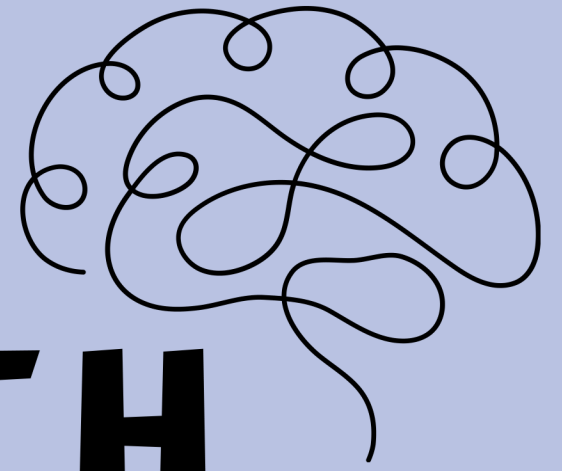


BRAIN DEATH



Batool dmour
Lena sbou'
Tala iyad
Qais ayasrah



Death is an irreversible, biological event that consists of permanent cessation of the critical function of the organism as a whole, especially respiration and heart beat.

1-Clinical Death: the cessation of the circulatory and respiratory functions.

2-Brain Death (Biological/or Legal Death):is the irreversible damage and loss of functions of the entire brain (the cerebrum and brain stem) which results in loss of consciousness and termination of vital signals from the brain stem.

SURVIVAL WINDOW

Clinical death will eventually progress into brain death, unless we revive the circulatory and respiratory systems by CPR and defibrillation and revive limit brain damage..

- Brain damage start as early as 4-10 minutes after clinical death..
- so basically those 4-10 minutes are our 'survival window'.

DEATH PRONOUNCEMENT

•Two physicians must be Involved in examining then announcing death..

•Criteria they should meet:

•5 years post bachelor`s degree of medicine and surgery

Preferably neurologist/neurosurgeon

**they mustn't be previously involved with patient care or with the organ transplant team.

WHEN IS THE PATIENT PRONOUNCENED DEAD??

1-GCS = 3

2-loss of Brain stem reflexes

3-absent motor activity

4-positive apnea test (done twice 12 hours apart)

GLASGOW COMA SCALE

PRACTICAL METHOD FOR ASSESSMENT USED TO DESCRIBE
THE LEVEL OF CONSCIOUSNESS IN A PERSON FOLLOWING A
TRAUMATIC BRAIN INJURY



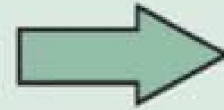
Fig. 10.1. A patient in a hospital bed with medical equipment.

Assess responses in
three domains

Eye (score range 1-4)

Motor (score range 1-6)

Verbal (score range 1-5)



Add scores from the
three components to
give a sum score (3-15)

