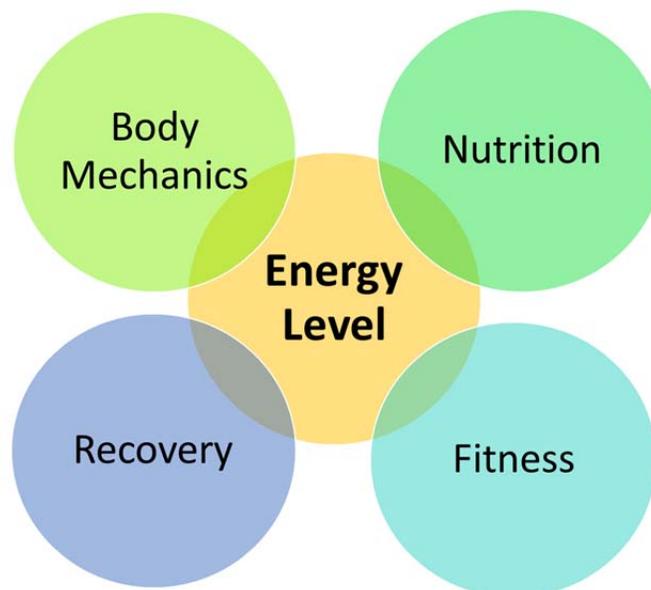




September 2016

Maximize Productivity and Minimize Fatigue with Fitness and Nutrition

Muscle fatigue is one of the first thresholds to injury. The demands of extended shift durations, adverse environments and the overall physical nature of working conditions require a strong focus on physical preparedness and work design. Top performance requires proper fueling through nutrition, good body mechanics, good physical fitness and effective recovery time. These factors will determine energy levels and the ability to reduce the risk of injury.



Muscles are the shock absorbers of the body. Working with a fatigued muscle is like driving a car without shocks. When muscles are fatigued, they do not absorb forces effectively. As a result, more force is transmitted to the tendons and joints.

Proper Nutrition Provides the Fuel

The body is a machine that needs the right fuel to run efficiently. Proper nutrition throughout the day is a key to ensuring energy levels are maintained. Eating the right foods at the right time of the day is also important. It is best to distribute the calories equally between breakfast, lunch and dinner. Drink water throughout the day, preferably before you get thirsty.

Fats and carbohydrates supply the body with energy, but protein helps regulate the release of that power. High fiber items will extend the burn, allowing the carbs to burn slower, thus increasing energy levels. Also, a balance of simple carbohydrates for quick energy and complex carbs for sustainability will reduce the fatigue potential.

Some foods are better than others at keeping us going. A few simple guidelines are as follows:

Eat a good breakfast to start the day:

- Whole grain bagel with cheese
- Cereal with fruit and yogurt
- Whole grain toast with peanut butter and fruit
- Hard-boiled egg sliced into a whole wheat pita
- Scrambled eggs, toast and fruit
- Oatmeal with raisins

Immediate energy foods, fast burning (simple carbohydrates):

- Apples, pears, bananas
- Melons
- Blueberries, strawberries
- Real fruit juices

Slow burning energy foods (complex carbohydrates)

- Green vegetables, spinach, Brussels sprouts
- Whole grains and food made from whole grains, such as oatmeal, whole-grain breads, pita and pasta
- Starchy vegetables such as potatoes, sweet potatoes, corn and pumpkin
- Beans, lentils, quinoa, peas, hummus

Energy regulating & repair foods (protein & healthy unsaturated fats)

- Eggs
- Meat, fish, poultry
- Yogurt (preferably low sugar)
- Peanut butter, almonds, walnuts other nuts
- Olives, olive oil, canola oil
- Avocado
- Flax seed, sunflower seeds, sesame seeds

Foods to avoid:

- Avoid the simple sugars to avoid the crash, such as soda, candy and sugary snacks
- Avoid the high caffeine energy drinks
- Avoid saturated fats and trans-fats with poly unsaturated fats

Optimizing Body Mechanics

Our goal should be to use the least amount of effort to complete the job. Proper work technique can dramatically reduce the effort needed to complete a task. For example, simply using a power grip results in 75% more strength than using a pinch grip.

