

Scientists have discovered an innovative way that may stop the spread of brain cancer glioblastoma multiforme. Activating a specific family of proteins halts cancer cell migration into healthy tissue.

# Iran offers high-quality orthopedic surgeries

## Orthopedic congress in October



Dr. Gholamali Akasheh (inset)

Exclusive

By Sadeq Dehqan & Atefeh Rezvan-Nia

Iran is among top five countries in the world and the first in the region in providing orthopedic surgeries of the highest quality and the availability of drugs and medical needed for such operations, said Gholamali Akasheh, the head of Iranian Orthopedic Association.

"The US, Britain, Canada and Germany are the top four countries in high-quality orthopedic services," he said, adding Iran is even ahead of Australia in this respect.

Akasheh noted Persian Gulf littoral states seek to broaden their experience in orthopedic treatments by taking part in scientific conferences held regularly in Iran.

"Orthopedic treatments have improved in the UAE and other Persian Gulf Arab states in lights of efforts of Iranian specialists," he said, adding patients from Central Asian countries also seek treatment in Iranian medical centers.

Pointing to arthritis as one of the common types of orthopedic disorders impacting the lives of people,

Akasheh said the risk of arthritis increases with age.

The specialist said hip, ankle and knee are more prone to arthritis.

"Obesity, poor physical activity, unhealthy diet — avoiding fruit and fresh vegetables and consuming excessive amount of carbohydrate — are among the most important causes of arthritis," he said, adding Iranians have a greater tendency to contact the disease, as they eat too much rice and bread every day and follow a sedentary lifestyle.

Akasheh said arthritis could affect people of all ages. "However, some people may develop arthritis under the age of 40 and some may be diagnosed with it over the age of 70," he said.

He urged citizens to take regular physical activities to slow down the process of joint damages and development of arthritis.

Akasheh said incorrect postures and weight gain play important roles in the development of knee arthritis.

"People over the age of 60, who are diagnosed with knee arthritis, require surgery most of the time," he said.

"Half of women who are above 55 years of age under-

go knee replacement surgery. The rate of knee arthritis is higher among women than men because of pregnancies and poor physical activities, which lead to sudden weight gain," he pointed out.

Akasheh said the use of squat toilet is one of the main reasons for the prevalence of knee arthritis among Iranians.

"Using such facilities or sitting with the knees together increase the pressure on the knees by 200 times," he said.

He said strengthening the muscles of knee by exercising regularly would reduce the risk of arthritis, even if a person is overweight.

"Natural disasters, such as flood and earthquake, are other reasons for arthritis disorders," he said, adding high incidence of road accidents in Iran have also increased the rate of such disorders.

Akasheh said the 23th Congress of Iranian Orthopedic Association is to be held in Tehran during Oct. 5-9.

"About 1,200 members of the association and 13 foreign guests will take part in the event to share and update their knowledge," he specialist said.

## DNA alterations among earliest to occur in lung cancer

Working with tissue, blood and DNA from six people with precancerous and cancerous lung lesions, a team of Johns Hopkins scientists has identified what it believes are among the very earliest premalignant genetic changes that mark the potential onset of the most common and deadliest form of disease.

In a report on the discovery, the team said the DNA alterations it uncovered were in premalignant lung lesions known as atypical adenomatous hyperplasia, or AAH, and that the alterations occurred long before the lesions would acquire the ability to invade surrounding tissue and fulfill the definition of adenocarcinoma of the lung, Medical Xpress said.



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"We believe we were able to detect, for the first time, DNA circulating in the blood from precancerous lesions of the lung," said Mariana Bratt, PhD, an assistant professor of otolaryngology-head and neck surgery at the Johns Hopkins University School of Medicine and a member of the research team. "This work is a big step in advancing our knowledge of lung cancer, because it could give us a chance to find people at risk early."

Their analysis also showed that different regions of the same lesion had various mutations distinctly associated with good and poor outcomes, and that in patients for whom blood samples were available, circulating DNA evidence of the mutations showed up clearly.