GCS 13-15: mild TBI

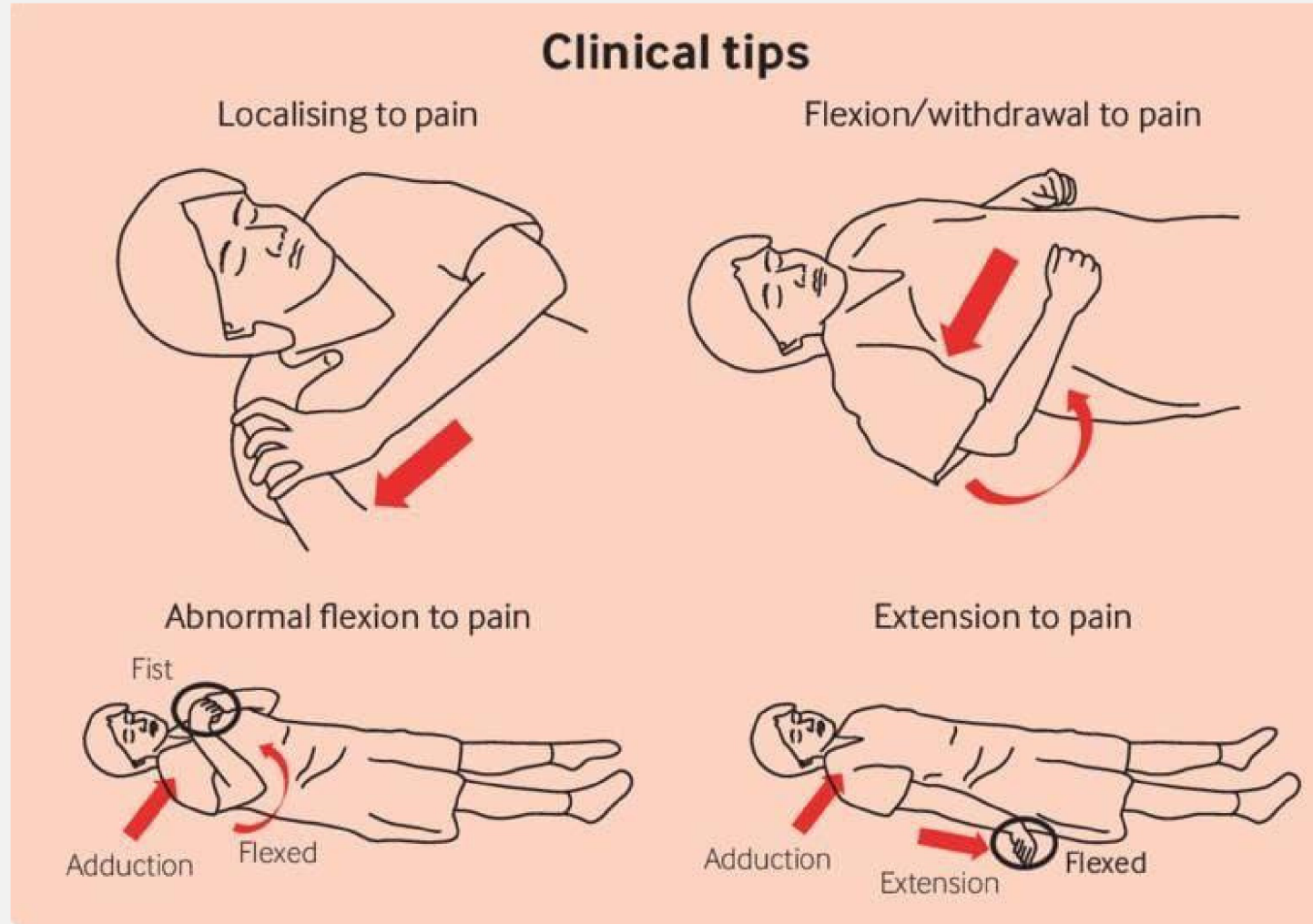
GCS 9-12: moderate TBI

GCS 3-8: severe TBI

TABLE 38-2**Glasgow Coma Scale**

BEHAVIOR	RESPONSE	SCORE
Eye opening response	Spontaneously	4
	To speech	3
	To pain	2
	No response	1
Best verbal response	Oriented to time, place, and person	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1
Best motor response	Obeys commands	6
	Moves to localized pain	5
	Flexion withdrawal from pain	4
	Abnormal flexion (decorticate)	3
	Abnormal extension (decerebrate)	2
	No response	1
Total score:	<i>Best response</i>	15
	<i>Comatose client</i>	8 or less
	<i>Totally unresponsive</i>	3

Motor response :



EXAMINATION

Before the examination 4 things should be stabilized; 1-stable vital signs

2-body temp $> 34^{\circ}\text{C}$.

3-normal electrolytes and a free toxicology screen 4-

normal pco₂ level (35-45 mmHg).

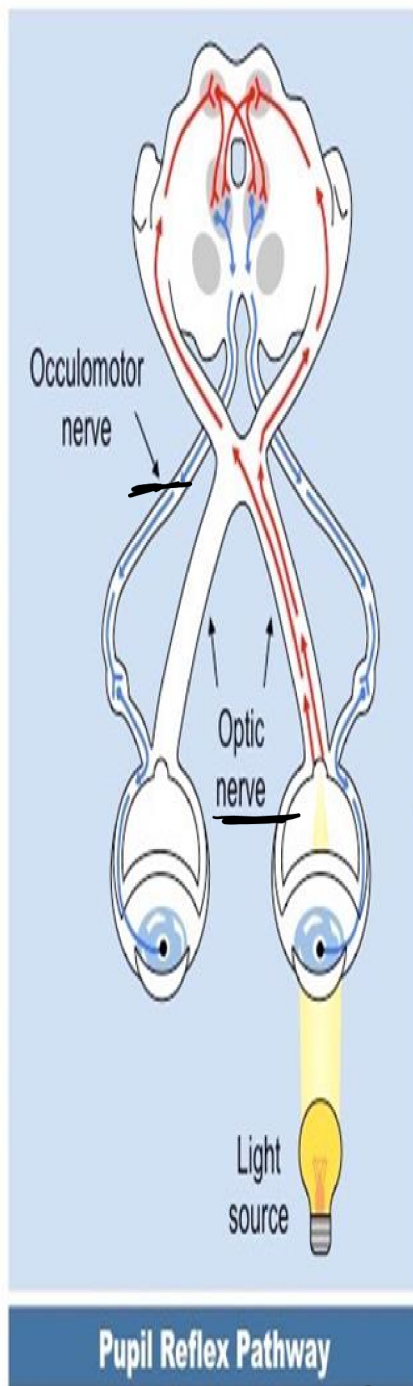
BRAIN STEM REFLEXES

- Corneal reflex : afferent → ophthalmic , efferent → facial
- Papillary reflex : afferent → optic , efferent → oculomotor

