

Caring for your body as a production arborist

Climber's Corner Presentation Monday 10:05-11:50

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Production arborists are industrial athletes. They physically exert themselves for a prolonged period of time and utilize a tremendous amount of energy, all while working in a variety of environmental conditions. However, not all arborists care for their bodies like they should. Maintaining peak physical performance can make an arborist more productive and efficient, which can benefit both small and large companies by decreasing the risk of injury and greatly improving productivity.

Production arborists can enhance physical performance as well as decrease the risk of injury by following some basic principles. These include: 1. proper nutritional intake, 2. appropriate rest and recovery, 3. adequate sleep, 4. proper training and conditioning and 5. adequate hydration. Proper nutritional intake includes eating healthy carbohydrates and fats to be utilized for energy, as well as protein for tissue repair. Rest and recovery involve taking time off from physical activity allowing the body to heal and refuel, and adequate sleep allows the body time to repair itself. Training and conditioning for arborists is done on the job during the sawdust biathlon of climbing and dragging brush. Adequate hydration is needed for a variety of bodily functions including allowing the body to cool itself.

Arborists utilize a tremendous amount of energy during their workday, whether dragging brush or climbing. When the body utilizes energy, heat is produced. As with mechanical equipment, increased heat must be dissipated from the body to prevent overheating and maintain a core temperature within a few degrees of 37°C (98.6°F). The body accomplishes this through a self-cooling process.

The body cools itself progressively in three ways. As the body initially heats up, there is an increase blood flow to the skin, removing heat from the core. If activity and heat production continue, then our breathing becomes heavier expelling heat during exhalation. The final stage of cooling as activity continues is sweating. Sweat beads up on the skin and cools through evaporation. Sweat must evaporate in order to cool the body, therefore if the humidity is high, sweat will not evaporate and cooling is not as effective. In high humidity environments, moisture wicking clothing can aid in the evaporation of sweat from the surface of the skin. The body can lose up to 3 L of water in the form of sweat in 1 hour, but can only absorb 1 L from fluid absorption.

When working in the heat, there is a risk of heat related illnesses such as heat exhaustion or heat stroke, which can lead to death. Heat exhaustion occurs when the body becomes too hot. If not adequately cooled down, it can lead to heat stroke, which occurs when the internal body temperature reaches 40°C (104°F). It is considered life threatening when temperatures rise to 106°F. Proper hydration is one way to decrease the risk of heat related illnesses.

Proper hydration needs to begin prior to activity because the body can lose 3L/hour from sweating, but can only absorb 1L/hour from fluids. Fluids for proper hydration should be non-caffeinated, non-alcoholic and non-carbonated. Water is best, but electrolyte replacement is also necessary for production arborists who sweat for greater than 2 hours/day at work. Sports drinks can replace some electrolytes, but are high in sugar.

Dehydration occurs when the body does not have enough water for bodily functions. It can range from mild to severe, which can be life threatening. Signs of dehydration include: dark colored urine, difficulty concentrating, feeling thirsty, cramping, headaches, low blood pressure and feeling lightheaded. Dehydration impairs coordination, concentration, decreases performance, causes quicker fatigue and afternoon sluggishness, slows reaction time and increases the risk of heat-related illnesses. Ultimately, dehydration increases the risk of an accident in production arborists, whose work is precise and physically demanding. Dehydration will not only effect the way one feels, but also production and precision on the job, which can be life threatening for an arborist.

According to a demonstration presented at the ISA conference in Toronto in August 2013 by Dr. John Ball, PhD, a professor of Forestry at South Dakota State University, an approximate 3% loss of body weight was observed in arborists after 4 hours of climbing, indicating dehydration. Dehydration decreases performance and increases reaction time, which was noted with a 20% increase in the time required to complete the same climbing tasks later in the day. His work is ongoing in this area, and will be beneficial to enhancing the performance and decreasing injury in production arborists.

Although dehydration is more common it is possible to over hydrate, which causes low sodium levels in the blood (hyponatremia), and can also be life threatening. To avoid hyponatremia, electrolyte replenishment is important. The body uses electrolytes to ensure proper cell functioning. They regulate water balance and play a vital role in muscle, nerve and brain function. Sweat is composed of body water and electrolytes. The most common electrolytes are sodium, potassium, calcium, magnesium and chloride.

When sweating for short intervals (between 90-120 minutes), electrolytes can be replaced by normal food intake. However, if activity lasts > 120 minutes, electrolyte replacement may be necessary, which is the case for most production tree care workers. Sports drinks are most often considered for electrolyte replenishment, however they contain high amounts of sugar and other additives. Sea salt, coconut water, and citrus fruits (oranges, lemon, limes, grapefruit) are good natural sources for electrolyte replenishment. Proper hydration includes both fluid and electrolyte replenishment. Ensuring proper hydration of tree care workers will make them feel better, enhance their performance to improve productivity and efficiency, will decrease the risk of an accident, and can ultimately improve the profitability of a tree care company.