

# TRAUMA KAPITIS

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Departemen Neurologi

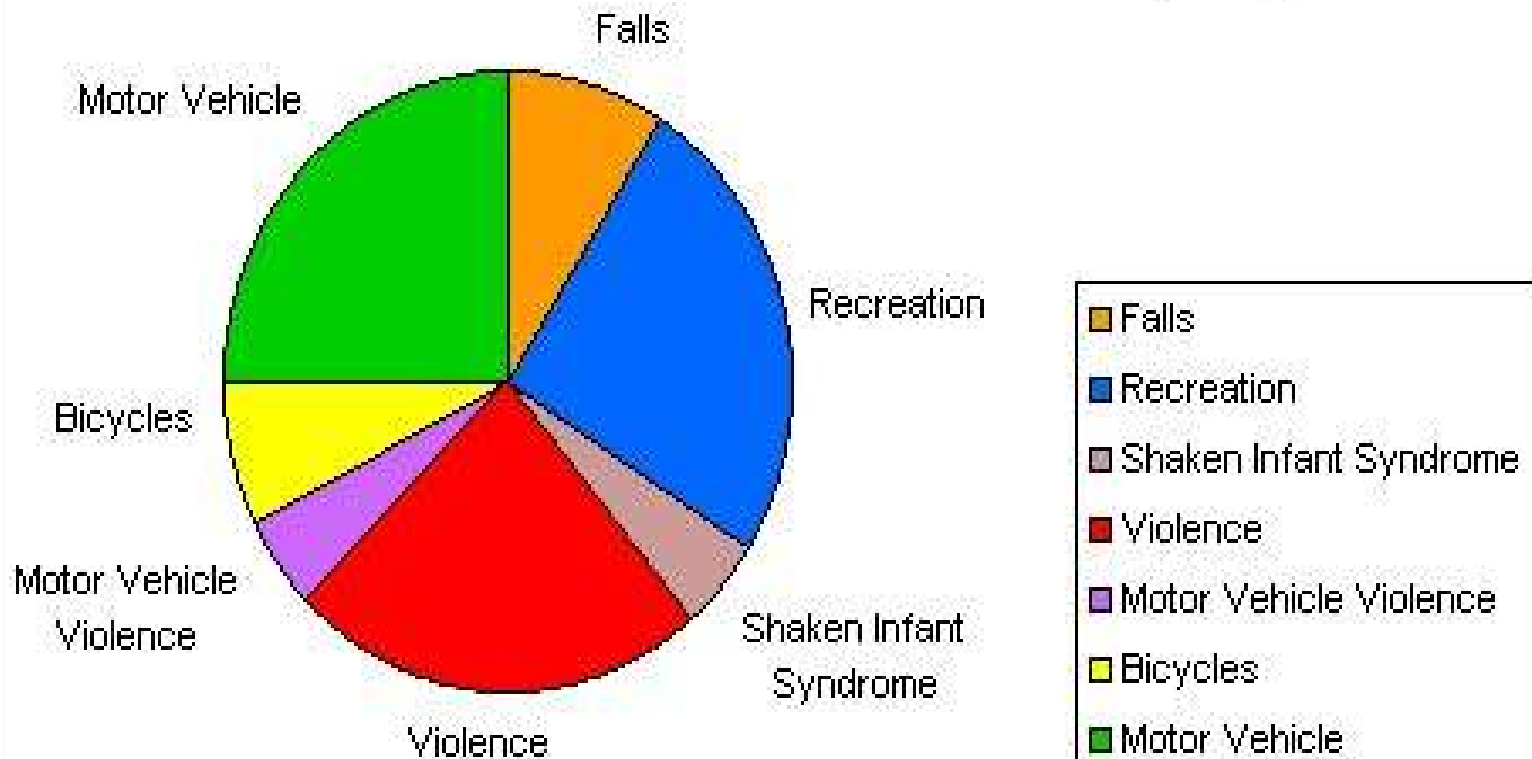
Fakultas Kedokteran USU

# Definisi

- **Traumatic Brain Injury** is a mechanic trauma to head either through direct and or indirectly causing temporary or permanently disturbance of neurological function (physically & cognitive/behaviour)
- Synonim:
  - cedera kepala = *head injury* =
  - trauma cranioserebral = trauma capitis

