



มหาวิทยาลัยราชภัฏนครปฐม



Adult and Geriatric Nursing Practicum 2

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increased intracranial pressure : IICP



Anatomy

GCS

IICP

Increased Intracranial Pressure

Ventriculostomy

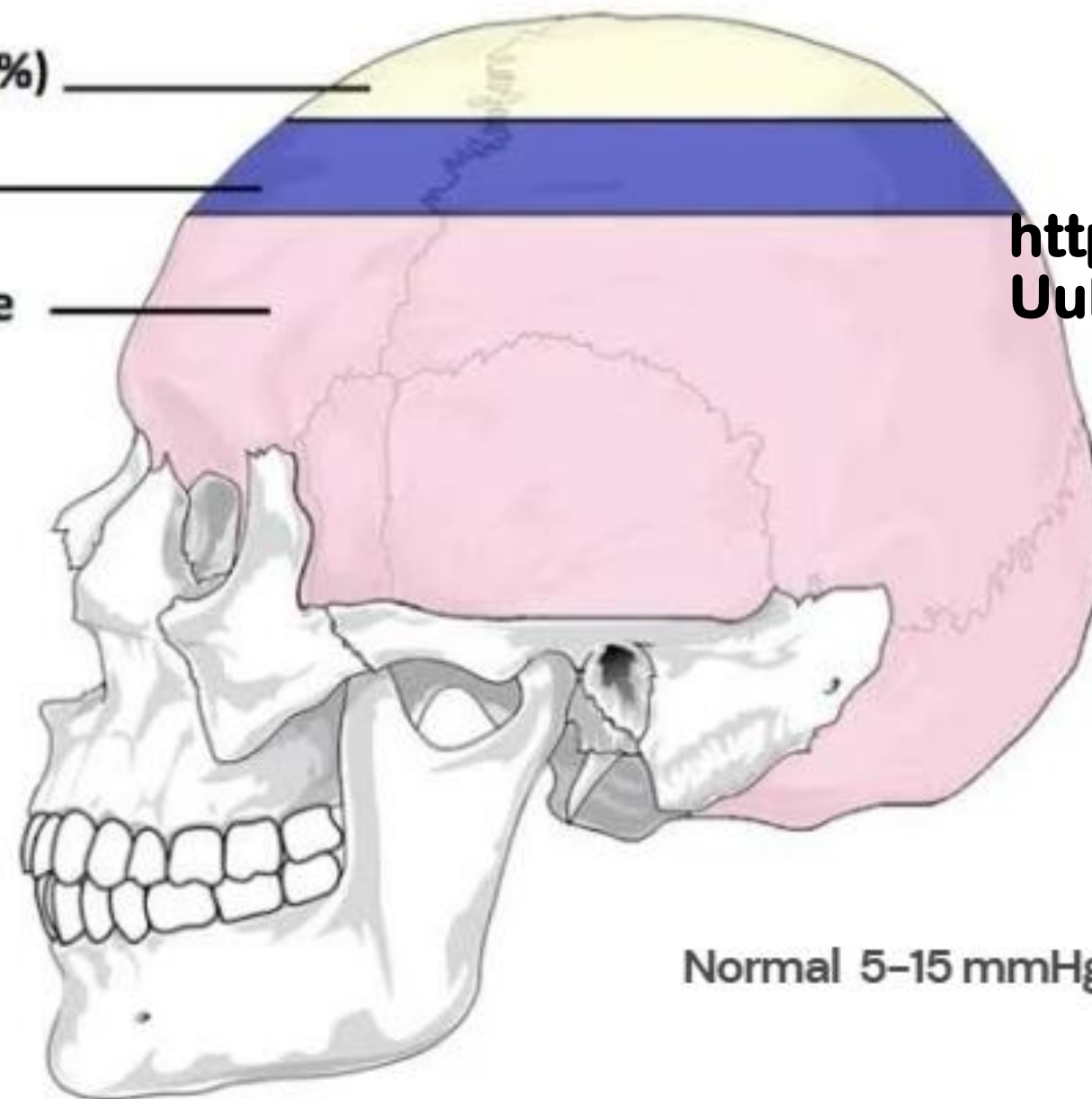
The 3 Components of intracranial

CSF volume = 150ml (10%)

Blood volume = 150ml (10%)

Brain parenchyma volume
= 1400ml (80%)

- ICP > 20–25 mmHg
- For a long time at least 5 min



Normal 5–15 mmHg

<https://images.app.goo.gl/AYd2UuHM6VWBC7qk8>

(ฉัตรกมล ประจวบลาภ, 2561)

