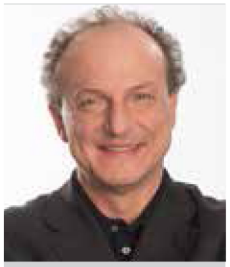
How we cured a once-fatal form of leukemia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Leukemia is a cancer of the blood that results in the excessive production of malignant blood cells produced by our bone marrow. Leukemia affects on average 2.5 million people worldwide every year and can still be highly fatal in spite of major advances in its treatment, including novel effective therapies, and, whenever indicated and available, bone marrow transplantation. While leukemia is the most common cancer in children, 90% of leukemias are diagnosed in adults.

Historically, leukemia has been one of the cancers most extensively investigated. One of the most important reasons is that blood is more readily accessible than other internal organs of our body. Due to research, we now know that there are different types of leukemia. The blood is made of different cell types and all of them can be subjected to malignant transformation. For example, cells that normally fight bacteria can become malignant leading to a so-called myeloid type of leukemia referred to as Acute Myeloid Leukemia. When on the other hand our B or T lymphoid blood cells - those which normally fight viral and bacterial infections - become malignant, we develop a leukemia referred to as Acute Lymphoblastic Leukemia. In some instances, the clinical course is less aggressive and those leukemias are referred as "chronic" rather than "acute."

Besides these clinical and cellular differences, after decades of genetic research, we now know that leukemias are profoundly diverse from a genetic standpoint. Different types of AML are associated with different genetic changes, mutations in specific genes, and/or major physical disruption in genes, gene deletion or gene fusions. Only thirty years ago when I was in medical school this was simply not known. Thus imagine the tremendous acceleration biomedical research has experienced in the last decades.

The acceleration of genetic knowledge has had a tremendous impact on the way we treat leukemia, also leading to real cures. Well, I personally had the privilege to be part of a phenomenal journey of discovery which led to the eradication of a specific form of AML, once fatal, called Acute Promyelocytic Leukemia, or APL for short. In the last year of my medical school training, along with Dr. Letizia Longo, who later became my wife, we identified the broken fusion genes found in the malignant cells from APL. At the time, we had no idea what those broken genes meant, and we wondered whether they were causing APL. To answer this question, we introduced these broken genes in the blood of mice and to our surprise, these mice developed APL, the same type of leukemia as in humans. This was exciting because we immediately reasoned we could try find medicines that counteracted what the broken genes were causing. And to make a very long story short, we found that a combination of two natural compounds, a vitamin and a chemical normally found in the soil, were able to cure APL in the mouse. Based on these results, we prompted the clinical research community to run clinical trials in humans with this drug combination. The rest is history. This drug combination has been approved by the FDA and today APL is considered curable. At diagnosis, APL patients are given this combination therapy and if properly managed they are sent home disease-free and drug free – a real, definite cure.

Our successful journey convinced us that this methodological approach is powerful and can be applied to other types of cancers. Indeed, this paradigm paved the way to multiple attempts to replicate the APL journey, currently ongoing. At the Pennington Cancer Institute in Reno, we are building the needed infrastructure to bring this cutting-edge research to our community.

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Strong, flexible spine restores energy and purpose

By Taylor Donovan

"You are as young as your spine is flexible" is a saying that you will hear often if you regularly attend yoga classes. For thousands of years, those that valued youthful vitality well into their seasoned lives have practiced proper movement and flexibility. You only get one spine in this life, so it is best to keep it in good working order for as long as possible.

Keeping your spine functional and strong is rather simple especially if you lead a busy and active lifestyle. The sedentary life steeped in comfort is the bane of spinal health. The reason for this is that the spine loses its curves as one becomes more sedentary and supported by backrests. Spinal health and performance are all about curves. These provide shock absorption and adaptability as you go about your days. Losing your spinal curves is akin to a downhill skier going through moguls with knees that won't bend. It looks awful, is painful, and doesn't end well.

Another saying that bears repeating often is, "an ounce of prevention is worth a pound of cure." The body is no different from many things we value, so if you don't use it, you will likely lose it. The spinal joints get their nutrition through movement as there is no dedicated blood supply to these articulating surfaces. Regular, predictable movements lubricate and provide nutrients essential to keep your joints moving smoothly and through a wider range of motion. Even better can be adding some passive movements performed by a trained professional. There is no reason for you to sit on the sidelines of your best life because of pain or immobility.

An actionable strength and flexibility plan is perfect in the winter months. These often incorporate daily movements and are reinforced with postural training to gradually restore spinal health, the primary curves, and core muscle reinforcement. Progress is made gradually and feels exceptional. Adding proper breathing techniques to reinforce this strong posture can give many folks their health freedom back.

Some common wisdom says, "We spend the first half of life creating wealth and the second half chasing health." It doesn't have to be this way, though. The best life has an abundance of both. Plenty of resources and energy to live the life that brings you the most joy and purpose.

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