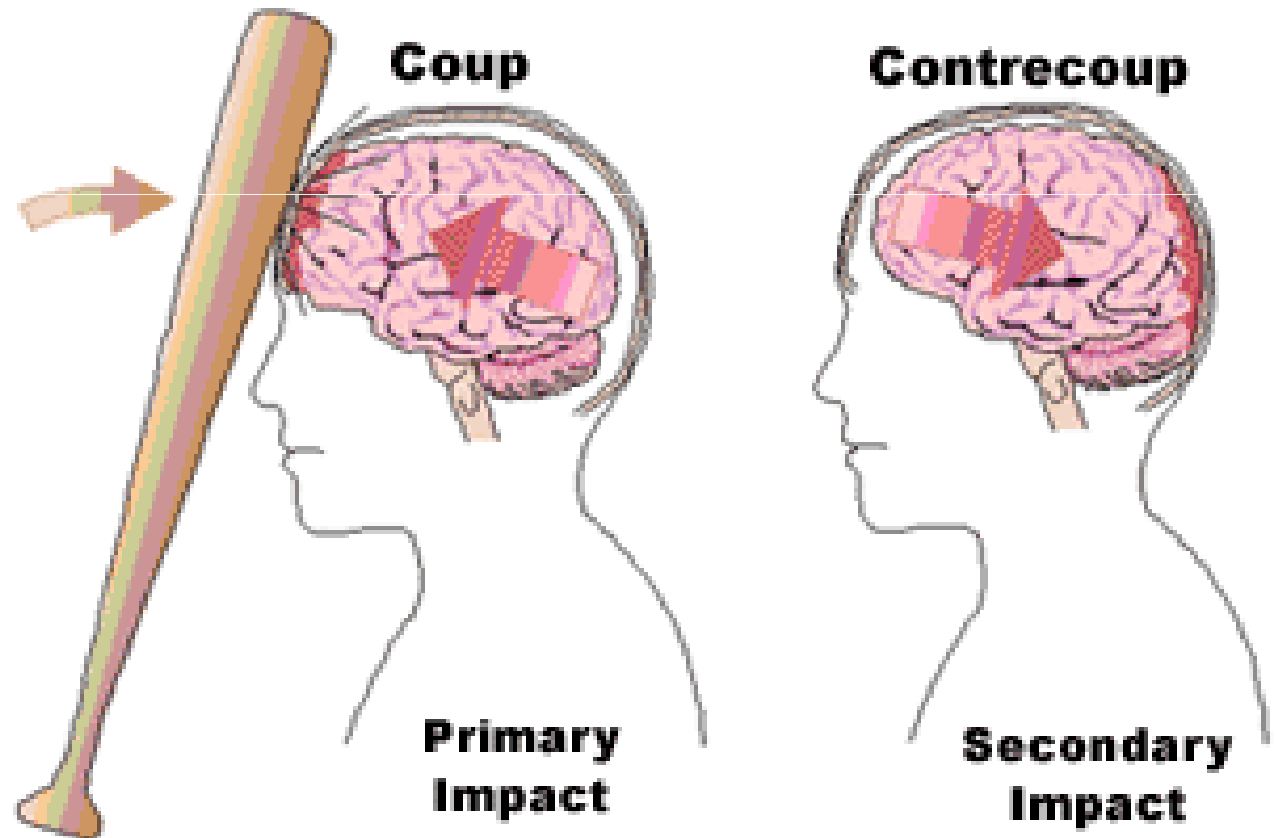
# Epidemiologi

## Causes of Brain Injury



# Proses Trauma Kapitis

- LESI
  - Lesi coup
  - Lesi media
  - Lesi counter coup



# SKALA KOMA GLASGOW

## *GLASGOW COMA SCALE*

Fungsi	Respons	Skor
MATA (4)	Buka spontan	4
	Buka diperintah	3
	Buka dengan rangsang nyeri	2
	Tidak ada respons	1
BICARA (5)	Normal	5
	Bingung	4
	Kata-kata kacau	3
	Suara tak menentu	2
	Diam	1
Motorik (6)	Dapat diperintah	6
	Dapat menunjuk tempat nyeri	5
	Fleksi normal terhadap nyeri	4
	Fleksi abnormal terhadap nyeri	3
	Ekstensi terhadap nyeri	2
	Tak ada respons	1

# KLASIFIKASI

## TRAUMATIC BRAIN INJURY

### NON-OPERATIVE

comosio cerebri  
contusio cerebri  
Impressio fracture non  
neurologically symp (< 1 cm)  
Fracture basis cranii  
Closed Fracture cranii linier

### OPERATIVE

Hematoma intracranial > 40 cc  
Epidural, subdural,  
intracerebral/cerebellar  
Open Fracture cranii (+ laceratio)  
Impressi fx with neurologically symptom  
(> 1 cm)  
Likuorrhoe, severe cerebral oedem

# KLASIFIKASI

## TRAUMATIC BRAIN INJURY

```
graph TD; A[TRAUMATIC BRAIN INJURY] --> B[CLOSED]; A --> C[PENETRATING]; B --> D["Primary injury<br/>Concussion<br/>Contusion<br/>Hematoma : epidural,<br/>subdural, intraventricular,<br/>subarachnoid"]; B --> E["Secondary<br/>Hypotension, hypoxia, acidosis,<br/>edema, ischaemia or other<br/>subsequent factors that can<br/>secondary damage brain tissue"];
```

### CLOSED

### PENETRATING

#### Primary injury

Concussion

Contusion

Hematoma : epidural,  
subdural, intraventricular,  
subarachnoid

#### Secondary

Hypotension, hypoxia, acidosis,  
edema, ischaemia or other  
subsequent factors that can  
secondary damage brain tissue

# GRADE

MILD	MODERATE	SEVERE
<ul style="list-style-type: none"><li>• GCS score greater than 12</li><li>• Loss of consciousness &lt; 30 minutes</li><li>• No abnormalities on CT scan</li><li>• No operative lesions</li><li>• Length of hospital stay less than 48 hours</li><li>• Post traumatic amnesia &lt; 1 hour</li><li>• Headache, nausea, vomiting</li></ul>	<ul style="list-style-type: none"><li>• Length of stay of at least 48 hours</li><li>• GCS score of 9-12 or higher</li><li>• Operative intracranial lesion</li><li>• Abnormal CT scan findings</li><li>• Loss of consciousness &gt; 30 minutes</li><li>• Post traumatic amnesia 1 – 24 hours</li></ul>	<ul style="list-style-type: none"><li>• The GCS score is below 9 within 48 hours of the injury.</li><li>• Abnormal CT scan findings</li><li>• Loss of consciousness &gt; 24 hours</li><li>• Post traumatic amnesia &gt; 7 day</li></ul>

