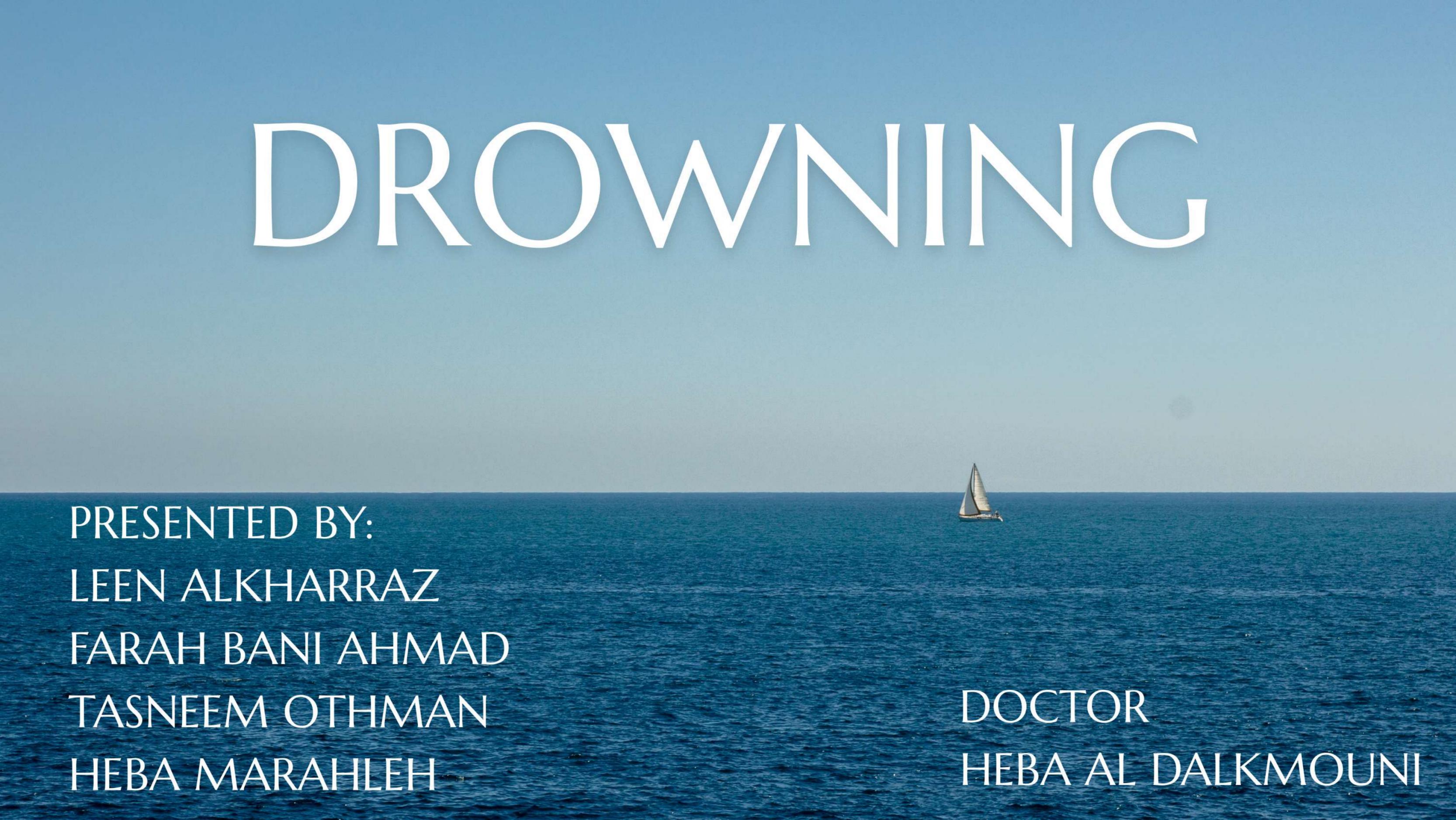


DROWNING

A small sailboat with a white sail is visible on the horizon of a vast, deep blue sea under a clear, light blue sky. The horizon line is straight and divides the image roughly in half.

PRESENTED BY:

LEEN ALKHARRAZ

FARAH BANI AHMAD

TASNEEM OTHMAN

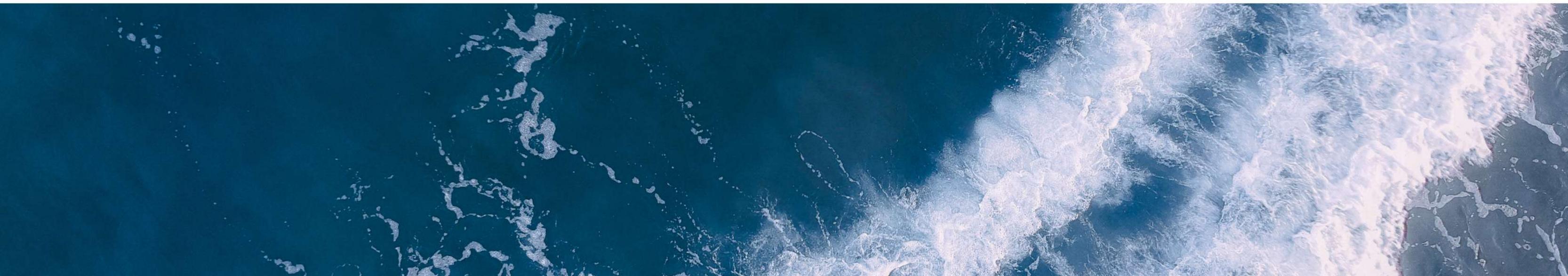
HEBA MARAHLEH

DOCTOR

HEBA AL DALKMOUNI

LECTURE OBJECTIVES

1. Definition of drowning
2. Classification (types) of drowning
3. Causes of death in drowning
4. Physiopathological changes
5. External and internal appearances





WHAT DO WE MEAN BY DROWNING?

It is a form of violent asphyxia in which death results

from

انغمار

submersion of mouth and nostrils of a **living person**

under water

Note: 90% of drowning cases occur in freshwaters such as rivers and pools. Drowning in fresh water and entering a large amount of pool or river water into the lungs and stomach is much more dangerous than swallowing a lot of sea water



CLASSIFICATION (TYPES) OF DROWNING

TYPICAL (WET)
DROWNING

DRY DROWNING

SECONDARY DROWNING
(NEAR-DROWNING)

TYPICAL (WET) DROWNING

when drowning begins with a period of panic loss of normal breathing pattern, breath holding, air hunger & struggling to stay above the water & this can lead to cerebral hypoxia seizures & loss of consciousness which can result in drowning

DRY DROWNING

an acute water aspiration that would develop over minutes to hours lung injury caused by & could progress to respiratory failure. (water didn't reach the lungs (vagovagal inhibition))

SECONDARY DROWNING (NEAR- DROWNING)

WATER REACHED LUNG.

complications that results from water aspiration to the lung & caused inflammation person may survive but subsequently suffer complications or die from the delayed effects of inhalation of water

e.g.

