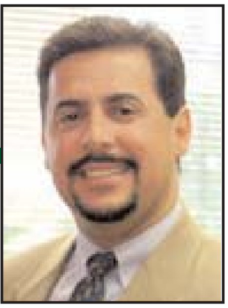

COFFEE, TEA, OR ME (HEALTH)

by Frank Roman MD JD

In a recent survey of thousands of workers in the United States, it was determined that the largest single factor for sleep deprivation was number of hours spent at work, but my question is who actually stops working when they leave work? The first thing that many of us sacrifice in an effort to complete all our work and social activities is sleep. My attempts to start a napvoluation with my last article "The Courage to Nap" has failed miserably. Therefore, I am doing an 180 degree about face and addressing one of the most common strategies to combat sleep deprivation: caffeine.

Caffeine (1, 3, 7, -trimethylxanthine) is a purine alkaloid that occurs naturally in coffee beans. Caffeine works through the antagonism of the A1 and A2a subtypes of the adenosine receptor. Adenosine is an endogenous neuromodulator with mostly inhibitory effects and adenosine antagonism by caffeine results in effects that are generally stimulatory.

Caffeine is rapidly and almost completely absorbed in the stomach and small intestine and distributed to all the tissues including the brain. Caffeine metabolism occurs in the liver with cytochrome P450. This is the same cytochrome system that the body uses to metabolize many of the medications that are currently prescribed.

Interestingly, there are over sixty plant species that naturally contain caffeine. Also of major interest caffeine is poisonous to herbivores and insects. It is also toxic to plants and is stored in special vacuoles or specialized plant compartments, which protect the plant from the toxic stimulant.

Of particular note, an important stimulant plant is guarana found in Brazil, Columbia, and Venezuela. If you only remember one thing in this article, remember the word guarana. This vine bears red capsules containing chocolate brown seeds. These brown seeds have a caffeine context of approximately 4.3% by weight or 3-5 times as much caffeine as coffee.

As you will see below many of the energy drinks marketed today have guarana.

Approximately 210 mgs. of caffeine per person is consumed daily in the United States but the highest consumption per capita is accredited to Sweden with an average consumption of 400 mgs. per day (Sweden? Who knew?)

Since caffeine is metabolized in the liver there are certain medications, which can alter the plasma caffeine concentrations. For example, Tagamet, Antabuse, Diflucan, Luvox, Mexitil, and Lamisil, estrogens, and quinolone class antibiotics can increase plasma concentrations and risk of caffeine related side effects. On the other hand Dilantin and cigarette smoking decrease the metabolism of caffeine.

The chronic ingestion of excessive amounts of caffeine can lead to caffeinism. This syndrome is characterized by restlessness, nervousness, insomnia, tachycardia, and dyspepsia. At extremely high doses considered to be over 1,000 mgs. per day, severe psychiatric affects have been reported. Moreover, there has also been cases of fatal or lacerating caffeine overdoses. Though oral doses of 5-50 grams of caffeine have resulted in fatalities in adults and a lethal dose is estimated at 100-200 mgs. per kilograms of body weight. Symptoms of caffeine overdose include agitation, delirium, seizures, dyspnea, cardiac arrhythmia, myoclonus, nausea, vomiting, hyperglycemia, and hyperkalemia.

On the other hand, the sudden cessation of caffeine can lead to withdrawal symptoms. These symptoms include headaches, fatigue, drowsiness, irritability, difficulty concentrating, and depressed mood. Nausea and general myalgia have also been seen.

Another common caffeine containing beverage is tea. Specifically camellia sinensis, which is the plant source for black tea (fermented), green tea (unfermented), and oolong (partially fermented). Of recent vogue is green tea thought to have many health benefits attributed to the various powerful antioxidants it contains. Most recent benefits that have been mentioned include weight loss, lowered cholesterol levels, and improved mental alertness. In general tea has approximately 35-50 mgs. of caffeine for each 8 ounce serving.

Stating the obvious, caffeine is not present only in coffee or tea. In our society since approximately 1987 there has been a market for energy drinks that contain caffeine. This hits close to home since my 14-year-old son, John, has a collection of empty cans of different energy drinks he has consumed. Some of these include Power Up, Red Jak, Mountain Dew MDX, Vault, Red Bull, KMX, Excess, AMP, Full Throttle, Diet Pepsi Max, Energy Meteor, Rock Star, No Fear, Extreme Energy Shot, and Adrenalin Rush. Some of these energy drinks state the amount of caffeine but the majority do not. Many of them list the other contents in detail including the amount of guarana. I forgot to mention my favorite energy drink, Pimp Juice, which contains 81 mgs. of caffeine and guarana. I personally obtained several cans of this energy drink in St. Louis, Missouri, which

