Untitled

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Patient Case Presentation

- A 57 years old man with typical chest pain
- 247 code (Cath-Lab)
- PCI of RCA
- Loss of Consciousness and Intubation
- Cardiac Arrest and CPR
- IABP Placement
- Infusion Levofed
- Operation Room

Vital Sign

- BP $= 80/50$
- HR $= 110$
- O2Sat $= 92\%$

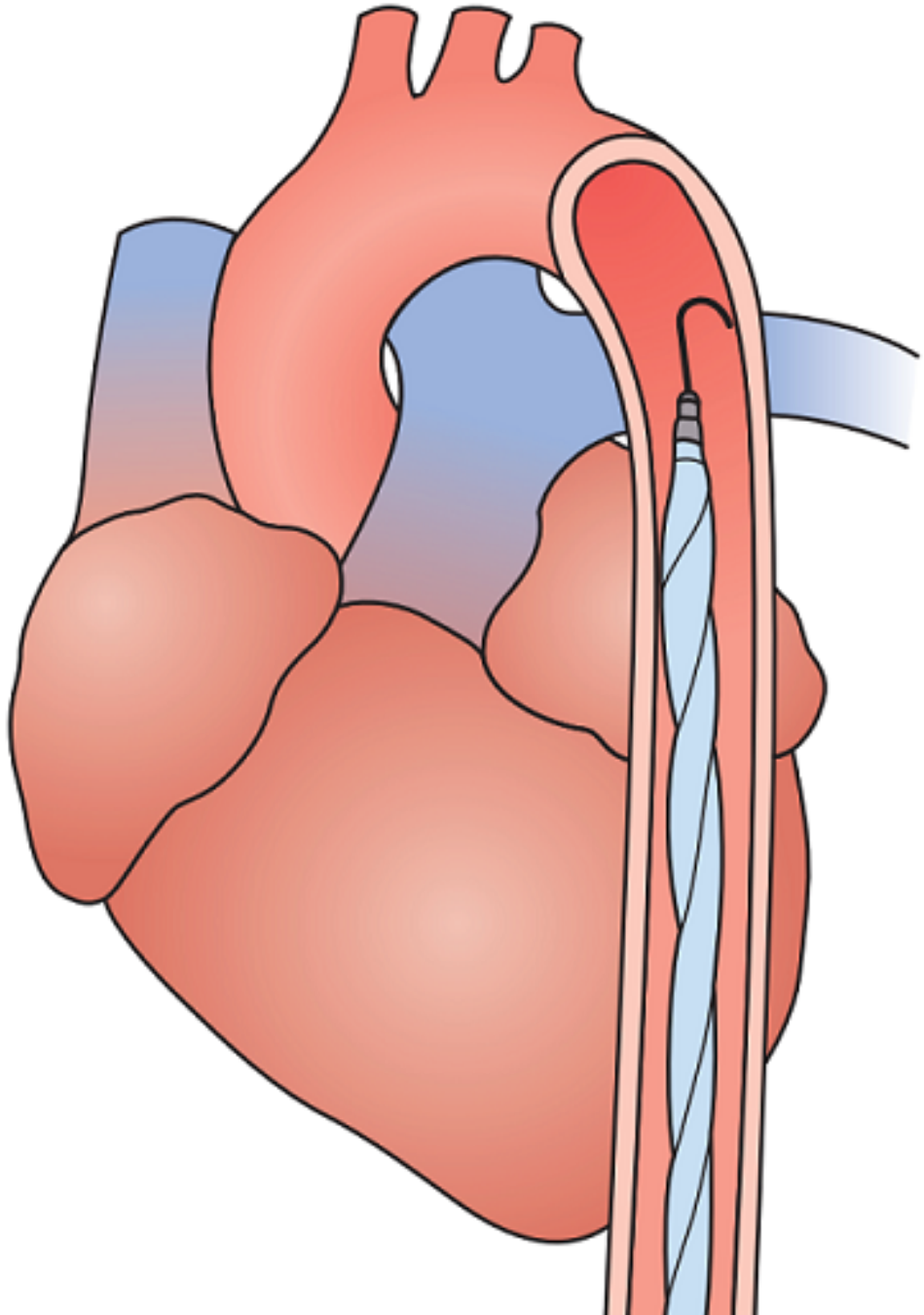
Lab Test

- Na = 141
- K = 2.8
- Hb = 11.9
- BS = 255
- Lactat = 5.5
- ABG
  - PH = 7.13
  - PO_2 = 87
  - PCO_2 = 54
  - HCO_3 = 18
  - BE = -11

Preoperation TEE

- EF = 10-15%
- Moderate-Sever MR
- No PE

Intra-aortic Balloon Pump



Indications and Contraindications

Indications	*Contraindications*
