Embolism

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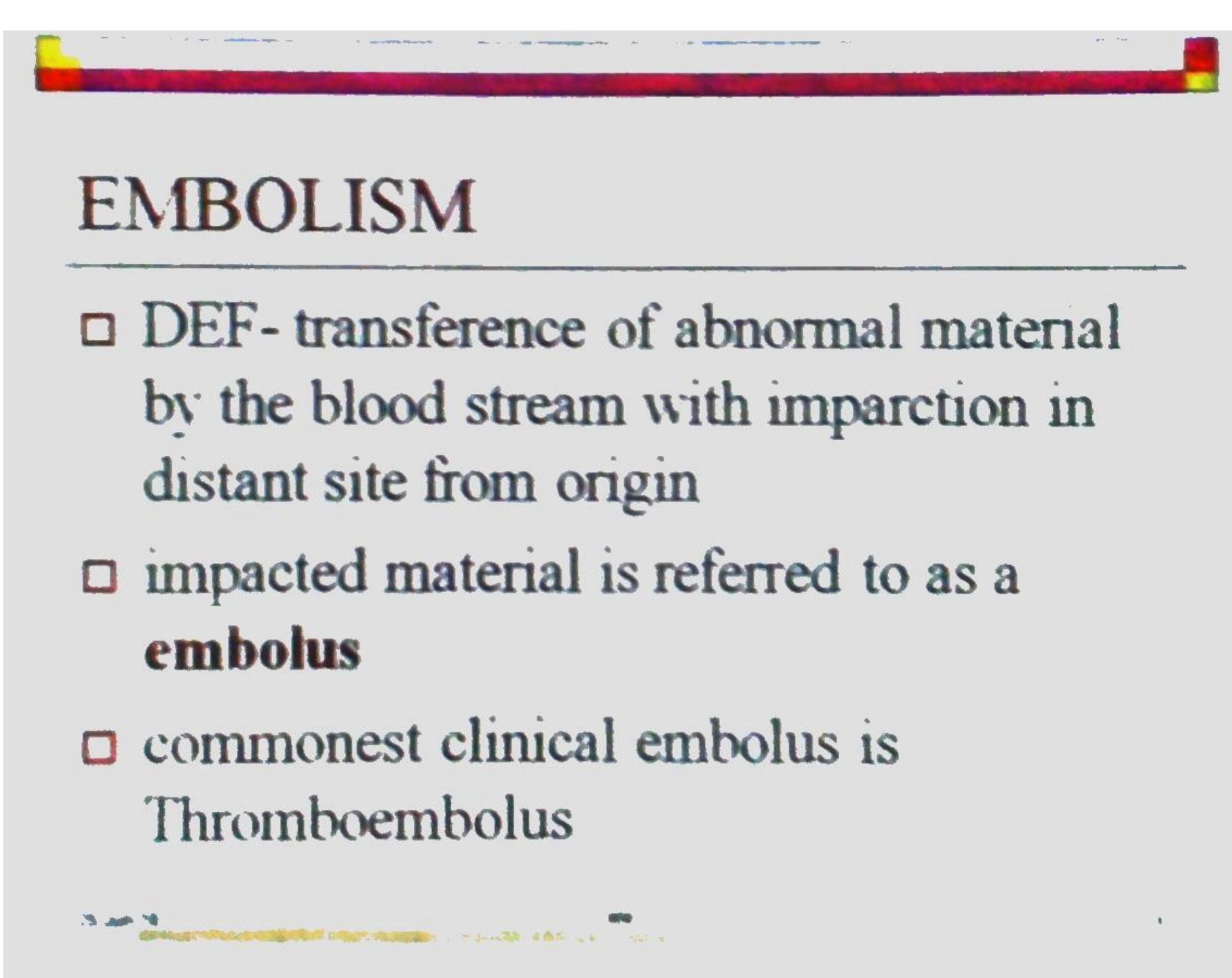
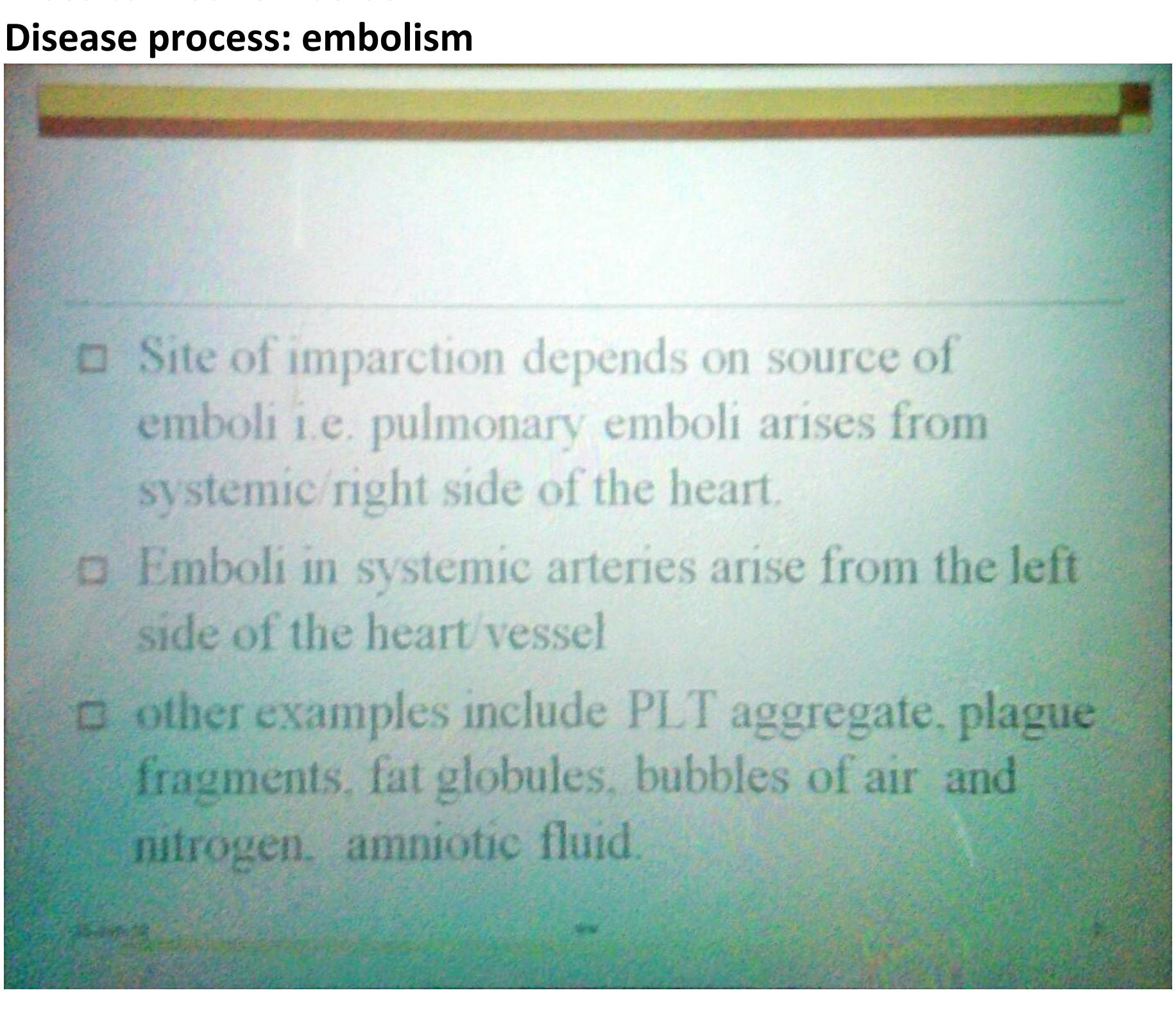