The National Institute of Health (NIH) sponsored the Traumatic Coma Data Bank (TCDB)



# TRAUMA KAPITIS NON BEDAH

- *Concussion= commotio (Mild TBI)*
- *Contussion (Moderate & Severe TBI)*
- *Post traumatic syndrome (Post concussive syndrome) = PTS*
- *Fracture Basis Cranii*

## COMMOTIO

- temporary dysfunction of brain neuron with normal macroscopic

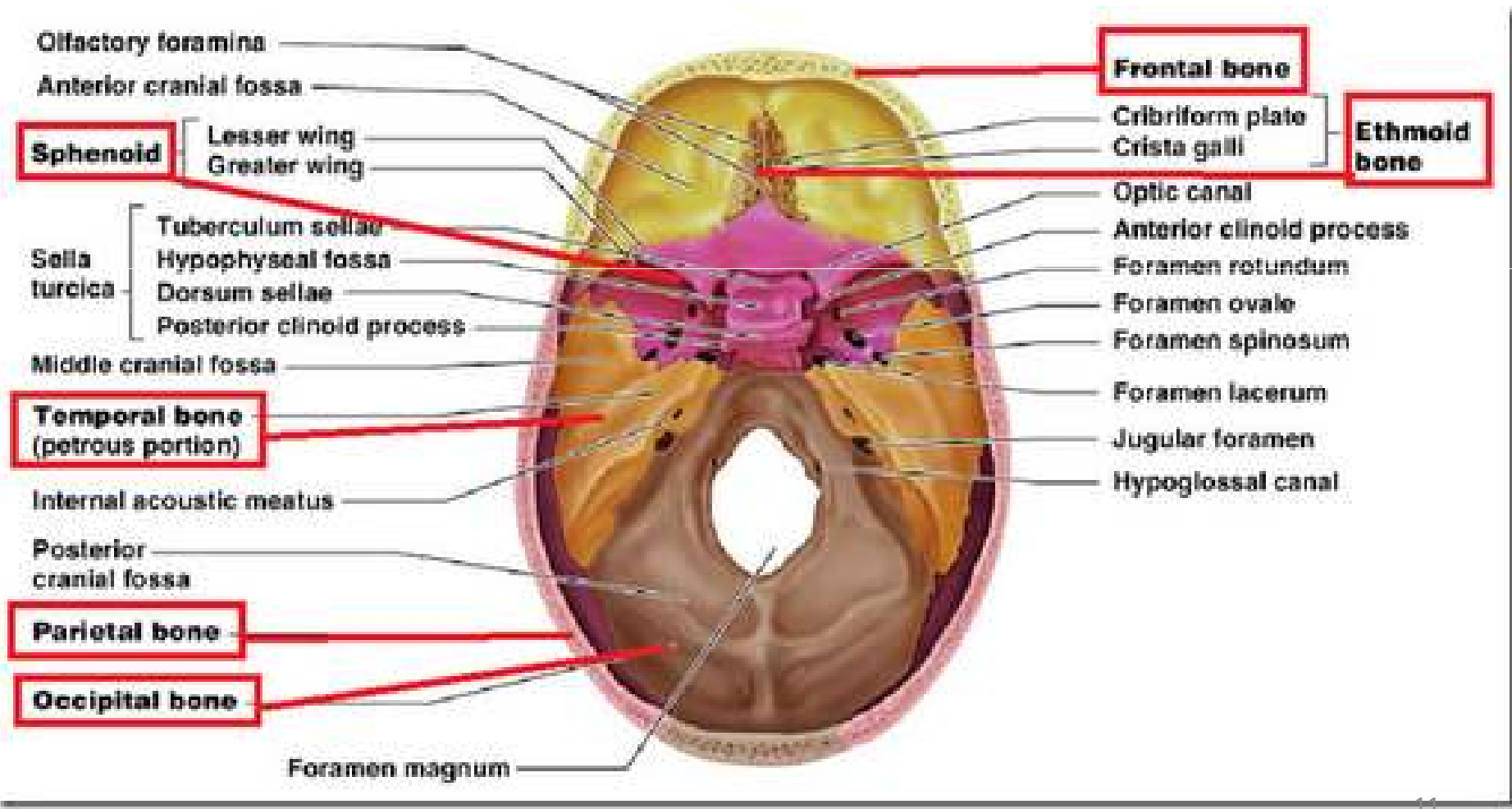
## CONTUSSION

- brain parenchym interstitial bleeding, without disrupt continuity parenchym.
- ≠ laceratio cerebri
- Grade of symptom
  - Unconscious > 30 minutes
  - FASE I :phase shock
  - FASE II : phase hiperactive central
  - FASE III : cerebral oedem
  - FASE IV: phase regeneration/recovalescence