increased intracranial pressure : IICP



Anatomy

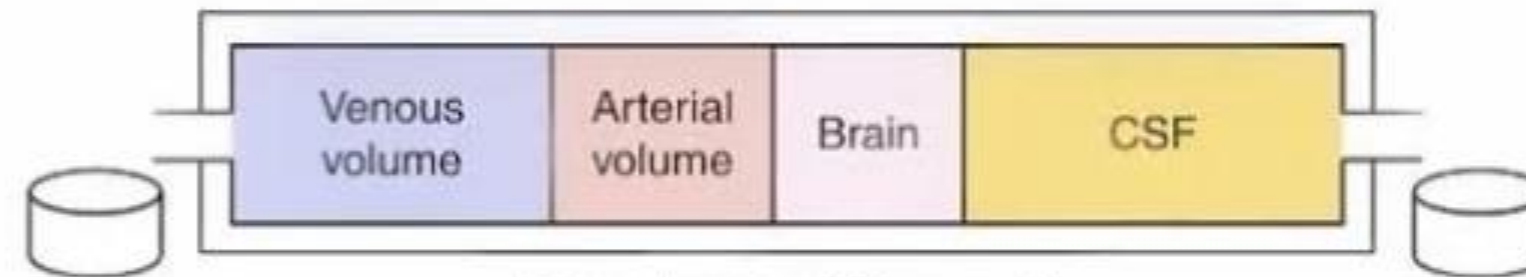
GCS

IICP

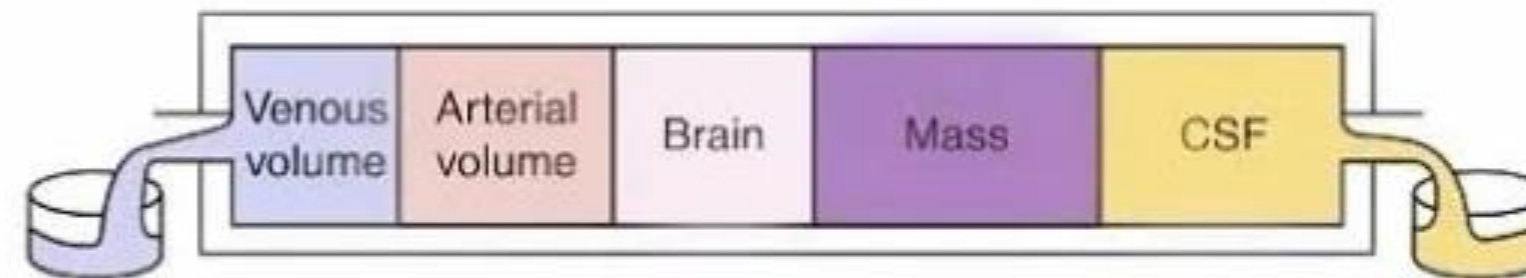
Ventriculostomy

Monro - Kellie

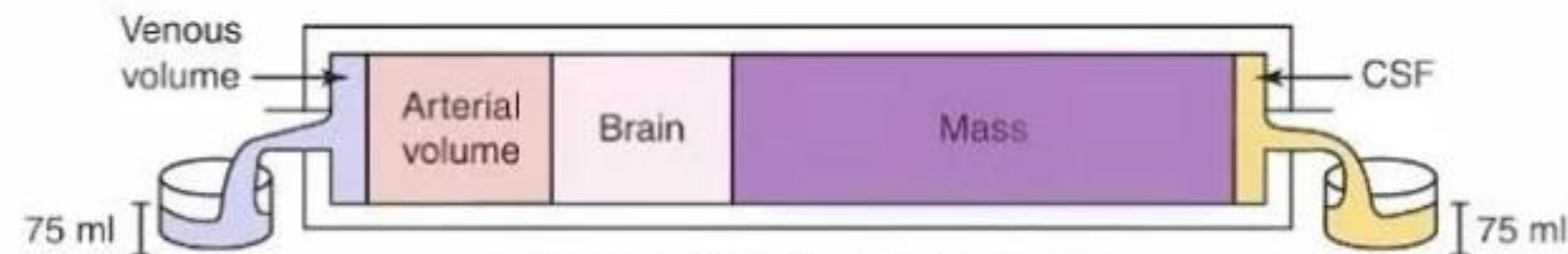
INTRACRANIAL COMPENSATION FOR EXPANDING MASS



Normal state - ICP normal



Compensated state - ICP normal



Uncompensated state - ICP elevated

<https://x.com/jamestooley/status/918794359734177793>

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Course of IICP

Increase in Brain volume

Mass, CA, Hematoma (epidural / subdural / subarachnoid hemorrhage) Brain edema, Ischemic stroke, Infection

Increase in Blood

1.vasodilation

Hypercapnia, acidosis, Fever, Infection

2.dural sinus tear

3. high valsalva pressure

Increase in CSF

Hydrocephalus
absorbtion, obstruction, production

(ไสว นรสาร, 2564)

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Cerebral autoregulation

Cerebral perfusion pressure (CPP)