- Inhalation pneumonitis.
- Bronchopneumonia.
- Pulmonary edema

Causes of death in drowning

RAPID DEATH

1. Asphyxia of drowning.

2. Electrolyte disturbances.

3. Hypothermia may develop rapidly in cold water.

Sudden unexpected immersion into cold water can

cause death by: -Cardiac failure due to rises in venous and arterial pressures.

-Ventricular fibrillation.

4. Inhalation of water due to respiratory distress.

5. Laryngeal spasm or dry drowning

6. Fatal head injuries during diving into the water.

← فتسبب اختناق بسبب مكن الماء يوصل إلى lung
وينتقل إلى الدم ، ويجذب $electrolytes$
الوجوده ، ويرهقه كما ان تسبب على نوعية الماء كل هي :

Fresh water on Salty water

← زي ما بنعرف إنه في منامه بتكون
باردة فلما ينزل الجسم فيها بغير
فيه تحفيز لـ Sympathetic
وهذا يؤدي إلى

Vasoconstriction

↓
leading to Cardiac Failure

← هذا السطح لما ينزل في الماء

بمثل حابس نفسه ويتكبر
في حد معين بقدر يتحمه جدار
بغير في ارتفاع CO_2

then death

بغير أعرف
Auto PSY

← هون ما يكون سبب الوفاة الـ drowning وإنما الـ head injuries ، بينما لو الضربة أفقته
توازنه وفات من الغرق فهون يكون سبب الوفاة الـ drowning ، طب كيفة بدية أعرف ← بغير أعرف

Causes of death in drowning

DELAYED CAUSE OF DEATH

Death occurs hours to days later due to:

- a. **Pulmonary edema (from inhaled water).**
- b. **Acute respiratory distress syndrome (ARDS).**
- c. **Aspiration pneumonia.**
- d. **Hypoxic brain injury (cerebral edema / encephalopathy)**

← اعراض بوجهل إلى الرئة وبتحل
atelectasis لل alveoli
→ leading to ↓ gas exchange

← وهي من أهم الأسباب التي عتقا
تؤدي إلى delayed death

← زي ما بنعرف انه ال Brain
من أكثر ال organs التي بتعثر
O₂ و نقصاه يؤدي إلى
Brain damage in a few minutes

DRY DROWNING

in dry drowning, water doesn't enter the lungs due to laryngeal spasm induced by water entering the larynx.

seen in 1-2% of cases.

انتفض

Death maybe extremely rapid and time elapsed is insufficient for typical drowning to occur.

له في dry drowning بغير في زيادة في CO_2 و O_2 وهما

يؤدي إلى الوفاة بسرعة قبل ما يغير ال Typical drowning

Two mechanisms have been postulated :

1. Reflex cardiac arrest due to vasovagal stimulation
2. Laryngeal spasm and airway closure causing lethal

hypoxemia — لأنه مش رز به خل O_2 إلى lung
وهذا يؤدي $\uparrow CO_2$ و Cyanosis

in these cases , autopsy findings and tests for drowning are negative , and the lung fields are dry





POSTMORTEM SUBMERSION

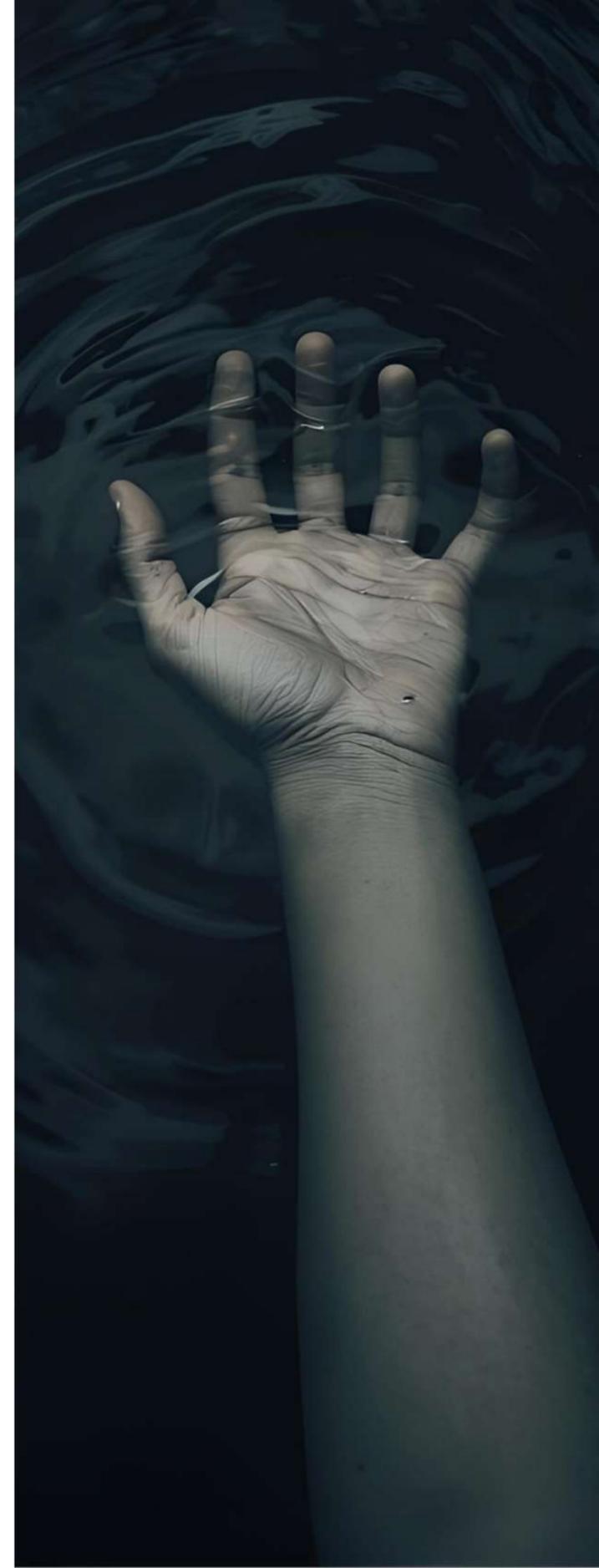
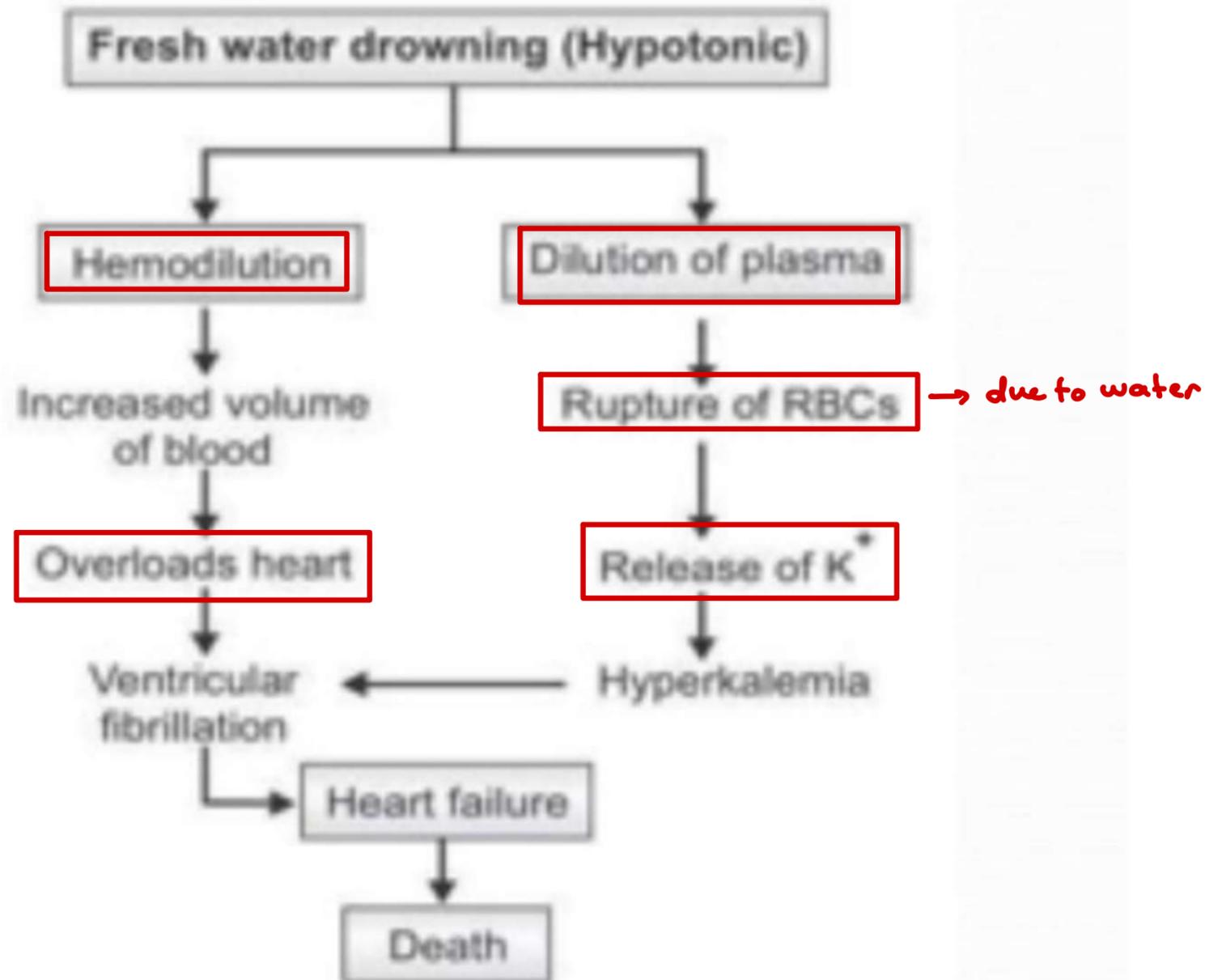
Bodies may be thrown into water after being killed by other means. Heavy objects are tied to the body to keep it under water for a long period. Sure signs of drowning are absent. Other cause of death is found e.g. strangulation, head injuries etc...

