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Consultant, Emergency Medicine

- ▶ He is a member of GMC UK and Royal College of Emergency medicine.
- ▶ He has participated in numerous national courses and has made many international presentation.
- ▶ He is a passionate achiever in emergency medicine and currently working as a consultant of his discipline in Europe's biggest emergency medicine dept. in London, UK.

Acute Medical Care in the UK and Prospects in Bangladesh

Dr Lunik R Sarder MBBS, MRCEM, FRCEM

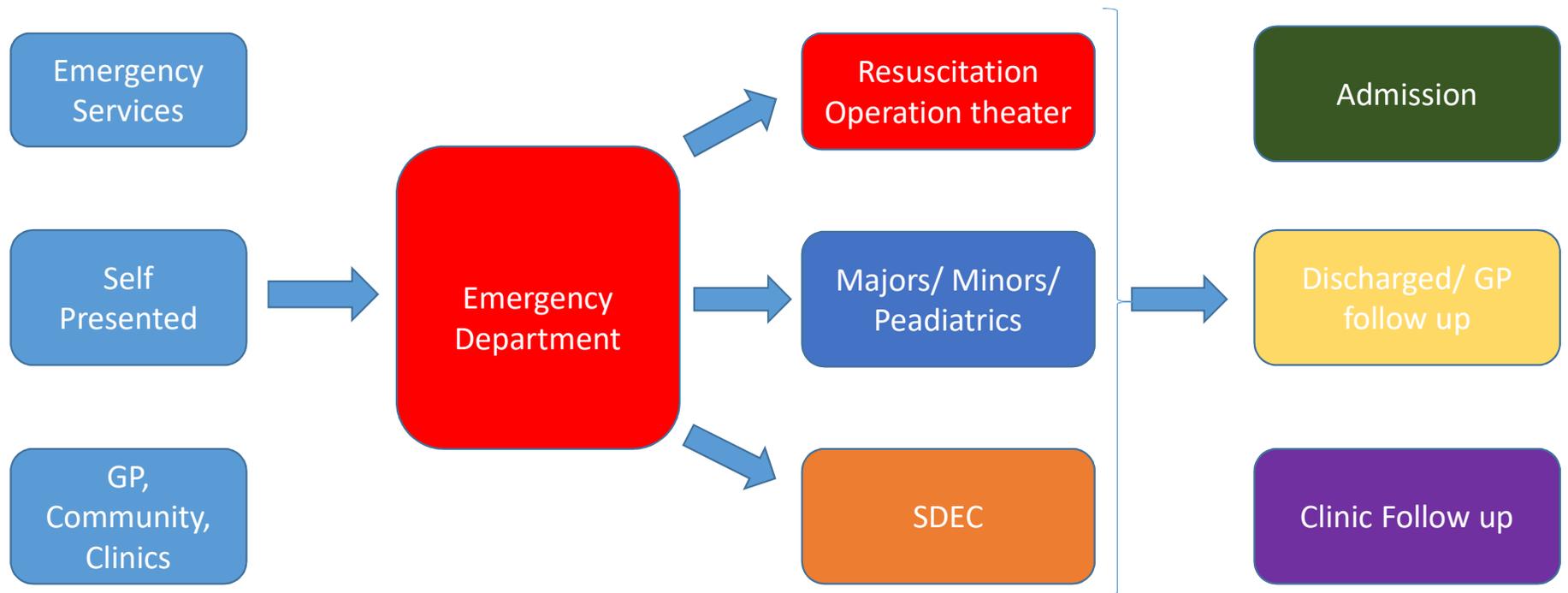
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Overview

- **Patient's journey in "Acute Emergency Care" in tertiary hospitals: 1**
- **Front door "Acute Medical Care": 2**
- **UK Medical(AIM Acute Internal Medicine) revised Training structure 2019: 3**
- **Discussion on "High yield cases": 4-14**

1. Patient's journey in "Acute Emergency Care"
in tertiary hospitals

Patient journey in the Emergency Department

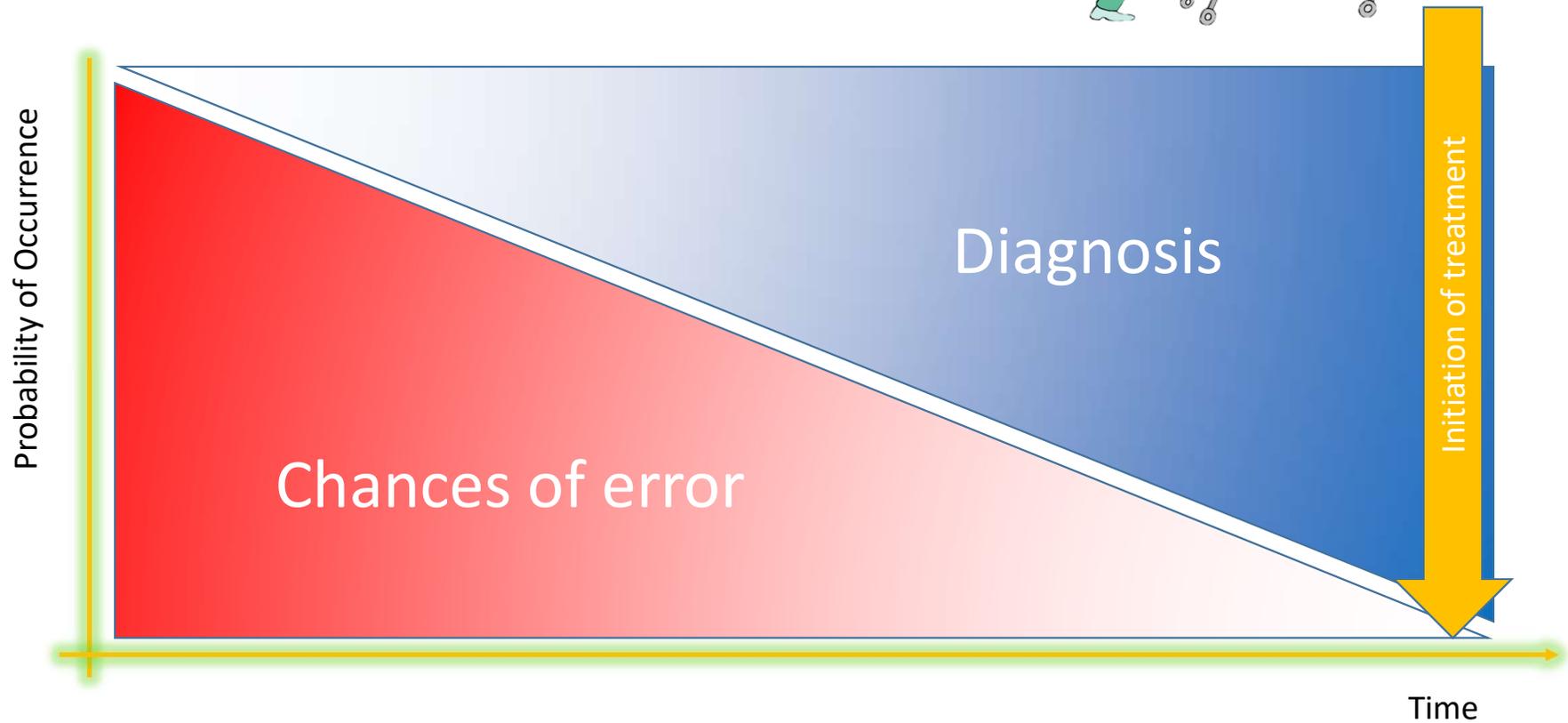




The Undifferentiated Patient



The ZABS Foundation

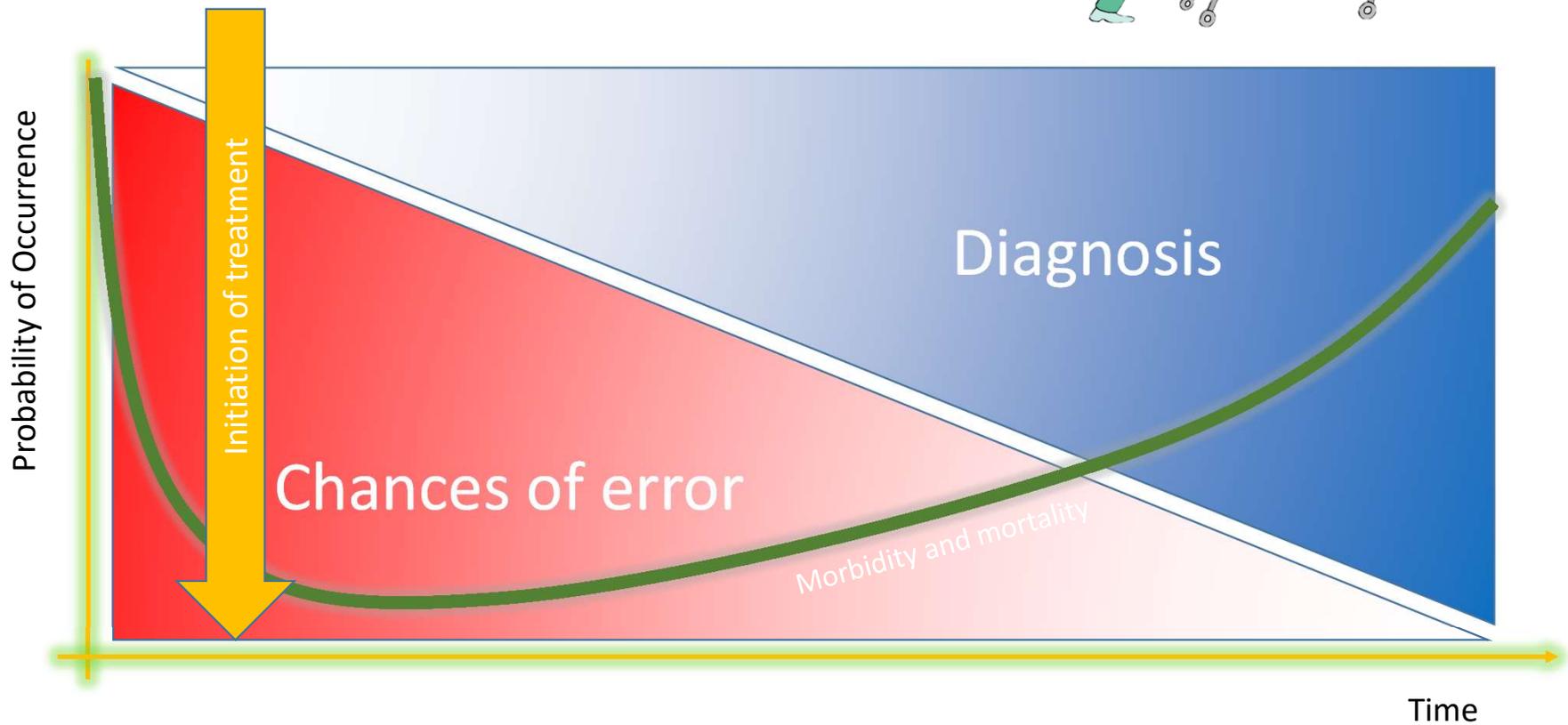




The Undifferentiated Patient



The ZABS Foundation





Life Savers

one Life Savers

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2. Front door “Acute Medical Care”



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Time

Depth of knowledge

Breadth of knowledge

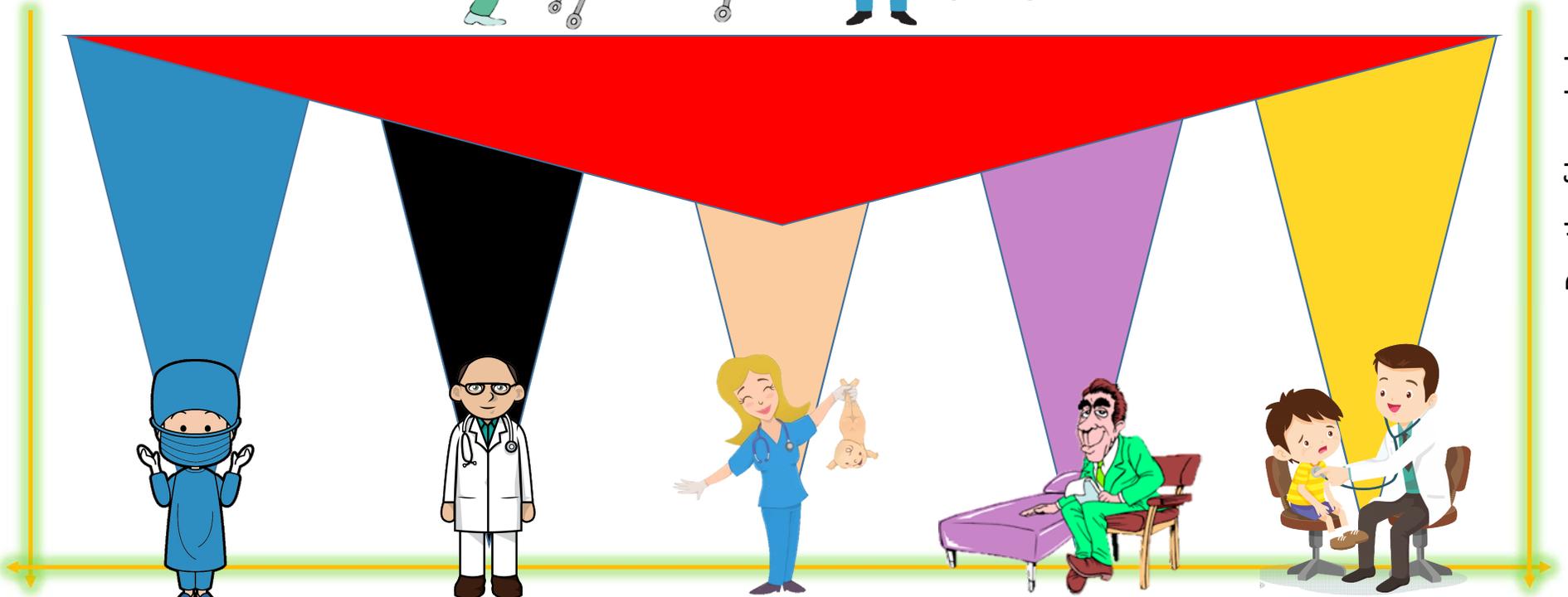


The ZABS Foundation



Time

Depth of knowledge



Breadth of knowledge



Harry Potter and the Philosopher's Stone

Emergency Medicine



- 1991
- “Emergency Medicine is a field of practice based on the **knowledge and skills required** for the **prevention, diagnosis and management of acute and urgent aspects of illness and injury** affecting patients of **all age groups** with a full spectrum of **undifferentiated physical and behavioural disorders**. It further encompasses an understanding of the development of pre-hospital and in-hospital emergency medical systems and the skills necessary for this development.”



INTERNATIONAL FEDERATION FOR
EMERGENCY MEDICINE

Intensive Care/ Anaesthetics

The Faculty of
Intensive Care Medicine



AIM



- 2009
- Acute Internal Medicine provides the **initial assessment, investigation, diagnosis and management** of patients who have an **acute medical illness** within the **first 72 hours** of their hospital stay.
 - AMU (Acute Medical Unit)
 - Ambulatory care

Same Day Emergency Care



Joint Statement RCEM and SAM regarding Same Day Emergency Care

"Ambulatory Care is clinical care which may include diagnosis, observation, treatment and rehabilitation, not provided within the traditional hospital bed base or within the traditional out-patient services that can be provided across the primary/secondary care interface".

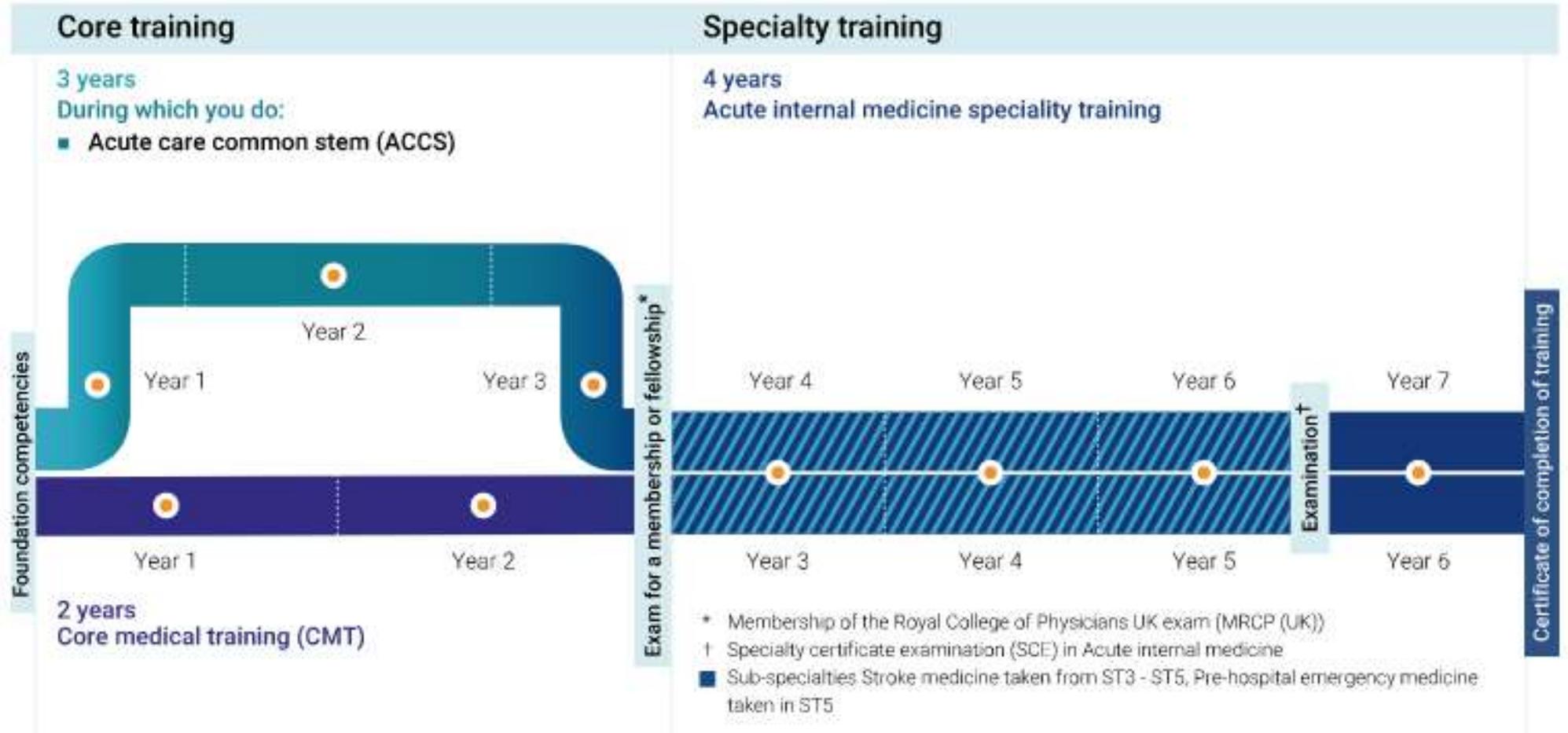
The Royal College of Physicians - Acute Medicine Task Force & endorsed by the College of Emergency Medicine.



NHS Improvement: Same day Emergency Care

3. UK Medical(AIM Acute Internal Medicine) revised Training structure 2019

Training pathway



JRCPTB

Joint Royal Colleges of Physicians Training Board

The physician training pathway – group 1 specialties (dual CCT)



4-14. Discussion on “High yield cases”

Q: How to recognize an acutely unwell patient?

NHS National Early Warning Score (NEWS2)

PHYSIOLOGICAL
SCORE

3 2 1 0 1 2 3

Respiration Rate (per
minute)

SpO2 Scale 1 (%)

SpO2 Scale 2 (%)

Air or oxygen?

Systolic blood
pressure (mmHg)

Pulse (per minute)

NEWS2

National Early Warning Score



Chart 1: The NEWS scoring system

Physiological parameter	Score						
	3	2	1	0	1	2	3
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO ₂ Scale 1 (%)	≤91	92–93	94–95	≥96			
SpO ₂ Scale 2 (%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	

National Early Warning Score Development and Implementation Group (NEWSDIG) (2012). *National Early Warning Score (NEWS): standardising the assessment of acute-illness severity in the NHS*. London: Royal College of Physicians. [ISBN 978-1-86016-471-2](https://doi.org/10.1136/npep.2012.000000).

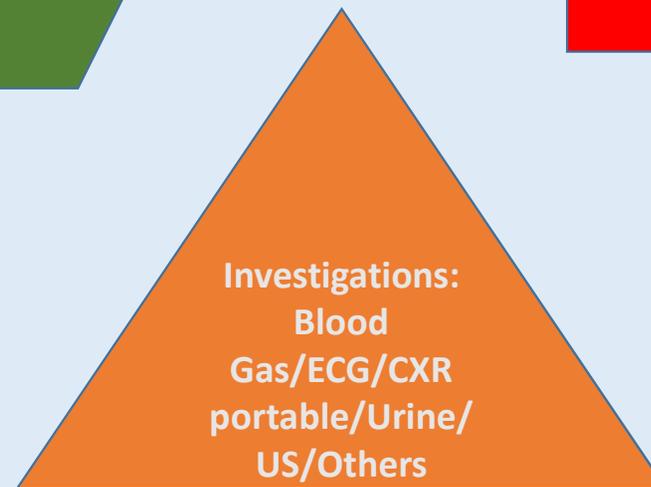
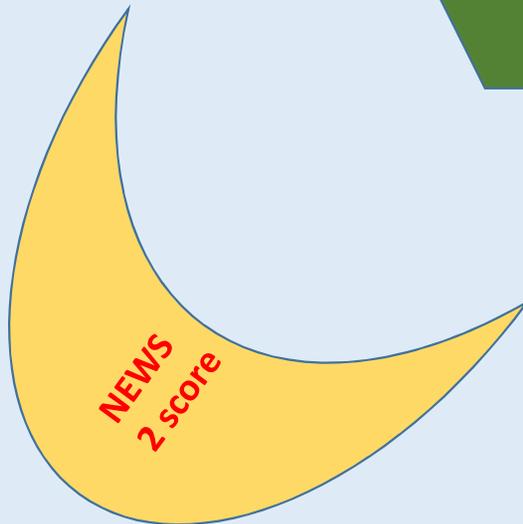
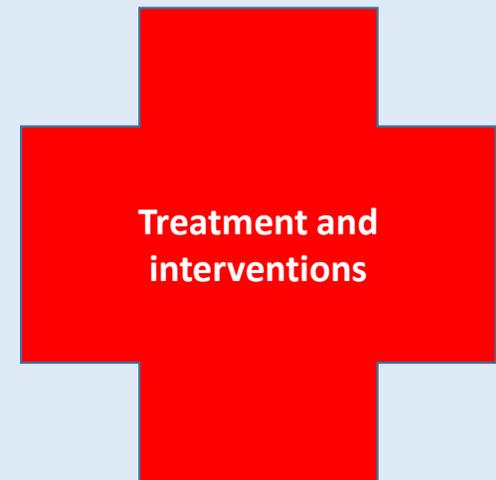
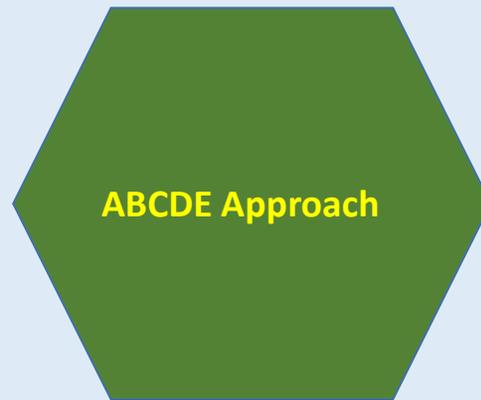
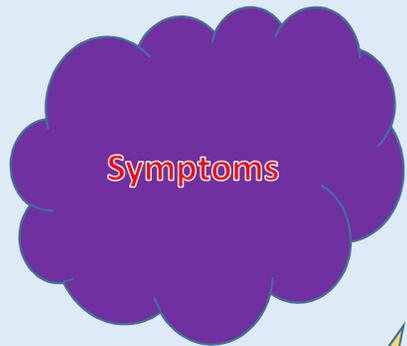
Chart 2: NEWS thresholds and triggers

NEWS score	Clinical risk	Response
Aggregate score 0–4	Low	Ward-based response
Red score Score of 3 in any individual parameter	Low–medium	Urgent ward-based response*
Aggregate score 5–6	Medium	Key threshold for urgent response*
Aggregate score 7 or more	High	Urgent or emergency response**

* Response by a clinician or team with competence in the assessment and treatment of acutely ill patients and in recognising when the escalation of care to a critical care team is appropriate.

**The response team must also include staff with critical care skills, including airway management.

RAT



Questions?

A 3D illustration of red blood cells flowing through a blood vessel. The cells are depicted as biconcave discs, some in sharp focus and others blurred in the background, creating a sense of depth and movement. The overall color palette is a rich, dark red. Overlaid on this scene is the word "SEPSIS" in a large, bold, white, sans-serif font, centered horizontally and vertically.

SEPSIS

UK



- Sepsis is a leading cause of death in the UK hospitals
- Severe sepsis mortality 35% -
 - Severe Sepsis = 5 X STEMI/ CVA
- In 2014, 123,000 cases (in England)
 - Nearly **37,000 deaths**.
- best practice could **avoid 10,000 deaths** each year.

Daniels R. Surviving the first hours in Sepsis: getting the basics right (an Intensivist's perspective). Journal of Antimicrobial Chemotherapy 2011; 66(Suppl ii): 11-23.



**The College of
Emergency Medicine**



THE UK
SEPSIS
TRUST

- Early Recognition
- Urgent Intervention
- Timely escalation

Early Recognition (SIRS or SOFA)

Box 1: Systemic Inflammatory Response Syndrome (SIRS)

SIRS is present if there at least 2 of the following present:



Temperature $>38.3^{\circ}\text{C}$ or $<36.0^{\circ}\text{C}$



Pulse $>90/\text{min}$



RR $>20/\text{min}$



New confusion/drowsiness



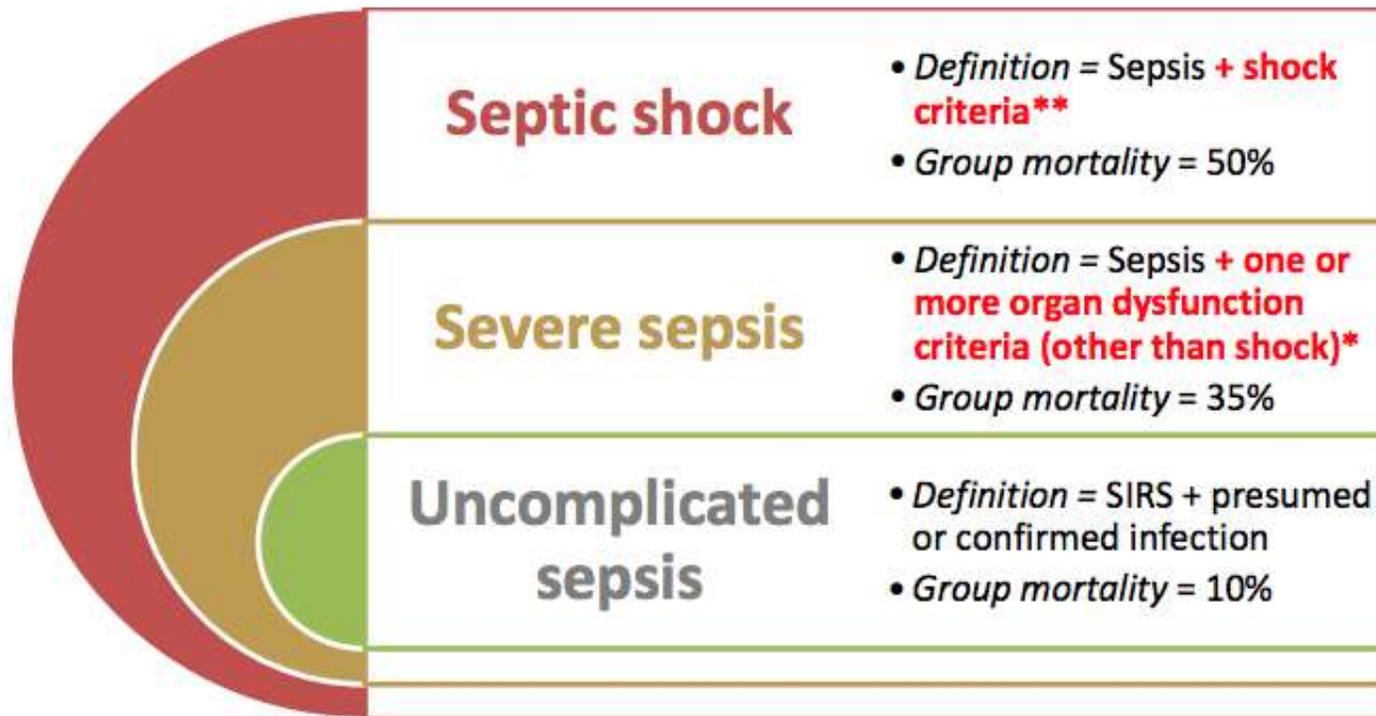
WBC >12 or $<4.0 \times 10^9/\text{L}$



Blood glucose $>7.7 \text{ mmol/L}$
(non-diabetic patients)

Early categorization

Box 2: Defining the severity of Sepsis



*Organ dysfunction criteria

- Bilateral lung infiltrates + new need for oxygen to maintain saturations >90%, **or** Bilateral lung infiltrates with PaO₂/FiO₂ ratio <300 (mmHg) or 39.9 (kPa)
- Lactate >2.0mmol/L
- Serum creatinine >176.8μmol/L or urine output <0.5mL/kg/hr for 2 successive hours
- INR >1.5 or aPTT >60s
- Platelet count <100 x 10⁹/L
- Bilirubin >34.2μmol/L

**Shock criteria

- Lactate >4mmol/l at any time point
- Hypotension persisting after 30ml/kg intravenous fluid, defined as:
 - Systolic Blood Pressure <90mmHg,
 - Mean Blood Pressure <65mmHg, **or** a fall of >40mmHg from the patient's usual Systolic Blood Pressure

- Lactate:
 - Highly predictive of death and poor outcomes and, when initially elevated.¹
 - The degree of reduction following resuscitation ('lactate clearance') predicts survival.²
 - Cryptic shock

1. Trzeciak S, Chansky ME, Dellinger PR et al. Operationalizing the use of serum lactate measurement for identifying high risk of death in a clinical practice algorithm for suspected severe sepsis. *Academic Emergency Medicine* 2006; 13: 150–1
2. Marty P, Roquilly A, Vallee F, et al. Lactate clearance for death prediction in severe sepsis or septic shock patients during the first 24 hours in Intensive Care Unit: an observational study. *Annals of Intensive Care* 2013; 3(1): 3

Red Flag Sepsis

- Heart rate of **>130**
 - AVPU score **less than 'Alert'**
 - Respiratory rate of **>25**.
-
- Must seen by ST3+
 - Consider investigation +/- Treatment.

Documentation

Septic shock

Severe Sepsis

Red Flag Sepsis

Uncomplicated sepsis

No current evidence of sepsis

Treatment of sepsis (Sepsis 6)?

The Sepsis Six

- 1 • Administer high-flow oxygen
- 2 • Take blood cultures and consider infective source
- 3 • Administer intravenous antibiotics
- 4 • Give intravenous fluid resuscitation
- 5 • Check haemoglobin and serial lactates
- 6 • Commence hourly urine output measurement

Questions?

SOB...

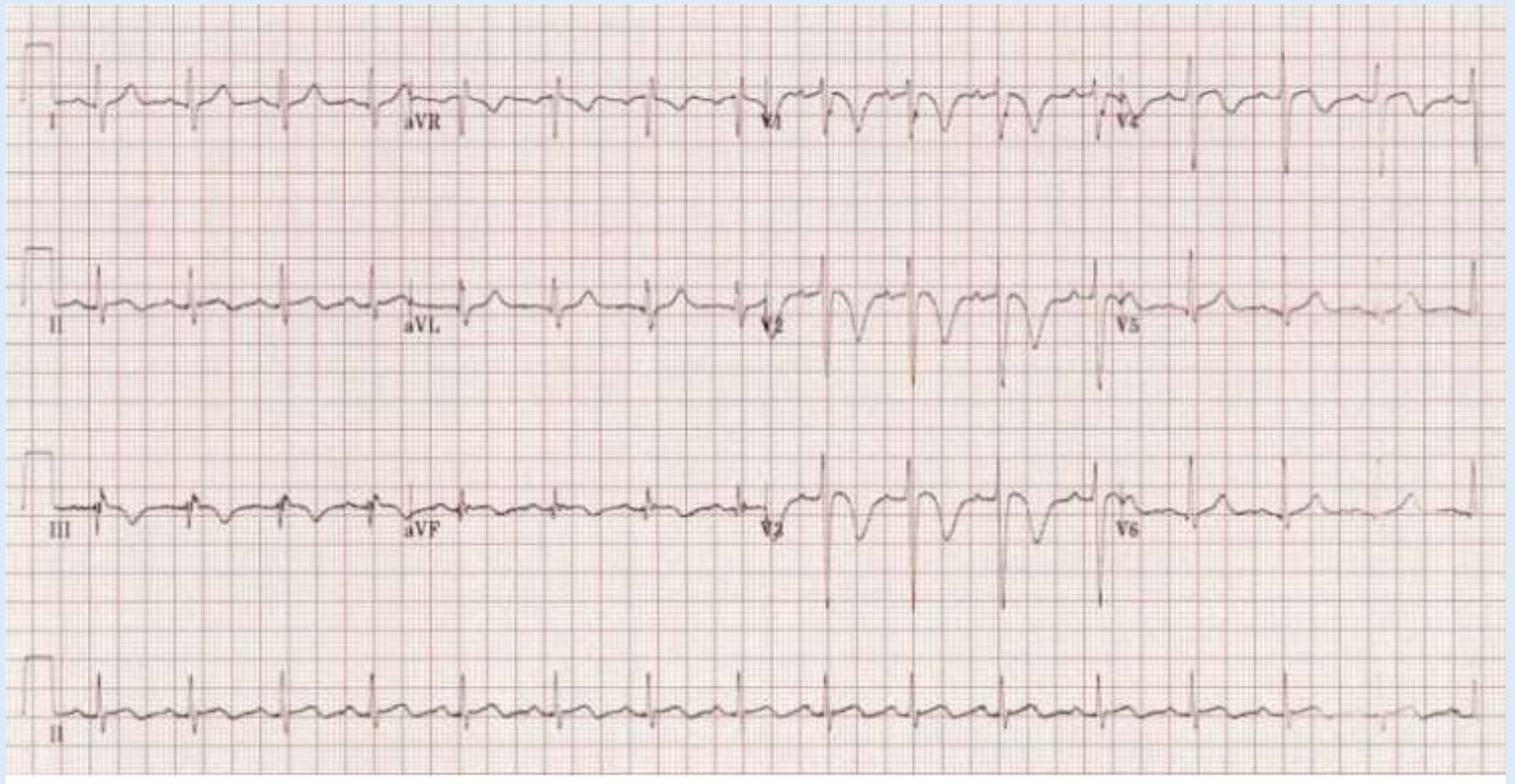
- 51 year old US Marine Corps **pilot** developed **SOB for 2 days**. He had some dry cough for few days. He **collapsed** while he was walking to work from home within US base. He got up and carried himself to work and then send by a driver to Emergency Department.
- **What is the probable diagnosis?**

- NEWS:
 - HR: 142
 - BP: 100/68
 - **RR: 32**
 - GCS: 15/15
 - **SATS: 84% OA**
 - Temp: 38.2

- **Thoughts/ Differentials/What next?**

- **A**irway: X
 - **B**reathing: Symmetrical air entry/ No added sound
 - **C**irculation: X
 - **D**isability: X
 - **E**xposure: X
-
- **Bedside Investigations?**

• ECG:



- CXR



- ABG

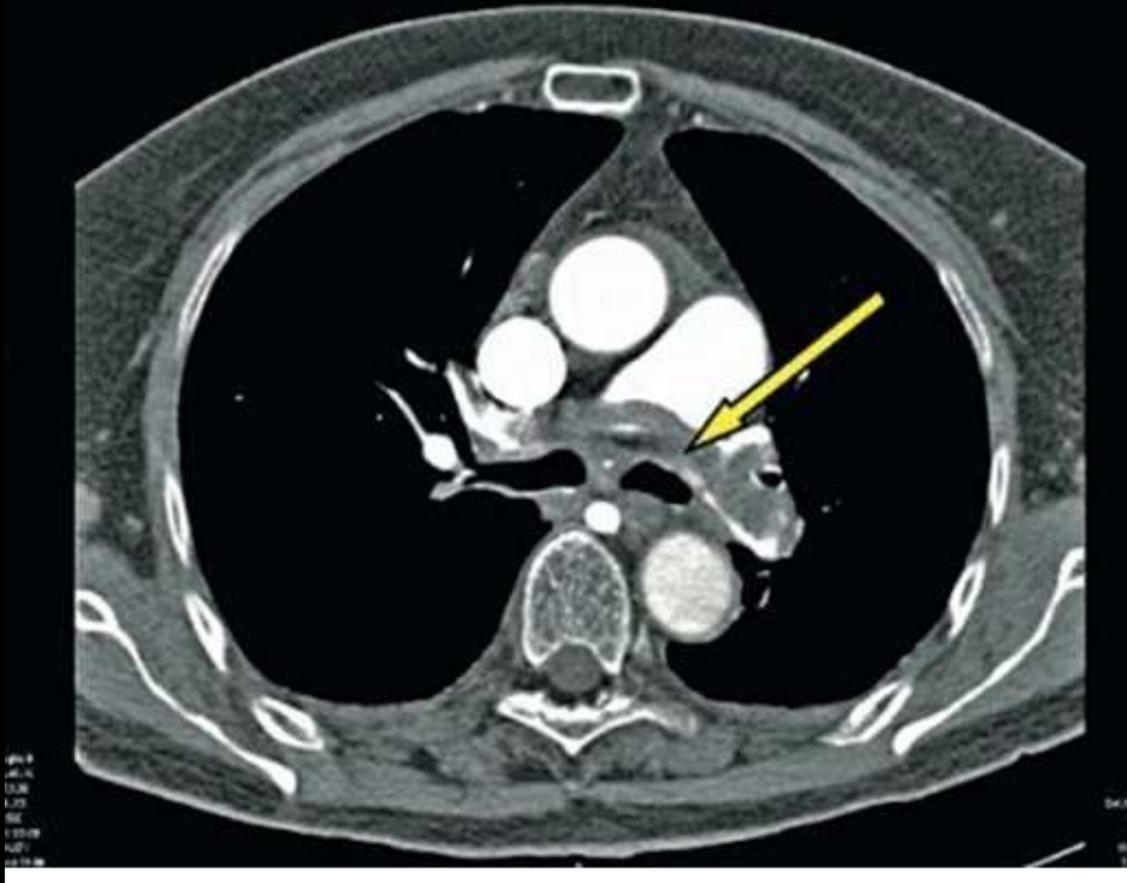
- **What investigation next?**

Wells' criteria

Clinically suspected DVT	3.0
PE at least as likely or more likely than alternative diagnosis	3.0
Pulse rate >100	1.5
Immobilisation > 3 days	1.5
Surgery last 4 weeks	1.5
Previous VTE	1.5
Haemoptysis	1.0
Malignancy	1.0

- D-dimer

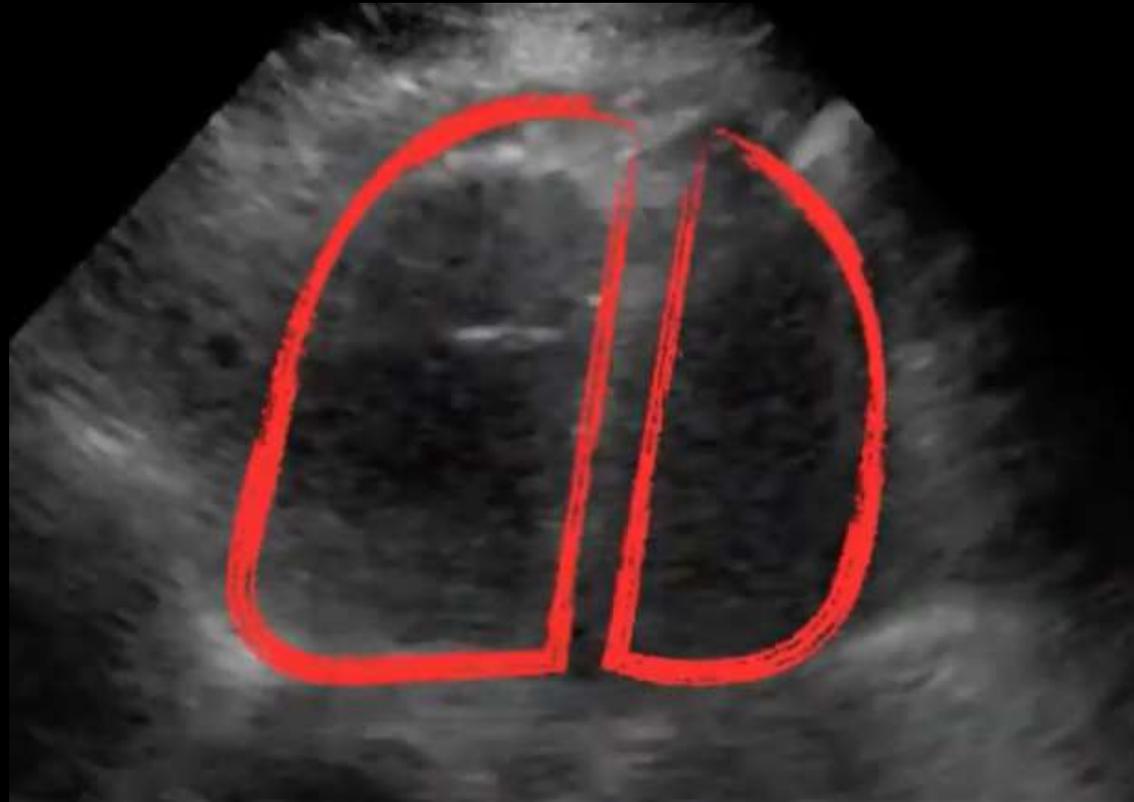
Wells PS, Anderson DR, Rodger M, Stiell et al. Excluding pulmonary embolism at the bedside without diagnostic imaging: management of patients with suspected pulmonary embolism presenting to the emergency department by using a simple clinical model and d-dimer. Ann Intern Med. 2001;135:98107.



- **Rx: Thrombolysis or Anticoagulation?**



Sosland R P, Gupta K. Images in cardiovascular medicine:
McConnell's Sign. *Circulation*. 2008;118:e517–518.



Pitfalls

- Fatal PE is not clinically suspected specially in Elderly.
- Wells reported that only 9.5% are true positive.
- ABG: 20 % cases normal
- ECG: To rule out alternative diagnosis

Pitfalls

- Massive PE:
 - Shocked and hypoxic
 - D/D: RV Infarction/ Sepsis
- Sub-Massive PE
 - < 50% obstruction
 - D/D: ACS/ Heart failure/ Pneumonia
- Pulmonary Infarction:
 - CP, and/or dyspnea, rarely haemoptysis
 - Low risk group

Case Senario

- 40 year old lady attended ED with vaguely pleuritic chest pain with mild SOB
 - with no PMH
 - not on any medication, not pregnant
 - No recent immobilization
 - Not on contraceptive

- Wells score: Negative
- You are considering PE as a possible cause.

- Patient not keen for blood test or any scan...
- **Can we rule out PE in this patient without further investigation?**

- **PERC = Pulmonary Embolism Rule-out Criteria**

- age < 50 years
- pulse < 100 beats min
- SaO₂ ≥ 95%
- no hemoptysis
- no estrogen use
- no surgery/trauma requiring hospitalization within 4 weeks
- no prior venous thromboembolism (VTE)
- no unilateral leg swelling

Diagnostic Accuracy of Pulmonary Embolism Rule-Out Criteria: A Systematic Review and Meta-analysis...2011

- 12 qualifying cohorts
- 10 prospective and 2 retrospective
- From 6 countries
- Studying 13,885 patients with 1,391 pulmonary embolism diagnoses
- Consistently high sensitivity and low but acceptable specificity
- PERC negatives have less than 2% chance of having a Pulmonary Embolism

Singh B, Parsaik AK, Agarwal D et al. Diagnostic Accuracy of the Pulmonary Embolism Rule-Out Criteria: A Systematic Review and Meta-Analysis. *Annals Emerg Med* 2012; 59(6): 517-520.

Questions?

FAST

Facial
weakness



Arm
weakness



Speech
problems



Time
to call 999



Learn it. Share it. You could save a life.

Stroke
association

Cerebrovascular Disease

- Strokes account for 11% of all deaths(3rd) in England and Wales.
 - 85% cerebral infarction
 - 10% due to primary haemorrhage
 - 5% due to subarachnoid haemorrhage

Royal College of Physicians, *National clinical guideline for stroke. Prepared by the Intercollegiate Stroke Working Party. 2016, Royal College of Physicians: London.*

Q: What is TIA?

TIA

- Most TIAs last less than 1 hour (median duration of)
 - 14 minutes in carotid artery territory symptoms
 - 8 minutes vertebrobasilar ischaemia.
- Only 2% of patients whose symptoms do not rapidly improve within 3 hours had complete resolution at 24 hours

- **New definition: tissue-based:**

- “A TIA is a **brief episode of neurologic dysfunction** caused by focal brain or retinal ischaemia, with clinical symptoms
- **typically lasting less than 1 hour**, and without evidence of acute infarction”

Albers, G.W., et al., *Transient ischemic attack—proposal for a new definition*. N Engl J Med, 2002. **347**(21): p. 1713-6.

TIA: Clinical symptoms

- **Negative symptoms / Focal**
- Limb weakness
- Speech difficulty
- Transient monocular loss of vision
- The symptoms fit with a vascular territory of the brain.

- NO: ABCD2 score
- Stroke risk halved due to urgent secondary prevention.¹

Amarenco, P., et al., *One-Year Risk of Stroke after Transient Ischemic Attack or Minor Stroke*. N Engl J Med, 2016. **374**(16): p. 1533-42.

STROKE Assessment and challenges

- Rapid structured assessment, and exclusion of **hypoglycaemia**.
- Distinguish true stroke from **stroke mimics**, cannot be replaced by imaging alone
 - In one study of consecutive patients thought to have had a stroke and presenting to an urban teaching hospital ED, **about 30% actually had a different pathology/diagnosis**

Hand, P.J., et al., *Distinguishing between stroke and mimic at the bedside: the brain attack study*. Stroke, 2006. **37**(3): p. 769-75.

ROSIER scale (The Recognition of Stroke in the Emergency Room)

Recognition of Stroke in the Emergency Room (ROSIER)

Score from -2 to +5

Clinical Hx: Score -1 for each

- Loss of consciousness
- Convulsive fit

Neuro signs: Score +1 for each

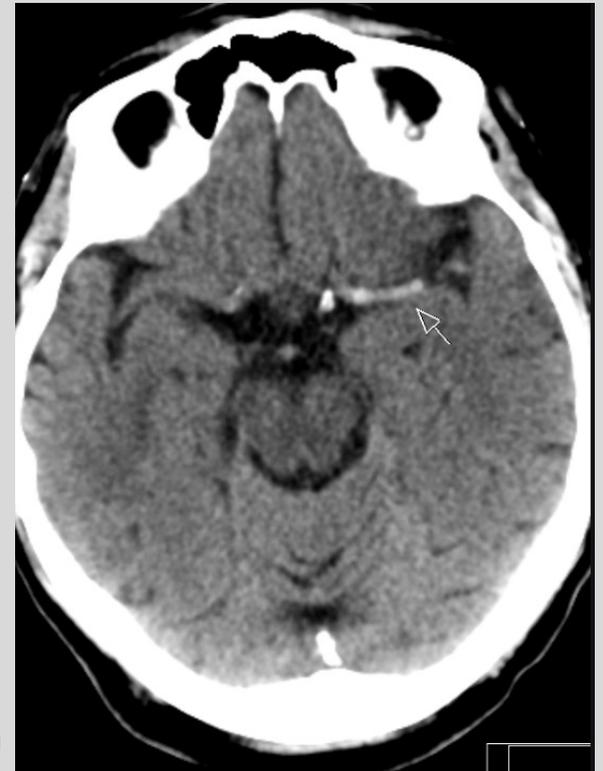
- Face weakness
- Arm weakness
- Leg weakness
- Speech disturbance
- Visual field defect

A score of 1 or above makes stroke more likely (PPV 90% (CI 85-95%) NPV 88% (CI 83-93%).

If the score is negative, another diagnosis should be considered: a stroke mimic.

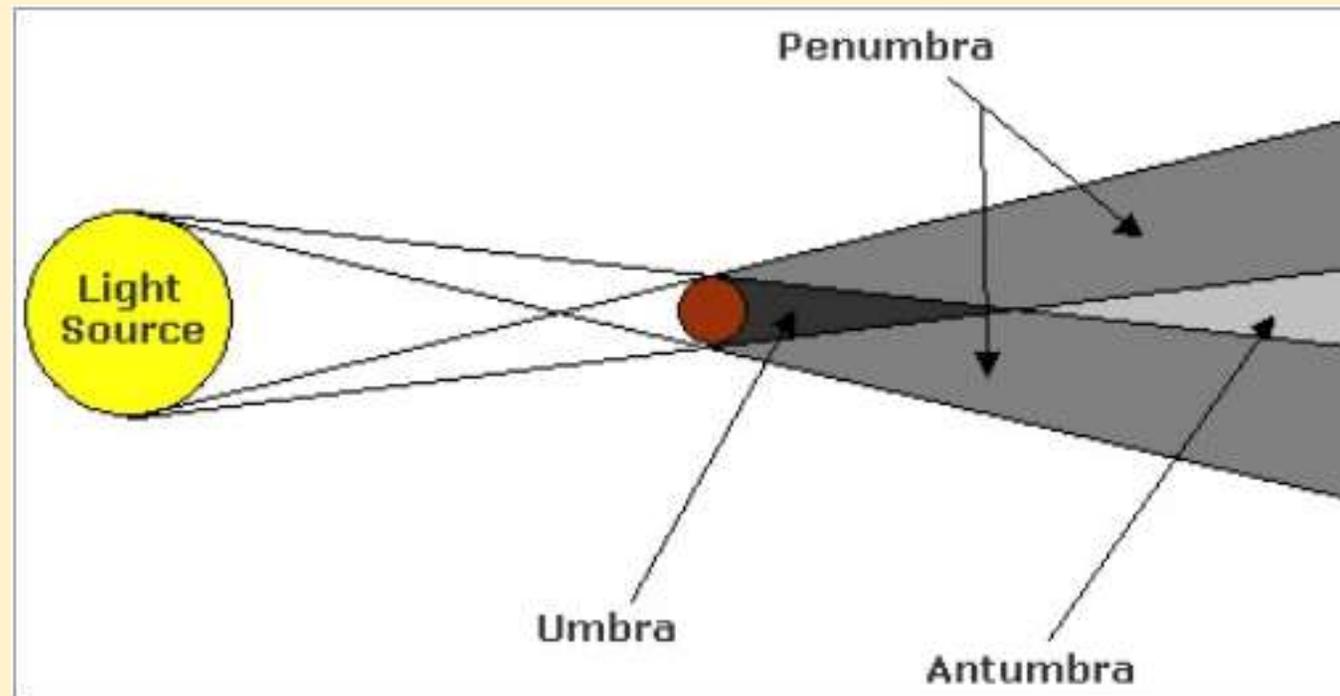
Nor, A.M., et al., *The Recognition of Stroke in the Emergency Room (ROSIER) scale: development and validation of a stroke recognition instrument*. Lancet Neurol, 2005. **4**(11): p. 727-34

- **CT: The main aim is to exclude a bleed as the cause of the focal neurological signs**



The hyperdense MCA sign

- **ischaemic penumbra**
 - may be saved if reperfused



- Stroke indicates benefit if delivered within 4.5 hours. (ECASS III trial)
- Time = Brain
- **Alteplase at 0.9mg/kg** body weight (maximum dose 90mg) given as an infusion over 60 minutes, with the first 10% of the total dose administered as a bolus. (27 trials)

Current US guidelines recommend the following ambitious time benchmarks [19]:

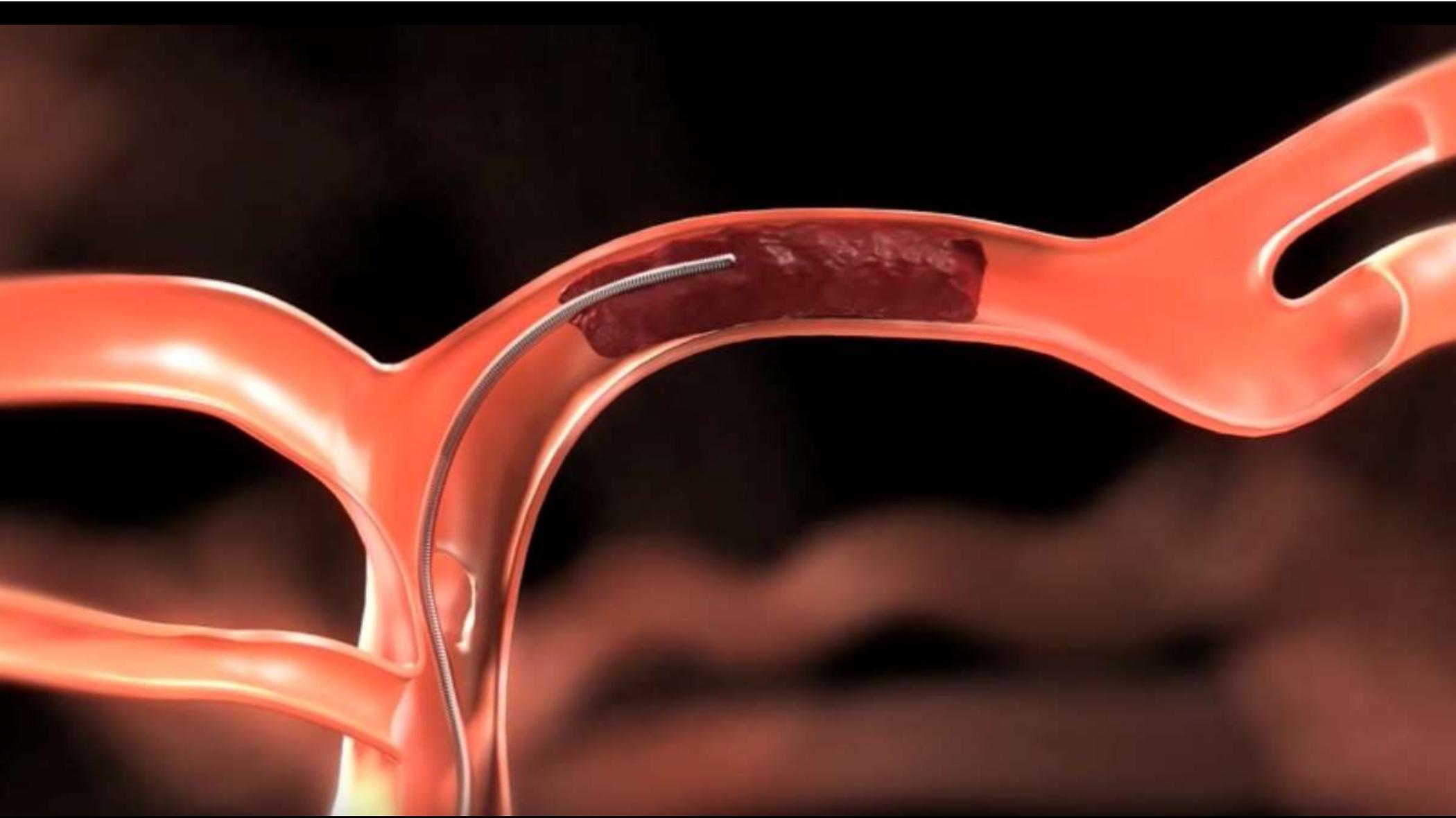
US Benchmark

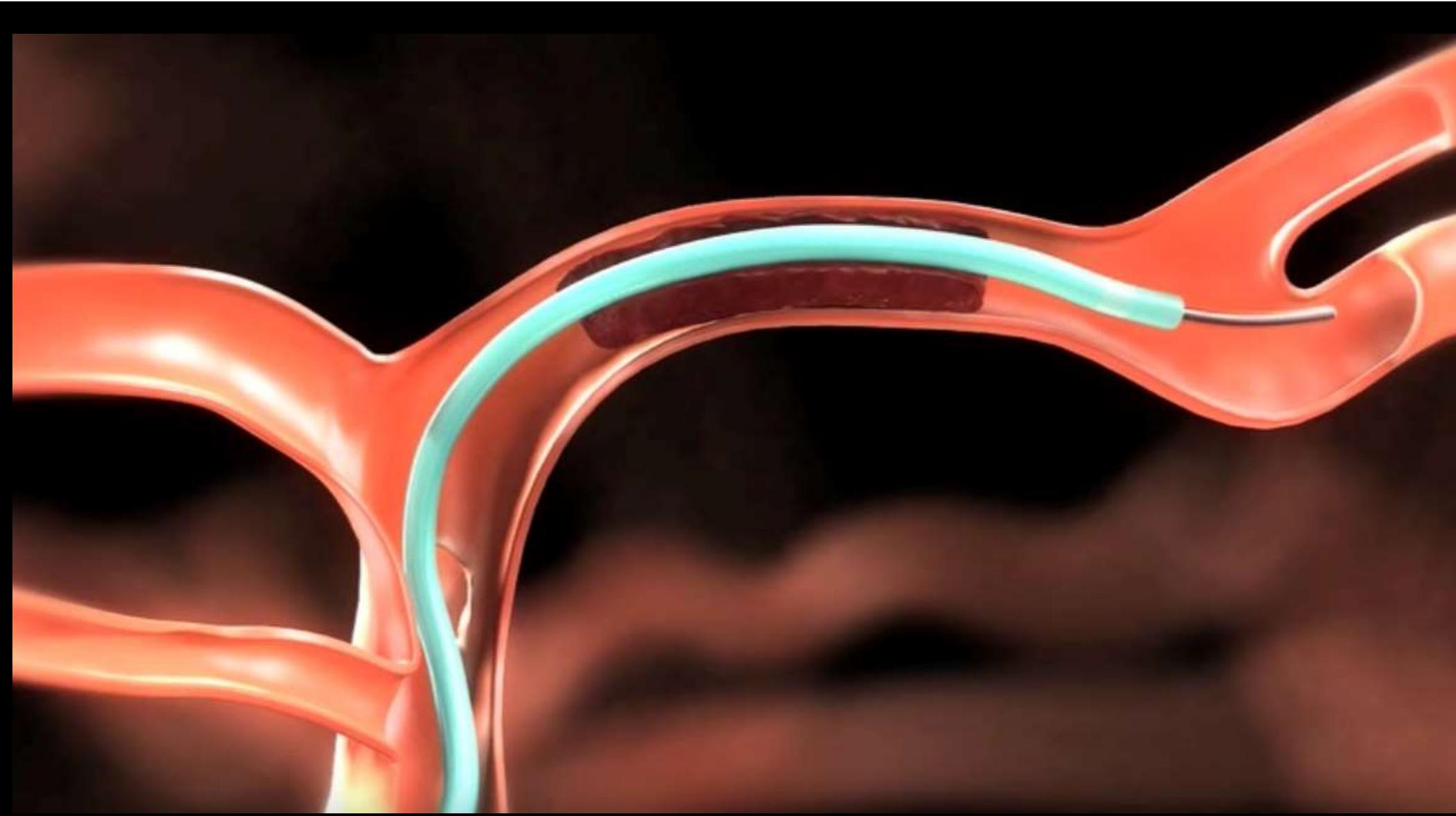
<i>Action</i>	<i>Time</i>
Door to physician	10 minutes
Door to stroke team	15 minutes
Door to CT initiation	25 minutes
Door to CT interpretation	45 minutes
Door to drug (80% compliance)	60 minutes
Door to stroke unit admission	3 hours

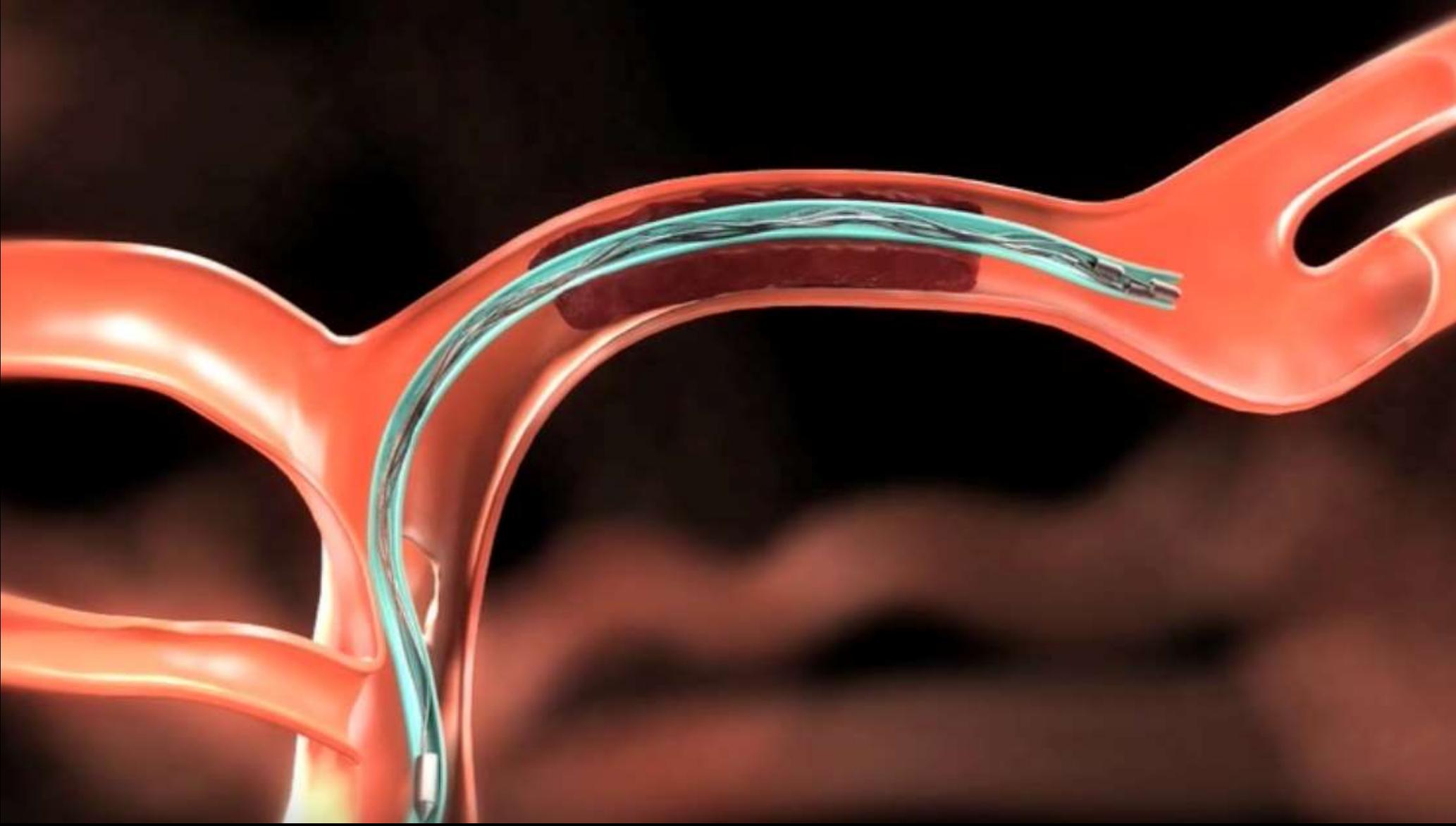
- **Thrombolysis Vs Endovascular therapy?**

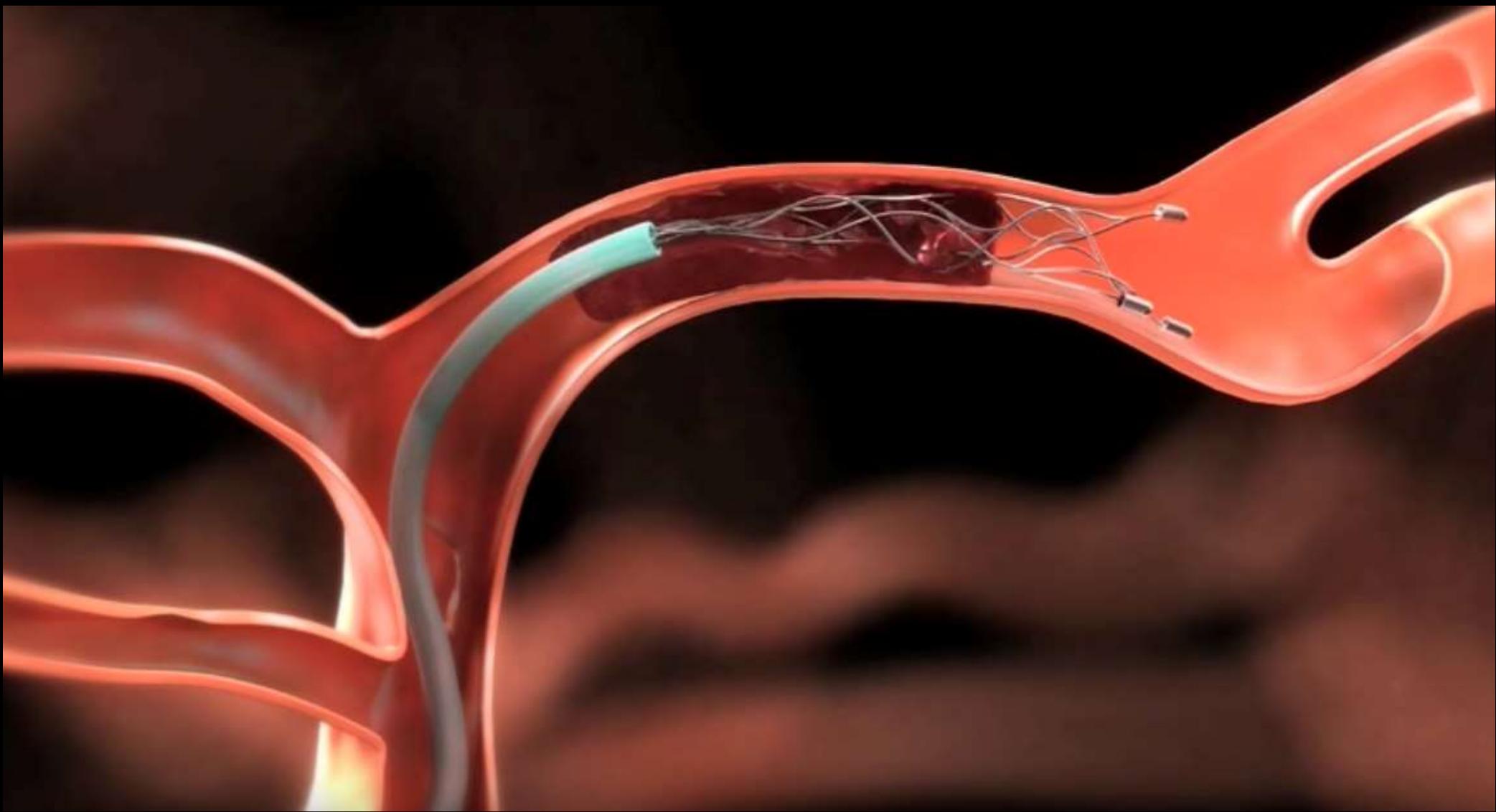
Endovascular therapy

- Proximal intracranial large vessel occlusion causing a disabling neurological deficit (NIHSS score of 6 or more)
- Upto 6 hours



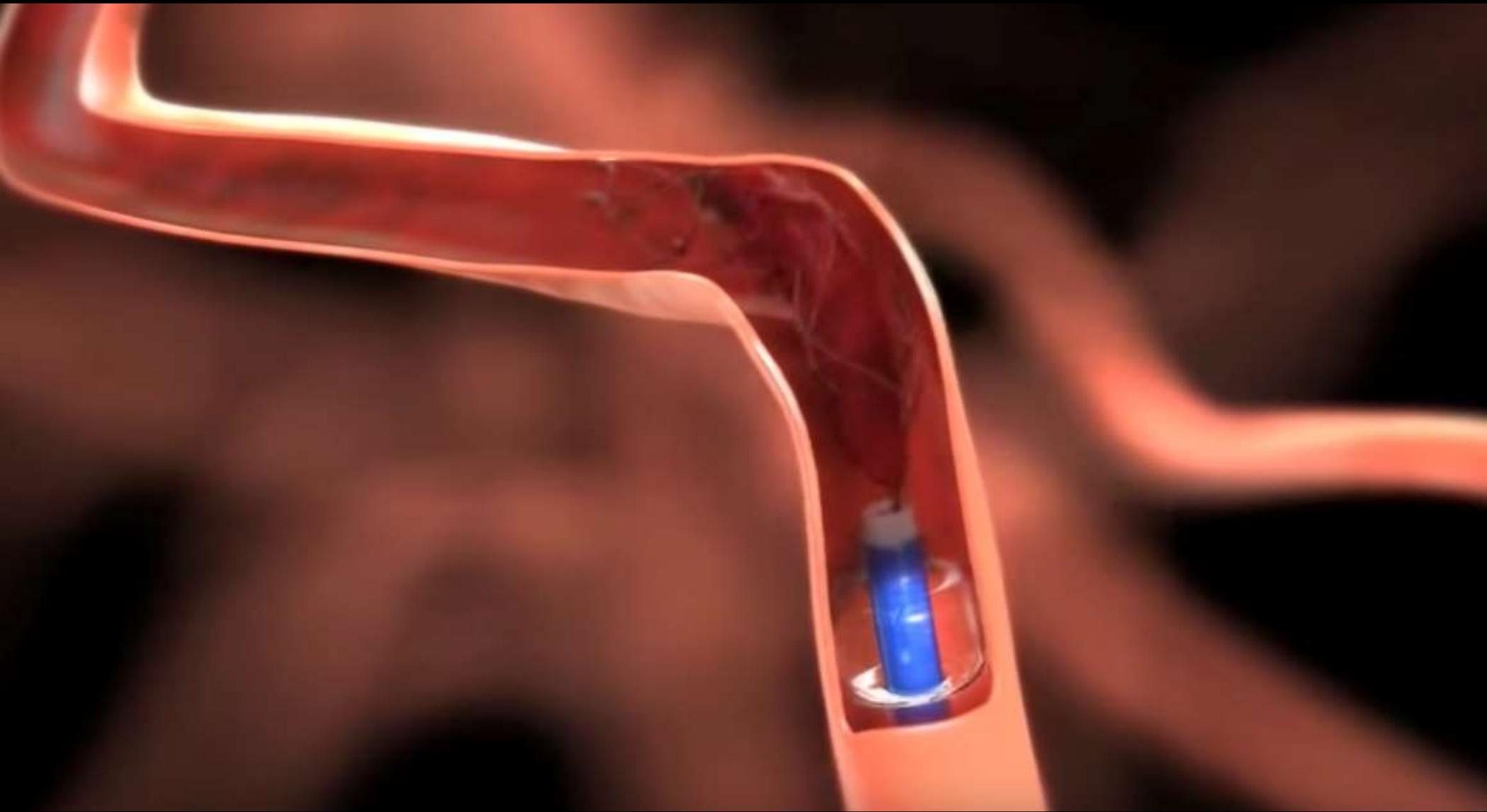






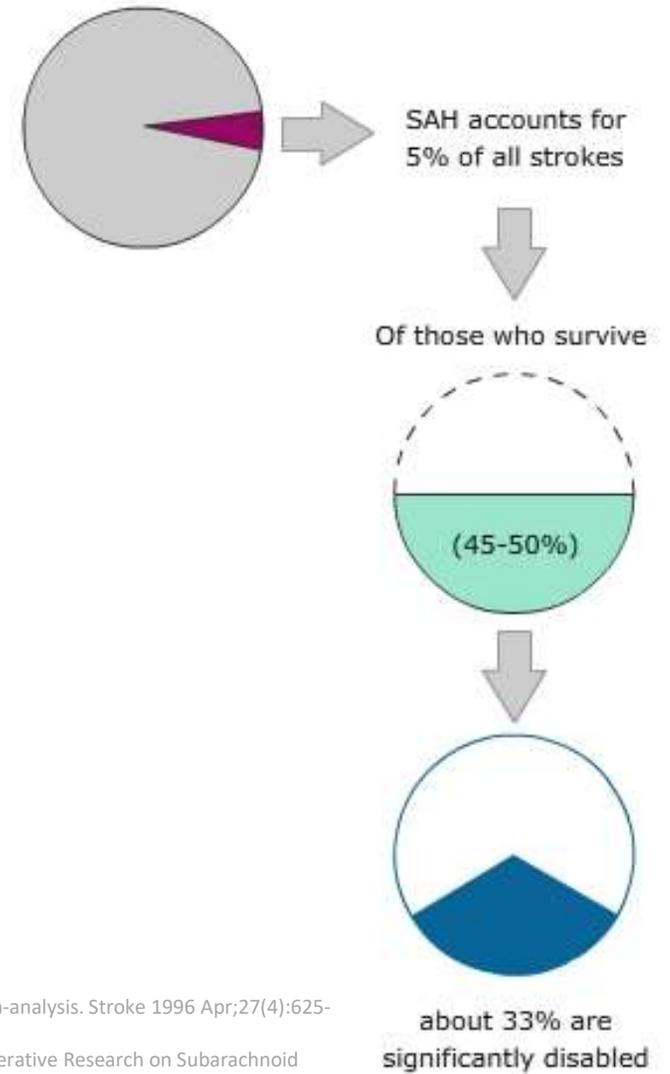






Headache and Vomiting

- 30 year old patient with migraine developed sudden onset of unusual headache. He is not sure but may had some residual headache and attended ED.
- **Should I investigate for SAH?**



Linn FH, Rinkel GJ, Algra A, van Gijn J. Incidence of subarachnoid hemorrhage: role of region, year, and rate of computed tomography: a meta-analysis. Stroke 1996 Apr;27(4):625-629.

Epidemiology of aneurysmal subarachnoid hemorrhage in Australia and New Zealand: incidence and case fatality from the Australasian Cooperative Research on Subarachnoid Hemorrhage Study (ACROSS). Stroke 2000 Aug;31(8):1843-1850.

Mitchell P, Hope T, Gregson BA, Mendelow AD. Regional differences in outcome from subarachnoid haemorrhage: comparative audit. BMJ 2004 May 22;328(7450):1234-1235.

- **Is cerebral vascular aneurism acquired or Congenital?**
- **Large or Small to rupture?**
- **Anterior or Posterior?**

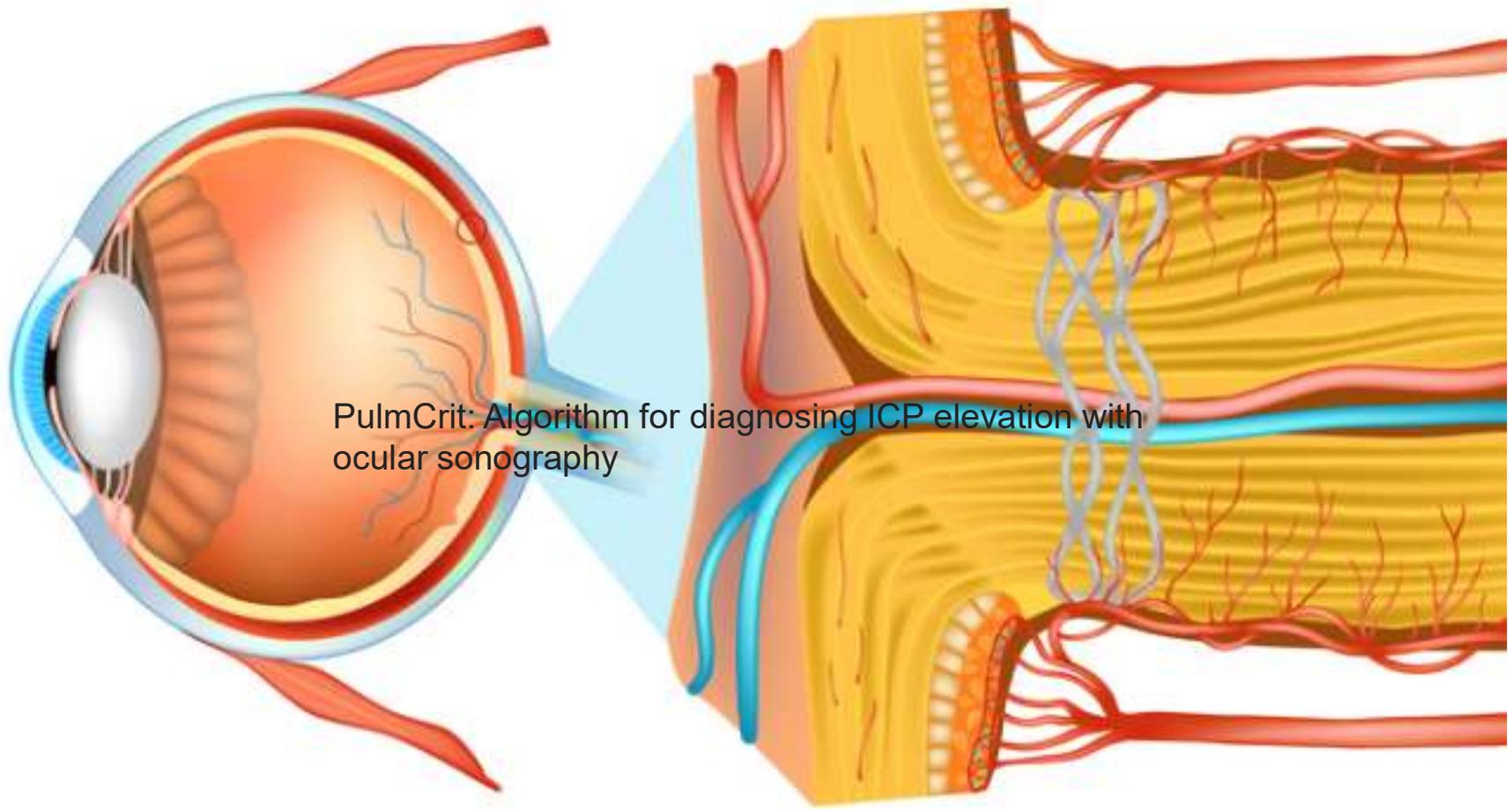
- Type:
 - **Acquired:** Turbulent blood flow (often bifurcations) due to intravascular shear stresses.
 - **Congenital:** increase in size, wall tension rises and compliance reduces

- Modifiable risk factors include:
 - Alcohol
 - Smoking
 - Hypertension

- Clinical suspicion:
 - Abrupt onset
 - Syncope

- Urgent Investigation and treatment
 - IR / Neurosurgery

- **How can you confirm early raised ICP in bedside?**



PulmCrit: Algorithm for diagnosing ICP elevation with ocular sonography

PulmCrit: Algorithm for diagnosing ICP elevation with ocular sonography

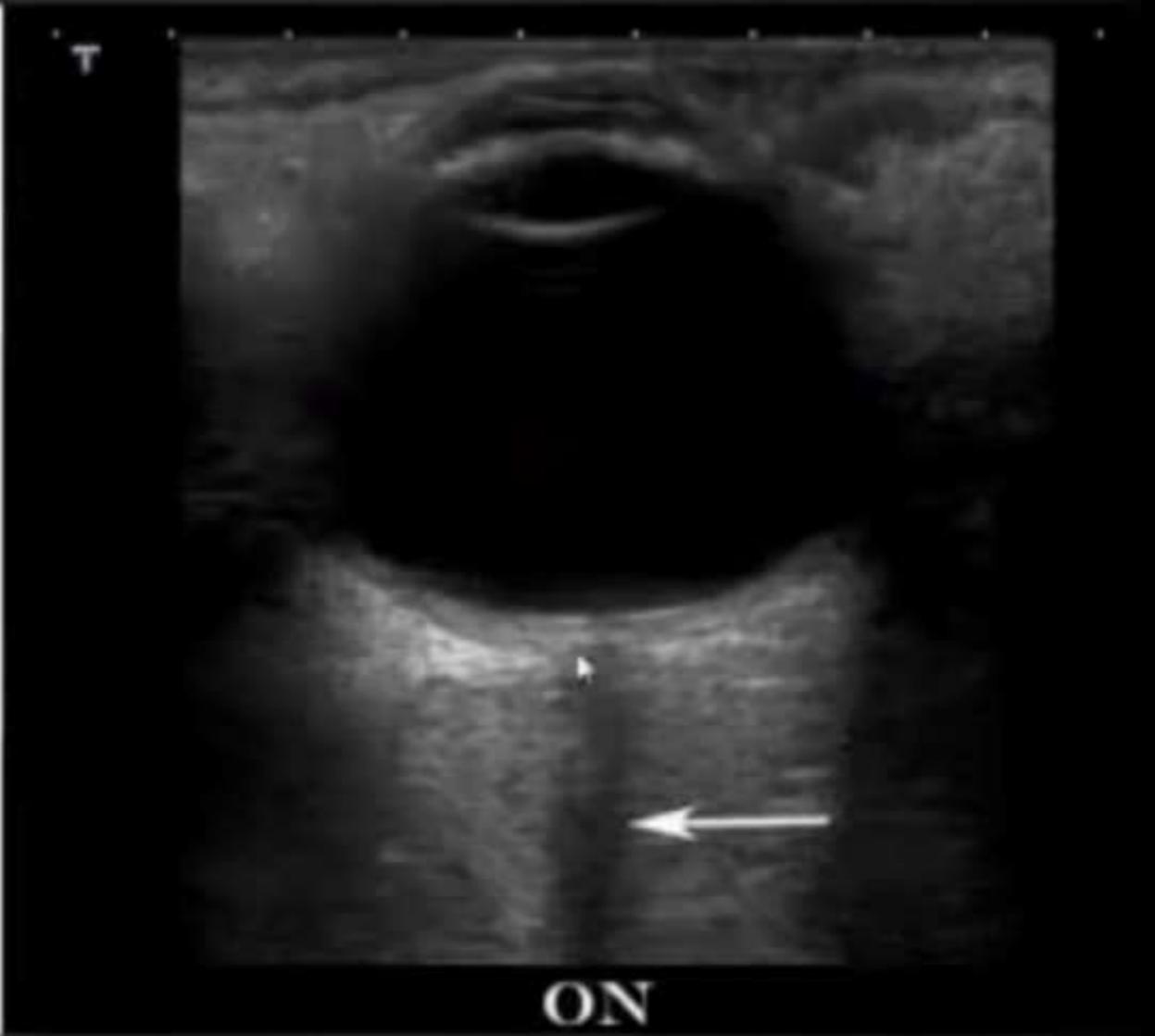
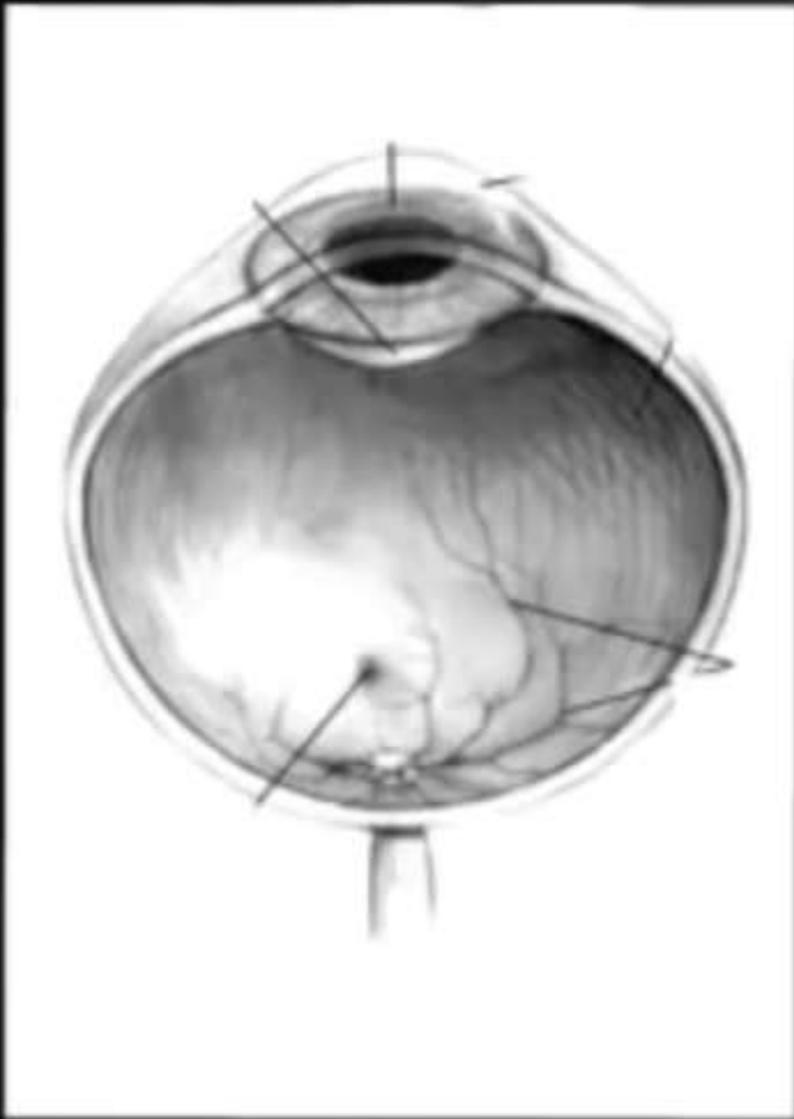
Scan away! "Look straight forward"



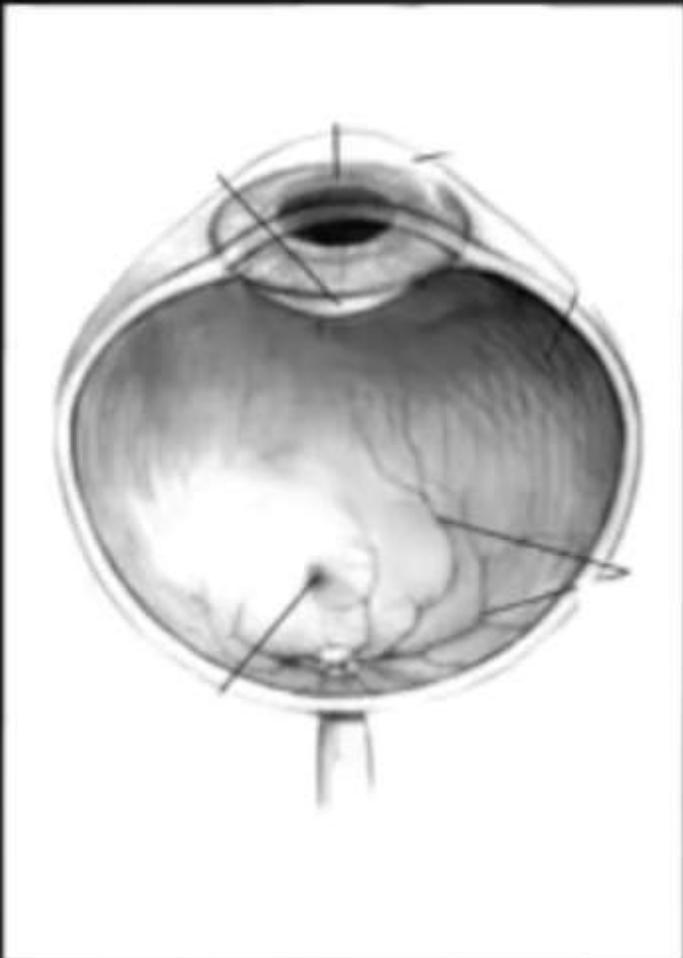
longitudinal



short axis

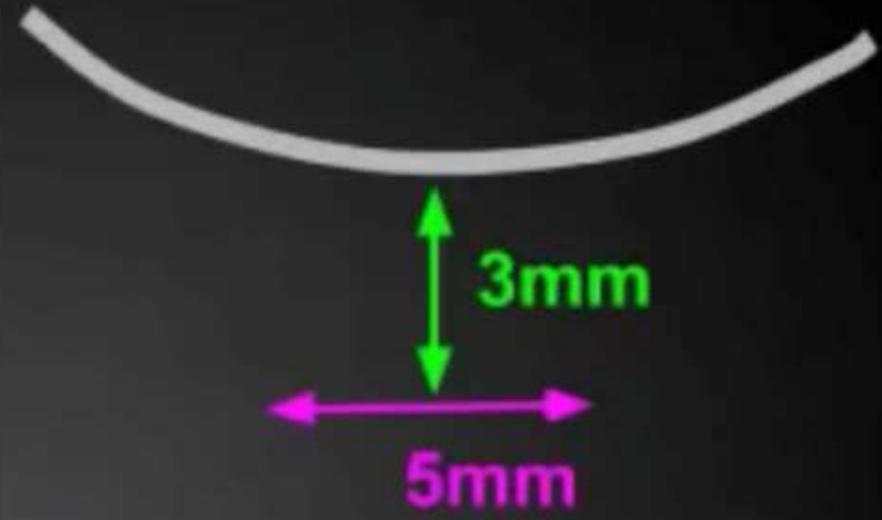


cornea lid anterior chamber



Increased ICP

3 down, 5 across



** average both eyes

↑ ICP

adult > 5.7-6.0
kid > 4.5

- **How to prevent further brain injury in raised ICP patient?**

- Propped up 30 degree
- Oxygen sats >94%
- Normal PCO₂
- MAP > 80 mm hg
- RSI to protect airway/to avoid raised ICP

Questions?

How far can we go with SOB?

- 32 year old man known well controlled asthma. Developed wheeze and got gradually worse, unable to manage symptoms with his normal inhaler. Brought in A&E by Ambulance.

“SICK” vs “NOT SO SICK”

- clearly in respiratory distress,
 - with altered mental status
 - and/or dangerous cardiac arrhythmias
-
- Resuscitation room
 - Categorization of Asthma ...
-
- *(2012-2013: 195 death in the UK)*

- A-B-Cs:
- IV/O₂/monitor/advanced airway equipment at bedside
- Supplemental O₂ (SATs 94-98%)

- Nebulise Salbutamol and continue
- Nebulise Ipratropium Bromide 500mcg (*once and then 4-6 hourly*)
- IV Steroid

- **Not improving.....What Next ?**

- Magnesium sulphate 1.2 - 2 g IV Infusion
- (PEF <50 % and not good response to initial inhaled bronchodilator)

- Aminophylline IV 5mg/kg loading dose followed by 0.5mg/kg/hr (*not recommended by SIGN*)

- **Not improving what next?**

- IV Salbutamol

- IV ketamin

- **Nil significant improvement....what next?**

Warnings...

- Deteriorating PEFV
- Persistent or worsening hypoxia
- Hypercapnea (or falling pH on arterial gas sample)
- Exhaustion, feeble respiration
- Reduced conscious level
- Respiratory arrest
- **Need presence of an Anaesthetist.**

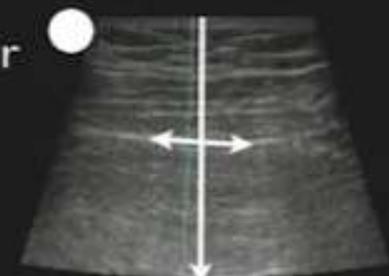
- NIV (BiPAP/ CPAP) (? ? ?)
 - Reduce intubation rate
- RSI
 - Does not solve the underlying problem
 - Permissive hypercapnia(Early RSI is vital)
- **Very high resistance to ventilate or unable to ventilate.....what next?**

Normal Lung



M Mode Marker
at Pleura

Pneumothorax



No Motion
Chest Wall
Waves

Positive
Motion Lung
Beach

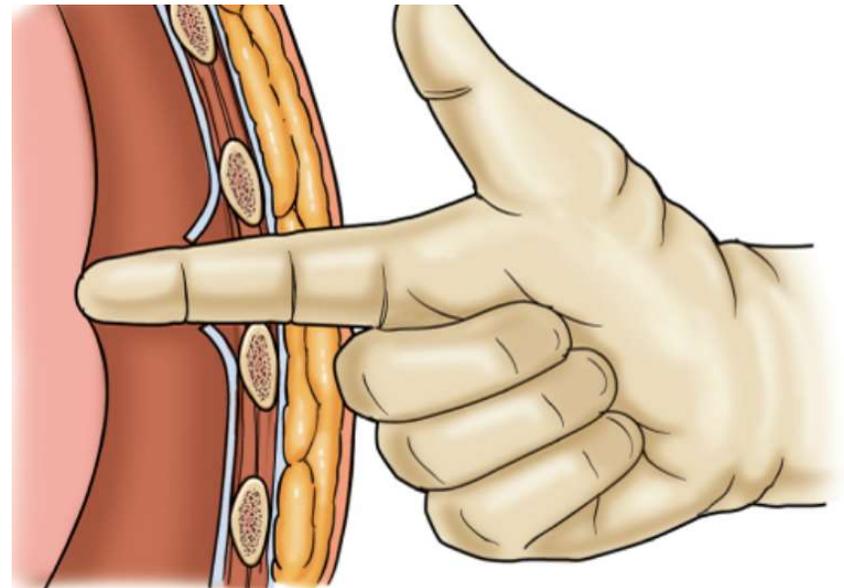
Seashore Sign

No Motion
Chest Wall

No Motion
Lung

Barcode/Stratosphere Sign

- Bilateral thoracentesis/ thoracostomy



Controversy

- Aminophylline:
 - Meta-analysis does not support
 - Anecdotal evidence
 - Widely used
- Heliox:
 - Helium 70% and oxygen 30%
 - real risk of hypoxia
 - Not commonly used

COPD

- Early use of NIV

Indications for NIV

COPD

pH <7.35
pCO₂ >6.5
RR >23

If persisting after bronchodilators and controlled oxygen therapy

Neuromuscular disease

Respiratory illness with RR > 20 if usual VC <1L even if pCO₂ <6.5
Or
pH < 7.35 and pCO₂ > 6.5

Obesity

pH <7.35, pCO₂ >6.5, RR >23
Or
Daytime pCO₂ > 6.0 and somnolent

Contraindications for NIV

Absolute

Severe facial deformity
Facial burns
Fixed upper airway obstruction

Relative

pH <7.15
(pH <7.25 and additional adverse feature)
GCS <8
Confusion/agitation
Cognitive impairment (warrants enhanced observation)

Indications for referral to ICU

AHRF with impending respiratory arrest

NIV failing to augment chest wall movement or reduce pCO₂

Inability to maintain Sao₂ > 85-88% on NIV

Need for IV sedation or adverse features indicating need for closer monitoring and/or possible difficult intubation as in OHS, DMD.

NIV SETUP

Mask

Full face mask (or own if home user of NIV)

Initial Pressure settings

EPAP: 3 (or higher if OSA known/expected)

IPAP in COPD/OHS/KS 15 (20 if pH <7.25)

Up titrate IPAP over 10-30 mins to IPAP 20-30 to achieve adequate augmentation of chest/abdo movement and slow RR

IPAP should not exceed 30 or EPAP 8* without expert review

IPAP in NM 10 (or 5 above usual setting)

Backup rate

Backup Rate of 16-20. Set appropriate inspiratory time

I:E ratio

COPD 1:2 to 1:3
OHS, NM & CWD 1:1

Inspiratory time

0.8-1.2s COPD
1.2-1.5s OHS, NM & CWD

Use NIV for as much time as possible in 1st 24 hours.
Taper depending on tolerance & ABGs over next 48-72 hours
SEEK AND TREAT REVERSIBLE CAUSES OF AHRF

NIV Monitoring

Oxygenation

Aim 88-92% in all patients

Note: Home style ventilators CANNOT provide > 50% inspired oxygen.

If high oxygen need or rapid desaturation on disconnection from NIV consider IMV.

Red flags

pH <7.25 on optimal NIV
RR persisting > 25

New onset confusion or patient distress

Actions

Check synchronisation, mask fit, exhalation port: give physiotherapy/bronchodilators, consider anxiolytic

CONSIDER IMV

NIV Not indicated

Asthma/Pneumonia

Refer to ICU for consideration IMV if increasing respiratory rate/distress or
pH <7.35 and pCO₂ >6.5

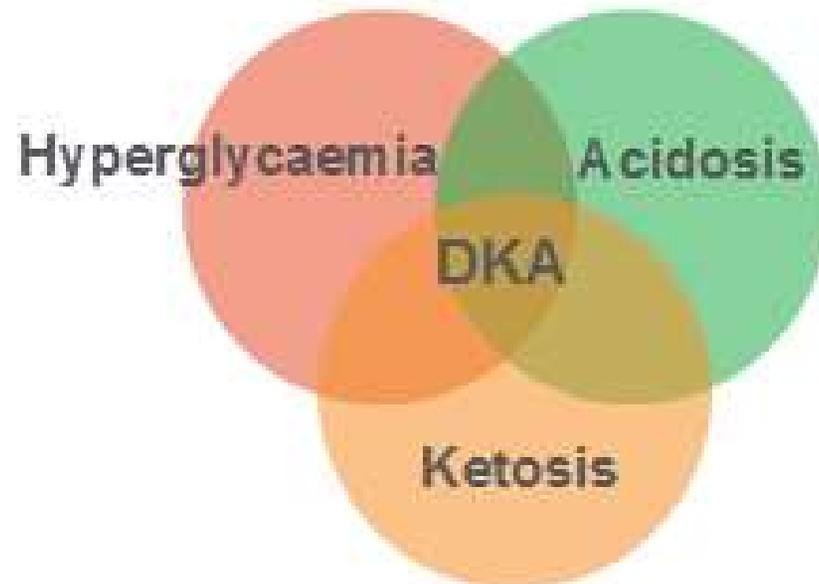
* Possible need for EPAP > 8

Severe OHS (BMI >35), lung recruitment eg hypoxia in severe kyphoscoliosis, oppose intrinsic PEEP in severe airflow obstruction or to maintain adequate PS when high EPAP required

Questions?

Diabetic Emergency

- **DKA: Diagnostic criteria?**



- DKA:
 - **Diabetics:** Blood glucose > 11.0 mmol/L or known diabetes mellitus
 - **Ketosis:** Ketonaemia > 3.0 mmol/L or significant ketonuria (more than 2+ on standard urine sticks)
 - **Acidosis:** Serum venous bicarbonate of < 15.0 mmol/L and/or venous pH < 7.3

- Management:

- RSI: GCS is reduced or ventilation is impaired.
- Oxygen
- IVF: Normal saline (1L over 1/2, 1, 2,2,4,4,6)
- Insulin: Fixed rate (0.1u/kg/hr until Glucose 14mmol/L, then ketone guided) ketone to reduce by 0.5mmol/l/h. if not increases insuline 1unit/hr.
- Glucose replacement: 14 mmol/ hour (10%, 125 ml/hr)

- KCl replacement:
 - >5.5 mmol/l – none
 - 3.5-5.5 mmol /l – 20 mmol/500 ml bag (i.e. 40 mmol/l)
 - <3.5 mmol/l – senior advice is required, and pharmacy involvement may be needed. The patient MUST be looked after in a high dependency area
- Treat precipitant cause (MI, Pneumonia)
- Prevent
 - Oedema (Cerebral/ Pulmonary)
 - VTE

- HHS

- Hyperosmolar: Osmolar gap > 10 or Osmolality > 320
- Hyperglycaemia : > 30

- -ve ketone < 3
- -ve: Ph > 7.3 , $\text{HCO}_3^- > 15$

- HHS Management:

- IVF: 0.9% Normal Saline (0.45% Saline if $\text{Na} > 155$, 5% dextrose later)

- Insulin: 0.05unit/kg/hr to start later

- when blood glucose is not falling with IVF.

- Ketone . 1mmol/L

Questions?

A PINT FOR A PINT

BLOOD DRIVE



Upper GI bleed

- **Identification:**

- Easy: Haematemesis (present in 50%) and melaena (present in 70%)
- Difficult: Syncope, dizziness, fresh PR bleeding, hypotension, tachycardia

- **Variceal Vs non-variceal**

Management

- A
- B
- C
- D
- E

Management plus

- Blatchford score

Shall we?

- PPI: ???
- Somatostatins and vasopressins?
- Vitamin K : ?
- Antibiotics: ?

In case...

	ACTION	DONE	COMMENTS	TIME
All Patients	Triage, EWS and Stream: Shocked AND/OR Actively Bleeding > Resus Not Shocked AND Not Actively Bleeding > Majors		Initial BP: / Initial HR: EWS:	
	Bloods: FBC, U&E, LFT, Coagulation Screen, VBG, G&S			
	Large Bore IV Access			
	Consider Fluid Resuscitation using balanced crystalloid			
	Do Not Transfuse Blood unless Hb <7g/dl (<9g/dl in setting of unstable coronary artery disease)		Hb:	
	Complete Risk Assessment using Blatchford Score (See Over)		Blatchford Score:	
	Blatchford Score 0 or 1, Bloods NAD > Go to Exclusion Criteria Box 2			
	Blatchford Score >1, Exclusion Criteria or other reason for admission admit to MAU			

**Shocked AND/OR
Actively Bleeding**

Seek ED Consultant / Middle Grade Assistance

Large Bore IV Access x 2

Consider Fluid Resuscitation using balanced crystalloid such as Plasmalyte while awaiting blood for transfusion

Cross-Match 6 Units Packed Red Cells OR initiate Massive Haemorrhage Protocol as appropriate

X-match 6 units
MHP

Refer to Medical Registrar to facilitate urgent Gastroscopy (where appropriate) following OPTIMAL Resuscitation

Ref'd to Med Reg
@: 00:00

Actively Bleeding and Platelet count < 50: Offer platelet transfusion

Platelets:

Actively Bleeding and PT or INR or APTT >1.5 times normal: Offer Fresh Frozen Plasma

Actively Bleeding
and Patient on WARFARIN: Yes No
If Yes offer Prothrombin Complex Concentrate

VARICEAL BLEEDING	<i>IN SUSPECTED VARICEAL BLEEDING</i>			
	Provide Antibiotics as per Antimicrobial Guidelines			
	Offer Terlipressin			

LONDON
SCHOOL *of*
HYGIENE
& TROPICAL
MEDICINE



Haemorrhage alleviation with
tranexamic acid - Intestinal system

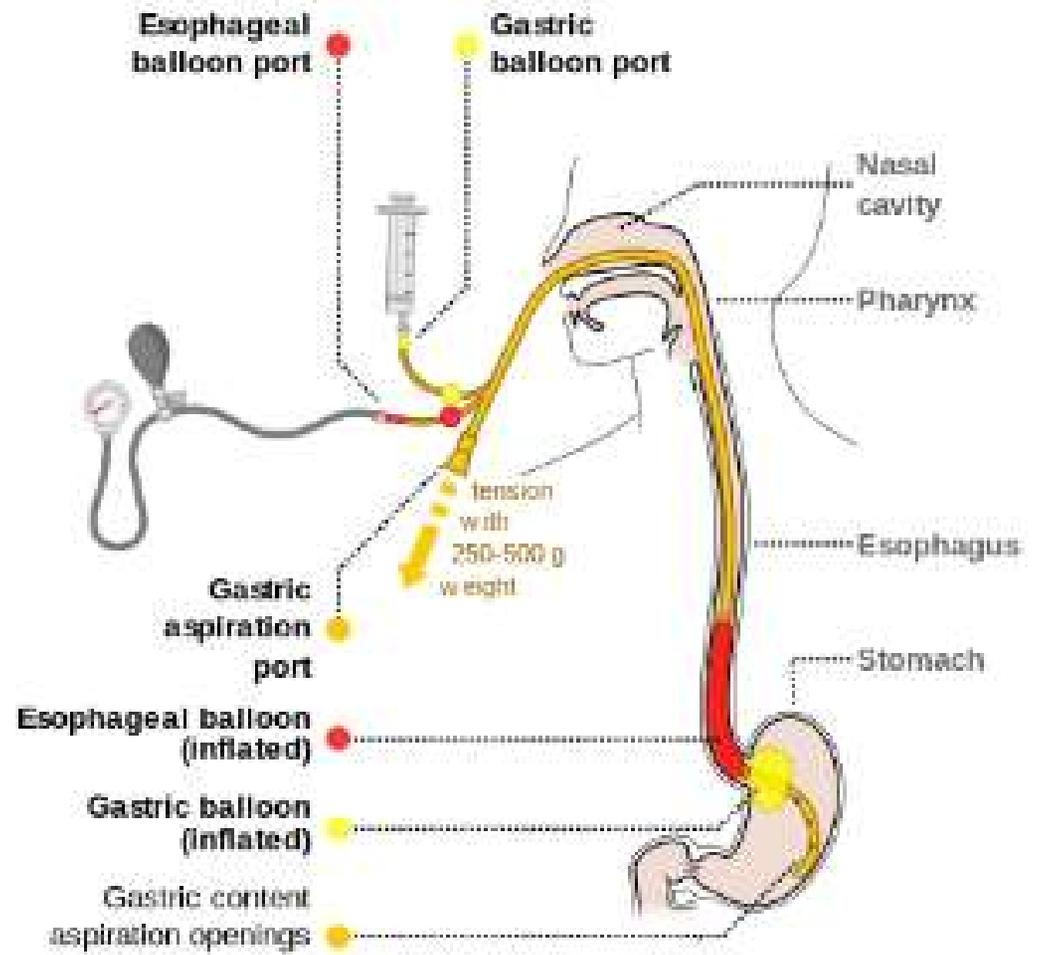
- **What is Major haemorrhage?**

- **Major haemorrhage:**

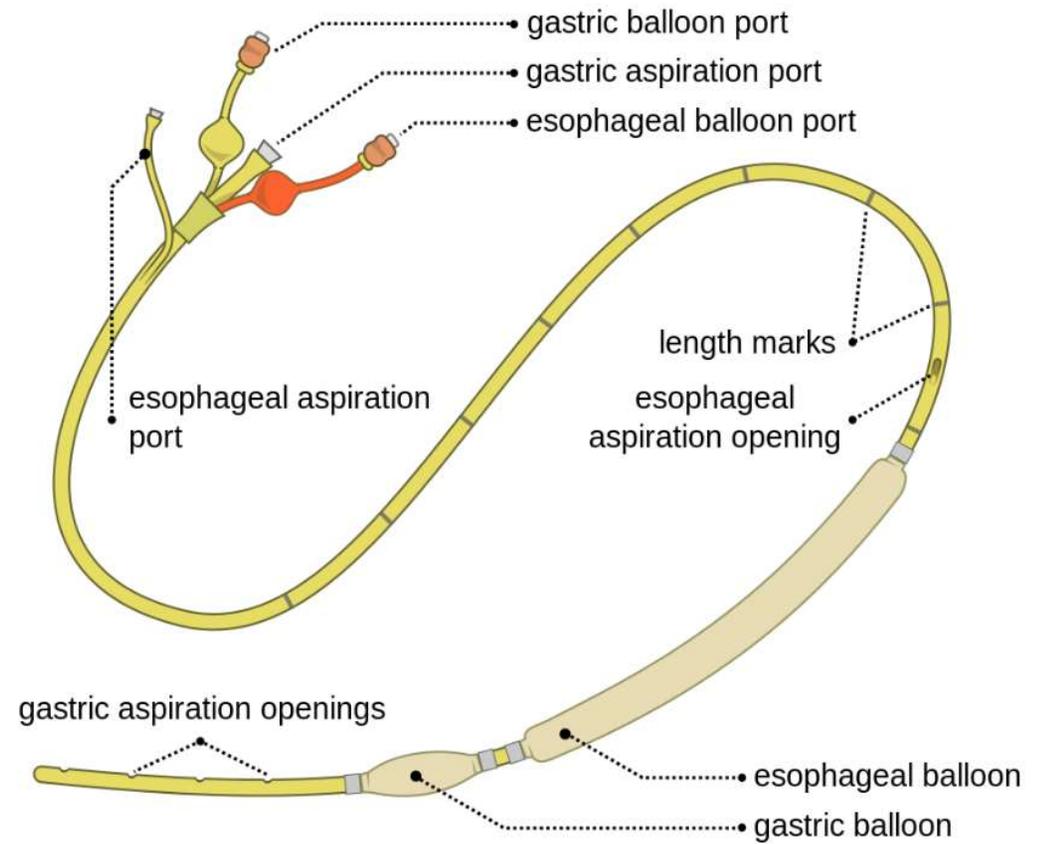
- Loss of more than one blood volume within 24 hours (around 70 mL/kg, >5 litres in a 70 kg adult)
- 50% of total blood volume lost in less than 3 hours
- Bleeding in excess of 150 mL/minute.

Major Haemorrhage Transfusion protocol:

- Give further FFP 1L (4 units) per 6 units red cells
- Consider cryoprecipitate (2 pools)
- Consider platelets (1 adult therapeutic dose (ATD))



Sengstaken tube



Questions?

Chest Pain...

- 32 year old French chef Developed **sudden sharp chest pain** at work with minimal left arm numbness. Pain improve within minutes became **painfree** when arrived in ED. Brought in by his colleague in A&E department.
- No PMH / cardiac risk
- Not on Medication
- Fit and well

- Clinical examination:
 - NEWS2 : 0
 - A: patent
 - B: Equal symmetrical air entry with expansion
 - C: **AR murmur**
 - D: 15/15, no neurology
 - E: NAD
- Further Examination: ?

- Further examination:
 - Pulse pressure deficit
 - Reduced systolic BP by 20mm in left

- **Differentials?**
- **What next?**

- **Acute Aortic Dissection**

- Pneumothorax

- ACS

Most important investigation in that time?

- ECG: ?

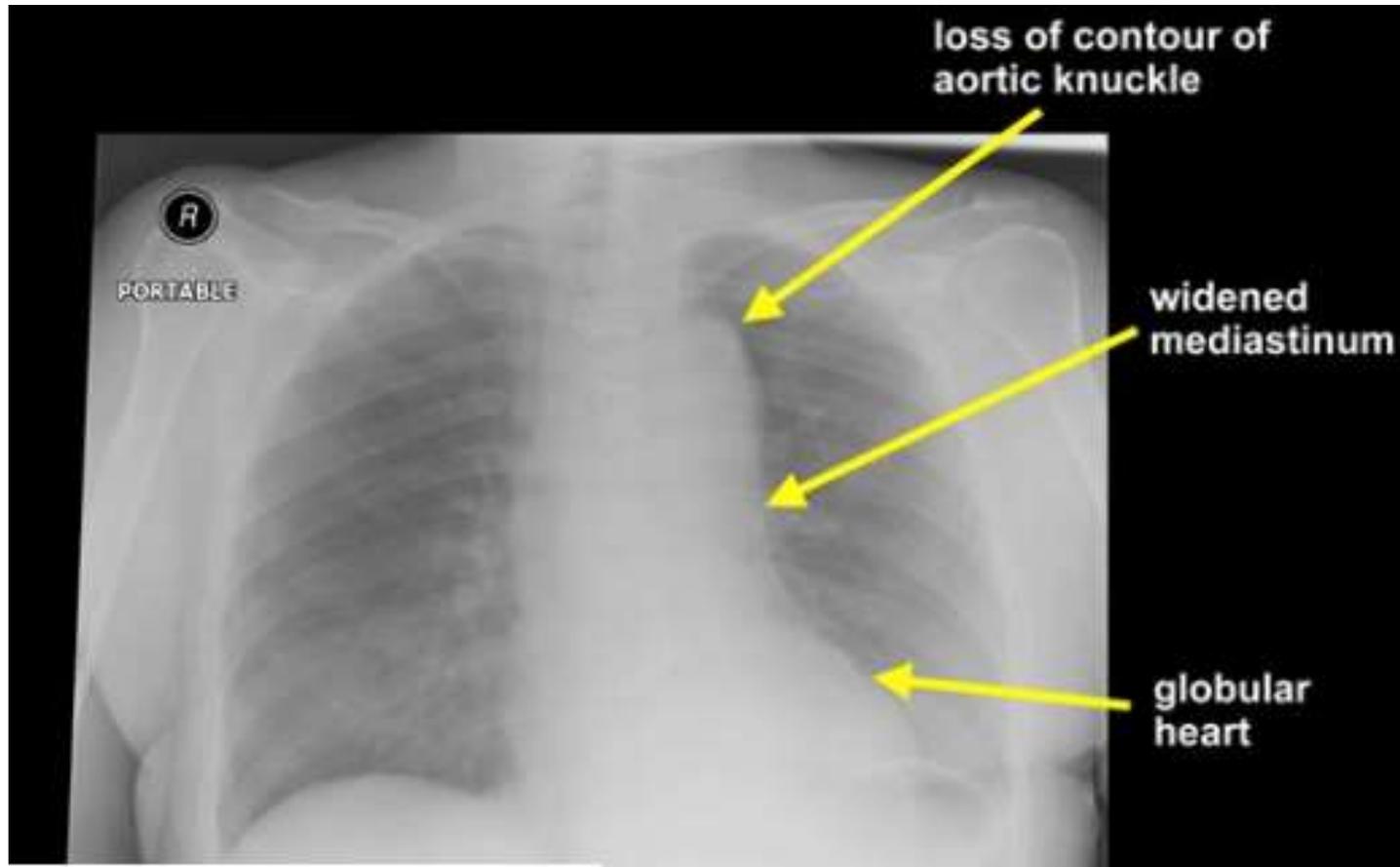
- CXR: ?

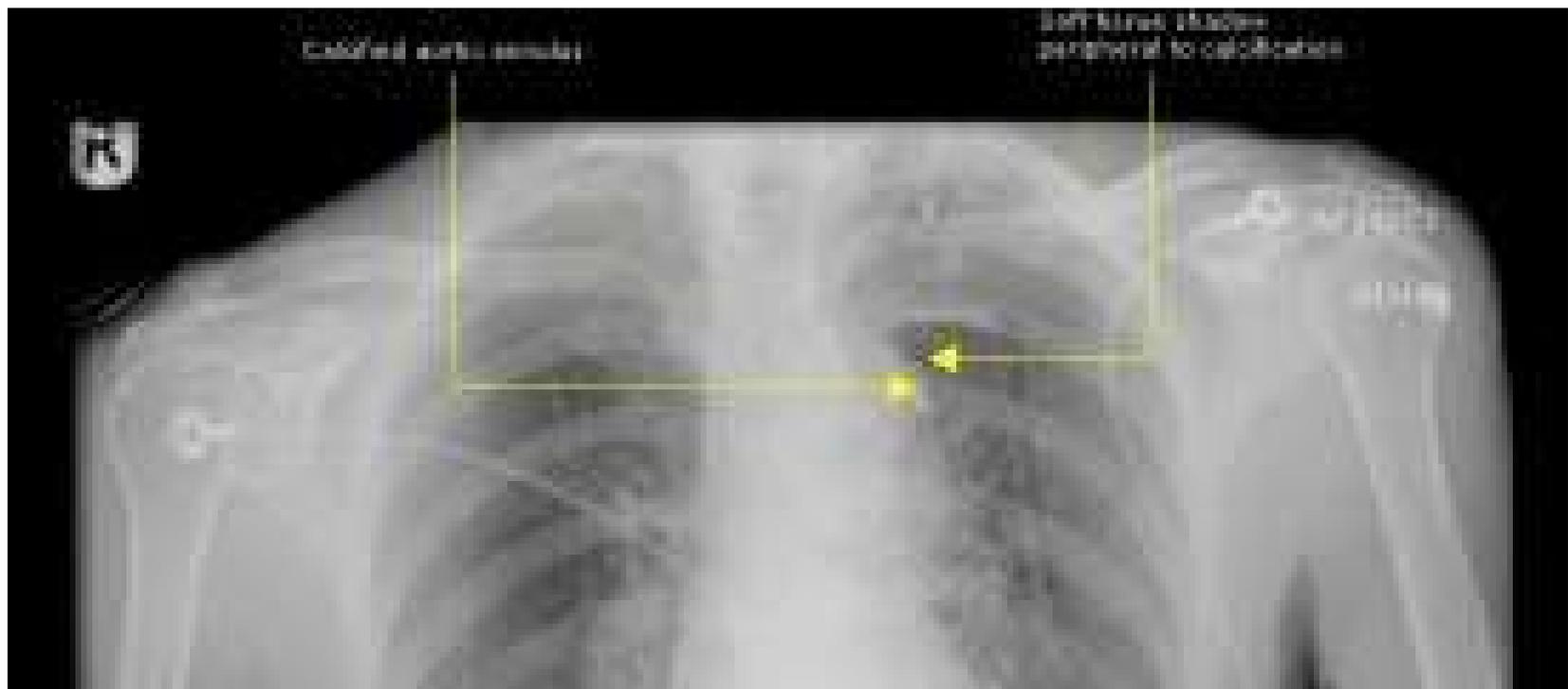
- ECHO/ US: ?

ECG: NOT HELPFUL

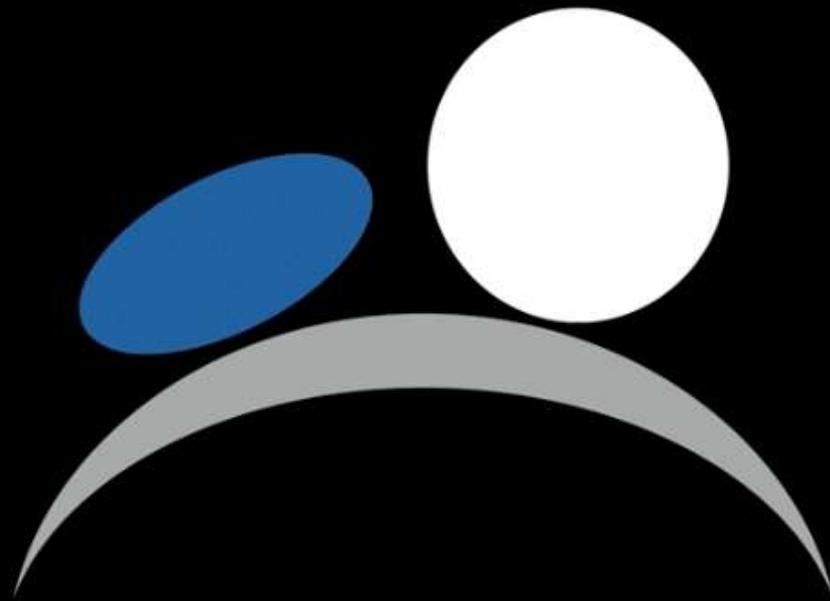
- Normal: 30%
- STEMI: 3%
- Acute Ischaemia: 15%
- Non –specific ST and T changes : 41%

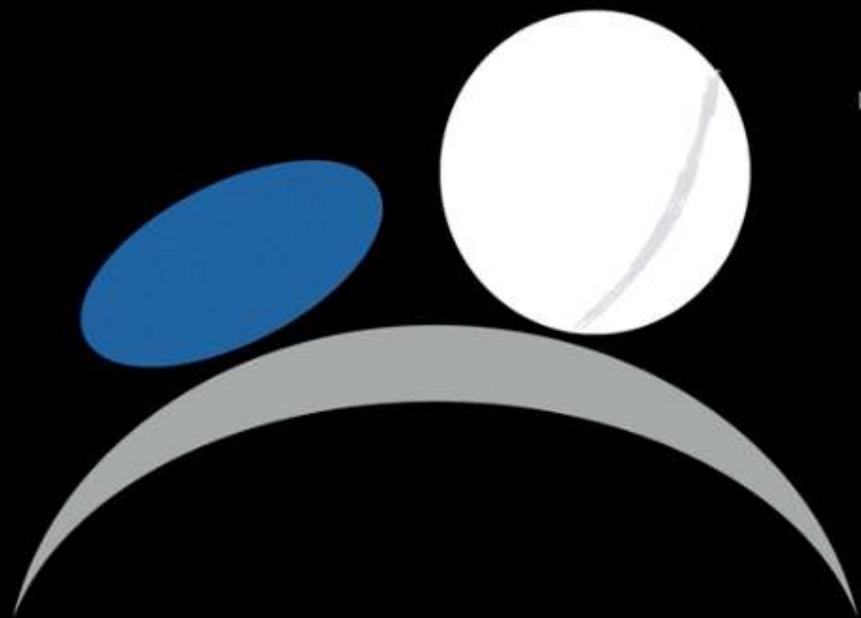
CXR





ECHO





4









CTA



- **What are the % we fail to diagnose?**

Aortic Dissection

- There are about 25,000 cases of aortic dissection every year.
- This is 2-3 times more common than a ruptured AAA.
- **Missed cases:**
 - 45%
 - **Only 15% was suspected in 100 Dissection patients.**
- We need tools to increase our pretest probability without over-ordering CT on our patients.

International Registry of acute Aortic Dissection (IRAD)

- Established in 1996
- >7300 cases
- >51 sites in 12 countries

- Presenting symptoms and physical findings have not changed significantly
- the use of computed tomography in the diagnosis has increased
- surgery in type A AAD / endovascular therapy in type B AAD

International Registry of acute Aortic Dissection (IRAD)

- History
 - Pain was **abrupt** in onset (85%)
 - Commonly **sharp** in nature whilst it is described as an **ache or tightness**
 - classic tearing **interscapular pain** (50%)
 - Site:
 - **Anterior chest: 80%**
 - **Back: 50%**
 - **Abdomen: lower than 50%**
- No Pain at all in 5-15%
 - presenting with syncope, stroke, congestive cardiac failure or the elderly.

Pathophysiological consequences of AAD

- Branch vessel occlusion
- Rupture in body cavity

Branch vessel occlusion and consequences

Coronary vessel(s)	ST elevation myocardial infarction
Common carotid(s)	any type of stroke
Subclavian(s)	an acutely ischaemic upper limb
Coeliac/mesenteric vessel(s)	ischaemic bowel
Renal vessel(s)	frank haematuria
Spinal artery(ies)	sudden onset painless paraplegia

Dissection into various body cavities

Ascending aorta	<ul style="list-style-type: none">• haemopericardium (syncope and /or sudden death)• right haemothorax (invariably sudden death)
Arch of aorta	<ul style="list-style-type: none">• mediastinal haematoma• interatrial septal haematoma (cardiac conduction defects)• compression of pulmonary trunk/ artery
Descending aorta	<ul style="list-style-type: none">• left haemothorax (sudden death)• rarely into oesophagus (profuse haematemesis)
Abdominal aorta	<ul style="list-style-type: none">• retroperitoneal haemorrhage (back pain with shock)• rarely intraperitoneal haemorrhage (shock and acute abdomen)

Unexplained Severe Pain?

**THINK
AORTA**

Aortic Dissection is an emergency
that is often fatal when missed

Abdominal Aortic Aneurism

- **Age of 50 with abdominal/back pain and hypotension, or in patients with known AAA.**
- **Target BP in leaking AAA?**
- **Investigation of choice for Stable / unstable patient?**

- **Avoid aggressive resuscitation.**
 - Permissive hypotension.
 - systolic blood pressure >70mmHg is advised.

- **CT aortogram** is the gold standard investigation for stable patients to evaluate AAA.

Level 1 US for EM Trainee

- Emergency ultrasound, performed by UK emergency physicians, has been reported as having the following accuracy profile for the detection of AAA:
 - Sensitivity of **96.3 %** (95 % confidence interval (CI), 81.0 % to 99.9 %)
 - Specificity of **100 %** (95 % CI, 91.8 % to 100 %)
 - Negative predictive value of 98.6 % (95 % CI, 88.0 % to 99.9 %)
 - Positive predictive value of 100 % (95 % CI, 86.8 % to 100 %)

□



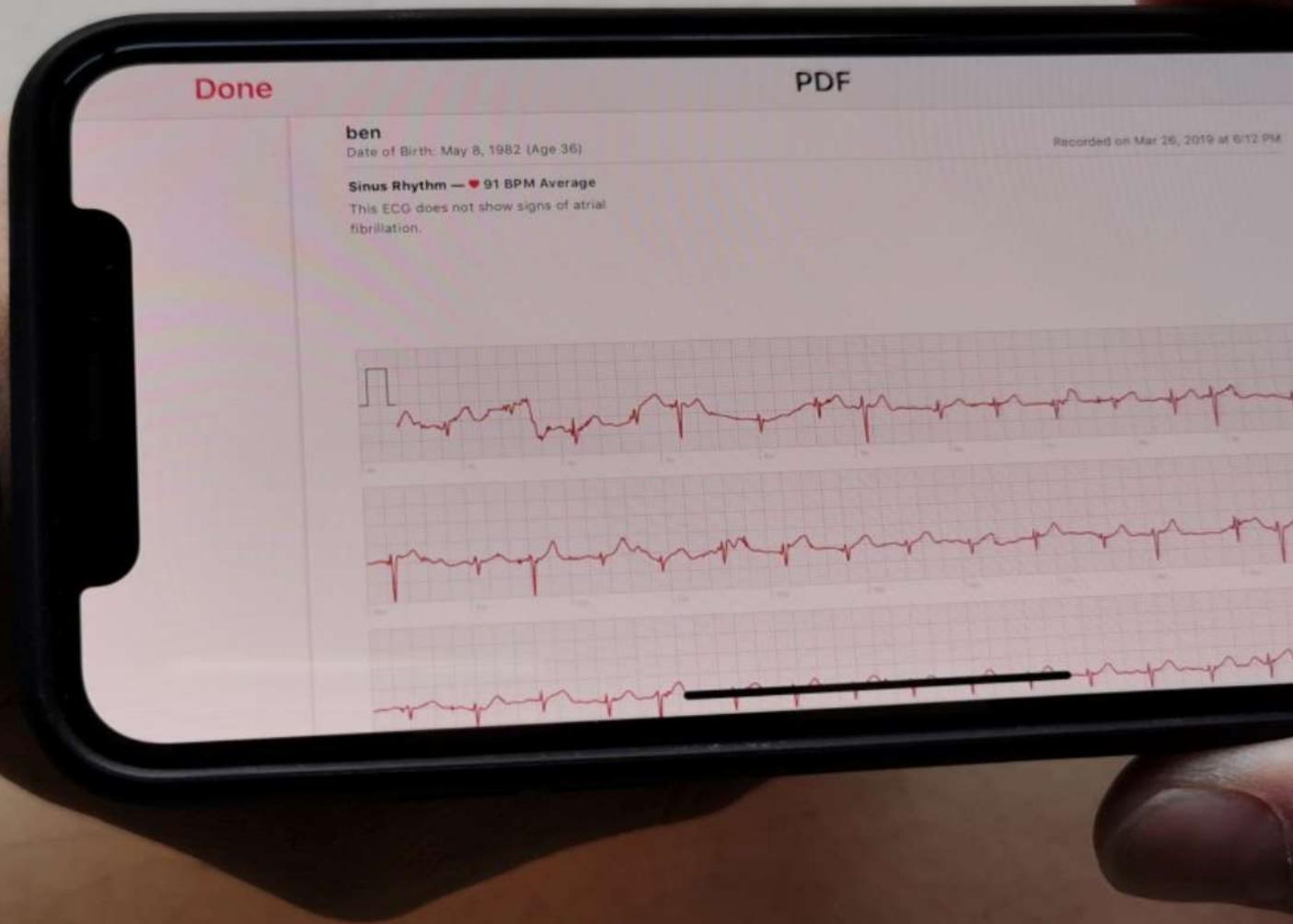
D1 = 37.1mm

P 100%

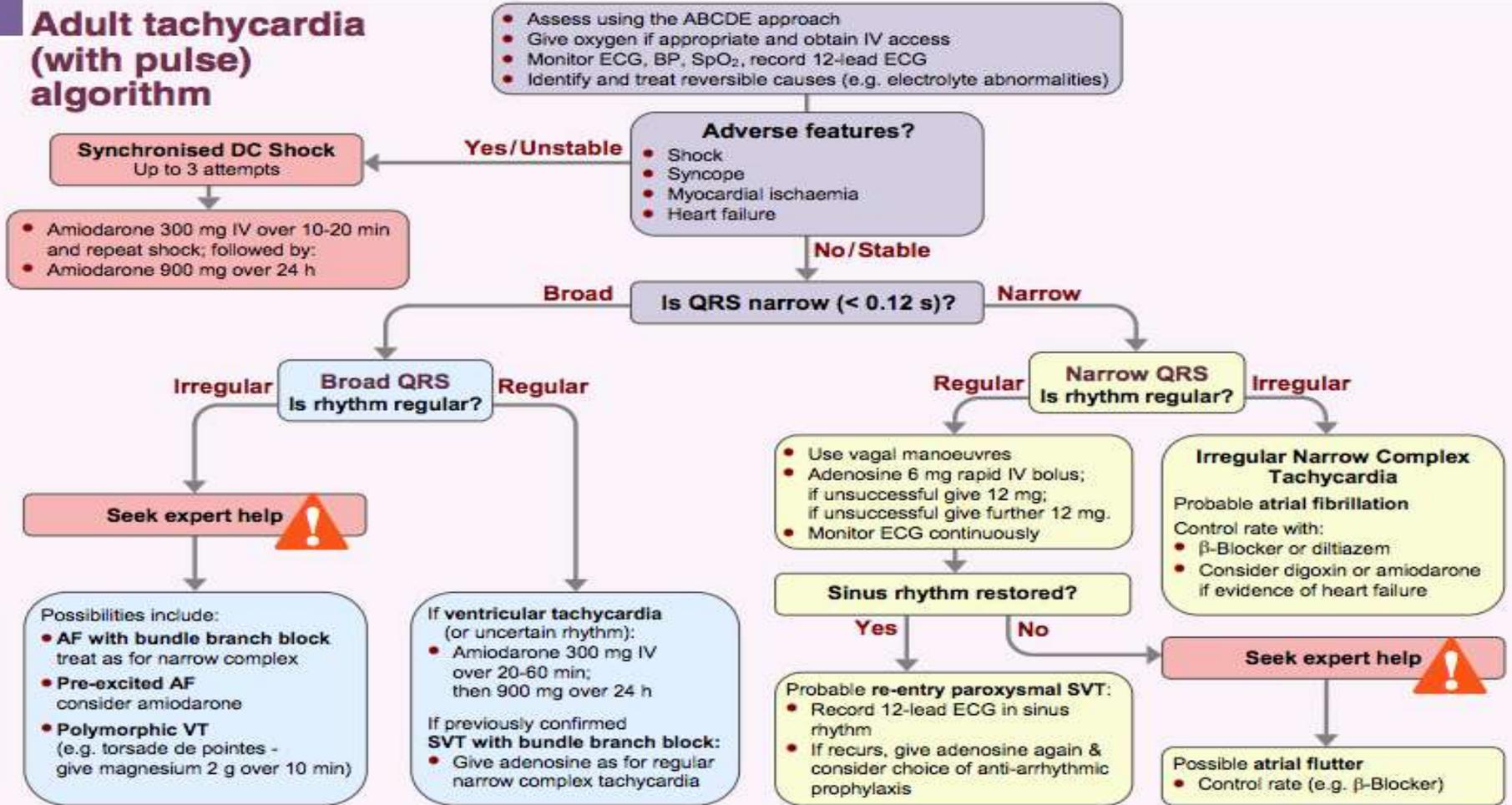
10 cm

Fr255

Questions?



Adult tachycardia (with pulse) algorithm



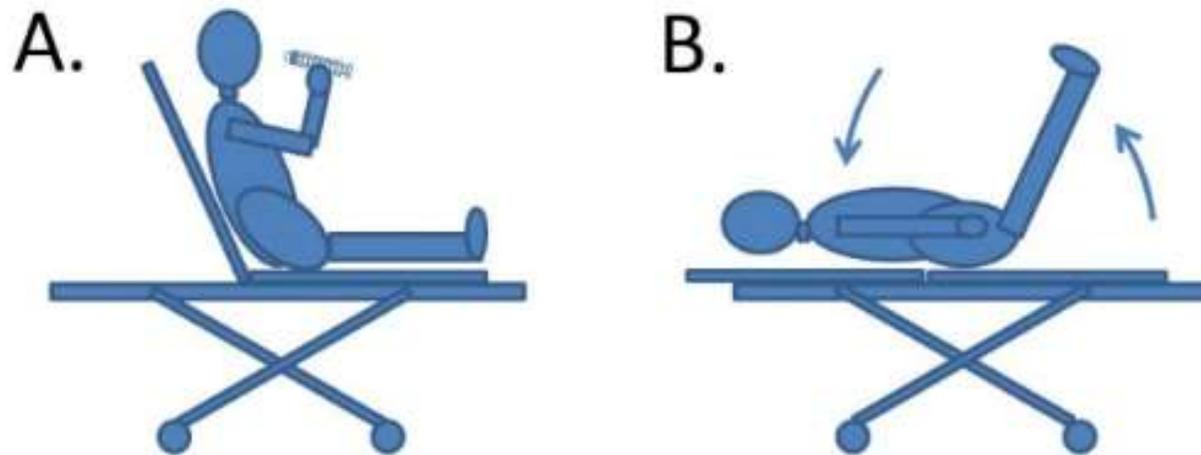
First step to treat confirmed SVT?

The Randomised Evaluation of modified Valsalva Effectiveness in Re-entrant Tachycardias (REVERT) trial

- 433 participants
- 37 (17%) of 214 participants assigned to standard Valsalva
- 93 (43%) of 214 in the modified Valsalva manoeuvre group (adjusted odds ratio 3·7
- (95% CI 2·3–5·8; $p < 0\cdot0001$).

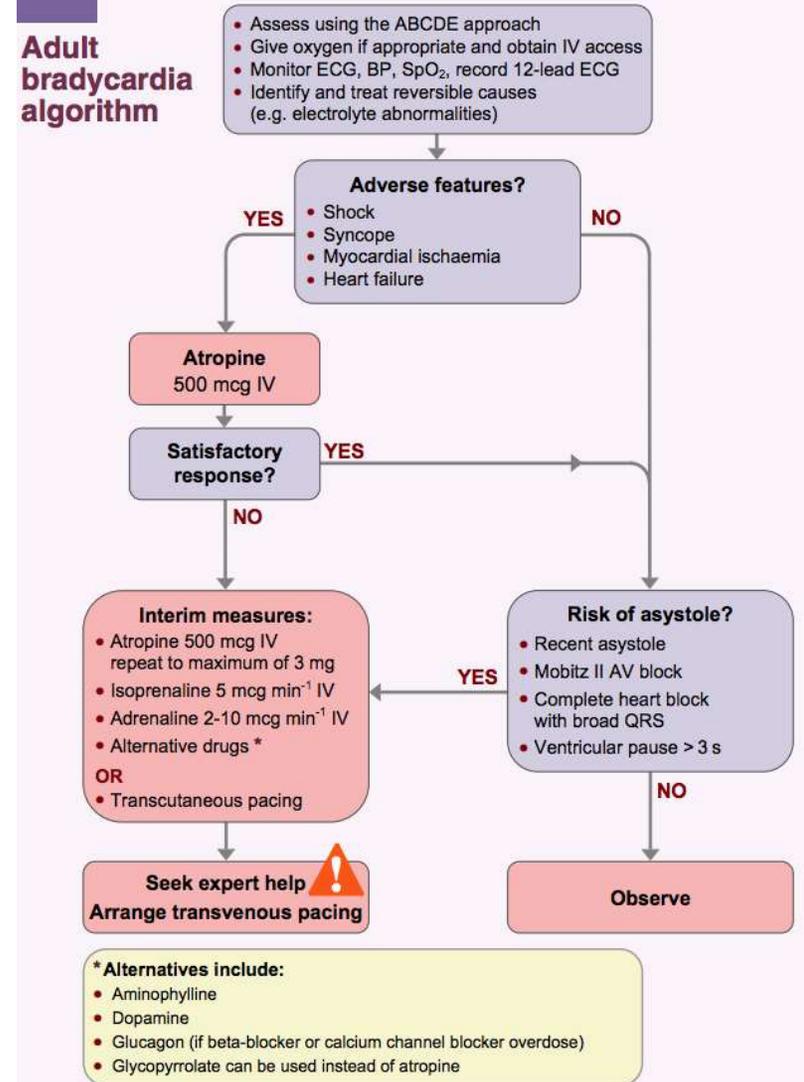
Modified Valsalva

REVERT Trial



Postural Modification to the Standard
Valsalva Maneuver

Adult bradycardia algorithm



14



Toxicology

- General principals
 - 1. ABCDE assessment and supporting management
 - 2. Decontamination
 - 3. Elimination
 - 4. Antidotes
 - 5. Psychiatric assessment

- Toxidromes

- 1. Sympathomimetic

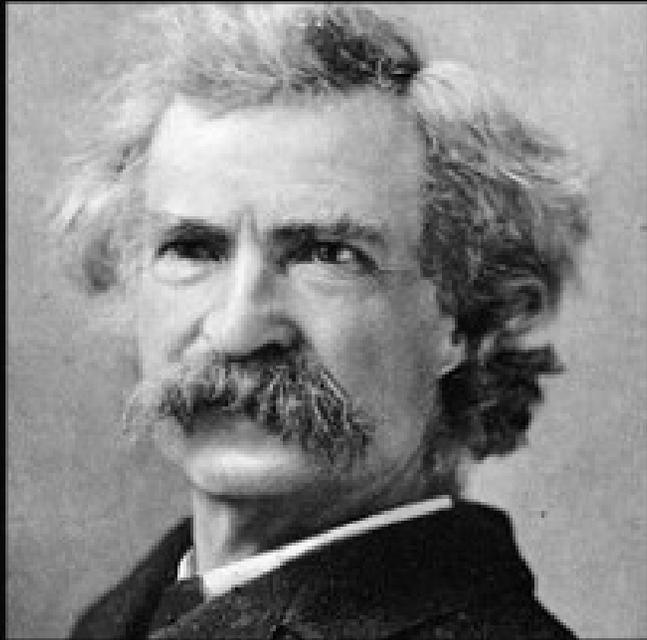
- 2. Anticholinergic

- 3. Cholinergic

- 4. Opiate



Questions?



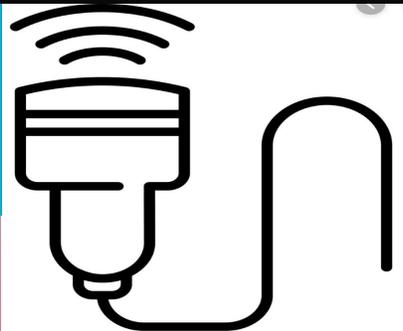
If you want to change the future, you must change what you're doing in the present.

~ Mark Twain



NEWS2

National Early Warning Score



**‘COULD IT BE
SEPSIS?’**