70-100 mmHg

Cerebral autoregulation

CPP > 100 mmHg และ < 50 mmHg

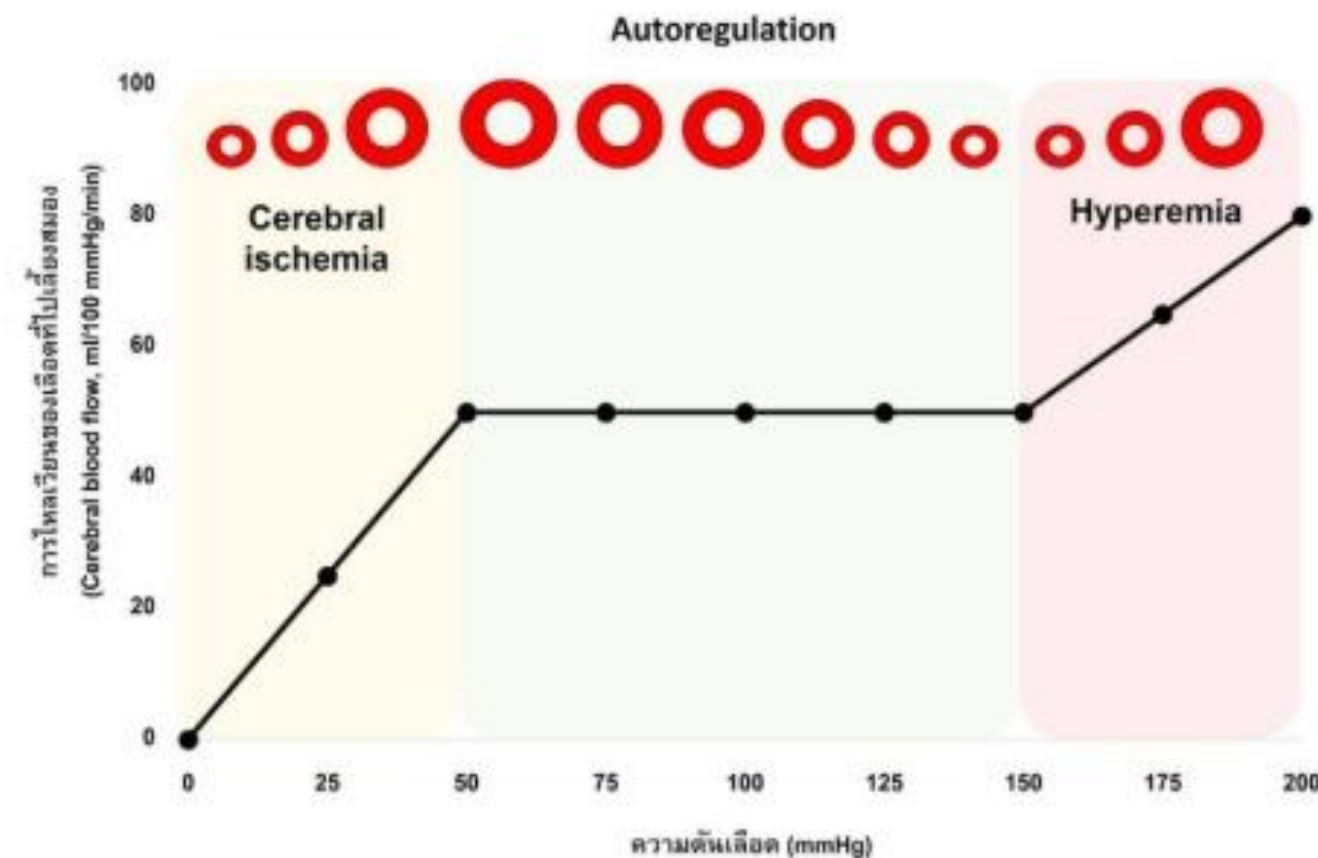
$$CPP = MAP - ICP$$

CPP = Cerebral perfusion pressure

MAP = Mean arterial pressure

$$MAP = \frac{SBP + 2(DBP)}{3}$$

ICP = Intracranial pressure



<https://images.app.goo.gl/KeR9TiLGjD6trhwi9>

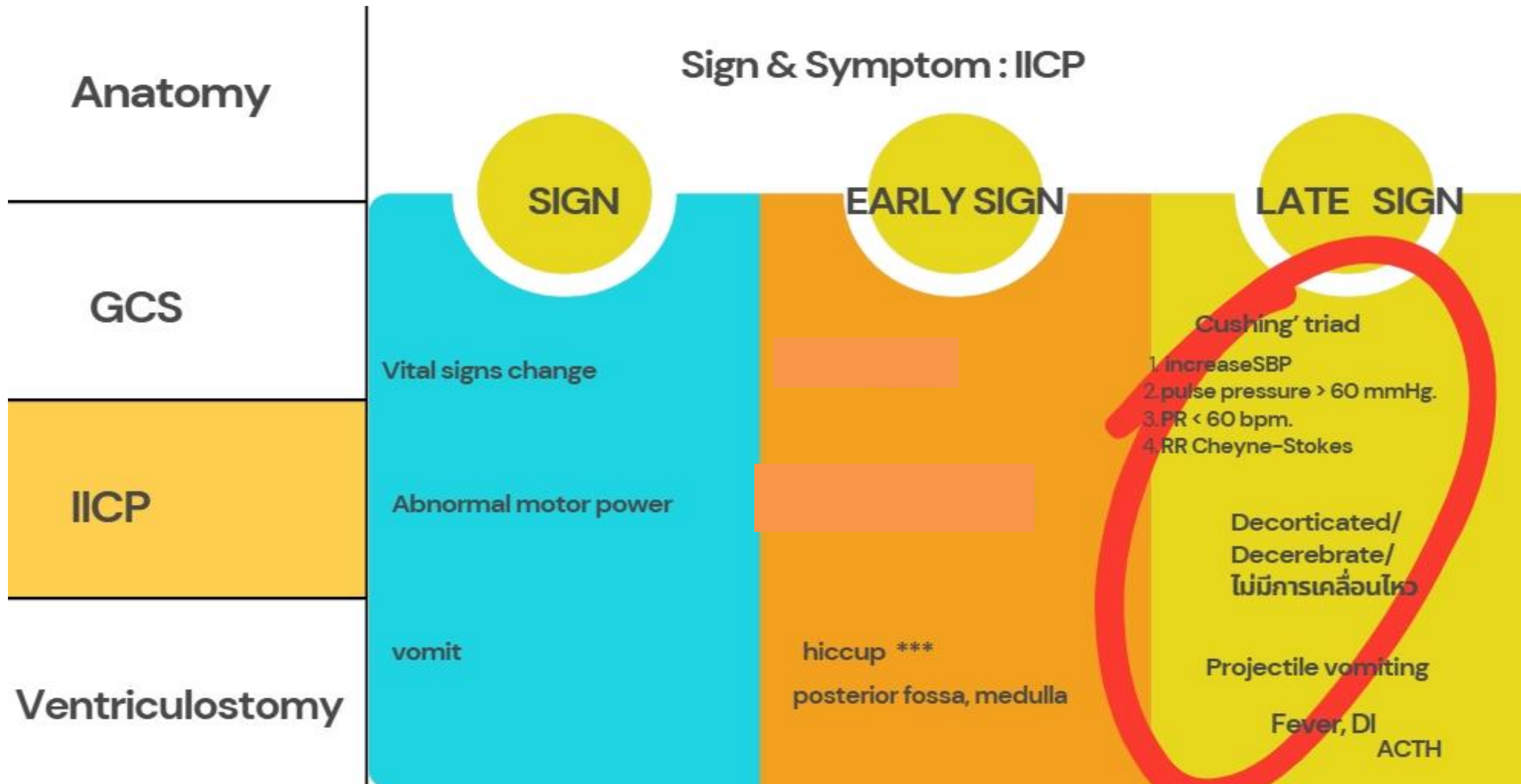
increased intracranial pressure : IICP



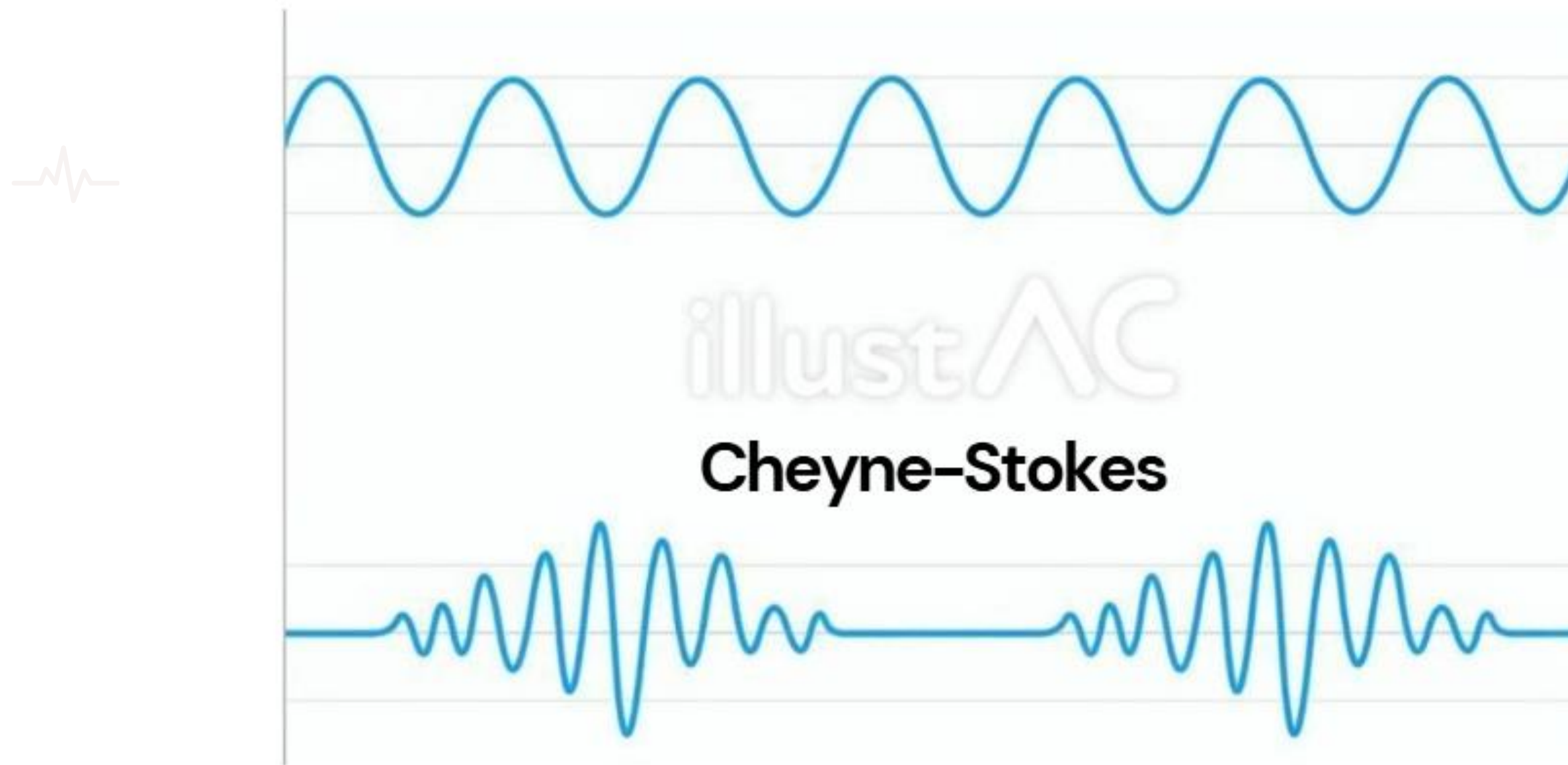
Sign & Symptom : IICP			
Anatomy	SIGN	EARLY SIGN	LATE SIGN
GCS	Changes in consciousness	Restless, confused, not knowing the day time place	Coma
IICP	Headache Blurred vision	Headache • vomit, Diplopia • papilledema IICP 2-3 hr.	Severe, excruciating headache
Ventriculostomy	Abnormal pupils	• pupil dilated and not reactive to light of the lesion	pupil dilated and not reactive to light both eye

(Galbiati & Paola, 2015)

