Most often, an individual transitions through phases of consciousness after sustaining a traumatic brain injury (TBI). Many patients initially experience a comatose phase, during which the patient displays an absence of arousal, closed eyes, and lack of voluntary movement [1]. Following coma, patients may progress to a vegetative state, a minimally conscious state, or to post-traumatic amnesia.

A vegetative state (VS) occurs when cardiovascular, respiratory, and thermoregulation systems continue to function, but there is the loss of cognitive functioning [1]. During this phase, patients show periods of eye opening and their sleep-wake cycle returns. Behaviours such as groaning, smiling and saying single words may occur infrequently but are not related to the environment. Persistent vegetative state occurs when the condition lasts more than 1 month. Vegetative state is considered permanent 12 months after TBI [1].

A minimally conscious state (MCS) occurs when there are inconsistent but clear signs of consciousness. Behaviours during this phase must be shown to be linked to the environment [1]. Visual tracking, or following something with their eyes, may be the first sign that a patient is in a minimally conscious state. Recovery from a minimally conscious state occurs when the patient is able to communicate with speech or gestures, or when they are able to use objects purposefully again [1].

Following either vegetative state or minimally conscious state, TBI patients may experience a period of confusion, disorientation and distractibility, known as a posttraumatic confusional state (PTCS). This phase is characterised by disruptions in sleep-wake cycle, restlessness, altered perceptions of the world, difficulties with new learning and memory, impaired reasoning and judgement, aggression and rapidly changing emotions [1]. During this phase, patients require constant supervision to ensure patients are safe and complete personal hygiene activities.

Patients will likely then experience a phase known as post-traumatic amnesia (PTA). PTA is a phase of significant cognitive impairment characterised by confusion, disorientation and memory disturbance. During PTA, patients generally demonstrate difficulty learning new information. This can result in patients being confused about their location and circumstances. Perception of their environment can be distorted and patients can lack awareness of their condition and need to be hospitalised. This can result in further patient confusion or fear [2]. Such confusion and disorientation can result in restlessness, agitation, physical and verbal aggression and patients often wander. Such behaviour may be worse at night when there are less environmental cues to remind patients of their circumstances. Hallucinations and delusions are also common during PTA. Duration of PTA is highly variable, ranging from minutes to months [3].

In Australia, PTA is usually measured using the Westmead PTA Scale [4]. The Westmead PTA Scale includes questions that examine orientation to self, time and place, recall of the assessor and new learning of 3 picture cards shown on the previous day.
Generally, a patient is considered to be in PTA until they score 12 out of 12 for three consecutive days, with the end of PTA being declared on the first of these three days [4]. Length of post-traumatic amnesia is one of the most significant predictors of the severity of injury and long-term outcomes. As such, length of post-traumatic amnesia is used worldwide to aid in the management of patients following traumatic brain injury.

It can be challenging to manage patients in PTA given they may present with behavioural and cognitive difficulties during this phase. Sedation is not uncommon but is generally not recommended as it can further reduce the patient’s arousal, increase confusion, agitation, and cognitive difficulties [2]. The best method of managing PTA is to adhere to behavioural management principles where staff create an environment that minimises agitation. Early in rehabilitation, patients in PTA may be nursed on the floor with padding around the bed or in a specially designed “Craig bed”.

Noisy and overstimulating environments tend to agitate patients who are in PTA. Hence, creating a quiet, safe and secure environment is important. It is recommended patients have their own room and spend much time there to become familiar with their environment. Patients who can walk should be allowed to wander with supervision on the ward. An enclosed courtyard will allow a patient in PTA to spend time outside, although this is not always available. Having consistent staff dealing with the patient will also promote familiarity with their environment. Familiarity with the environment can also be promoted by having photos of family around the patient’s bed. Frequent reminders that the patient has been in an accident and are in hospital, the date and time of day may also assist to orient the patient. An orientation board at the end of the patient’s bed is also useful. Visitor numbers should be limited and visitors should be encouraged to stay with the patient for short periods. Patients in PTA are often fatigued and need to sleep more, which should be encouraged.

Physiotherapy, if required, should be conducted on the ward. Other therapists might be encouraged to establish rapport through brief contact sessions on the ward. Further formal assessment of language or cognitive abilities and to a lesser extent, physical abilities, are likely to be difficult and unreliable given reduced attention, restlessness and fluctuating levels of arousal seen in PTA. It may also provide a picture of global deterioration not present on emergence from PTA.

Little is known about the specific aspects of memory processing that are impaired during PTA. In addition, it is not known how memory is affected during or the reason behind the return of memory after TBI. Knowing more about memory functioning during PTA may help patients to make earlier gains after TBI.

References: