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High-tech glasses developed at Washington University School of Medicine in St. Louis may help surgeons visualize cancer cells, which glow blue when viewed through the eyewear.

The wearable technology, so new it's yet unnamed, was used during surgery for the first time today at Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine.

Cancer cells are notoriously difficult to see, even under high-powered magnification. The glasses are designed to make it easier for surgeons to distinguish cancer cells from healthy cells, helping to ensure that no stray tumor cells are left behind during surgery.

"We're in the early stages of this technology, and more development and testing will be done, but we're certainly encouraged by the potential benefits to patients," said breast surgeon Julie Margenthaler, MD, an associate professor of surgery at Washington University, who performed today's operation. "Imagine what it would mean if these glasses eliminated the need for follow-up surgery and the associated pain, inconvenience and anxiety."

Current standard of care requires surgeons to remove the tumor and some neighboring tissue that may or may not include cancer cells. The samples are sent to a pathology lab and viewed under a microscope. If cancer cells are found in neighboring tissue, a second surgery often is recommended to remove additional tissue that also is checked for the presence of cancer.

The glasses could reduce the need for additional surgical procedures and subsequent stress on patients, as well as time and expense.

Margenthaler said about 20 to 25 percent of breast cancer patients who have lumps removed require a second surgery because current technology doesn't adequately show the extent of the disease during the first operation.

"Our hope is that this new technology will reduce or ideally eliminate the need for a second surgery," she said.

The technology, developed by a team led by Samuel Achilefu, PhD, professor of radiology and biomedical engineering at Washington University, incorporates custom video technology, a head-mounted display and a targeted molecular agent that attaches to cancer cells, making them glow when viewed with the glasses.

In a study published in the Journal of Biomedical Optics, researchers noted that tumors as small as 1 mm in diameter (the thickness of about 10 sheets of paper) could be detected.