1. Cardiogenic shock a. Myocardial infarction b. Myocarditis c. Cardiomyopathy 2. Failure to separate from CPB 3. Stabilization of preoperative patient a. Ventricular septal defect b. Mitral regurgitation 4. Stabilization of noncardiac surgical patient 5. Procedural support during coronary angiography 6. Bridge to transplantation	1. Aortic valvular insufficiency 2. Aortic disease a. Aortic dissection b. Aortic aneurysm 3. Severe peripheral vascular disease 4. Severe noncardiac systemic disease 5. Massive trauma 6. Patients with "do not resuscitate" instructions 7. Mitral SAM with dynamic outflow tract obstruction

CPB, Cardiopulmonary bypass; *SAM*, systolic anterior motion.

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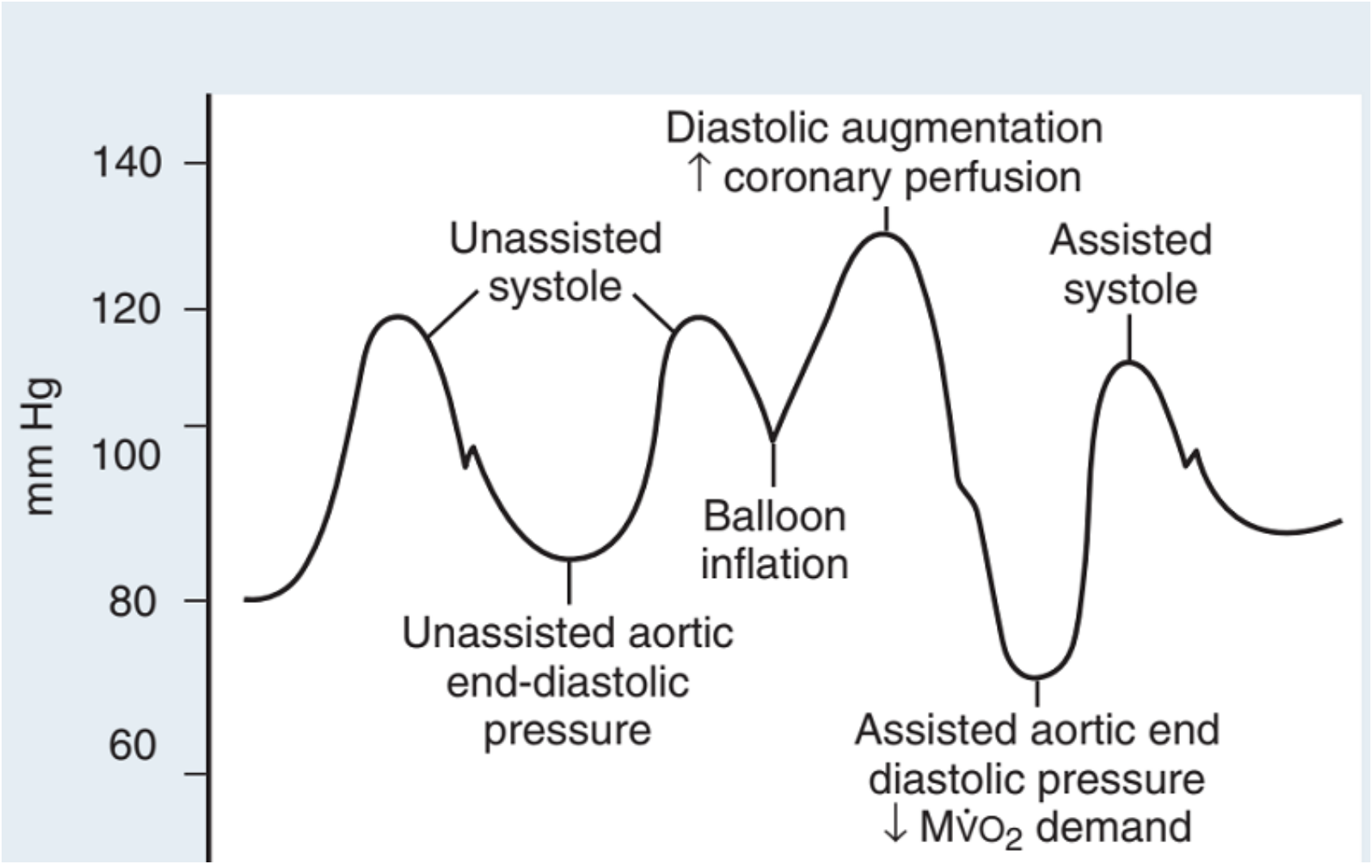
Arterial Waveforms During IABP assist