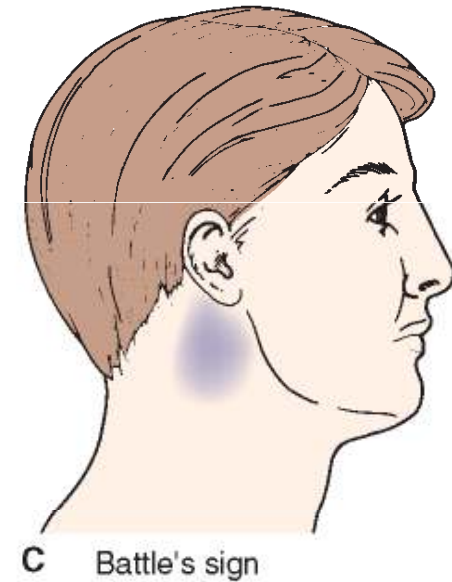
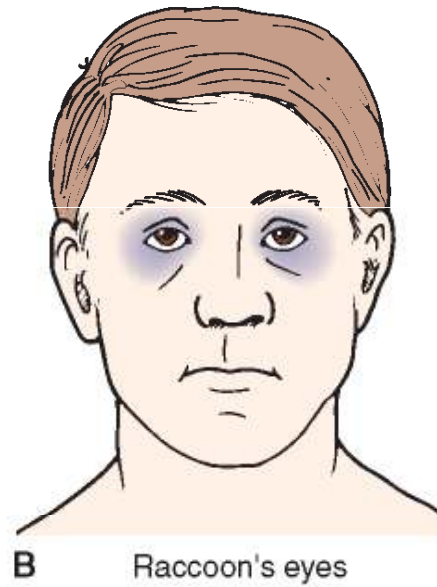
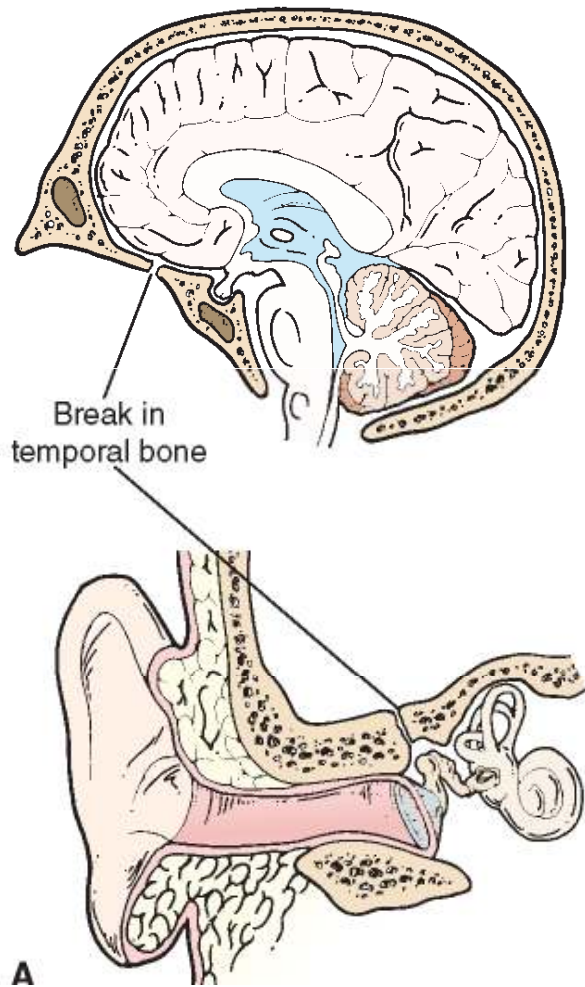
## PTS

- Headache
- Dizziness
- Blurred vision
- Fatigue
- Memory & concentration difficulties
- Depression, anxiety, irritability
- Sleep disturbances

# FRAKTUR BASIS CRANII



# FRAKTUR BASIS CRANII



# FRAKTUR BASIS CRANII



RACCOON EYE

# FRAKTUR BASIS CRANII



BATTLE'S SIGN

# EPIDURAL HEMATOM

- *Definition :*  
*hematoma between tabula interna duramater*
- *Short Lucid interval*
- *Rare in children*
- *Diagnosis by Brain CT-Scan*
- *Hematom massive:*
  - *Arteri meningeae media*
  - *Sinus venosus*

