



DR FRANCOIS SWART
NEUROSURGEON

GAMMA KNIFE



Neurosurgeon and Radiation Oncologist, Dr Dheerendra Prasad of the Roswell Park Cancer Institute in New York, Radiation Oncologist, Dr Sylvia Rodrigue; patient Melanie Thomson and Neurosurgeon Dr Francois Swart. Thomson, who suffers from trigeminal neuralgia, was one of the first patients to receive Gamma Knife Icon treatment at Netcare Milpark Hospital.

The cutting-edge radio-surgical technology, **Leksell Gamma Knife Icon**, is used in the treatment of selected brain tumours, head and neck tumours, vascular malformations in the brain as well as functional disorders and was installed at the hospital in 2017.

The introduction of Gamma Knife Icon is a tremendously exciting advancement in medicine in South Africa, as this is the most precise radiosurgery device on the market internationally. The technology delivers powerful doses of precision-targeted radiation that acts as a surgeon's 'scalpel'. This greatly



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reduces many of the risks associated with traditional cranial surgery as it enables us to consistently limit radiation doses to healthy tissue.

Dr Francois Swart was part of a team of surgeons who performed the first Gamma Knife procedures in South Africa.

To date more than a million patients have already undergone Gamma Knife Icon treatment throughout the world, a number to which South Africa is now actively contributing to.

The technology is used in the treatment of malignant as well as benign brain, head and neck tumours. In addition, the Gamma Knife Icon is also used for the treatment of acoustic neuromas or growths on the nerves near the inner ear controlling hearing and balance, vascular malformations such as arteriovenous malformations [AVMs], and functional disorders including trigeminal neuralgia, a chronic condition that causes severe facial pain, and unresponsive medication tremor in certain Parkinson's patients.

The introduction of this advanced technology, which is internationally regarded as the gold standard in cranial radiosurgery, and the establishment of the Gamma Knife SA centre, have been firsts for the Southern African sub-continent.

Since being introduced in April 2017 in South Africa, the demand and enquiries for this technology increased from both doctors and patients around the country.

It is exciting to consider the future potential of the Gamma Knife Icon locally, which has already been used to treat more than a million patients worldwide. "The development of this centre in Johannesburg brings South Africa firmly in line with global standards," Dr Richard Friedland, chief executive officer of the Netcare Group, said at the official opening.

Medical and technological advances in cancer treatment, such as those offered by the Leksell Gamma Knife Icon, bring hope for many patients suffering from debilitating cranial conditions.

Introduced to the country by Gamma Knife South Africa, in partnership with Netcare and Eurolab, the Icon, is considered to be the most precise radiosurgery device in the world. The technology delivers powerful doses of Gamma radiation from a cobalt source to the targeted area, with an unparalleled degree of precision.

The Gamma Knife is the only device of its type with micro-surgery capabilities, allowing for the treatment of virtually any target in the brain with ultra-high precision. Think of a magnifying glass that harnesses the rays of the sun and focuses it on a pinpoint to create a burn at that precise target area, and you will gain some idea of how we are able to use this technology to precisely focus the radiation dose to the targeted tissue.



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One of the characteristics that sets the Gamma Knife Icon apart from other stereotactic radiosurgery devices is that its ability to target diseased tissue more precisely means that surrounding healthy nerves and tissues are better preserved, which is of key importance when treating tumours in the brain which are located close to critical brain structures. The technology greatly reduces many of the risks associated with other forms of cranial radiotherapy, as it enables us to consistently limit radiation exposure to healthy tissue.

The effect of the treatment takes some time to demonstrate its full benefit for the patient. We do not usually expect it to completely destroy the tumours, but our aim is to restrict their growth and assist the patient to become free of the often-debilitating symptoms associated with them for years to come. In other words, the aim of the treatment is to give patients their quality of life back.

Gamma Knife treatment is very much a team effort, which is planned and executed by a highly specialised multidisciplinary team, including a neurosurgeon, a radiation oncologist, a radiologist, a medical physicist, and a radiotherapist.

South African patients who could benefit from this highly advanced treatment now no longer have to pay an enormous amount of money and travel abroad to access such cutting-edge cranial radiosurgery.

Gamma Knife makes cancer treatment more affordable, less surgically invasive, and more accessible to patients who can benefit from this remarkable technology.

The Icon is the sixth generation of the Leksell Gamma Knife system, and introduces a number of new innovations, including the novel integrated stereotactic cone-beam CT (CBCT) imaging system, high definition motion management and online adaptive treatment planning software. Both frame-based and frameless patient immobilisation alternatives can be used.

Gamma Knife Icon radiosurgery offers a number of advantages over traditional forms of surgery for selected patients and conditions. Frequently, a single treatment lasting up to 90 minutes can be as effective as open brain surgery, yet it incurs far fewer risks. It does not require general anaesthetic and does not take hours to perform. Multiple treatment sessions over time can also be used to treat larger tumour volumes, as well as to target tumours situated close to critical brain structures. In addition, Gamma Knife Icon treatment does not require general anaesthetic, hospitalisation and the comparatively lengthy recovery period associated with traditional cranial surgeries.