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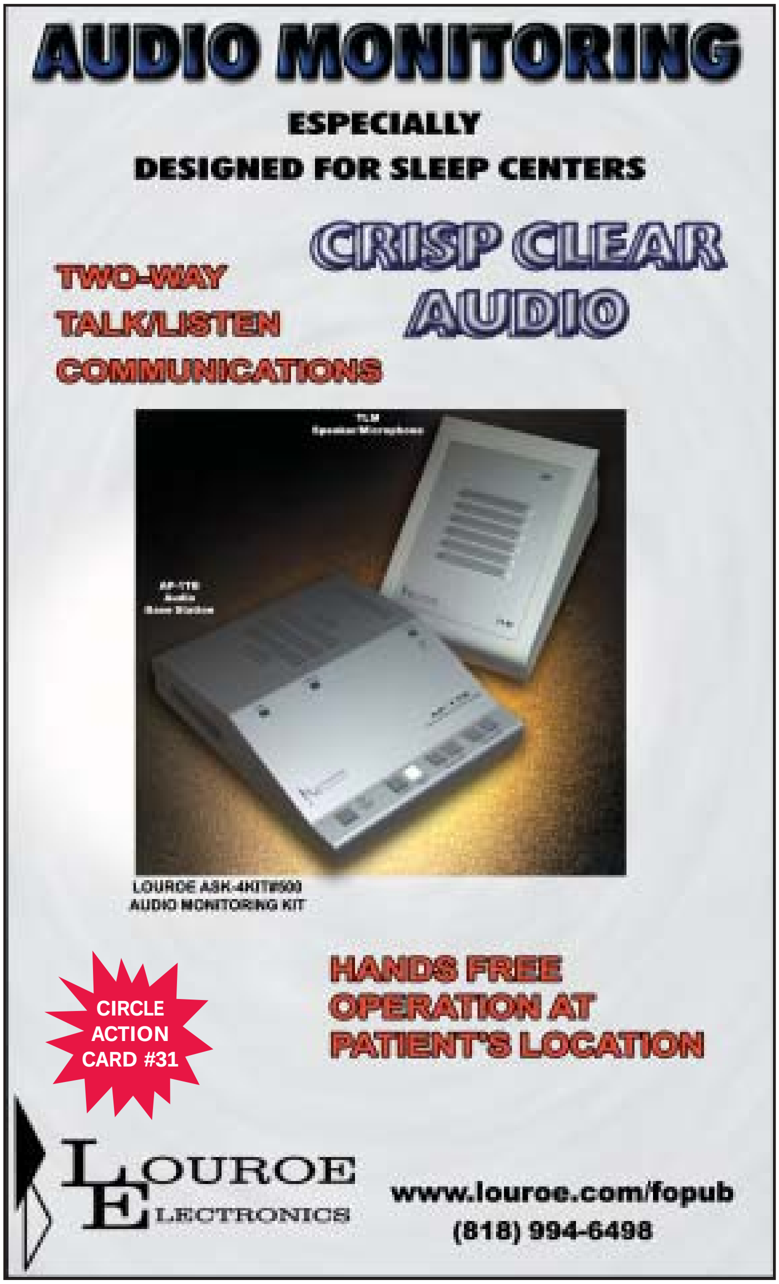
as you hipsters know out there is based on a famous song of a regional rap artist (for those of you who are not so hip, Nelly). If energy drinks are not your cup of tea, caffeine can also be obtained through an array of non-liquid items: for example candy, specifically Java Pops which are lollipops that come in different flavors including cappuccino and Irish crème. They have approximately 60 mgs. of caffeine. Or on the other hand if you are addicted to gum you may try Blitz Energy Gum, Penguin Peppermint Energy Gum, and Jolt Energy Gum. The caffeine content varies among these different gums. There are also caffeine strips, for example Nrage Energy Strips which dissolve in your mouth similar to the breath freshening strips. The company web site states that four strips offer an equivalent amount of caffeine to a cup of coffee. Mints are also available through the Penguin brand and the label asserts that three mints are the caffeine equivalent to one cola. Finally, sunflower seeds which are infused with caffeine, taurine, and ginseng.

Not to be outdone we also have caffeinated products in the over the counter medication section. Some of the examples include a .44 magnum capsule or a 357 HR magnum tablet, which contain 200 mgs. of caffeine. Other examples include Anacin tablet, which has 32 mgs. of caffeine, Analgesic tablet with 32 mgs., Arcet with 40 mgs., and Alertness AL tablet with 200 mgs. of caffeine. Bayer Extra Strength Back and Body Pain tablet have 32.5 mgs. As you already know many of these medications are mixed with acetaminophen or aspirin. Also found in the research for this article was caffeine containing suppositories which are no longer marked in the United States.

Beverage companies that sell alcoholic energy drinks were criticized this year by the attorneys general of 28 states and Washington, D.C. Their collective position is that the aggressive marketing of energy drinks, mixing alcohol and caffeine, targets teenagers and young adults who buy non-alcoholic energy drinks. They have requested a federal investigation into the makeup of alcoholic energy drinks to determine whether, based on the percent of alcohol contained in the specific drink, they are properly classified as malt beverages under federal law. Malt beverages are more readily obtainable by younger people. Many of these energy drinks have a specific warning on the bottle stating not recommended for children, pregnant, or nursing women, or those sensitive to caffeine.

Products singled out by the attorneys general including Sparks and Sparks Plus from Miller Brewing Company, Bud Extra from Anheuser-Busch, and finally Liquid Charge and Liquid Core from Charge Beverages of Portland. Another recent phenomenon is the mixing of energy drinks with alcohol at the different clubs. For example, Red Bull mixed with various types of distilled spirits in an effort to keep the party going. This reminds me somehow of the Drew Carey show based out of Cleveland, Ohio where Drew and his lifelong childhood friends attempted to launch Buzz Beer which consisted of alcoholic beer with caffeine. However it seems to me there is actually such a beer that was recently introduced into the market place.



In general, coffee seems to be considered an inappropriate beverage for children in the United States. However in some societies, particularly Hispanic, coffee drinking is introduced very early in life. There is one study that reported coffee being introduced into infant diets as early as two months of age. In some South American cultures, especially in coffee growing countries, coffee consumption is part of many meals. In addition in these countries there are no restrictions on coffee consumption during pregnancy and lactation. Being Hispanic, one of my fondest and perhaps only memory of my grandfather who died when I was six years old was sitting on his lap while eating cheese and crackers soaked in coffee.

Space constraints have restricted my discussion on this topic to the point I have not even started listing health benefits and risks of this worldwide chemical. Therefore, I must continue this review in our next article, which my editor Robert Miglio absolutely hates.

I will just tell him that I'm on my coffee break until the next issue.

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