

## **Witness to Progress**

Dr. Eamonn Boyle reflects on 30 years of advancements in cancer care

Dr. Eamonn Boyle has two words for people who say all of the money spent on cancer research hasn't produced anything.

"They're wrong."

Boyle, a practicing medical oncologist since 1973, says he has witnessed 30-plus years of progress – "substantial progress" he calls it – in the war against one of the world's most deadly and feared diseases.

"People who say we have little to show for all of the money spent on research have a 'half empty' viewpoint in my opinion," says Boyle, a partner in Cancer Care Associates of York. "If we hadn't spent that money we'd have *nothing* to show."

Over his career, Boyle says he has seen countless examples of "yesterday's big thing turned into today's routine."

"Better chemotherapy agents, more precise radiation treatments, improvements in surgical techniques, better screening tools...all of these were 'big news' at one point but are now fairly routine," he says. "None of these would have been possible without research."

Years ago, cancer treatments were relatively rudimentary, says Boyle. Early stage cancers were primarily treated with surgery, sometimes followed by radiation to kill cancer cells still lingering near the tumor site. Over time, researchers learned that cancer cells can break away from the primary tumor and begin to spread even when the disease is in an early stage, contributing to cancer recurrence.

Beginning in the late 1950s, chemotherapy drugs were used primarily to treat advanced cancers that could not be controlled with surgery or radiation therapy. Unfortunately, the side effects were substantial.

"Chemotherapy back then was like aerial bombing in World War II, meaning not very precise," says Boyle. "You may have hit the target but you also damaged a heck of a lot of other stuff."

Today, the goal is "targeted therapy." Until recently, treatments focused primarily on killing rapidly dividing cancer cells because that is a prominent feature of those cells. Unfortunately, some normal cells also divide rapidly. That means the treatments can cause multiple side effects.

Targeted therapy involves identifying *other* features of cancer cells. Researchers look for specific differences in the cancer cells and the normal cells. This information is used to create a targeted therapy to attack the "bad" without damaging the "good," thus leading to fewer side effects.

"Each type of targeted therapy works a little bit differently, but all interfere with the ability of the cancer cell to grow, divide, repair or communicate with other cells," says Boyle.

The different types of targeted therapies are defined in three broad categories. Some focus on the internal components and function of the cancer cell. These therapies use small molecules that can get into the cell and disrupt its function, causing it to die.

Other therapies target receptors that are on the outside of the cell. Therapies that target receptors are also known as monoclonal antibodies. Finally, antiangiogenesis drugs target the blood vessels that supply oxygen to the cells, ultimately causing them to starve and die.

In recent years, targeted therapies have shown promise against breast, colon, lung, kidney, and head and neck cancers, as well as follicular lymphoma (a slow-growing cancer of the lymph system).

“We are now starting to move away from an era where we threw paint against the wall and into an era where we’re able to be much more precise,” he says.

In addition to better treatments, Boyle also has seen much advancement in the area of cancer diagnosis.

“Traditionally, you diagnose cancer by taking a piece of it, looking at it under a microscope and staining it with chemicals,” he says. “It’s quite an old technique.

“We’ve now moved to molecular and genetic testing, which goes beyond the microscope and the eye. Now we look at what genes are in a particular cancer and come up with gene ‘signature.’ This more precise method of diagnosis allows us to better direct therapy.”

Another major advancement Boyle has seen over the past 30 years is the increased use and effectiveness of screening tools.

“Colonoscopy, mammography, PSA tests...these are things that save lives every day,” he says. “Prevention and screening are the lifeblood of cancer work. Technology continues to advance and I expect we’ll soon have even more reliable tests to help us catch problems even earlier. I see as much potential in the prevention and screening fields as I do in the treatment field.”

Finally, Boyle points to other, “softer” advances that have been made in the cancer field.

“I have seen many, many positive attitudinal changes in the last 30 years,” he says. “More attention and compassion about end-of-life issues, pain management, nutrition, quality of life, patient and family education, psychiatric care and symptom relief. We’re all more open and enlightened now than we used to be, and there is much more collaboration between patients and physicians.

“Not too long ago, cancer was dreadful, a death sentence, not to be discussed in polite conversation. Now, because of societal changes, cancer is ‘out of the closet’ so to speak. I think that’s a good thing.”

Boyle says he was privileged to enter the cancer field in its “infancy.” Following a residency at Bryn Mawr Hospital in Philadelphia during the early 1970s and further training at M.D. Anderson Cancer Center in Texas, he came to York in 1978. However, it was back in his native Ireland where the interest in cancer first struck.

“One of my classes in medical school was the biology of cancer and that was it for me,” he says. “I was lucky to be interested in something that, back then, was a relatively new and evolving branch of medicine.”

Boyle acknowledges that cancer is a tough opponent that will most likely take many more years and many more dollars to beat.

“You can’t buy a quick answer to something as complex as cell biology,” he says. Boyle also agrees with the often uttered statement that “cancer” should more properly be referred to as “cancers.”

“That’s because it’s not just one disease, it’s many,” says Boyle. “Saying you’re looking for a cure for cancer is like saying you’re going to study geography. Well, what kind? Rivers, mountains, countries? It’s endless. There’s never going to be a single cure for cancer because it’s not a single disease.”

Boyle does know one thing. Further treatment advancements, when they come, won’t be made by one person.

“There are tens of thousands of people out there working on this disease,” he says. “We’ll never know these peoples’ names but the work they do is what gives us the building blocks of advancement. Never underestimate the power of research.”

Asked if he’s hopeful about the future treatment of cancer, Boyle responds with a resounding “yes.”

“Only a few decades ago, fewer than one in 10 children with leukemia survived 10 years after diagnosis,” says Boyle. “With modern chemotherapy, the cure rate for these children is almost 80 percent. Examples of similar progress include Hodgkin’s lymphoma, breast cancer, bone and kidney cancers in children, and testicular cancer.

“It’s fascinating for me to stand back and look at where we’ve been and where we’re going. The glass is half full if you ask me. We *are* making progress.”