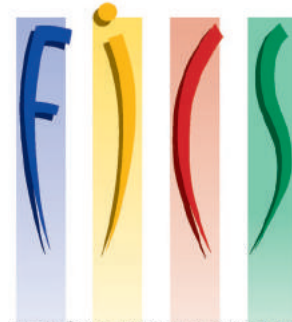


Intracranial Bleeds & Haematomas



FEDERATION INTERNATIONALE
DE CHIROPRATIQUE DU SPORT

Definition

**Mechanism
of injury**

**Histological
Process**

**Potential
Problems**

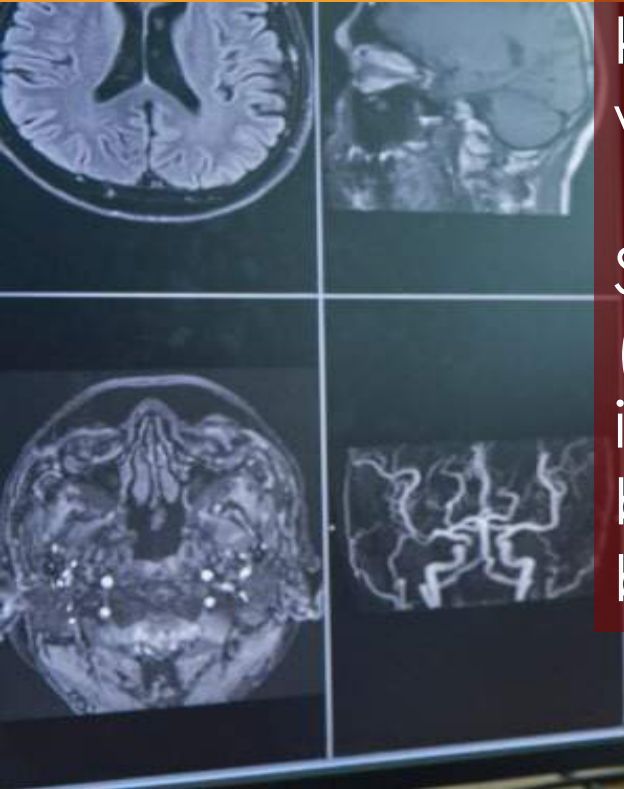
Guest Instructor: DR. ROBERT ANDREW REID, AM, MBBS, Dip. Sports Med, FACSP, FASMF

Definition: Wiki

(in the context of head injuries)

Intracranial hemorrhage (ICH), also known as intracranial bleed, is bleeding within the skull.

Subtypes are intracerebral bleeds (intraventricular bleeds and intraparenchymal bleeds), subarachnoid bleeds, epidural bleeds, and subdural bleeds.



Causes

Intracranial bleeding occurs when a blood vessel within the skull is ruptured or leaks.

It can result from physical trauma (as occurs in head injury) or nontraumatic causes (as occurs in hemorrhagic stroke) such as a ruptured aneurysm.

Here the discussion will be confined to trauma-related intracranial bleeding.



Causes II

These bleeds are much more likely in high speed impacts to the skull in sports such as motor vehicle racing, downhill mountain biking, equestrian events, ice hockey, etc., but can occur in other sports.



Complications

Intracranial hemorrhage is a serious medical emergency because the buildup of blood within the fixed volume of the skull occupies space. This pushes the delicate brain tissue out of the way and can lead to increases in intracranial pressure (ICP).



Complications II

Significant increases in ICP can cause the brain to be pushed out the foramen magnum, putting more pressure on the mid-brain and brainstem. This will cause an increase in blood pressure, decrease in heart rate, and potentially death.



Diagnosis

Early symptoms and signs of an intracranial bleed are similar to those of a concussion.

There is nothing to distinguish between these, so any head injury needs to be treated with respect.



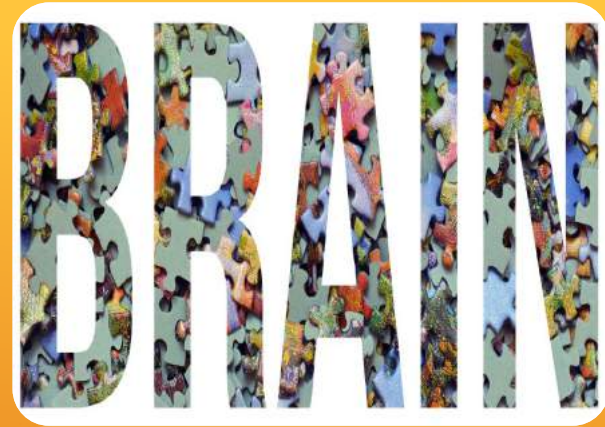
Diagnosis II

A diagnosis of a head-injury-related intracranial bleed is a medical emergency. The presumptive diagnosis is made on symptoms and signs as well as noting the force of the injury.



Diagnosis III

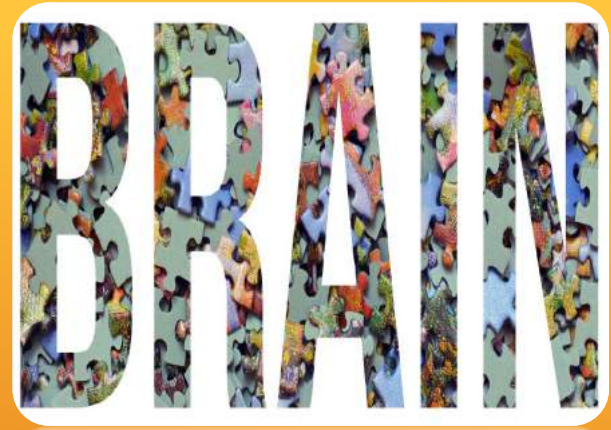
A practitioner should have a high level of suspicion when there is any serious head injury or concussion. Early recognition and prompt management and referral to an appropriate facility are vital. (See Management).