increased intracranial pressure : IICP



increased intracranial pressure : IICP



<https://images.app.goo.gl/ZrKRmjPyJ16M3DaP7>

increased intracranial pressure : IICP

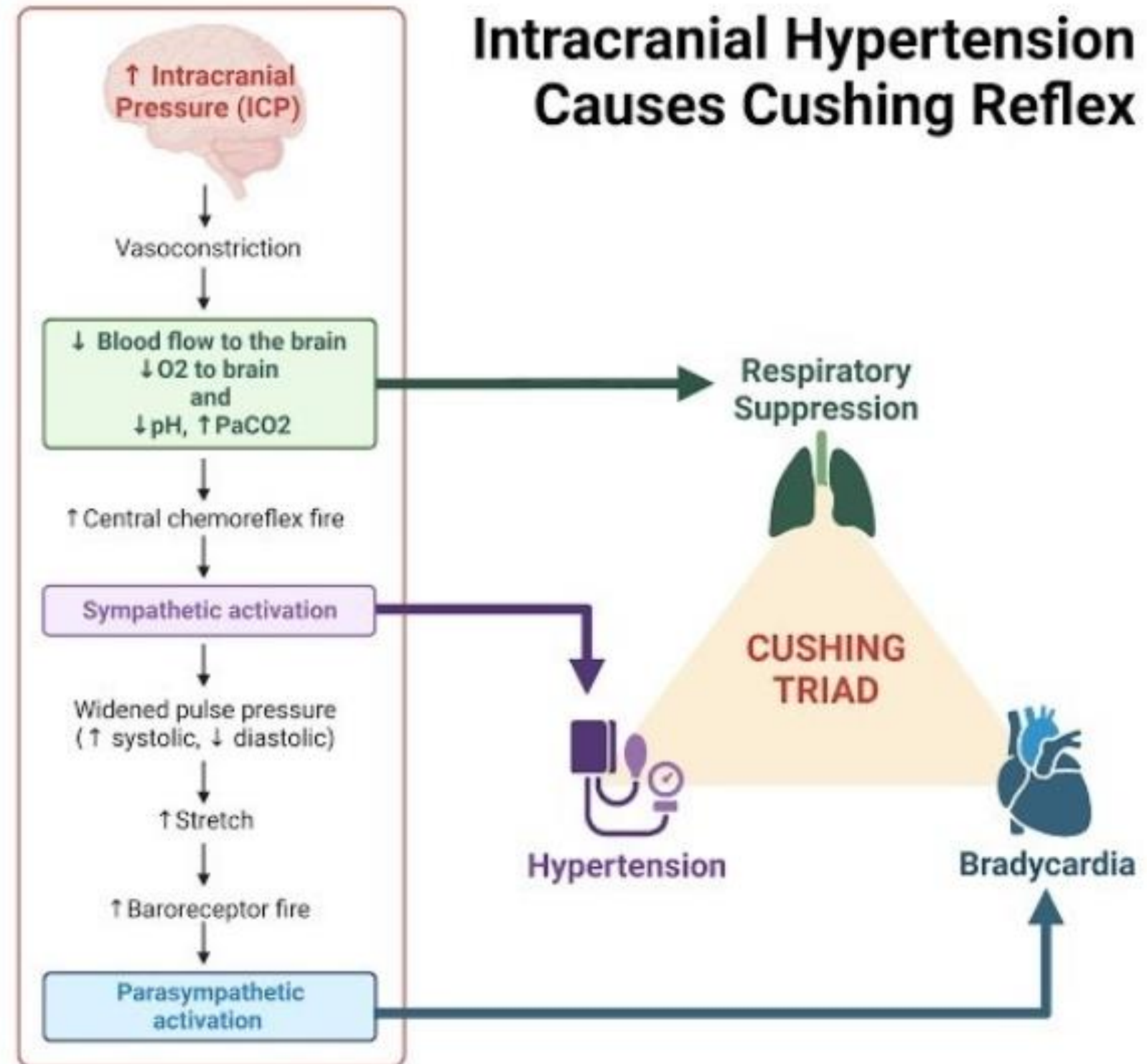


Anatomy

GCS

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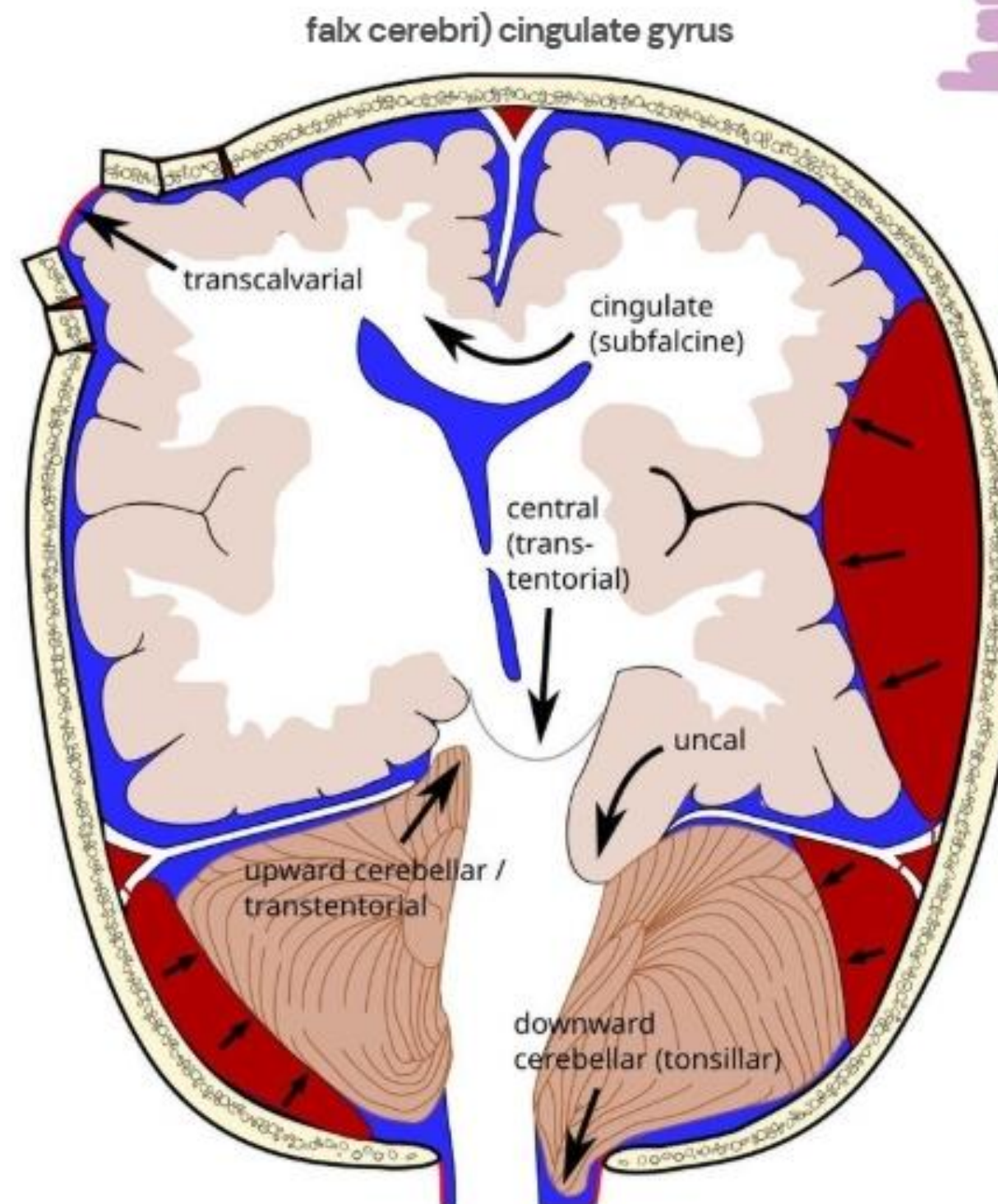
Ventriculostomy



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Anatomy
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Ventriculostomy