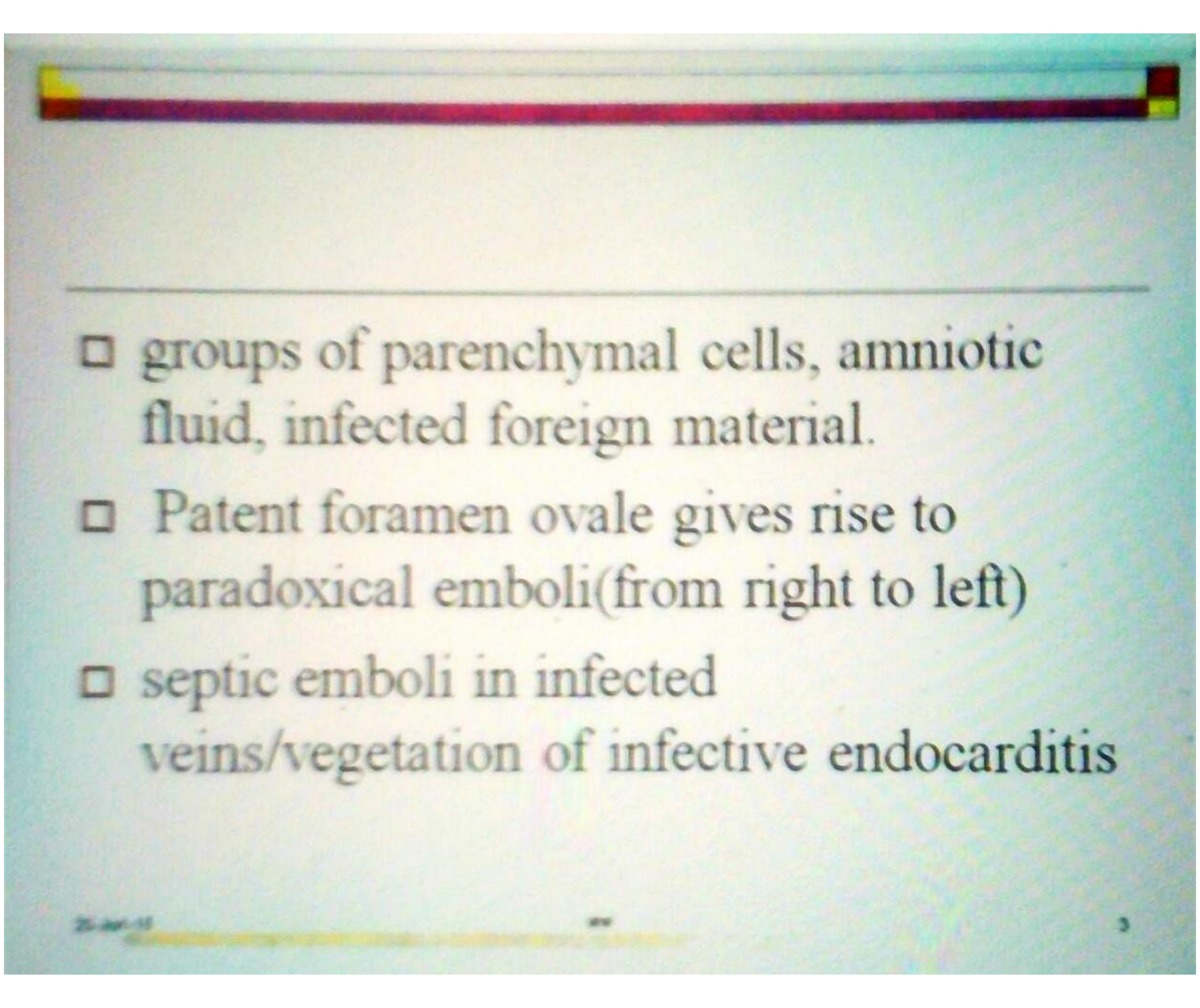
EMBOLISM

- ☐ DEF- transference of abnormal material by the blood stream with imparction in distant site from origin
- ☐ impacted material is referred to as a **embolus**
- ☐ commonest clinical embolus is Thromboembolus

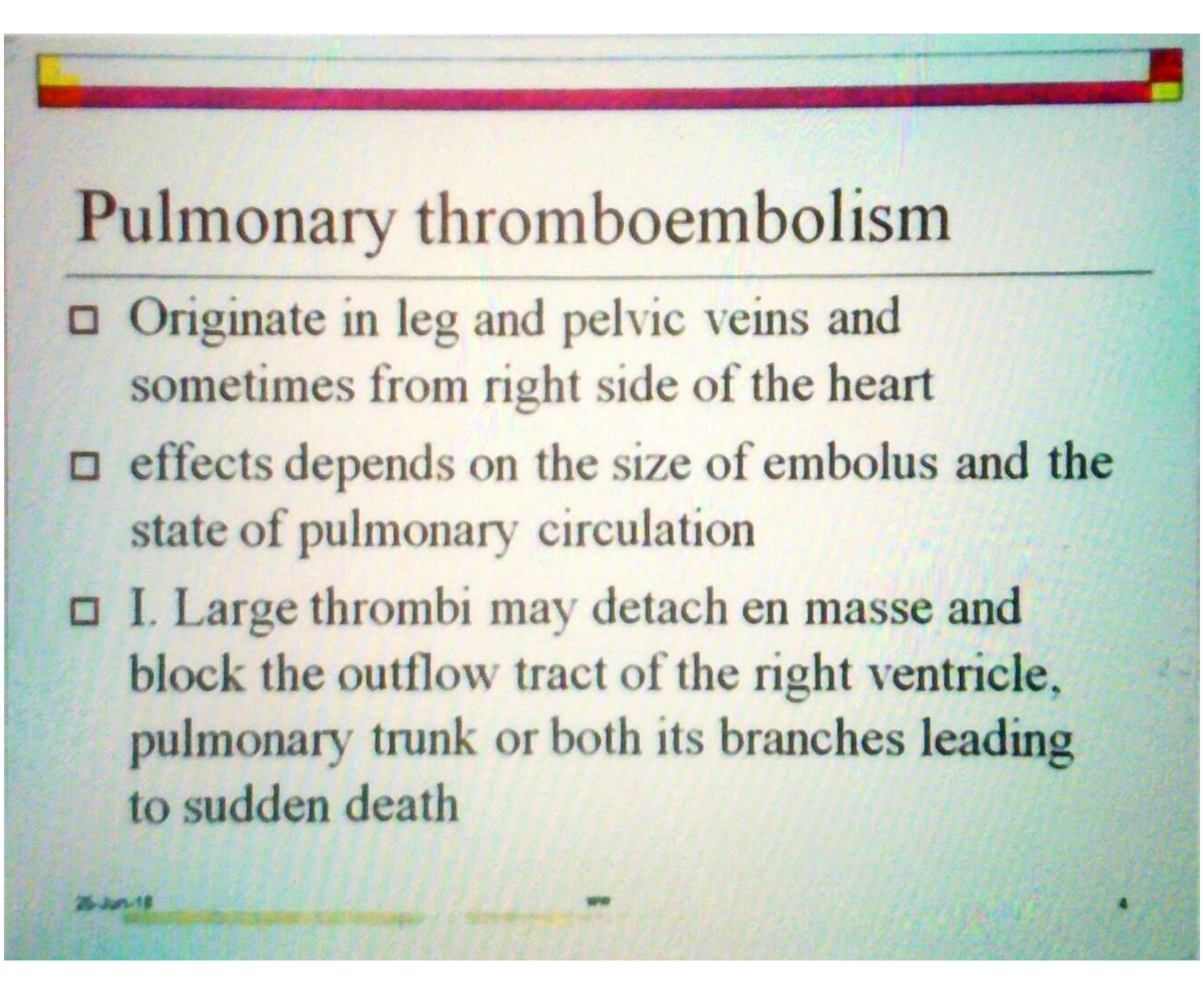
Mass carried: embolus
Disease process: embolism



- ☐ Site of imparction depends on source of emboli i.e. pulmonary emboli arises from systemic/right side of the heart.
- ☐ Emboli in systemic arteries arise from the left side of the heart/vessel
- ☐ other examples include PLT aggregate, plague fragments, fat globules, bubbles of air and nitrogen, amniotic fluid.

