

# New procedure aims to save vision of children with eye cancer

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Retinoblastoma patient Savannah Smith and her mother, Courtney, before a recent appointment with J. William Harbour, M.D., at the Center for Advanced Medicine. Savannah had a radioactive plaque implanted Feb. 26 at St. Louis Children's Hospital. Credit: Robert Boston Washington University School of Medicine

An ophthalmologist at Washington University School of Medicine in St. Louis is implanting radioactive discs in the eyes of children with a rare cancer in an attempt to save their vision and their eyes.

J. William Harbour, MD, is one of only a few doctors nationwide to use the approach for treating a rare, childhood eye cancer, called retinoblastoma. Harbour, the Paul A. Cibis Distinguished Professor of Ophthalmology and Visual Sciences, performs the surgery at St. Louis Children's Hospital. He implants a small disc, or plaque, which stays in the eye for three days before a second surgery to remove it.

"The standard of care for retinoblastoma is chemotherapy, followed by laser and freezing treatments to eliminate the last remnants of tumors," Harbour says. "But occasionally there will be a tumor that doesn't respond to chemotherapy or is too large to treat with a laser or freezing treatment. That's where this plaque treatment comes in. It gives us an option that may allow us to save the eyes of a young child."

Retinoblastoma, as the name suggests, is characterized by tumors in the eye's [retina](#). It is extremely rare, affecting about one child in 20,000. In the United States, about 200 children each year are diagnosed with retinoblastoma. Approximately 40 percent of them develop tumors in both eyes, so in cases where the tumors prove resistant to chemotherapy, very young children and their parents are faced with a choice between a life without eyes and a high risk of death.

That's why Harbour, also a professor of cell biology and of molecular oncology and director of ocular oncology at the Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine, and a handful of other eye cancer specialists have recently started using the plaque method to treat the cancer and possibly save the eyes.

"The treatment plaque looks like a bottle cap made of gold," Harbour says. "Radiation seeds are placed on one side of the plaque, shining the radiation in one direction like a flashlight focused on the tumor. That prevents the radiation from affecting other parts of the body."

The plaques contain seeds that deliver radiation directly to the tumor cells. Harbour says because the radiation gets to the tumor in a much more focused way than was possible in the past, it is not likely that these plaques will contribute to future problems in or around the eye.

Implantation of radioactive plaques has been relatively common in adult patients with a different eye cancer called ocular melanoma. The gold discs have been the standard of care for those patients for decades, and results to date in an ongoing National Institutes of Health (NIH) study have demonstrated that the plaques are an effective treatment in adults with ocular melanoma.

Although the NIH study showed that plaque therapy is as effective as eye removal in preventing the spread of ocular melanoma, the small number of children who have retinoblastoma make it unlikely a similar study could be conducted for that form of [eye cancer](#). He estimates only about 10 to 20 children per year will require the plaque therapy in the United States.

Harbour says it takes several weeks to months to see the tumor start to melt away, but in both ocular melanoma and retinoblastoma, the plaques usually deal the cancer a fatal blow.

"The radiation causes damage within the cancer cells that prevents them from proliferating and spreading," he says. "By the time we take off the plaque, the cancer cells are either dead or mortally wounded, even though we do not immediately see a difference in the appearance of the tumor. After the plaque therapy, as the cancer cells try to proliferate and divide, those cells die, which we then notice in follow-up exams as the tumor shrinks over time."

Harbour still begins [retinoblastoma](#) treatment with [chemotherapy](#), but when tumors are too big or unresponsive, the plaques provide a new

option that has delivered positive results. Some children even can return to 20/20 vision depending on the size and location of the tumor, he says.

Provided by Washington University School of Medicine

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