



The Vitamin & Herb Stores

Human Technology Research Synopsis

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- 2. New study will make criminals sweat**
- 3. Common bronchodilator linked to increased deaths**
- 4. Higher urinary levels of commonly used chemical, BPA, linked with cardiovascular disease, diabetes**
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Loss of sleep, even for a single night, increases inflammation in the body

Philadelphia, PA, September 2, 2008 – Loss of sleep, even for a few short hours during the night, can prompt one's immune system to turn against healthy tissue and organs. A new article in the September 15th issue of *Biological Psychiatry*, by the UCLA Cousins Center research team, reports that losing sleep for even part of one night can trigger the key cellular pathway that produces tissue-damaging inflammation. The findings suggest a good night's sleep can ease the risk of both heart disease and autoimmune disorders such as rheumatoid arthritis.

Specifically, the researchers measured the levels of nuclear factor (NF)- κ B, a transcription factor that serves a vital role in the body's inflammatory signaling, in healthy adults. These measurements were repeatedly assessed, including in the morning after baseline (or normal) sleep, after partial sleep deprivation (where the volunteers were awake from 11 pm to 3:00 am), and after recovery sleep. In the morning after sleep loss, they discovered that activation of NF- κ B signaling was significantly greater than after baseline or recovery sleep. It's important to note that they found this increase in inflammatory response in only the female subjects.

These data close an important gap in understanding the cellular mechanisms by which sleep loss enhances inflammatory biology in humans, with implications for understanding the association between sleep disturbance and risk of a wide spectrum of medical conditions including cardiovascular disease, arthritis, diabetes, certain cancers, and obesity. John H. Krystal, M.D., Editor of *Biological Psychiatry* and affiliated with both Yale University School of Medicine and the VA Connecticut Healthcare System, comments: "The closer that we look at sleep, the more that we learn about the benefits of sleeping. In this case, Irwin and colleagues provide evidence that sleep deprivation is

associated with enhancement of pro-inflammatory processes in the body."

"Physical and psychological stress brought on in part by grinding work, school and social schedules is keeping millions of Americans up at night," said Dr. Irwin, lead author and director of the Cousins Center for Psychoneuroimmunology at the Semel Institute.

"America's sleep habits are simply not healthy. Our findings suggest even modest sleep loss may play a role in common disorders that affect sweeping segments of the population." In other words, sleep is vitally important to maintaining a healthy body. And as Dr. Krystal notes, "these findings provide a potential mechanistic avenue through which addressing sleep disturbance might improve health."

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Study finds B-vitamin deficiency may cause vascular cognitive impairment

deficiency of B-vitamins may cause vascular cognitive impairment, according to a new study. Researchers at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts University used an experimental model to examine the metabolic, cognitive, and microvascular effects of dietary B-vitamin deficiency. Their findings appear in the August 26, 2008 issue of Proceedings of the National Academy of Sciences (PNAS).

"Metabolic impairments induced by a diet deficient in three B-vitamins -folate, B12 and B6- caused cognitive dysfunction and reductions in brain capillary length and density in our mouse model," says Aron Troen, PhD, the study's lead author. "The vascular changes occurred in the absence of neurotoxic or degenerative changes."

Troen, who is an assistant professor at Tufts University's Friedman School of Nutrition Science and Policy, explains, "Mice fed a diet deficient in folate and vitamins B12 and B6 demonstrated significant deficits in spatial learning and memory compared with normal mice." Troen and colleagues observed similar but less pronounced differences between normal mice and a third group of mice that were fed a diet enriched with methionine.

"The B-vitamin-deficient mice also developed plasma homocysteine concentrations that were seven-fold higher than the concentrations observed in mice fed a normal diet," adds Troen. Homocysteine is produced by the breakdown of a dietary protein called methionine. B-vitamins, including folate, vitamin B12, and vitamin B6, are required to convert homocysteine back to methionine, thereby reducing the blood concentration of homocysteine.

Studies have linked elevations in plasma homocysteine with an increased risk for cognitive impairment. "However," Troen says, "it has not been determined that

homocysteine is directly responsible. Based on the findings of our study, we theorize that a deficiency of B-vitamins induces a metabolic disorder that manifests with high homocysteine, as well as cerebral microvascular dysfunction."

Troen and colleagues divided their study mice into three groups and fed each group a different diet for 10 weeks. While the control (comparison) group was fed a normal diet containing methionine and B-vitamins, the other two diets were designed to induce high homocysteine levels but through different metabolic mechanisms. One was methionine-enriched, and the other was deficient in B vitamins. Researchers measured blood concentrations of B-vitamins and homocysteine and assessed the brain anatomy and vasculature. They also evaluated psychomotor function by a battery of age-sensitive tests, such as holding on to a wire and walking a beam, and assessed spatial learning and memory with the Morris water maze, a well-validated and sensitive test of rodent cognitive function.

"It took longer, on average, for the B-vitamin-deficient mice to maneuver the water maze, compared with controls," says Troen. "Longer latencies were associated with higher plasma homocysteine levels and shorter capillaries, particularly in the brain region called the hippocampus." Troen adds, "Despite the vascular changes, the brain anatomy appeared normal, and there was no evidence of a cellular proliferation process called gliosis, which typically accompanies neurodegeneration."

Irwin Rosenberg, MD, director of the Nutrition and Neurocognition Laboratory at the HNRCA, notes, "The elevated levels of homocysteine that were associated with vascular cognitive impairment in the mice in our study are comparable to the levels that are associated in older adults with an increased risk for Alzheimer's disease and cerebrovascular disease, the latter of which manifests with conditions such as stroke and atherosclerosis. These findings may indicate that microvascular changes mediate the association between high homocysteine levels and human age-related cognitive decline."

Troen and colleagues write that their study helps to "...define more precisely the mechanisms underlying cerebral microvascular disease, independent of or prior to the onset of irreversible neurodegeneration." According to Troen, this work, which was funded by the U.S. Department of Agriculture, "may provide a model system in which to study the role of the brain's microvascular circulation in cognitive function."

Public release date: 2-Sep-2008

Innate immune system targets asthma-linked fungus for destruction

Blacksburg, Va. – A new study shows that the innate immune system of humans is capable of killing a fungus linked to airway inflammation, chronic rhinosinusitis and bronchial asthma. Researchers at Mayo Clinic and the Virginia Bioinformatics Institute (VBI) have revealed that eosinophils, a particular type of white blood cell, exert a strong immune response against the environmental fungus *Alternaria alternata*. The

groundbreaking findings, which shed light on some of the early events involved in the recognition of *A. alternata* by the human immune system, were published recently in the *Journal of Immunology*.*

Eosinophils typically combat parasitic invaders of the human body larger than bacteria or viruses, such as flukes or parasitic worms (collectively known as helminths). Evidence from different experimental approaches suggests that asthma and chronic sinusitis can arise when the body perceives that it has encountered a disease-causing organism. Environmental fungi such as *Alternaria* do not typically cause invasive infections like parasites but for some reason, in certain people, the body responds as if it is being attacked and chronic inflammation can result from the ensuing cascade of immune-related events.

Principal Investigator Hirohito Kita, M.D., from Mayo Clinic, remarked: "Our results strongly demonstrate that eosinophils have the capacity to recognize and exert immunological responses to certain fungi such as *Alternaria*. We have shown that CD11b receptors on the surface of eosinophils recognize and adhere to beta-glucan, a major cell wall component of the fungus. This in turn sets in motion the release of toxic granule proteins by the white blood cells, leading to extensive damage and ultimate destruction of the fungus. To the best of our knowledge, this is the first time that live eosinophils and not just the intracellular components have been shown to target and destroy a fungus."

The researchers used fluorescence microscopy to determine the outcome of the interaction between eosinophils and *A. alternata*. The contact of fungus with eosinophils resulted in bright red fluorescence due to the damaged fungal cell wall and subsequent death of *Alternaria*. Immunohistochemistry confirmed the release of toxic granular proteins by eosinophils due to contact with the fungus.

Dr. Chris Lawrence, Associate Professor at VBI and the Department of Biological Sciences at Virginia Tech, remarked: "T helper 2 (Th2) cells in the immune system typically produce cytokine signaling molecules or interleukins that lead to the recruitment of eosinophils for the dysregulated immune response commonly associated with airway inflammatory disorders. Continual exposure of sensitized individuals to common environmental fungi like *Alternaria* may result in Th2 cells being constantly activated to recruit eosinophils and this sustained defense mechanism results in chronic inflammation. It has been shown previously that degranulation of eosinophils causes damage of airway mucosa and enhances inflammation. The next step in our transdisciplinary research collaboration will be to use recombinant fungal proteins and fungal knockout mutants for specific genes to dissect the different molecular steps involved in the development and progression of this acute immune response."