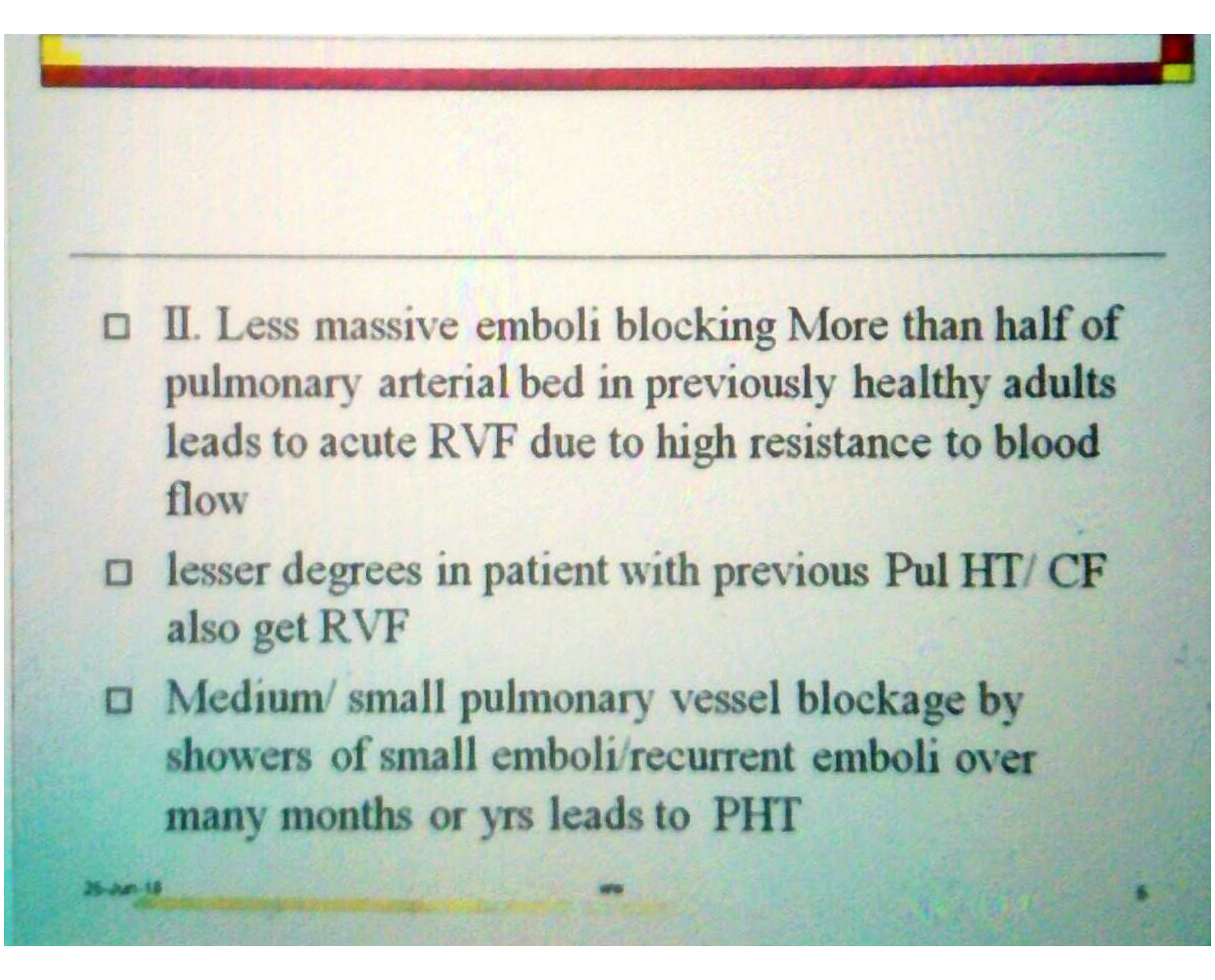


- ☐ groups of parenchymal cells, amniotic fluid, infected foreign material.
- ☐ Patent foramen ovale gives rise to paradoxical emboli(from right to left)
- ☐ septic emboli in infected veins/vegetation of infective endocarditis

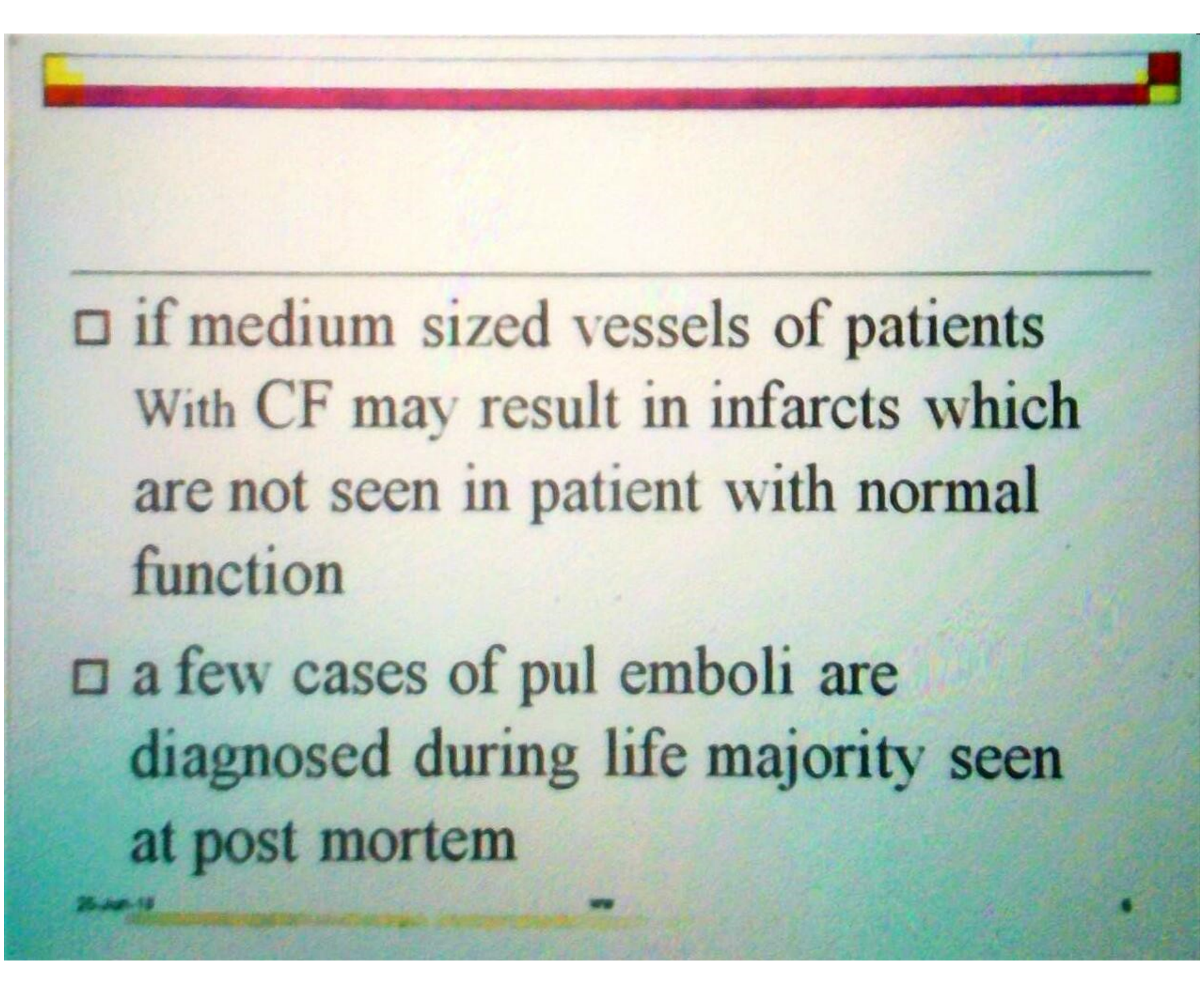


Pulmonary thromboembolism

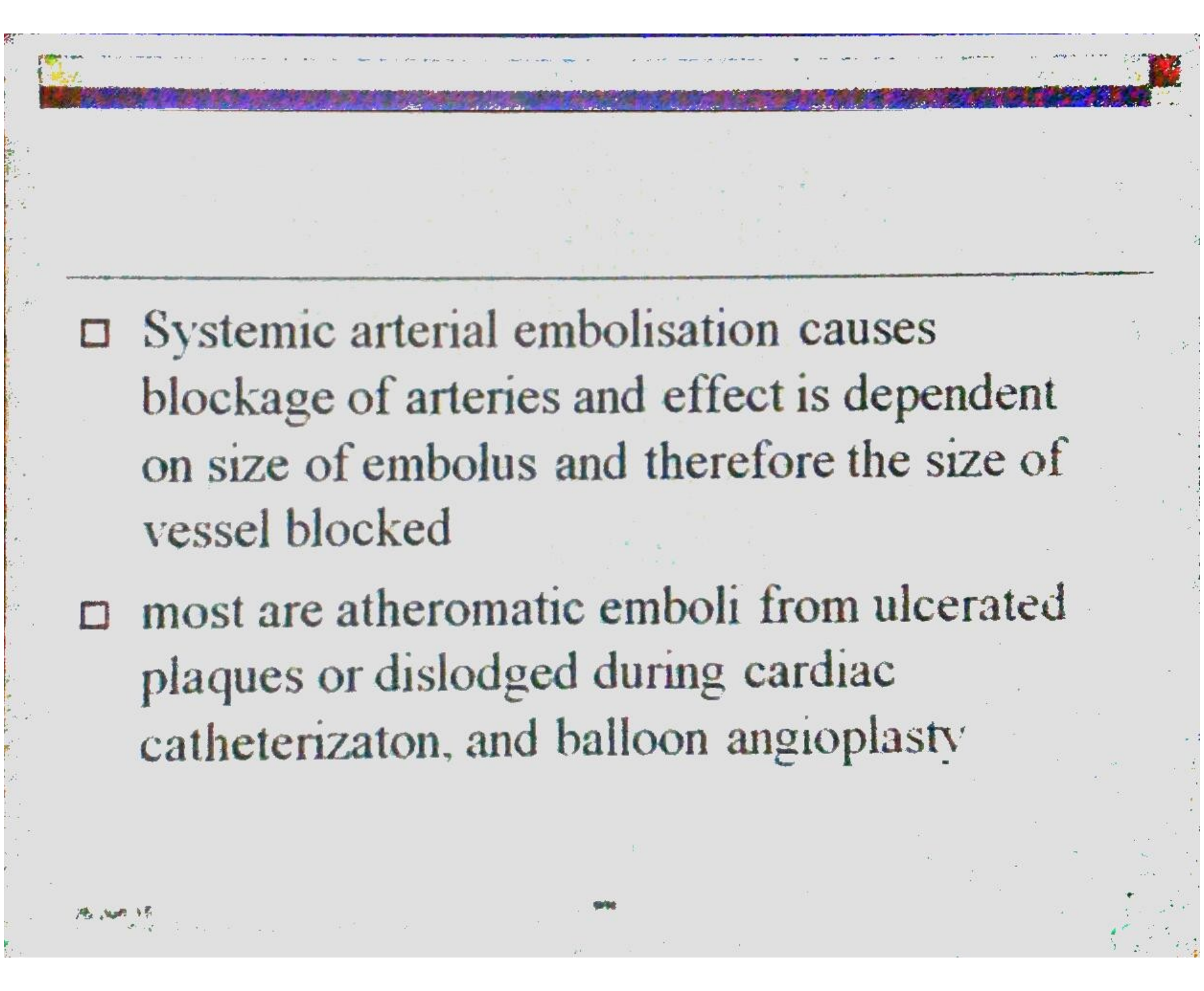
- ☐ Originate in leg and pelvic veins and sometimes from right side of the heart
- ☐ effects depends on the size of embolus and the state of pulmonary circulation
- ☐ I. Large thrombi may detach en masse and block the outflow tract of the right ventricle, pulmonary trunk or both its branches leading to sudden death



