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## Media Release

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# First patient to receive Gamma Knife treatment in Australia

Australians will begin benefiting from the country's first ever Gamma Knife from today, as the nation's newest and most technologically-advanced hospital – Macquarie University Hospital in Sydney – treats its first patient using the \$4 million device. Genesis Cancer Care will deliver the Gamma Knife service on behalf of Macquarie University Hospital.

For certain types of tumours and neurological disorders, the Gamma Knife provides better outcomes for patients with fewer complications in a same day treatment with a lower total treatment cost compared to more traditional invasive neurosurgery techniques.

Consistent with Macquarie University Hospital's approach to medicine and improving care for patients, the Gamma Knife Treatment will be delivered by a team of leading neurosurgeons, radiation oncologists, medical physicists and nurses using the best technology available.

The Gamma Knife is a non-invasive neurosurgical tool for treating brain cancer and a range of other brain-related disorders. Despite its name, it is not a cutting implement and there is no blood or incision involved in treatment. Instead, some 200 radiation beams from cobalt-60 sources converge with high accuracy on the target inside the brain. Each individual beam has low intensity and therefore does not affect the tissue through which it passes on its way to the target. The beams converge in an isocentre where the cumulative radiation intensity becomes extremely high.

Neurosurgeon Dr John Fuller, whose patient will be the first to be treated in Australia with the device, says Gamma Knife treatment is very different to traditional neurosurgery.

"Although our first patient has tumours in multiple parts of his brain, we'll only need to do one operation lasting an hour or so, no scalpel will be used, the patient will be awake throughout the entire procedure and will only receive a local anaesthetic, and he will most likely go home tonight having been treated in an out-patient setting."

Fuller says the low impact nature of the treatment on the patient has a range of flow-on benefits for their families, the medical treatment team and the wider healthcare system.

"Patients who receive Gamma Knife treatment generally have fewer complications than traditional neurosurgery patients because of the minimal need for hospitalisation and intensive care," he says.

“For patients the Gamma Knife equates to fewer treatment sessions, shorter hospital stays and less physical, mental and emotional strain. Additionally, it reduces the overall burden on the healthcare system.”

One published study shows that one Gamma Knife system can free up to 700 ICU beds per year.

Some of the conditions that can be treated with the Gamma Knife include arteriovenous malformations (AVMs), abnormal arteries and veins which in most cases form prior to birth; acoustic neuromas, benign tumours of the eighth cranial nerve in the brain; trigeminal neuralgia, a condition that affects one of the largest nerves in the head and is associated with sharp, piercing pain in the jaw or cheek; and other brain tumours such as glioblastoma multiforme, oligodendroglioma, astrocytomas, meningiomas, pituitary tumors, and skull base tumours.

Overseas peer-reviewed studies report that Gamma Knife treatment has resulted in tumour control (elimination of further growth, tumour shrinkage or obliteration) in about 90 percent of cases.

The device’s versatility is borne out by the fact that the first four patients scheduled for Gamma Knife treatment this week will each be treated for different conditions.

However, the Gamma Knife is most well-known as the preferred type of treatment globally for brain metastases, which develop in 20-40% of all cancer patients. Brain metastases are cancer that has spread (metastasised) to the brain from another site in the body, commonly the lung or breast. Around 300,000 Gamma Knife treatments will occur worldwide this year, mostly to treat patients with brain metastases, and the first patient to be treated by Macquarie University Hospital’s Gamma Knife is a young man with multiple cerebral metastases.

“Before now, a patient in Australia with multiple brain metastases would have basically been told by their doctor to ‘go home and die’,” says Professor Michael Morgan, a world-renowned neurosurgeon and Dean of the Australian School of Advanced Medicine at Macquarie University. “Their doctor would say it in a much kinder and more caring way than that, of course, but that would effectively have been the message.

“Now with the Gamma Knife we can offer treatment and along with that hope that the patient’s life may not only be extended, but also that their remaining time will involve a much better quality of life.”

**On Tuesday 3 August 2010 at 2pm at Macquarie University Hospital, following the first ever Gamma Knife treatment in Australia, media will be able to interview:**

- **Professor Michael Morgan**
- **Dr John Fuller**
- **Dr Michael Izard (Genesis Care) - lead radiation oncologist for the Gamma Knife program,**
- **Macquarie University Hospital CEO, Robert Glynn**
- **the first patient**

**After interviews, filming/photography can occur inside the Gamma Knife chamber. Animated video footage of the device in action, supplied by the manufacturer will also be provided to any attending media.**

**Please contact Greg Welsh (02) 9850 7456, 0407 200 474, [greg.welsh@mq.edu.au](mailto:greg.welsh@mq.edu.au) to confirm your attendance and arrange parking.**

## FAQs\*

### **Which patients can benefit from Gamma Knife radiosurgery?**

Although the Gamma Knife is commonly used to treat brain metastases, it can also be used to treat other brain disorders when the location of the lesion, the age of the patient or other factors make traditional surgery not recommended.