Hirohito Kita added: "We have taken an important step in showing that the innate immune system of eosinophils is capable of targeting an asthma-associated fungus for destruction. The biological significance of these results will need to be verified further in animal models and in humans and our collaborative efforts with Dr. Lawrence's research group for proteomics and functional genomics will be invaluable in this respect. We

suspect that the dysregulated immune responses to *Alternaria*, other filamentous fungi, and perhaps chitin-encased insects, such as mites and cockroaches, may play a pivotal role in chronic inflammation and the subsequent development of bronchial airway disease."

Ralph's Note - Just wanted to leave this as an example of how asthma and other breathing related disorders can be something more than biological defects.

Public release date: 3-Sep-2008

New study reveals higher protein breakfast may help dieters stay on track

Research findings reveal eating more protein in the morning helps dieters retain fullness throughout the day

Lafayette, Ind. (September 3, 2008) – A new study published online today in the *British Journal of Nutrition* found that timing of dietary protein intake affects feelings of fullness throughout the day. The study concluded that when people ate high-quality protein foods, from sources such as eggs and lean Canadian bacon, for breakfast they had a greater sense of sustained fullness throughout the day compared to when more protein was eaten at lunch or dinner.

"There is a growing body of research which supports eating high-quality protein foods when dieting to maintain a sense of fullness," said Wayne W. Campbell, PhD, study author and professor of Foods and Nutrition at Purdue University. "This study is particularly unique in that it looked at the timing of protein intake and reveals that when you consume more protein may be a critical piece of the equation."

A Closer Look at the Study

The study included overweight or obese men who ate a reduced calorie diet. The diet consisted of two variations of protein intakes, both which were within federal nutrition recommendations: normal protein intake (11-14 percent of calories) or increased protein (18-25 percent of calories). The researchers tested the effect of consuming the additional protein at specific meals – breakfast, lunch or dinner – or spaced evenly throughout the day.

Purdue researchers found that the feeling of fullness was greatest and most sustained throughout the day when the additional protein, from eggs and lean Canadian bacon, was eaten at breakfast – versus lunch or dinner.

Additional Research

This study adds to a growing body of research on the benefits of eating high-quality protein for weight management. Recent research provides further evidence to support the findings of this study:

A study published online last month in the *International Journal of Obesity* found that

eating two eggs for breakfast, as part of a reduced-calorie diet, helped overweight adults lose more weight and feel more energetic than those who ate a bagel breakfast of equal calories.

A Purdue University study published in a 2007 issue of *Obesity*, a scientific journal, revealed that a calorie-restricted diet with additional protein resulted in retained post-meal feelings of fullness and improved overall mood. The same study also found that a higher level of protein intake was more effective in maintaining lean body mass during weight loss.

Public release date: 3-Sep-2008

Substance found in fruits and vegetables reduces likelihood of the flu

BETHESDA, Md. (Sept. 3, 2008) — Mice given quercetin, a naturally occurring substance found in fruits and vegetables, were less likely to contract the flu, according to a study published by The American Physiological Society. The study also found that stressful exercise increased the susceptibility of mice to the flu, but quercetin canceled out that negative effect.

Quercetin, a close chemical relative of resveratrol, is present in a variety of fruits and vegetables, including red onions, grapes, blueberries, tea, broccoli and red wine. It has been shown to have anti-viral properties in cell culture experiments and some animal studies, but none of these studies has looked specifically at the flu.

The study, "Quercetin reduces susceptibility to influenza infection following stressful exercise," was carried out by J. Mark Davis, E.A. Murphy, J.L. McClellan, and M.D. Carmichael, of the University of South Carolina and J.D. Gangemi of Clemson University. The study appears in the current issue of the *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*.

The study was conducted using mice, but if quercetin provides a similar benefit for humans, it could help endurance athletes, soldiers and others undergoing difficult training regimens, as well as people under psychological stress, according to Davis.

Study builds on previous research

"Quercetin was used because of its documented widespread health benefits, which include antiviral activity, abundance in the diet and reported lack of side effects when used as a dietary supplement or food additive," Davis said.

Earlier mouse studies have found that stressful exercise can increase susceptibility to upper respiratory infections, although it is not yet clear if the same is true for humans. There was also preliminary information that mice may be more susceptible to the flu when they exercise to fatigue. The researchers in the current study hypothesized that exercise would increase the chance of the mice getting the flu but that quercetin would

counteract the increased risk.

Davis and his colleagues examined four groups of mice. Two groups performed three consecutive days of running to fatigue on a treadmill to mimic a short period of stressful exercise. One group of runners received quercetin, the other did not.

The remaining two groups did not exercise. One non-exercise group received quercetin while the other did not. All four groups were then exposed to a common flu virus, H1N1.

The researchers found that:

Stressful exercise increased susceptibility to the flu. The mice that exercised to fatigue for three days were more likely to develop the flu than the mice that did not exercise (91% versus 63%).

The mice that exercised developed the flu much sooner than those that did not (6.9 days versus 12.4 days).

Mice that exercised and took quercetin had nearly the same rate of illness as those that did not exercise. In other words, quercetin canceled out the negative effect of stressful exercise.

The severity of the symptoms among those mice that either did not exercise or those that exercised but took the quercetin was about the same.

Quercetin had protective effects for the mice that did not exercise.

Although this study was done with mice, a recent human study found that people who took quercetin suffered fewer illnesses following three days of exhaustive exercise compared to those who did not. Unlike the mouse study, the humans were not inoculated with a virus.

"This is the first controlled experimental study to show a benefit of short-term quercetin feedings on susceptibility to respiratory infection following exercise stress," said Davis. "Quercetin feeding was an effective preventive strategy to offset the increase in susceptibility to infection that was associated with stressful exercise."

Public Release: 3-Sep-2008

Oxidative Stress: Mechanism of Cell Death Clarified

Neuherberg/Munich, 3 September. Dr. Marcus Conrad of the Institute of Clinical Molecular Biology and Tumor Genetics at the Helmholtz Zentrum München has decrypted the molecular mechanism through which the death of cells is caused by

oxidative stress.

This knowledge opens novel perspectives to systematically explore the benefit of targeted therapeutic interventions in the cure of ageing and stress-related degenerative diseases.

Life processes in cells require a reducing environment that needs to be sustained with the help of a large number of antioxidative enzymes. This may sound abstract and incomprehensible, but everyone knows the phenomenon that a piece of cut apple or a piece of cut meat changes colour quickly and deteriorates, because the oxygen in the air produces chemical reactions in the tissues (oxidation of biomolecules).

If the equilibrium in the organism moves towards oxidative processes, then this is known as oxidative stress. Oxidative stress, for instance, is associated with the aging of body cells. Furthermore, a strong accumulation of reactive oxygen species (ROS) along with drops in cellular concentrations of glutathione, (GSH), the major antioxidant produced by the body, is well known as a common cause of acute and chronic degenerative diseases, such as, arteriosclerosis, diabetes, stroke, Alzheimer's and Parkinson's diseases.

"To investigate the molecular function of the cellular reducing agent GSH in the metabolic pathway of cell death triggered by oxidative stress, mice and cells were generated that specifically lack glutathione peroxidase 4 (GPx4), which is emerging as one of the most important GSH dependent enzymes", explains Marcus Conrad. The induced inactivation of GPx4 caused massive oxidation of lipids and eventually cell death. A similar phenotype could be observed when intracellular GSH was removed from wild-type cells by a chemical inhibitor of GSH biosynthesis.

Interestingly enough, this cell death could be completely prevented by Vitamin E, but not by water-soluble antioxidants. Since the oxidation of fatty acids in this cell death pathway, was of paramount importance, multiple studies were performed to describe, in greater detail, the source and nature of lipid peroxides.

Pharmacological and reverse genetic analyses showed that lipid peroxides in GPx4-depleted cells do not appear by coincidence, but accumulate due to increased activity of a specific enzyme of the arachidonic acid metabolism, the 12/15-lipoxygenase. Activation of apoptosis inducing factor (AIF), evidenced by its relocation from mitochondria to the cell nucleus, was identified as another important event in this signaling cascade.

