

What is Awake Craniotomy?

Awake craniotomy, or awake brain surgery, focuses on the optimisation of oncological and functional outcomes of patients with brain tumours. Tumours located within eloquent areas of the brain previously considered “inoperable” are now resectable, while preserving or even improving patients’ quality of life.

The National University Hospital’s (NUH) awake brain surgery team has developed rigorous protocols to evaluate patients who have tumours and are suitable for awake surgeries. We understand the concerns associated with awake craniotomy, and endeavour to involve our patients’ loved ones and family throughout the process.



From left to right: Dr Chan Hui Minn (Neuropsychologist), Dr Teo Kejia (Neurosurgeon), Dr Will Loh (Anaesthesiologist)

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Awake Surgery For Brain Tumours



Introduction

Awake brain surgery (also known as awake craniotomy), which refers to the resection of brain tumours located in eloquent areas of the brain, is now the standard practice in most neurosurgical departments. The aims of awake craniotomy are not only to remove as much tumour as possible, but just as importantly, to improve the patient's quality of life (both symptoms and seizure control).

Many studies have shown improvements in epilepsy (seizures/fits) control and in post-operative neurocognitive (brain functioning) scores. In addition, contrary to beliefs, patients tolerate the procedure very well as the brain itself is unable to feel any pain. During surgery, functions (such as speech, language and movement) will be tested, and patients can provide real-time feedback to the neurosurgeon as the tumour is being removed. This allows the neurosurgeon to safely remove the tumour whilst preserving the patient's functions.

How do I know if I am suitable for awake brain surgery?

NUH specialises in the resection of brain tumours via awake surgery. Our team consists of a neurosurgeon, an anaesthesiologist and a neuropsychologist who will assess and evaluate your suitability for this surgery. We will review your general health and fitness. The neurosurgeon will also have a comprehensive discussion with you regarding the risks involved in the surgery.

What are the various procedures involved in awake surgery?

Before Surgery

You will undergo a series of tests by our neuropsychologist and anaesthesiologist. We will provide you with the relevant information and training so that you will be well-prepared for the awake brain surgery.

During Surgery

At NUH, we use the asleep-awake-asleep technique for awake surgeries. The first phase of the surgery will be done under anaesthesia, where you will be deeply sedated.

After the completion of the first phase of the surgery, the anaesthesiologist will stop the sedation to proceed with the awake phase of the surgery. You may experience some headaches or discomfort at this phase. During the awake surgery, you will perform a variety of tasks guided by our neuropsychologist. These may include speaking one or more languages, basic and skilled movements of the hand and recognising pictures. You will be able to communicate with the neurosurgeon, the anaesthesiologist and neuropsychologist during this awake phase. When we stimulate your brain, you may feel some occasional

twitches or tingling sensations in your hands or legs. You may also occasionally be unable to speak when the neurosurgeon is trying to assess the critical areas of the brain around the tumour.

Once the tumour has been removed, you will be placed under anaesthesia again to complete the remaining phase of the surgery. This may include other adjuncts to remove any remaining tumour that cannot be done while you are awake. You will be woken up at the end of the surgery and brought to the High Dependency ward for further monitoring.

After Surgery

We will focus on rest and recuperation for the first 24-48 hours after surgery. Once your condition has stabilised, our speech therapists and physiotherapists will work with you. Depending on your condition, you may require an inpatient stay (up to a few weeks) at a rehabilitation hospital for intensive rehabilitation to improve your cognition, speech, and motor movements. Alternatively, you may be discharged after a few days of inpatient stay with outpatient follow-up. The approximate length of inpatient stay for most patients ranges from 7 to 10 days.

Recovery

Upon your discharge from the hospital, you will be given a period of hospitalisation leave to rest and recuperate at home. The same team will follow-up with you to assess your condition, recovery and ability to return to your daily activities or work.

In addition, you may undergo chemotherapy and radiotherapy, depending on the type of tumour that was removed. You will have regular visits with the neurosurgeon, neuropsychologist, speech therapists, and physiotherapists to ensure that you are on the expected track of recovery.