Gag reflex : afferent glossopharyngeal , efferent vagus

Tracheal reflex : afferent vagus, efferent vagus

vestibulo-ocular/oculocephalicreflex; the most clinically important reflex to diagnose brain death



Pupil Reflex Pathway

Pupil Response - Bright Light



Pupil Constricts



Circular Muscles Contract

Pupil Response - Dim Light



Pupil Dilates



Radial Muscles Contract

CN V – Trigeminal

- **Corneal Reflex Test**

- Usually not done if light touch is intact
- Instruct the patient to look up and away from you.
- Approaching the patient laterally, out of his line of vision, and avoiding the eyelashes, touch the cornea lightly with a fine wisp of cotton.
- Look for blinking of the eyes, the normal reaction to this stimulus.
- Be aware that use of contact lenses frequently diminishes, or may even eliminate, the corneal reflex response.



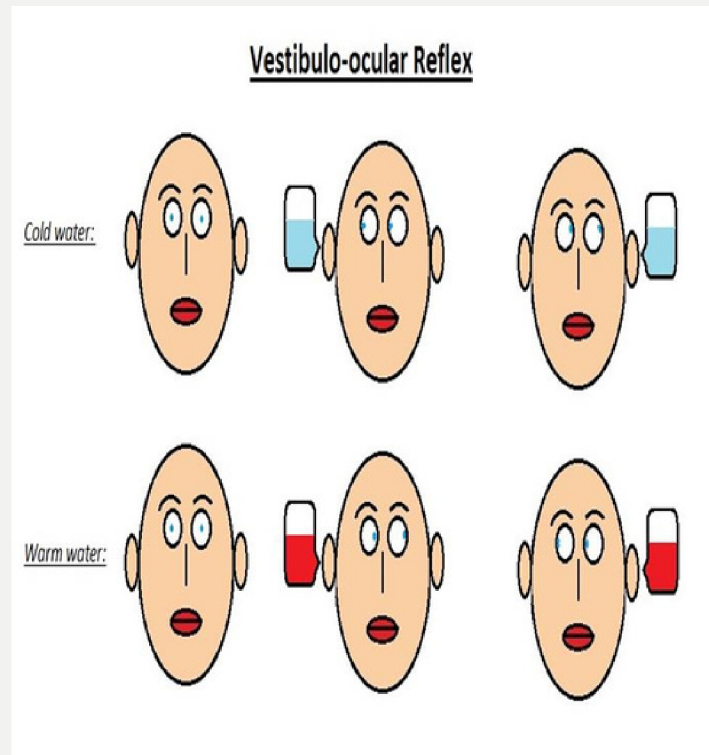
The corneal reflex tests the afferent (sensory) arc of CN V, and the efferent (motor) arc of CN VII.

Gag and Cough reflex

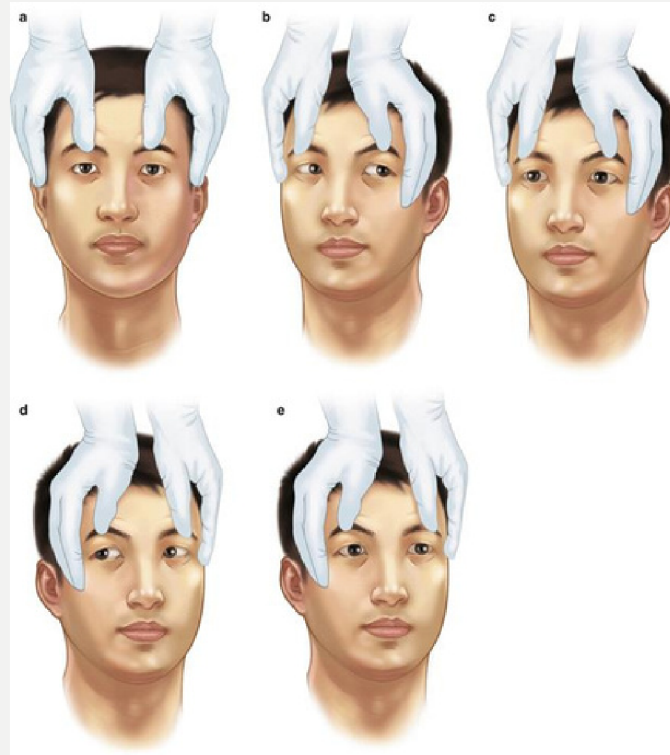


- Area tested – CN IX and X , medulla.
- Brain death – absence of both cough and gag reflex.

