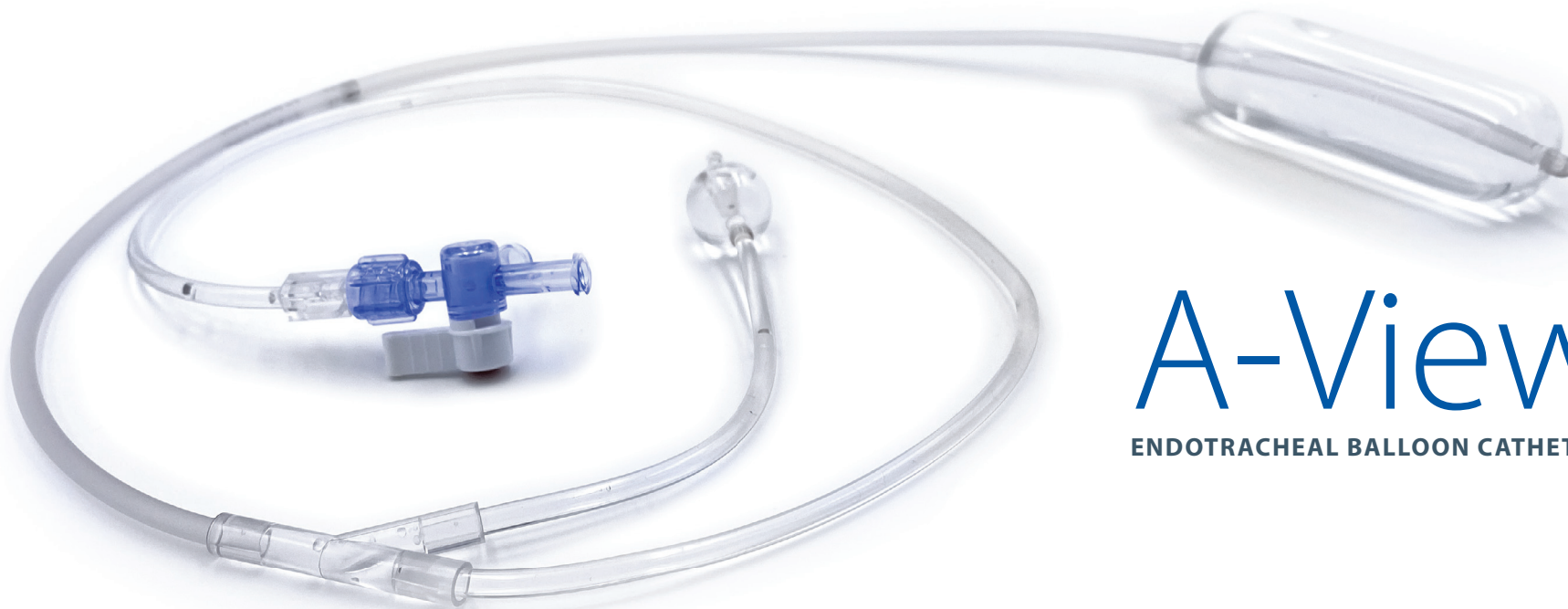# DeRoyal®

Improving Care. Improving Business.®

Vascular TEE Views

**14 safety check guideline views
including aortic arch views**

A-View®

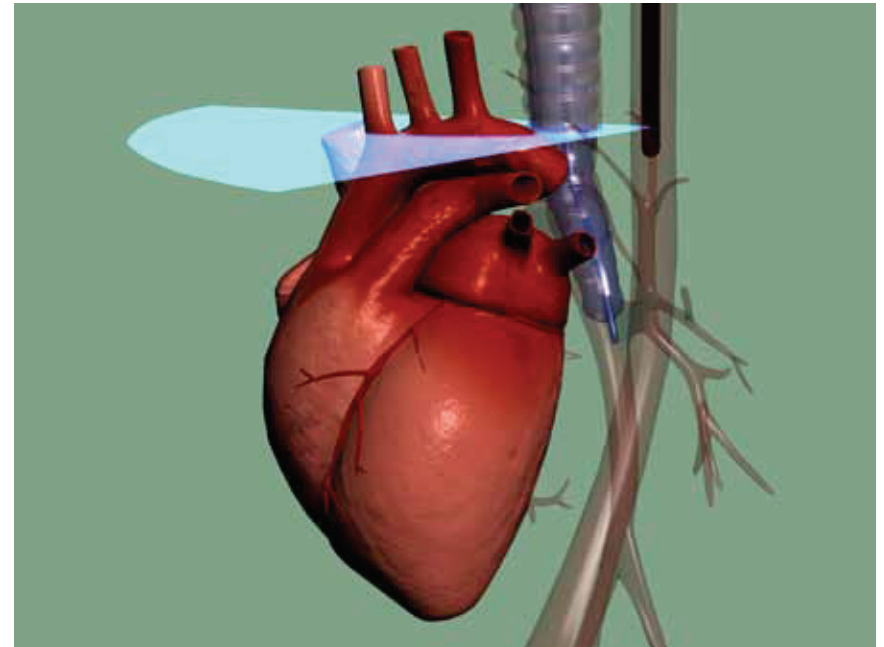**ENDOTRACHEAL BALLOON CATHETER**

deroyal.com

Preface

Transesophageal echocardiography (TEE) is being used in cardiothoracic surgery and interventional cardiology to create vascular views before and during cardiac surgery. Knowledge on the presence and localization of atherosclerotic plaques helps the surgeon to determine the safest surgical approach.
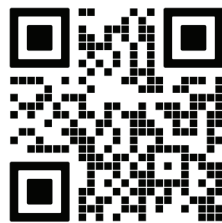
However, due to the position of the air-filled trachea, between the thoracic aorta and the TEE-probe, visualization of the distal ascending aorta (DAA) and Arch is impossible or mostly limited. The DAA is the location where cannulation and crossclamping