



Cardiac Case Walkthrough Part 1 Pre-assessment to CPB

What a "pump case" could be

Emergency Type A dissection repair

Tricuspid valve repair or replacement

Ross procedure

ACHD surgery

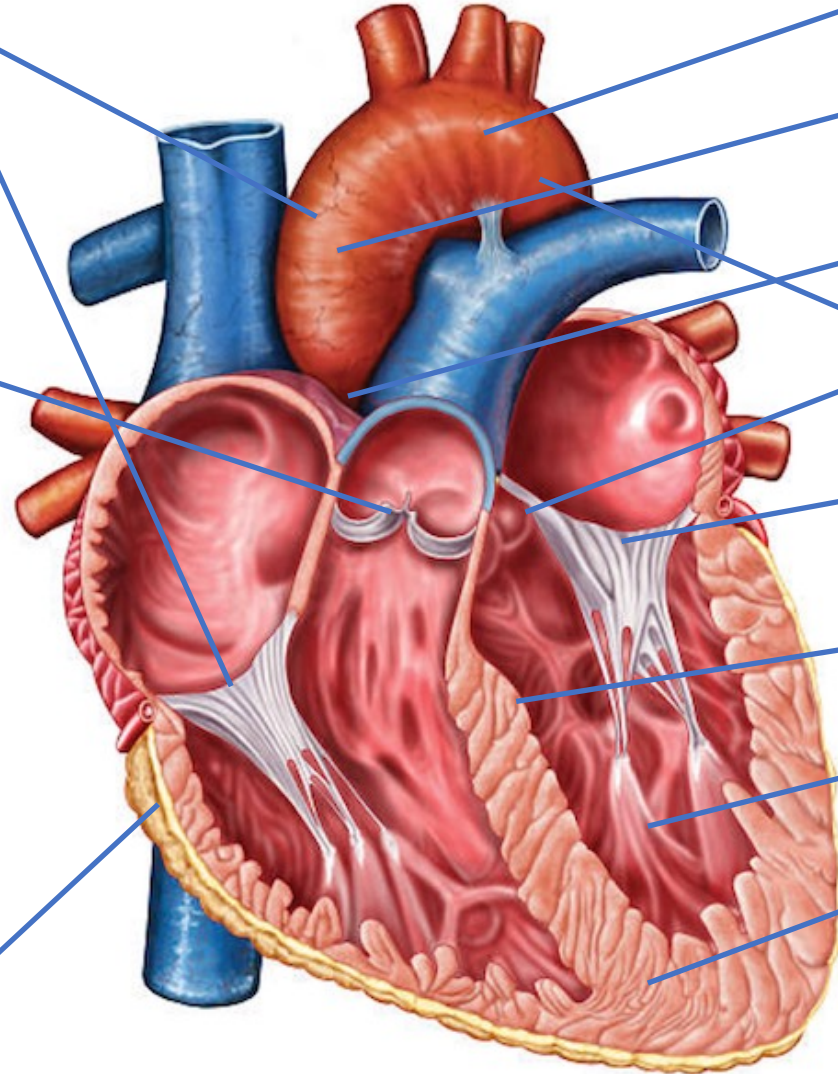
CALS requiring CPB

Establishment on MCS

Heart transplantation

Lung transplantation

Coronary artery bypass grafting



Aortic arch replacement

Ascending aorta replacement

Aortic root replacement

Aortic valve replacement

Descending thoracic aorta repair

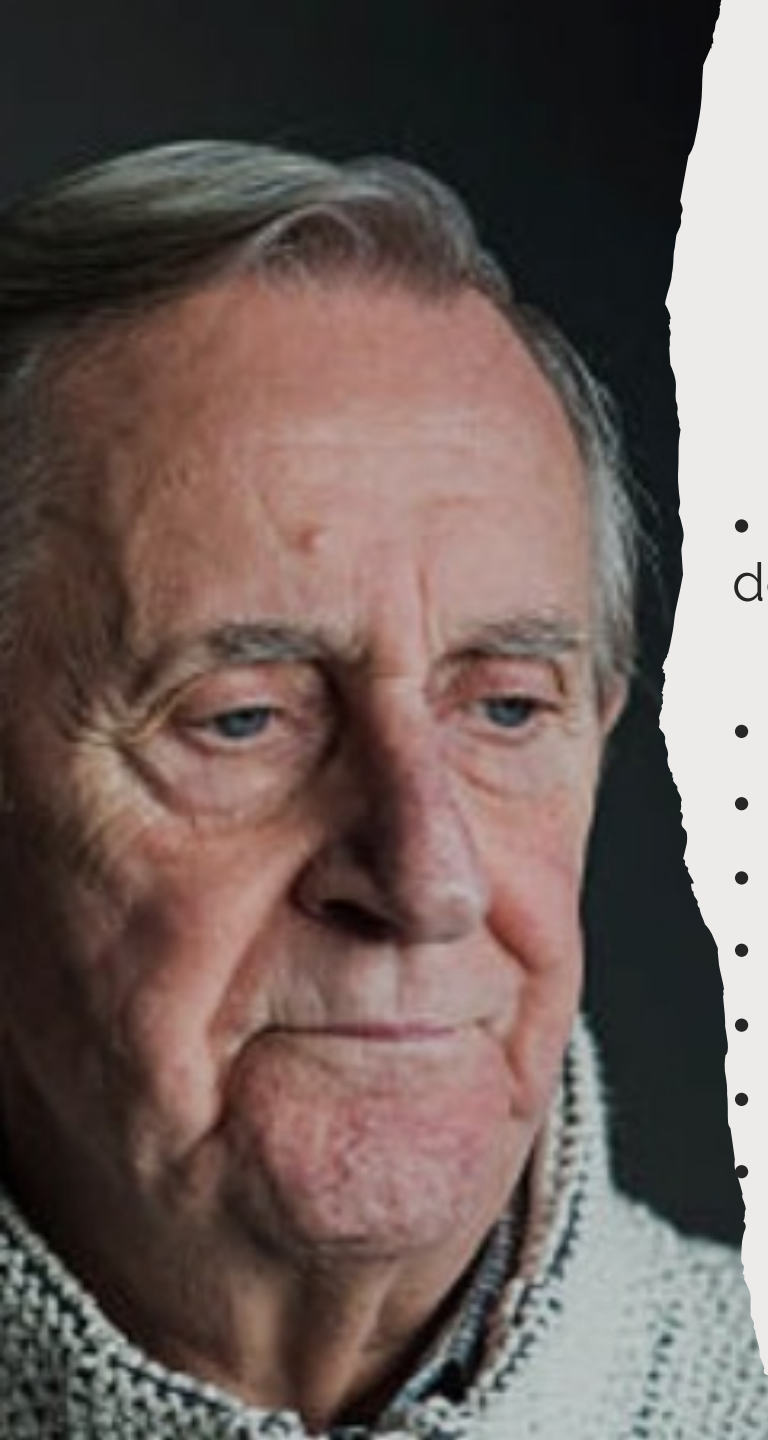
Mitral valve repair or replacement

Septal myectomy

LV aneurysm repair

Cardiac trauma repair

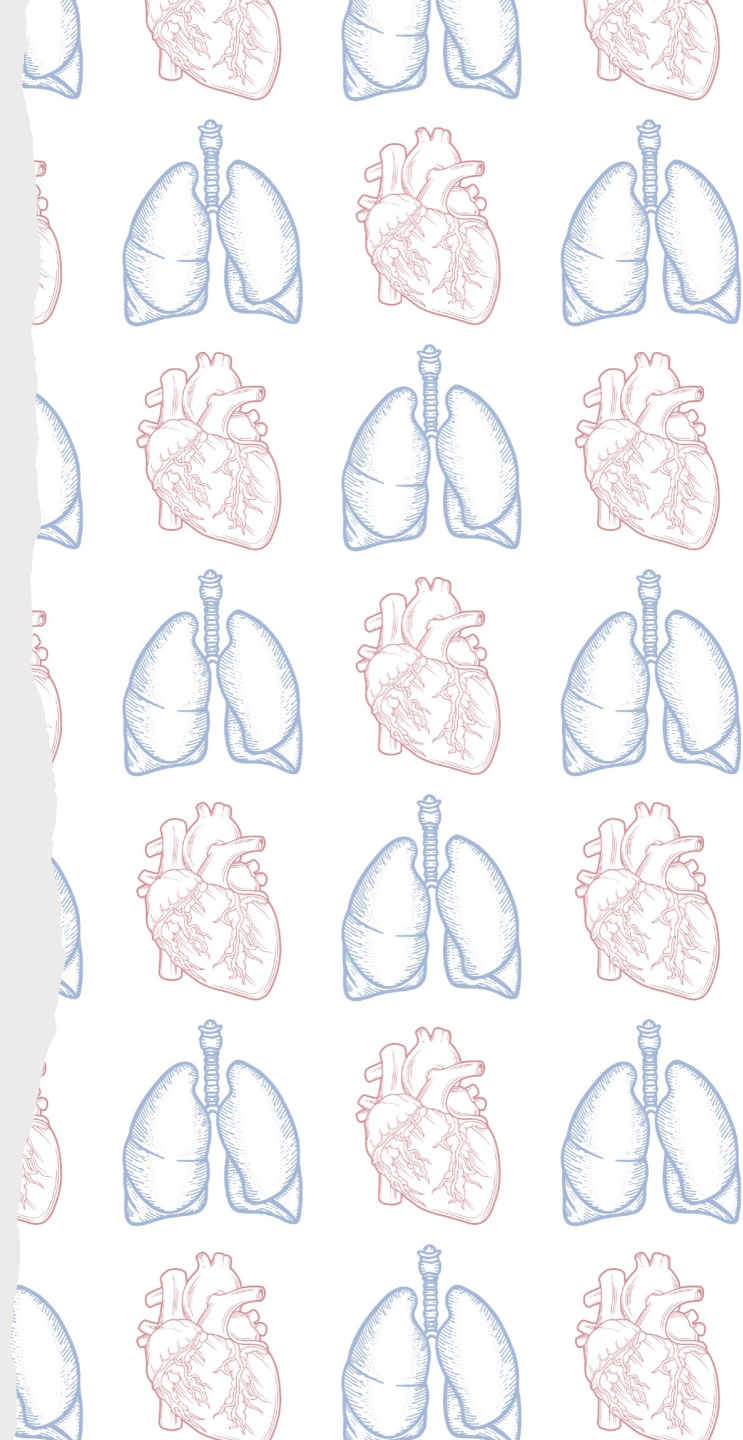
Any combination of these



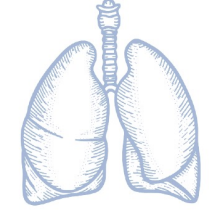
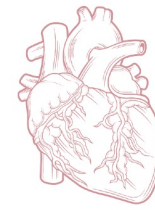
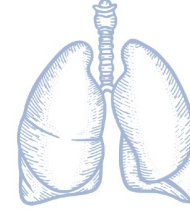
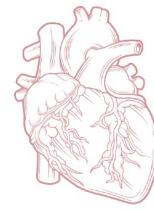
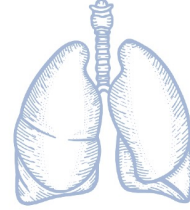
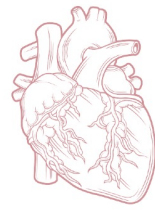
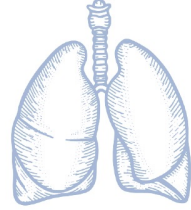
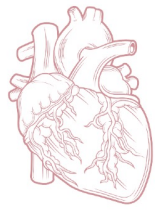
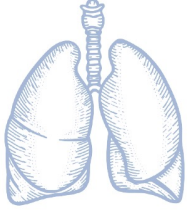
Case 1

Mr Thomas
72M 85kg 175cm

- Chest pain after 10 minutes walking his dog
- Type 2 diabetes
- Hypertension
- Hypercholesterolaemia
- Previous Right THR
- Ex-smoker, 30 pack year history
- Drinks half a bottle of wine twice a week
- Retired accountant



Case 1



He presented to his GP

Angiogram at his local hospital identified “surgical disease”.

He was discussed at the coronary MDT and decision for surgery made.

He's been on the P3 waiting list for 5 months.

He's come in for an elective CABG*3

Case 1



Drug history

NKDA

Aspirin 75mg OD

Metformin 500mg BD

Lisinopril 20mg OD

Atorvastatin 80mg ON

Bisoprolol 2.5mg OD

ISMN 30mg OD

GTN 2 sprays PRN

Tamsulosin 400mcg ON

Case 1

What investigations do I need to see pre-op?

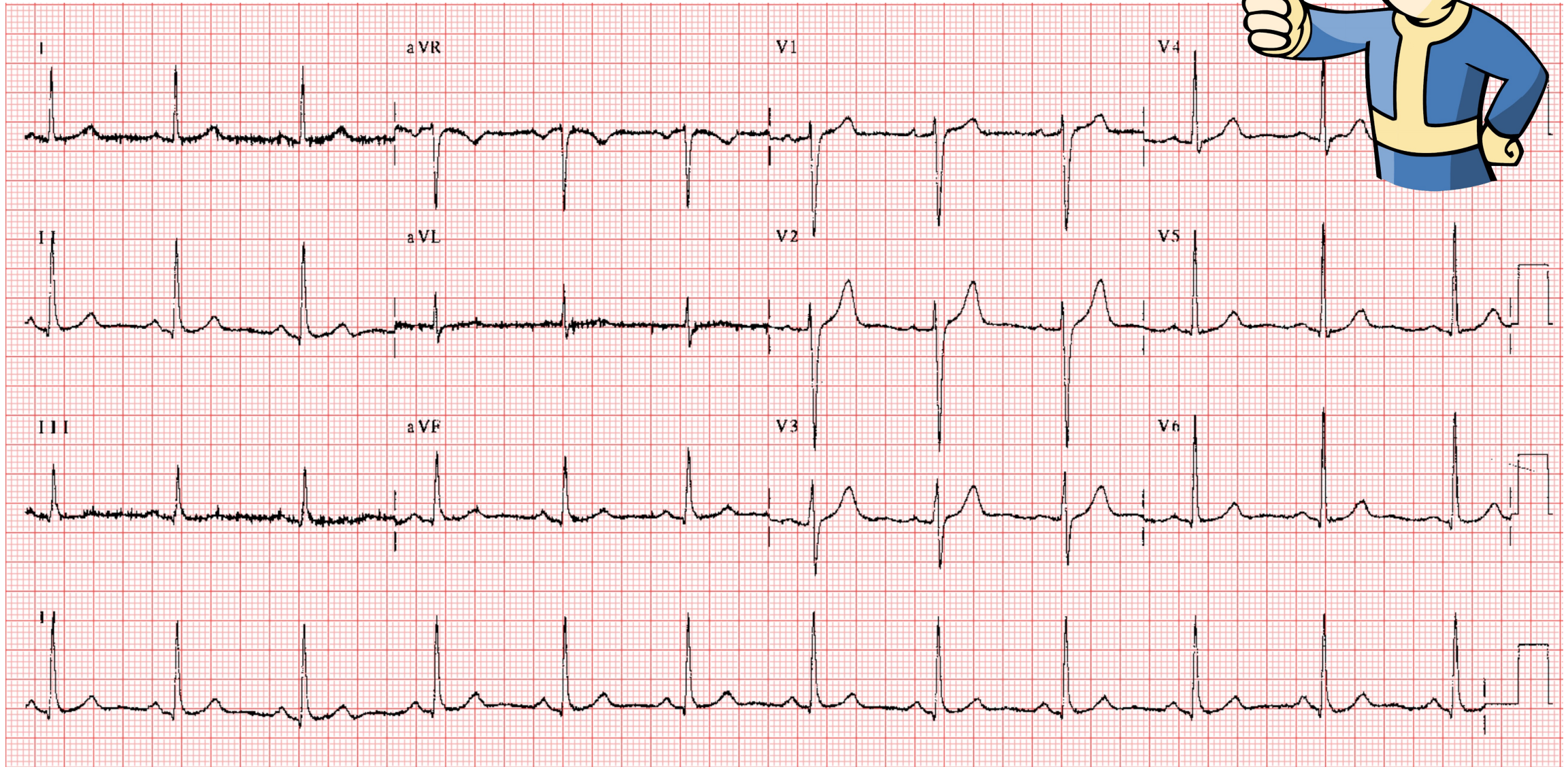
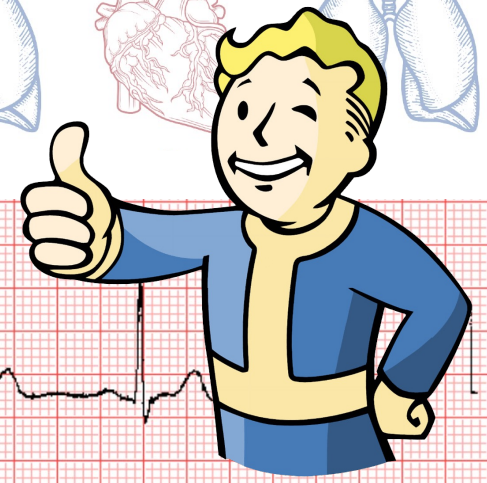
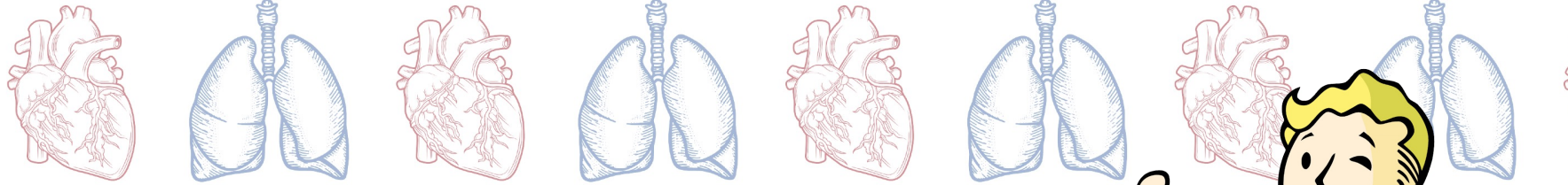


ECG
Transthoracic echo
Angiogram
Lung function tests
Carotid dopplers
FBC
U+E
Liver function
Clotting screen
Chest X-ray
CT chest
Group and screen
Cross match



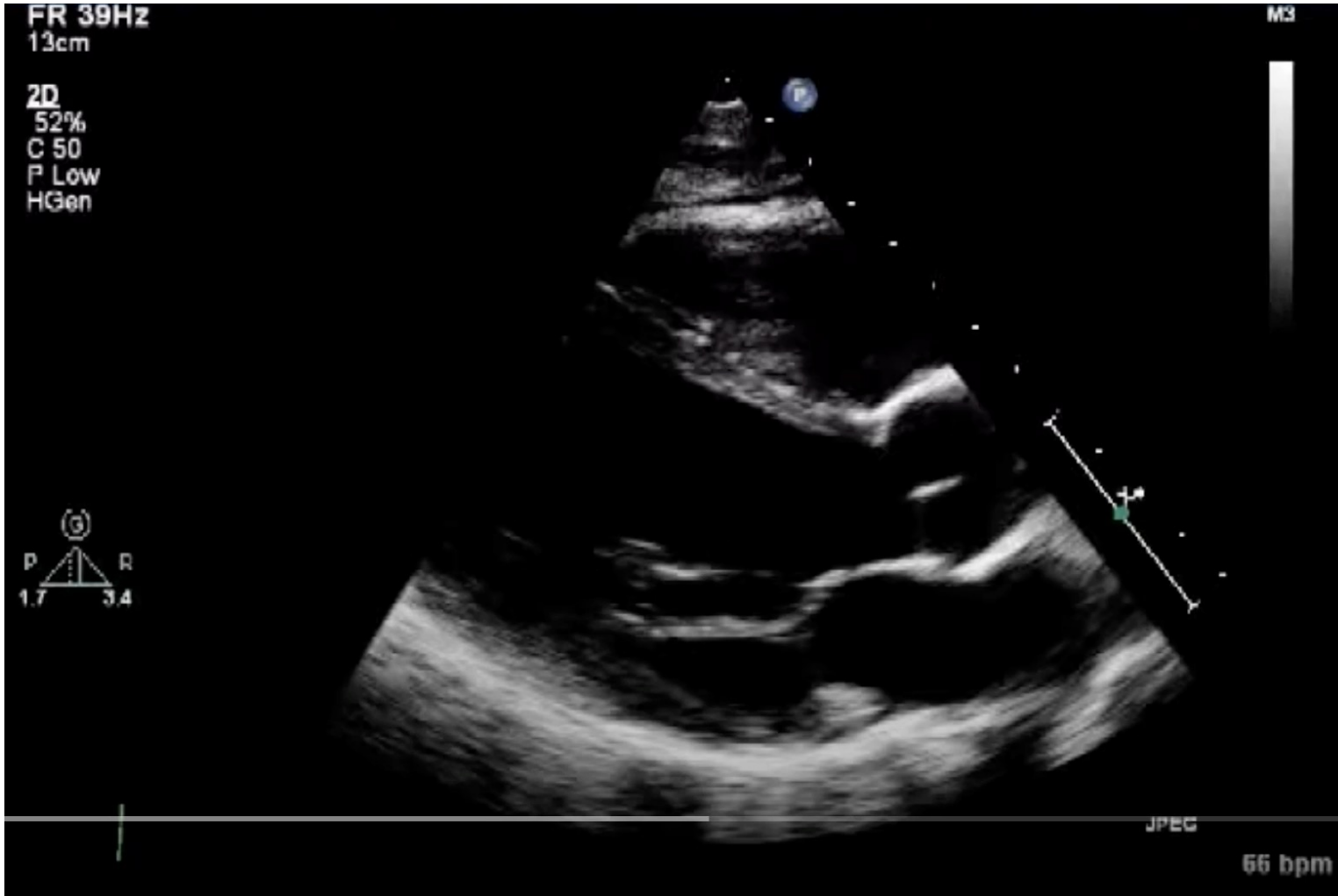
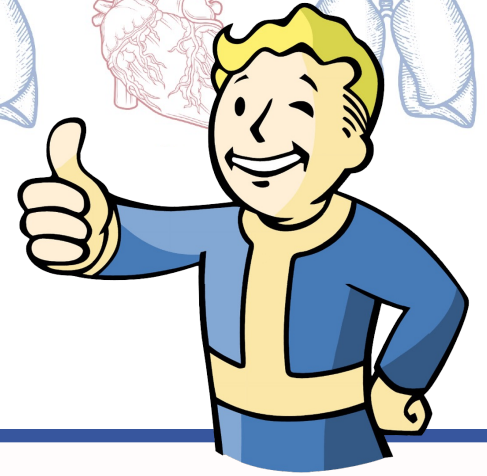
Case 1

ECG



Case 1

Transthoracic Echocardiogram



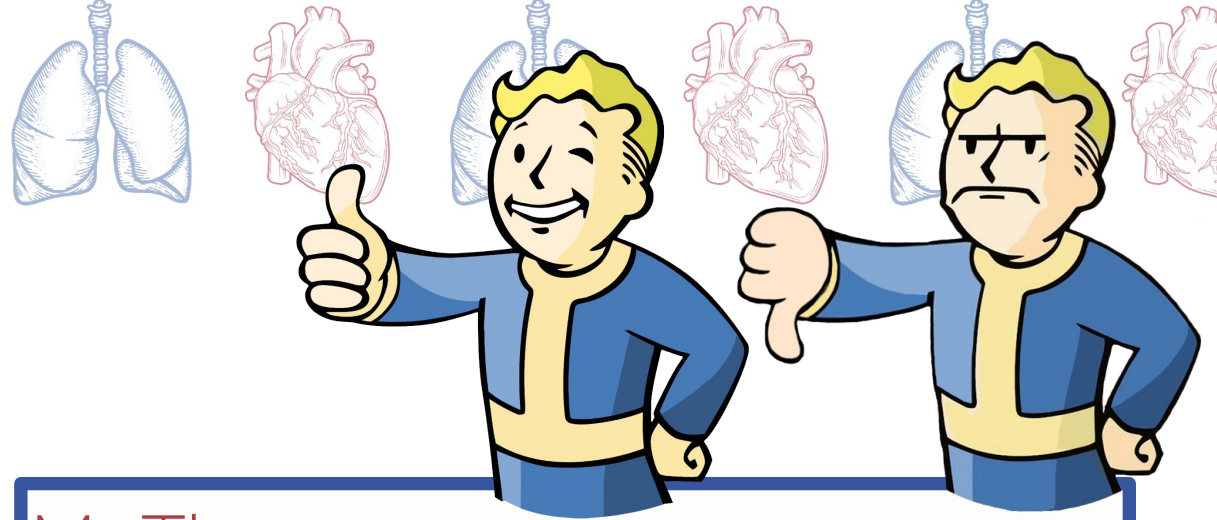
Mr Thomas

Normal biventricular
function
LVEF 58%
No significant valvular
lesions

Case 1

Coronary Angiogram

RAO 31 CAUD 20



Mr Thomas

LMS – normal

LAD – severe proximal disease

LCx – severe diffuse disease

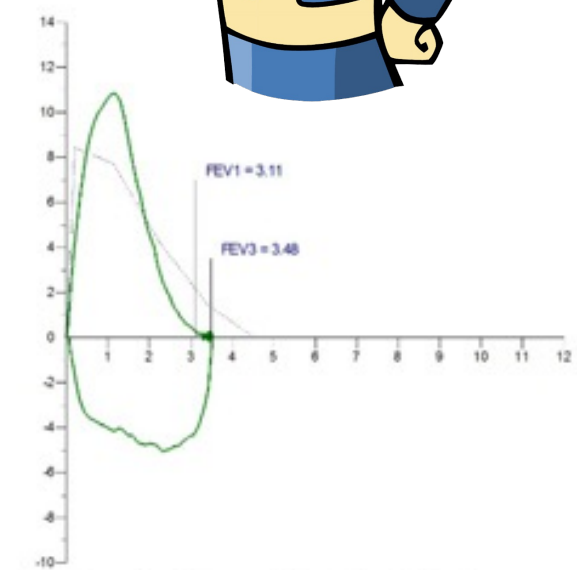
RCA – (dominant). severe diffuse disease

Case 1

Lung function tests

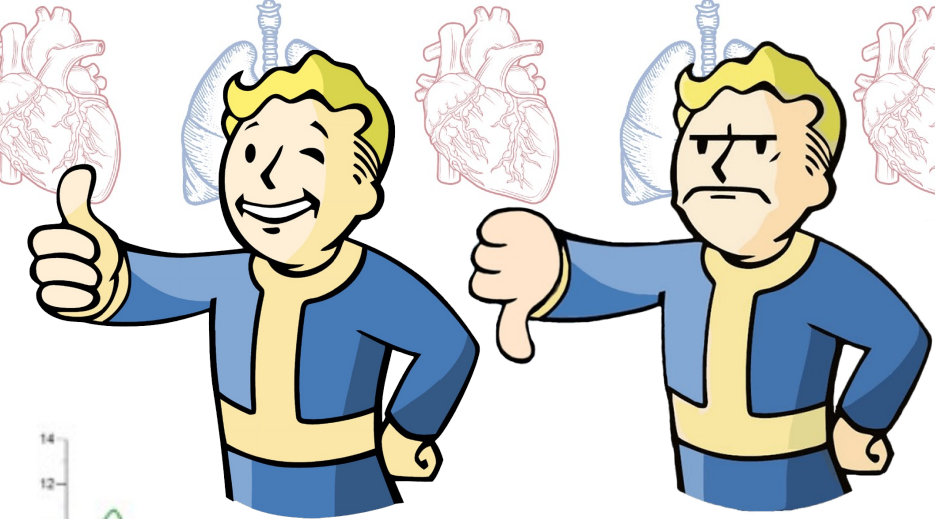
		Mean	Predicted Range		Pre Bronchodilator	
			95% LLN	95% ULN	Actual	% Pred
FEV1	L	3.36	2.37	4.30	3.11	93
FVC	L	4.57	3.27	5.77	3.72	81
FEV1/FVC	%	74	63	85	84	114
FEF25-75	L/s	2.51	1.00	4.37	4.22	168
PEF	L/s	8.55	5.07	11.70	10.84	127
PEF/FVC	L/s/L	1.95	1.29	2.65	2.91	149
FEF25-75%/FVC	L/s/L	0.59	0.25	1.06	1.13	192
FEF25-75%/PEF	%	30	15	52	39	131
TLC (body box)	L	7.05	5.44		5.43	77
DLCO	ml/min/mm Hg	27.18	18.93		18.80	69
VA (BTPS)	L	6.88	5.27		5.08	74
KCO	ml/min/mm Hg/L	3.95	2.67		3.70	94
DACO	ml/min/mm Hg	24.20	16.85		18.80	78

DLCO and KCO are 78% adjusted for lung volume, Hb, barometric pressure



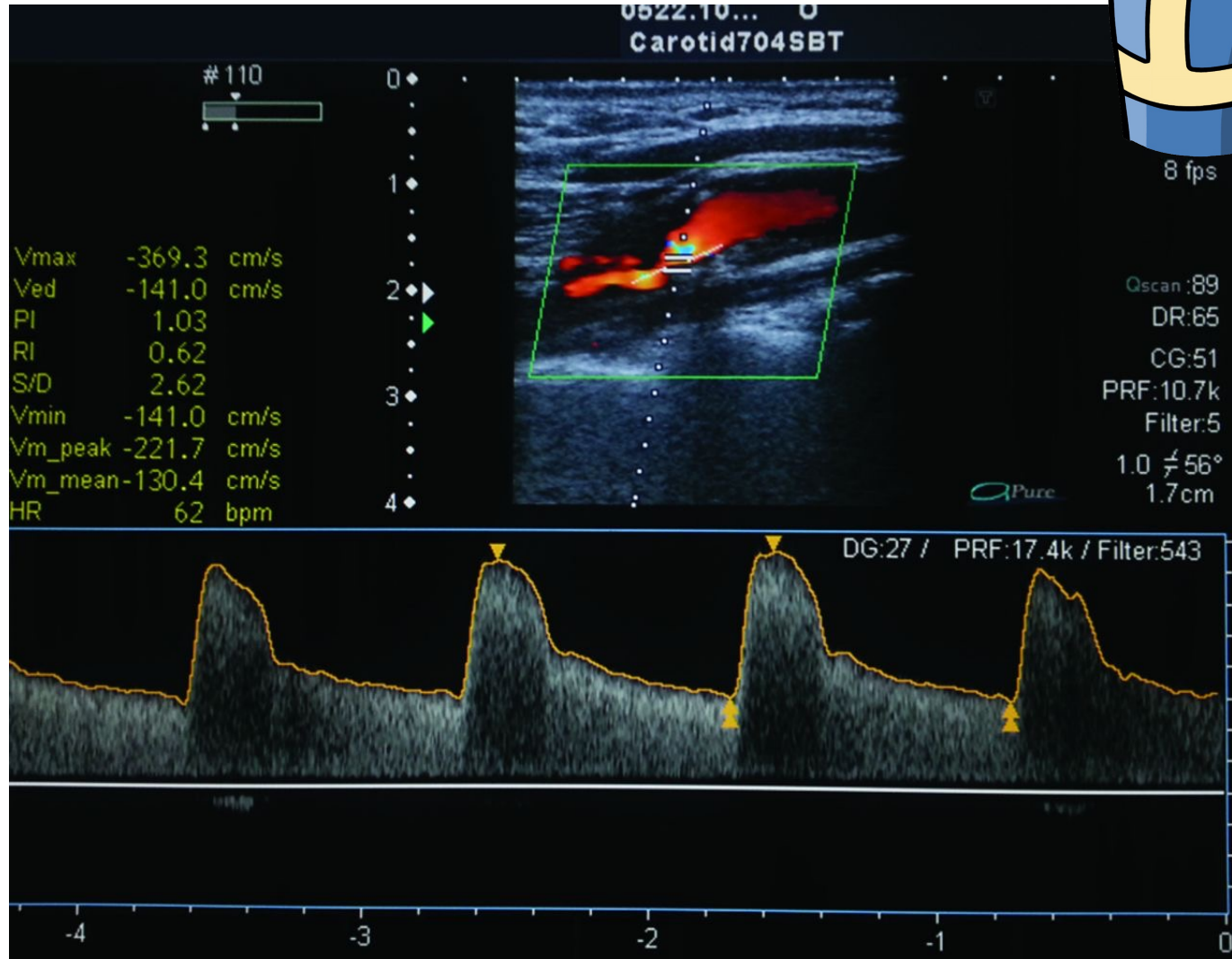
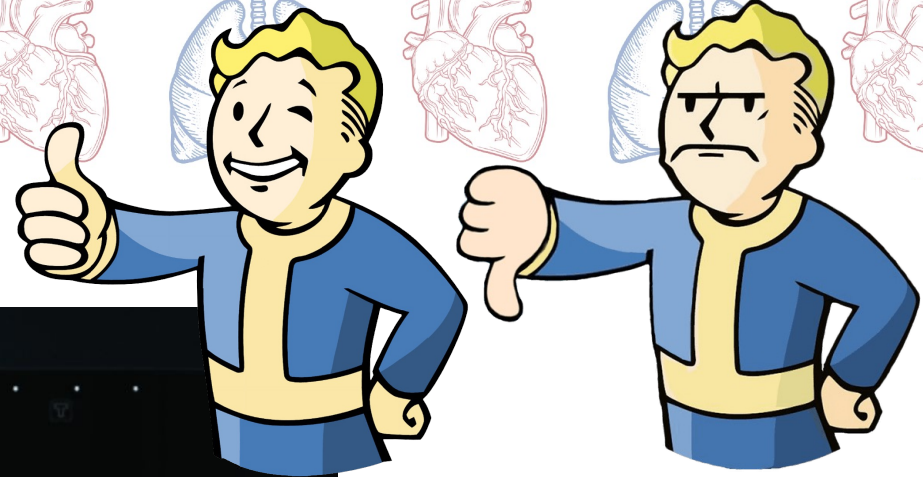
Predicted adjusted for Hb of 15.8

Adjusted for lung volume and Hb



Case 1

Carotid Dopplers



Case 1

Pre-op blood tests

FBC

- Hb
- Plt count
- WCC



Renal & liver function

- Na, K
- U & Cr
- LFTs

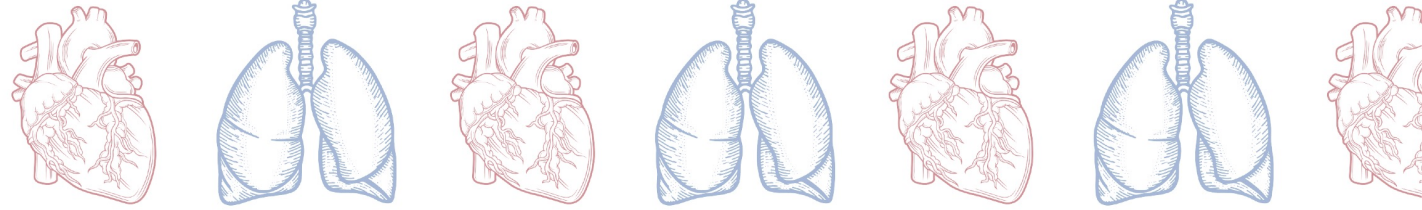


Coagulation screen



Mr Thomas

- Hb - 132
- Plt count - 312
- WCC - 7.4
- Na - 141
- K - 4.2
- U - 6.5
- Cr 68
- LFTs normal
- Coag screen normal



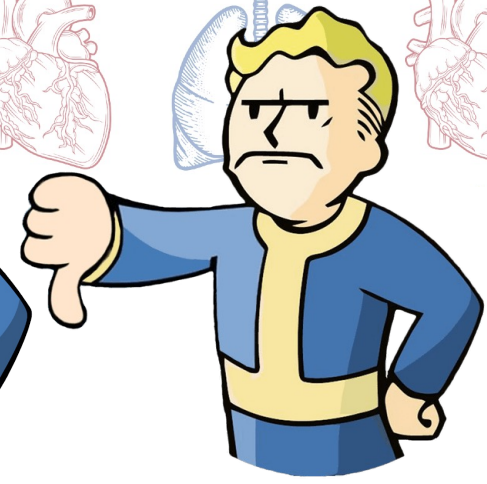
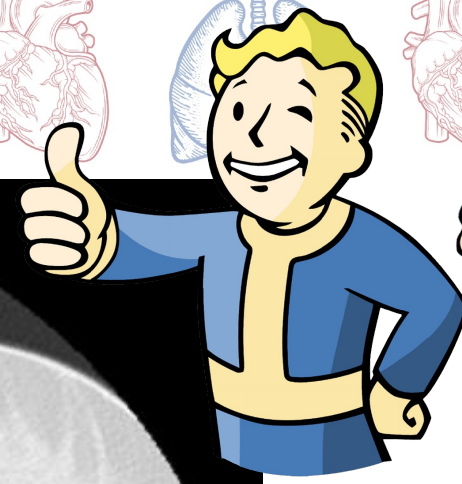
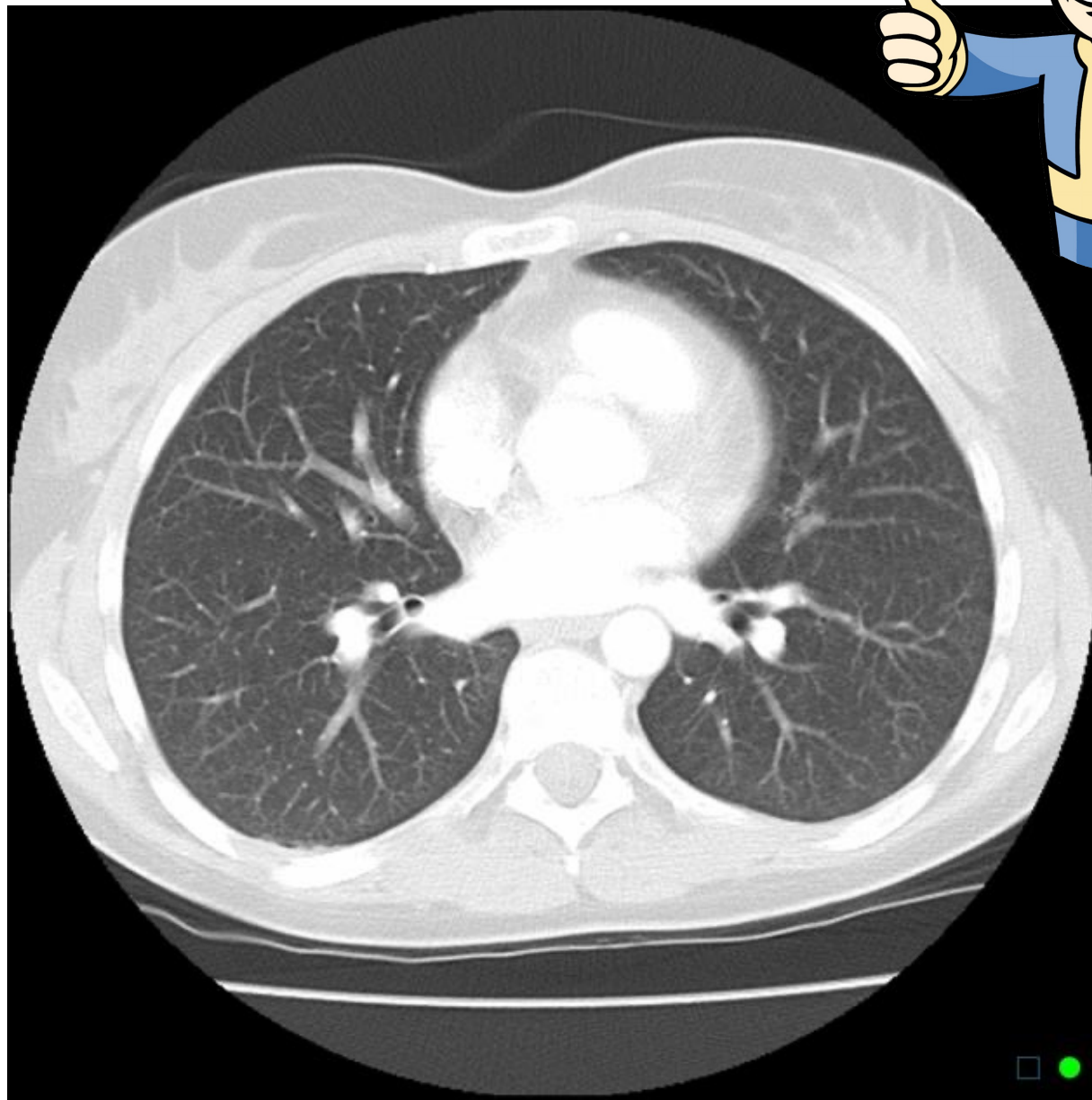
Case 1

CXR

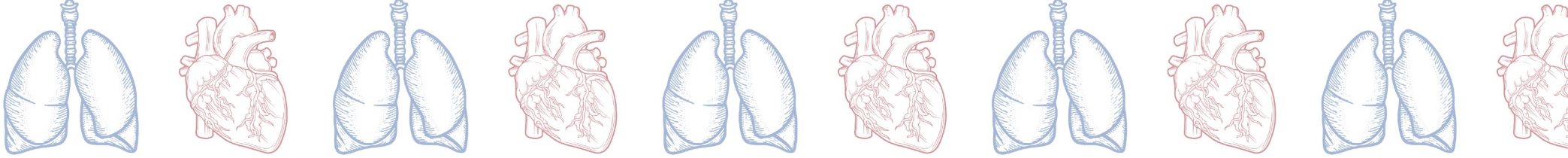


Case 1

CT Chest



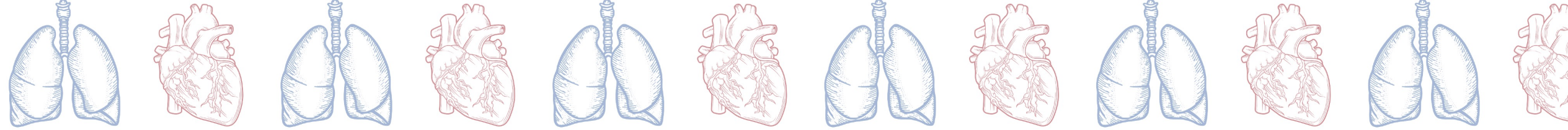
Case 1



What if the bloods looked like this?

Mr Thomas

- Hb - 112
- Plt count - 312
- WCC - 7.4
- Na - 141
- K - 4.2
- U - 9.1
- Cr 126
- LFTs normal
- Coag screen normal



Understanding the Relationships Between Preoperative Anemia and Postoperative Outcomes in Cardiac Surgery

Preoperative anemia is linked to adverse outcomes after cardiac surgery, such as acute kidney injury (AKI)



However, the extent to which these outcomes are mediated by red blood cell (RBC) transfusions is unclear

Historical observational cohort study



4,117 adults undergoing cardiac surgery



2008–2018

Evaluation of association using mediation analysis framework

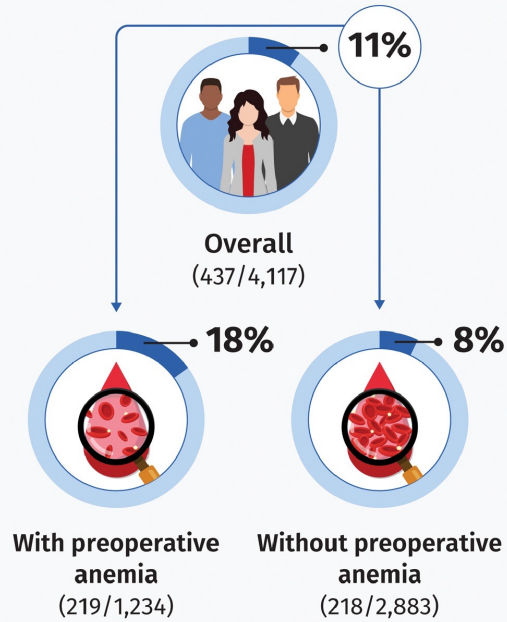


Preoperative anemia

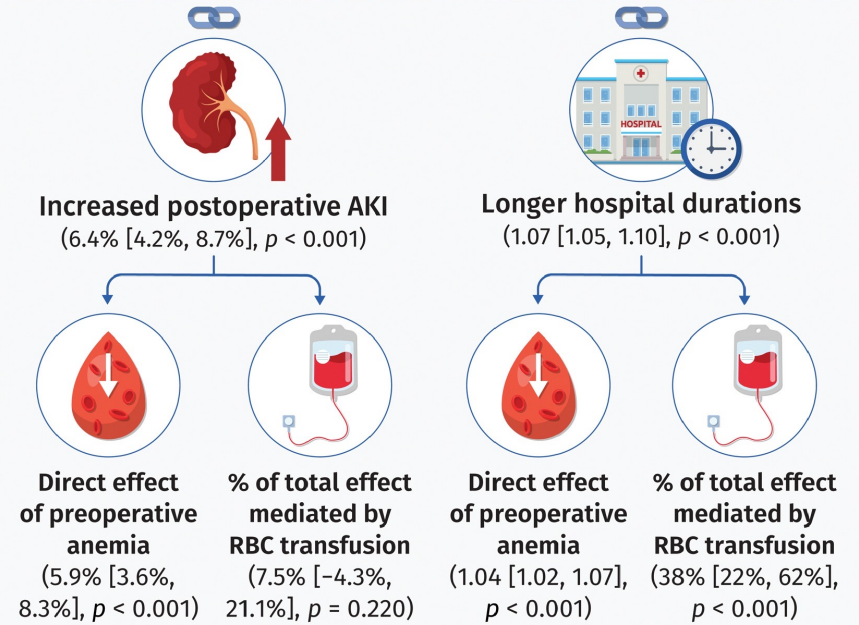


AKI (primary outcome)

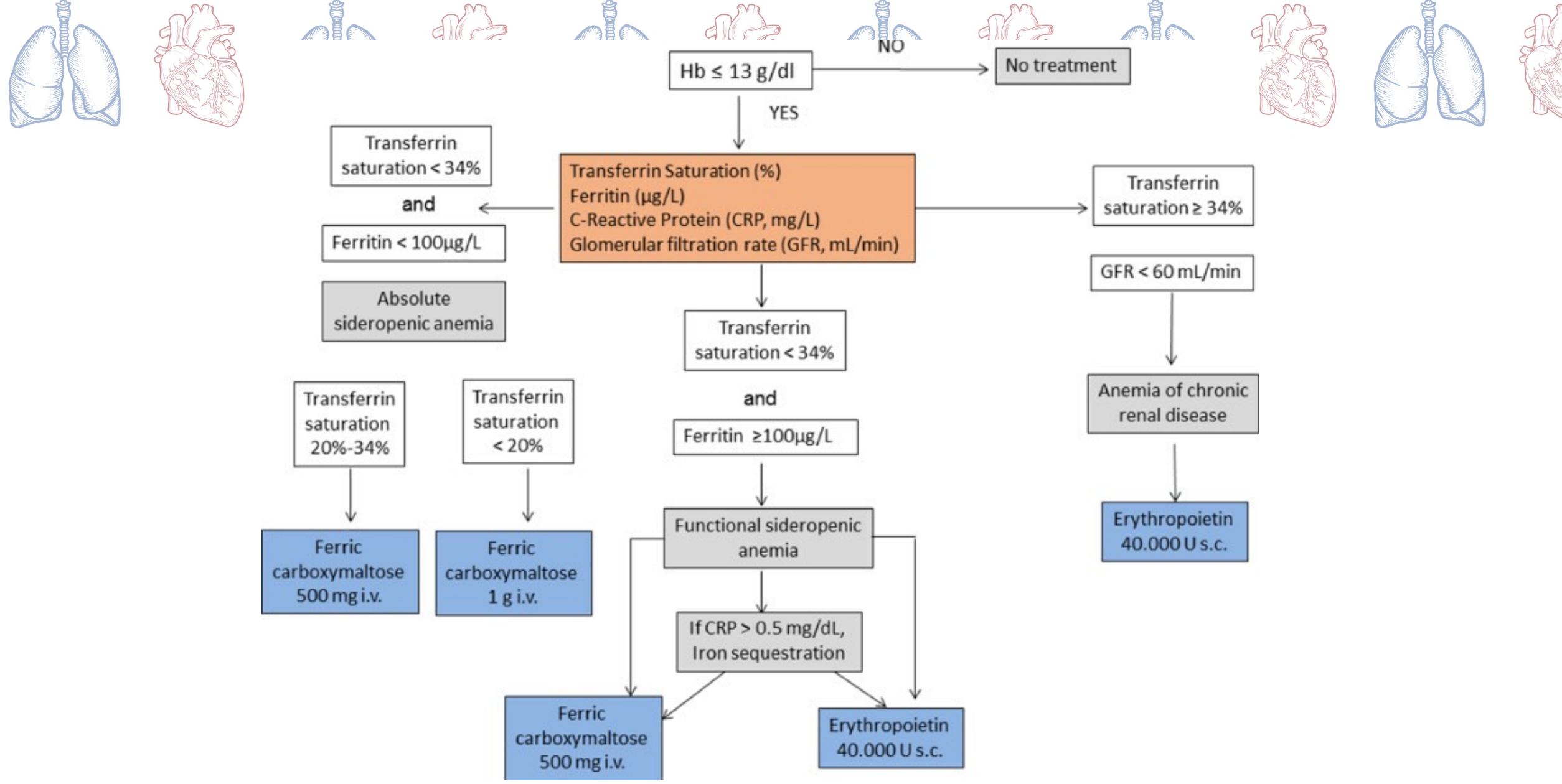
Patients who developed AKI



Presence of preoperative anemia



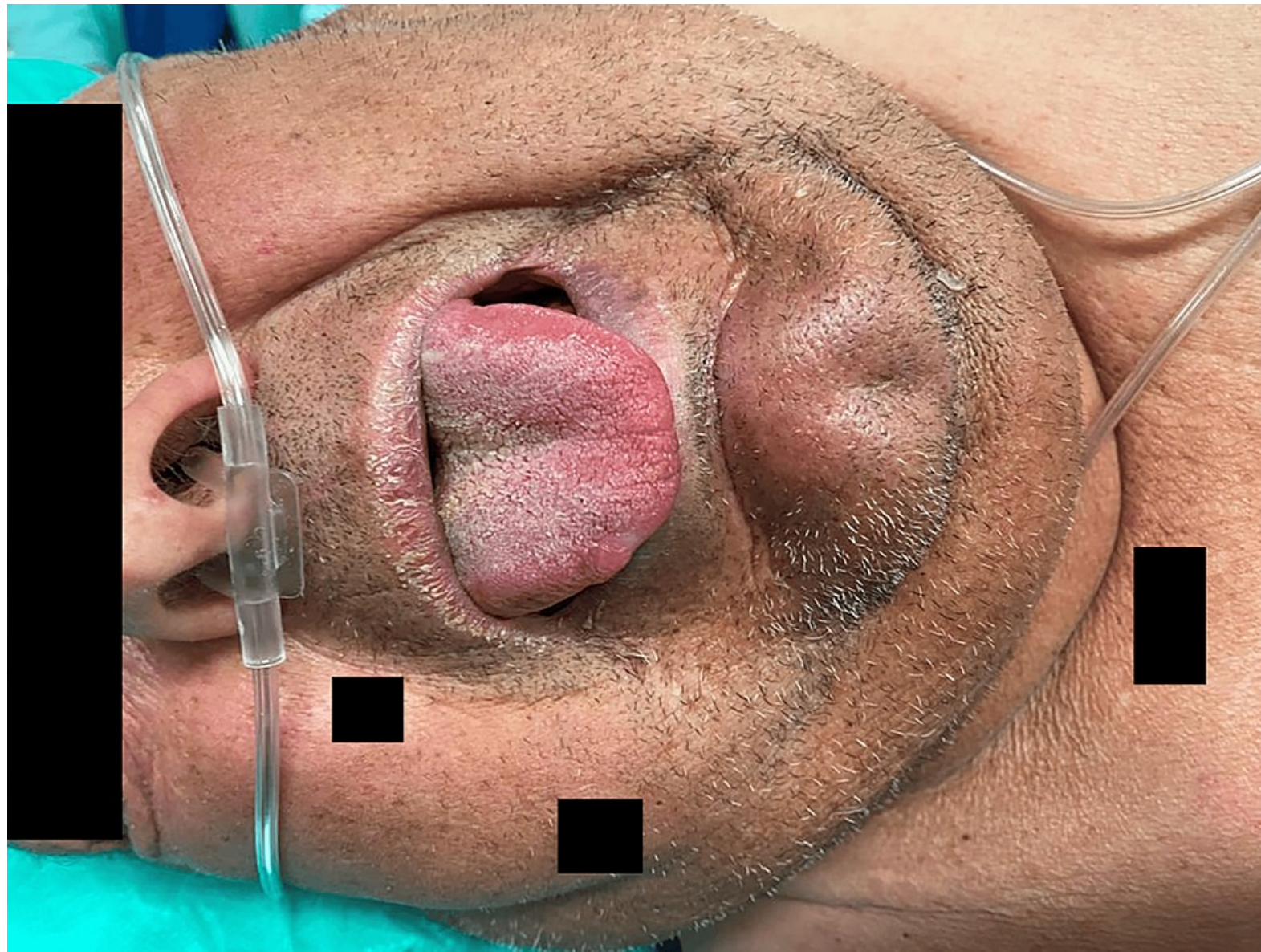
Preoperative anemia is associated with higher rates of AKI and longer hospitalizations after cardiac surgery. The association with AKI is primarily driven by direct effects of anemia, while both anemia and transfusions contribute to prolonged hospitalizations



1. Preoperative Anemia Correction in Cardiac Surgery: A Propensity-Matched Study. Ranucci, Marco et al. Journal of Cardiothoracic and Vascular Anesthesia, Volume 35, Issue 3, 874 - 881

Case 1

Airway assessment





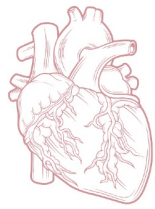
Case 1

Anaesthesia

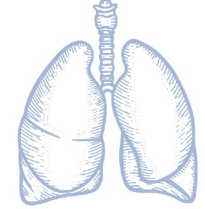
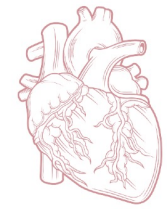
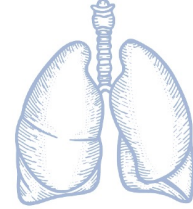




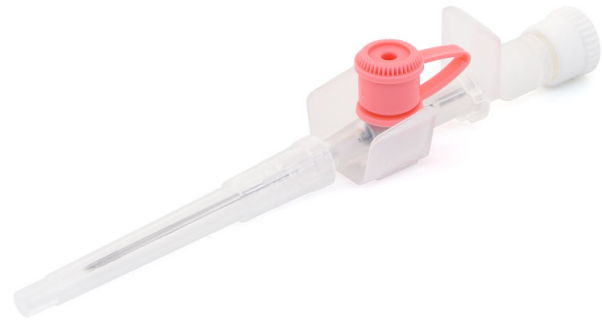
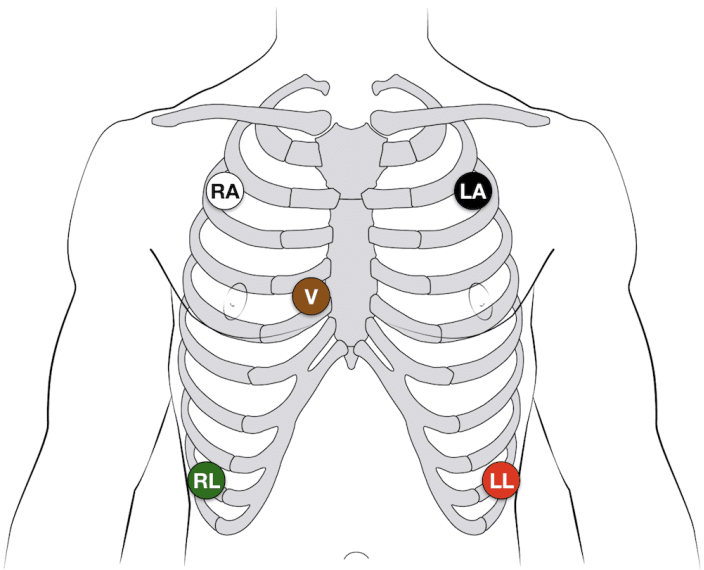
Case 1

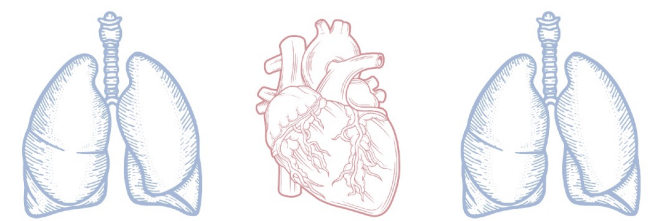


Pre-induction



Midazolam
.....mg/ml





Asleep patient

Normotension

Normal heart rate

Not hypoxic

Avoid myocardial ischaemia
Avoid cardiac arrest



Case 1

Induction Goals

Normotension

Not tachycardic

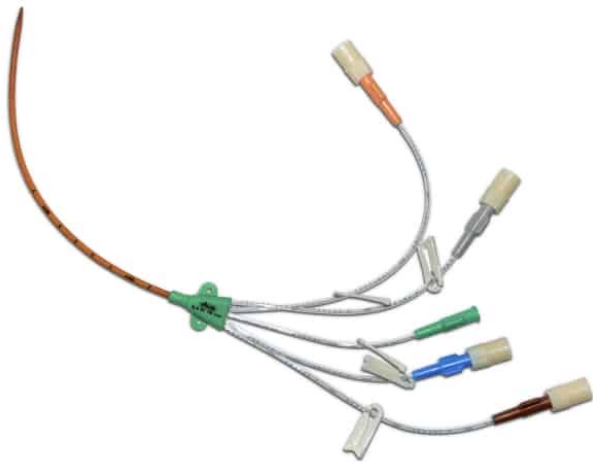


Case 1

Post-induction

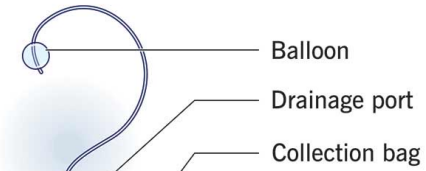
Normotension

Not tachycardic

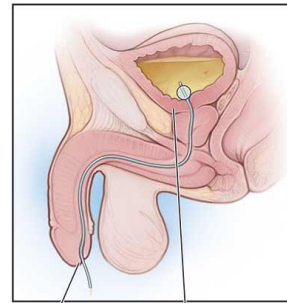


Foley catheter

Foley catheter



Catheter in place



Cleveland Clinic ©2023



Case 1

Does this case need a TOE?



Case 1

Does this case
need a TOE?



81 yo Lady

- Emergency CABG
- Intraoperative TOE
- Unable to pass NG

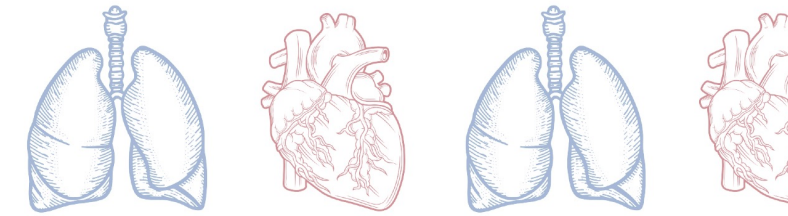
CT – perforation
distal oesophagus –
perforation into
right pleural cavity



Case 1



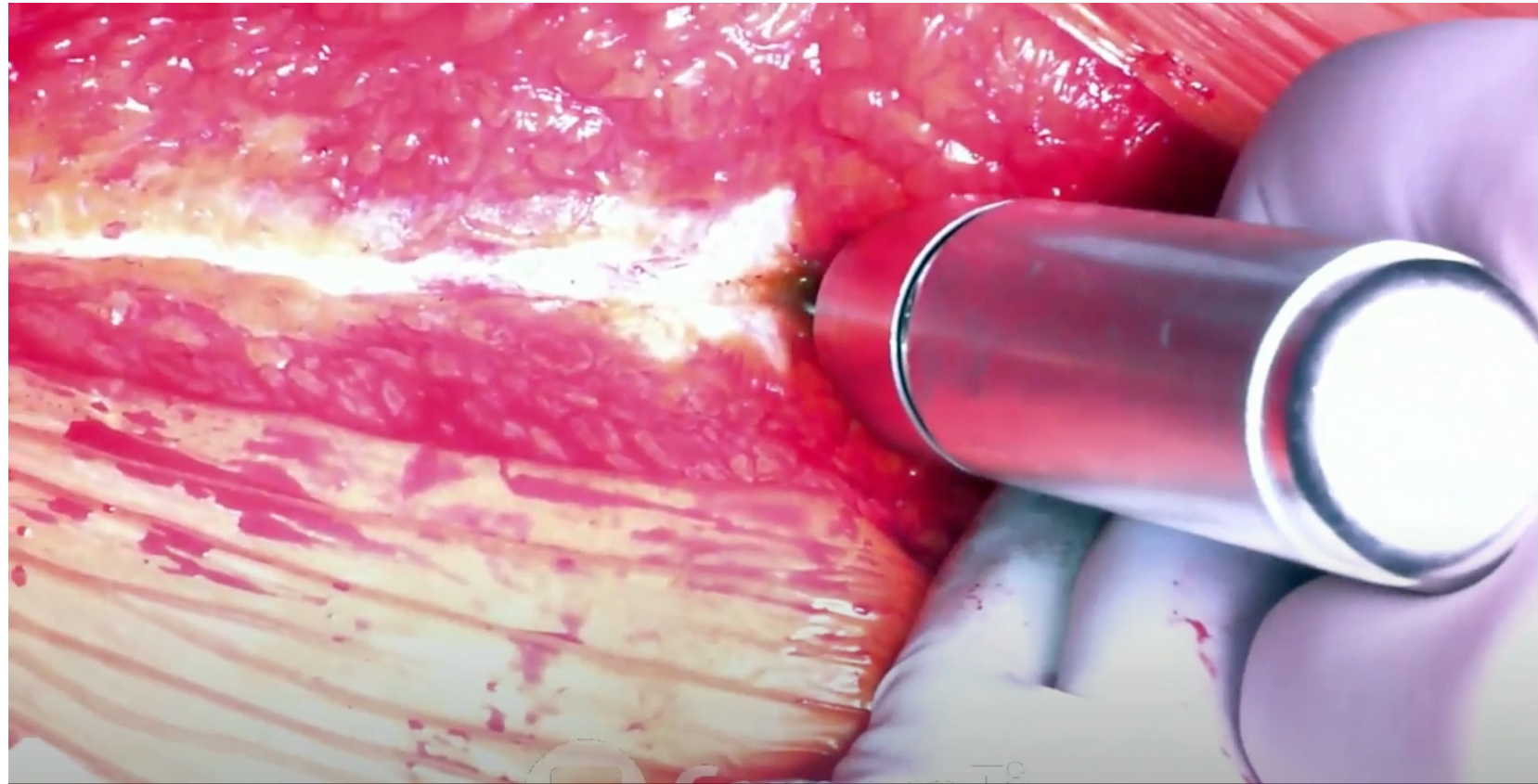
In theatre



Time out - perfusion ready

KTS

Sternotomy



Case 1

In theatre

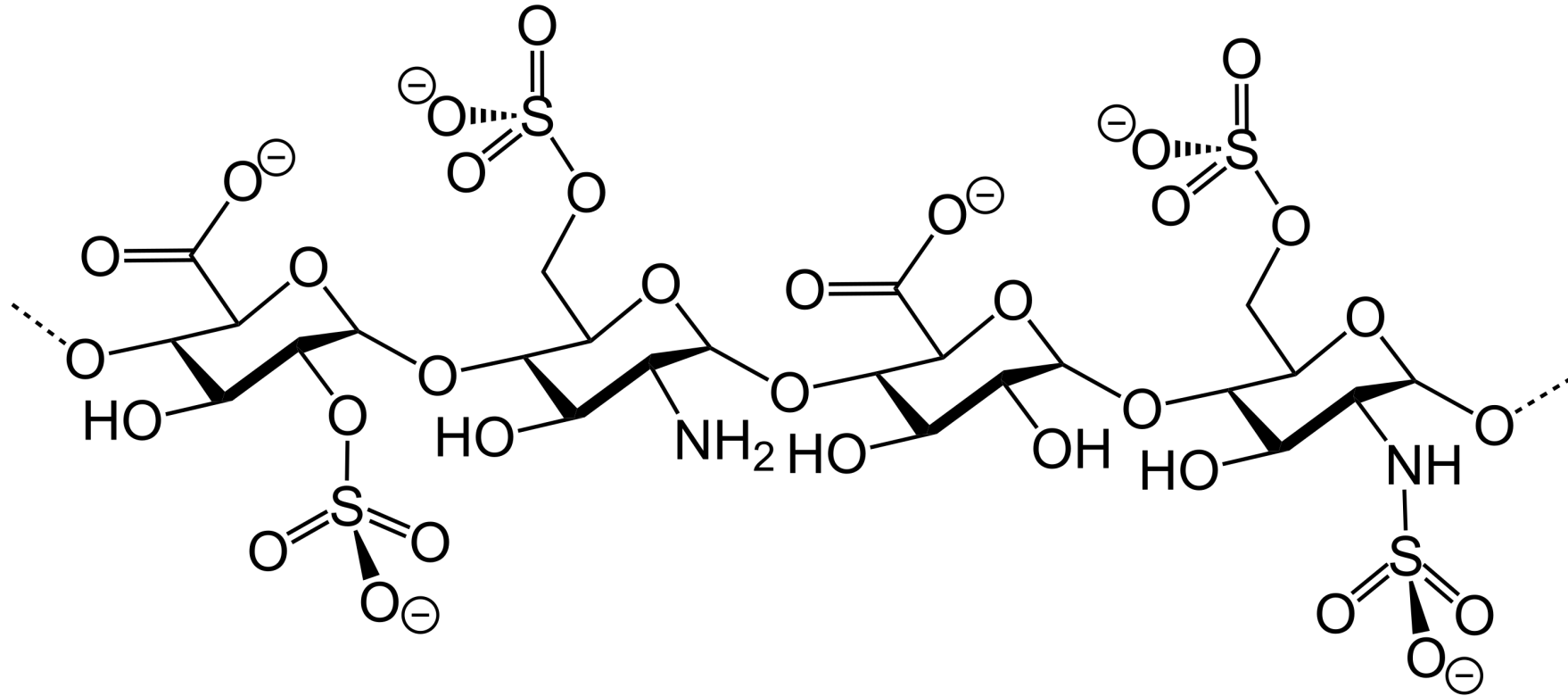
Harvesting of
graft conduit



Case 1

In theatre

Preparation for CPB

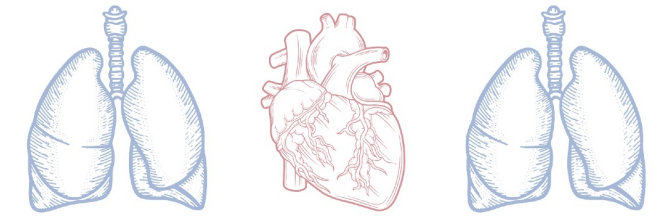




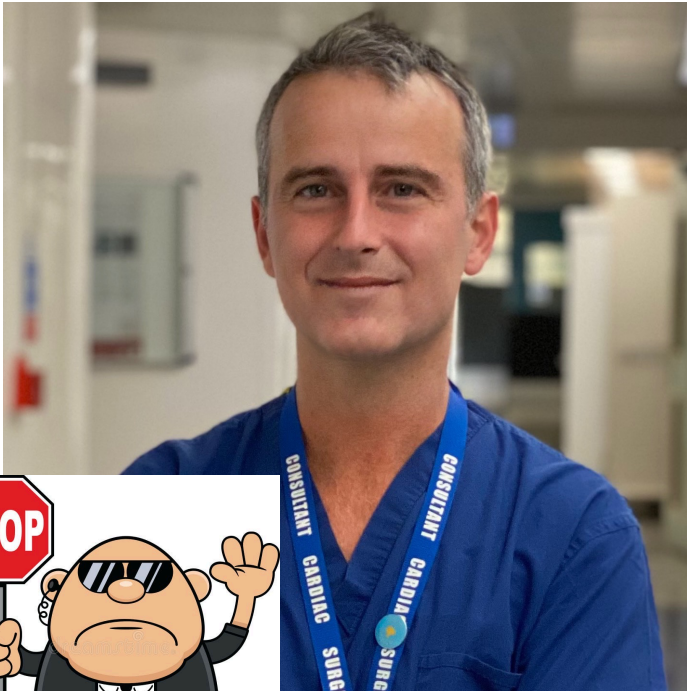
Case 1



In theatre



Managing hypotension

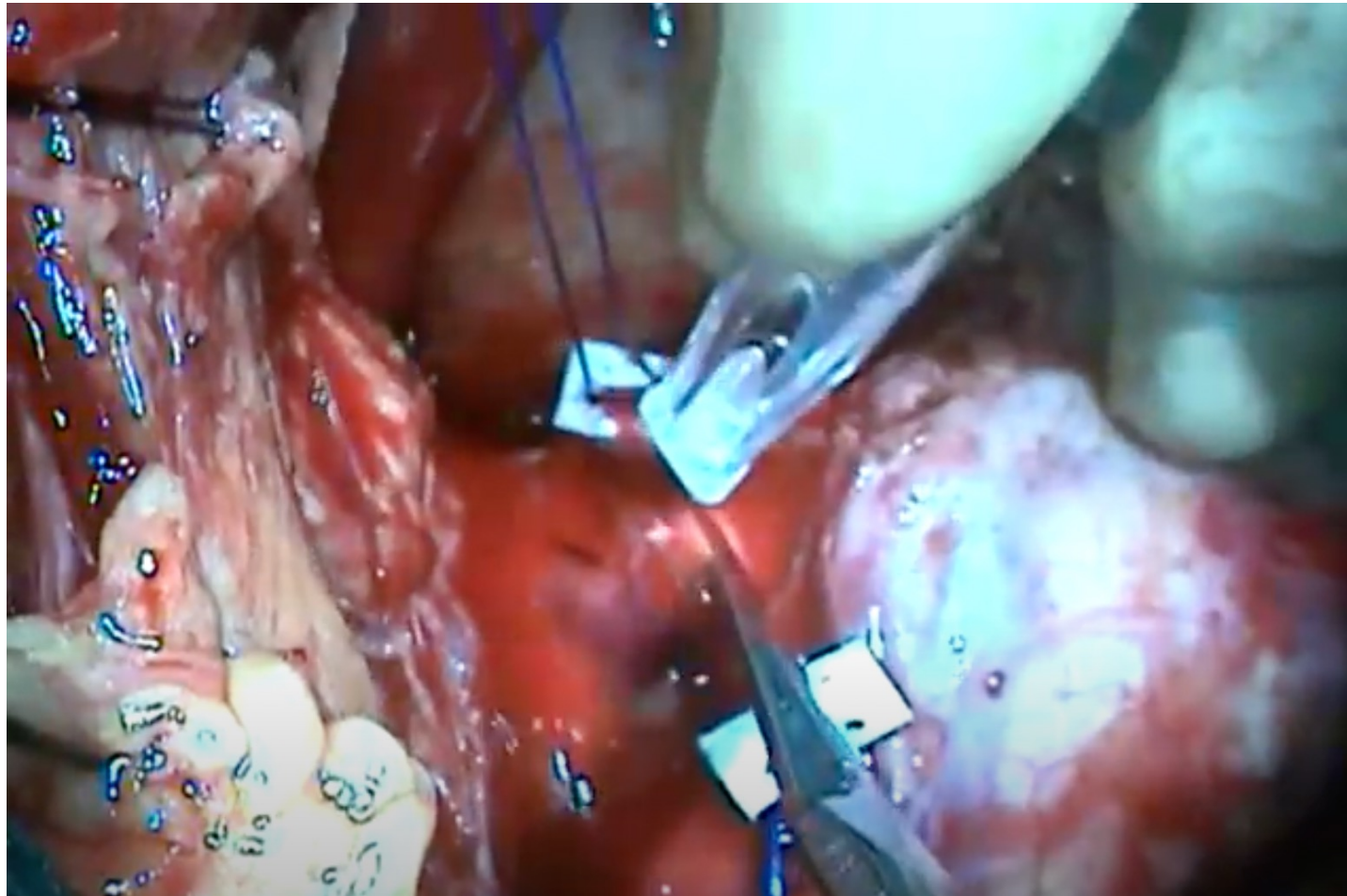


Noradrenaline
.....micrograms/ml

Case 1

In theatre

Setting up for CPB





Case 1

In theatre

Setting up for CPB

At what systolic BP is it safe to cannulate the aorta?

- >150mmHg
- 120-150mmHg
- 90-120mmHg
- 70-90mmHg
- 50-70mmHg

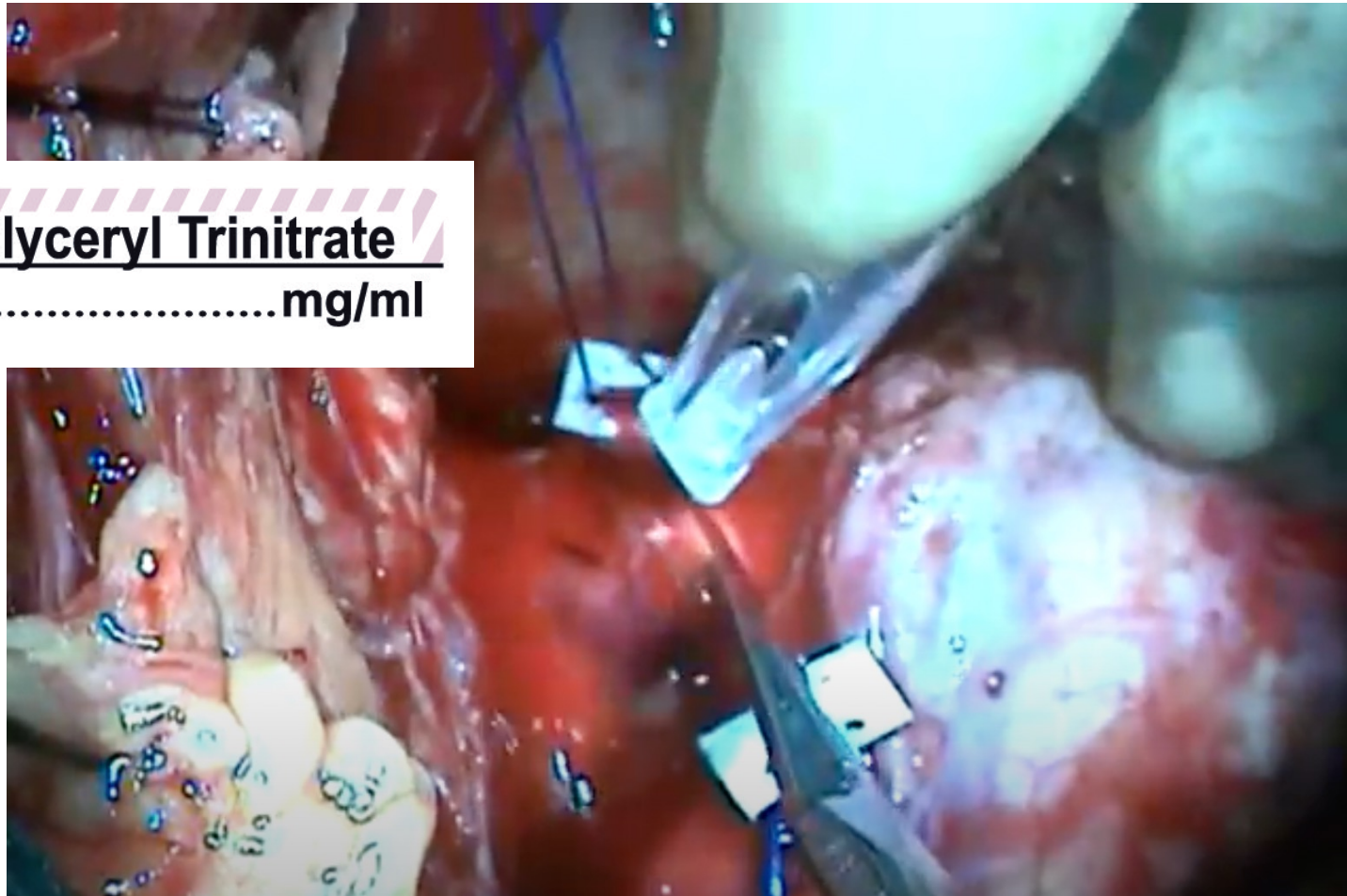
Case 1

In theatre

Setting up for CPB

Glyceryl Trinitrate

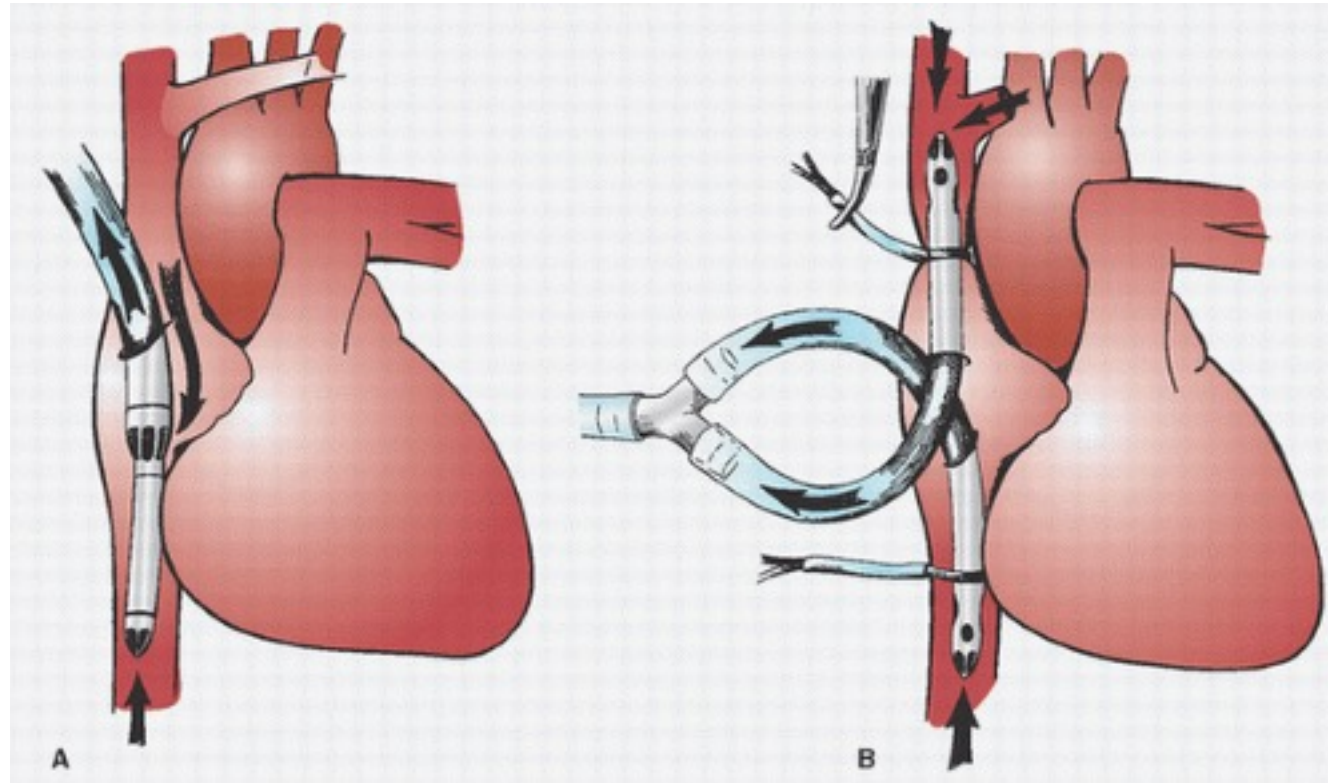
.....mg/ml



Case 1

In theatre

Setting up for CPB

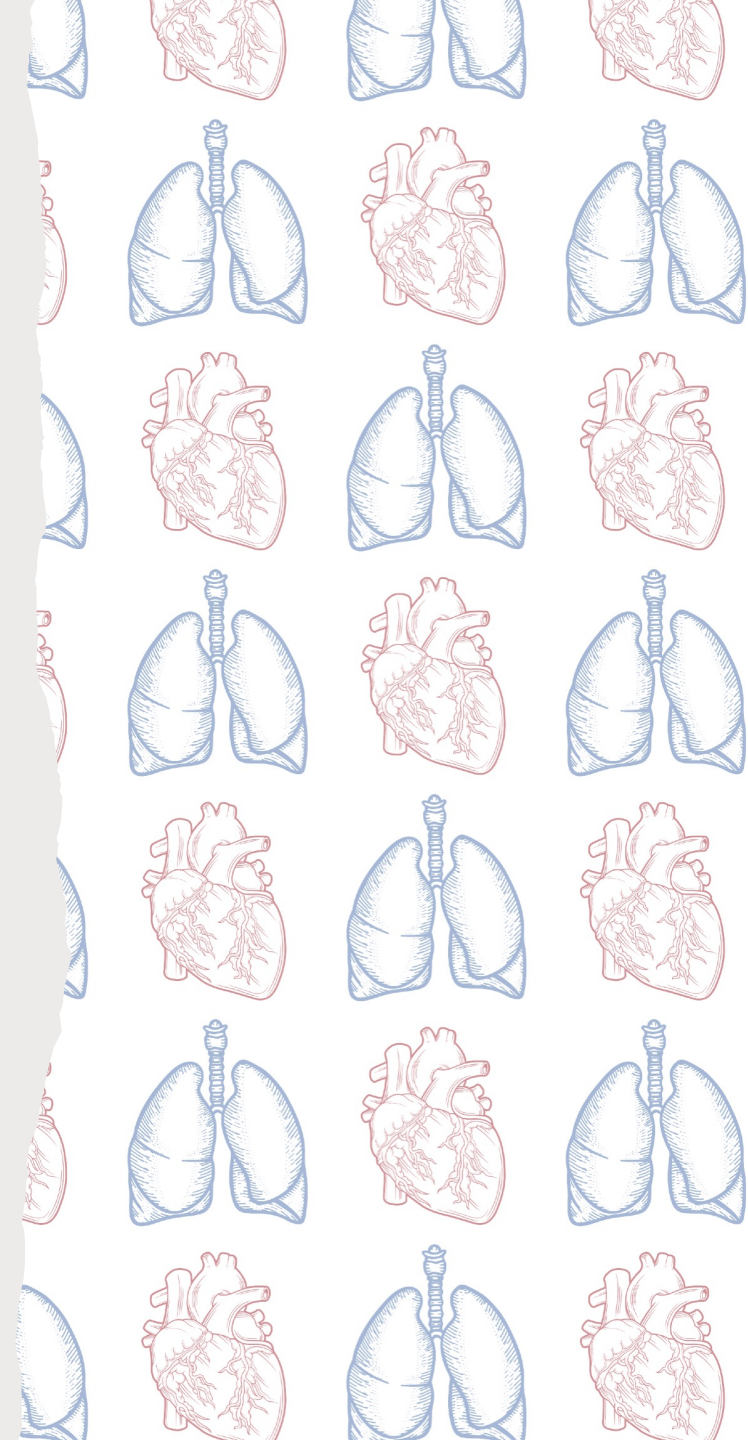




Case 2

Mr Smith
58M 120kg 175cm

- Chest pain after 10 minutes walking his dog, pain didn't stop called 999, coming to St. Thomas' as a STEMI.
- High BMI
- Hypertension
- Hypercholesterolaemia
- Smoker 10/d
- Drinks 2 pints per day
- DHx – Aspirin, Atorvastatin, Omeprazole, Ramipril



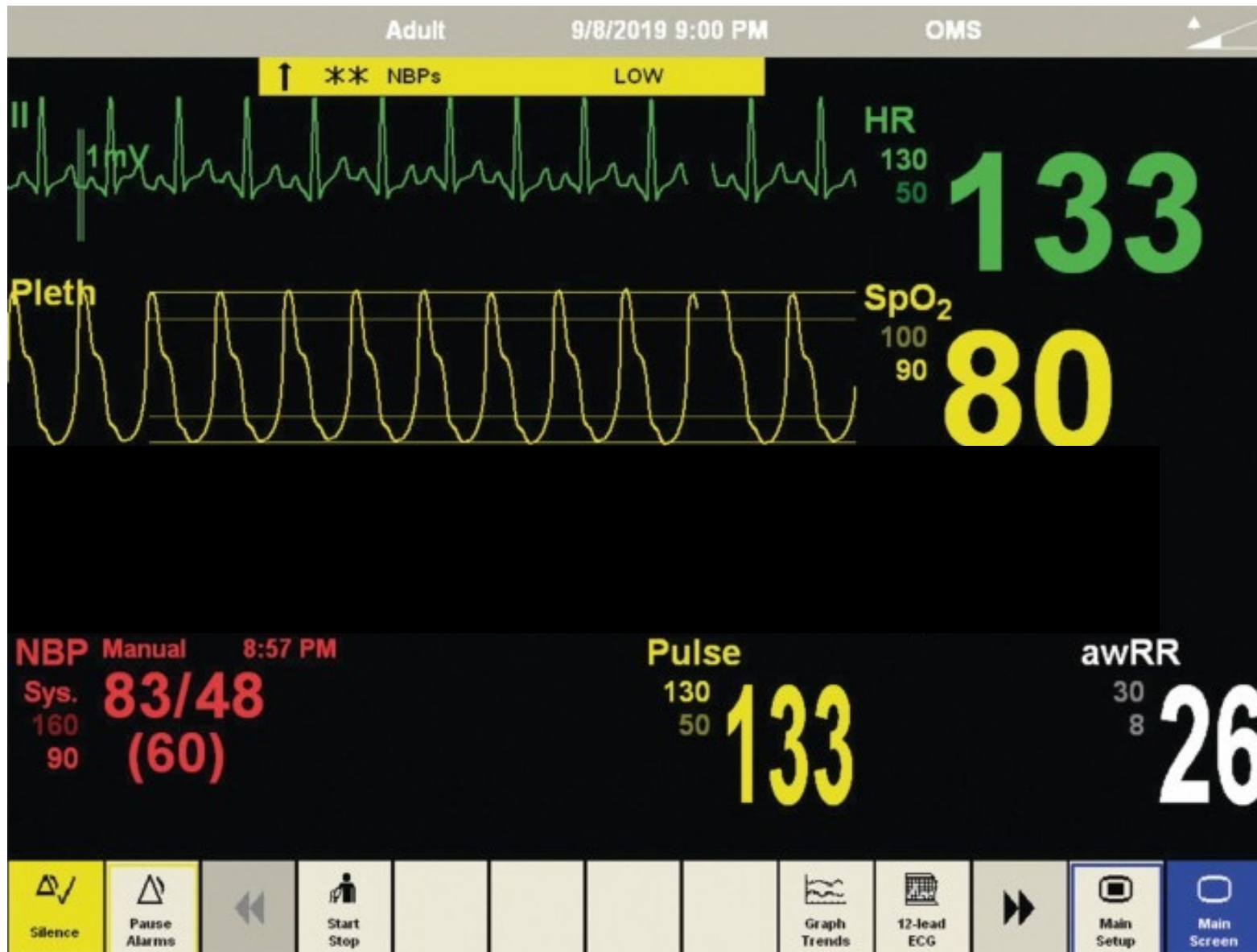
Case 2

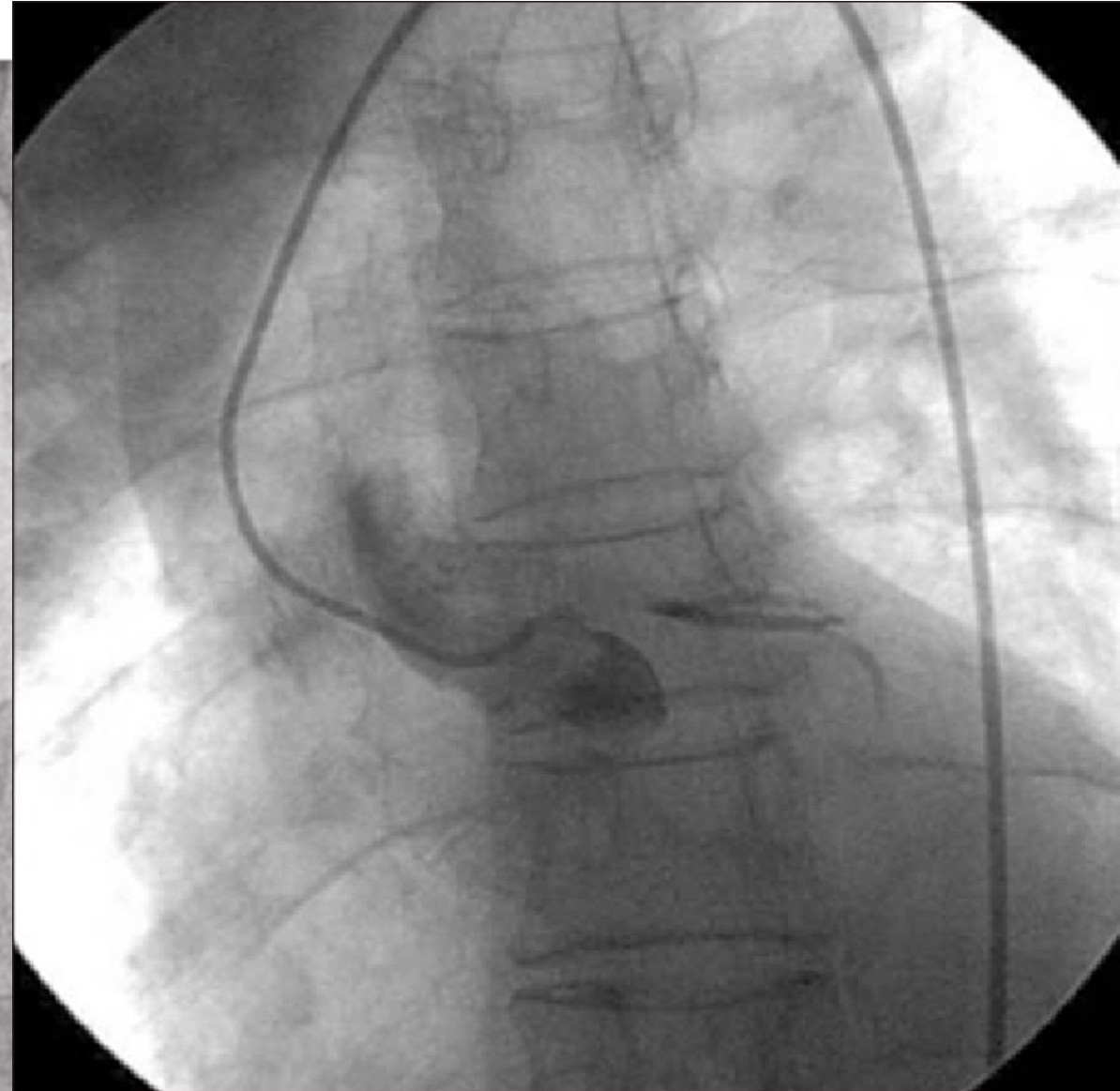
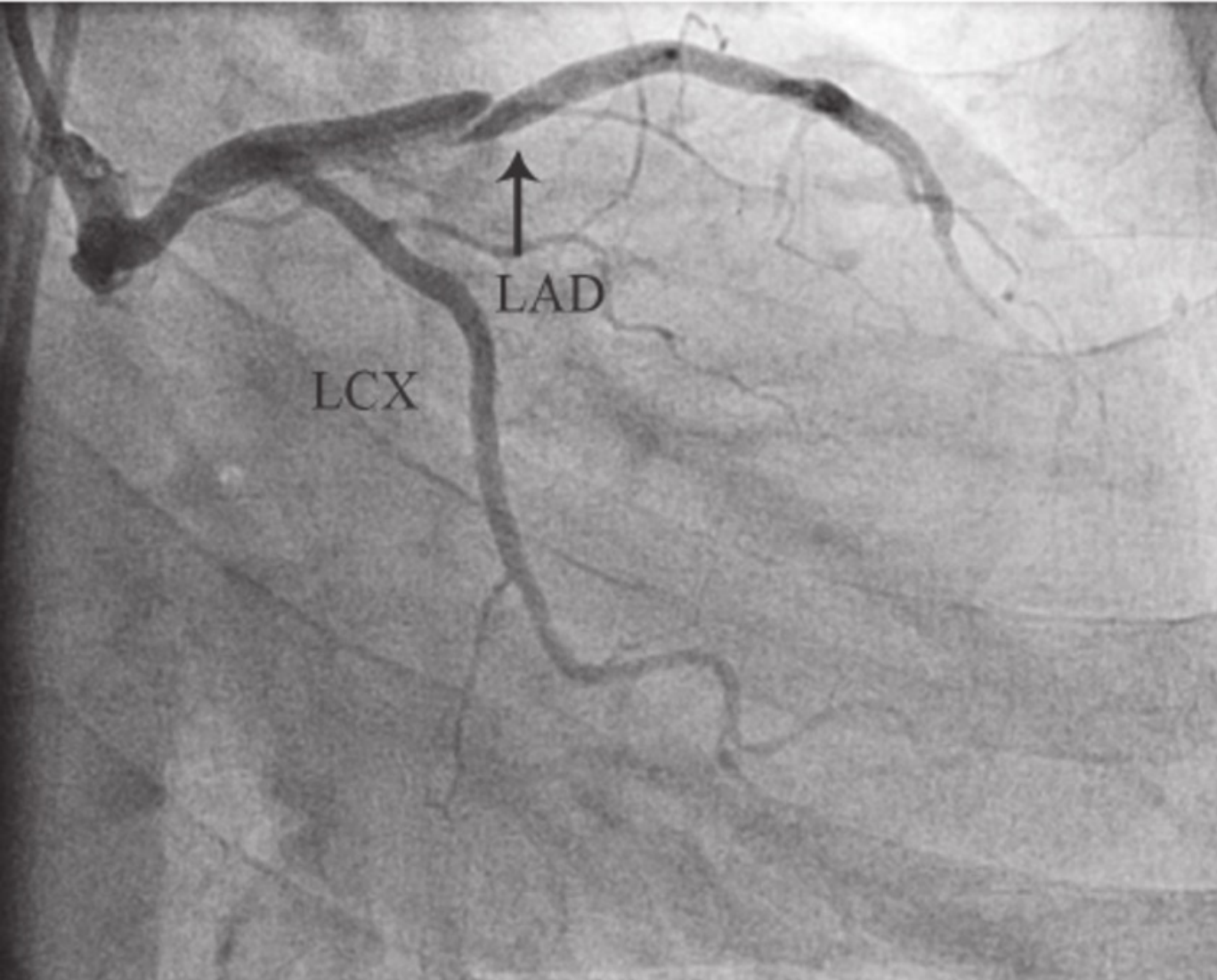
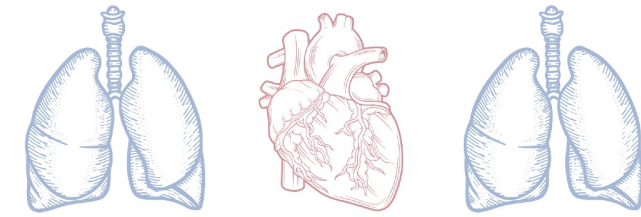
In cath lab



Case 2

In cath lab







Case 2

In cath lab

ABG

pH 7.01

PCO₂ 5.7

PO₂ 5.7

Hb 110

K⁺ 5.1

Lactate 7.3

BE -9.1

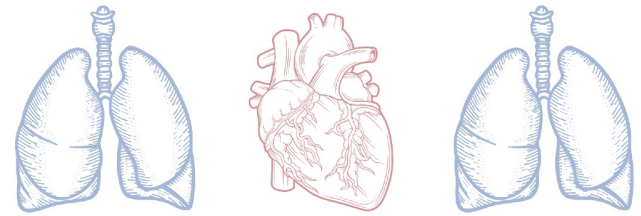
HCO₃⁻ 16.0



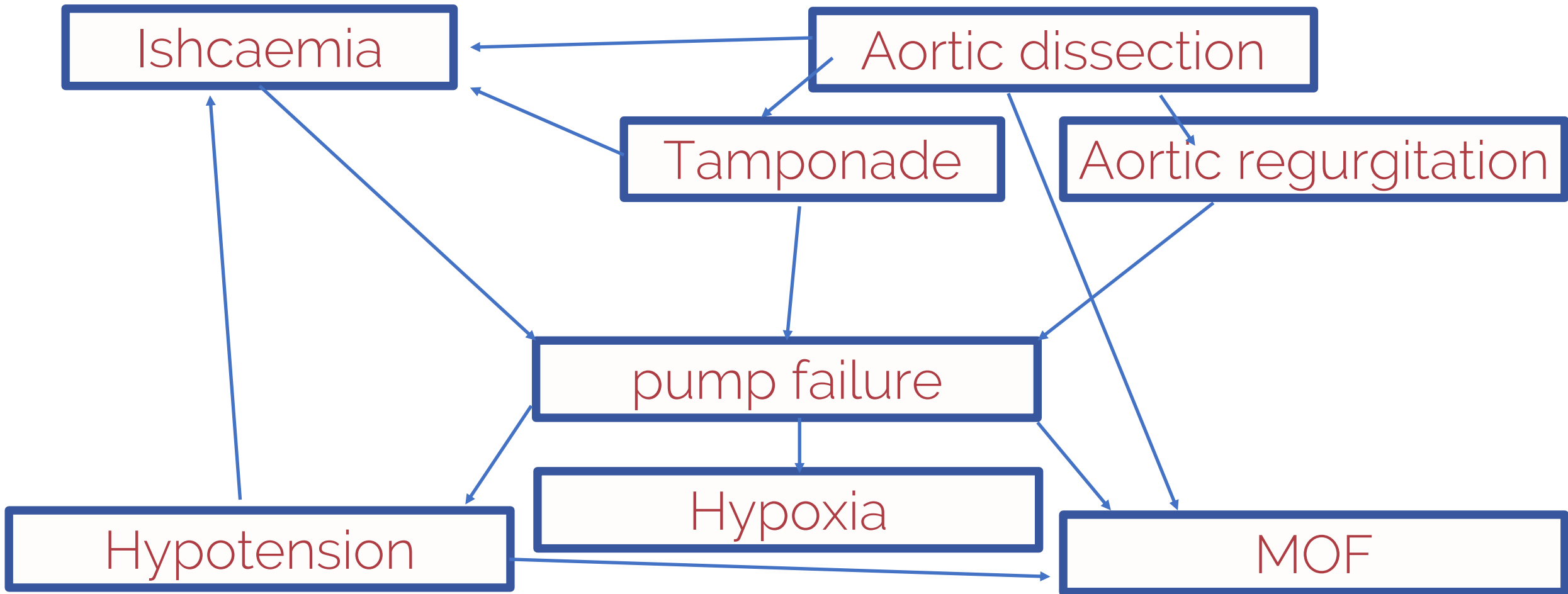
Case 2



In cath lab



Threats to life





Case 2

What to do now?

