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15-Year-Old Invents New Test for Early, Reliable Detection of Pancreatic Cancer

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By Dr. Mercola

Pancreatic cancer is a devastatingly fatal form of cancer, and is typically regarded as the most deadly and universally rapid-killing form of cancer. According to the U.S. National Cancer Institute,¹ an estimated 45,220 Americans will be diagnosed with pancreatic cancer this year, of which 38,460 are expected to die.

Part of the problem is that this cancer is usually diagnosed quite late, contributing to the abysmal five-year survival rate. It also shows you just how ineffective conventional detection methods and treatments are.

All of that may soon change however — all due to the persistence and dedication of a high school kid who decided there must be a better way to detect this lethal cancer sooner...

Yes, a 15-year-old boy named Jack Andraka has done what scientists with millions of dollars-worth of research grants at their disposal have failed to do. He invented a dipstick-type sensor to detect pancreatic, ovarian, and lung cancer that is:

- 168 times faster
- 26,000 times less expensive, and
- 400 times more sensitive than the current standard of detection

And he did it using Google and Wikipedia as his primary research tools — online resources that are available to virtually anyone on the planet with an internet connection. What's more, the test costs three cents, takes five minutes, and has a 90 percent accuracy rate. Compare that to the current standard, which employs 60-year-old technology, costs about \$800, and misses 30 percent of all pancreatic cancers.

How Could a High School Kid Make Such an Amazing Discovery?

You are in for a real treat. Please find the time to watch this awesomely inspiring video of a high school freshman who accomplished a major feat that most of us will never surpass in our lifetime. It is clearly one of the most inspiring videos I have ever seen. You are left with the impression if this high school freshman can do this, why can't I achieve my goals?

Last year, Jack was awarded first place in the Intel International Science & Engineering Fair for his invention.² To me the most impressive part of his story are the thousands of failures he went through that did not deter him in the pursuit of his goal. Absolutely magnificent story.

When Jack first began his research, he didn't even know he *had* a pancreas, but when pancreatic cancer suddenly claimed the life of a close family friend who was like "an uncle" to him he got to thinking... and researching, using readily available online tools and freely available studies, he determined that the reason we haven't done a better job at detecting pancreatic cancer is because we're looking for a particular protein present in the blood, called mesothelin.

This protein is always present, but in ovarian, pancreatic, or lung cancer patients, this protein is elevated. The problem is, detecting elevated levels is like "finding a needle in a stack of identical needles."

After determining the parameters for an ideal detection sensor — noninvasive, rapid, inexpensive, simple, sensitive, and selective — he set to work trying to figure out how to detect elevated levels of mesothelin. The idea for his dipstick sensor

Story at-a-glance

- » Pancreatic cancer is a devastatingly fatal form of cancer, and is typically regarded as the most deadly and universally rapid-killing form of cancer
- » A 15-year-old freshman high school student, Jack Andraka, invented a dipstick-type sensor to detect pancreatic, ovarian, and lung cancer that is 168 times faster, 26,000 times less expensive, and 400 times more sensitive than the current standard of detection. The test costs three cents, takes five minutes, and has a 90 percent accuracy rate
- » His primary research tools were Google, Wikipedia, and freely available research studies—online resources available to virtually anyone on the planet with an internet connection
- » Three lifestyle issues known to contribute to pancreatic cancer are sugar/fructose consumption, lack of exercise, and vitamin D deficiency

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came during a high school biology class on the subject of antibodies, during which he was secretly reviewing a paper on analytical methods using the 21st century technology of carbon nanotubes. (His approach would be absolutely impossible when I was in high school as carbon nanotubes would not be discovered for many decades.)

Antibodies fit like a lock and key into an antigen binding site. In this case, that would be the mesothelin protein. His idea involved lacing the nanotubes with the antibody, which would subsequently only attract the mesothelin protein. The nanotube strip would then generate an electrical response large enough to detect with a simple ohm meter.

Once he had locked down his theory, he needed a lab space. He applied to 200 laboratories working with pancreatic cancer and promptly received 199 rejections. But there was one “maybe.” He “hunted down” the professor and eventually landed a meeting. And a place to work. Seven months later, after countless trials and errors, he had created his first paper sensor. The sensor has now been tested in blind studies on humans, and has been found to have a 90 percent accuracy rate. Another key is that this protein becomes elevated during the earliest stages of cancer, allowing for a greatly increased survival rate.

“Through the internet anything is possible,” Jack says.

I couldn't agree more. Not only is this story amazing because of his youth, it's also an incredible testament to the power of the internet. Anyone can now, quite literally, change the world by putting the available information to good use! That is really the primary reason why I am able to provide all these news stories for you in the newsletter. Virtually all of them are carefully researched on the internet. We supplement these stories with my 20-plus years of clinical experience treating 25,000 patients and interviews with some of the leading health experts in the world.