Brain herniation

Supratentorial herniation

1. Uncal (transtentorial)
2. Central
3. Cingulate (subfalcine)
4. Transcalvarial

Infratentorial herniation

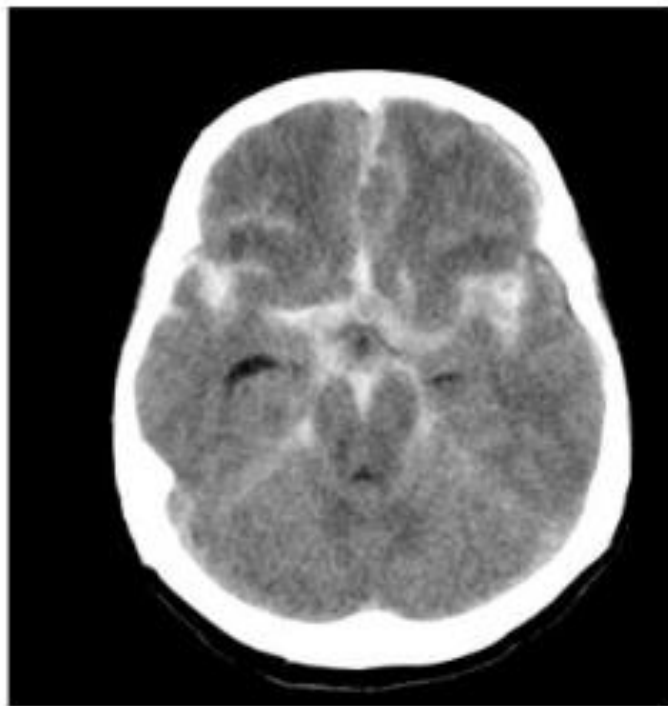
5. Upward (upward cerebellar or upward transtentorial)
6. Tonsillar (downward cerebellar)

increased intracranial pressure : IICP

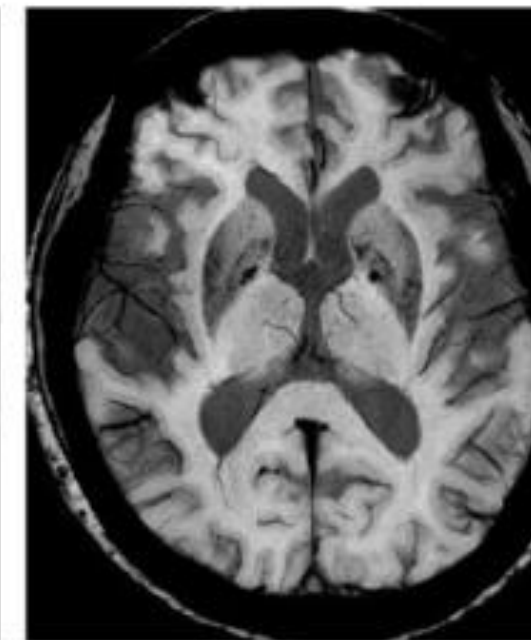
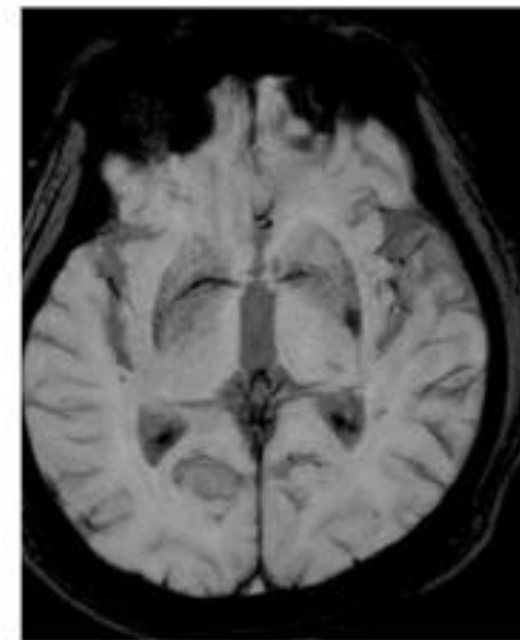
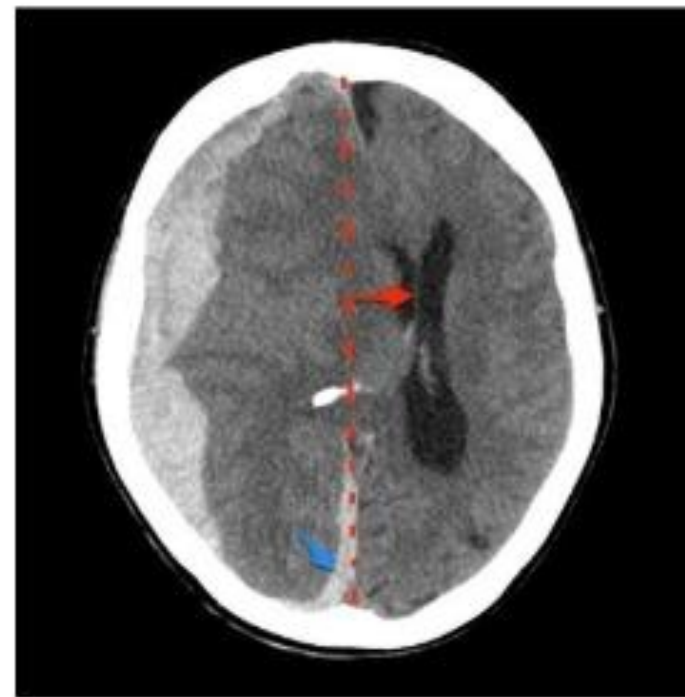