The fact that oxidative stress is a major inducer of cell death is a well accepted current model. Until now however, the source and nature of the reactive oxygen species has remained obscure, as have questions concerning the way they act. Marcus Conrad: "So far, it was assumed that oxidative stress is detrimental to cells by unspecific oxidation of many essential biomolecules, such as proteins and lipids. That is why we were amazed to find that in cells lacking either glutathione or glutathione peroxidase 4, a distinctive signaling pathway is engaged, which causes cell death. The data represent the first molecular analyses of a redox-regulated signaling pathway, describing how oxidative stress is recognized in the body and translated into cell death".

Since this cell death cascade can be interrupted at any single stage with the help of drugs, this pathway harbors promising targets for therapeutic intervention to mitigate the deleterious effects of oxidative stress in complex degenerative human diseases.

Public release date: 3-Sep-2008

Study shows pine bark naturally reduces knee osteoarthritis

Third clinical trial reconfirms strong evidence pycnogenol lowers joint pain, symptoms; May now have lasting effect on joints following cessation of the extract

According to the Center for Disease Control (CDC), osteoarthritis, the most common type of arthritis, is on the rise. A new study published in the August journal of Phytotherapy Research, reveals Pycnogenol, bark extract from the French maritime pine tree, reduced overall knee osteoarthritis (OA) symptoms by 20.9 percent and lowered pain by 40.3 percent. To date, this is the third clinical trial on osteoarthritis treatment with Pycnogenol. This study investigated what happens to joint symptoms after treatment with Pycnogenol is terminated and the results show that no relapse occurred after two weeks. Pycnogenol acts as potent anti-inflammatory and the lasting effects found in this study suggest that Pycnogenol may help the joints to recover.

With osteoarthritis cases on the rise, many are seeking non-traditional medication to help ease the pain and reduce the amount of traditional medication taken. The CDC estimates osteoarthritis affects 34 percent of all adults over the age of 65. In 2005, an estimated 26.9 million adults in the U.S. had osteoarthritis, which was up from 21 million in 1990. While there's no known cure for osteoarthritis, treatments such as nonsteroidal anti-inflammatory drugs (NSAIDs) or analgesics can help reduce pain and also maintain joint movement, to help the quality of life for people living with the disease. In more severe cases, cortisone shots and joint replacement surgery are used to treat OA.

"The current study is in accordance with the two previous Pycnogenol studies for osteoarthritis," said Dr. Peter Rohdewald, one of the researchers of the study. "Again the pain is gradually decreasing during the course of three months treatment with Pycnogenol. An improvement is found after the first month and a further improvement is seen after two months, where values are significantly different to the placebo group. This study again showed that patients required significantly less analgesic medication while supplementing with Pycnogenol, whereas this was not the case with the placebo-treated control group."

The study was held at Slovakia's Comenius University School of Medicine. One hundred patients with stage I or II OA were included in the study and were randomly allocated to either a Pycnogenol or placebo group. Patients were supplemented with 150 mg

Pycnogenol or placebo per day over a period of three months. They were allowed to continue taking their NSAID or analgesics prescribed before the study but had to record every pill taken. The established Western Ontario McMaster questionnaire for joint function was employed to rate the pain level, and obtain measures of joint stiffness and to what extent the arthritis affects participation in daily activities. Patients were investigated in two week intervals over the treatment period of three months and a final time two weeks after discontinuation of medication.

The overall score, summarizing pain, stiffness and daily activities, improved statistical significantly by 20.9 percent in the Pycnogenol group. Interestingly, the joint improvement achieved with Pycnogenol persisted after intake of Pycnogenol was discontinued for four weeks. The joint pain decreased by 40.3 percent after completion of the three months supplementation with Pycnogenol and two weeks later the pain was still 36.1 percent lower than at baseline. Furthermore, 38 percent of patients in the Pycnogenol group required less NSAID's or other analgesic medication for joint pain.

"The anti-inflammatory potency of Pycnogenol explains the success in lowering joint pain and stiffness for arthritic joints," said Rohdewald. "After three recent clinical studies on osteoarthritis, Pycnogenol continues to demonstrate its effectiveness for osteoarthritis symptoms making it a viable, natural and safe alternative for individuals. This is the first study that investigated whether a relapse of symptoms occurs after taking Pycnogenol is stopped. The results show a lasting effect after discontinuation which suggest the anti-inflammatory mechanisms of Pycnogenol has allowed the joints to recover."

In another study this year (also published in the journal of Phytotherapy Research), Pycnogenol was shown to reduce osteoarthritis symptoms by 56 percent. Moreover, patients required 58 percent less standard pain medication, which greatly improved the gastrointestinal complications resulting from the pain medication by 63 percent. Last year, a study on osteoarthritis carried out at the University of Arizona Tucson (published in Nutrition Research) discovered that Pycnogenol was effective for improving pain and joint function. After three months in the Pycnogenol group, there was a reduction of 43 percent in pain, 35 percent in stiffness and 52 percent in physical function subscales, respectively. The placebo group showed no significant scores throughout the entire study.

Public release date: 8-Sep-2008

Vitamin B12 may protect the brain in old age

ST. PAUL, Minn. – Vitamin B12, a nutrient found in meat, fish and milk, may protect against brain volume loss in older people, according to a study published in the September 9, 2008, issue of *Neurology*, the medical journal of the American Academy of Neurology.

For the study, 107 people between the ages of 61 and 87 underwent brain scans, memory testing and physical exams. Researchers also collected blood samples to check vitamin B12 levels. Brain scans and memory tests were also performed again five years later.

The study found that people who had higher vitamin B12 levels were six times less likely to experience brain shrinkage compared with those who had lower levels of the vitamin in their blood. None of the people in the study had vitamin B12 deficiency.

"Many factors that affect brain health are thought to be out of our control, but this study suggests that simply adjusting our diets to consume more vitamin B12 through eating meat, fish, fortified cereals or milk may be something we can easily adjust to prevent brain shrinkage and so perhaps save our memory," said study author Anna Vogiatzoglou, MSc, with the University of Oxford in the United Kingdom. "Research shows that vitamin B12 deficiency is a public health problem, especially among the elderly, so more vitamin B12 intake could help reverse this problem. Without carrying out a clinical trial, we acknowledge that it is still not known whether B12 supplementation would actually make a difference in elderly persons at risk for brain shrinkage."

"Previous research on the vitamin has had mixed results and few studies have been done specifically with brain scans in elderly populations. We tested for vitamin B12 levels in a unique, more accurate way by looking at two certain markers for it in the blood," said Vogiatzoglou.

Vogiatzoglou says the study did not look at whether taking vitamin B12 supplements would have the same effect on memory.

Public release date: 8-Sep-2008

Fluctuations in serotonin transport may explain winter blues

Why do many Canadians get the winter blues? In the first study of its kind in the living human brain, Dr. Jeffrey Meyer and colleagues at the Centre for Addiction and Mental Health (CAMH) have discovered greater levels of serotonin transporter in the brain in winter than in summer. These findings have important implications for understanding seasonal mood change in healthy people, vulnerability to seasonal affective disorders and the relationship of light exposure to mood.

CAMH's scientific team discovered that the serotonin transporter levels were significantly higher in all investigated brain regions in individuals studied in fall/winter,

compared to those studied in spring/summer in a study of healthy subjects. Serotonin transporters remove serotonin so this discovery argues that there is more serotonin removal in the fall/winter as compared to spring/summer. Also, the higher serotonin transporter binding values occurred at times when there is less sunlight. This is the first time scientists have found differences in serotonin transporter levels in the brain in fall/winter versus spring/summer.

Serotonin is involved in regulating physical functions such as eating and energy balance, and emotional functions like mood and energy levels. These phenomena vary across the seasons and the molecular background for why this happens was previously unknown. For this study, Dr. Jeffrey Meyer and his team used a world-leading positron emission tomography (PET) technology (originally created at CAMH by Dr. Alan Wilson) to detect these seasonal variations in serotonin transporter binding (the process that removes serotonin) in the living human brain and correlations between serotonin binding and duration of daily sunshine.

As Dr. Meyer explains, this is "an important lead in understanding how season changes serotonin levels. This offers an explanation for why some healthy people experience low mood and energy in the winter, and why there is a regular reoccurrence of depressive episodes in fall and winter in some vulnerable individuals. The next steps will be to understand what causes this change and how to interfere with it."

