

# MANAGEMENT OF HEAD INJURIES

CIVIL DEFENCE ACADEMY

# Objectives

Be able to:

- List the types of head injury
- List signs & symptoms of head injury
- State the dangers of head injury
- Evaluate patient's response to Glasgow Coma Scale
- Describe management of patient with head injury

# Scope

- Introduction
- Pathophysiology
- Types of Head Injuries
- Signs and Symptoms
- Principles of Management for Head Injuries
- Summary

# Head Injury

May be due to:

- Blunt blow to the head (fall from height, RTAs)
- Penetrating head injury (gunshot, stabbing)

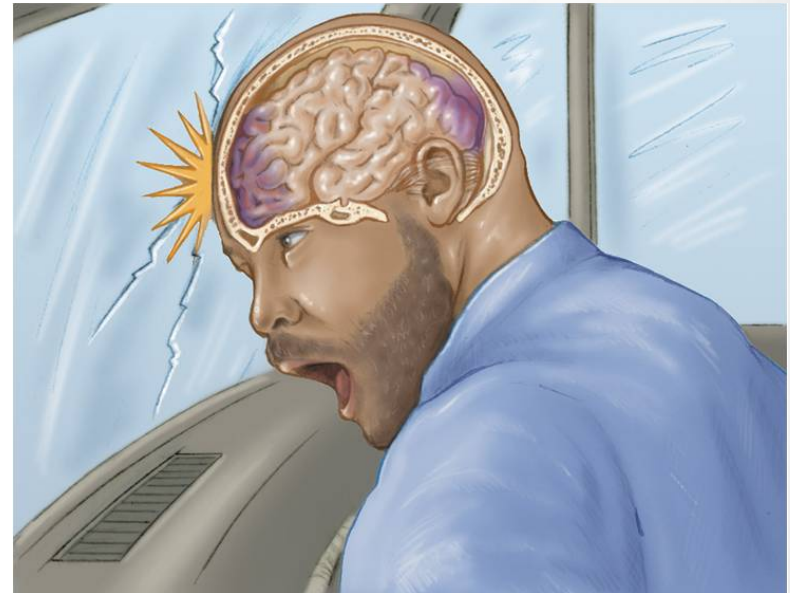
A blow to the head can cause:

- Skull fracture
- Bleeding in the brain
  - Can occur within the skull
  - Can occur within the brain tissue itself.

# Pathophysiology

## In a deceleration accident

- Head strikes object and **stops** suddenly
- Brain moves forward, **hits skull and rebounds**, hitting opposite side
- Repeated rebounding causes **injury to brain or blood vessels**
- Known as “coup contre coup” effect

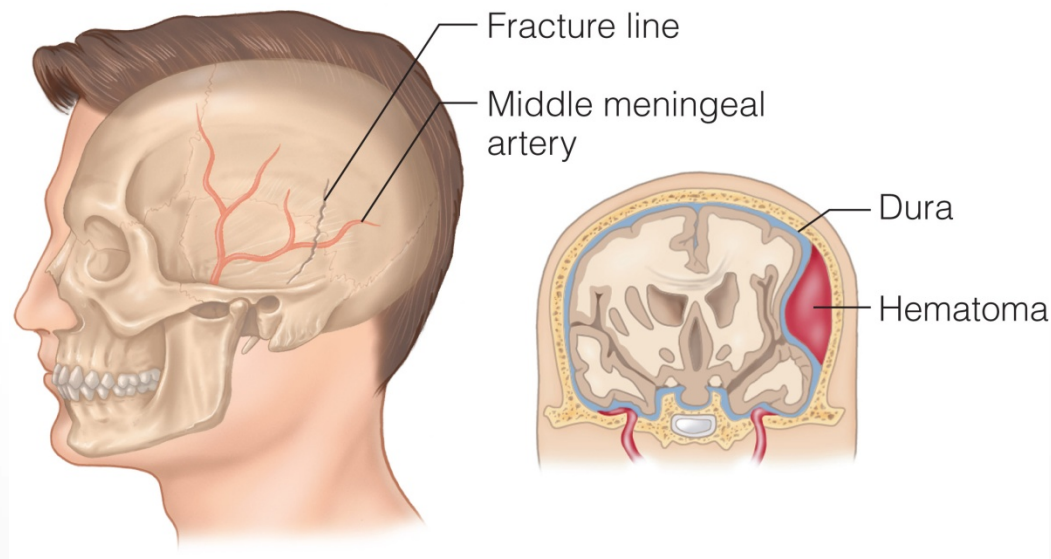


# Pathophysiology

- Bruised brain **swells**
- Vasodilation and increased blood flow occurs
- **Intracranial pressure increases**
- Decreased blood flow to uninjured parts
- Decreased LOC

