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Press Release

Date: 09-16-08
Name: Jerry Carey
Phone: 973-972-5000
Email: careyge@umdnj.edu

UMDNJ Study Finds Lead in Synthetic Turf Can Be Absorbed into Gastric Fluids

PISCATAWAY - Adding to the growing concerns over the health risks posed by lead and other chemicals in synthetic turf materials, a new study by researchers at the UMDNJ-School of Public Health finds that when children or athletes ingest the tiny rubber granules in synthetic turf, it is likely that a significant portion of the lead in the granules will be absorbed by their bodies' gastric fluids.

The investigation, led by Junfeng (Jim) Zhang, Ph.D., an associate dean and professor of environmental and occupational health at the UMDNJ-School of Public Health, examined lead levels in rubber granules from four parks in New York and simulated digestive tract absorption in two of the samples. Zhang is also a member of the Environmental and Occupational Health Sciences Institute (EOHSI), a joint institute of the UMDNJ-Robert Wood Johnson Medical School and Rutgers University.

"Even though the samples had relatively low concentrations of lead in the rubber granules, we observed that substantial amounts of lead – 22.7 and 44.2 percent in the two samples tested – were absorbed into synthetic gastric juices," Zhang said. "Because we know that even low levels of lead can cause neuro-cognitive problems – such as IQ loss – in children, these absorption fractions are meaningful."

The findings will appear in the November/December issue of the Journal of Exposure Science and Environmental Epidemiology. The journal posted the report online on August 27, 2008. The United States currently has about 3,500 synthetic turf fields with new fields being added at the rate of about 1,000 per year.

Concern over synthetic turf intensified earlier this year when high levels of lead were reported in three aged AstroTurf fields in New Jersey, and the U.S. Centers for Disease Control and Prevention issued a health advisory. In August, the U.S. Consumer Product Safety Commission gave the plastic fibers in "new generation" turf a clean bill of health, but, in September, a California environmental group reported high levels of lead in the "new generation" synthetic turf, sparking lawsuits against three manufacturers.

The UMDNJ study included just one "new generation" artificial fiber. While the sample had a relatively low level of lead, the absorption fractions into synthetic gastric and intestinal fluids were still high (34.6 and 54.0 percent, respectively).

William Crain, a co-author on the study and a child psychologist at The City College of New York, said the findings are especially worrisome with respect to young children who might pick up granules and ingest them. The granules can also be transported to homes in the shoes of field users, making the granules accessible to young children. "Whenever young children are involved, we need to particularly careful, because they are most vulnerable to toxic chemicals," Crain adds.

The study also included an analysis of the rubber granules in seven park samples for the presence of polycyclic aromatic hydrocarbons (PAHs). The researchers found that five of the seven samples contained at least two PAHs that exceeded New York State

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More than 180 faculty members at UMDNJ have been named "Top Doctors" by New Jersey Monthly magazine. The list, published as part of the New Jersey Monthly's annual survey of New Jersey's practicing physicians, appears in the November 2007 issue of the magazine..

Department of Environmental Conservation safety limits for contaminated soil. The PAHs that were found are possible, probable, or known human carcinogens as defined by the International Agency for Research on Cancer. The investigators found that the PAHs seemed not be absorbed into the digestive tract, which should help direct researchers to other potential PAH exposure routes, such as inhalation or skin contact.

The investigators also noted high levels of zinc in rubber granules. High zinc levels present a special danger to non-human species in the environment.

“Our study was on a small scale,” Zhang said. “But I hope it helps give a clearer picture of the health risks that synthetic turf poses. I urge public and private agencies to step up funding for research on this crucial public health issue.”

Media interested in interviewing Jim Zhang should contact Jerry Carey, UMDNJ News Service, at (973) 972-5000.

The UMDNJ-School of Public Health is the nation’s first collaborative school of public health and is sponsored by the University of Medicine and Dentistry of New Jersey in cooperation with Rutgers, The State University of New Jersey, and New Jersey Institute of Technology.

The University of Medicine and Dentistry of New Jersey (UMDNJ) is the nation's largest free-standing public health sciences university with more than 5,500 students attending the state's three medical schools, its only dental school, a graduate school of biomedical sciences, a school of health related professions, a school of nursing and its only school of public health, on five campuses. Last year, there were more than two million patient visits to UMDNJ facilities and faculty at campuses in Newark, New Brunswick/Piscataway, Scotch Plains, Camden and Stratford. UMDNJ operates University Hospital, a Level I Trauma Center in Newark, and University Behavioral HealthCare, a mental health and addiction services network.