PHYSIOPATHOLOGICAL CHANGES

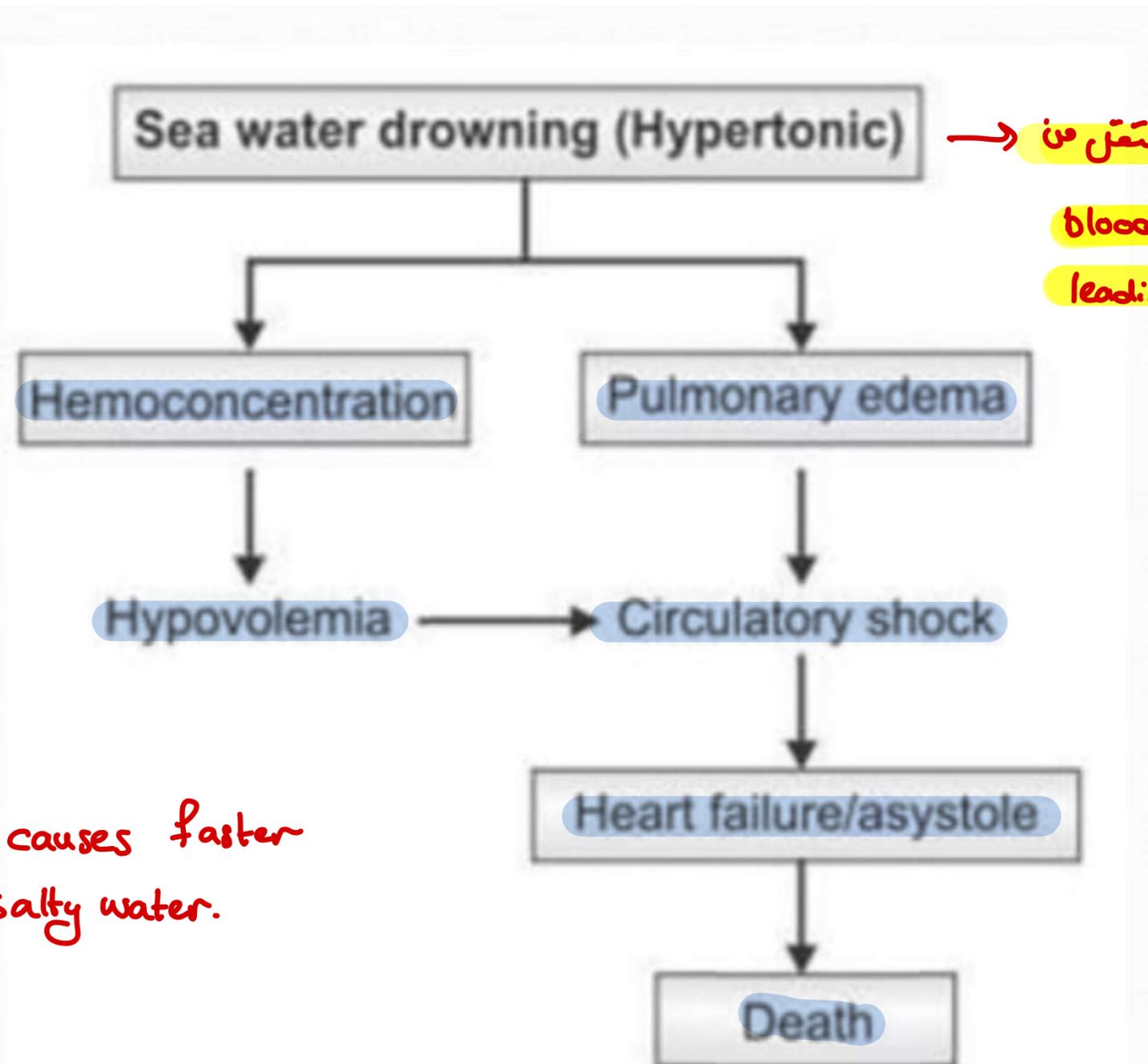
Mechanism of fresh water drowning

Fresh water لا Osmolarity
أقل من Blood Osmolarity وزي
ما يعرف! في الماء ينتقل من
low osmolarity → high osmolarity