Diagnosis IV

CT scan (computed tomography) is the definitive tool for accurate diagnosis of an intracranial hemorrhage.

In difficult cases, a 3T-MRI scan can also be used.



Symptoms:

Headache, dizziness, amnesia (retrograde or post-traumatic), disorientation, ringing in the ears, feeling foggy, difficulty thinking, nausea, lightheadedness, irritability or emotional changes, difficulty concentrating, difficulty remembering new information, anxiety, blurred or double vision, memory loss.



Signs

Loss of consciousness, vomiting, drowsiness/somnolence, fainting, loss of balance, slurred speech, seizures, slower reaction times, vacant or dazed stare, changes in pupillary size/reflexes, sensitivity to bright lights, sound sensitivity, sleepiness, forgetting questions, elevated blood pressure, slow pulse.



Classification

Trauma-induced intracranial hemorrhage is considered a focal brain injury; that is, it occurs in a localized spot rather than causing diffuse damage over a wider area.

Bleeding that occurs within the skull but outside of the brain tissue, falls into three subtypes:

**Extradural
Haemorrhage**

**Subdural
Haemorrhage**

**Subarachnoid
Hemorrhage**



Extradural Haemorrhage

An extradural (or epidural) hemorrhage occurs between the dura mater and the skull and is caused by trauma. It mostly results from laceration of an artery, most commonly the middle meningeal artery.

Arterial bleeds increase in size rapidly because of the blood pressure. As a result, a rapid increase in intracranial pressure occurs. Thankfully, it is the least common type of meningeal bleed and is only seen in 1% to 3% cases of head injury.



Extradural Haemorrhage

These patients have a history of head trauma with loss of consciousness, then a lucid period, followed by increasing symptoms including:

- Vomiting
- Agitation
- Loss of consciousness.

Clinical onset occurs over minutes to hours. A "lenticular", or convex, lens-shaped extracerebral hemorrhage that does not cross suture lines will likely be visible on a CT scan of the head.



Extradural Haemorrhage

Management - Secondary

Craniotomy and surgical evacuation is required as there is nearly always a significant pressure effect on the brain. Although death is a potential complication, the prognosis is good when this injury is recognized and treated early.



Subdural Haemorrhage

A subdural hematoma occurs when there is tearing of a bridging vein between the cerebral cortex and a draining venous sinus. Rarely they may be caused by arterial lacerations on the brain surface. Acute subdural hematomas are usually associated with cerebral cortex injury as so are likely to be associated with long-term problems.



Subdural Haemorrhage

Clinical features depend on the site of injury and severity of injury.

Patients may have a history of loss of consciousness, but they recover and later relapse. Clinical onset occurs over hours, so patients who have had a high impact injury need to be watched for 4-8 hours. A crescent shaped hemorrhage compressing the brain that does cross suture lines will be noted on CT of the head.



Subdural Haemorrhage

Management - Secondary

Craniotomy and surgical evacuation are required if there is significant pressure effect on the brain.

Focal neurologic deficits will depend on the site of hematoma and brain injury. Increased intracranial pressure may lead to herniation of the brain through the foramen magnum.



Subarachnoid Haemorrhage

A subarachnoid hemorrhage is very uncommon with a head injury. Most of these are spontaneous in older middle-aged people. The bleeding is into the subarachnoid space - between the arachnoid membrane and the pia mater. It starts with a sudden severe headache (often at the back of the head), nausea and vomiting. Neck stiffness is common. Confusion, a lowered level of consciousness, and seizures occur in severe cases.



Subarachnoid Haemorrhage

This emergency is diagnosed clinically but is generally confirmed with a CT scan of the head, or occasionally by lumbar puncture.

A CT scan shows blood layering into the brain along sulci and fissures or filling subarachnoid cisterns.



Subdural Haemorrhage

Management - Secondary

Treatment is by neurosurgery or angiography to repair the arterial defect. SAH is considered a form of stroke. Confirmed spontaneous SAH requires further investigations as to the source of the bleeding, as the bleeding may recur without intervention.



Basic Emergency Care Protocol

- D - Danger - look for any dangers surrounding the player/athlete that may impact on the safety of the athlete or the first responders
- R - Response - respond early to the problem in a safe manner
- A - Airway (with cervical spine control)
- B - Breathing
- C - Circulation or Compressions (depends on where you are)
- D - Defibrillator or Drugs
- R - Remove/Refer to an appropriate facility.



Basic Emergency Care Protocol II



FICS Doctors are trained and certified as primary contact practitioners and therefore have a duty of care. In the absence of any emergency services at an event, the emergency care goals are to first stabilize the patient and provide basic life support. Other sports medicine members who are emergency care certified should be primary care providers in the event of life-threatening trauma.

If there is any question that there is an intra-cranial haemorrhage of any sort, prompt action and referral to an appropriate facility that can look after this type of injury is vital.

Early diagnosis and treatment of any of these conditions produces a much better response, and a more likely return to normal.

Return to Sport Concerns, Precautions

Any intracranial haemorrhage is likely to cause long-term problems. A considered approach and at an appropriate time frame will be required prior to any possible return to sport.

A rapid return to sport may compromise the long-term health of the athlete, and the athlete may be in greater danger of having other injuries or further injuries if returned to sport early.