"This study takes detection to a whole new level in terms of size of the lesion," said David Sidransky, MD, professor of oncology and pathology at the Johns Hopkins University School of Medicine and the director of head and neck cancer research at Johns Hopkins. "I'm not aware that circulating DNA from precancerous lesions this small has ever been identified before."

Sidransky cautioned that the findings are preliminary, involved only a few patients and are but a first step in figuring out how DNA testing might be used to detect precancerous changes at their earliest stages. But the knowledge is invaluable, he said, for both understanding the molecular biology of how lung cancer originates and how to use the findings in clinical applications.

## Exercise may help keep an aging mind agile

Regular exercise may help seniors' minds stay as agile as their bodies, a new study found.

The study included 100 adults, aged 60 to 80, who wore monitors to record their physical activity levels over one week. The participants also underwent MRI scans to measure blood oxygen levels and assess brain activity at rest.



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Those who did regular moderate to vigorous exercise had more variable brain activity at rest than those who were less active, the investigators found, health.com wrote.

"In a previous study, we showed that in some of the same regions of the brain, those people who have higher brain variability also performed better on complex cognitive [mental] tasks, especially on intelligence tasks and memory," study co-leader Agnieszka Burzyska said in a news release from the University of Illinois at Urbana-Champaign.

She was a postdoctoral researcher at the university when she conducted the study, and is now a professor at Colorado State University.

The researchers also found that more-active seniors had better white matter structure in the brain than those who were less active. White matter fibers carry nerve impulses and connect different brain regions to each other.

The findings suggest a new way to assess people's brain health as they age, according to Burzyska.

"We want to know how the brain relates to the body, and how physical health influences mental and brain health in aging," she said. "Here, instead of a structural measure, we are taking a functional measure of brain health. And we are finding that tracking changes in blood-oxygenation levels over time is useful for predicting cognitive functioning and physical health in aging."

## Pregnancy complications may be linked to later heart disease

A complicated pregnancy may increase a woman's risk of dying from heart disease later in life, a new research suggested.

The risk is particularly high for women who've had more than one health problem during pregnancy, said senior study author Barbara Cohn, director of Child Health and Development Studies at the Public Health Institute in Berkeley, California, HealthDay wrote.

"We discovered there were some combinations of pregnancy complications that were associated with as much as a sevenfold increase in the risk of cardiovascular disease death," Cohn said.

For example, the risk of fatal heart disease prior to age 60 doubled or even tripled in women who developed pre-eclampsia, a sudden increase in blood pressure late in pregnancy. But a woman's risk escalated six times if she developed pre-eclampsia on top of high blood pressure she already had earlier in her pregnancy, the researchers found.

However, the new study could only show associations between pregnancy complications and later heart problems; it did not prove a cause-and-effect relationship.

Heart disease is the number-one killer of American women, according to the American Heart Association.

In this study, researchers analyzed decades of data gathered from about 15,000 women who became pregnant in the Oakland, California, metropolitan area between 1959 and 1967. Overall, 64 percent of the mothers had no complications, 31 percent experienced a single complication, and 5 percent had two or more complications.



FOX NEWS

## Protein-based sensor could detect viral infection

Biological engineers from MIT have developed a modular system of proteins that can detect a particular DNA sequence in a cell and then trigger a specific response such as cell death.

This system can be customized to detect any DNA sequence in a mammalian cell and then trigger a desired response, including killing cancer cells or cells infected with a virus, the researchers said.

"There is a range of applications for which this could be important," said James Collins, the Termeer Professor of Medical Engineering and Science in MIT's Department of Biological Engineering and Institute of Medical Engineering and Science (IMES). "This allows you to readily design constructs that enable a programmed cell to both detect DNA and act on that detection,

with a report system and/or a respond system," reddit.com quoted him as saying.

"The technologies are out there to engineer proteins to bind to virtually any DNA sequence that you want," said Shimyn Slomovic, an IMES postdoctoral and the paper's lead author. "This is used in many ways, but not so much for detection. We felt that there was a

lot of potential in harnessing this designable DNA-binding technology for detection."

To create their new system, the researchers needed to link zinc fingers' DNA-binding capability with a consequence, either turning on a fluorescent protein to reveal that the target DNA is present or generating another type of action inside the cell.