# Pathophysiology

- Tearing of **cerebral blood vessels**
  - Bleeding
  - Increased intracranial pressure
  - Formation of contusions or hematomas



# Types of Head Injuries

- Facial Injuries
  - Injuries to the **scalp, face, eyes, ears, nose, mouth or tongue**
  - From blunt or penetrating trauma
  - May cause **impaired breathing, blood loss and swelling**



# Facial Injuries



*We Set The Standard* Patient sustained a facial laceration.

# Types of Head Injuries

- Neck Injuries (Upper Airway Injuries)
  - May involve **respiratory and digestive tracts, spinal cord, carotid arteries, veins**
  - Serious injuries
    - Upper airway obstruction
    - Catastrophic bleeding from lacerated vessels



# Neck Injuries



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Stabbed while fighting

# Neck Injuries



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Stabbed while fighting



# Neck Injuries



# Types of Head Injuries

- Skull Fractures
  - **Simple fracture** (linear fracture)
  - **Open fracture** – leakage of cerebrospinal fluid
  - **Depressed fracture** – fragments of the broken bones are driven into brain tissue

# Skull Fractures

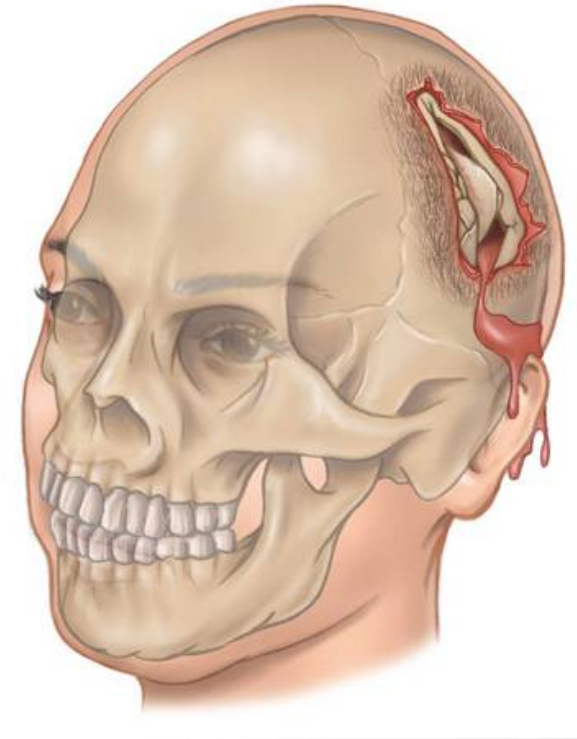


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Victim of domestic violence

# Signs & Symptoms of Skull Fractures

- Visible bone fragments
- Deformity
- Depression
- Swelling
- Decrease LOC or coma