فإنما تقوت ال fresh water على lung
و ينتقل الماء من lung إلى blood
وهذا يؤدي إلى حدوث hemodilution
و increase volume of blood



MECHANISM OF SEA WATER DROWNING



→ هون الماء رح يتغل من

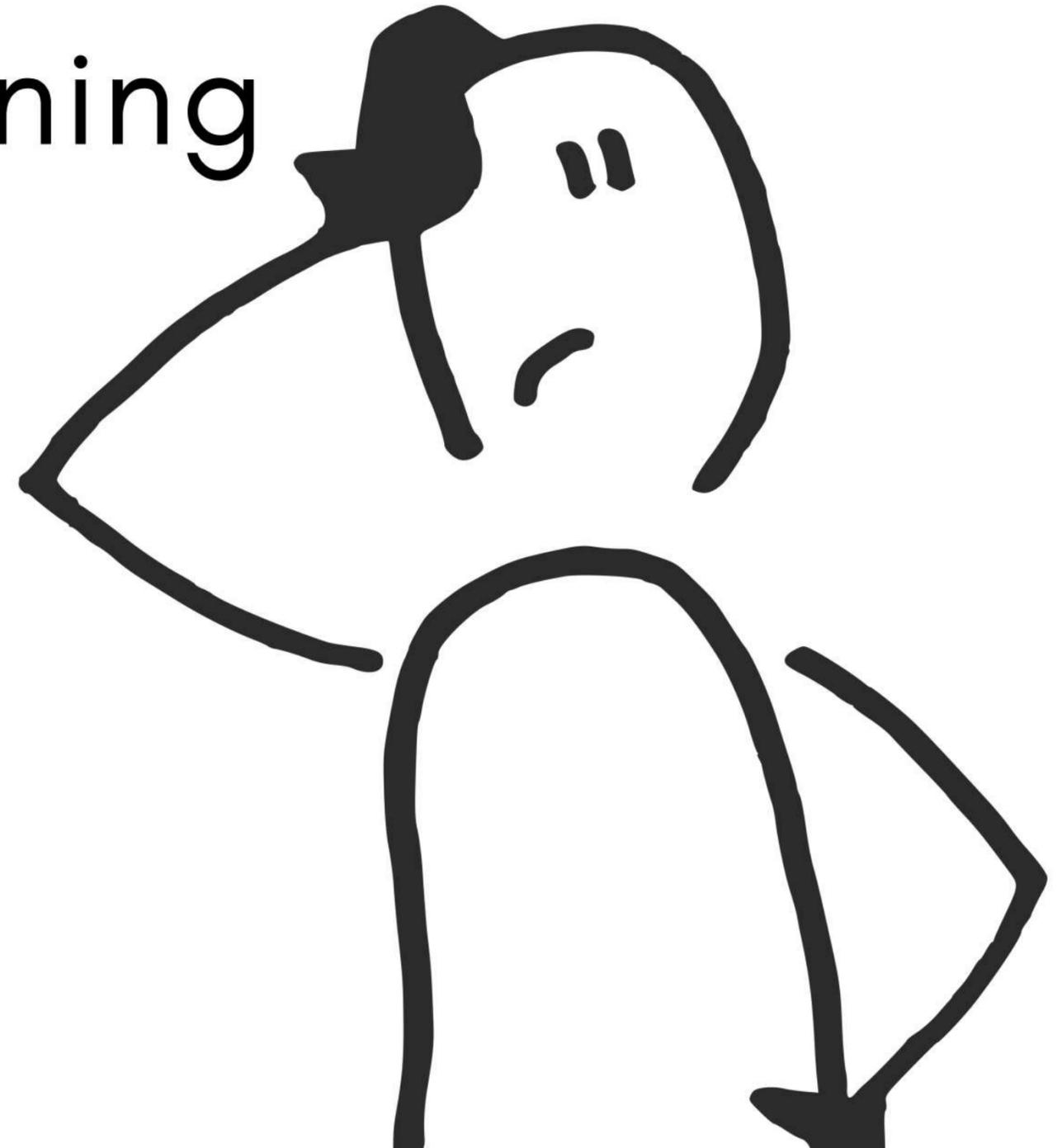
blood → lung

leading to hypovolemia and pulmonary edema

* Fresh water causes faster death than salty water.



In your opinion, how the
person dead from drowning
looks like?