Not all patients are good candidates for Gamma Knife surgery. Gamma Knife patients are chosen after thorough evaluation of patient history, medical records, X-rays and other diagnostic tests. The Gamma Knife team includes neurosurgeons, radiation oncologists, radiation physicists and nurses.

### **How does the Gamma Knife work?**

The Gamma Knife utilises a technique called stereotactic radiosurgery, which uses multiple beams of radiation converging in three dimensions to focus precisely on a small volume, such as a tumour, permitting intense doses of radiation to be delivered to that volume safely. Current models of the Gamma Knife use advanced robotic technology to move the patient in submillimetre increments during treatment, to focus radiation successfully to all parts of the target. Gamma Knife treatments are typically given in a single session.

Under local anesthesia, a special rigid head frame incorporating a three-dimensional coordinate system is attached to the patient's skull with four screws. Imaging studies, such as magnetic resonance imaging (MRI), computed tomography (CT), or angiography are then obtained and the results are sent to the Gamma Knife's planning computer system. Together, physicians (radiation oncologists and neurosurgeons) and medical radiation physicists delineate targets and normal anatomical structures and use the planning computer to determine the exact relationship between them and the headframe and calculate Gamma Knife treatment parameters. Targets often are best treated during the treatment session with combinations of several successive aimings, commonly known as "shots." The physicians and physicists routinely consider numerous fine-tuning adjustments of treatment parameters until an optimal plan and dose are determined.

Using the three-dimensional coordinates determined in the planning process, the frame is then precisely attached to the Gamma Knife unit to guarantee that when the unit is activated, the target is placed exactly in the center of approximately 200 precision-aimed, converging beams of (Cobalt-60 generated) gamma radiation. Treatment takes anywhere from several minutes to a few hours to complete depending on the shape and size of the target, the number of "shots" and the dose required. Patients do not feel the radiation. Following treatment the headframe is removed and the patient may return to normal activity.

Gamma-knife radiosurgery doesn't have immediate results. Progress is monitored through follow-up imaging studies.

### **How established is Gamma Knife treatment?**

The number of patients to undergo Gamma Knife surgery has risen from about 7,000 patients in 1991 to around half a million today. Correspondingly, the number of units installed globally over the last fifteen years has gone from 20 units in 1991, to over 250 units by 2007.

### **About Macquarie University Hospital**

Macquarie University Hospital is Australia's first and only private university hospital and offers comprehensive services to patients, with a significant number of specialists, health care workers and researchers working collaboratively.

The co-location of the hospital and clinic with world-class research facilities and training programs based at the Australian School of Advanced Medicine (ASAM) brings clinical, academic and research excellence together in one facility.

While Macquarie University Hospital specialises in a number of areas, we have particular strengths in oncology and neuroscience. Specialists in key areas work together with allied health workers and researchers to provide the best possible patient outcomes. Because Macquarie University Hospital is a teaching hospital, scholars are exposed to the most recent and most innovative practice, which is also available to other medical staff as part of their ongoing professional development.

The hospital itself is a 183-bed facility that includes 120 in-patient beds, as well as a small number of VIP suites. It has 12 fully digital operating theatres. The latest technology that has been installed throughout the hospital also allows patients to enjoy digital bedside communications, entertainment and meal ordering.

### **About Genesis Cancer Care**

Genesis Cancer Care will provide the Gamma Knife service on behalf of Macquarie University Hospital. In addition to the Gamma Knife service, Genesis Cancer Care will also provide comprehensive cancer services on campus from August 18, including external beam radiotherapy, medical oncology, surgical and consulting services. Cancer patients will be able to access the highest quality care in a single location with the best doctors and technology available.

Genesis Cancer Care is part of the Australian owned and operated health services organisation, Genesis Care. The organisation is focused on its vision of “sustainable care excellence” expanding the quality, reach and access of specialist services around Australia.

Genesis Care provides high quality specialist care to patients with cancer and cardiovascular disease, the two largest disease burdens in Australia. In the last twelve months Genesis Care conducted 100,000 treatments for cancer patients and treated more than 150,000 patients with cardiovascular disease. Genesis Care employs approximately 520 highly trained health professionals and support staff including more than 60 physicians. Services are provided across 55 sites and clinics ranging from the major capital cities to regional and rural centres. The organisation’s expansion planning includes 4 new comprehensive cancer centres and 3 cardiovascular service sites in areas of greatest need, including in key underserved suburban and regional areas.

The Genesis Care medical team comprises some of Australia's most experienced specialists with many dedicating time as consultants in public hospitals or participating in research and teaching. Genesis Care is adopting internationally proven medical technologies integrated with electronic healthcare records to improve patient clinical outcomes and their service experience.

Genesis Care’s commitment to service development, research and education is demonstrated through its partnership with Macquarie University Hospital and the Australian School of Advanced Medicine where they fund and support:

- The Genesis Care Chair of Cancer Research
- Two annual radiation oncology fellowships commencing 2011
- Two annual post graduate scholarships in applied physics
- The co-development of Australia’s first Gamma Knife Program