According to the world health organization, major depressive disorder is the fourth leading cause of death and disability. Dr. Meyer points out that, "the future for treatment should be to prevent the illness itself." The presence of higher serotonin transporter levels might explain why many people experience the onset of major depressive episodes in the fall and winter. "Over the following years, we intend to determine the specifics of the environment (such as light exposure) that influence serotonin transporter levels so as to determine what is the optimal environment to prevent illness. In the future, it may be that just like we have lifestyle recommendations to prevent heart disease, we will have lifestyle recommendations to prevent major depressive disorder."

Public release date: 8-Sep-2008

Diet may eliminate spasms for infants with epilepsy

Treatment shown to be effective without side effects in children before trying drugs
Baltimore, Md. – September 08, 2008 – Infantile spasms are a severe and potentially devastating epilepsy condition affecting children aged typically 4-8 months. In a new study appearing in *Epilepsia*, researchers have found that the ketogenic diet, a high fat, low carbohydrate diet more traditionally used for intractable childhood epilepsy, is an effective treatment for this condition before using drugs. The study is the first description of the ketogenic diet as a first-line therapy for infantile spasms.

ACTH and vigabatrin, medications that are the commonly-used first treatments worldwide, can have potentially-serious side effects such as hypertension, gastric

ulceration, cortical atrophy, and visual field constriction. **ACTH, though it is effective in 60-70 percent of cases, also costs more than \$80,000 for a one-month supply and vigabatrin is not currently available in the U.S. Both drugs have about a 30-40 percent recurrence rate of spasms as well.** Other therapies are not yet proven.

"We decided to review our experience at Johns Hopkins using the ketogenic diet to treat infantile spasms before medications were tried and compare this to our use of ACTH over the same time period," says Eric Kossoff, M.D, a pediatric neurologist at Johns Hopkins Hospital and lead author of the study. "We knew that the ketogenic diet worked well for difficult-to-control infantile spasms, so we thought it would also be effective earlier."

If the diet stopped the spasms, infants were kept on it for usually 6 months. **The diet worked in 8-of-13 infants within approximately one week. Only 1-of-8 had recurring spasms,** and that infant was controlled again with the addition of topiramate to the diet. Side effects were fewer than ACTH in this series and the recurrence rate was also lower with the diet. In the 5 patients in which the diet did not work, ACTH was started immediately; it worked quickly in 4 of the 5 infants. ACTH did lead to a normal EEG quicker, but long-term developmental outcomes were identical.

As a result of the findings, the ketogenic diet is now one of the typically-offered first-line therapies for new-onset infantile spasms at Johns Hopkins. Other hospitals are beginning to use the ketogenic diet similarly. The researchers hope this novel use of the ketogenic diet may be the first step in finding another treatment to control new-onset infantile spasms.

Public release date: 9-Sep-2008

Cortisol and fatty liver: Researchers find cause of severe metabolic disorders

healthy body stores fat in the form of so-called triglycerides in specialized fatty tissue as an energy reserve. Under certain conditions the delicate balance of the lipid metabolism gets out of control and fat is accumulated in the liver, leading to the dreaded fatty liver. This increases the risk of many metabolic diseases, such as the metabolic syndrome known as "deadly quartet". This combination of fatty liver, obesity, diabetes and hypertension is regarded as the primary cause of life-threatening vascular events such as myocardial infarction and stroke.

It was still unknown which conditions cause the body to deposit fat in the liver. However, scientists knew that the body's own glucocorticoid hormones such as cortisol promote the development of fatty liver. This can be observed, for example, in a condition known as Cushing syndrome. Cortisol levels in affected patients are permanently raised – often caused by malignant tumors. This, in turn, leads to high blood sugar levels and patients frequently develop fatty liver. Long-term cortisone therapies such as those used for treating chronic inflammatory diseases such as asthma also cause the triglyceride level in the liver to rise to dangerous levels. Dr. Stephan Herzig, head of the Junior Research

Group "Molecular Metabolic Control" at the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ), and his team have now published the mechanism by which the body's own glucocorticoid hormones contribute to this disruption of the lipid metabolism.

The researchers in Herzig's team specifically switched off the cortisol receptor in the livers of mice, thus blocking the hormone's effect. As a result, the triglyceride level in the livers of the experimental animals dropped considerably. Investigations have revealed that, in the absence of the cortisol receptor, large amounts of the HES1 protein are produced in the livers of these animals. HES1 activates a number of enzymes that break down fat and, thus, counteracts fat accumulation in the liver. If, on other hand, normal mice are treated with cortisol, their HES1 levels in the liver drops, while triglyceride levels rise. Further experiments have shown that the cortisol receptor in this newly found metabolic pathway act directly on a switch of the HES1 gene and, thus, switches it off completely.

"We have discovered a key mechanism here that plays a crucial role in many pathologic metabolic disorders," explains Stephan Herzig. "It has been obvious for some time that there is an association between the body's own cortisol or therapeutically administered cortisone and the development of fatty liver. Now we also know what the interconnections look like at a molecular level."

Public release date: 9-Sep-2008

Calcium during pregnancy reduces harmful blood lead levels

ANN ARBOR, Mich.---Pregnant women who take high levels of daily calcium supplements show a marked reduction in lead levels in their blood, suggesting calcium could play a critical role in reducing fetal and infant exposure.

A new study at the University of Michigan shows that women who take 1,200 milligrams of calcium daily have up to a 31 percent reduction in lead levels.

Women who used lead-glazed ceramics and those with high bone lead levels showed the largest reductions; the average reduction was about 11 percent, said Howard Hu, chair of the Department of Environmental Health Sciences at the School of Public Health.

Hu is the principal investigator of the study and one of the senior authors on the paper, which is available online in *Environmental Health Perspectives*, the official journal of the U.S. National Institute for Environmental Health Sciences. Hu, who is also affiliated with the University of Michigan School of Medicine, said this is the first known randomized study examining calcium supplementation on lead levels in pregnant women.

"We and others have previously shown that during pregnancy, mothers can transfer lead from their bones to their unborn -- with significant adverse consequences--making

maternal bone lead stores a threat even if current environmental lead exposures are low," Hu said. "This study demonstrates that dietary calcium supplementation during pregnancy may constitute a low-cost and low-risk approach for reducing this threat."

Lead exposure is a great concern for pregnant and lactating women, especially in developing countries where lead exposures have been high until recently, and for women with occupational exposure. Developing fetuses and nursing babies are exposed to lead from either current exposures to mothers or from the mobilization of maternal skeletal lead stores accumulated from prior years of exposure. Bone lead can stay in the body for decades, so even with minimal environmental exposure, the fetus or nursing infant can still be at great risk from maternal stores of lead.

Lead exposure during fetal development and infancy can cause low birth weight or slow weight gain after birth, cognitive defects such as lower intelligence scores, lower motor and visual skills, or even miscarriage. Damage from lead exposure and poisoning is usually permanent.

"The bottom line is that obstetricians and pediatricians should consider adding calcium supplementation to the prenatal vitamins normally recommended in pregnant women, particularly if their patients have a significant history of environmental or occupational lead exposure," Hu said.

The study showed that reductions in blood lead levels were more evident in the second trimester at 14 percent than in the third trimester at 8 percent. The most compliant group of women in the study (those who consumed greater than 75 percent of the assigned 1,200 milligram doses of calcium per day) showed a 24 percent decrease. Women in the most compliant group who also reported using lead glazed ceramics and had the highest bone lead levels saw the greatest reduction of 31 percent.

Researchers analyzed 557 women recruited from the Mexican Social Security Institute prenatal clinics, which treat the low to moderate income population of Mexico City. All were in their first trimester; roughly half were assigned calcium and half a placebo.

This recent study corresponds with a previous study performed by the same group of investigators showing that 1,200-milligram daily calcium supplementation during lactation reduced maternal blood lead by 15-20 percent, and breast milk lead by 5-10 percent. This is the first randomized trial to evaluate the effect of supplementation during pregnancy, when lead is more easily transferred to the fetus, Hu said.

Public release date: 9-Sep-2008

Eating fish while pregnant, longer breastfeeding, lead to better infant development

BOSTON, Mass. (Sept. 9, 2008) — Both higher fish consumption and longer breastfeeding are linked to better physical and cognitive development in infants,

according to a study of mothers and infants from Denmark. Maternal fish consumption and longer breastfeeding were independently beneficial.

