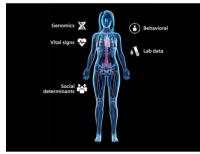**How My Digital Self Helped Me Survive Cancer**


Imagine an avatar,

a digital "you" so accurately mapped to your physical self that it could be used to personalize your healthcare, to predict and even prevent disease. It's called a Digital Twin. And in the near future it's going to become reality. Step into the future and read about how Anna's Digital Twin saved her life.

My cancer journey: On the way back to normal life

Hi guys, it's Anna again. After being quiet for a while, I feel like writing to you again to tell you about what's been happening over the past few weeks.Hopefully writing about my illness won't just help me, but also other patients out there who are experiencing similar things. As some of you might remember, I had colorectal cancer a few years ago. It was successfully treated at the time and I thought I was done with it, but that sadly doesn't seem to be the case. My doctors recently found several liver metastases that needed urgent treatment. The weird thing is, I wasn't feeling ill or anything. I just received a call from my health coach a couple of weeks ago asking me to come in to have an ultrasound. Turns out, it was my "digital self" who triggered the call.

The doctors had created a "twin" of me when they'd diagnosed and removed my colorectal tumor. It includes biomarkers of my intestine, lab data from blood tests, and various other diagnostic data that they collect every so often.

Anyway, my Digital Twin recently noticed a deviation from my normal values, and that caused my health coach to take action. So, my coach – who is a real person, by the way – asked me to come in. And my digital self was unfortunately right – there were metastases. I was obviously totally shocked and angry that the cancer had come back, but I was also glad that my Digital Twin had spotted it so early. This gave me hope that it was still treatable. Have any of you been diagnosed with cancer more than once? How did you deal with it?
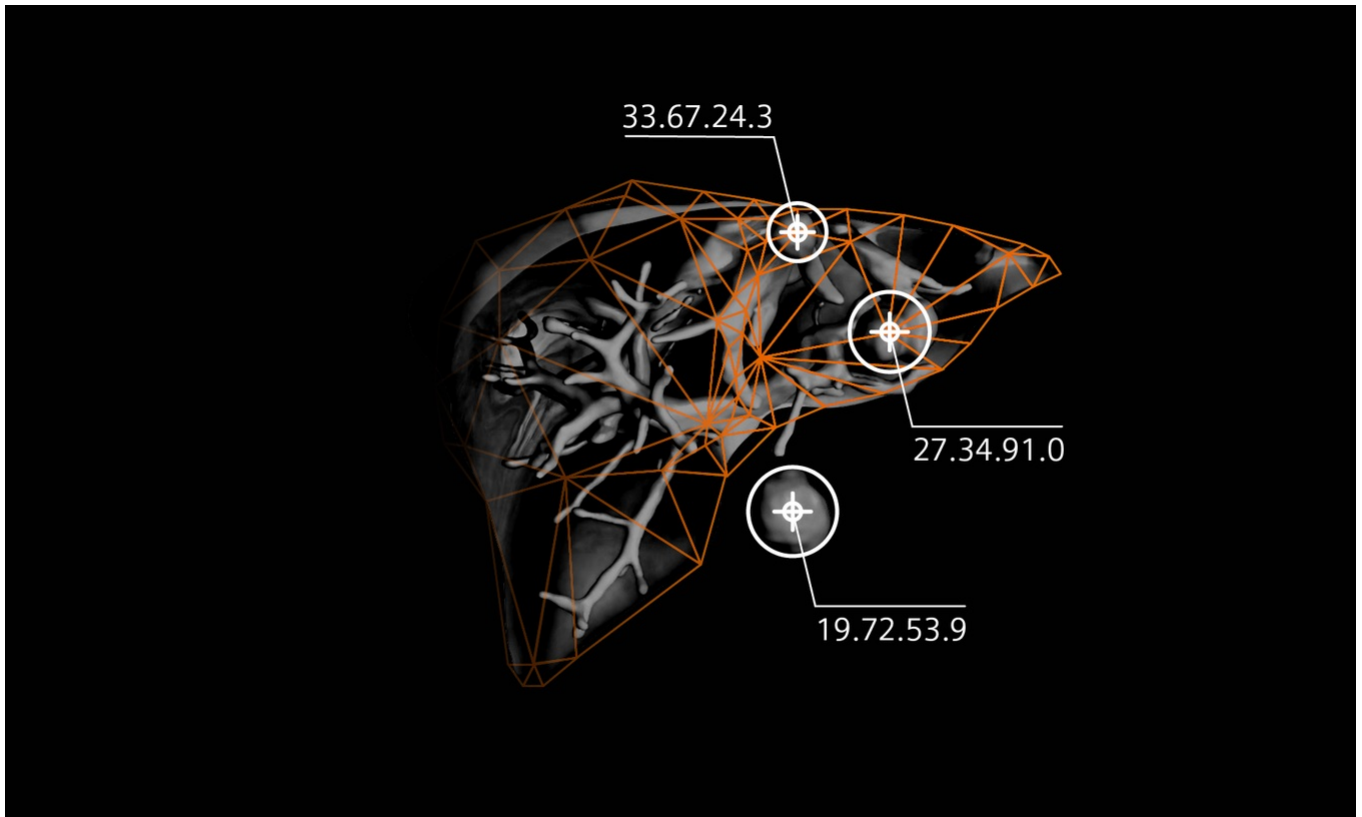
Before I had any treatment, the doctors sent me for preparatory CT and MRI scans to get more detail for the diagnosis. Then I had a PET-CT with some tracer. The doctors told me that this was to make sure the tumor was only in the liver.