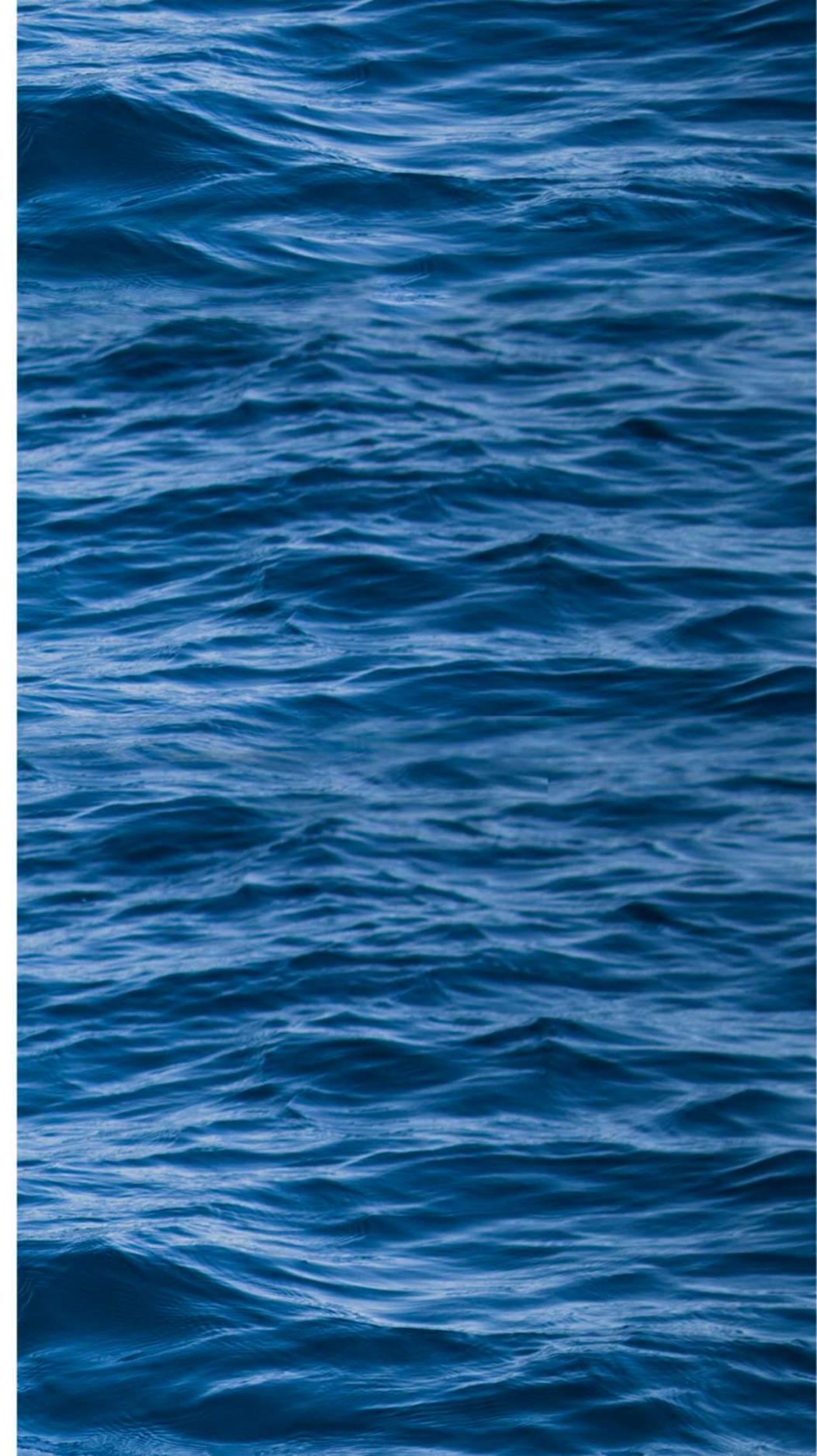


EXTERNAL APPEARANCES

Signs of immersion:

These are found in any body found dead in water (whatever the cause of death). → These are general signs not Specific for drowning

- Coolness of the body.
- Goose-skin the skin is wrinkled.
- Washerwoman-skin: the skin is sodden.
- Peeling of the epidermis in the form of gloves and stockings.
- Hypostasis





GOOSE SKIN



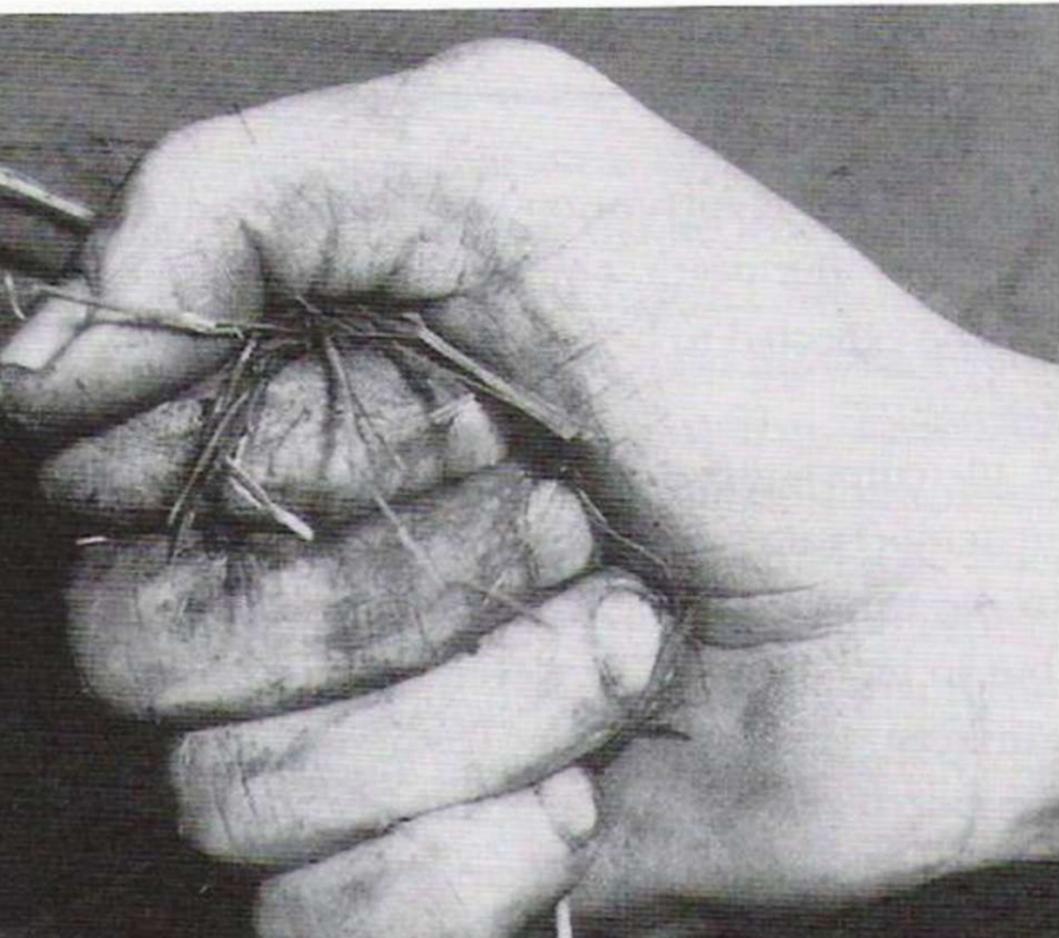
WRINKLES



**GLOVES AND
STOCKINGS
APPEARANCE**



SURE EXTERNAL SIGNS:



زَبَد

1. Froth

هو specific لأنَّهُ لا تدخل اليه بكتيريا

مع air و surfactant و mucus

ويتكوّن إلى هذا froth

fine, white, odorless, increase



لما عسج ال Froth

وترجع ضغط على

الصدر مرة ثانية

2. يرجع يطلع

فإن مرة

2. Cadaveric spasm

→ affect one group of muscles (voluntary)

وكثير تليل إنف تشوفه ، وهي تدل على آخره action قبل الوفاة

of the hands weeds, mud, sand, etc.

Rigor mortis ← تيبس بالجثة بغير بعد الوفاة ، بغير في Stiffness بال muscles سواء كانت voluntary or involuntary

INTERNAL APPEARANCES

→ سببها وجود الماء في الرئتين
water lungs

lungs will be heavy, ballooned, rib markings and pale in color

↑
Characteristic for wet drawing

- Lungs **emphysema aquosum** are ballooned and overlap the pericardium.
- Being loaded with water, they pit on pressure and rib markings are usually present.
- They are pale in color.