Diagnosis

1) neuroimaging



CT



MRI

<https://images.app.goo.gl/X5L24eDrfh7KF6ym7>

increased intracranial pressure : IICP



IICP treatment

Hypertonic saline

weakness

- hyperchloremic metabolic acidosis
- osmotic demyelination syndrome

Monitor

- serum osmolality 320–340 mOsmol/kg
- Lab Na

Mannitol

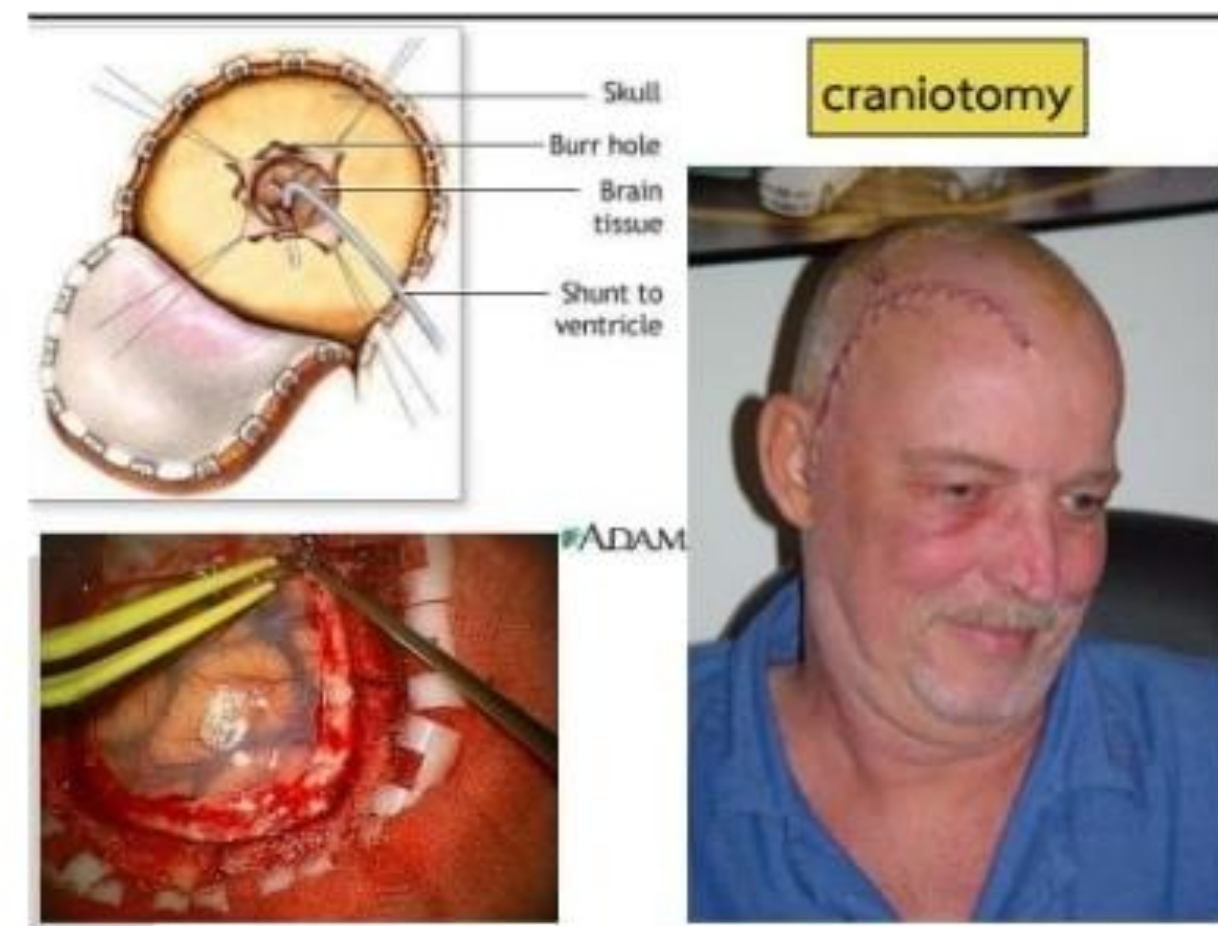
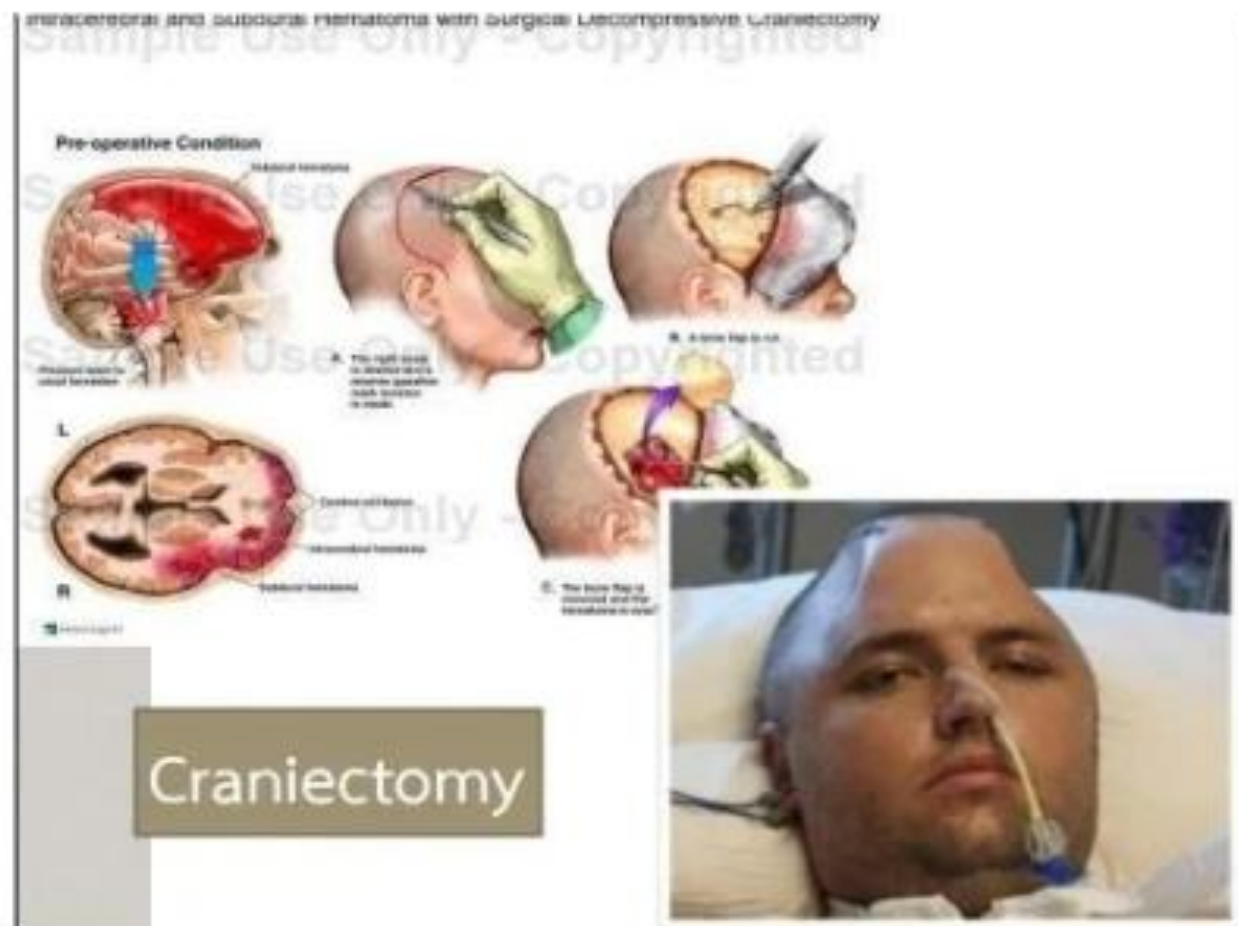
- Hypotension
- osmotic diuresis
- Dehydration
- Acute kidney injury
- rebound cerebral edema