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Indications for Placement

- In the cardiac catheterization laboratory
  - High-grade lesion of proximal coronary vessels
  - MI occurs after an intervention
- LV failure despite moderate-to-high-dose inotropic support
- Evidence of ongoing regional myocardial ischemia

Contraindications to Placement

- Aortic Insufficiency
- Sepsis
- Sever Vascular Disease

Functional Design

- The balloon inflates during diastole
- Increasing aortic diastole pressure
- Balloon inflation improves coronary perfusion pressure
- During early systole, rapid balloon deflation reduces LV afterload

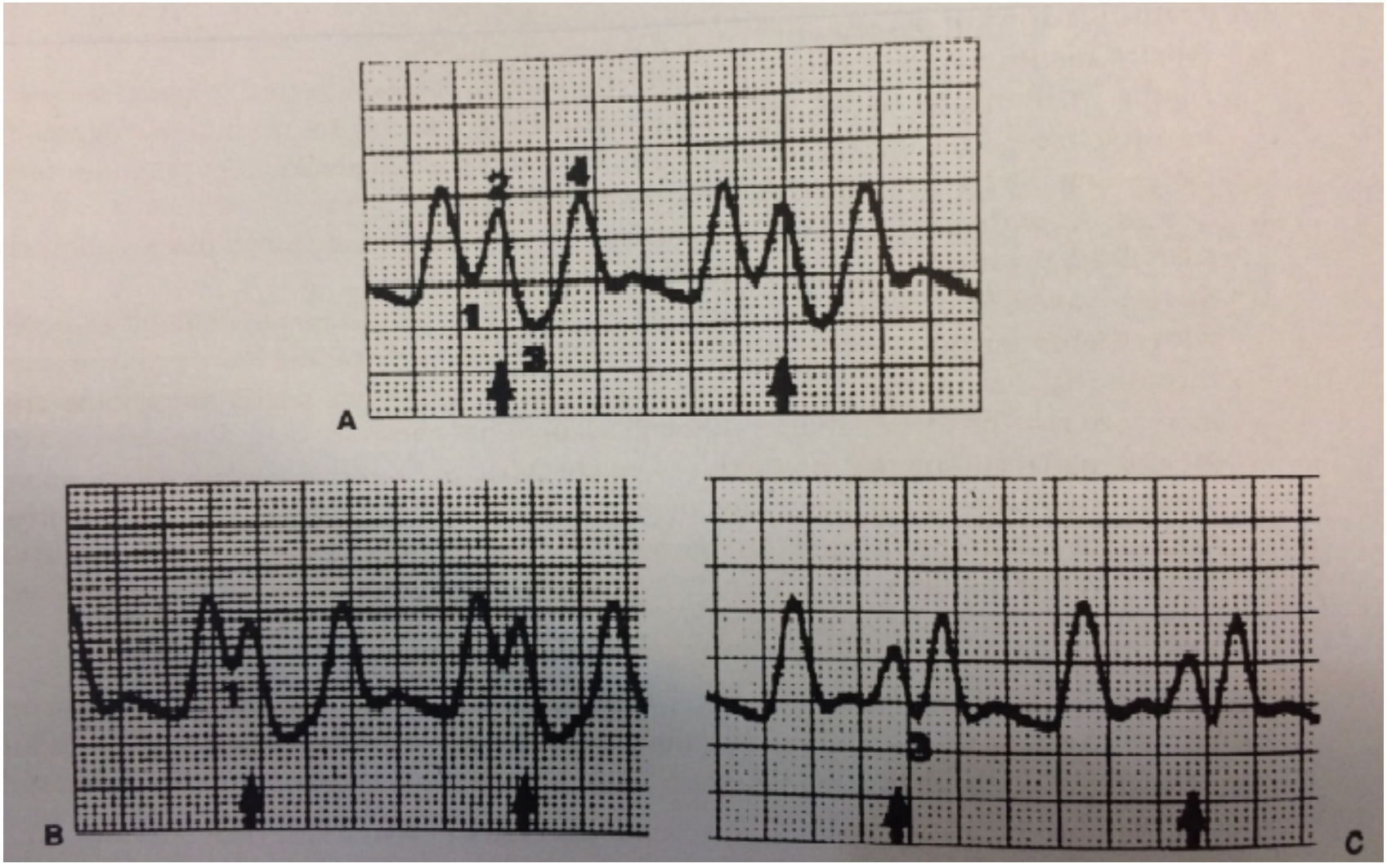
IABP Placement

- The balloon is ideally positioned so that its tip is at the junction of the descending aorta and the aortic arch
- Radiographically the tip should lie between the anterior portion of the second intercostal space and the first lumbar vertebra
- When the IABP is placed intraoperatively, TEE can confirm proper tip location before initiation of balloon assitance

IABP Control

- Synchronization of the IABP
  - Cardiac rhythm (EKG - Arterial Pressure waveform)
- Timing of Balloon Inflation and Deflation
  - It is important to time the onset of the pressure rise caused by balloon inflation with the dicrotic notch of the arterial waveform
- Ratio of Native Ventricle Pulsations to IABP Pulsation
- Stroke Volume of the Balloon