"These results, together with findings from other studies of women in the U.S. and the United Kingdom, provide additional evidence that moderate maternal fish intake during pregnancy does not harm child development and may on balance be beneficial," said Assistant Professor Emily Oken, lead author of the study.

The study, which appeared in the September issue of the *American Journal of Clinical Nutrition*, was conducted by researchers from the Department of Ambulatory Care and Prevention of Harvard Medical School and Harvard Pilgrim Health Care and the Maternal Nutrition Group from the Department of Epidemiology at Statens Serum Institut in Copenhagen, Denmark. These findings provide further evidence that the omega-3 fatty acids found in fish and compounds in breast milk are beneficial to infant development.

The study team looked at 25,446 children born to mothers participating in the Danish Birth Cohort, a study that includes pregnant women enrolled from 1997-2002. Mothers were interviewed about child development markers at 6 and 18 months postpartum and asked about their breastfeeding at 6 months postpartum. Prenatal diet, including amounts and types of fish consumed weekly, was assessed by a detailed food frequency questionnaire administered when they were six months pregnant.

During the interviews mothers were asked about specific physical and cognitive developmental milestones such as whether the child at six months could hold up his/her head, sit with a straight back, sit unsupported, respond to sound or voices, imitate sounds, or crawl. At 18 months, they were asked about more advanced milestones such as whether the child could climb stairs, remove his/her socks, drink from a cup, write or draw, use word-like sounds and put words together, and whether they could walk unassisted.

The children whose mothers ate the most fish during pregnancy were more likely to have better motor and cognitive skills. For example, among mothers who ate the least fish, 5.7% of their children had the lowest developmental scores at 18 months, compared with only 3.7% of children whose mothers had the highest fish intake. Compared with women who ate the least fish, women with the highest fish intake (about 60 grams - 2 ounces - per day on average) had children 25% more likely to have higher developmental scores at 6 months and almost 30% more likely to have higher scores at 18 months.

Longer duration of breastfeeding was also associated with better infant development, especially at 18 months. Breastmilk also contains omega-3 fatty acids. The benefit of fish consumption was similar among infants breastfed for shorter or longer durations.

Women in the U.S. have been advised to limit their fish intake to two servings a week because some fish contains high traces of mercury, which has demonstrated toxic effects. Information regarding mercury levels was not available in this population, but most

women consumed cod, plaice, salmon, herring, and mackerel, fish types that tend to have low mercury content. In this study, consumption of three or more weekly servings of fish was associated with higher development scores, so in this case the nutrient benefits of prenatal fish appeared to outweigh toxicant harm.

"In previous work in a population of U.S. women, we similarly found that higher prenatal fish consumption was associated with an overall benefit for child cognitive development, but that higher mercury levels attenuated this benefit," says Dr. Oken. "Therefore, women should continue to eat fish - especially during pregnancy - but should choose fish types likely to be lower in mercury." Information on mercury levels in commonly consumed fish is available at the U.S. Food and Drug Administration website (<http://www.cfsan.fda.gov/~frf/sea-mehg.html>).

Public release date: 10-Sep-2008

Is yakult helpful in the treatment of irritable bowel syndrome?

SIBO is a common feature in IBS and in fact may be directly related to the genesis of IBS symptoms. An ERBHAL on a lactulose breath test may indicate SIBO. Antibiotics and elemental diets have been shown to be effective in treating SIBO, but the efficacy of probiotics is untested. A pilot study was undertaken to determine the effect of L. strain Shirota (Yakult(R)) on intestinal fermentation patterns of IBS patients. After 6 week of treatment with 1 x 65 mL dose of Yakult(R) daily, 9 of 14 patients (64%) completing the study had reversal of ERBHAL, with the median time of first rise increasing from 45 to 75 min ($P = 0.03$). Furthermore, symptoms improved in those in whom ERBHAL was corrected. The results indicate that Yakult(R) alters fermentation patterns suggesting a reduction in SIBO. ERBHAL can also indicate rapid small intestinal transit and therefore, in order to confirm the effect of Yakult(R) on SIBO, future studies will include monitoring of transit time in addition to placebo control.

A research article to be published on August 28, 2008 in the World Journal of Gastroenterology addresses this question. The research team was led by Peter Gibson and his colleagues at Monash University, Box Hill Hospital. The pilot trial was undertaken to determine whether a probiotic could have an effect on SIBO. Currently, SIBO is managed by antibiotics and/or elemental diets, the side effects and practicalities of which make them undesirable options. Probiotics may provide a safe alternative. The results of the pilot trial warrant a well powered, double blind, placebo-controlled trial.

The effect of probiotics on SIBO had not previously been investigated, but after taking Yakult(R) daily for 6 wk, there was a significant shift in the time of first rise on the lactulose breath test indicating a reduction in SIBO. If these findings are confirmed by further research, Yakult(R) may be a safe and effective alternative for the management of this patient group.

Public release date: 11-Sep-2008

New research could hold the key to keeping older people fit for longer

A carefully framed combination of moderate exercise and nutritional supplements could help older people maintain an active lifestyle for longer.

A Manchester Metropolitan University study has found that taking carbohydrate and protein supplements just before and just after low-resistance exercise could boost muscle performance and slow muscle wastage in people over retirement age.

Moreover, this combination appears to deliver greater fitness benefits than undertaking heavy-resistance training with or without changing one's nutritional habits.

This was the first-ever study of the combination of structured exercise and nutritional supplements to focus wholly on older people. Undertaken as part of the SPARC (Strategic Promotion of Ageing Research Capacity) initiative, the findings will be discussed at this year's BA Festival of Science in Liverpool on Thursday 11th September. SPARC is supported by the Engineering and Physical Sciences Research Council (EPSRC) and the Biotechnology and Biological Sciences Research Council (BBSRC).

This groundbreaking study involved a carefully selected sample of around 60 healthy, independent-living adults aged 65 and over.

The volunteers were randomly divided into groups who underwent different 12 week programmes of physical exercise and nutritional supplementation. Everyone was then re-assessed at the end of the programme.

Some groups undertook low-resistance exercise once a week; others undertook high-resistance exercise twice a week. Within each group, some of the volunteers took protein and carbohydrate supplements while others did not.

When all the participants were re-assessed at the end of the 12 week programme, it was observed that muscle size and strength had increased in all groups.

However, the results suggested that older people would derive the most benefits if they took appropriate supplements coupled with low-intensity exercise.

"Maintaining muscle performance and arresting muscle wastage can offer older people real improvements in their quality of life," says Dr Gladys Pearson, who led the research. "Though we still need to assess precisely what level of exercise gives the best results, we believe we've shown that regular low-resistance exercise complemented by the right nutritional supplements could boost the well-being of the UK's ageing population."

Dr Pearson and her team now aim to look at the effectiveness of novel combinations of strength training and nutritional supplementation as a way of speeding recovery and improving mobility for old and young orthopaedic surgery patients.

Public release date: 12-Sep-2008

COPD? Eat your veggies

You know it's good for you in other ways, but could eating your broccoli also help patients with chronic lung disease? It just might.

According to recent research from Johns Hopkins Medical School, a decrease in lung concentrations of NRF2-dependent antioxidants, key components of the lung's defense system against inflammatory injury, is linked to the severity of chronic obstructive pulmonary disease (COPD) in smokers. Broccoli is known to contain a compound that prevents the degradation of NRF2.

The findings were published in the second issue for September of the American Journal of Respiratory and Critical Care Medicine, published by the American Thoracic Society.

COPD is the fourth-leading cause of death in the U.S. and affects more than 16 million Americans.

In this study, researchers examined tissue samples from the lungs of smokers with and without COPD to determine if there were differences in measured levels of NRF2 expression and the level of its biochemical regulators, including KEAP1, which inhibits NRF2, and DJ-1, which stabilizes it. Dr. Biswal had previously shown that disruption in NRF2 expression in mice exposed to cigarette smoke caused early onset of severe emphysema.

When compared to non-COPD lungs, the lungs of patients with COPD showed markedly decreased levels of NRF2-dependent antioxidants, increased oxidative stress markers, a significant decrease in NRF2 protein with no change in NRF2 mRNA levels (indicating that it was expressed, but subsequently degraded), and similar KEAP1 levels, but a marked decrease in the level of DJ-1.