What Causes Pancreatic Cancer?

Three lifestyle issues keep popping up on the radar when you look at what's contributing to pancreatic cancer:

- Sugar/fructose consumption
- Lack of physical exercise
- Vitamin D deficiency

Obesity and physical inactivity makes your body less sensitive to the glucose-lowering effects of insulin. Diminished sensitivity to insulin leads to higher blood levels of insulin, which in turn can increase your risk of pancreatic cancer. One [previous study](#) found that men and women with high Body Mass Index (BMI) faced a pancreatic cancer risk 1.5 to 2 times higher than those with low BMI. And for women who are both overweight and sedentary, your risk is 2.5 times higher. When they reduced their weight and exercised, they lowered their risk. In fact, the men who exercised strenuously at least 8 hours a month were found to have only 59% of the pancreatic cancer risk of men who exercised less. Insulin seems to be one of the main drivers for cancer in general, and for pancreatic cancer in particular.

Why?

Because insulin production is one of your pancreas' main functions, used by your body to process blood sugar, and, in the laboratory, insulin actually promotes the growth of pancreatic cancer cells. Researchers suspect that if your body maintains high levels of insulin, you increase the pancreatic cancer's ability to survive and grow. In fact, researchers now believe that up to a third of all cancers may be caused by diet and lifestyle. **So if you want to prevent cancer, or want to treat cancer, it is imperative that you keep your insulin levels as low as possible.** Furthermore, pancreatic tumor cells have been found to use [fructose](#), specifically, to divide and proliferate — again attesting to the fact that there are significant metabolic differences between fructose and other sugars.

According to the authors:³

“Importantly, fructose and glucose metabolism are quite different... These findings show that cancer cells can readily metabolize fructose to increase proliferation.”

The study confirms the old adage that sugar feeds cancer because they found that tumor cells do thrive on sugar (glucose). However, the cells used *fructose* for cell division, speeding up the growth and spread of the cancer. If this difference isn't of major consequence, then I don't know what is, especially when you consider how quickly pancreatic cancer can kill you. As Jack stated in his talk, his friend was asymptomatic, and went from “healthy” to “a walking skeleton” in just three months.

It may surprise you, but the theory that sugar feeds cancer was born nearly *80 years* ago. In 1931 the Nobel Prize was awarded to German researcher Dr. Otto Warburg, who first discovered that cancer cells have a fundamentally different energy metabolism compared to healthy cells. Yet most conventional cancer programs STILL do not adequately address diet and the need to avoid sugars.

Additionally, carbohydrates from glucose and sucrose significantly decreases the capacity of neutrophils to do their job. Neutrophils are a type of white blood cell that help cells to envelop and destroy invaders, such as cancer. In a nutshell, ALL forms of sugar are detrimental to health in general and promote cancer, but in slightly different ways, and to a different extent. Fructose, however, clearly seems to be one of the overall *most* harmful.

Fructose — Uric Acid — Cancer

The study above also mentions that fructose metabolism leads to increased uric acid production along with cancer cell proliferation. This is another gigantic clue that fructose is directly associated with cancer.

In [my first interview with Dr. Johnson](#) back in 2010 (the same year that study was published), he explained the detrimental impact fructose has on your uric acid level. Interestingly, ONLY fructose, NOT glucose, drives up uric acid as part of its normal metabolic pathways. The connection between fructose, uric acid, hypertension, insulin resistance/diabetes and kidney disease is so clear that your uric acid level can actually be used as a marker for toxicity from fructose -- meaning that if your levels are high, you're at increased risk of all the health hazards associated with fructose consumption and you really need to reduce your fructose intake.

Dr. Richard Johnson has authored two of the best books on the market on the health dangers of fructose. The first one, *The Sugar Fix*, explains how fructose causes high blood pressure, heart disease, obesity, diabetes and kidney disease. The second, *The Fat Switch*, explains how fructose triggers a *specific 'switch' located in the powerhouse of each of your cells — the mitochondria — causing your body to activate enzymes that tell your cells to accumulate fat. This is an ancient adaptive mechanism found in a variety of animals that need to gain fat in anticipation of food scarcity or hibernation.*

Now it's safe to say that cancer, at least pancreatic cancer, is also definitely on the list of diseases that are directly linked to excessive fructose consumption.

Reducing (or preferably eliminating) fructose and other added sugars, as well as limiting grain carbohydrates from your diet should be part of any comprehensive cancer treatment plan. By doing so, you'll help stave off any potential cancer growth, and "starve" any tumors you currently have. It also bolsters your overall immune function, because sugar decreases the function of your immune system almost immediately.

Unfortunately, few cancer patients undergoing conventional cancer care in the US are offered any scientifically guided nutrition therapy beyond being told to "just eat healthy foods." I believe many cancer patients would see major improvement in their outcome if they controlled the supply of cancer's preferred fuel, glucose, and stayed clear of fructose to significantly reduce tumor proliferation.