Then AI software automatically contoured the tumor. So the doctors knew exactly how big it was, where it was, and what the tissue was. The software also had to show all the surrounding organs so that they could be protected during my therapy. It's important that only the tumor is treated, and no other organs are damaged.

After all the examinations, the doctors then showed me a 3D map of my liver, the tumor, and all the surrounding organs. Being able to see my liver and the metastases in a 3D model and even move it around on a tablet helped me to understand everything better. And it was somehow reassuring to see how tiny the metastases were. At that moment, I was very hopeful that I would make it and beat cancer again.

Then the doctors explained that there were different ways of treating my metastases. Because my first tumor a few years ago responded very well to the chemotherapy that they gave me before the surgery, they wanted to first treat the liver metastases with the same chemotherapy. They would then decide which surgical intervention made the most sense for me by running my detailed data set through AI software to identify possible treatment options and see which ones might work best.

In my case, a procedure they called "tissue sparing resection" – using small holes and a camera – was the best option. The doctors told me that because of my young age and other individual factors, this would give me the best chances of living for many more years if everything went well.

When I found out that I would have to have surgery again, I was really nervous. I tried to stay optimistic and strong, but I was honestly pretty scared just before the surgery. To help reassure me, the doctors used again my Digital Twin with the 3D model of my liver to explain exactly what would happen during surgery and how they would use my Digital Twin to help plan and simulate the surgery. Luckily the surgery went very well and the doctors were optimistic after the procedure. Even though I wasn't feeling too good immediately afterwards, I'm really glad that everything went so well, I left the hospital after just three days! Then I had some more chemo again.

In the end, I only really felt fully relieved when no more abnormalities were found in my latest follow-up examination and I finally had the certainty that all tumor cells had been successfully removed! Of course, I'll have to keep having check-ups to see if the cancer comes back. They'll check lab data more often and do more abdominal imaging than before. But that's fine with me.
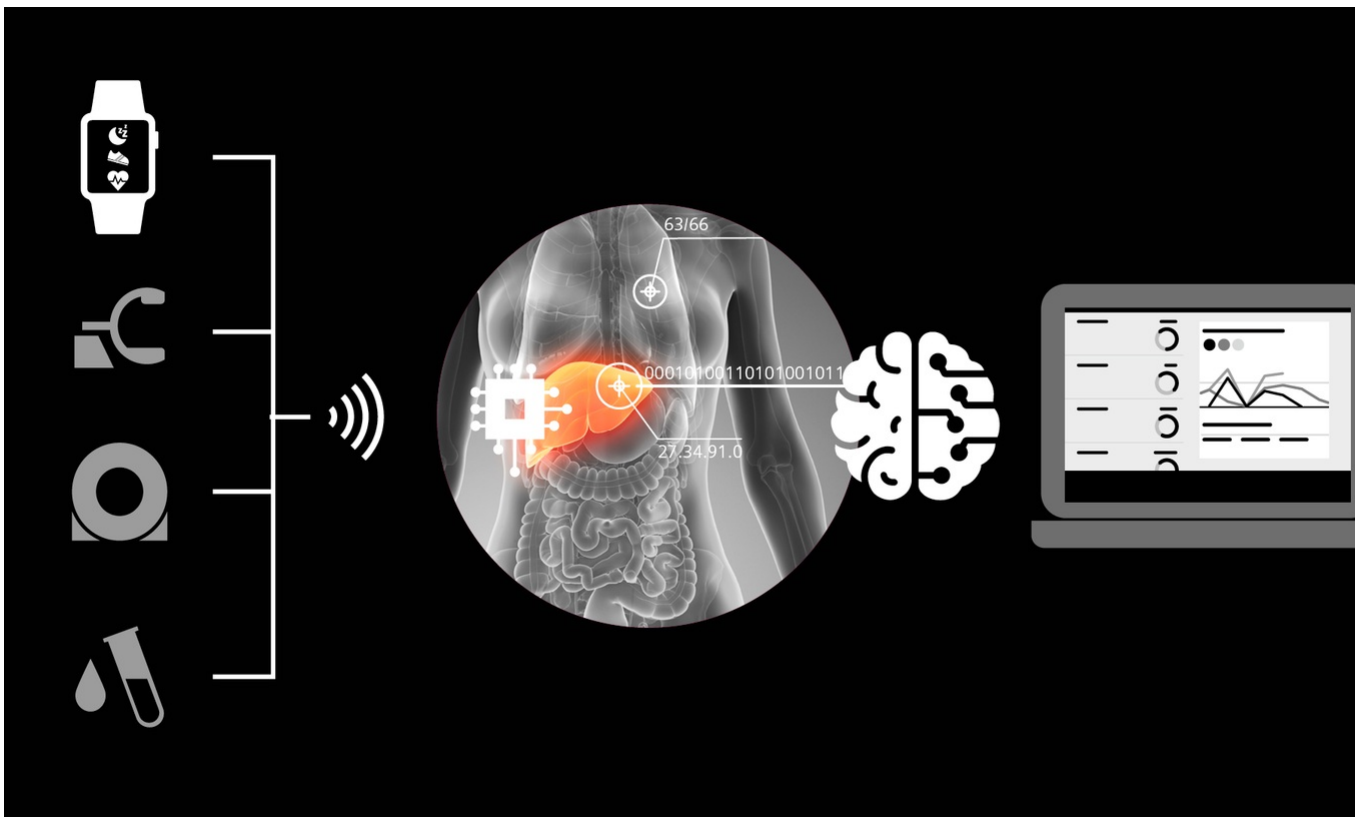

Now that I'm feeling well again, my health coach and I are creating a plan to make sure it stays that way. Everything runs through my digital self. My health Digital Twin continues to store all the data from my lab tests and follow-up exams, and from my smartwatch, including my heart rate, steps, sleep.

It uses artificial intelligence to monitor and check my current health status, and to predict my future health curve and compare mine with others. (Now I just have to stop leaving my watch in the bathroom every morning.)

As soon as there are any deviations from my standard curve, like if I haven't been getting as much exercise for a while, haven't slept enough, or my latest lab results show some deficiency, my Digital Twin lets me know and helps me get back on track with my health curve. More importantly, my Digital Twin tells me when I start getting sick, even before I notice it. That's what I call being proactive!
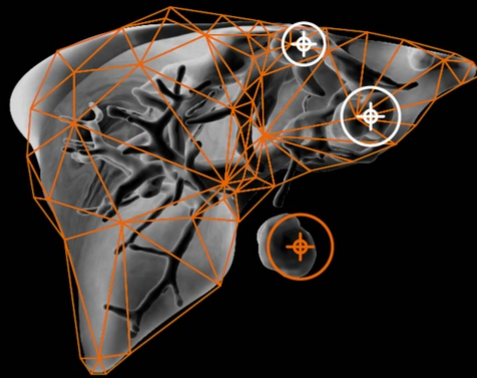
What can a health Digital Twin do?
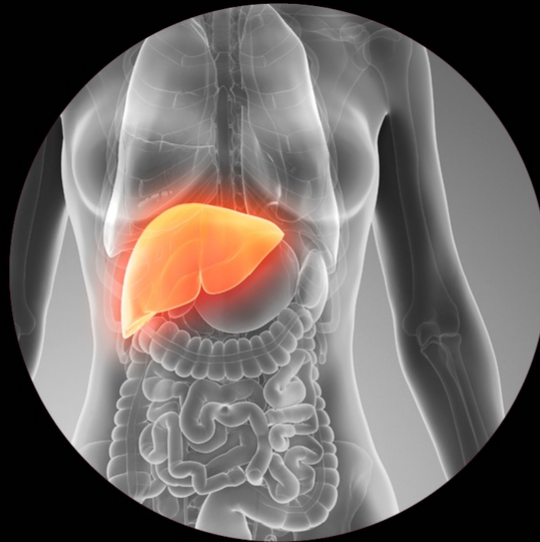
Patient Avatar Models

Development of a virtual representation of the structure of a patient's physical body.
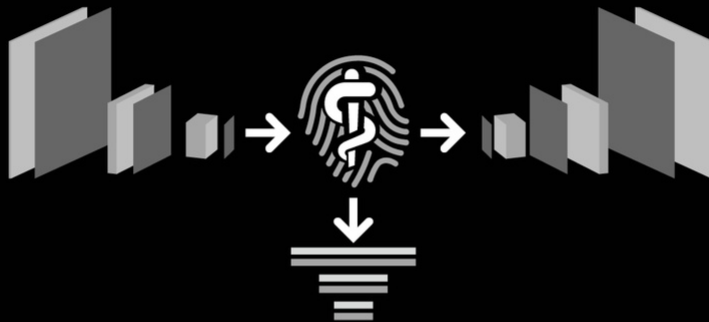

Organ Models

Simulate the structure, mechanics and/or functions of organs and/or organ systems.

Disease Models

Represents some or all of the pathological processes observed in an actual disease.

Predictive Models

Predicts an event, behavior or outcome using a multivariate set of predictors.

And even if I had to go to another doctor somewhere else, they could easily access my digital information and have all the details in one place. I'm so grateful that something as amazing as this is possible today. Who would have thought that the approaches and research from ten years ago would end up helping patients so soon?

Source: Siemens Healthineers

Published on : Thu, 27 Jan 2022