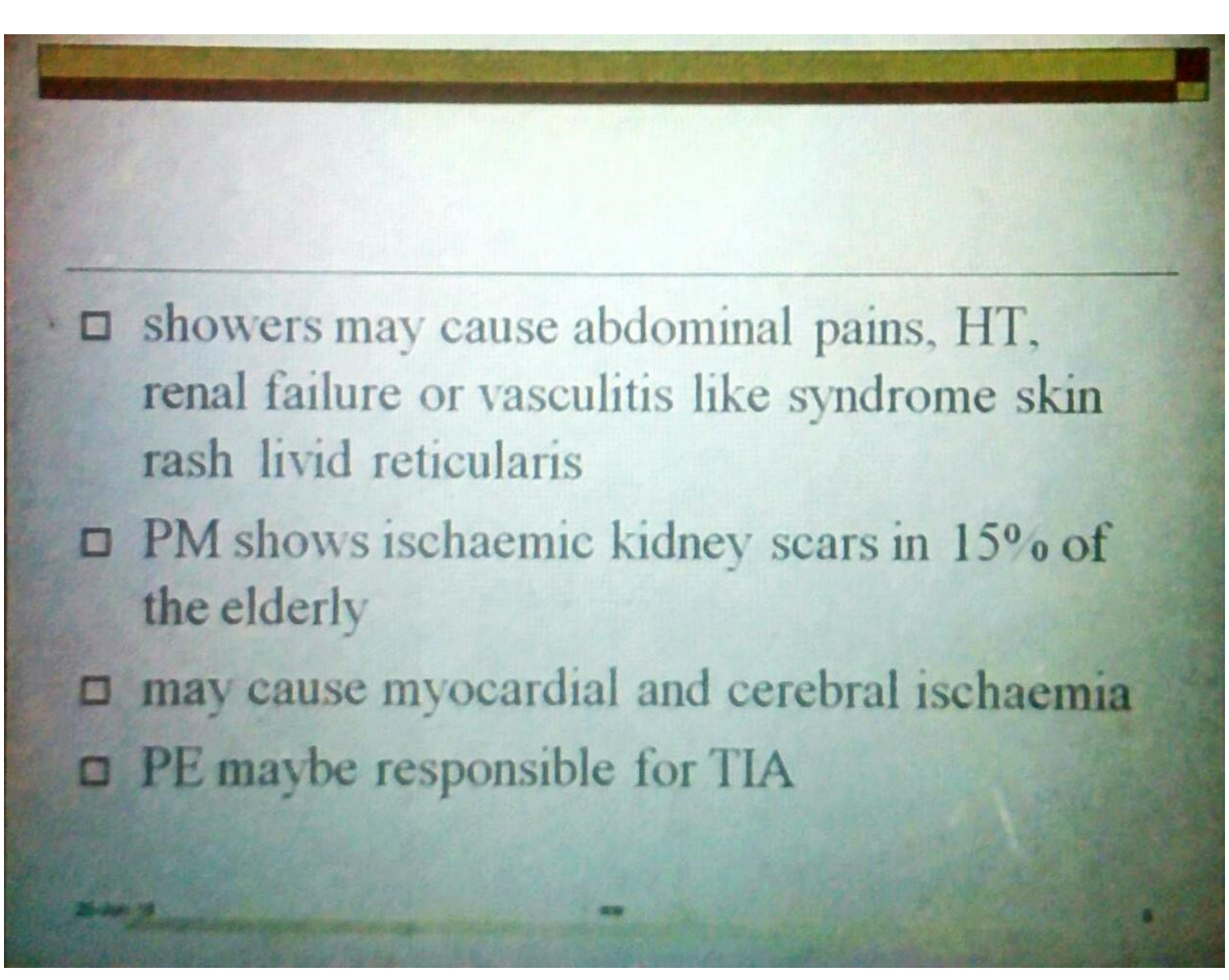
- ☐ II. Less massive emboli blocking More than half of pulmonary arterial bed in previously healthy adults leads to acute RVF due to high resistance to blood flow
- ☐ lesser degrees in patient with previous Pul HT/ CF also get RVF
- ☐ Medium/ small pulmonary vessel blockage by showers of small emboli/recurrent emboli over many months or yrs leads to PHT



- ☐ if medium sized vessels of patients With CF may result in infarcts which are not seen in patient with normal function
- ☐ a few cases of pul emboli are diagnosed during life majority seen at post mortem