Go straight to theatre

Intubate the patient here

Palliate the patient

Call the ECMO team

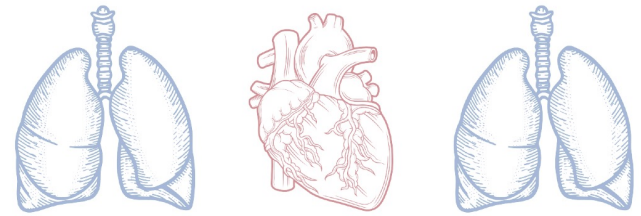
Go for coffee



Case 2



Induction goals



Avoid cardiac arrest

Defib pads on

Adrenaline
.....micrograms/ml

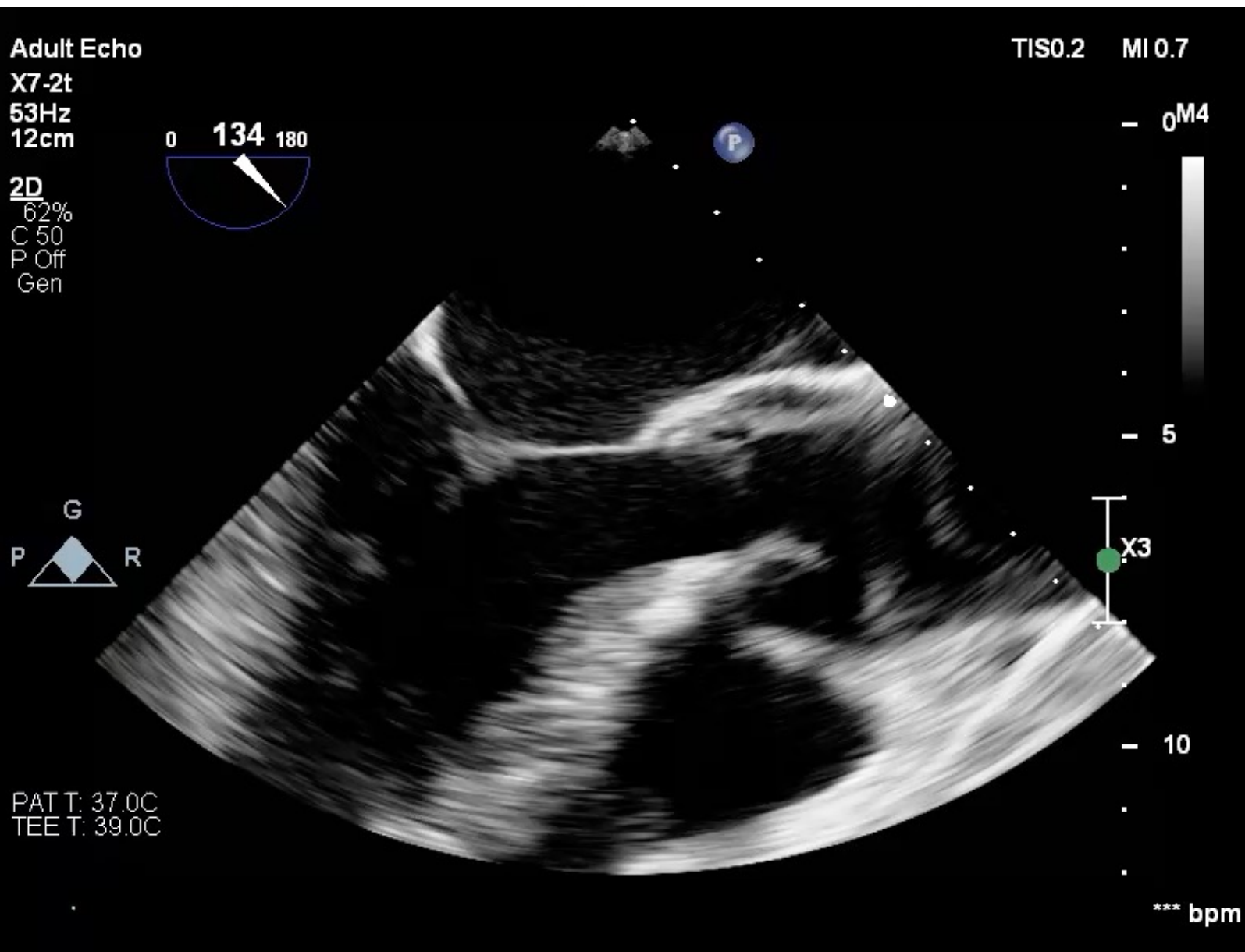
10mls, 100mcg/ml

Adrenaline
.....micrograms/ml

20mls, 5mcg/ml

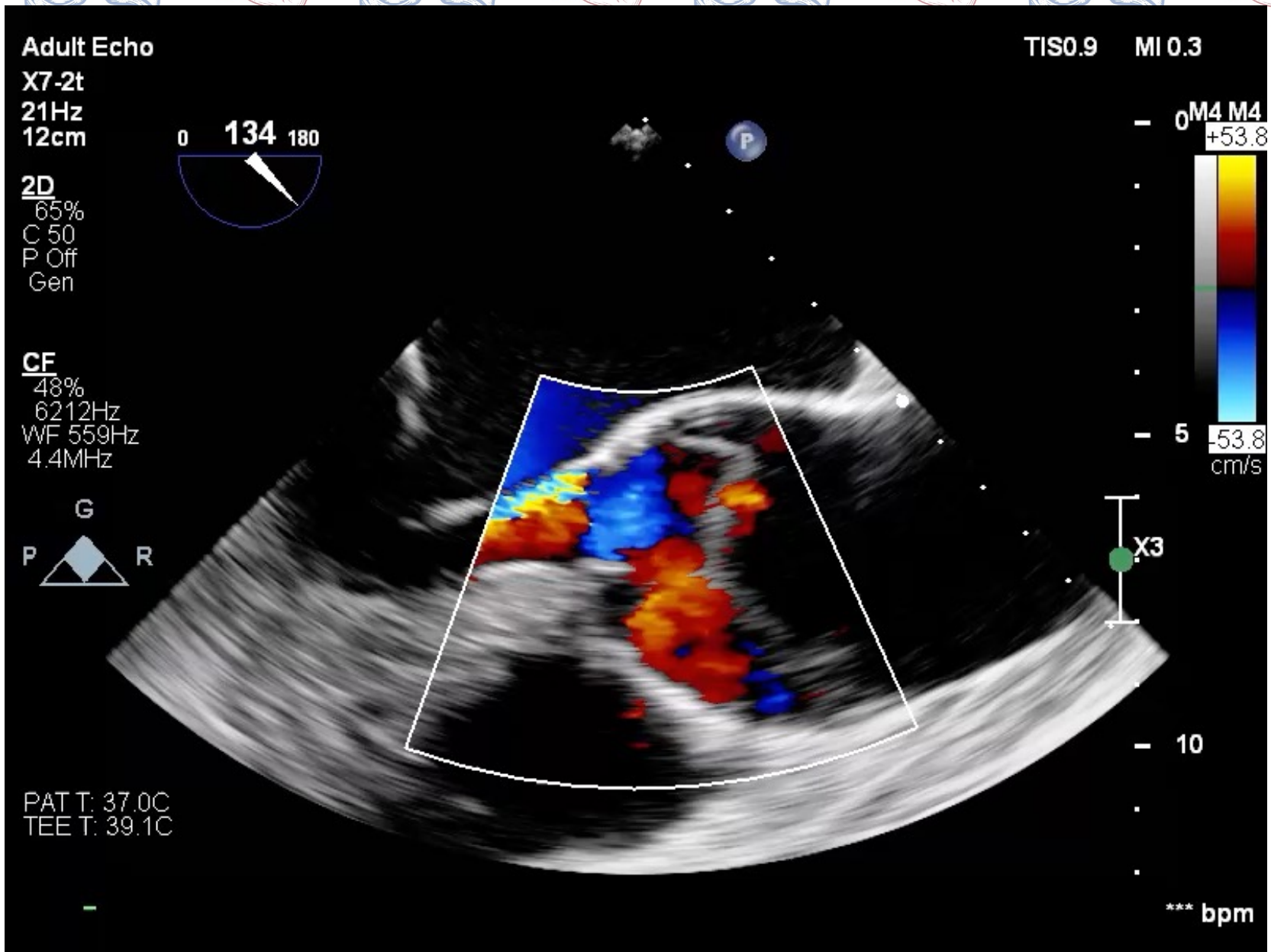
Case 2

Get to theatre



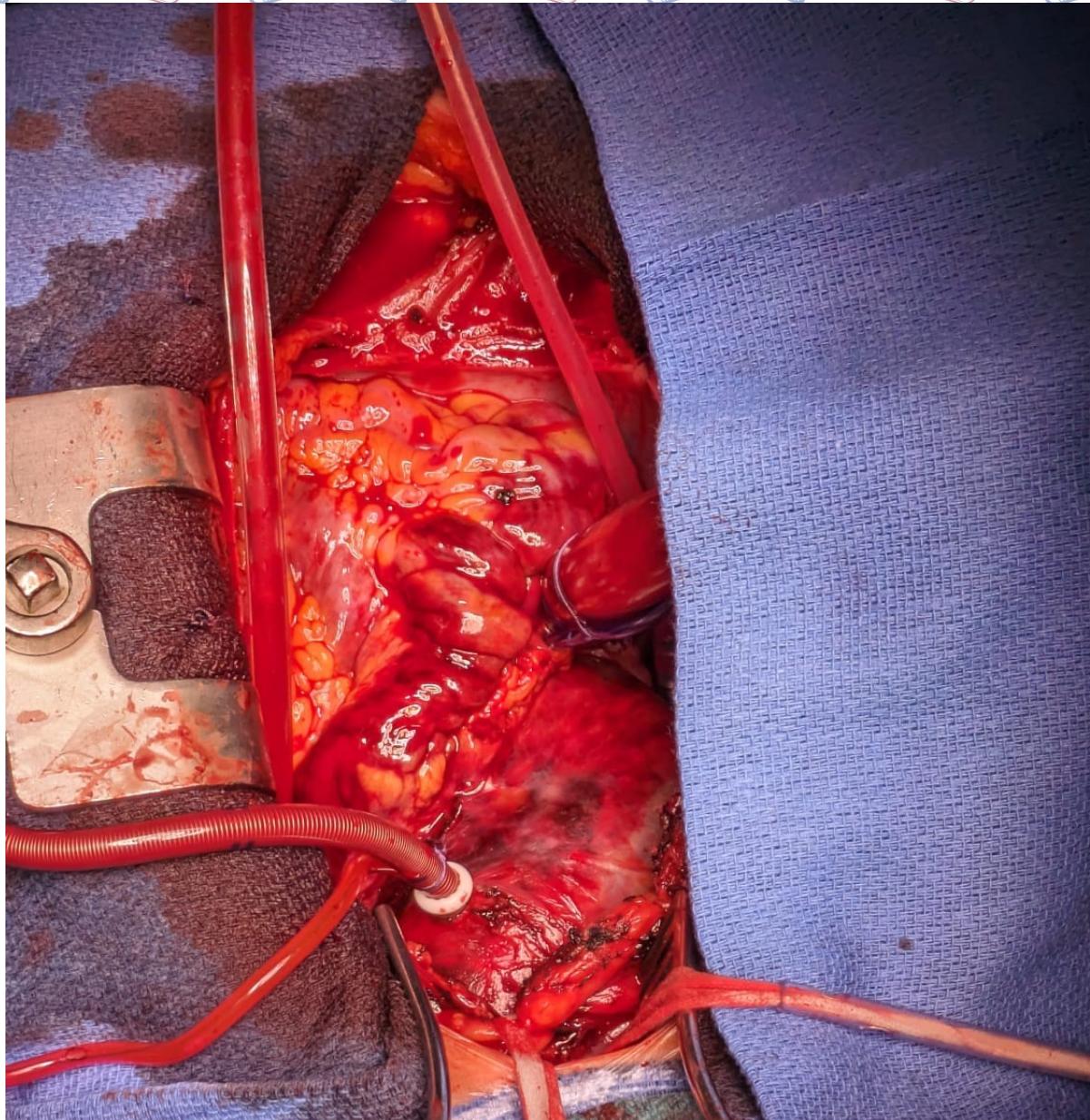
Case 2

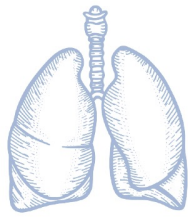
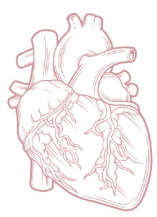
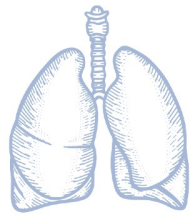
Get to theatre



Case 2

Get to theatre





Case 2 vs case 1

Pre-op preparation

Monitoring requirements

IV access

TOE

Blood management

Cannulation strategy

Separation strategy