"NRF2-dependent antioxidants and DJ-1 expression was negatively associated with severity of COPD," wrote principle investigator, Shyam Biswal, Ph.D., an associate professor in the Bloomberg School's Department of Environmental Health Sciences and Division of Pulmonary and Critical Care at the Johns Hopkins School of Medicine. "Therapy directed toward enhancing NRF2-regulated antioxidants may be a novel strategy for attenuating the effects of oxidative stress in the pathogenesis of COPD."

While clinical trials to date of antioxidants have been disappointing in improving the clinical course of patients with COPD, this study points to a possibility of benefit from restoring NRF2 levels in damaged lungs by reducing the action of KEAP1, which is an inhibitor of NRF2. "[I]ncreasing NRF2 may also restore important detoxifying enzymes to counteract other effects of tobacco smoke," wrote Peter Barnes, D.M., of the National Heart and Lung Institute in London, in the accompanying editorial. "This has been

achieved in vitro and in vivo by isothiocyanate compounds, such as sulforaphane, which occurs naturally in broccoli and [wasabi]."

Sulforaphane has been shown to be able to restore antioxidant gene expression in human epithelial tissue in which DJ-1 has been reduced. Isothiocyanate compounds such as that found in broccoli inhibit KEAP1, and thus prevent it from degrading NRF2, according to Dr. Barnes.

"Future studies should target NRF2 as a novel strategy to increase antioxidant protection in the lungs and test its ability to decrease exacerbations and improve lung function in patients with COPD," concluded Dr. Biswal.

John Heffner, MD, past president of the ATS, commented that "mounting evidence over several decades underscores the importance of oxidant-mediated damage for the development of COPD in addition to other lung diseases. This study adds greater precision to our understanding of the specific antioxidants that may protect the lung against emphysema to allow clinical trials based on valid pathophysiologic principles."

Public release date: 12-Sep-2008

Drinking chamomile tea may help fight complications of diabetes

Journal of Agricultural and Food Chemistry

Drinking chamomile tea daily with meals may help prevent the complications of diabetes, which include loss of vision, nerve damage, and kidney damage, researchers in Japan and the United Kingdom are reporting.

The findings could lead to the development of a new chamomile-based drug for type 2 diabetes, which is at epidemic levels in this country and spreading worldwide, they note. Their study appears in the Sept. 10 issue of the ACS' *Journal of Agricultural and Food Chemistry*, a bi-weekly publication.

In the new study, Atsushi Kato and colleagues point out that chamomile, also known as manzanilla, has been used for years as a medicinal cure-all to treat a variety of medical problems including stress, colds, and menstrual cramps. Scientists recently proposed that the herbal tea might also be beneficial for fighting diabetes, but the theory hasn't been scientifically tested until now.

To find out, the researchers fed chamomile extract to a group of diabetic rats for 21 days and compared the results to a group of control animals on a normal diet. The chamomile-supplemented animals showed a significant decrease in blood glucose levels compared with the controls, they say. The extract also showed significant inhibition of both ALR2 enzymes and sorbitol, whose elevated levels are associated with increased diabetic complications, the scientists say. — MTS

Public release date: 15-Sep-2008

Majority of osteoporosis patients not receiving calcium and vitamin D with treatment

Study highlights underlying reasons for why patients are missing their supplementation

Study highlights underlying reasons for why patients are missing their supplementation
Geneva, Switzerland – 15th September, 2008: New research published today at the annual meeting of the American Society for Bone and Mineral Research (ASBMR), Montréal, Canada, reveals that less than half (43%) of patients in Europe with osteoporosis are claiming to take both calcium and vitamin D supplementation with their osteoporosis treatment. Maximum benefit in managing osteoporosis can be achieved with combination therapy of an osteoporosis treatment (such as a bisphosphonate) with calcium and vitamin D supplementation, yet the majority of patients in this research claim they do not follow this approach.

"Patients with a low intake of calcium and vitamin D may not be receiving the full benefit of their osteoporosis treatment if they do not take enough supplementation", said Professor Steven Boonen MD, PhD, of Leuven University in Belgium and lead author of the abstract reporting the research results. "It is important that patients not only take both their calcium and vitamin D supplements, but also to ensure that they take them regularly".

The patient research was conducted amongst 383 women aged 50 years and older who had been diagnosed and treated for post-menopausal osteoporosis in France (n=97), Germany (n=98), Spain (n=94) and the UK (n=94). The aim of the study was to evaluate treatment knowledge and behaviour in women receiving treatment for their osteoporosis with regard to their calcium and vitamin D supplementation.

Patients need help to take supplementation regularly

Even when patients do take some form of supplementation, up to 30% claim they regularly miss a dose. An analysis of those patients who declared they were regularly missing a supplement dose revealed this was due either to the fact that they were not convinced of the importance of supplementation, or that they did not receive a detailed explanation from their treating physician. i Patient responses also showed that there is a need for some sort of aid, for example, a tool or packaging that would help them take their osteoporosis medication and supplementation. i This need for help is supported by patient preference data, which shows that over 70% of patients believe that providing a bisphosphonate with calcium and vitamin D in one box can help them take their supplements regularly and correctly.

Public release date: 15-Sep-2008

New study will make criminals sweat

Inventor of forensic fingerprint technique says criminals who eat processed foods have 'sticky fingers,' which are more likely to corrode metal

The inventor of a revolutionary new forensic fingerprinting technique claims criminals who eat processed foods are more likely to be discovered by police through their fingerprint sweat corroding metal.

Dr John Bond, a researcher at the University of Leicester and scientific support officer at Northamptonshire Police, said processed food fans are more likely to leave tell-tale signs at a crime scene.

Speaking before a conference on forensic science at the University of Leicester, Dr Bond said sweaty fingerprint marks made more of a corrosive impression on metal if they had a high salt content.

And he revealed he was currently in early talks with colleagues at the University of Leicester to assess whether a sweat mark left at a crime scene could be analysed to reveal a 'sweat profile' ie more about the type of person who left the mark.

Dr Bond, from Northamptonshire Police Scientific Support Unit is an Honorary Research Fellow at the University of Leicester's Forensic Research Centre. He has developed a method that enables scientists to 'visualise fingerprints' even after the print itself has been removed. He and colleagues conducted a study into the way fingerprints can corrode metal surfaces. The technique can enhance – after firing– a fingerprint that has been deposited on a small calibre metal cartridge case before it is fired.

Dr Bond said: "On the basis that processed foods tend to be high in salt as a preservative, the body needs to excrete excess salt which comes out as sweat through the pores in our fingers.

"So the sweaty fingerprint impression you leave when you touch a surface will be high in salt if you eat a lot of processed foods -the higher the salt, the better the corrosion of the metal."

Dr Bond added there was therefore an indirect link therefore between obesity and the chances of being caught of a crime. "Other research has drawn links between processed foods and obesity and we know that consumers of processed foods will leave better fingerprints," he said.

Dr Bond said there was scope to take his research further and to look at the constituents of sweat itself in order to profile an individual: "We are currently in talks with the University of Leicester to see if there is scope to investigate sweat itself and whether it can identify the type of person who left that sweat mark.

"This is because the amount of sweat people leave varies and the components of the sweat varies. Important for us is how the salt varies but there is potential to investigate

other elements to describe the kind of person who left the mark. It would give lifestyle information that, whilst nowhere near as good as identifying individuals with their fingerprints, it is still very good for police if they have got nothing else to go on.

"This would be particularly helpful for terrorist type crimes where the nature of the incident would tend to obliterate forensic evidence. So a sweat mark on a piece of metal or bomb fragment that might be recovered from an incident might be able to provide a clue to the type of person who perpetrated the incident."

"We would describe the study of sweat as a process of intelligent fingerprinting - using the fingerprint to tell us more about the individual rather than a simple identification."

Public release date: 15-Sep-2008

Avoid coupon redeemers: Their stigma is contagious (unless they're attractive)

Less than 2 percent of Americans use coupons, likely because of fear of being viewed as cheap or poor. A new study in the Journal of Consumer Research demonstrates that not only do coupon users face stigmatization; people who stand near them do too.

Authors Jennifer J. Argo (University of Alberta) and Kelley J. Main (University of Manitoba) studied a phenomenon called "stigma-by-association," which has already been documented in regard to physical disabilities and alcoholism. In a series of studies, the authors found that coupon stigma is real and it transfers to people who are in close proximity to coupon users.

