is your diastolic blood pressure.

Checking your blood pressure once or twice a year is often sufficient because blood pressure remains fairly constant when daily life remains constant. Blood pressures vary between individuals. The average blood pressure is 120/80. Smoking, stress, poor diet, lack of exercise, and genetics are key contributors to high blood pressure. Low blood pressure is common but rarely problematic. High blood pressure on the other hand is sometimes referred to as the "silent killer" because it often occurs without any symptoms. If you have chronically high blood pressure you should consult your physician. In addition to a physician's advice, natural remedies have been shown to be beneficial in the reduction of hypertension. They include relaxation techniques, stress-management action plans, reducing dietary fat and salt intakes, and aerobic exercise three times a week.

- Julia Devonish

2001 -2002 Publications and Presentations

Publications:

Board, W.B., G. Street and C. Caspers. A comparison of trans-tibial amputee suction and vacuum socket conditions. Prosthetics and Orthodics International. In press, 2002.

Street, G.M., S. McMillan, W. Board, M. Rasmussen, and J.M. Heneghan. Sources of error in determining countermovement jump height with the impulse method. Journal of Applied Biomechanics 17(l):43-54. 2001.

Peer Reviewed Papers and Chapters:

Bacharach, DW, JG Seifert, K Dean, D Schultz, and L Rice. Coaching cues via radio enhance performance of junior alpine skiers. 2 nd International Congress on Skiing and Science. Eds. Muller, Schwameder, Raschner, Lindinger, Kornexl. Verlag, Dr. Kovac, Hamburg, 2001.

Seifert, JG, M.J. Luetkemeier, AT White, LM Mino, &D. Miller. Fluid balance during slalom training in elite collegiate alpine ski racers. 2nd International Congress on Skiing and Science. Eds. Muller, Schwameder, Raschner, Lindinger, Komexl. Verlag, Dr. Kovac, Hamburg, 200 1.

Presentations:

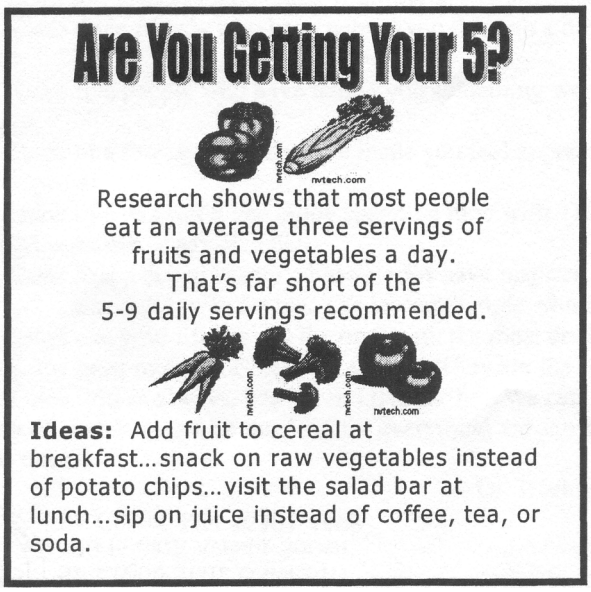
Bacharach, DW., JG. Seifert, R. Kipp, S. von Duvillard2, and A. Subudhi3. Physiological responses to skiing on shaped and conventional skis. To be presented at the National ACSM Meeting, May, 2002.

Beil, T., G. Street and S. Covey. "A Comparison of Pressures with Pin and Non-pin Liners During Ambulation." American Academy of Orthotists and Prosthetists, Tuscon AZ, Oct. 24-27, 2001.