takes place and where atherosclerotic plaques are most prevalent as a source of embolisms often known to be the cause of a major stroke.

A-View® Endotracheal Balloon Catheter is used to overcome the limitation of the so called 'blind spot' of TEE. After introduction of the saline filled catheter in the trachea, echo conduction through the trachea is enabled and the ascending aorta, aortic arch and its branching vessels can be imaged. For more information about A-View see our website.

The TEE safety check contains 14 TEE views of which 6 imaged with the use of the A-View® balloon. This guide, developed in conjunction with a leading cardiac anesthesiologist-intensivist, Dr. Arno Nierich, can assist in obtaining the best vascular views when utilizing the A-View® device.
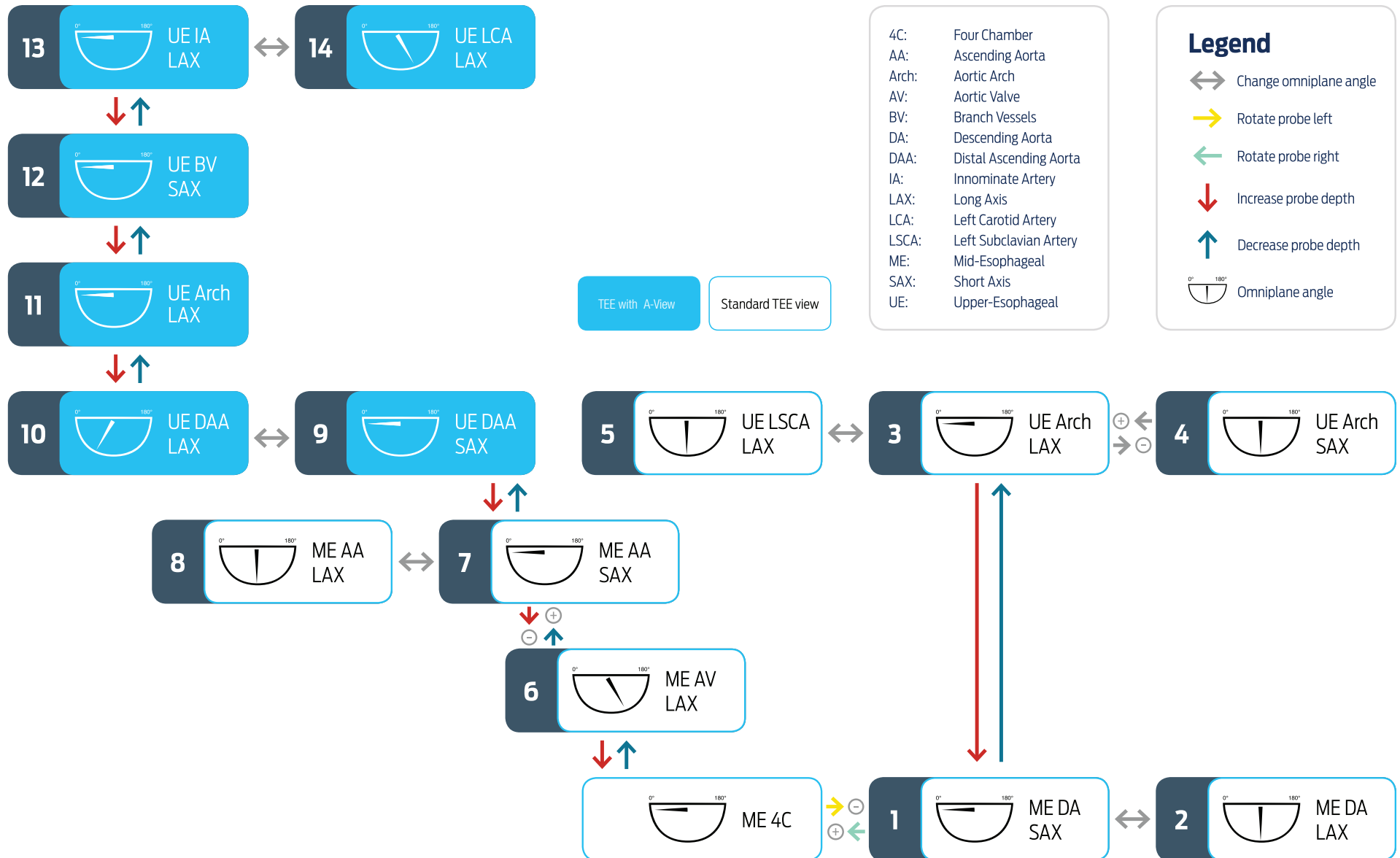
DeRoyal Industries, Inc.
www.deroyal.com

