



Far-reaching advances in the diagnosis and treatment of cancer have been made during the last decade, from digital mammography to stereotactic radio-surgery, radioactive seeds to robot-assisted surgery. But by far some of the most astounding advances are being made on a much smaller scale—at the cellular and genetic level.

The treatment of cancer, according to Dr. Wilson Mertens, medical director of the Baystate Regional Cancer Program, is becoming increasingly personalized. “Moving forward, cancer presentations will become much more highly ‘segmented’ than before, with a variety of tissue and patient factors used to determine more specific treatment plans.”

In the next 20 years, he says, more and more cancers and

precancerous lesions will be evaluated genetically to determine the likelihood of progression or recurrence, or to evaluate how they will respond to specific therapies.

“Even doses of anticancer medication will be calculated based on each patient’s personal biochemical parameters, such as metabolic profile, rather than their weight and height, as we do now,” says Mertens.

IT’S IN THE GENES

“We are quickly evolving from ‘one-size-fits-all’ treatments for cancer,” says Mertens. “Cancer cells are genetically programmed to mutate. Many cancers are driven by mutations that either activate growth-inducing genes, or that stop cell growth. But since there are many genetic mutations, there can’t be one single cure for cancer. Rather, we have

to develop therapies that target specific mutations.”

Dr. Grace Makari-Judson, director of Baystate’s Comprehensive Breast Center, elaborates. “The focus of much of the research we are doing today is to identify targets that drive the growth of cancer cells, and then develop therapies that attack those targets.”

For example, Baystate researchers participated in an earlier significant national research study exploring the use of trastuzumab (Herceptin) in addition to chemotherapy for patients with early stage breast cancer who were found to have the mutated gene called HER2/neu.

“This study produced some of the most dramatic results we had for breast cancer in years, and is now part of our standard of care for appropriate

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patients," says Makari-Judson. "We now have a number of new therapies under study."

ADVANCES IN SURGERY & RADIATION

Surgery will remain a fundamental treatment for cancer and will continue to become more sophisticated, thanks to advances in minimally invasive and robot-assisted procedures. More patients will also be candidates for medication or radiation therapy after surgery.

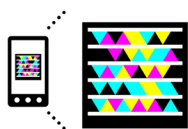
Says Mertens, "Some small cancers will be treated with high-dose radiation or other non-surgical 'ablative' treatments such as freezing or radiofrequency ablation."

One of the latest advances is stereotactic radiosurgery, which has been used at Baystate since 2007 for the treatment of brain cancer, and is now being employed by Baystate radiation oncologists for tumors in other areas of the

body as well (see article on page 7).

Dr. Brian Acker, chief of Radiation Oncology, says that advanced radiation technologies, such as stereotactic radiosurgery and image-guided radiation therapy, allow treatment of tumors using higher doses of radiation that are delivered much more precisely than in the past, minimizing the damage to surrounding healthy tissue.

"We're moving ever-closer to being able to adapt therapy on a daily basis depending on how the tumor and anatomy change," he says. "In the future, we'll be able to adapt our treatment in 'real-time' to more precisely treat a changing tumor. We believe that will result in better outcomes for patients."



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Dr. Wilson Mertens meets with a patient.

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Baystate Regional Cancer Program services are provided at:

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3350 Main Street, Springfield

The Comprehensive Breast Center
3400 Main Street, Springfield

Baystate Franklin Medical Center
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Baystate Mary Lane Hospital
85 South Street, Ware