Curried Chicken With Almonds & Dried Fruit

Ingredients:
4 Tbsp. sliced almonds
2 Tsp. olive oil
4 skinless chicken breast halves (or ½ cup tempeh)
½ cup chopped onion
2 garlic cloves minced
1 Tbsp. fresh minced ginger
2 Tsp. curry powder
¼ Tsp. salt
½ Tsp. black pepper
1 ½ cups fat-free chicken broth
½ cup dried fruit bits
(apricots, apples, pears, plums, cranberries)
2 cups brown or white rice
½ cup chopped green onions

Toast almonds by heating in a dry skillet over medium-high heat until golden, shaking frequently. Set aside. In a high-sided skillet, sauté chicken or tempeh using oil or non-fat cooking spray until golden brown. Remove from pan and set aside. In the same pan, add onion, garlic and ginger; sauté for two minutes. Add curry, salt, and pepper. Return chicken or tempeb. to pan. Slowly stir in chicken broth and dried fruit. Bring to a boil, reduce heat, cover and simmer 10- 15 minutes. Spoon 1/2 cup rice onto four individual plates. Arrange chicken or tempeh alongside rice and spoon sauce over both. Top chicken or tempeh with green onions and toasted almonds.
Nutrition Per Serving:
386 calories
10.5 g fat (1.8g saturated fat)
41.0 g carbohydrate
32.0 g protein
5.0 g fiber
Preparation time: 10 minutes
Cooking time: 20-25 minutes
Servings: 4



Update Your Exercise Prescription!

Many of you receiving this newsletter had an exercise evaluation conducted at the SCSU Human Performance Laboratory at some time.

To encourage more of you to return for this update, the HPL is continuing the 2 for 1 promotion offered last year. Talk to a friend, spouse, or colleague about sharing the cost of an evaluation and take advantage of the 2 for 1 promotion. Re-evaluation fees are just $55 or $27.50 if you share the cost. We appreciate you suggesting our program to others. Call Barb at 320-255-3105 for more information or to register for this program.

Heart Scan for Calcium Deposits

Every year thousands of people suffer from coronary artery disease, which can lead to cardiac events such as a heart attack. Every year 22% of Americans have a heart attack, and it kills 150,000 people a year. Unfortunately, there is no single test that can determine if a cardiac event is in our future.

There are tests that can help determine the likelihood of these cardiac events. The first is a graded exercise stress test, which has been performed for many years. This test is performed by hospitals, medical clinics and laboratories like ours. Another fairly new test conducted by groups like HeartScan Minnesota and the Mayo Clinic is known as Ultrafast CT. The Ultrafast CT uses electron beam computer tomography (EBCT) to detect calcium deposits in the heart and coronary arteries. The EBCT scan takes pictures of the heart in cross-sectional slices. These slices are placed together to form a three dimensional picture of the heart. A cardiologist then analyzes these pictures to determine if the coronary arteries have reduced blood flow to the cardiac muscle due to the calcium build up.

The company recommends this test for men and women over 40 with family history of heart disease, or one or more of the other common risk factors associated with heart disease- high cholesterol, high blood pressure, physical inactivity, diabetes, smoking, obesity, and/or stress.

The HeartScan Company claims that this test is the only direct method in which a cardiac event can be predicted. However, this is not entirely true. There has not been any significant scientific research that supports these claims. Therefore the heart scan should not be considered a direct predictor tool at this time.

When speaking with doctors from the St. Cloud Heart Center, their opinion was that the heart scan is a good test; however, they caution against the claims made by advertisements as being a direct measure of heart disease. The cardiologists recommend a heart scan for patients who do not have any physical symptoms but have multiple risk factors that would increase his/her risk of heart attack. Before you elect to do EBCT, check with your personal physician. Always be aware that the best prevention of heart attacks is to maintain a healthy diet and stay physically active.

- Brian Berntsen

Thank You-Gracias-Merci-Toda-DanK U Wel-Efharisto'-Grazie

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

David & Nancy Bacharach
Mary Beth & Ron Cochran
Ray & Phyllis Collins
Dennis & Anne Fields
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Rick Jones
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Louis Krippner
David & Barbara Kunze
Thomas & Mille Lembeck
Mary McKenzie
Merck Company Foundation
Ruth Nearing
Harry Olson, Jr.
John & Carole Pike
Sherwood Reid
Glenn & Nancy Street
Stephen & Elaine Thrune

We greatly appreciate the financial support so many of you have provided over the years. At this time the Human Performance Lab needs a new treadmill. Thanks to past donations we are nearly at our goal of $8,000.00 for the purchase of a new Quinton Q65 treadmill. If you are in a position to make a contribution toward this purchase, we would be very grateful.

Please make checks payable to SCSU Foundation-Adult Fitness and mail them to:

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