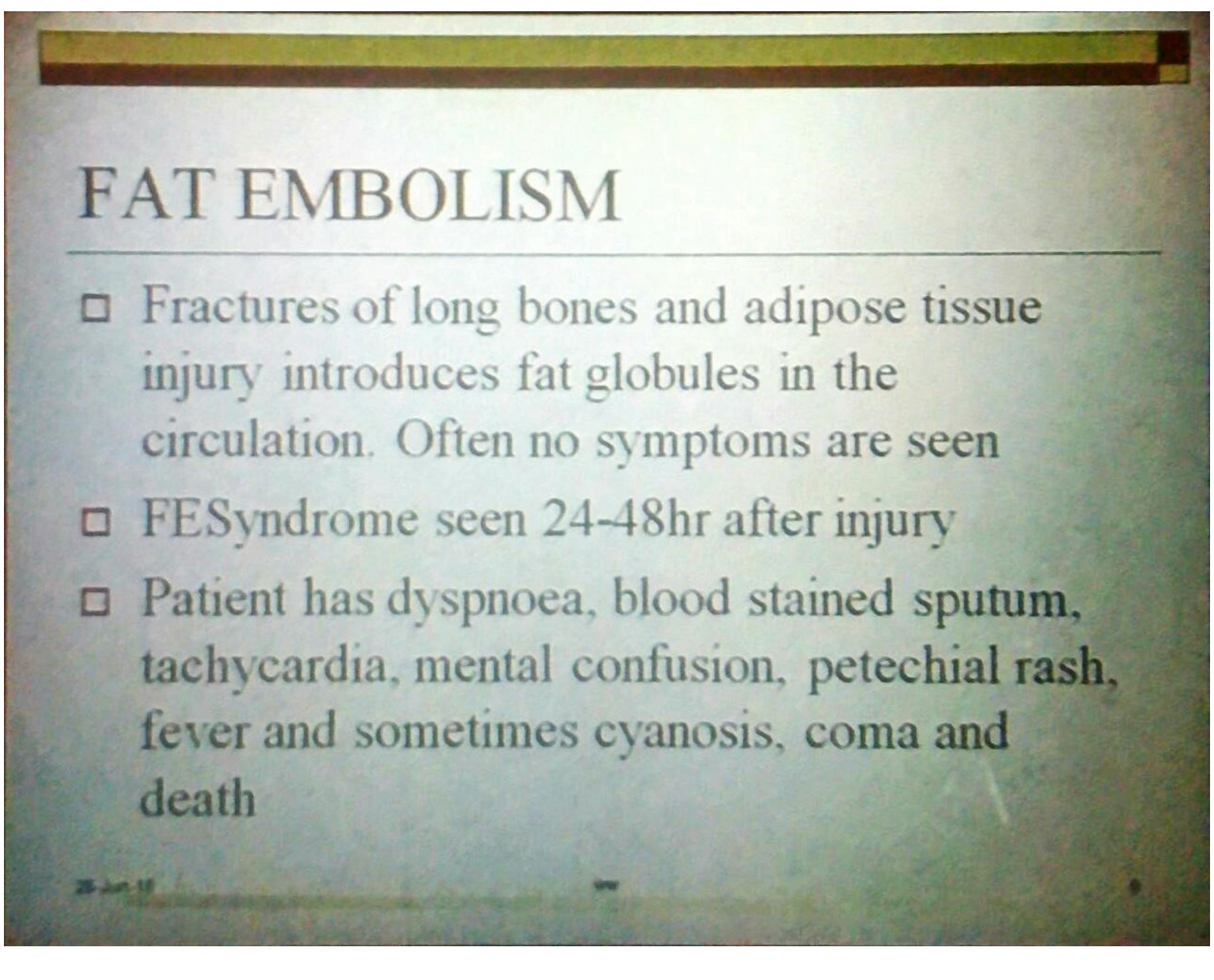


- ☐ Systemic arterial embolisation causes blockage of arteries and effect is dependent on size of embolus and therefore the size of vessel blocked
- ☐ most are atheromatic emboli from ulcerated plaques or dislodged during cardiac catheterizaton, and balloon angioplasty



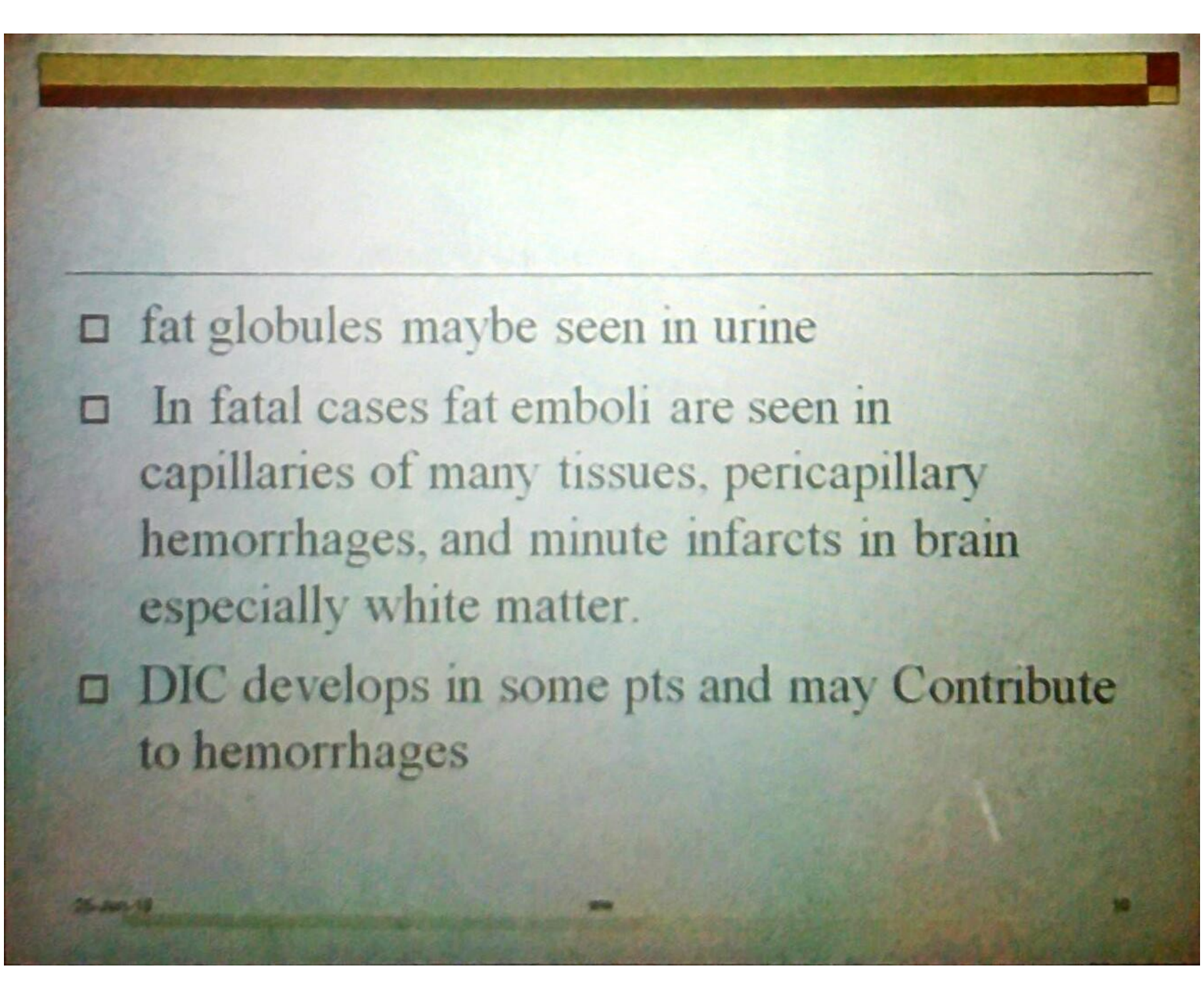
- ☐ showers may cause abdominal pains, HT, renal failure or vasculitis like syndrome skin rash livid reticularis
- ☐ PM shows ischaemic kidney scars in 15% of the elderly
- ☐ may cause myocardial and cerebral ischaemia
- ☐ PE maybe responsible for TIA

PM: post mortem
TIA: transient ischemic attack

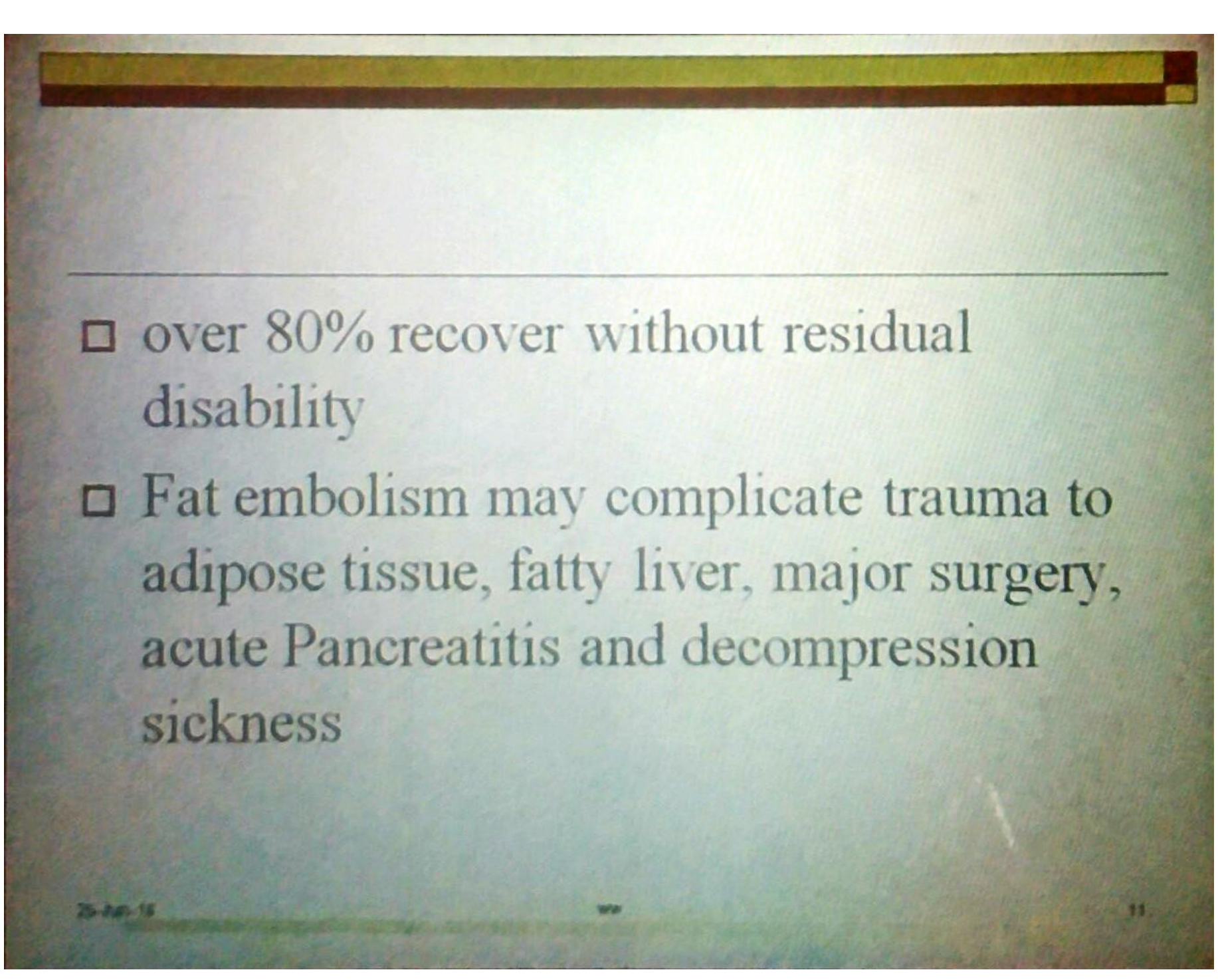


FAT EMBOLISM

- ☐ Fractures of long bones and adipose tissue injury introduces fat globules in the circulation. Often no symptoms are seen
- ☐ FESyndrome seen 24-48hr after injury
- ☐ Patient has dyspnoea, blood stained sputum, tachycardia, mental confusion, petechial rash, fever and sometimes cyanosis, coma and death