Scan here to get a
PDF of this document

A-View®
ENDOTRACHEAL BALLOON CATHETER

Overview Vascular TEE Views

DeRoyal®
Improving Care. Improving Business.

13 UE IA LAX ↔ 14 UE LCA LAX

12 UE BV SAX

11 UE Arch LAX

10 UE DAA LAX ↔ 9 UE DAA SAX

5 UE LSCA LAX ↔ 3 UE Arch LAX ⊕⊖ 4 UE Arch SAX

8 ME AA LAX ↔ 7 ME AA SAX

6 ME AV LAX

ME 4C ⊖⊕ 1 ME DA SAX ↔ 2 ME DA LAX

TEE with A-View | Standard TEE view

4C: Four Chamber
AA: Ascending Aorta
Arch: Aortic Arch
AV: Aortic Valve
BV: Branch Vessels
DA: Descending Aorta
DAA: Distal Ascending Aorta
IA: Innominate Artery
LAX: Long Axis
LCA: Left Carotid Artery
LSCA: Left Subclavian Artery
ME: Mid-Esophageal
SAX: Short Axis
UE: Upper-Esophageal

Legend

↔ Change omniplane angle
→ Rotate probe left
← Rotate probe right
↓ Increase probe depth
↑ Decrease probe depth
0° 180° Omniplane angle

Abbreviations

4C:	Four Chamber	LSCA:	Left Subclavian Artery
AA:	Ascending Aorta	LVOT:	Left Ventricular Outflow Tract
Arch:	AorticArch	ME:	Mid-Esophageal
AV:	Aortic Valve	PA:	Pulmonary Artery
BV:	Branch Vessels	PAA:	Proximal Ascending Aorta
DA:	Descending Aorta	PV:	Pulmonary Valve
DAA:	Distal Ascending Aorta	RPA:	Right Pulmonary Artery
IA:	Innominate Artery	RVOT:	Right Ventricular Outflow Tract
IV:	Innominate Vein	SAX:	Short Axis
LA:	Left Atrium	SVC:	Superior Vena Cava
LAX:	Long Axis	UE:	Upper-Esophageal
LCA:	LeftCarotid Artery		