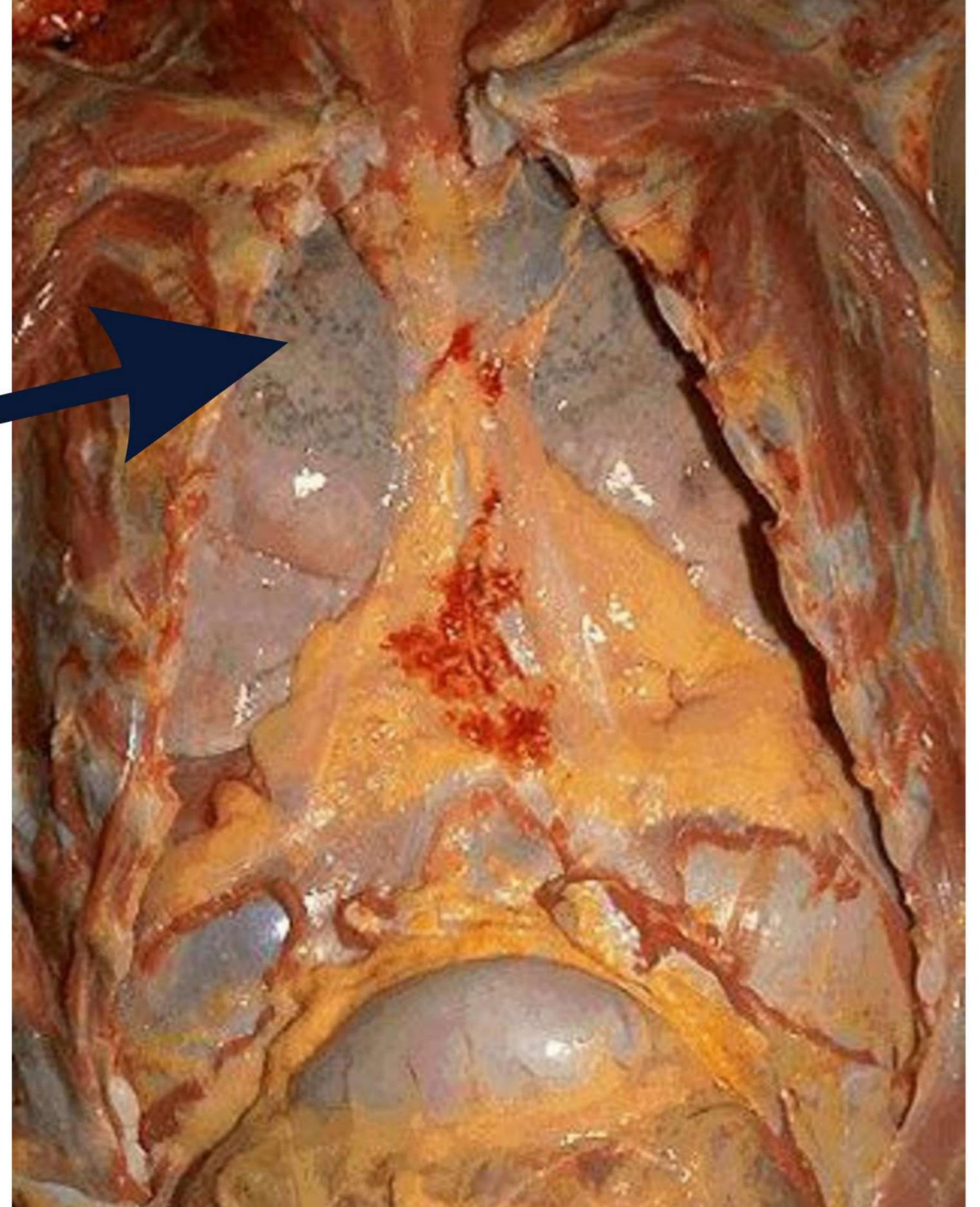
↑
لأنه الرئة الـ lung كبرت
و ribs حفظوا عيها

- Voluminous lungs.
- Respiratory passages contain froth (having the same characters of that found externally at the mouth and nostrils).
- foreign material (weeds, mud, sand, ..).

حشيش

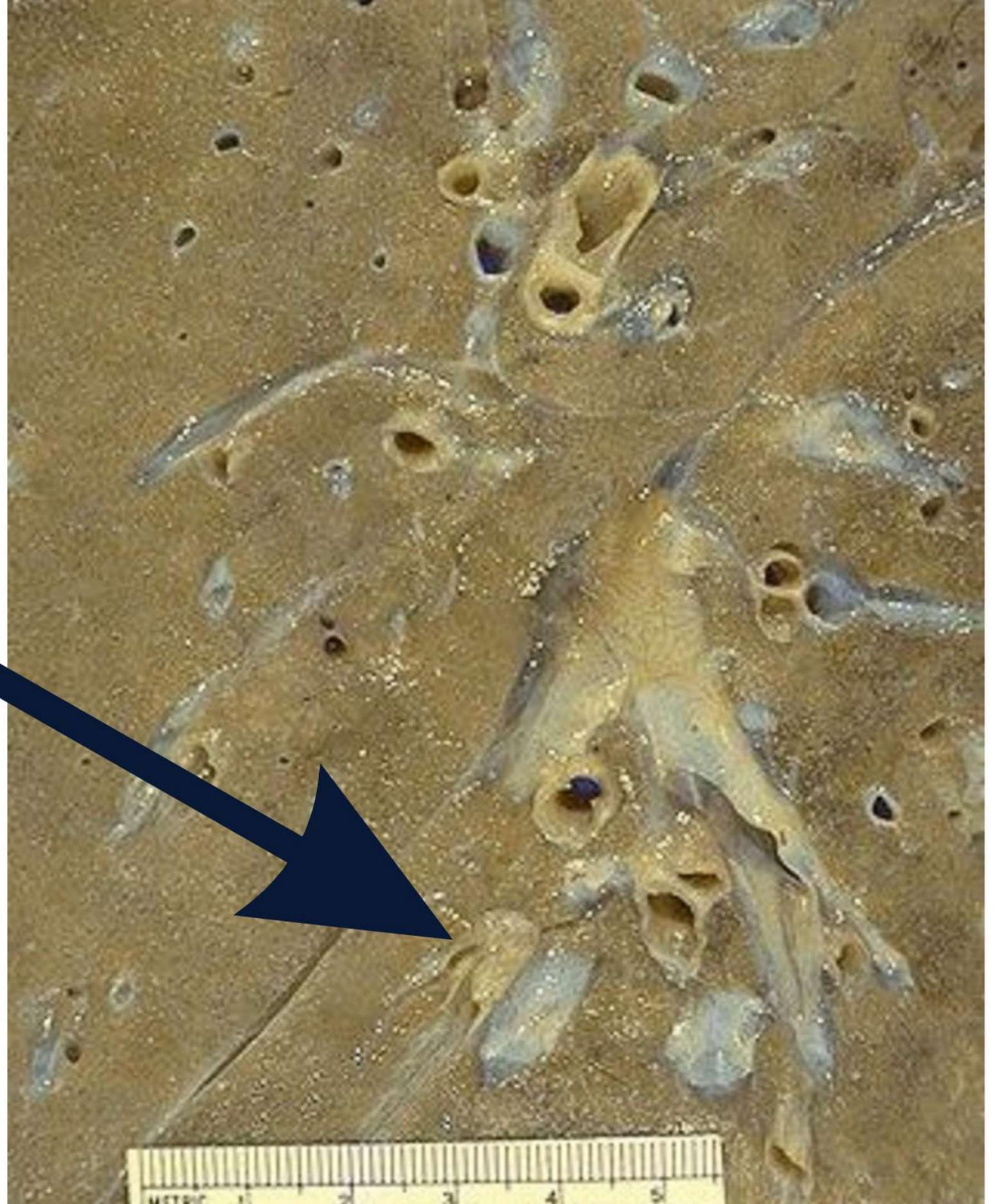
A normal pink aerated appearance
with minimal anthracotic
pigmentation