Upper Body Technique:

- Avoid forceful pinch grips, use power grips
- Avoid forceful exertions over shoulder height
- Avoid the chicken wing (elbows raised from the side of the body)
- Minimize hammering/hand pounding
- Use a slight bend of the elbow when carrying
- Minimize forceful forearm rotations & high torque reactions
- Keep things close, avoid extended reaching

Lifting & Handling Technique:

- Keep weight close to body
- Use smooth lifting motions
- Avoid long carries
- Squat or kneel for low product
 - Maintain lower spinal curve
 - Tighten abdominal muscles
- Test unknown load weight
- Use the leg muscles
- DO NOT TWIST
- Better to push than pull
- Use available equipment

Avoid Static Work

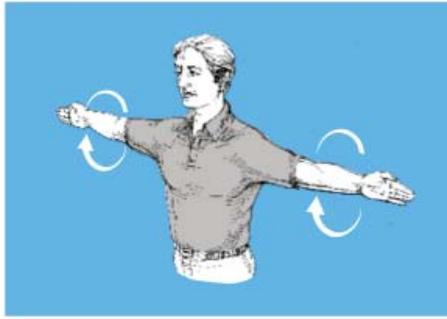
Static work occurs when working in a fixed position for extended periods. Static work zaps strength and quickly contributes to fatigue. Examples include working with arms raised overhead or carrying items over long distances, affecting the shoulder and arm muscles. We only have our maximum strength for 6-seconds during a static exertion. After that, our strength drops dramatically. Rest and recovery time are needed after periods of static work.

Rest & Recovery

To give your muscle a break, consider alternating your work tasks. Job rotation is also an effective technique for alternating the physical work demands.

Micro-breaks that last just a few seconds or less than a minute can often provide the recovery that is needed. Look for opportunities to incorporate micro-breaks into the jobs design. For example, pausing to review paper work or completing some other non-physical component of the work can be sources of recovery.

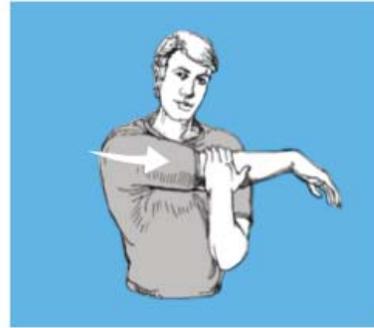
Stretching can be used to increase blood flow to the affected muscles to wash away the waste product of static work. After periods of static work, performing light stretches or massage of the affected muscle groups will stimulate blood flow and speed the recovery from fatigue.



ARM CIRCLES

Hold arms to side: Rotate arms forward then backwards

Dynamic stretch = movement



SHOULDER STRETCH

Grab elbow and pull the upper arm across the chest

Static stretch = holding a posture
(less than 6 seconds)

Summary of Techniques for Maximizing Productivity and Reducing Fatigue

Eat Effectively: Carbs provide energy to last through a physically demanding day, while protein helps regulate the burn and rebuild muscles after being broken down during heavy exertions. Consume a reasonable mixture of protein and carbs throughout the workday.

Use Proper Body Mechanics and Technique: Work smarter, not harder. Proper setup of the work area and the use of proper technique can improve working postures resulting in less effort. Focus on proper upper extremity technique and materials handling techniques.

Increase Your Muscle Strength: The stronger you are, the less effort you need to do the job. Performing strengthening exercises is one of the best ways to avoid muscle fatigue.

Increase Your Endurance: Your cardio endurance will determine how long you can work before experiencing fatigue. By performing exercises that get the heart going (like bicycle riding, jogging, etc.), you can increase endurance and reduce fatigue.

Avoid Static Muscle Exertions: Working in fixed static postures limits blood flow to the muscles, quickly zaps strength and contributes to fatigue.

Get Appropriate Rest & Recovery: If you know you are about to have a heavy day (for example, hot/humid weather, heavy work schedule), make sure that your body is prepared by getting the rest it needs. While working, change the muscle groups used to do the job and take micro-breaks to provide recovery.

Occasional Stretching to Improve Circulation: Keeping the blood flowing is a key to avoiding fatigue. By taking a couple of minutes to gently stretch muscles after periods of exertion, the blood can wash through the muscles bringing oxygen and removing the waste. Massage is another great way to rejuvenate tired muscles.

Author**Kevin Costello, CPE**

President

United States Ergonomics

E. k.costello@us-ergo.com**T.** 516.759.2418 ext. 1**W:** www.us-ergo.com**Contributor/Editor****Thad Whittier, CIE**

Assistant Vice President, Loss Control

AWAC Services Company,Member Company of **Allied World****E.** riskmanagement@awacservices.com**T.** 860.284.1305**W:** www.awac.com

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