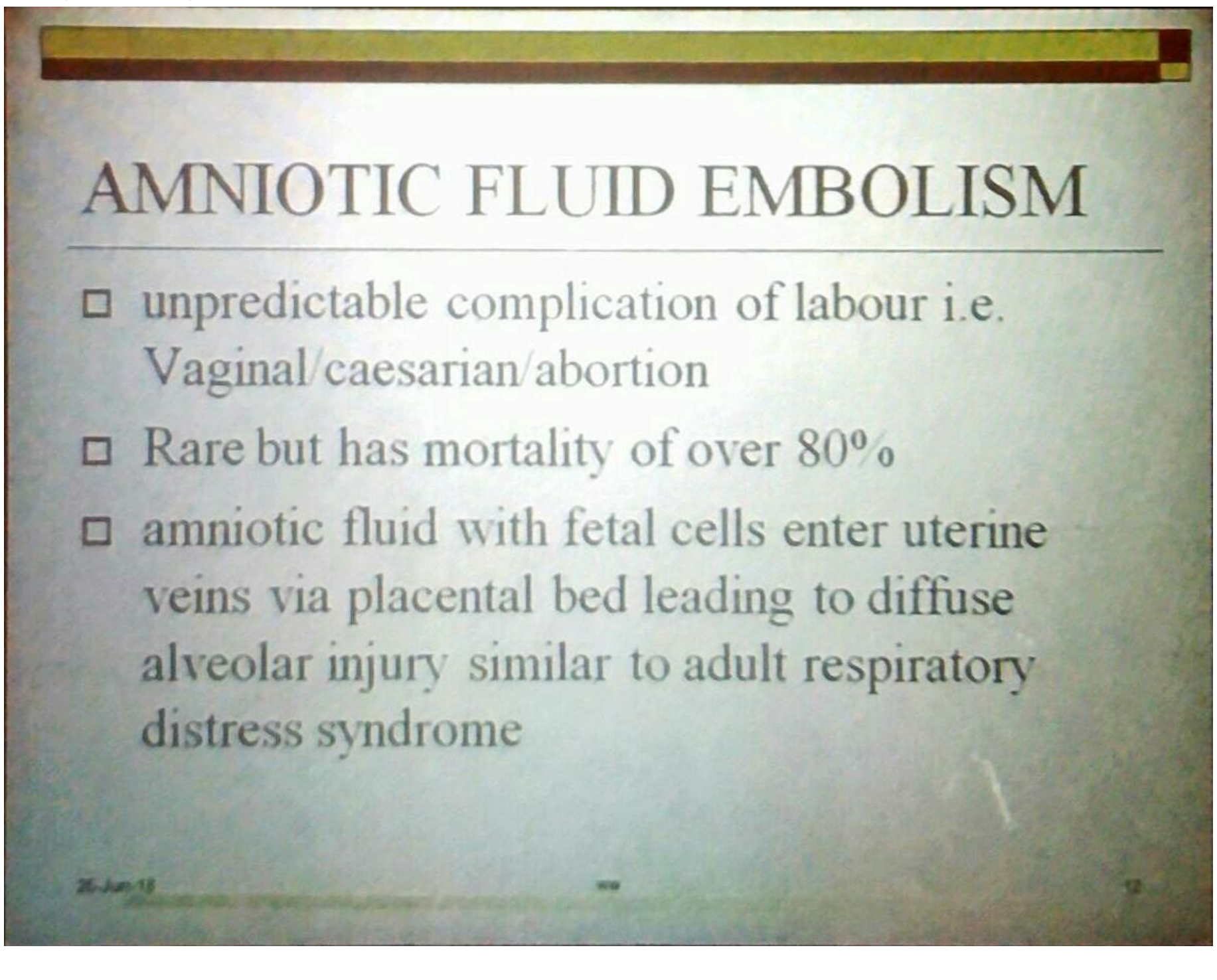


- ☐ fat globules maybe seen in urine
- ☐ In fatal cases fat emboli are seen in capillaries of many tissues, pericapillary hemorrhages, and minute infarcts in brain especially white matter.
- ☐ DIC develops in some pts and may Contribute to hemorrhages



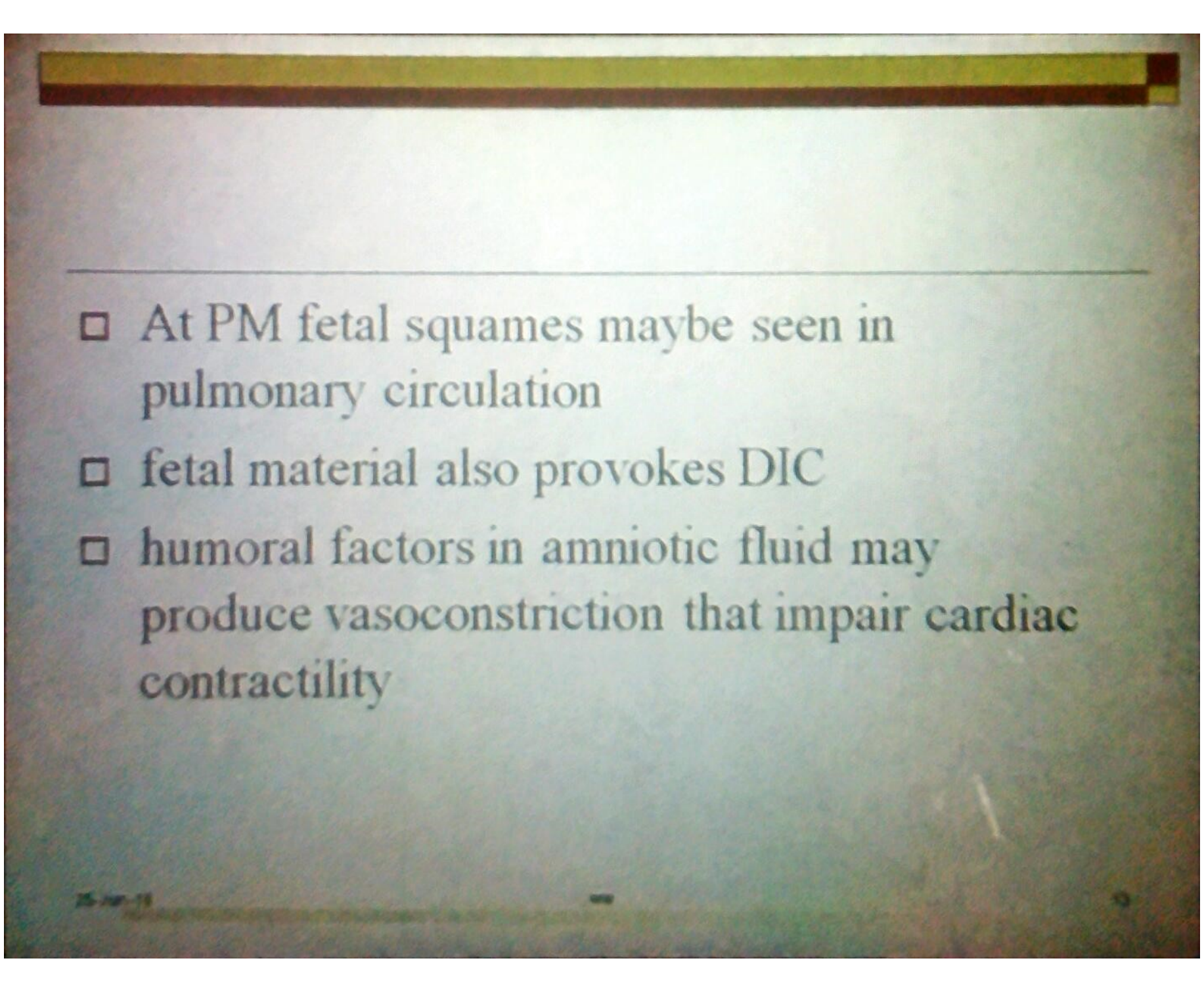
- ☐ over 80% recover without residual disability
- ☐ Fat embolism may complicate trauma to adipose tissue, fatty liver, major surgery, acute Pancreatitis and decompression sickness