Black pigmentation
تظهِر على شكل نقاط
مغبرة سوداء



Diffuse alveolar damage in which the lung is diffusely firm and rubbery, spongy

مبتغاً لهذا از damage که به سبب دخول املاک



Diatom

← نوع من أنواع الطحالب موجودة في كل أنواع water

سواء fresh أو Salty

ولكن ليس والي بخلف !!

هي بتساعدنا على معرفة نوع المي والي توغى

فيها وتساعدني أعرف هل هو

ماء

دج ايتضيا في organs → drowning

post mortem submerssion



ممكن يكون مقتول

بعد ها الرمي في

الماء

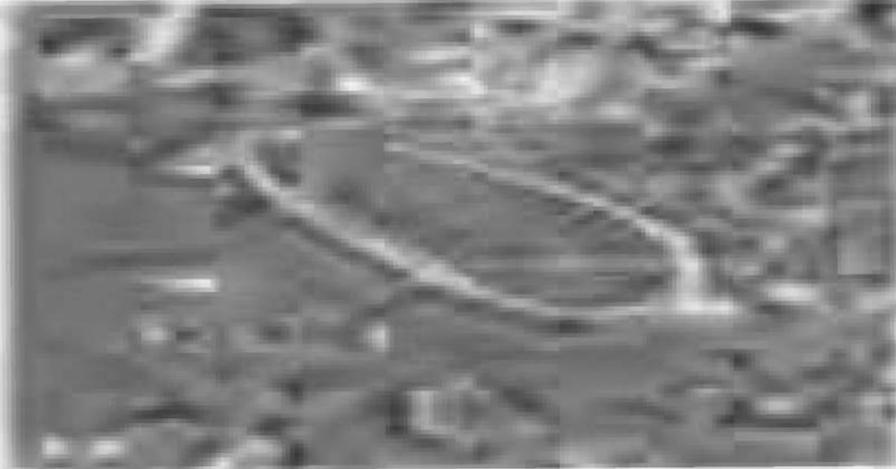
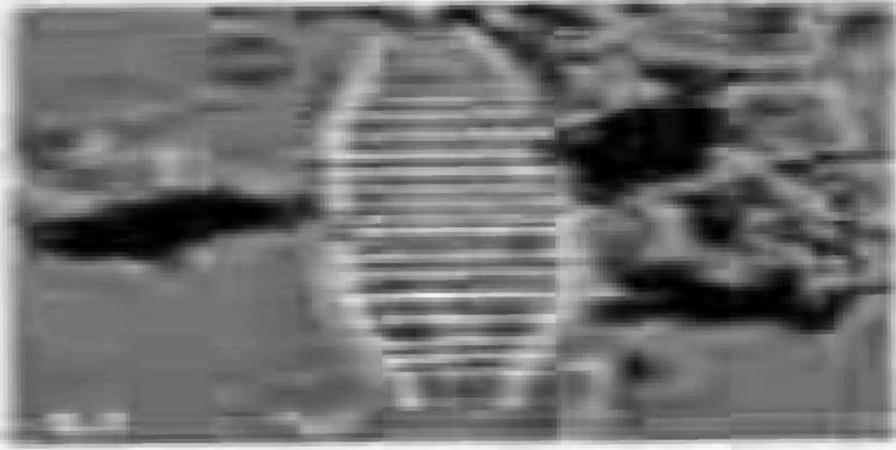
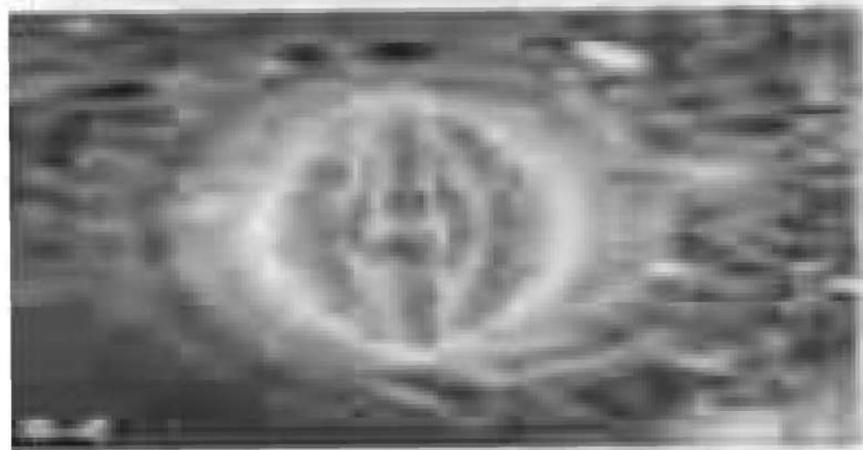
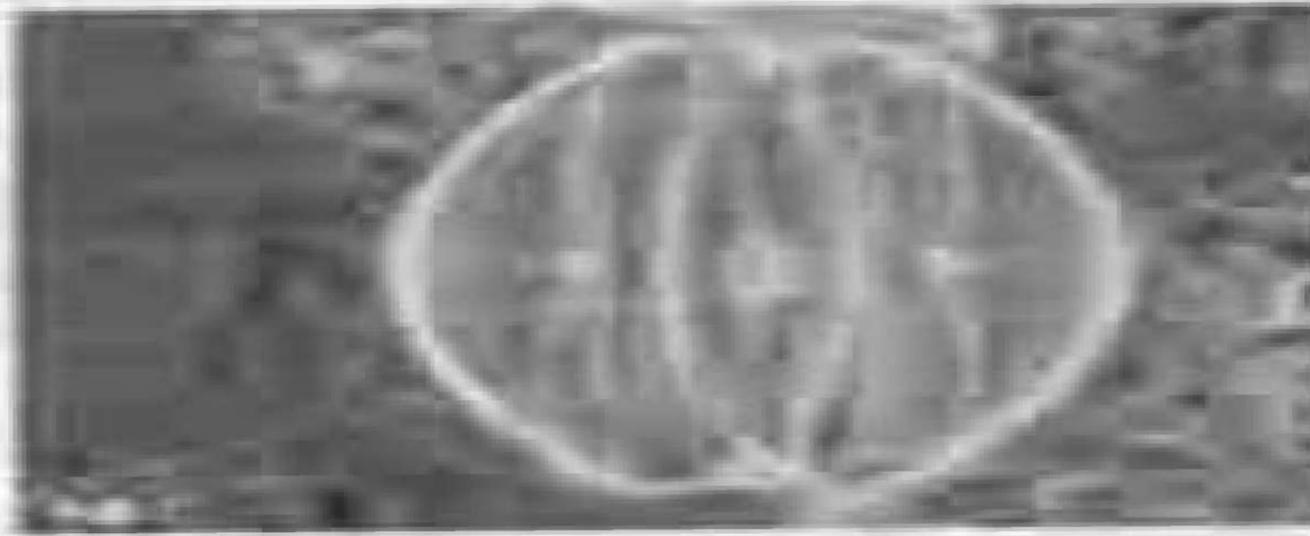