# Signs & Symptoms of Skull Fractures

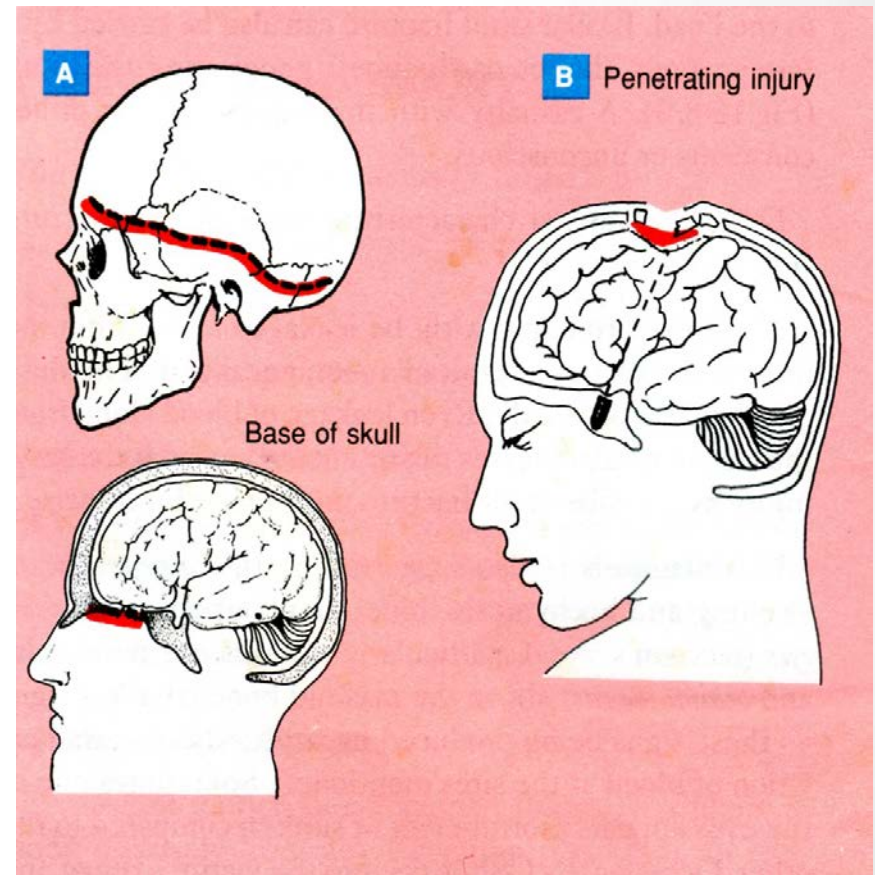
- Deep laceration or bruise
- Severe pain
- Unequal pupils
- Unstable areas



# BASILAR SKULL FRACTURE

What is it?

- A fracture on the lower part of the bones at the base of skull where the brain rests.



# Signs & Symptoms of Basilar Skull Fracture

- Deep laceration or bruise
- Severe pain
- Unstable areas
- Unequal pupils
- Battle's Signs