"One implication that arises from society's fascination with wealth and status is that when consumers engage in behaviors that differ from this view they risk being sanctioned," the authors explain. "Using a retail context, we conducted four experiments to demonstrate that the presence of one consumer redeeming a coupon results in a second non-coupon redeeming shopper being stigmatized-by-association (i.e., perceived as cheap)."

The researchers interviewed shoppers who observed people using various kinds of coupons. They tested participants' impressions of the coupon shoppers and people standing near them. They found that people had negative ideas about the people using coupons, especially low-value coupons. This stigma was more likely to be transferred if the shoppers knew each other well, stood in the same line, or were of similar (average) attractiveness.

In addition, the authors discovered two ways to avoid catching the coupon stigma: standing in a different checkout lane or being highly attractive. In fact, being highly attractive also protected coupon redeemers from being stigmatized.

"Thus, in a naturally occurring environment, where our interest in coupon redemption is not salient, consumers appear to infer that one shopper in the retail environment is cheap

based on the behavior of another," the study concludes.

Public release date: 15-Sep-2008

Is re-emerging superbug the next MRSA?

MAYWOOD, Ill. – Dr. Ed Corboy had no idea what was afflicting his 80-year-old mother, Joan Corboy.

All he knew for certain was that since being treated for what was a routine diarrheal infection, she seemed to be wasting away and none of her doctors or other health specialists could explain why.

"She lost almost 55 pounds between July Fourth and Christmas in 2006," said Corboy, a resident of Wilmette. "She was so sick, so weak and despite the best care of her doctors, she was getting weaker. It was clear she was in big trouble."

Afraid that his mother was running out of time, Corboy called the Centers for Disease Control in Atlanta for advice. Dr. Clifford McDonald told him the infection his mother probably had was of the NAP1 type of the bacteria *Clostridium difficile*, a virulent strain of a common intestinal bacteria currently plaguing hospitals that now rivals the superbug Methicillin-resistant staphylococcus aureus (MRSA) as one of the top emerging disease threats to humans.

"Disease caused by *Clostridium difficile* can range from nuisance diarrhea to life-threatening colitis that could lead to the surgical removal of the colon, and even death," said Dr. Stuart Johnson, associate professor of medicine, division of infectious diseases, Loyola University Chicago Stritch School of Medicine. "It's a very hardy strain and it seems to persist."

C-diff, as it is better known, is a bacterium that was discovered in 1978 to be the cause of antibiotic-associated diarrhea and colitis, said Johnson, one of the world's top C-diff researchers and physicians, and who successfully treated Joan Corboy's infection. Although C-diff sickens about 500,000 Americans a year and has reached epidemic proportions in 38 states including Illinois, most people have not yet heard of it.

"I don't think that people appreciate the urgency and severity of this disease," said Dr. Dale Gerding, professor of medicine, division of infectious diseases, Stritch School of Medicine, and associate chief of staff for Research, Hines VA Hospital. "In the past, it was thought to be a nuisance illness. Now it is a fatal illness and a lot of physicians have not figured that out as yet."

Hospitals in Quebec have been particularly hard hit by C-diff. In the 12 hospitals affected, about 2,000 deaths were directly attributable to the antibiotic resistant strain between the 2003 and 2004. In the United Kingdom, deaths from C-diff leaped by 28% in 2007 to more than 8,000, according to the nation's Department of Health.

"What was surprising was not just the rates, but the number of severe cases," said Johnson, who helped treat Joan Corboy's illness.

Similar to MRSA, C-diff is an infection that is mainly acquired in a hospital or nursing

home, although like MRSA there is some evidence that a community-acquired strain may be developing, according to the CDC.

"When a patient is in the hospital getting antibiotics for some type of infection, one of the potential complications is that the normal bacterium that lives in the colon is disturbed with that antibiotic. That makes you susceptible to an infection with *Clostridium difficile*," Johnson said. "The great majority of cases occur in people who have recently used antibiotics."

When C-diff is not actively dividing, it forms very tough spores that can exist on surfaces for months and years, making it very difficult to kill, Johnson said.

"Antibiotics are very effective against the growing form of the bacteria but it doesn't do anything to the spores," Johnson said. "If there are spores they can sit around like stealth bombs. Once the antibiotic is gone, these spores can germinate again and spread their toxins."

Since its discovery, C-diff has grown increasingly resistant to antibiotics, according to Johnson and Gerding, who has been studying the bacteria since 1980. Though it is appearing more often in younger people, those 65 years and older face a greater risk of developing infection from C-diff and has more severe outcomes and higher death rates. Relapse is common with about 25 percent of patient experiencing a second bout of disease within two months after their first. Patients who have had two or more episodes of disease have a 30 percent to 65 percent risk of another bout.

Symptoms of C-diff include profuse diarrhea and abdominal pain and distention of the abdomen. An infection is also frequently accompanied by fever, nausea and dehydration. In some rare cases blood may be present in the stool. The infection is spread by spores that contaminate the hospital environment and hands of healthcare workers who can transmit the spores to patients. The resistance of the spores to hospital cleaning agents and to alcohol hand disinfectants makes it extremely difficult to eradicate.

Public release date: 15-Sep-2008

Common bronchodilator linked to increased deaths

CHICAGO --- A common bronchodilator drug which has been used for more than a decade by patients with chronic obstructive pulmonary disease (COPD) has been linked to a one-third higher risk of cardiovascular-related deaths.

The drug, ipratropium, is sold under the brand names Atrovent and Combivent, the latter a combination product that contains ipratropium.

A new study from Northwestern University's Feinberg School of Medicine found that veterans with recently diagnosed COPD using ipratropium were 34 percent more likely to die of a heart attack or of arrhythmia than COPD patients using only

albuterol (another bronchodilator) or patients not using any treatment.

The study is published in the Sept. 15 issue of the Annals of Internal Medicine.

"This medication may be having some systemic cardiovascular effect that is increasing the risk of death in COPD patients," said Todd Lee, lead author and research assistant professor in the Institute for HealthCare Studies at the Feinberg School.

COPD is an umbrella term for respiratory diseases that include chronic bronchitis and emphysema. The primary cause is smoking. An estimated 12 million people in the U.S. have COPD. The disease is the fourth leading cause of death in the U.S. and is expected to grow to the third leading cause by 2020 due largely to an aging population with a higher historical rate of smoking.

Todd noted his study is observational and indicates the need for researchers to take a closer look at this medication, which has been considered safe for many years. The study looked at the cause of death of 145,000 veterans with newly diagnosed COPD from 1999 to 2003.

"The safety of drugs for COPD patients has flown under the radar," Lee said. "We decided to look into the safety of respiratory medications for COPD patients because of some concerns that had been raised in asthma drugs. We were curious as to whether there were safety problems with these medications in patients with COPD."

Todd said patients and providers should be aware of the potential risk. "When they make treatment decisions they need to weigh these potential risks against other medications that are available for COPD," he noted.

Public release date: 15-Sep-2008

Higher urinary levels of commonly used chemical, BPA, linked with cardiovascular disease, diabetes

Higher levels of urinary Bisphenol A (BPA), a chemical compound commonly used in plastic packaging for food and beverages, is associated with cardiovascular disease, type 2 diabetes and liver-enzyme abnormalities, according to a study in the September 17 issue of JAMA. This study is being released early to coincide with a Food and Drug Administration (FDA) hearing on BPA.

BPA is one of the world's highest production-volume chemicals, with more than two million metric tons produced worldwide in 2003 and annual increase in demand of 6 percent to 10 percent annually, according to background information in the article. It is used in plastics in many consumer products. "Widespread and continuous exposure to BPA, primarily through food but also through drinking water, dental sealants, dermal exposure, and inhalation of household dusts, **is evident from the presence of detectable**

levels of BPA in more than 90 percent of the U.S. population," the authors write. Evidence of adverse effects in animals has created concern over low-level chronic exposures in humans, but there is little data of sufficient statistical power to detect low-dose effects. This is the first study of associations with BPA levels in a large population, and it explores "normal" levels of BPA exposure.

David Melzer, M.B., Ph.D., of Peninsula Medical School, Exeter, U.K., and colleagues examined associations between urinary BPA concentrations and the health status of adults, using data from the National Health and Nutrition Examination Survey (NHANES) 2003-2004. The survey included 1,455 adults, age 18 through 74 years, with measured urinary BPA concentrations.