Top 13 Tips to Prevent Cancer

There's a lot you can do to lower your chances of getting cancer -- you and your family CAN take control of your health. Don't wait for diagnosis, take the reins and be a proactive participant in your own health care, *before* you end up in need for disease management. I believe you can virtually eliminate your risk of cancer and chronic disease, and radically improve your chances of recovering from cancer if you currently have it, by following these relatively simple risk reduction strategies.

1. Reduce or eliminate your processed food, sugar/fructose and grain carbohydrate intake. This applies to whole unprocessed organic grains as well, as they tend to rapidly break down and drive your insulin and leptin levels up, which is the last thing you need to have happening if you are seeking to resolve or prevent cancer.
2. Consider seriously reducing your protein levels. I believe most people consume twice as much protein as they need, and most of this protein is of the worst kind - CAFO beef and chicken loaded with hormones and antibiotics. Look for Alaskan fish varieties, but avoid tuna as the bigger the fish the more toxins they accumulate. It is hard to find, but do your best to locate natural grass fed beef and organic chickens.
3. Control your fasting insulin and leptin levels. This is the end result you'll get when you remove sugars and grains from your diet and start to exercise regularly. Your levels can be easily monitored with the use of simple and relatively inexpensive blood tests.
4. Normalize your ratio of omega-3 to omega-6 fats by taking a high-quality krill oil and reducing your intake of most processed vegetable oils.
5. Get regular exercise. One of the primary reasons exercise works is that it drives your insulin levels down. Controlling insulin levels is one of the most powerful ways to reduce your cancer risks.

The trick about exercise, though, is understanding how to use it as a precise tool. This ensures you are getting enough to achieve the benefit, not too much to cause injury, and the right variety to balance your entire physical structure and maintain strength and flexibility, and aerobic and anaerobic fitness levels. If you have limited time Peak Fitness exercises are your best bet but ideally you should have a good strength training program as well.

6. Normalize your vitamin D levels by getting appropriate sun exposure, and consider careful supplementation when this is not possible. However, if you're taking oral vitamin D, you also need to make sure you're taking vitamin K2 as well, as K2 deficiency is actually what produces the symptoms of vitamin D toxicity, which includes inappropriate calcification that can lead to hardening of your arteries. To learn more, please see my previous article: What You Need to Know About Vitamin K2, D and Calcium. If you take oral vitamin D and have a cancer, it would be very prudent to monitor your vitamin D blood levels regularly.

7. Get regular, high quality sleep. Using a Zeo will help you objectively determine if your current sleeping strategy is providing you with the amount of deep and REM sleep that you need to heal and repair properly.
8. Reduce your exposure to environmental toxins like pesticides, household chemical cleaners, synthetic air fresheners and air pollution.
9. Limit your exposure and provide protection for yourself from radiation produced by cell phones, towers, base stations, and WiFi stations.
10. Avoid frying or charbroiling your food. Boil, poach or steam your foods instead.
11. Have a tool to permanently reprogram the neurological short-circuiting that can activate cancer genes. Even the CDC states that 85 percent of disease is caused by emotions. It is likely that this factor may be more important than all the other physical ones listed here, so make sure this is addressed. My particular favorite tool for resolving emotional challenges, as you may know, is the Emotional Freedom Technique (EFT).
12. Eat at least one-third of your food raw.
13. Consider adding cancer-fighting whole foods, herbs, spices and supplements to your diet, such as broccoli, curcumin and resveratrol. To learn more about how these anti-angiogenetic foods, and many others, work to fight cancer, please see my previous article: Dramatically Effective New Natural Way to Starve Cancer and Obesity.

Knowledge is Power

While most of us may lack the genius to invent a paradigm-breaking medical device while browsing the internet, all of us have the power to research matters relating to our own health, and more. Like Jack, I urge you to take full advantage of the internet, and even if your findings won't change the world, rest assured it can change *yours*.

Jack's story is an absolutely incredible testament to the power of applying yourself using common tools that are available to each and every one of us. He also reminds us of the importance of not letting failure and rejection deter you from your passion and purpose.

When it comes to your health, conventional medicine has precious little to offer. But that does not mean you have no options! On the contrary, there are many alternatives available, no matter what your health condition might be. Unfortunately, with pharmaceutical companies ruling the roost over medicine, you won't get that information from your doctor. You have to find it on your own. My website can help you get started. I have literally tens of thousands of free articles available, covering countless health issues. Just use the search engine at the top of every page and enter a topic you would like to learn more about. You will typically find dozens if not hundreds of articles on any given subject.

Remember, good health rests on just a few basic principles, and if you get those right, the rest will be much easier. Your diet accounts for about 80 percent of all the health benefits you'll reap from a healthy lifestyle, so *start there*. My free optimized nutrition plan can get you off on the right foot.

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