Manipulation of Timing



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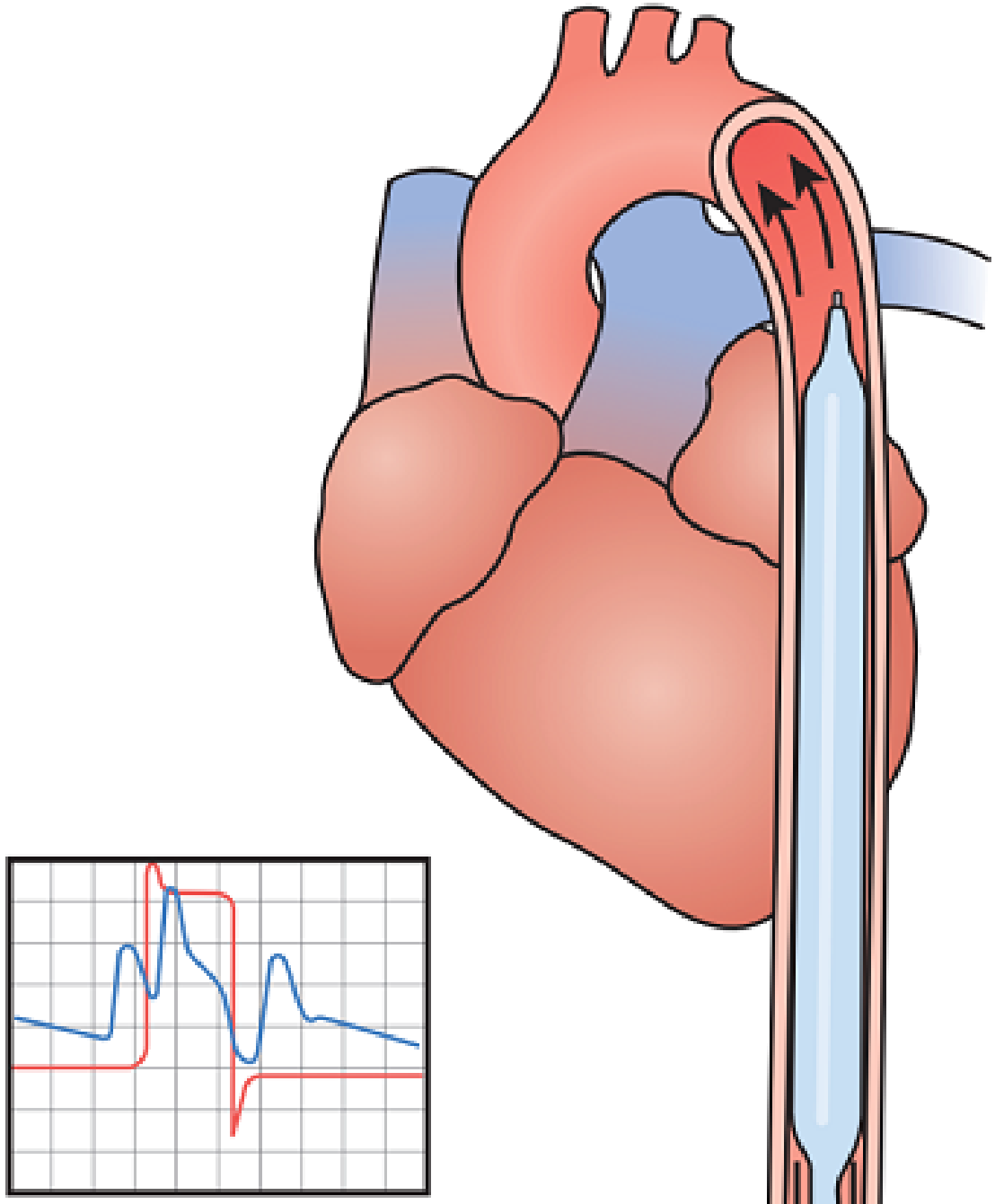
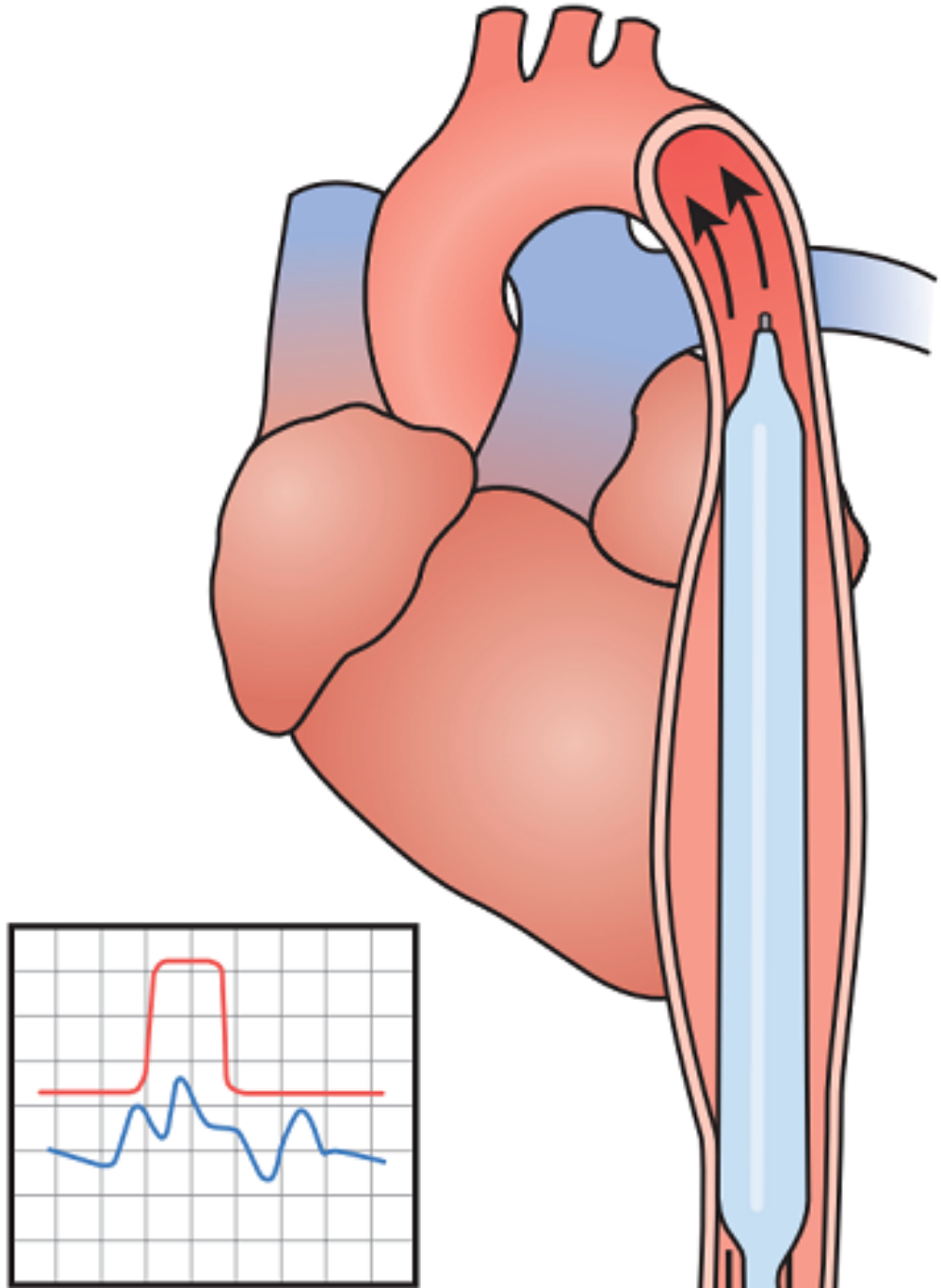
