We can't cure cancer: and here's why you shouldn't worry

By Dr James Garner, Chief Executive Officer & Executive Director, Kazia Therapeutics Ltd.

About 150,000 Australians will be diagnosed with cancer this year. Working in drug development, I am often asked when we might expect a cure. The question is usually accompanied by a nervous chuckle — hopeful, but recognising that the question may have no answer.

In reality, of course, cancer is not one disease. It ranges from basal cell carcinoma, a form of skin cancer that is easily treated and rarely spreads, to glioblastoma, the most common and most aggressive form of brain cancer, where the average life expectancy from diagnosis is little more than a year.

In between these two types are a vast number of distinct diseases, each with its own treatment and prognosis. The only common factor is that all these diseases result from damage to our cells' DNA — the genetic code that forms the basis of all life — and it is this feature that distinguishes cancer from other types of disease.

It is unlikely that any one medical innovation will address all the different diseases that comprise cancer. However, we have made enormous progress in treating many individual forms of cancer. For example, a patient diagnosed with invasive prostate cancer in 1976 had about a 68% chance of being alive five years later. In 2016, his chances had risen to 98%. As one oncologist likes to comment, "patients these days don't die from prostate cancer, they die with prostate cancer."

Similar trends are seen in many other cancers. The survival rates for lung cancer and for leukaemia have doubled in the last four decades. In bowel cancer and ovarian cancer they have increased by 50%. Sadly, some cancers have still seen very little progress. In bladder cancer and brain cancer, for example, the prognosis today is little changed from the end of the last century. These very challenging diseases lie at the frontier of cancer drug development.

Even in the cancers where greatest progress has been made, very few patients can claim to be cured. Rather, their cancer has been rendered indolent and inactive. Sometimes it will rear its head again at some point in the future, but in the majority of cases the patient will be able to get on with their life and will eventually pass away from some other cause.

An analogy can be drawn with HIV/AIDS. In the early 1980s, when AIDS was first characterised, the life expectancy at diagnosis was around 18 months. Today, HIV/AIDS is not a life-shortening illness for many patients. The development of new treatments in the mid-1990s has relegated it to the status of a chronic disease, like diabetes or hypertension. Something similar is perhaps the likely outcome for many cancers that a few decades ago would have been considered terminal.

Of course, the best way to eliminate disease is to prevent it from developing in the first place. As an old medical saying has it, "an ounce of prevention is worth a pound of cure". As we learn more about the causes of cancer, we can modify our behaviours to reduce risk. For example, as smoking rates declined from the 1970s onwards, the mortality from lung cancer decades later has fallen by around 40% in the United States.

In some cases, we can eliminate the cause altogether. It has been known for some time that cervical cancer, which affects almost a thousand women each year in Australia, is caused primarily by a virus called HPV. Australian scientists, led by Professor Ian Frazer, developed a vaccine against HPV, Gardasil, which is now routinely administered in many countries. In time, if HPV can be successfully eradicated, like smallpox and polio before it, then cervical cancer will become a thing of the past.

So, although a single all-encompassing cure for cancer may never arise, the outlook for patients with cancer becomes more optimistic with every passing year. Even diseases like brain cancer, long considered essentially untreatable, are beginning to show signs of improvement. As our understanding grows, the more we can prevent, detect, treat, and manage the disease. At Kazia, we are using cutting-edge insights about glioblastoma, and the significance of a biochemical pathway called PI3K, to develop a promising new drug called Paxalisib. If successful, it will be the first new drug for patients diagnosed with the disease in over 20 years and the first signal of hope that even this most challenging of cancers can be beaten.

In the long term, the future of cancer may look rather like the history of infection. For much of human history, cancer was the least of mankind's worries: plague, smallpox, tuberculosis and water-borne infections were infinitely greater risks. Improvements in sanitation, the discovery of antibiotics, and global vaccination campaigns eliminated many of these diseases, and others became easily treatable.

As we have learned to our cost in recent months, infectious disease is far from cured, but it is no longer the primary cause of death for most of the world's population. With a small amount of luck and a great deal of hard work, the same will one day be said of cancer. E

Dr Garner is a medical doctor and published medical historian. After undertaking his medical training in London, he completed an MBA at the University of Queensland and then worked for several years as a management consultant with Bain & Company. He has spent most of the last 20 years working in international drug development and commercialisation, primarily in large pharmaceutical companies. Prior to joining Kazia Therapeutics in 2016, he led R&D strategy for Sanofi in Asia-Pacific and was based in Singapore. At Kazia, Dr Garner has been responsible for overseeing the significant progress of the company's lead candidate, Paxalisib, which is currently in five clinical trials in various forms of brain cancer.

Email: James.Garner@kaziatherapeutics.com; https://www.kaziatherapeutics.com