- serum osmolality 320–340 mOsmol/kg
- osmolar gap < 20 mOsmol/kg

increased intracranial pressure : IICP



IICP treatment

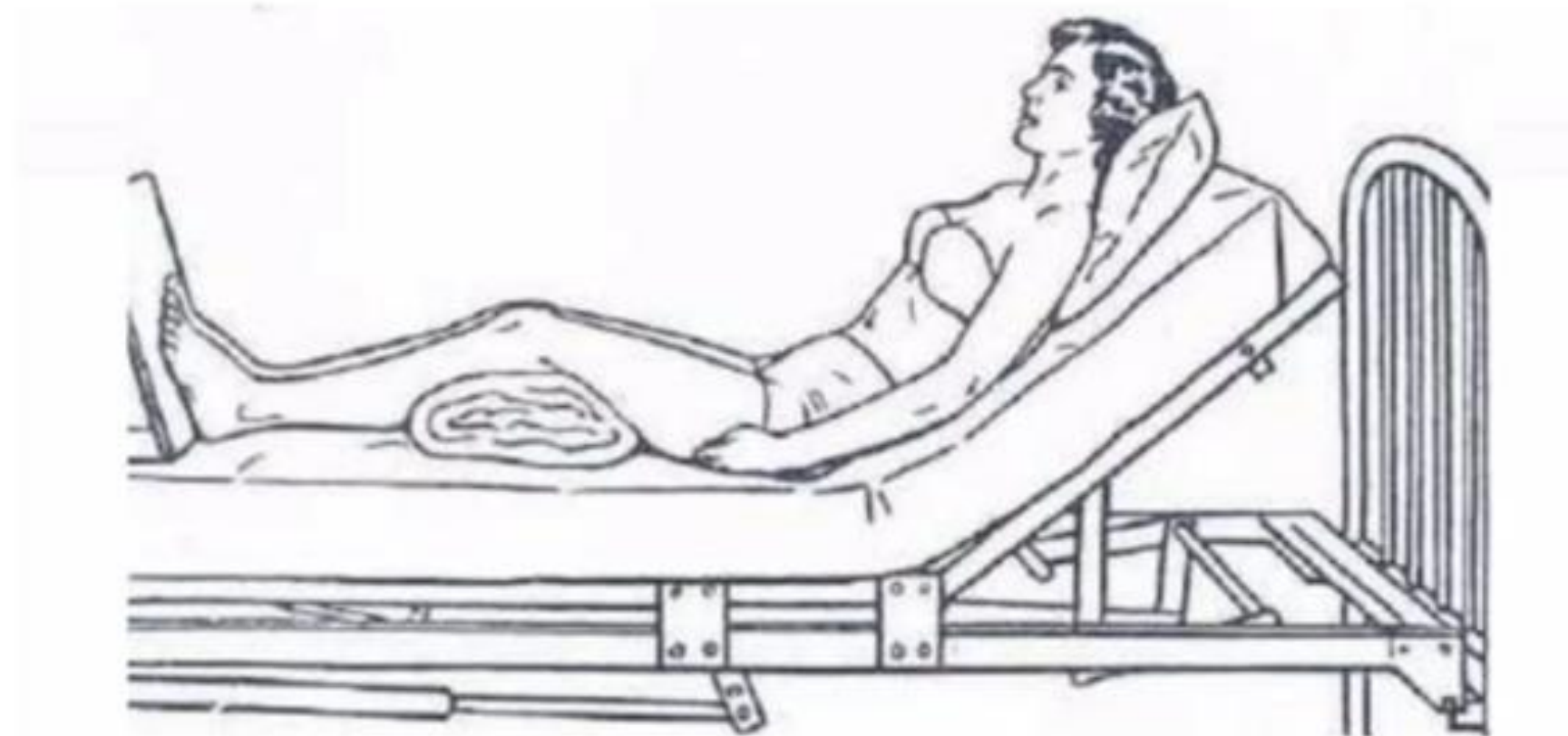


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IICP
Nursing care IICP

Nursing care IICP



- semi fowler position at 30 degrees.
- Avoid bending your hips more than 90 degrees.
- Straight neck
- Do not sleep on the wound. decompressive craniectomy

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Nursing care IICP

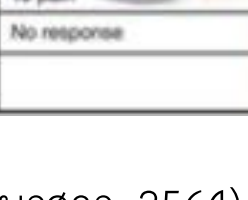
Nursing care IICP



Cushing' triad

1. increase SBP
2. pulse pressure > 60 mmHg.
3. PR < 60 bpm.
4. RR Cheyne-Stokes

GCS
Pupil
Motor power

GLASGOW COMA SCALE									
EYE OPENING RESPONSE			MOTOR RESPONSE			VERBAL RESPONSE			
	4			6		5			
			Obey verbal command		Oriented X3 - appropriate				
	3			5		4			
			Localizes pain		Conversation confused				
	2			4		3			
			Flexion - withdrawal		Speech inappropriate				
	1			3		2			
			Flexion - abnormal		Speech incomprehensible				
No response	1		No response	1	No response	1			
SUB-TOTAL			- - - - - ➔ plus		SUB-TOTAL		- - - - - ➔ plus		
							SUB-TOTAL		TOTAL SCORE
									Normal total 15

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Anatomy	Nursing care IICP	
GCS	● O2 support ● Reduce fever, Not added Metabolism ● Reduce valsalva maneuver	
IICP		
Nursing care IICP	(ฉัตรกมล ประจวบลาภ, 2561; Rakhit et al., 2021; ไสว นรสาร, 2564)	



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