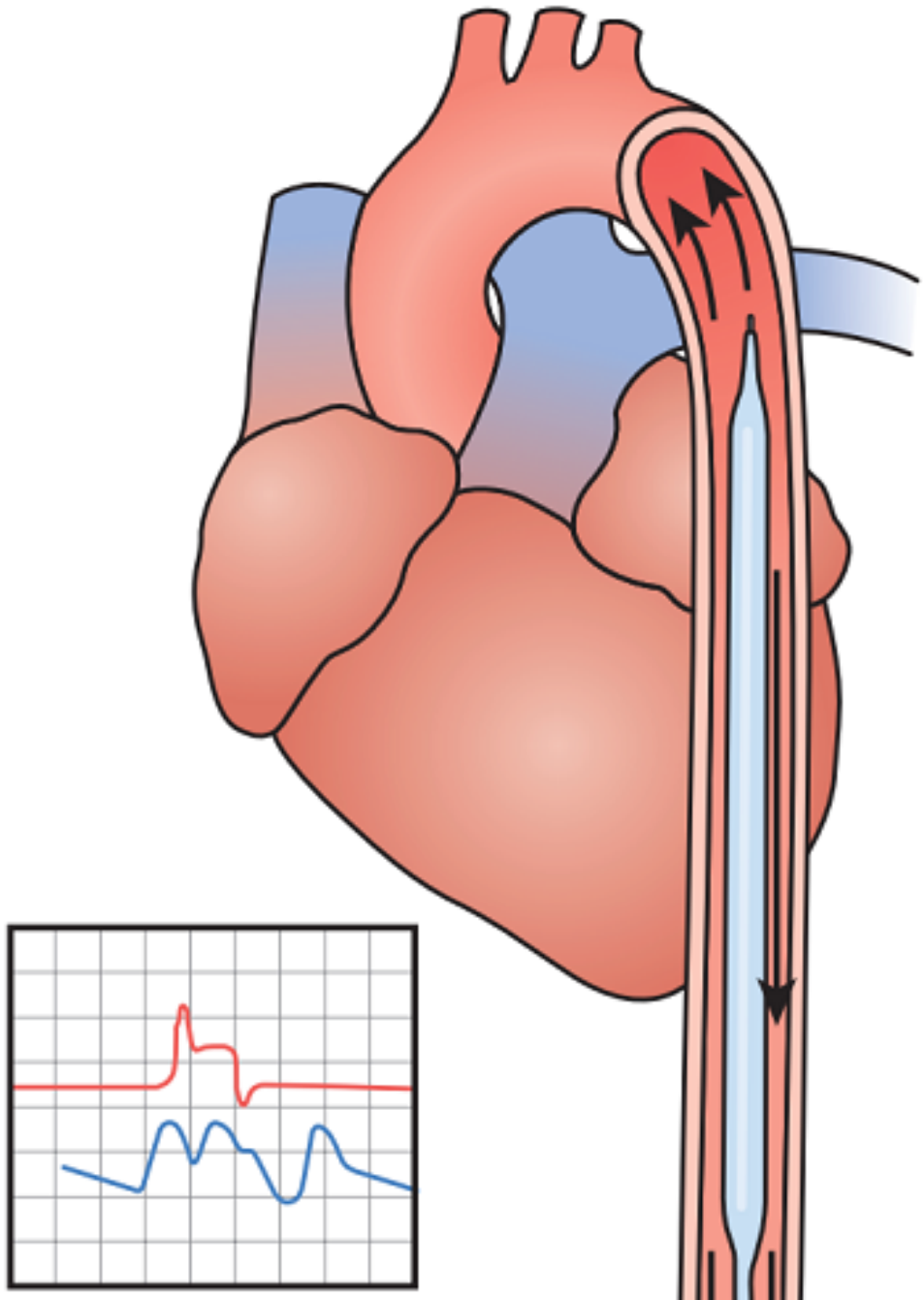
Normal Size Balloon