The researchers found that average BPA concentrations, adjusted for age and sex, appeared higher in those who reported diagnoses of cardiovascular diseases and diabetes. A 1-Standard Deviation (SD) increase in BPA concentration was associated with a 39 percent increased odds of cardiovascular disease (angina, coronary heart disease, or heart attack combined) and diabetes.

When dividing BPA concentrations into quartiles, participants in the highest BPA concentration quartile had nearly three times the odds of cardiovascular disease compared with those in the lowest quartile. Similarly, those in the highest BPA concentration quartile had 2.4 times the odds of diabetes compared with those in the lowest quartile.

In addition, higher BPA concentrations were associated with clinically abnormal concentrations for three liver enzymes. No associations with other diagnoses were observed.

"Using data representative of the adult U.S. population, we found that higher urinary concentrations of BPA were associated with an increased prevalence of cardiovascular disease, diabetes, and liver-enzyme abnormalities. These findings add to the evidence suggesting adverse effects of low-dose BPA in animals. Independent replication and follow-up studies are needed to confirm these findings and to provide evidence on whether the associations are causal," the authors conclude. "Given the substantial negative effects on adult health that may be associated with increased BPA concentrations and also given the potential for reducing human exposure, our findings deserve scientific follow-up."

Public release date: 16-Sep-2008

Expert urges FDA to take action to reduce BPA exposure

MU studies have shown dangerous health effects with BPA exposure since 1997
COLUMBIA, Mo. – In the current issue of the Journal of the American Medical Association (JAMA), researchers report a significant relationship between urine concentrations of the environmental estrogen bisphenol A (BPA) and cardiovascular

disease, type 2 diabetes and liver-enzyme abnormalities. In an accompanying editorial, Frederick vom Saal, a University of Missouri scientist, urges the Food and Drug Administration (FDA) to follow recent action by Canadian regulatory agencies, which have taken significant steps to limit human and environmental exposures to BPA. Since 1997, research from vom Saal and other MU colleagues have shown adverse health effects of BPA at exposure levels below those currently considered safe by the FDA.

"Despite growing research that confirms BPA is dangerous to our health, the FDA and the European Food Safety Authority have chosen to ignore warnings from expert panels and other government agencies and have continued to declare BPA as 'safe,'" wrote vom Saal, who is a Curator's professor of biological sciences in MU's College of Arts and Science. "Further evidence of harm should not be required for regulatory action to begin the process of reducing exposure to BPA."

BPA is a one of the world's highest production-volume chemicals and is used to make hard plastic items such as: drinking glasses, baby bottles, food-storage containers, the lining of food and beverage containers, and dental sealants. Previous studies have shown adverse health effects of BPA on the brain and reproductive system, as well as metabolic diseases in laboratory animals. After a two-year review, the United States National Toxicology Program stated its concern that, at current levels of exposure, BPA posed a risk to human infants. The research published in JAMA is based on data from more than 1,450 Americans examined by the Centers for Disease Control and Prevention in the National Health and Nutrition Examination Survey and is the first major study linking BPA to diseases in humans, vom Saal said.

"The good news is that government action to reduce exposures may offer an effective intervention for improving health and reducing the burden of some of the most consequential human health problems," vom Saal said.

Public release date: 16-Sep-2008

FDA defends plastic linked with health risks

With scientists at odds over the safety of a chemical found in plastic baby bottles, metal cans and other food packaging, consumers got minimal guidance Tuesday about how to protect themselves.

At a scientific hearing, the Food and Drug Administration defended its assessment that bisphenol A_ or BPA_ is safe, even as the first major study of health effects in people linked it with possible risks for heart disease and diabetes. The debate could drag on for years.

"Right now, our tentative conclusion is that it's safe, so we're not recommending any change in habits," said Laura Tarantino, head of the FDA's office of food additive safety. But she acknowledged, "there are a number of things people can do to lower their

exposure."

For example, consumers can avoid plastic containers imprinted with the recycling number '7,' as many of those contain BPA. Or, said Tarantino, they can avoid warming food in such containers, as heat helps to release the chemical.

More than 90 percent of Americans have traces of BPA in their bodies, but the FDA says the levels of exposure are too low to pose a health risk, even for infants and children.

However, a study released Tuesday by the Journal of the American Medical Association suggested a new concern about BPA. Because of the possible public health implications, the results "deserve scientific follow-up," the study authors said. Using a health survey of nearly 1,500 adults, they found that those exposed to higher amounts of BPA were more likely to report having heart disease and diabetes.

But the study is preliminary, far from proof that the chemical caused the health problems. Two Dartmouth College analysts of medical research said it raises questions but provides no answers about whether the ubiquitous chemical is harmful.

FDA officials said they are not dismissing such findings, and conceded that further research is needed. "We recognize the need to resolve the concerning questions that have been raised," said Tarantino. But the FDA is arguing that the studies with rats and mice it relied on for its assessment are more thorough than some of the human research that has raised doubts.

The FDA has asked an outside panel for a second opinion on its BPA safety assessment, and the medical journal article was released to coincide with the advisers' hearing.

The FDA has the power to limit use of BPA in food containers and medical devices but last month released its internal report concluding that BPA exposure is not enough to warrant action.

Since then, another government agency released a separate report concluding that risks to people, in particular to infants and children, cannot be ruled out.

Past animal studies have suggested reproductive and hormone-related problems from BPA. The JAMA study is the largest to examine possible BPA effects in people and the first suggesting a direct link to heart disease, said scientists Frederick vom Saal and John Peterson Myers, both longtime critics of the chemical.

Still, they said more rigorous studies are needed to confirm the results.

Vom Saal is a biological sciences professor at University of Missouri who has served as an expert witness and consultant on BPA litigation. Myers is chief scientist at Environmental Health Sciences, a Charlottesville, Va., nonprofit group. They wrote an

editorial accompanying the JAMA study.

BPA is used in hardened plastics in a wide range of consumer goods including food containers, eyeglass lenses and compact discs. Many scientists believe it can act like the hormone estrogen, and animal studies have linked it with breast, prostate and reproductive system problems and some cancers.

Researchers from Britain and the University of Iowa examined a U.S. government health survey of 1,455 American adults who gave urine samples in 2003-04 and reported whether they had any of several common diseases.

Participants were divided into four groups based on BPA urine amounts; more than 90 percent had detectable BPA in their urine.

A total of 79 had heart attacks, chest pain or other types of cardiovascular disease and 136 had diabetes. There were more than twice as many people with heart disease or diabetes in the highest BPA group than in the lowest BPA group. The study showed no connection between BPA and other ailments, including cancer.

No one in the study had BPA urine amounts showing higher than recommended exposure levels, said co-author Dr. David Melzer, a University of Exeter researcher.

Drs. Lisa Schwartz and Steven Woloshin of the Dartmouth Institute for Health Policy and Clinical Practice said the study presents no clear information about what might have caused participants' heart disease and diabetes.

"Measuring who has disease and high BPA levels at a single point in time cannot tell you which comes first," Schwartz said.

The study authors acknowledge that it's impossible to rule out that people who already have heart disease or diabetes are somehow more vulnerable to having BPA show up in their urine.

The American Chemistry Council, an industry trade group, said the study is flawed, has substantial limitations and proves nothing.

But Dr. Ana Soto of Tufts University said the study raises enough concerns to warrant government action to limit BPA exposure.

"We shouldn't wait until further studies are done in order to act in protecting humans," said Soto, who has called for more restrictions in the past.

An earlier lab experiment with human fat tissue found that BPA can interfere with a hormone involved in protecting against diabetes, heart disease and obesity. That study appeared online last month in *Environmental Health Perspectives*, a monthly journal published by the National Institutes of Health.

Government toxicology experts have also studied BPA and recently completed their own report based on earlier animal studies. They found no strong evidence of health hazards from BPA, but said there was "some concern" about possible effects on the brain in fetuses, infants and children.

Several states are considering restricting BPA use, some manufacturers have begun promoting BPA-free baby bottles, and some stores are phasing out baby products containing the chemical. The European Union has said that BPA-containing products are safe, but Canada's government has proposed banning the sale of baby bottles with BPA as a precaution.

**These reports are done with the appreciation of all the Doctors, Scientist, and other Medical Researchers who sacrificed their time and effort. In order to give people the ability to empower themselves. Without the base aspirations for fame, or fortune.
Just honorable people, doing honorable things.**