A-View® ENDOTRACHEAL BALLOON CATHETER

1. ME Descending Aorta SAX View
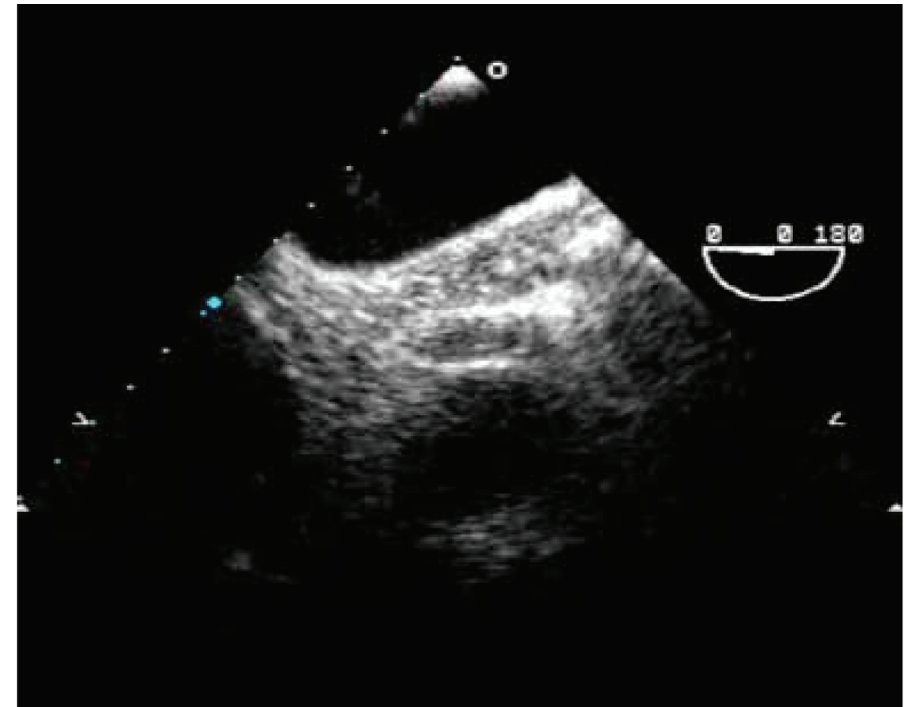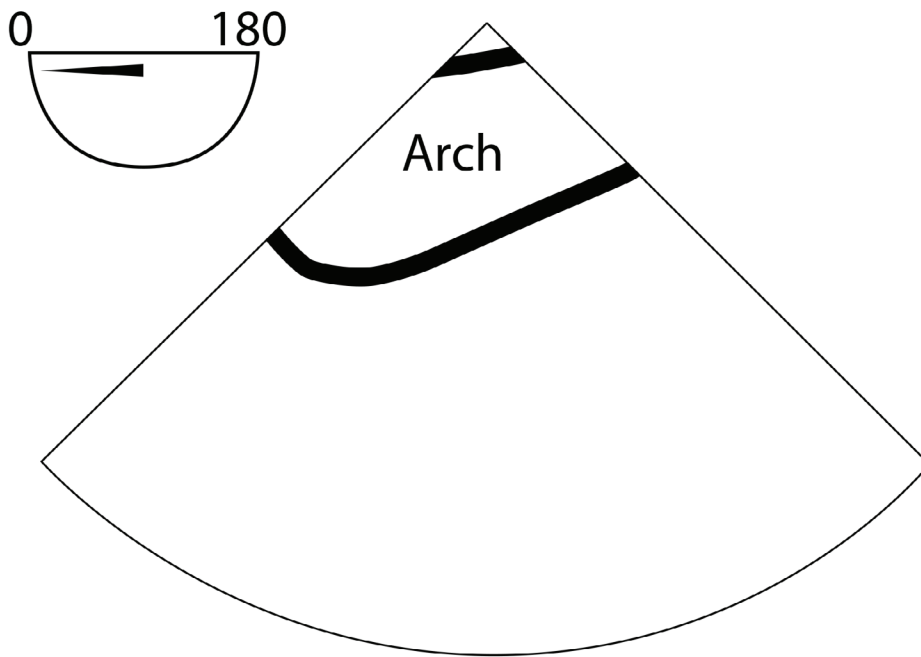

Structures to identify	To obtain this view	Diagnostic issues
AA: Ascending Aorta RPA: Right Pulmonary Artery	• Insert the probe to the ME, sector depth 8-10 cm, angle 0° • Find the ME AV LAX (120°) • Withdraw probe to bring the Right Pulmonary Artery in view • Decrease omniplane angle slightly by 10-20° to make the aortic wall symmetric	• Aortic Pathology • Pericardial Effusion • Pulmonary Embolus