COLD CALORIC



DOLL'S EYES



APNEA TEST

We test for the respiratory centers in the medulla oblongata by sensitizing them with increasing PaCO₂ up to 60mmHg (we anticipate visible signs of respiratory musculature contraction if the brain stem isn't severely damaged beyond repair).

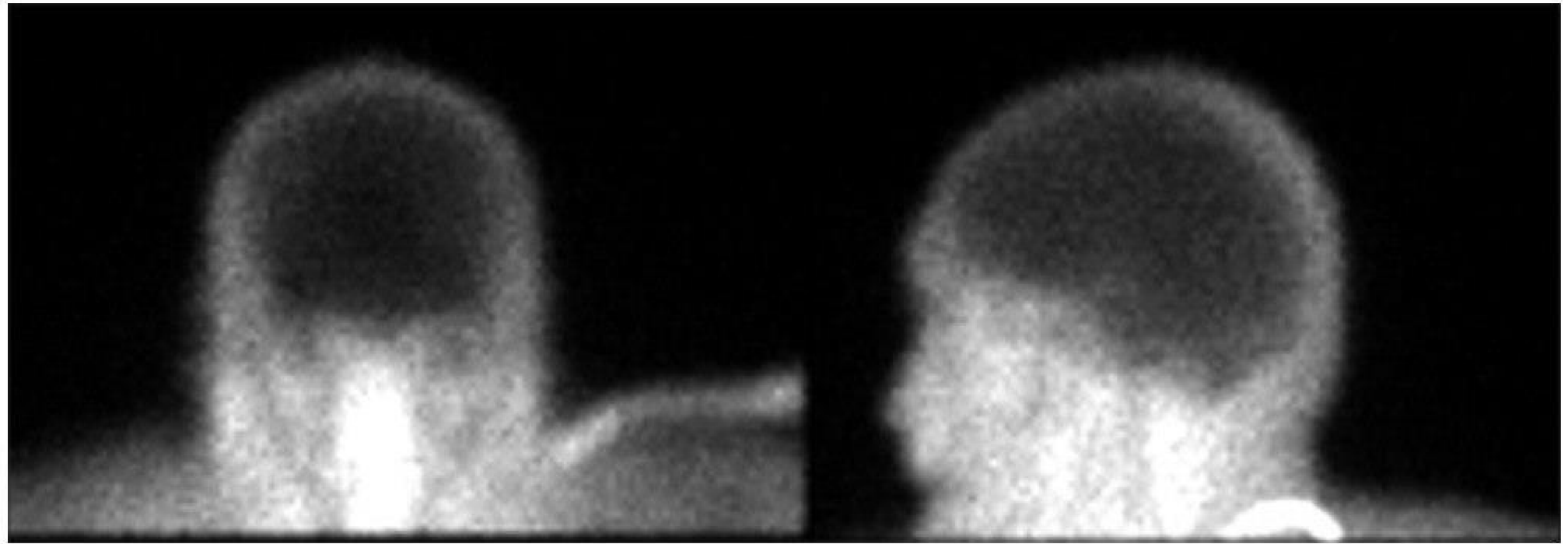
A common method of apnea testing involves disconnection of mechanical ventilation from the patient, followed by the insertion of a catheter or cannula into the endotracheal tube, down to the level of the carina, through which oxygen is delivered.

before we start we hyperventilate the patient with 100% O₂

- CPAP into tube with 6L of O₂/Min

- ABG every min for 8-10 min

- we make sure that systolic blood pressure doesn't fall below 90mmHG during the entire test and the oxygen saturation level below 85% or else we stop and end the test and repeat it else time.



POSITIVE OR NEGATIVE BRAIN DEATH

brain death	indeterminate result
respiratory movements are absent	respiratory movements are detected
arterial PCO ₂ is 60 mm Hg (option: 20 mm Hg increase in PCO ₂ over a baseline normal PCO ₂)	If the PCO ₂ is < 60 mm Hg or PCO ₂ increase is < 20 mm Hg over baseline normal PCO ₂
the apnea test is positive	the result is indeterminate and an additional confirmatory test can be considered

AFTER CONFIRMATION OF BRAINSTEM DEATH

- If the patient meets all criteria for brain death on both examinations, this should be noted in the medical record at the time of the second
- exam. This time becomes the time of legal death declaration.

If organ donation is considered, the situation is discussed with the family, primarily to ascertain the patient's wishes about donation (if known).

If donation is possible, intensive care of the body must be continued.

اللهم كن لأهلنا في غزة، اللهم كن لهم ولا
تكن عليهم، اللهم اهلك الظالمين وأرنا فيهم
آية، اللهم استجب لدعاء المظلومين وأنزل
عليهم سكينتك ورحمتك
و لا حول ولا قوة إلا بالله



**THANK
YOU**