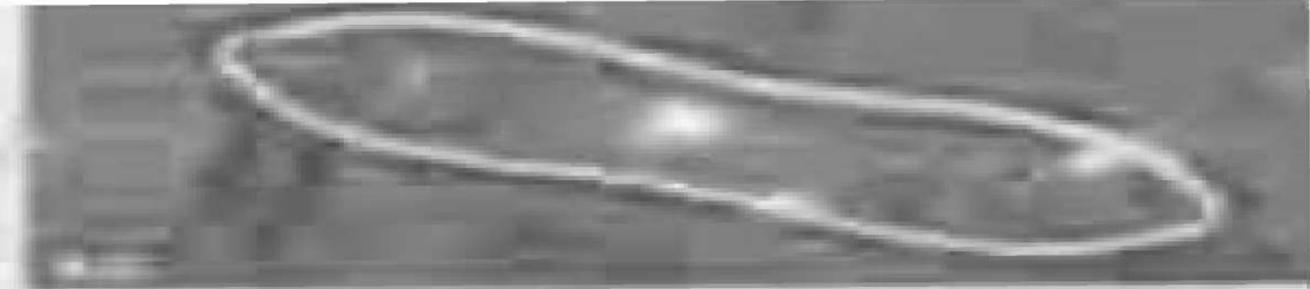
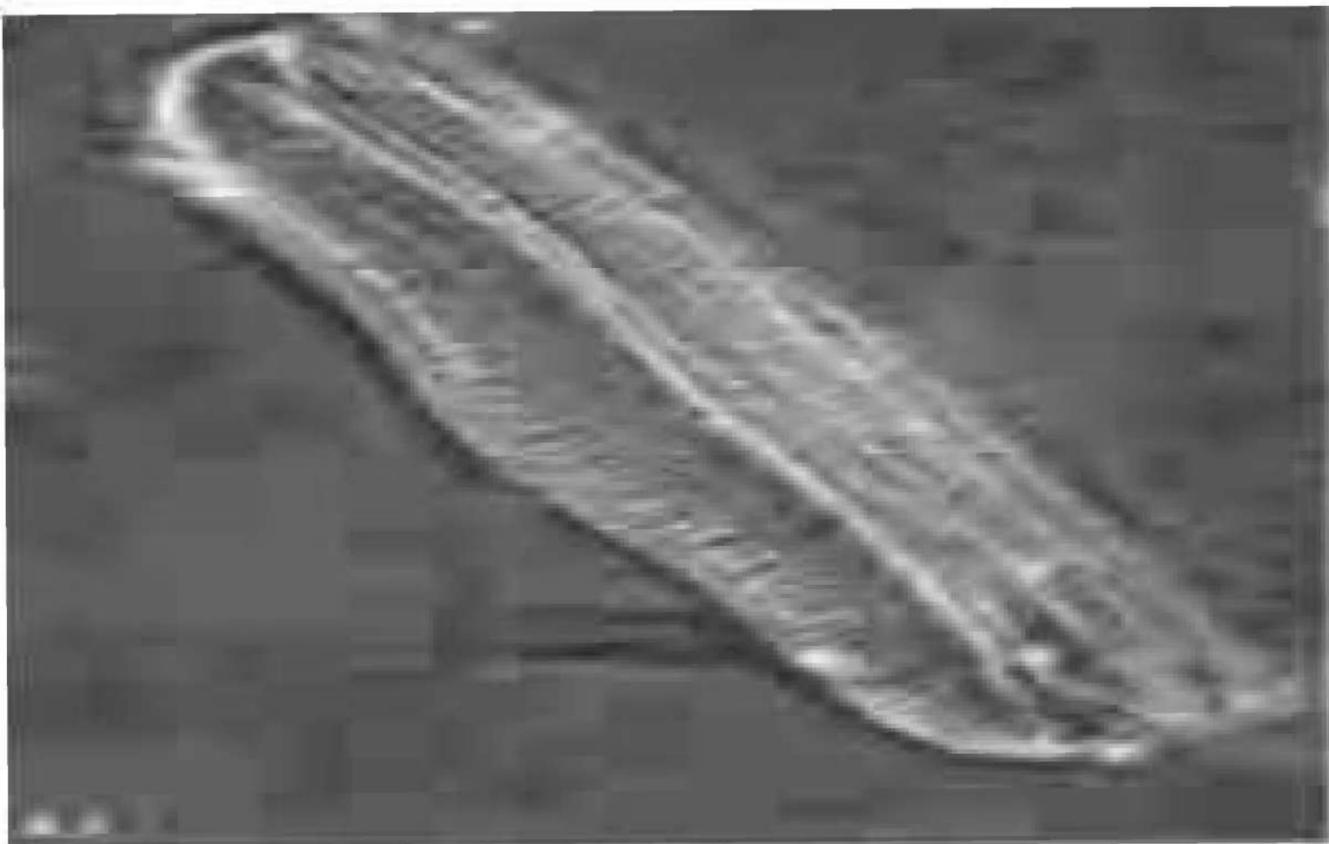
عن طريق
it's species

50-μM



DIATOM

- These are microscopic, unicellular algae, found in fresh as well as salt water.
- When a live person is drowned in water, they penetrate his alveolar membrane and pass with the circulation to distant organs.



THE MEDICO-LEGAL (ML) IMPORTANCE OF DIATOMS:

- 1- Sure signs of drowning.
- 2- Could still be identified in putrefied bodies.
- 3- Could give an evidence of the site of drowning (fresh or salt water species).

تَعْنِيَة

CASE EXAMPLE







سكتة دماغية
of raining *

05/13/2013 12:51 AM

THANK YOU.