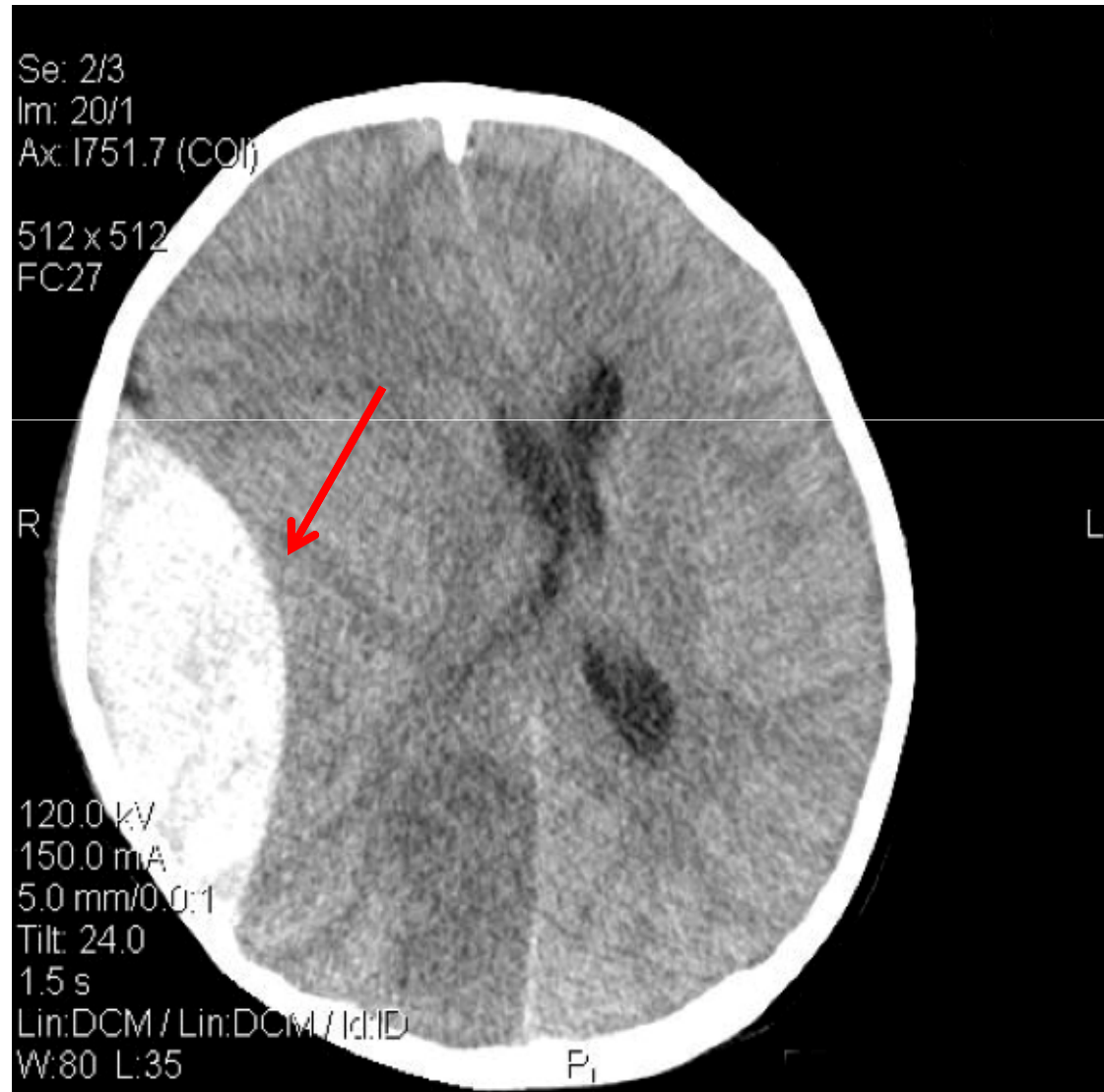
# EPIDURAL HEMATOM

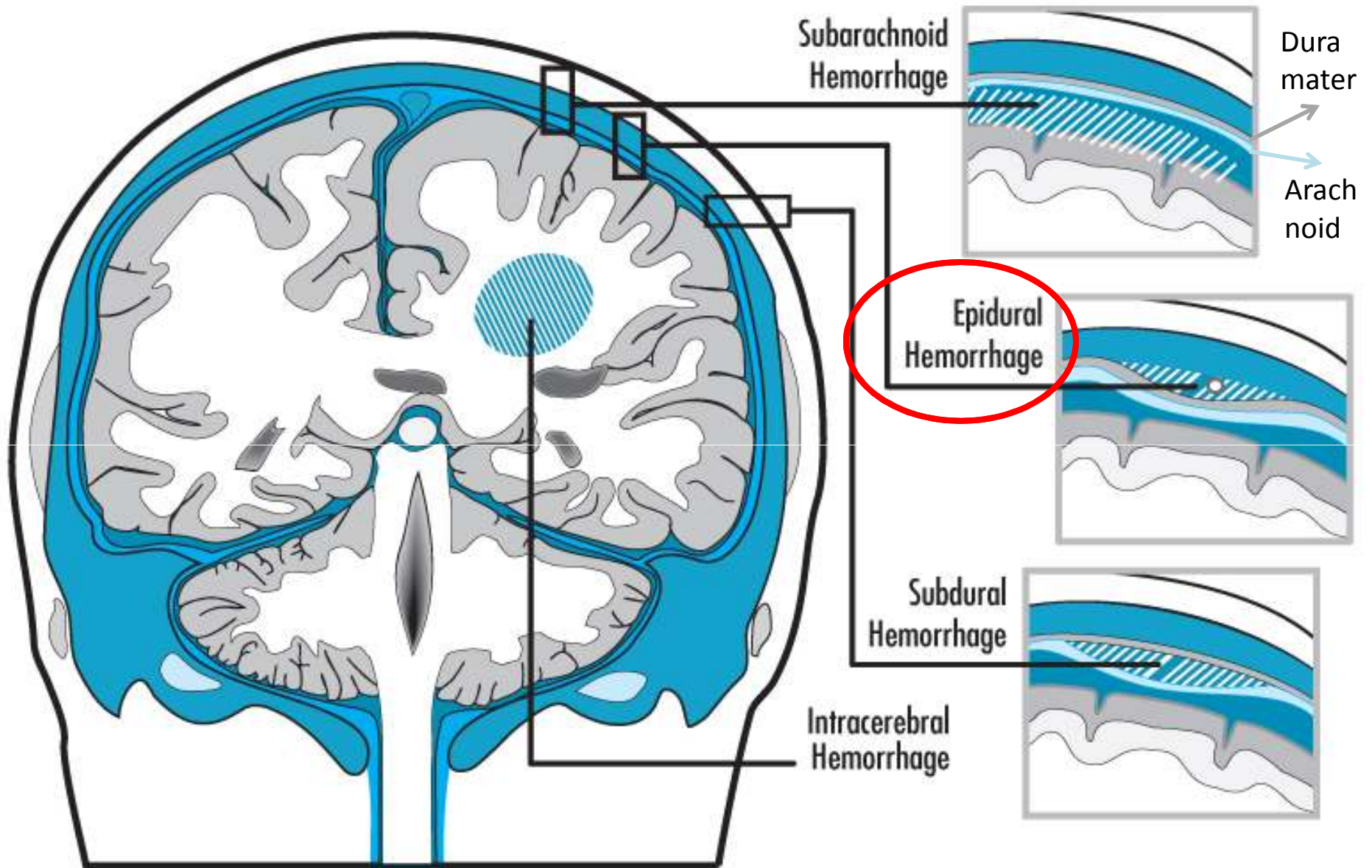
## *SYMPTOMS :*

- *Short Lucid interval :*
  - ***Lucid interval : awake periode in between 2 phase of loss of conciousness***
- *Gradual loss of unconciousness*
- *Delayed hemiparesis*
- *Pupil anisokor*
- *Babinski (+)*
