

AGROMEDICINE PROGRAM UPDATE

MUSC DEPARTMENT OF FAMILY MEDICINE – DIVISION OF PUBLIC HEALTH AND PUBLIC SERVICE
19 HAGOOD AVENUE – SUITE 305 HOT, P.O. BOX 250805, CHARLESTON, SC 29425

Samuel T. Caldwell, Editor
caldwest@musc.edu
843-792-2281 Fax 843-792-4702

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Fatigue: A Preventable Hazard

by Dr. Stanley Schuman

Did you know:

- watching the Late, Late Night Show on TV can affect your risk of injury from farm hazards?
- “about 1/3 of the U.S. population suffers from clinically disturbed sleep?”¹
- “disruption of circadian rhythms leads to a decrease in performance?”²
- “short naps and rest breaks may restore performance for most individuals, under most conditions.”²
- sleep apnea, affecting 3% of middle-aged workers carries an increased risk of fatal and nonfatal driving accidents?³
- young adults may need more than 8 hours sleep per night?
- individuals may not recognize their own sleepiness and lapses of attention? Such lapses



are equivalent to being alcohol-intoxicated?

- “a short nap of less than 15 minutes combined with a cup of coffee or iced tea (containing 200 mgm of caffeine) reduces the number of performance errors in a driving simulator 3 to 4 fold?”²

Comment: Sleep deprivation can set the stage for serious injury during any typical summer on the farm in South Carolina. Heat-and-humidity stress, prolonged work hours and dehydration can lead to slowed reflexes, impaired judgment, and lapses in attention, making fatigue a prime risk factor for a tragic agricultural accident. Falling asleep driving vehicles to and from the farm can be life threatening as well.

¹Bixler E, et al. Prevalence of sleep disorders, *Am J Psychiatry* 1976; 136:1257-1262.

²Sherry P. Fatigue in the transportation industry. *Clin Occup Environ Med* 3 (2003):109-129.

³Ulfberg J, et al. Sleep-disordered breathing and occupational accidents. *Scandinavian J Work* 2000; 26:237-242.

Work-Related Wildlife Infections

by Dr. Stanley Schuman

According to Guidotti and Naidoo,¹ “wilderness-related occupations carry a much higher risk for infections than do recreational hunters or hikers.” Such jobs include foresters, utility workers, agriculture, construction, nature guides, professional hunters and trappers.

Acute febrile illnesses in such workers should alert the clinician to think of a range of animal, insect vector, bite-and-wound, and carcass-and-meat exposures. Among the illnesses to be considered in the differential diagnosis are: hantavirus pulmonary syndrome (deer-mice droppings); leptospirosis (rodent infested sugar-cane fields); tularemia (rabbit fever, deer fly fever); sylvatic plague (flea-borne); rabies (animal bites, bat cave droppings); rat bite fever (streptococcal infection); Lyme disease, ehrlichiosis, babesiosis, Rocky Mountain spotted fever, and relapsing fever (tick-borne).

The authors recommend the following tips for prevention:

- “regular tick inspection and careful removal;”
- “tick repellent on clothing and exposed skin;”
- “avoid excessive contact with blood of captured or butchered animal;”
- “mosquito repellents and netting at night;”
- “be attentive to rodent and mouse habitats; disinfect with bleach;”
- “prompt disinfection of all wounds, including bites.”

Farmers should not neglect wounds received while clearing underbrush. Workers butchering carcasses are at risk of bone fragment wounds. Ticks may be directly or indirectly transmitted by dogs. Insect vectors may infest campsites and sleeping quarters. Wild rodents and birds may carry a variety of infectious agents into barns, granaries, and packing and storage sheds.

¹Guidotti TL, Naidoo K. Hunting, trapping, and wilderness work, *Clin Occup Environ Med* 2 (2002) 651-661.

Semen Quality and Chemical Exposure

by Dr. Stanley Schuman

Investigators at Massachusetts General Hospital¹ recruited 168 men from their infertility clinic to provide samples of semen for

sperm quality and urine for traces of metabolites of commonly used phthalate in industrial plastics, home products, insect repellents, cosmetics, and medical products. Since laboratory studies of male rats demonstrated chemically-induced spermatotoxic effects, the search for human reproductive effects is going on. This is especially true in Denmark² since the early 1990's.

Duty and her eight colleagues compare six phthalates in the urine with three measures of sperm quality (concentration, motility, and morphology). Of the 18 cells in their table of results, only one cell for mono-butylphthalate (MBP) achieves a significant odds ratio (2.4, 1.1 – 5.0 confidence interval). In the table for dose-response trend statistics, only 3 of the 9 possible cells showed possible correlation between three phthalate parameters and three sperm parameters. Nonetheless, the authors conclude that more research is needed on possible deleterious hormonal effects of similar manmade chemicals on the reproductive fitness of our male population. “Biomarkers have the potential to integrate exposures to chemicals from all routes of exposure including oral, dermal, inhalation and ingestion.”



By contrast, Professor Klein, in his monograph on plants in health and disease,³ reminds us that botanical extracts have been used by every culture since time immemorial, as prescribed contraceptives and cures for infertility. Documentation includes use of ginseng, mandrake, soybean stems, tulip bulbs, sweetpeas, bugleweeds, stoneseed, clover, cowbane, and other alkaloids.

The early herbalists did not have the technology of Duty's research team detecting traces of urinary metabolites of manmade plastics. Without using “high-performance liquid chromatography and tandem mass spectrometry,” old time botanists had to evaluate their botanical cures and negative side effects observationally, without depending on odds ratios and probability statistics. Nature's own potent chemicals have been part of our environmental exposures long before manmade plastics were invented.

¹Duty SM, et al. Phthalate exposure and human semen parameters. *Epidemiology* 2003; 14:269-277.

²Storgaard, et al. Does smoking during pregnancy affect sons' sperm counts in Denmark? *Epidemiology* 2003; 14:278-286.

³Klein RM. Chapter 5, *Medicinal Plants in The Green World*, 1979, Harper & Row, N.Y.