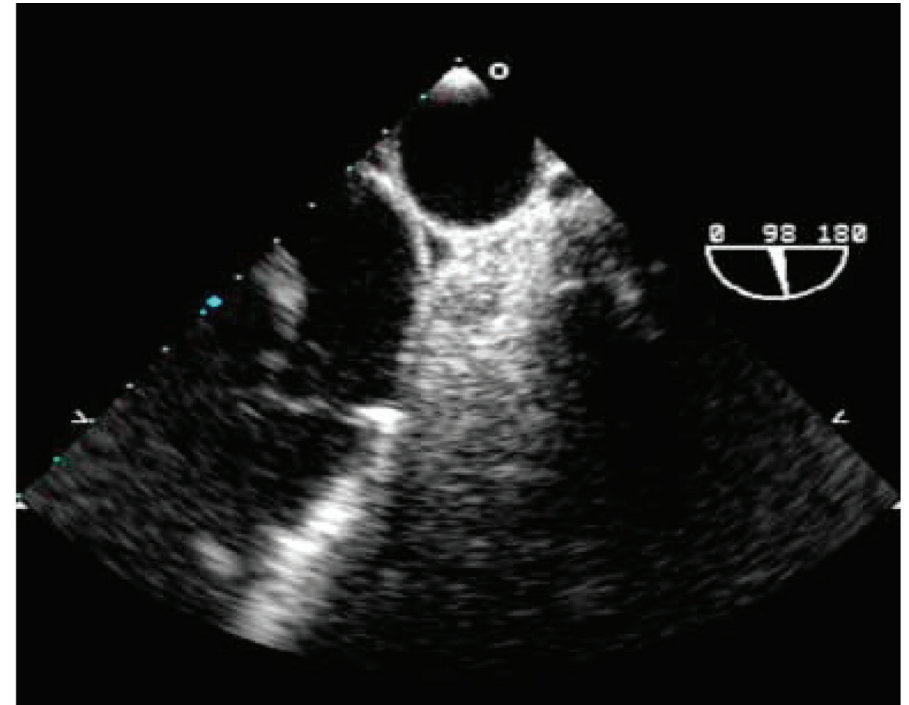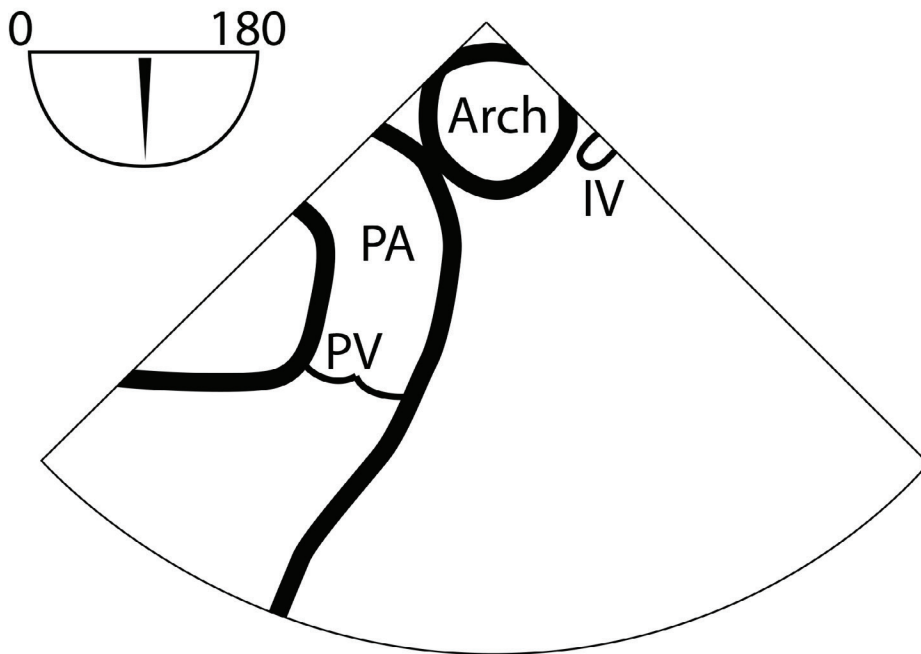A-View® ENDOTRACHEAL BALLOON CATHETER

2. ME Descending Aorta LAX

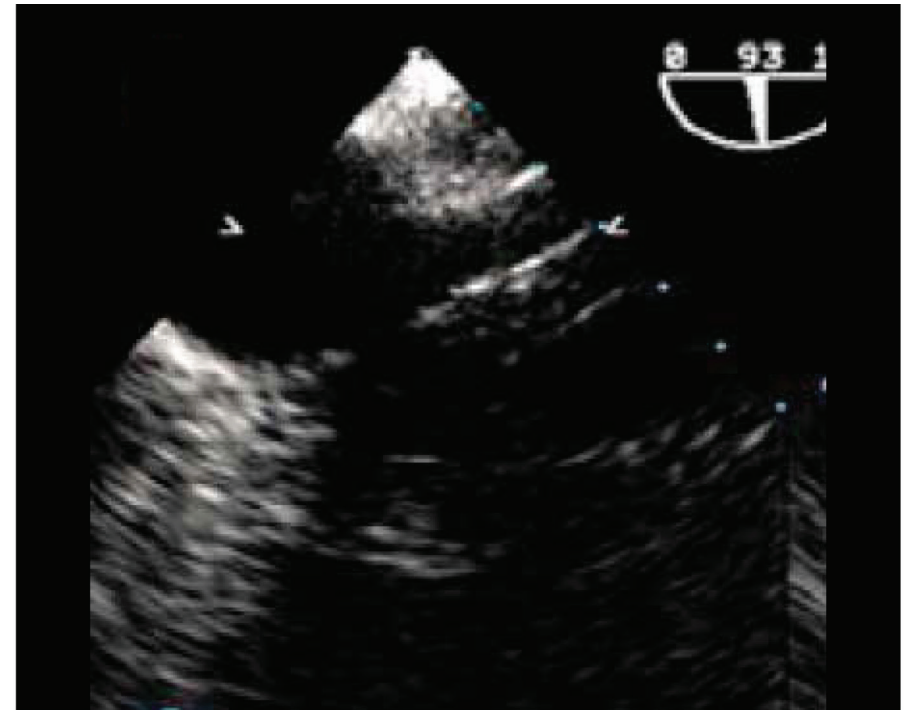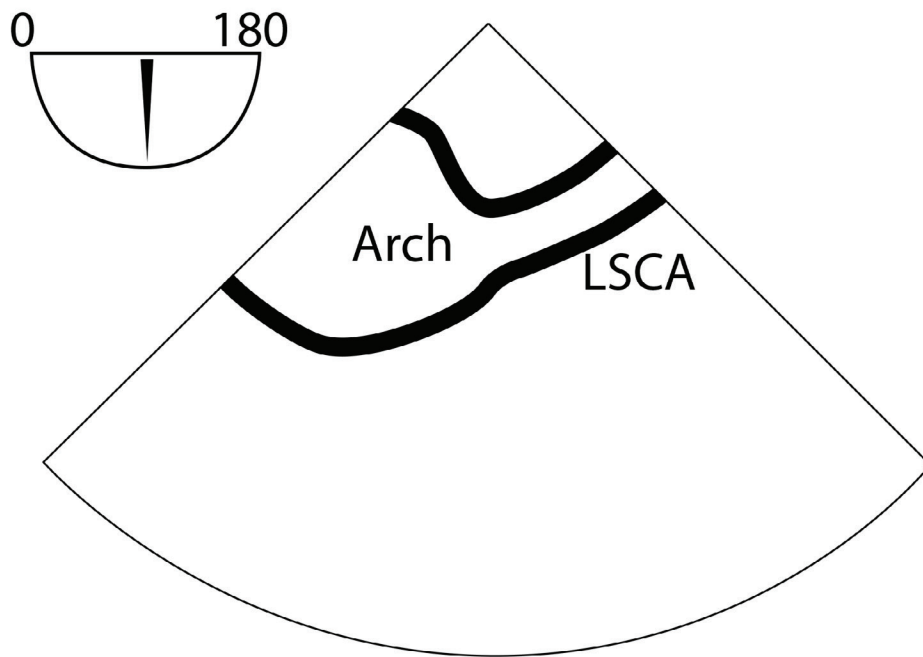| Structures to identify	To obtain this view	Diagnostic issues
AA: Ascending Aorta RPA: Right Pulmonary Artery	• Insert the probe to the ME, sector depth 8-10 cm, angle 0° • Find the ME AV LAX (120°) • Withdraw probe to bring the Right Pulmonary Artery in view • Decrease omniplane angle slightly by 10-20° to make the aortic wall symmetric	• Aortic Pathology • Pericardial Effusion • Pulmonary Embolus

