

The Meninges: Dura, Arachnoid and Pia.Dura:

The outer membrane surrounding the brain and spinal cord is known as the dura mater, or simply, dura.

In the head, the thick grey dura lies right against the skull, with the potential space between the dura and the skull being called the epidural space.

After trauma, the arteries in this space can be ruptured and bleed resulting in an epidural haematoma.

The space between the dura and the arachnoid membrane is the Subdural space.

After trauma, some of the veins that bridge this space can be ruptured and bleed, resulting in a collection or pool of blood known as a Subdural haematoma.

The arachnoid is a delicate membrane with a fenestrated surface pattern. It is the middle of the 3 meninges which cover the brain and spinal cord.

Between the arachnoid and the inner layer (pia) is the subarachnoid space in which flows the cerebrospinal fluid (CSF).

The CSF is secreted within the ventricles of the brain (fluid-filled spaces deep inside the brain) and the ependymal cells lining the cerebral subarachnoid space.

CSF then circulates out and around the brain and spinal cord in the subarachnoid space, being absorbed into the venous sinuses via the arachnoid granulations and via spinal nerve root pockets into the lymphatic system.

The fluid provides a protective fluid cushion between the brain and the skull whilst bathing the nervous system with nutrients and removes waste products. I

mpaired CSF flow therefore prevents this natural exchange from taking place, to the detriment of the affected nerve roots.

The entire volume of fluid is produced, absorbed, and replaced about three times per day in a continuous manner.

Thus if flow is impeded, this may lead to a build-up of fluid with increasing pressure in the brain (hydrocephalus).

CSF flow is seen as a pulse in the dural membrane at operation, but dural pulse is absent in areas where arachnoiditis has obliterated the subarachnoid space, due to impaired CSF flow and hardened dural membrane (pachymeningitis).

Pia: The pia is the thinnest and innermost of the meninges. It is a very delicate membrane, rich in capillaries for blood flow.