Battle's sign

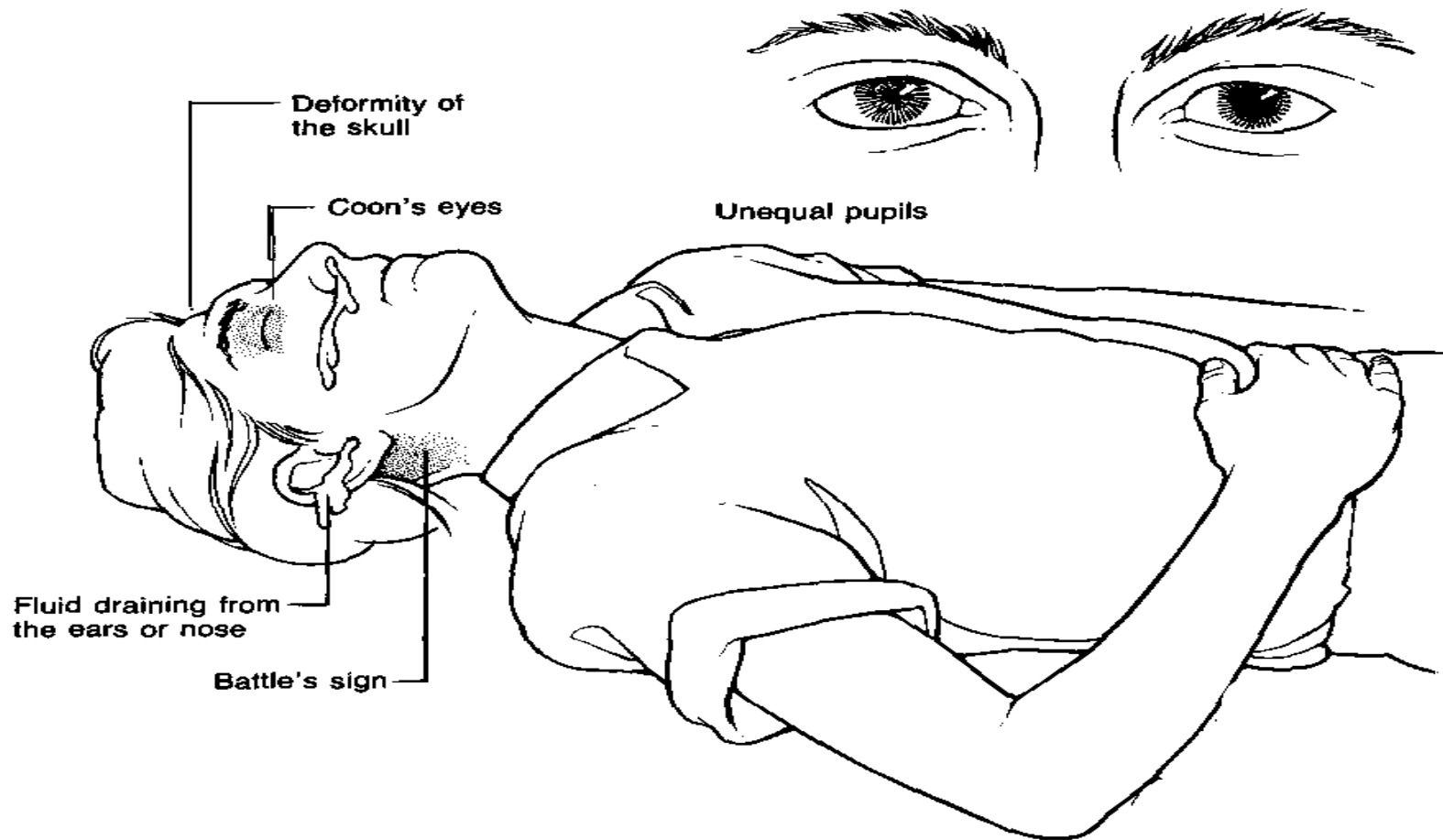
# Signs & Symptoms of Skull Fractures

- “Raccoon Eyes”
- Bleeding from ears or nose
- Clear fluid from ears or nose (CSF)
- Nausea, vomiting



Raccoon eyes

# Basilar Skull Fracture



# Cerebral Hematoma

Skull fracture may cause cerebral hematoma (injury to the brain)

Develops when there is significant bleeding

## **A) Within the skull**

- Injury to the skull can cause fracture
- The skull is particularly thin in the area of the temples & at the base of skull.