- *Crossing linier Fracture temporal*
- *Seizure*
- *Bradycardia*



# EPIDURAL HEMATOMA





# EPIDURAL HEMATOM

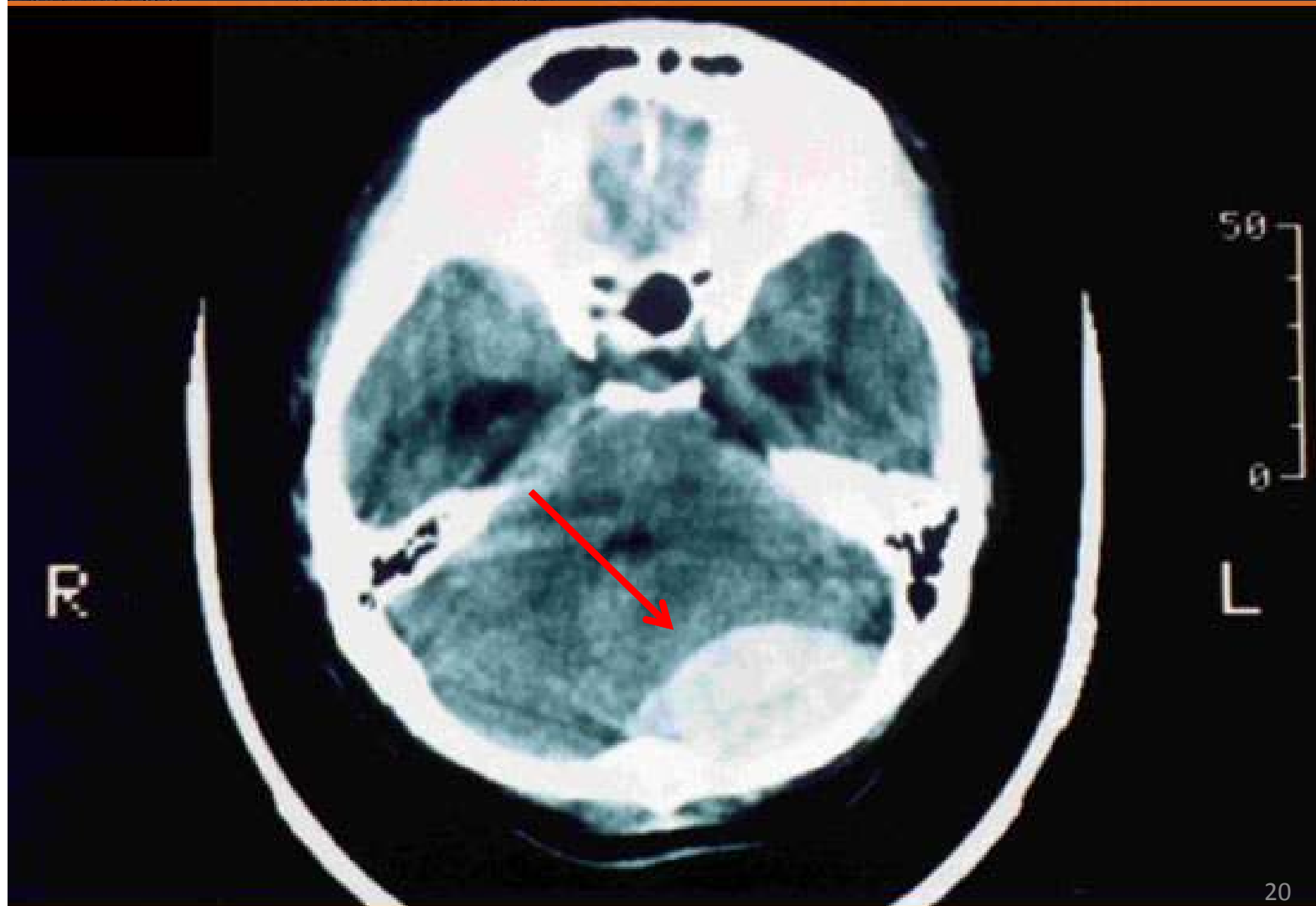
## *FOSSA POSTERIOR EDH*

- *Lucid interval (-)*
- *Fracture cranii occipital*
- *Deep comatous*
- *Disturbances of cerebellum, brain stem, and breathing*
- *Pupil isokor*
- ***Bad Prognose***

