SYNAPSE
AUSTRALIA'S BRAIN INJURY ORGANISATION

Coma and brain injury

Coma is generally the result of damage or interference with particular structures of the brain, and its length and depth provide a strong indication of the severity of brain injury.

In this article

During a coma

During a coma, a person is in a state of unconsciousness. They do not show intentional response or movement, the eyes remain closed, and they cannot be awakened or obey commands during this state.

The person may show some level of response to touch, pain, and verbal commands, so it is more accurate to talk about depth of coma rather than an all-or-nothing state. Family members often have trouble accepting their loved one is in a coma when there are basic responses.

A coma can be chemically induced to accelerate healing, protect the brain from secondary damage, or to relieve severe chronic pain during healing after a traumatic brain injury (TBI) or other kind of brain disorder.

Post-coma unresponsiveness (PCU)

Some coma patients may progress to a wakeful but unconscious state called post-coma unresponsiveness (previously called persistent vegetative state) where the cerebral cortex is not functioning. The person is unable to respond to stimuli in their environment, but they maintain a normal sleep-wake cycle and breathing.

People can remain in this state for a long time, and it can be difficult for family members to accept when there are seemingly conscious behaviours e.g. a patient's eyes may follow them around the room.

Coma scales

There are two scales commonly used to measure the depth and duration of a coma. The most common is the Glasgow Coma Scale (GCS) which scores actions and reactions in three specific areas including eye, verbal and motor response. The scores in each area are summed to give an overall score, ranging from 3 (deep coma) to 15 (fully awake). The Rancho Los Amigos Scale is another measure of coma, it has a single scale and assesses global functioning.

Treatment during a coma

During a coma the medical team provides treatment to prevent any further complications. A respirator may be used to assist breathing, and surgery may be required to stop any bleeding or swelling in the brain. There is constant monitoring of vital signs, such as blood pressure and pulse and levels of any prescribed medications.

Other therapies may be used to prevent problems upon awakening from coma. There is a risk of the patient losing their range of motion in their extremities, so the limbs will be moved regularly to avoid spasticity (involuntary muscle tightness).

Changing the patient's position is necessary on a regular basis to prevent pressure sores or skin ulcers, as the patient will not have the reflex actions that prevent these sores from occurring as in someone who is just asleep.

Can people be aware during a coma?

It is difficult to know if there is any degree of awareness during a coma. As the patient emerges from coma, awareness of those around them increases. There have been cases where patients reported awareness of family members around them and could remember some of what was said. For this reason families and medical staff should be careful of what is said near the patient while in a coma.

How long will a coma last?

There is no reliable way to accurately tell how long a coma will last, and there are currently no medications, which will reliably shorten the duration of a coma. A coma is usually said to last no longer than four weeks, but post-coma unresponsiveness may last from months to years.

Recently, programs that use sensory or physical stimulation to accelerate the healing process and bring someone out of a coma have been used in the United States and claim high levels of success. Before any program is attempted, it should be discussed with the treating medical team. It is also important to note that a coma may accelerate healing, and attempts to rouse somebody from a coma should not be attempted too soon after the accident.

Post-traumatic amnesia (PTA)

Unlike the popular concept of coma shown in many movies, an individual coming out of a coma doesn't just wake up. Individuals will go through a gradual process of regaining consciousness. When a patient responds with intentional movement or attempts to communicate, they are generally considered to have emerged from coma.

Following emergence from a coma, the patient enters another level of consciousness known as post-traumatic amnesia (PTA). Individuals in PTA are partially or fully awake, but are confused about the day and time, where they are, what is happening and sometimes who they are.

The duration of PTA can be used along with that of the coma to provide an indication of how severe the traumatic brain injury or other type of brain disorder is, and what the long-term outcomes are likely to be.

It is also possible for an injury or pressure to the frontal lobes to mimic the effects of PTA, so diagnostic scans may be used during PTA to ensure that the diagnosis is correct as well as to ensure that healing is progressing normally.

References and further information

Glasgow Coma Scale https://www.neuroskills.com/education-and-resources/glasgow-coma-scale/

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