

PRINT-(Part one) OSF HealthCare and Caterpillar: Removing health care obstacles through collaboration

First installment of a two-part story on this unique, life-saving informal partnership

It is the word none of us ever wants to hear: cancer. For Kevin and Melissa Asbury of Peoria, Illinois, it was a mass in Kevin's colon and the cancer had spread.

"You know, it's a shock. Like, okay... hopefully its Stage 1, we can get this taken care of. Then you get the scan and find out it's in your lymph nodes and in your liver... it's Stage 4." Melissa adds, "To find out it had already gone to his liver, I just thought it was going to be the end of our story... like we're not going to make it very much further."

The initial diagnosis was grim – a 20 to 30% chance of surviving five years. Doctors started Asbury on chemotherapy, but the surgery was going to be extremely challenging with tumors on both sides of his liver. It's the type of surgery others might not be willing to tackle. But, Dr. Sonia Orcutt has access to the technology and unique expertise at OSF HealthCare, a 15-hospital integrated health system.

Through OSF Innovation at the Jump Simulation and Education Center, OSF can 3-D print models and translate images of complex tumors, such as Asbury's, into virtual reality to help in pre-surgery planning. It allows surgeons like Dr. Orcutt to have a better understanding of the relationship of the tumors to other structures within vital organs.

"And the reason it makes a difference for someone like him is if I did a really big resection, there wouldn't be a lot of liver left behind. And you have to leave so much liver behind, for your liver to function, for you not to go into liver failure."

However, cases such as Asbury's are so complex, it's beyond the printing technology available at OSF HealthCare. John Vozenilek, vice president/chief medical officer, OSF Innovation and Digital Health, says a few years ago, Innovation leaders had an 'ah hah' moment when they realized that heavy equipment manufacturer Caterpillar had the technology to print fractional and full-scale models for product development. So, why not for organs with tumors and complications in difficult surgical cases? A partnership was born.

Eric Bonk worked on the model of Asbury's liver.

"The printer we have is a polyjet technology, which means it can mix different materials, giving you different colors and durometers. So, I can make a soft, clear material and I can make a hard, colored material. And that works out well for seeing the veins inside the liver or seeing the tumors inside the liver. That way doctors can see exactly where it is inside."

Dr. Orcutt says it gave her confidence, and the Asbury's had a much better understanding of what would be involved and the risks of a six-hour surgery.

"When you actually get in there to operate and you actually see how things are in a real, living person, it's the only way for you to really understand... 'Well, maybe I should do this instead of this' and if you know ahead of time, you can counsel the patients better. Sometimes you can provide different options, you can prepare the O-R team better, so there's a lot that goes into it if you go into it better prepared and I think that's where the benefit of these models really lives."

Dr. Vozenilek believes it is transformative when patients really understand what they're facing.

"I think it relieves anxiety. It creates greater understanding. It lets them know what's going on fully. I think there's pain in anxiety and our job is, as clinicians, to alleviate pain so let's think about it that way."

With the worst of their ordeal behind them, the Asbury's are excited the successful surgery has given them a fighting chance at survival ... and a new outlook on life.

Every day is a blessing. Every day. Every birthday, every Christmas, every Thanksgiving. People take that for granted until they have something like this going on. - I cherish everything now a little more than what I used to."

Part two of our story-What it's like to work on a complex case and where this life-saving technology is headed.