A-View® ENDOTRACHEAL BALLOON CATHETER

3. UE Aortic Arch LAX

Structures to identify	To obtain this view	Diagnostic issues
AA: Ascending Aorta RPA: Right Pulmonary Artery	• Insert the probe to the ME, sector depth 8-10 cm, angle 0° • Find the ME AV LAX (120°) • Withdraw probe to bring the Right Pulmonary Artery in view • Decrease omniplane angle slightly by 10-20° to make the aortic wall symmetric	• Aortic Pathology • Pericardial Effusion • Pulmonary Embolus

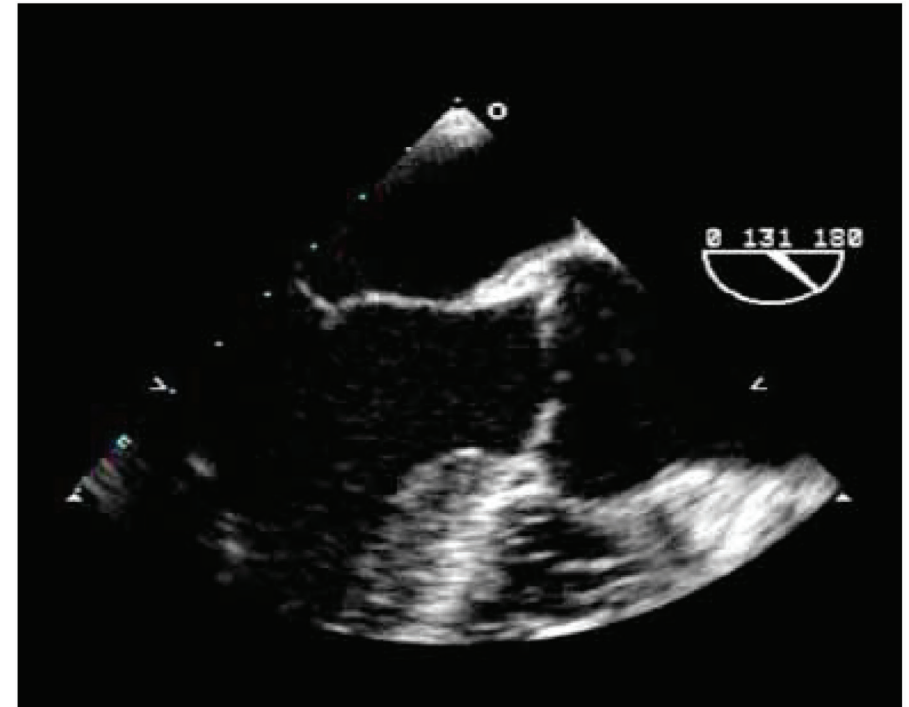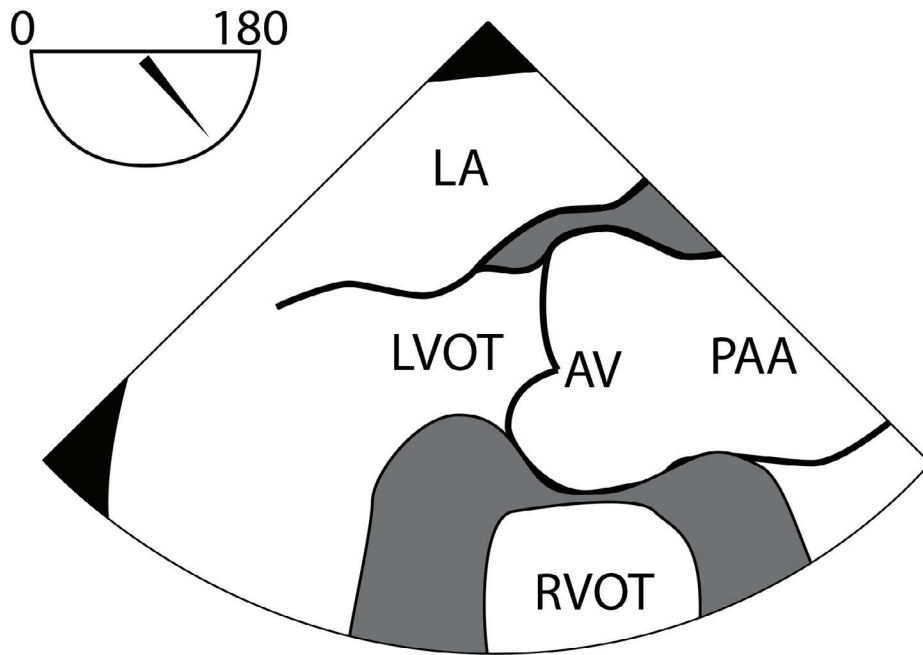A-View® ENDOTRACHEAL BALLOON CATHETER

4. UE Aortic Arch SAX

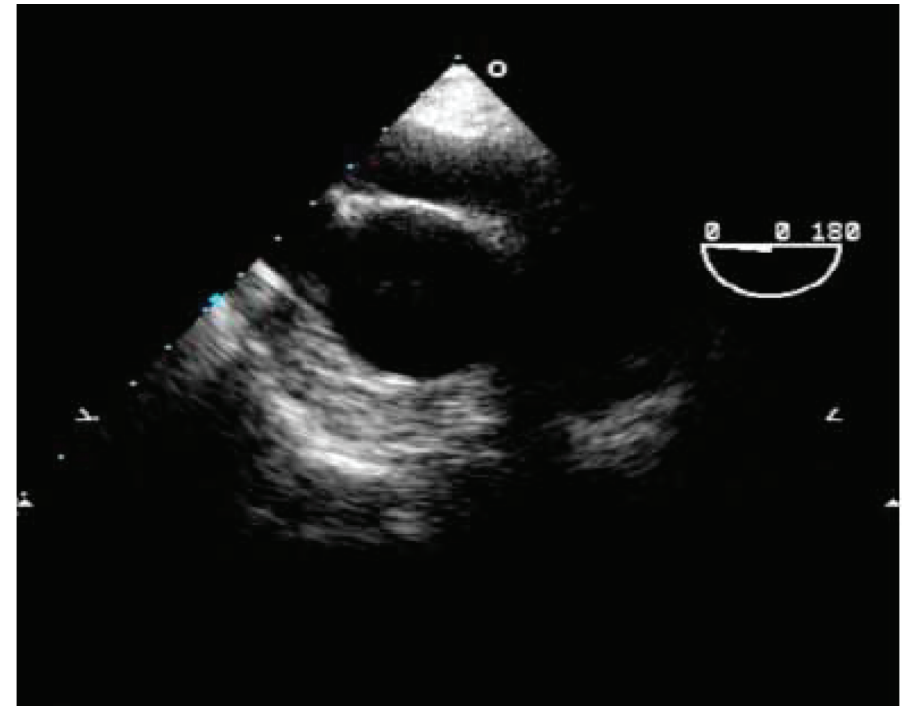| Structures to identify	To obtain this view	Diagnostic issues
AA: Ascending Aorta RPA: Right Pulmonary Artery	• Insert the probe to the ME, sector depth 8-10 cm, angle 0° • Find the ME AV LAX (120°) • Withdraw probe to bring the Right Pulmonary Artery in view • Decrease omniplane angle slightly by 10-20° to make the aortic wall symmetric	• Aortic Pathology • Pericardial Effusion • Pulmonary Embolus