# FOSSA POSTERIOR EDH

Medscape®

www.medscape.com



Source: Neurosurg Focus © 2004 American Association of Neurological Surgeons

# EPIDURAL HEMATOM

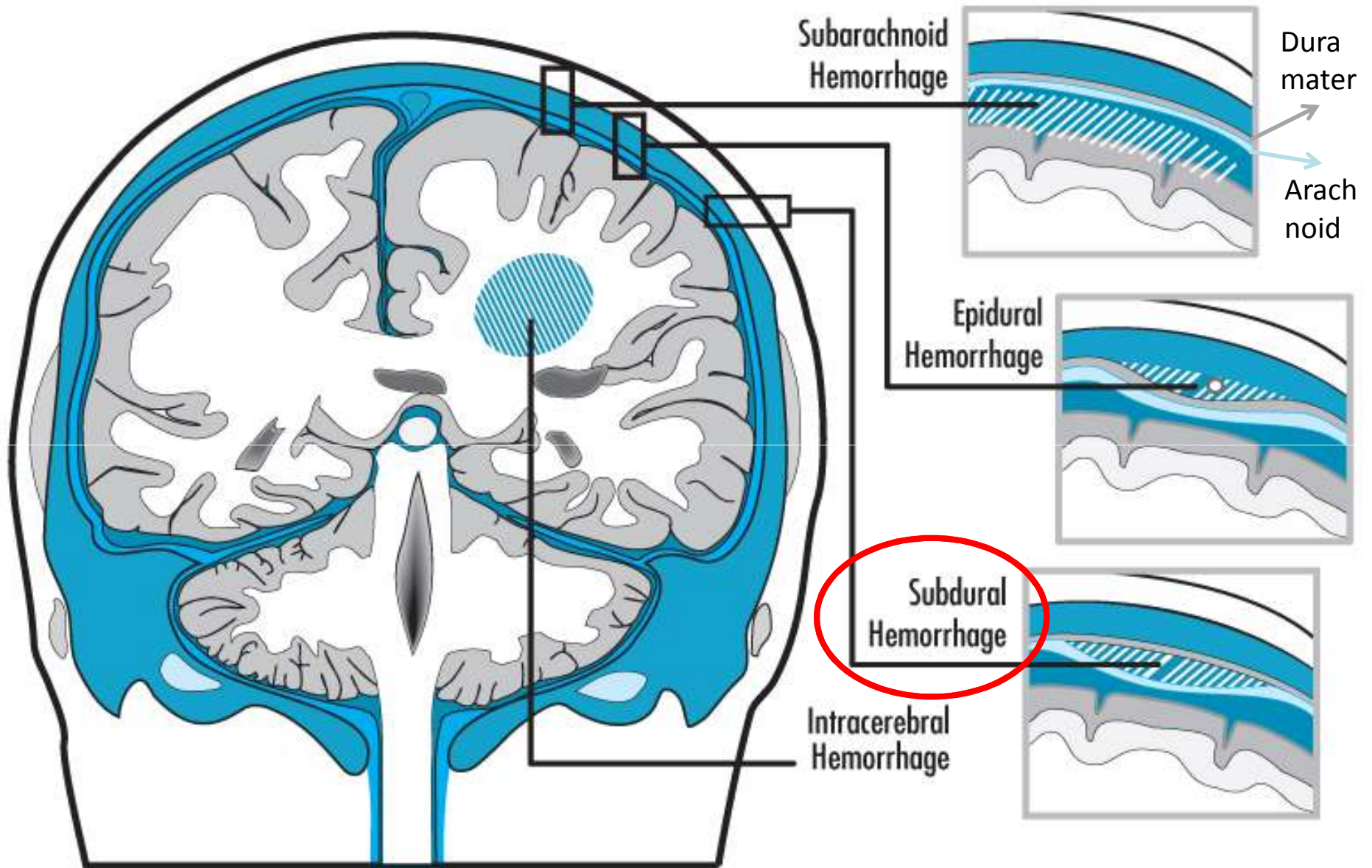
## ***SURGERY INDICATION :***

- *Haematom > 40 cc with midline shifting, with good intact brain stem function.*
- *Haematom > 30 cc within posterior fossa, followed by sign of brain stem compression and hydrocephalus, with good intact brain stem function.*
- *EDH progresive.*

# SUBDURAL HEMATOM

- *Def : duramater – arachnoid*
- *≠ hygroma subdural*
- *Hematom:*
  - *Tears of Bridging vein*
  - *causa: Tr.capitis, cehexitic, haematology abn*
- *Location frontal , parietal, temporal*
- *Classification*
  - *Acut : Lucid interval 0-5 days*
  - *Subacut : 5-15 days*
  - *chronic: 15 hari - years*





