



Research Leads to New Individualized Treatment

Electron beam technology for skin cancers now available

Dr. Henkelmann, radiation oncologist, and Janis Mayfield, medical dosimetrist, review BolusECT™ patient treatment plan.

New electron beam technology now offers improved treatments for complex cancers of the skin, or just below the skin, as a result of research by Mary Bird Perkins Cancer Center (MBP) medical physicists. This new treatment technique called bolus electron conformal therapy (BolusECT™) is the electron beam equivalent to intensity modulated radiation therapy (IMRT) with X-ray beams. BolusECT™ tailors the penetration of the electron beams to the cancer, sparing underlying healthy tissues for individual treatment. This reduces the chance for side effects.

“Specific tumors can be treated very well with this technology, especially skin cancers of the head and neck,” said Greg Henkelmann, M.D., radiation oncologist, who has used this treatment for certain cases at MBP. Dr. Henkelmann consulted with a patient at MBP’s Covington location he thought would be a perfect candidate for BolusECT™. “The patient was diagnosed with a very extensive skin cancer immediately adjacent to the eye and ear and a large part of the scalp and face area,” he explained. “Although treatment using a specialized IMRT machine at one of our other locations was being considered, the patient did not want to travel outside of Covington, so I saw this particular situation as the optimal opportunity to use utilize this technology. I couldn’t be more pleased with the results of BolusECT™ and that the patient was able to stay at home in Covington and receive the treatment he needed. BolusECT™ is not meant to replace other technology but rather to fill a niche for very specific situations.”

Explained Todd Stevens, president and CEO, Mary Bird Perkins, “BolusECT™ is extremely specialized and may be the treatment of choice for a small number of patients each year. However, its availability for those cases demonstrates another example of Mary

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Greg Henkelmann, M.D.
Radiation Oncologist

Bird Perkins’ commitment to putting patients first and providing them with care customized to their unique, individual needs.”

With the help of MBP medical physicists, the Florida-based company .decimal, Inc. (pronounced dot decimal) recently developed the product BolusECT™. The world’s largest medical device manufacturer of treatment aids that require precision machining, .decimal® fabricates the bolus out of a blue machinable wax. The wax bolus acts as a method to vary the penetration of the electron beam dose across the treatment field, providing treatment to the varying depth of the cancer – but no deeper. One side of the wax bolus is shaped to fit the skin surface. The opposite side, facing the incoming electron beam, conforms the delivered dose to the patient’s cancer. The secret to the shape of the front surface of the bolus is the result of the research.

Performing a treatment planning CT scan is the first step in the BolusECT™ planning process. The doctor then marks the target volume (cancer) on the CT scan and uses the .decimal® software to design the bolus shape. Once the simulated dose delivery using the designed bolus is approved by the doctor, data is sent to the .decimal® factory in Sanford, Fla., where the bolus is fabricated by a robotic milling machine and returned to MBP the next day. A second treatment planning CT scan is then performed with the wax bolus in place, and the resulting dose delivery is calculated. “This final dose calculation is a key step in our quality control process,” explained Connel Chu, MS, one of MBP’s 12 medical physicists and the lead medical physicist for clinical implementation and utilization of this technology.

MBP currently is in the second year of a research grant from .decimal® in which Kenneth Hogstrom, PhD, Chief of Physics, MBP, is the Principal Investigator. The research team, along with Chu, includes two LSU graduate students and one postdoctoral fellow. “Our role has been to advise in the design specifications, to test the computer code and recommend improvements to it, to consult on any questions from other users, and to help educate therapy clinics around the world on BolusECT™ and how it can help cancer patients,” said Hogstrom. “With the extension of the grant for a second year, we are looking at ways to make BolusECT™ even more useful.”

BolusECT™ technology is based on published research conducted by Dr. Hogstrom’s team at M.D. Anderson Cancer Center in the 1990s before he came to Mary Bird Perkins. Previous efforts there to translate the technology with other companies were unsuccessful; however, the patient benefit of this technology was later recognized by .decimal, Inc. “In summer 2006, two years after arriving at Mary Bird, I was approached by .decimal®. The clinical potential of bolus electron conformal therapy was untapped and attractive to them as a new product. We have helped guide them in their development of BolusECT™,” said Dr. Hogstrom.

“.decimal is excited about having been able to add BolusECT™ to its product line. Our business, whether electrons, protons, or X-ray therapies, is about producing custom treatment aids for individually optimized cancer treatments. We derive great

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**Kenneth R. Hogstrom, PhD
Chief of Physics**

satisfaction in being the first company worldwide to offer BolusECT™ for patient use, made possible by Dr. Hogstrom’s previous research and the opportunity to collaborate with the Mary Bird Perkins’ team throughout the development process,” said .decimal® President Richard Sweat.

Connel Chu, lead medical physicist for BolusECT™, who works closely with Dr. Hogstrom on this initiative.

