



Your Questions Answered

ADHD

Q Can pesticides increase my child's risk for ADHD?



DR. MICHAEL L. GOLDSTEIN RESPONDS:

A There are good reasons to be concerned that pesticides can increase the risk of attention deficit-hyperactivity disorder (ADHD) in children. A study published in the June 6, 2010 *Pediatrics* journal adds to a growing body of scientific literature that points to possible developmental problems in children associated with exposure to organophosphate pesticides. These insecticides kill insects by attacking their brains and nervous systems.

The *Pediatrics* study found that there was a strong correlation between evidence of pesticide exposure (as measured by pesticide byproducts called metabolites) found in the urine of children and the occurrence of ADHD. In fact, researchers found that a tenfold increase in metabolites was associated with a 55 percent to 72 percent increase in the likelihood of ADHD.

The simplest way to reduce pesticide exposure is to thoroughly wash all fruits and vegetables. Another way to reduce exposure is to consume fruits and vegetables that are grown without organophosphate pesticides. However, children are still exposed to pesticides in drinking water and the environment through the breakdown of chemicals used in both residential and industrial settings.

Michael L. Goldstein, M.D., specializes in child neurology and practices with Western Neurological Associates in Salt Lake City, UT. He is also the former vice president of the American Academy of Neurology.

BRAIN TUMORS

Q How does proton-beam therapy compare to standard radiation for treating pediatric brain tumors?



DR. ROGER J. PACKER RESPONDS:

A Standard X-ray therapy, in which radiation is “scattered,” is often used when a tumor's edges are ill defined. Conversely, proton-beam X-rays provide greater ability to limit radiation to a well-defined tumor.

Standard X-ray therapy uses photon particles to deliver radiation to the affected tissue. This results in both an entry beam—the path of the beam entering the targeted tissue—and an exit beam—the path of the beam when it leaves the tissue—as well as some scatter radiation to the surrounding tissue. When the tumor is ill defined, scatter radiation is desirable because it may get the leading edge of the tumor.

Proton-beam therapy uses proton particle radiation to target affected tissue. Although there is an entry beam, there is no exit beam, which provides a greater ability to target the

radiation to a specific area. The proton beam has a significant advantage when the tumor is located at the periphery of the brain, because all the radiation can be aimed toward the tumor without affecting surrounding organs.

The side effects of proton beam radiation are similar to the side effects of any form of external radiation. The brain is exposed to essentially the same dose of radiation therapy and, as a result, the long-term effects on cognitive functioning—thinking, memory, and executive function, such as attention—may be the same regardless of the type of radiation used. However, since the proton beam can be a bit more focused, it may spare other sites, such as the inner ear, causing less hearing deficits.

Parents and caregivers should discuss their options with treating physicians and with the radiation oncologist available in the patient's community. If proton-beam therapy is determined to be a better option, patients should visit a facility that is experienced in the delivery of proton-beam therapy, especially in pediatric brain tumors. Go to www.proton-therapy.org to learn more.

Roger J. Packer, M.D., is the senior vice president for the Center for Neuroscience and Behavioral Medicine, director of the Brain Tumor Institute at the Children's National Medical Center, and professor of neurology and pediatrics at the George Washington University School of Medicine and Health Sciences.

CLUSTER HEADACHES

Q Is the sudden and permanent relief of cluster headaches common, or am I exceptionally fortunate? Also, after an attack I experienced an intense euphoric sensation. Is this common?



DR. KATHLEEN B. DIGRE RESPONDS:

A Cluster headaches are a primary headache disorder associated with one-sided pain, feelings of restlessness, eye tearing, nasal stuffiness, and drooping eyelid (ptosis). Attacks typically last one to four hours and are excruciatingly painful. Most people experience episodic cluster headaches in bouts and then go for months without headaches before they recur again. Conversely, chronic cluster headache is experienced without remission for more than a year. In some cases pain-free intervals last less than a month and multiple attacks can occur in one day. There's a 30 percent chance episodic cluster headache can turn into chronic cluster. Onset is typically in early adulthood, and men are more commonly affected.

Some studies (such as one published in the journal *Headache* in 2010) suggest that only 12 percent of individuals with cluster headaches experience a remission and never experience them again.

Most people report a premonition prior to a cluster attack, and some also report sensations afterward. Most of these are twinges of pain or sensitivity to light. Although some patients experience a change in mood before the attack, euphoria is rarely ever described after the attack. However, endorphin levels have been shown to be elevated in some individuals after a cluster attack.

Kathleen B. Digre, M.D., is professor of neurology and ophthalmology at the University of Utah School of Medicine.

ACROMEGALY

Q What is acromegaly and how does it progress? Does catching it early make a difference?

DR. MYRNA ROSENFELD RESPONDS:

A Acromegaly is a hormonal disorder in which the pituitary gland produces excess growth hormone. The pituitary gland is responsible for secreting and regulating hormone functions in the body and can develop benign masses called adenomas that overproduce a variety of hormones. Acromegaly is not hereditary.

The overproduction of growth hormone has many effects. Affected children can grow excessively tall, known as gigantism. In adults, bones grow wider rather than longer; and the feet, hands, nose, and tongue often enlarge.

Acromegaly symptoms occur over several years and often go unnoticed, even when rings become tight or hats and shoes no longer fit. The excessive growth hormone also alters one's metabolism, leading to weight gain, diabetes, high blood pressure, arthritis, and heart disease. Due to the insidious nature of these changes, most patients have symptoms for an average of 10 years before a diagnosis is made. The diagnosis is confirmed by measuring growth hormone levels in a blood sample. In addition, a CT scan of the brain is important, because some adenomas can grow very large, causing headaches or vision loss by pressing on the brain. While many problems can improve after successful therapy, some changes may be permanent and lead to persistent problems—so early diagnosis and intervention is important.

Acromegaly is traditionally treated through transsphenoidal surgery, in which the adenoma is removed through a small incision made in the back of the nose. The procedure requires a short hospital stay and also recovery time. Eighty percent to 85 percent of patients with tumors less than 1cm in size (microadenomas) typically experience long-term cure, compared to 50 percent to 60 percent of patients with larger tumors (macroadenomas). Those patients whose symptoms persist after surgery are treated with drugs that block the actions of the growth hormone. These may include somatostatin analogues, effective in 50 percent to 70 percent of patients; indopamine agonists, effective in up to 90 percent of patients; and growth hormone antagonists, which aren't as effective as the previous two drugs and can be prescribed in addition to somatostatin analogues. All patients with acromegaly should be seen by an endocrinologist, who can make sure that the treatment is effective and that all other hormone functions are working well.

Myrna Rosenfeld, M.D., Ph.D., is professor of neurology and division chief of neuro-oncology at the University of Pennsylvania.

DO YOU HAVE A QUESTION TO ASK THE EXPERTS?

Send it to neurologynow@lwwny.com