

Precision Medicine Driving Change in Brain Tumor Diagnostics and Treatment

By Paul Crowe

In 2017, up to [78,000 new cases of primary brain tumors](#) are expected to be diagnosed globally; [approximately 25,000 of them will be malignant](#). Brain tumor patients have one of the hardest roads to travel when it comes to diagnosis and treatment. Traditional treatment methods include invasive biopsies and surgeries along with interventions such as chemotherapy or radiation. These conventional therapies [may continue for months or years](#)—patients often have several brain surgeries and must try multiple anticancer drugs before finding a medication that effectively treats their unique condition. Unfortunately for many, these treatments [do not stop tumors from growing](#), and they often cause a host of [severe side effects that profoundly affects their quality of life](#). As an alternative to traditional therapies and diagnosis, many in the medical community are looking towards precision medicine providers, such as the [San Diego Gamma Knife® Center \(SDGKC\)](#), which offer highly targeted solutions with far fewer side effects.

Precision medicine is an approach to treatment which utilizes genetic variables (an individual's unique genetic code) to tailor treatment to a specific patient. Precision medicine uses our DNA to target the specific abnormalities that make us sick. Tools like the [Gamma Knife™](#) (stereotactic radiosurgery) can be used to precisely target tumors in the brain without surgical risks, a long hospital stay or subsequent rehabilitation. Precision medicine recently received a stamp of approval from the U.S. government which has [allocated \\$34 billion to the National Institutes of Health](#) this year for the sole purpose of advancing precision medicine research. Healthcare experts anticipate far greater use of precision medicine in the near future for many types of cancer, including brain cancer.

Emerging technologies, like precision medicine, are driving the expansion of the global brain tumor diagnosis and therapeutics market, which is expected to [grow extensively through 2025 to reach a value of up to \\$773.1 million](#). The global precision medicine market size alone was [over \\$39 billion in 2015](#) and is expected to grow at [an estimated 10.3% per year](#). Hospitals and other medical facilities are responsible for much of the growth and excitement surrounding precision medicine as these therapies have a positive effect on patient outcomes as well as their bottom line. For example, precision medicine was shown to [reduce hospital readmissions 52%](#), reduce visits to the emergency department by 42% and decrease deaths by 85%.

For brain tumor patients, precision medicine may serve to significantly improve their prognosis. The current survival rate for patients with malignant forms of brain tumors is [only about 34%](#), and for pediatric cancer patients, brain tumors account for [up to 25% of all deaths](#). Scientists and physicians are finding that targeted approaches to treatment offer more effective options, when dealing with many types of brain tumors, at a lower cost. After treatment with the Gamma Knife™, [between 73 – 98% of patients achieve complete tumor control](#) at a cost that is [typically 25 – 30% less](#) than traditional neurosurgery. In many

cases where the Gamma Knife treatment option is utilized, brain tumors are successfully treated during one minimally invasive, out-patient appointment.

Because precision medicine is tailored to each patient, the individual becomes the center of any treatment plan. Using a patient-centric healthcare model, clinicians and researchers work together with the patient to develop a highly-personalized plan of care based on the individual's unique circumstances. This focus on precision medicine represents the beginning of a [new era in medical care](#), especially as attempts are made to better understand and effectively treat many types of cancers.

By taking a precision medicine-based approach to treatment, we can help ensure that patients receive the most effective, most appropriate therapies to address their unique needs. Precision therapies such as the Gamma Knife™ offer a tailored treatment plan that can be modified depending on the patient's variability in genes, environment, and lifestyle as well as the location of the tumor.