Major surgery thru fat

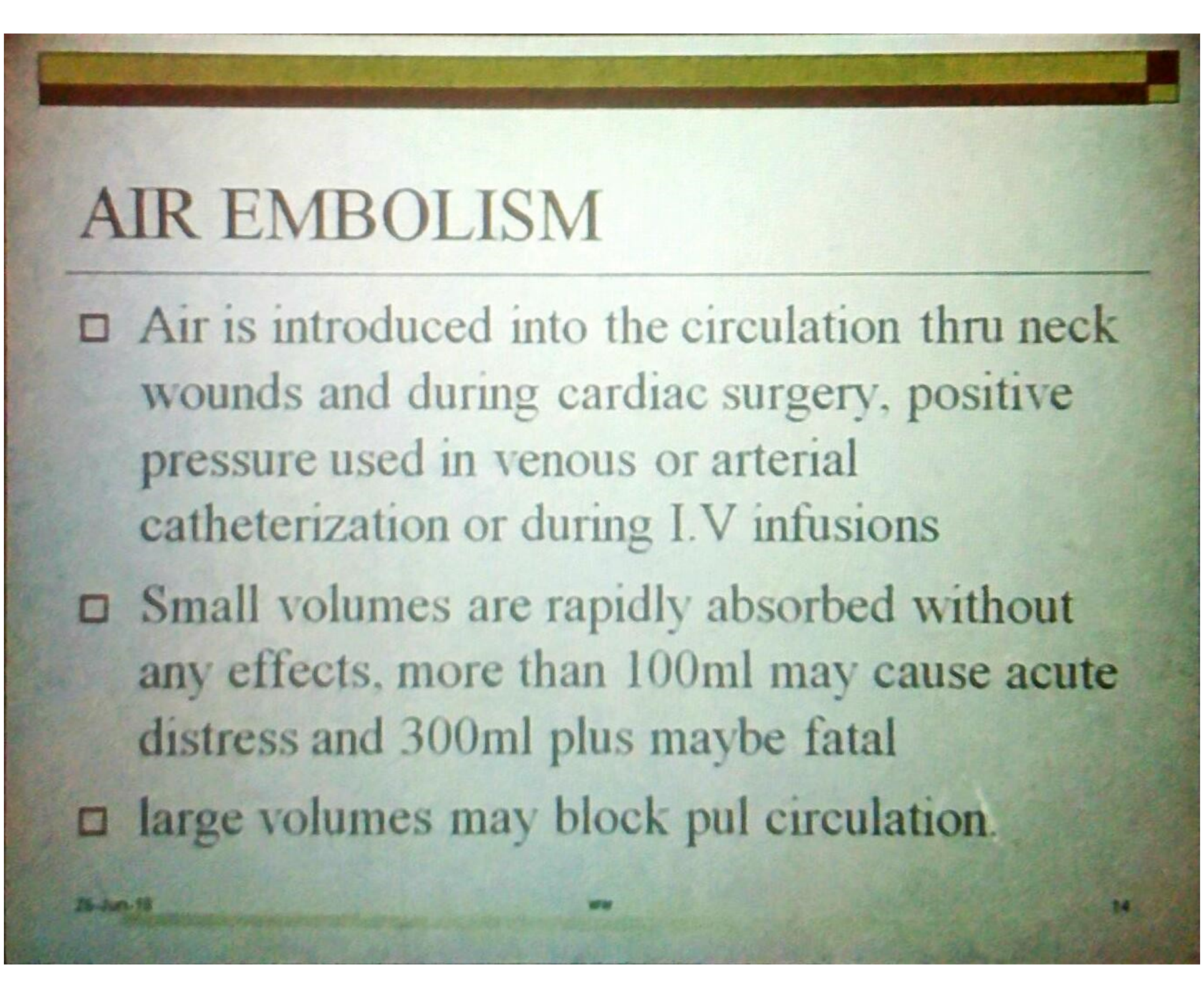


AMNIOTIC FLUID EMBOLISM

- ☐ unpredictable complication of labour i.e. Vaginal/caesarian/abortion
- ☐ Rare but has mortality of over 80%
- ☐ amniotic fluid with fetal cells enter uterine veins via placental bed leading to diffuse alveolar injury similar to adult respiratory distress syndrome

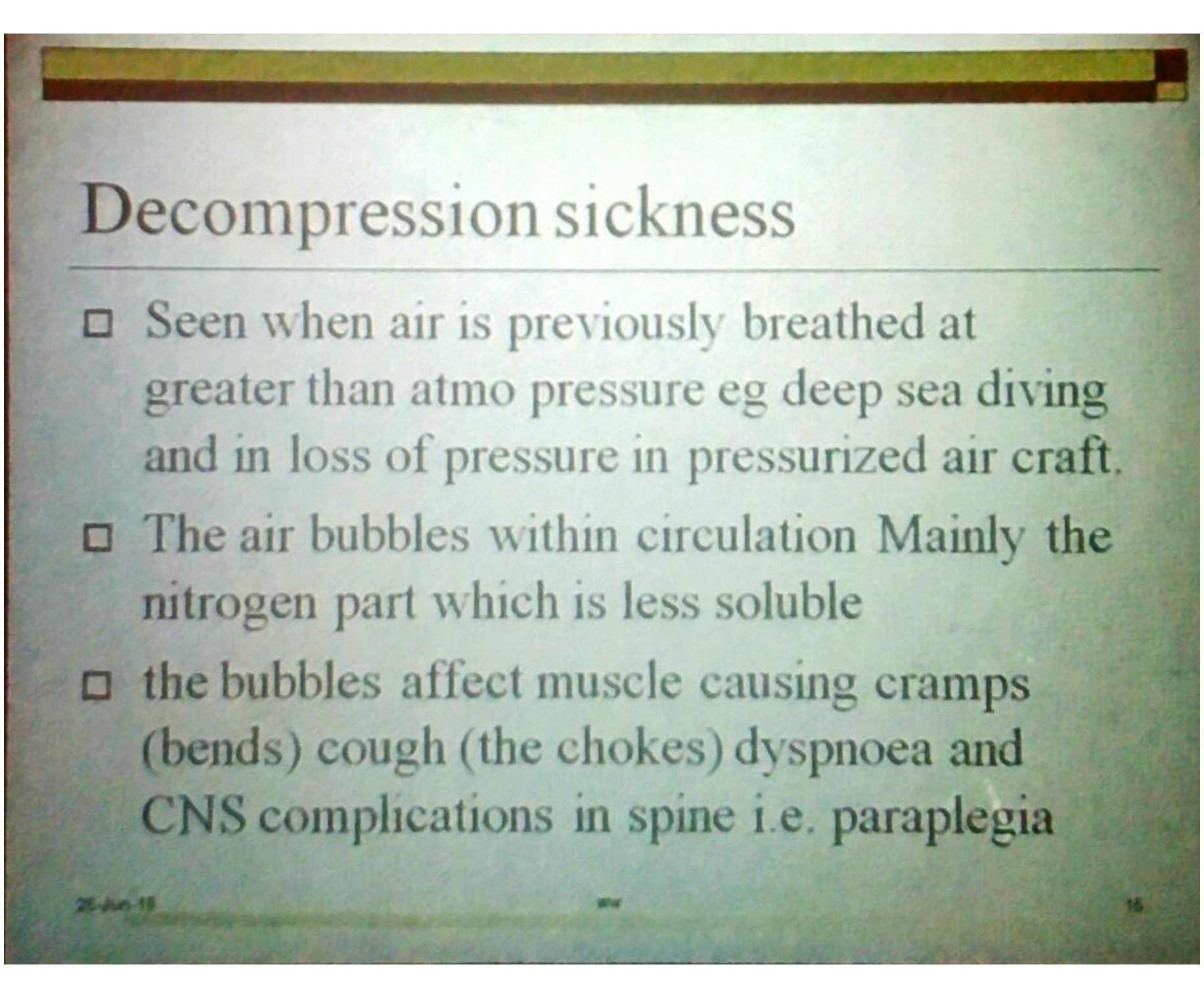


- ☐ At PM fetal squames maybe seen in pulmonary circulation
- ☐ fetal material also provokes DIC
- ☐ humoral factors in amniotic fluid may produce vasoconstriction that impair cardiac contractility