Balloon Too Large



Balloon Too Small



IABP Weaning

- Weaning is done primarily by gradually decreasing the ratio of augmented to native heartbeats

Management of Anticoagulation During IABP Assistance

- During extended IABP use, anticoagulation is generally indicated
- If heparin is used, adequate anticoagulation should be confirmed every 4 to 6 hours with ACT or PTT

Complication

- Limb Ischemia
- Compartment Syndrome
- Mesenteric Infarction
- Aortic Perforation
- Aortic Dissection

IABP Complications

Vascular	*Miscellaneous*	*Balloon*
Arterial injury (perforation, dissection)	Hemolysis	Perforation (preinsertion)
Aortic perforation	Thrombocytopenia	Tear (during insertion)
Aortic dissection	Infection	Incorrect positioning
Femoral artery thrombosis	Claudication (postremoval)	Gas embolization
Peripheral embolization	Hemorrhage	Inadvertent removal
Femoral vein cannulation	Paraplegia	—
Pseudoaneurysm of femoral vessels	Entrapment	—
Lower extremity ischemia	Spinal cord necrosis	—
Compartment syndrome	Left internal mammary artery occlusion	—
Visceral ischemia	Aggravation of dynamic outflow tract obstruction	—

Figure 8: alt text here

Risk Factors for Complication

- Peripheral Vascular Disease
- Female Gender
- Tobacco Smoking
- DM
  Little old ladies and balloon pump don't mix