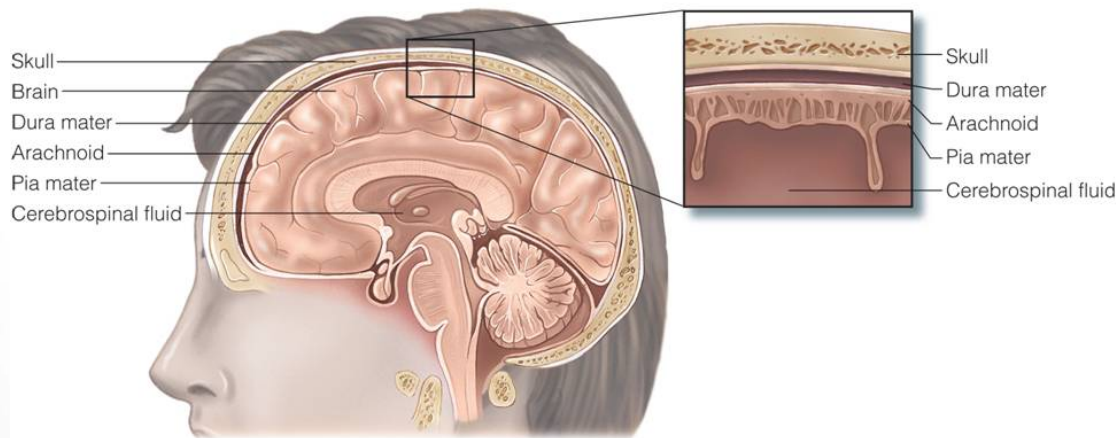


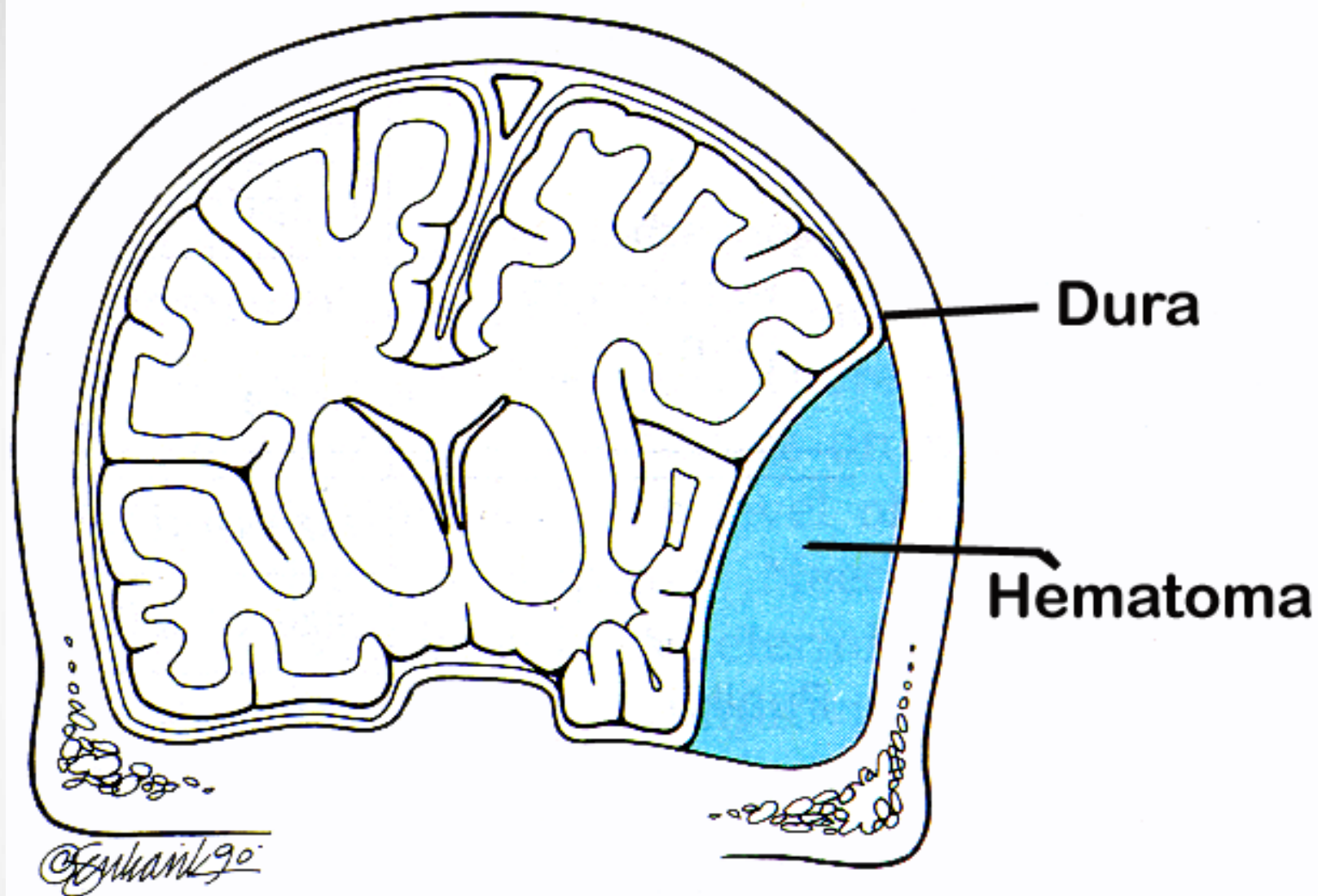
# Cerebral hematoma

Develops when there is significant bleeding

## **B) Between skull and dura**

- The brain is covered by 3 membranes
