BRAC UNIVERSITY
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PHARMA HIGHLIGHTS

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Heart Attack or Cardiac Arrest?

Understanding the distinction between a heart attack and cardiac arrest is vital; rapid intervention must occur in either case, but the best plan of action to prevent permanent damage is different based on the pathological differences between the two conditions. ACLS defines the key difference between the two conditions as a "blood flow problem" versus an "electrical problem".

A heart attack, also known more technically as myocardial infarction, is considered a blood flow problem because the coronary arteries must allow blood to flow through them in order for oxygen to reach the heart for dissemination to the tissues. If an artery is partially or fully blocked, often due to a buildup of plaque from atherosclerosis, blood cannot reach the heart, and a heart attack occurs. A heart attack warrants calling an ambulance, but there are several actions individuals can take while waiting for paramedics to arrive. If aspirin or nitroglycerin are available, one dose can be given to the heart attack patient. The patients should be calm; an excess of stress could cause cardiac arrest.

Cardiac arrest is sudden, visible, and lethal. This condition is a result of an irregular heartbeat that causes the heart to completely stop pumping, and it can lead to death in just a few minutes. A person experiencing cardiac arrest will immediately stop breathing and become unresponsive. Studies have shown that each minute after the cardiac arrest occurred is connected to a ten percent decrease in survival for the patient. If a person shows signs of cardiac arrest, CPR must be administered as soon as possible and continued until an ambulance arrives. An automated external defibrillator (AED) can be used in between chest compressions.

Source: ACLS Medical Training, American Heart Association

Restricted Diet Led to Blindness!

When an 11-year-old boy showed signs of severe vision deterioration, doctors were perplexed since there didn't seem to be a family medical history. Upon further investigation, they found the cause of the boy's vision impairments to be due to a severely restricted diet.

The boy's parents observed that their son's vision seemed to be declining for a period of 8 months. When doctors finally examined the boy's eyes, they found physical signs of deterioration in his eyes and vision. His cornea had "Bitot spots," which are raised patches that occur when the eye is abnormally dry. Furthermore, the boy's vision was impaired – he could only see within 12 inches of his face.

Although the boy didn't have a family history of vision impairment, he did have a history of eczema and food allergies. Eczema causes the skin to become inflamed and irritated. His parents feared the eczema can be triggered or exacerbated by certain foods, and so they reportedly restricted his diet to potatoes, pork, lamb, apples, cucumbers and Cheerios.

Source: Live Science

Hidden in this diet regimen was the smoking gun behind the boy's vision impairment. He had vitamin A deficiency because the foods he ate didn't provide enough of this compound (around 2,000 IU per day). Blood tests confirmed the doctor's suspicions. The boy's vitamin A levels were 14.3 micrograms per deciliter (µg/dL), which is approximately 2 to 3 times lower than what it should be (normal range is 25.8 to 48.7 µg/dL). The boy was immediately treated with "megadoses" of vitamin A.

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For the Sake of Your Arteries, Eat More Bananas

In a new study from the University of Alabama at Birmingham, scientists illustrate the importance of potassium in helping arteries stay healthy and flexible. Potassium is a mineral found in bananas, avocados, leafy greens, and root vegetables. Using a series of models from the organism level to the cellular level, UAB researchers show just how dangerous it can be when dietary potassium hits rock bottom.

According to the Dietary Guidelines for Americans 2015-2020, adults and adolescents should be taking in 4700 milligrams of potassium every day. For perspective, that is about 11 bananas or 6.6 avocados, but the easiest (and healthiest) way to achieve any daily recommended amount of a nutrient would be to eat a variety of fruits and vegetables.

For people who consume much less potassium than is recommended, the risk of pathogenic vascular calcification is a lot higher than it is for people who eat more potassium-rich foods. Vascular calcification, the process of calcium aggregating in major arteries, leads to hardening of the arteries that makes it more difficult for them to stretch in response to increasing blood pressure. With arteries less able to expand and deflate as blood flows through the blood vessels, the heart has to work harder to pump enough blood to the body's organs. When the heart is overworked, congestive heart failure can develop.

Source: JCI Insight

Is Zika Coming Back For Round Two?

The Zika virus is mutating so dangerously fast that experts studying the pathogen in Brazil are concerned that we may be on the verge of another Zika outbreak, one that existing vaccines and diagnostic tests may be completely useless against. From the University of São Paulo, funded by the São Paulo Research Foundation, a new in-depth study of three asymptomatic Zika patients suggests that new serotypes of the Zika virus could appear as a result of its rapid mutation.

Viruses of the same serotype can be genetically different but have the same surface antigens. This means that the neutralizing antibodies produced by the immune system can target different strains of a virus as long as they are the same serotype. Researchers previously observed that the dengue virus, a family member of Zika, mutating and producing different serotypes. Now the same seems to be happening with Zika.

The recent São Paulo study involved regular collection of blood, saliva, and urine samples from all three patients and semen samples from the two men. Researchers sent off these samples for whole-genome sequencing of the Zika virus, every week asking: what's different in the viral genome?

Source: São Paulo Research Foundation

In one male participant, researchers observed "compartmentalized strains," meaning Zika virus in the semen was genetically different than Zika virus in the urine. And for all three patients, the pathogen found in the final stage of the infection wasn't the same as the virus that entered the patient. This ominous observation means that preventative strategies to avoid Zika virus infection altogether are more important than ever.

It is clear that unfortunately we haven't seen the last of the Zika virus, yet!