# SUBDURAL HEMATOMA





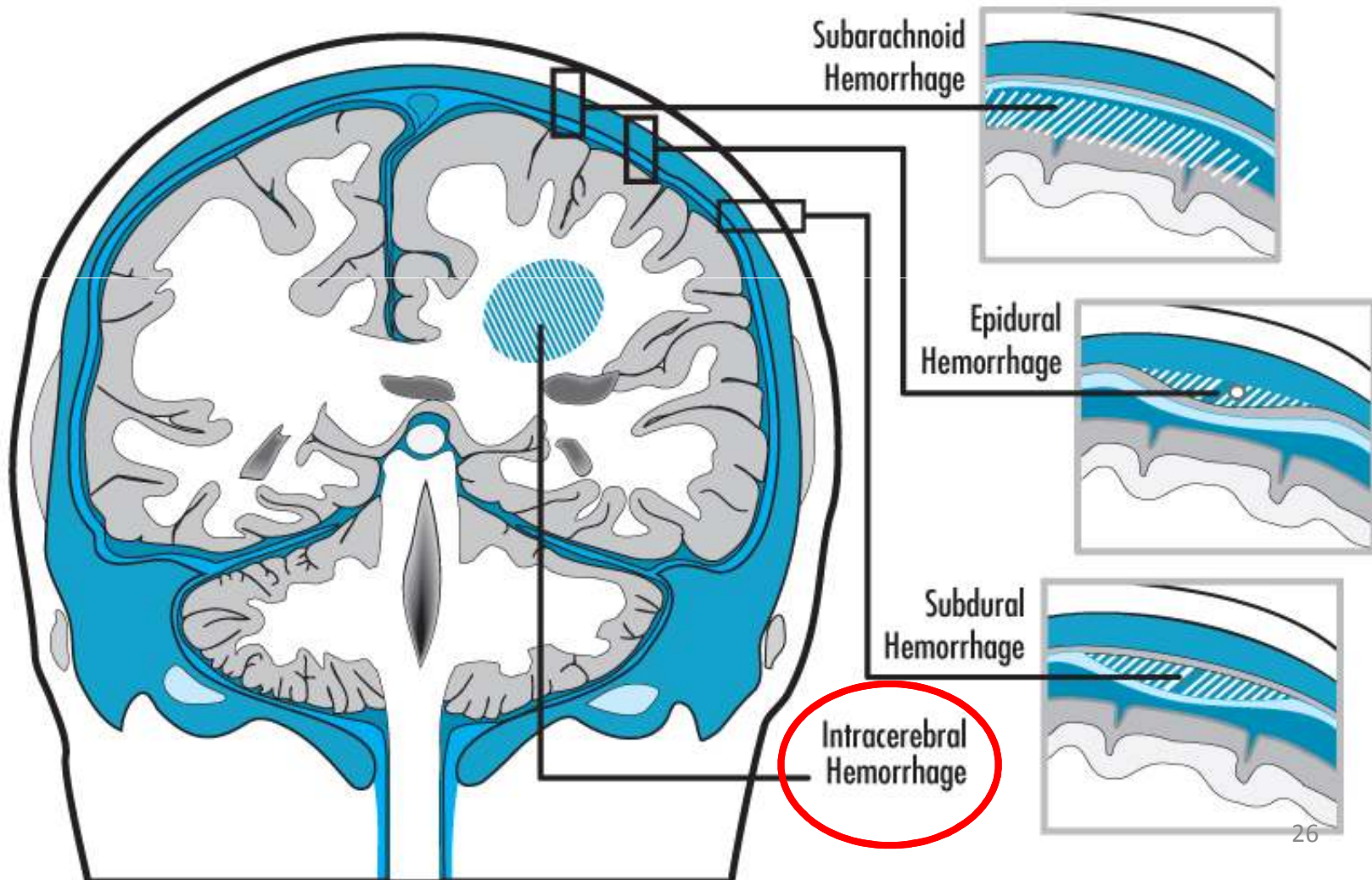
# SUBDURAL HEMATOM

## ***SURGERY INDICATION***

- *Massive SDH (> 40 cc / > 5 mm) + GCS > 6, with good intact of brainstem function.*
- *SDH + edema serebri / contusio serebri + midline shifting with good intact of brainstem function.*

# INTRACEREBRAL HEMATOM

- Mono - Multiple



# DIAGNOSIS

- *Head CT-Scan is the standard diagnostic procedure for TBI, Evidence that injury was minor, normal neurologic exam, does not ensure the absence of an intracranial lesion*
- *A repeat head CT Scan is recommended within 4-8 hours of patients with ICH and/or coagulopathies*
- *A repeat CT Scan is recommended sooner in patients who deteriorating neurologically*

# MANAGEMENT

- Shock treatment
- Air way
- Evaluation of consciousness
- Observation of all injury
- Beware of fracture cervicalis
- clinically neurology & X ray
- edema serebri
- Balance of liquid & electrolyte, calorie
- Monitor ICP
- Conservative treatment
- Refer to neuro surgeon if indication for surgery

**TERIMA KASIH**