- The outer layer is called the dura mater







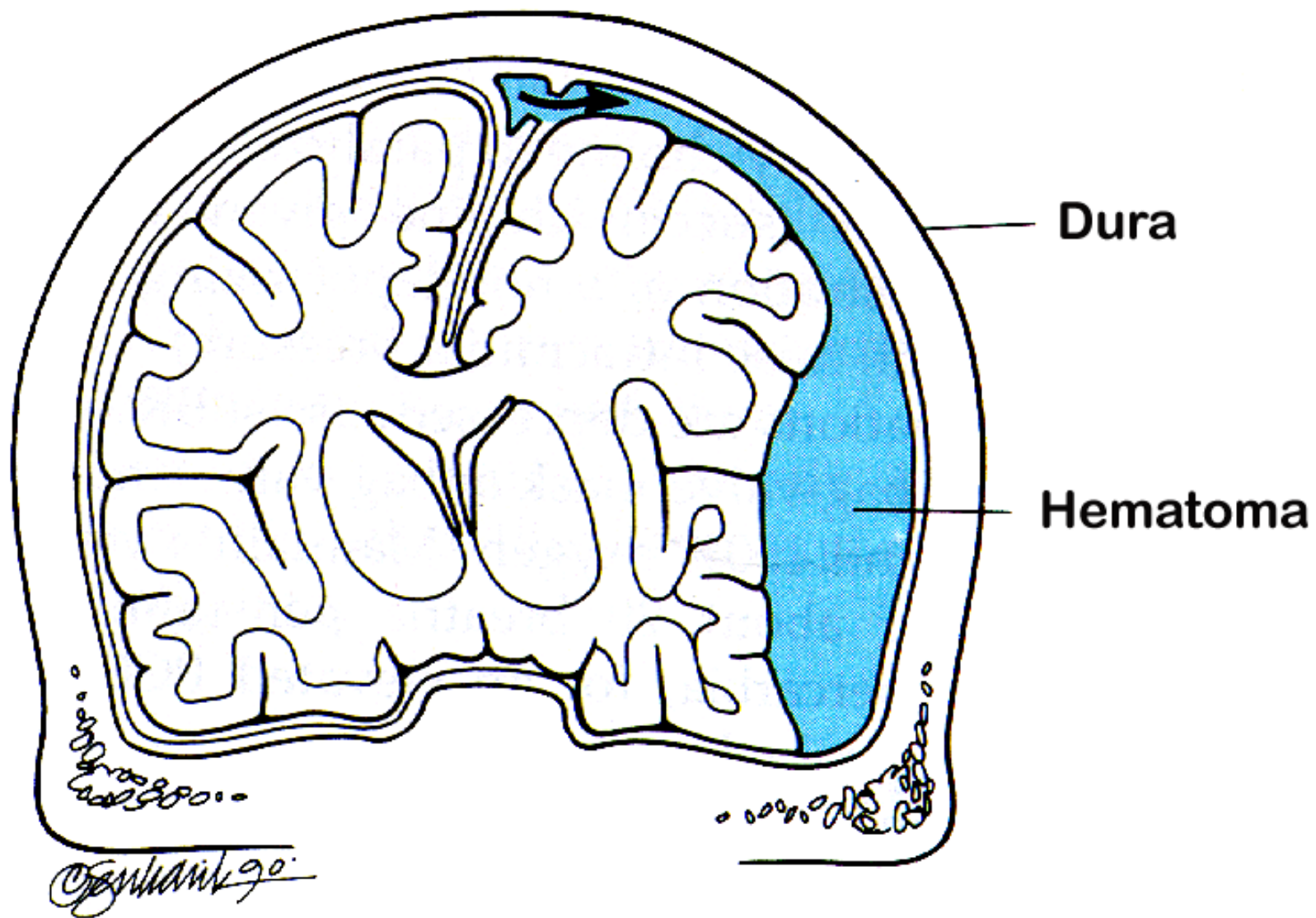
# Cerebral Hematoma

Develops when there is significant bleeding

## **C) Between the dura and the brain**

(subdural) i.e bleeding within the brain.