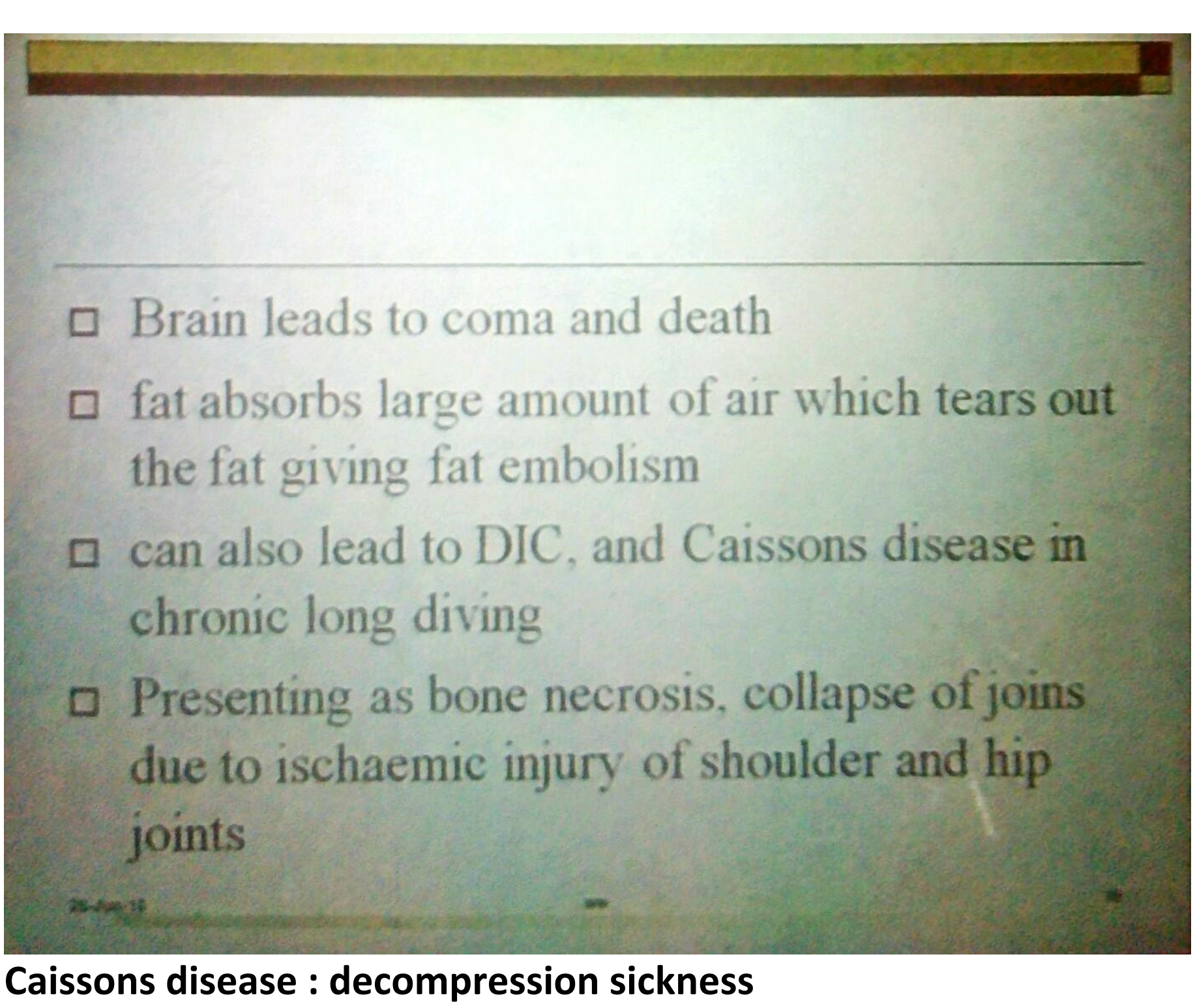
AIR EMBOLISM

- ☐ Air is introduced into the circulation thru neck wounds and during cardiac surgery, positive pressure used in venous or arterial catheterization or during I.V infusions
- ☐ Small volumes are rapidly absorbed without any effects, more than 100ml may cause acute distress and 300ml plus maybe fatal
- ☐ large volumes may block pul circulation.



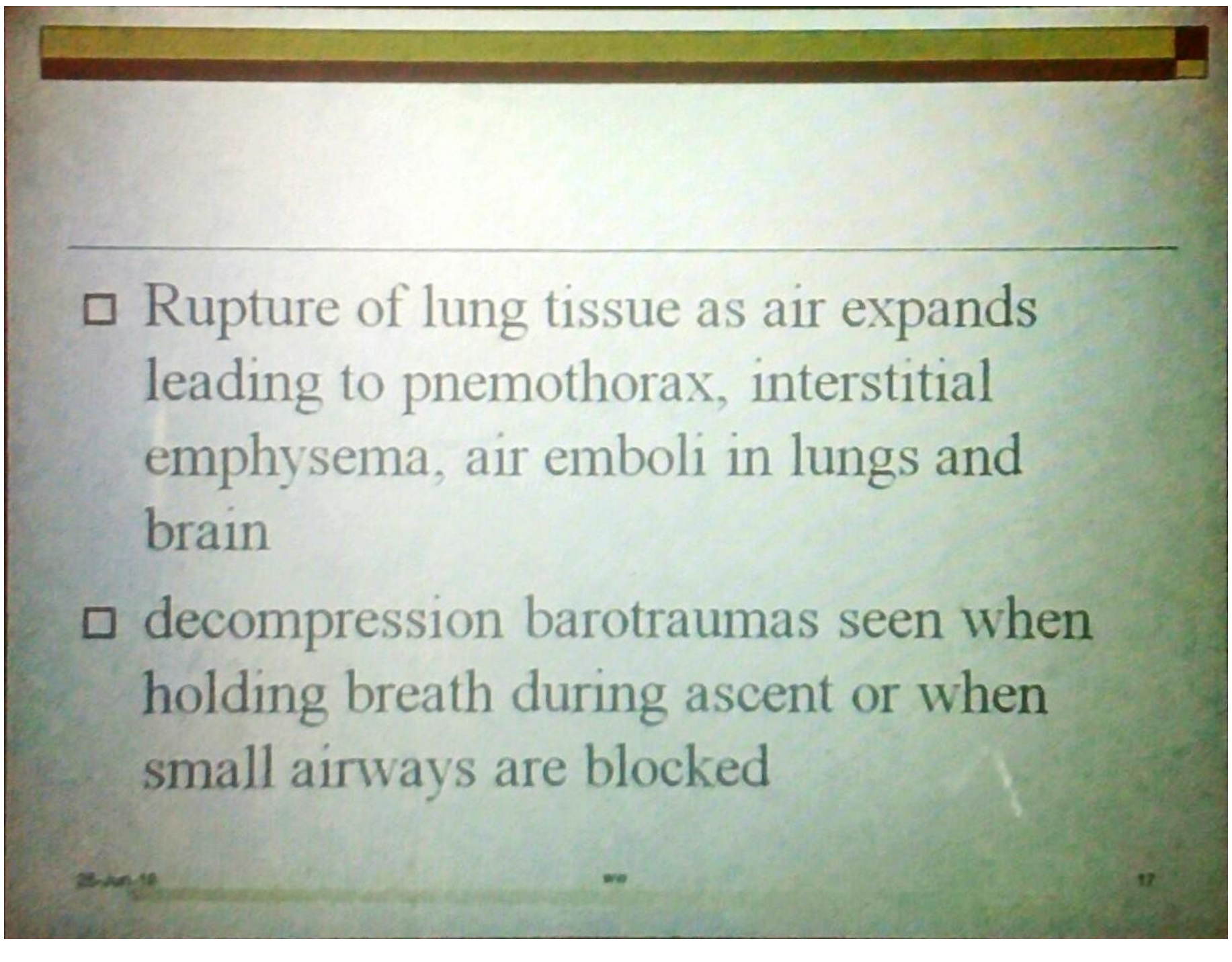
Decompression sickness

- ☐ Seen when air is previously breathed at greater than atmo pressure eg deep sea diving and in loss of pressure in pressurized air craft.
- ☐ The air bubbles within circulation Mainly the nitrogen part which is less soluble
- ☐ the bubbles affect muscle causing cramps (bends) cough (the chokes) dyspnoea and CNS complications in spine i.e. paraplegia



- ☐ Brain leads to coma and death
- ☐ fat absorbs large amount of air which tears out the fat giving fat embolism
- ☐ can also lead to DIC, and Caissons disease in chronic long diving
- ☐ Presenting as bone necrosis, collapse of joins due to ischaemic injury of shoulder and hip joints

Caissons disease : decompression sickness



- ☐ Rupture of lung tissue as air expands leading to pnemothorax, interstitial emphysema, air emboli in lungs and brain
- ☐ decompression barotraumas seen when holding breath during ascent or when small airways are blocked