E.g tearing of the cerebral blood vessels,



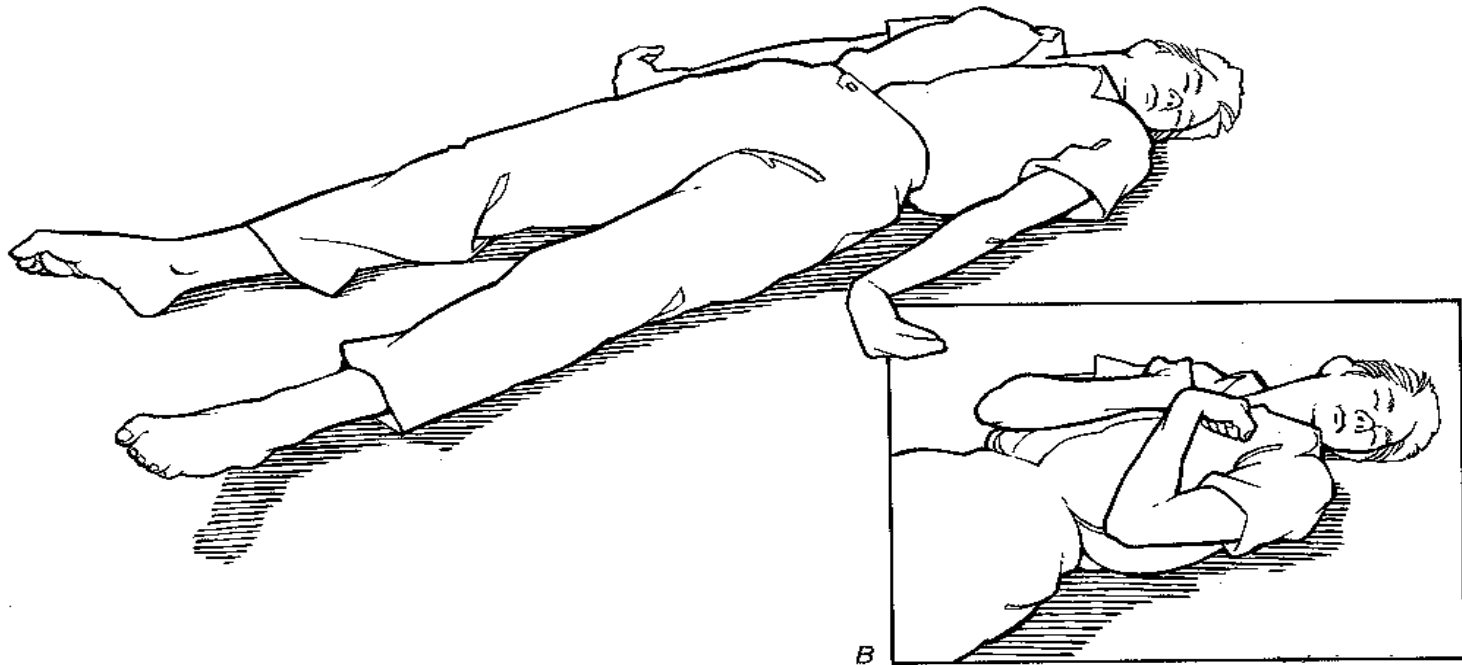
# Signs of Brain Injury

- Bradycardia
- Cheyne-Stokes respiration
- Increased blood pressure
- Unequal pupils

# Signs of Brain Injury

- **Hemiplegia** - Numbness, weakness and paralysis
- **Decorticate response** - legs extended, arms flexed
- **Decerebrate response** - arms and legs extended

# Responses Suggestive of Brain Injury



# Principles of Management for Head Injury

## – Head-To-Toe Survey

- Mouth > blood, vomitus, broken teeth or dentures
- Neck > ASSUME CERVICAL SPINE INJURY
- Chest > breathing movements
- Extremities > sensation and movements



# Principles of Management for Head Injury

- **Treatment**

- Manage all patients with significant head injury as spinal patients
- Assess and monitor patient's neurological status frequently

# SUMMARY

- If the **LOC** is altered or changed during assessment of injury, it is a sign of **deteriorating condition**
- **Rising BP + Falling Pulse Rate = Increased Intracranial Pressure**



# SUMMARY

- **Rapid Pulse + Falling BP**
  - Signs of shock
  - Almost never solely due to head injury
  - Look for spinal injury or source of blood loss

# Q & A

1. List S&S of skull fracture

- Visible bone fragments
- Deformity
- Depression
- Swelling
- Decrease LOC or coma
- Deep laceration or bruise
- Severe pain
- Unequal pupils
- Unstable areas

2. Define **BASILAR SKULL FRACTURE**

A fracture on the lower part of the bones at the base of skull where the brain rests.

3. What is the name of the haematoma called if found between the dura and the brain

Subdural haematoma

4. Lists the S&S of brain injury

- Bradycardia
- Cheyne-Stokes respiration
- Increased blood pressure
- Unequal pupils



# MED 318

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