A-View® ENDOTRACHEAL BALLOON CATHETER

5. UE Left Subclavian Artery SAX

Structures to identify	To obtain this view	Diagnostic issues
AA: Ascending Aorta RPA: Right Pulmonary Artery	• Insert the probe to the ME, sector depth 8-10 cm, angle 0° • Find the ME AV LAX (120°) • Withdraw probe to bring the Right Pulmonary Artery in view • Decrease omniplane angle slightly by 10-20° to make the aortic wall symmetric	• Aortic Pathology • Pericardial Effusion • Pulmonary Embolus

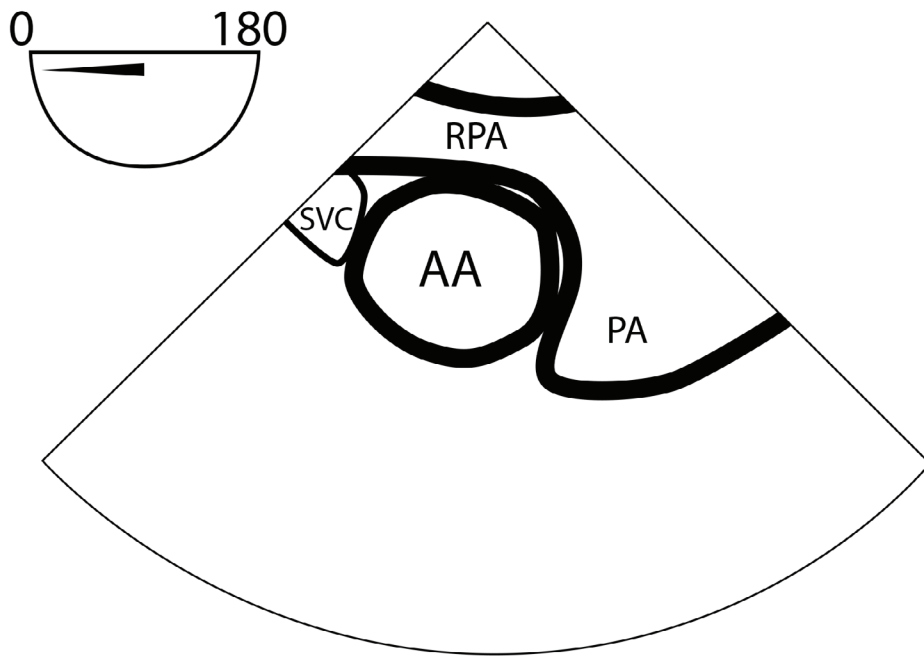A-View® ENDOTRACHEAL BALLOON CATHETER

6. ME Aortic Valve LAX

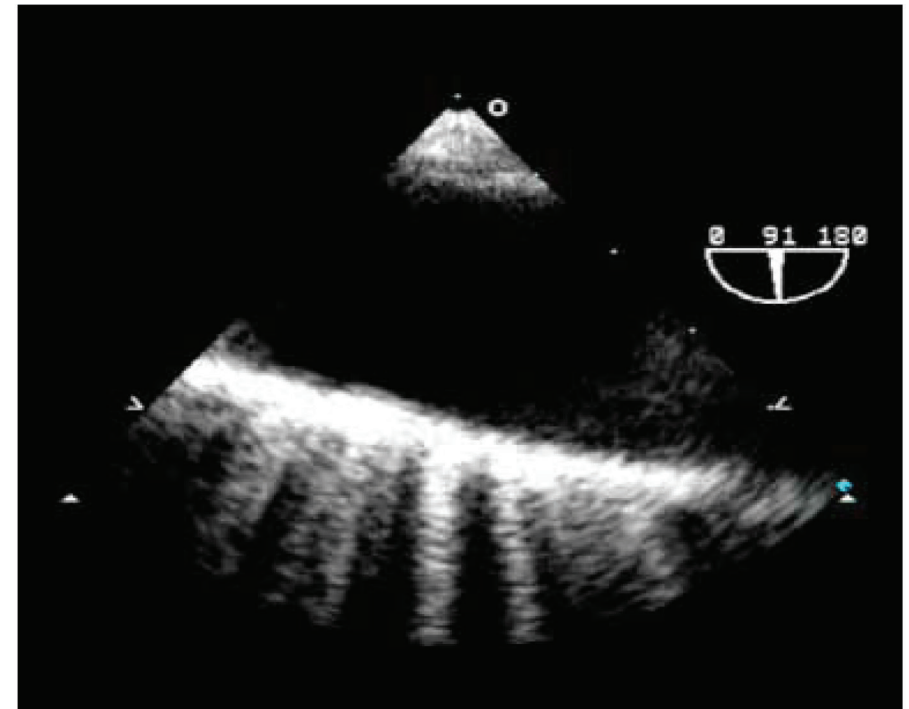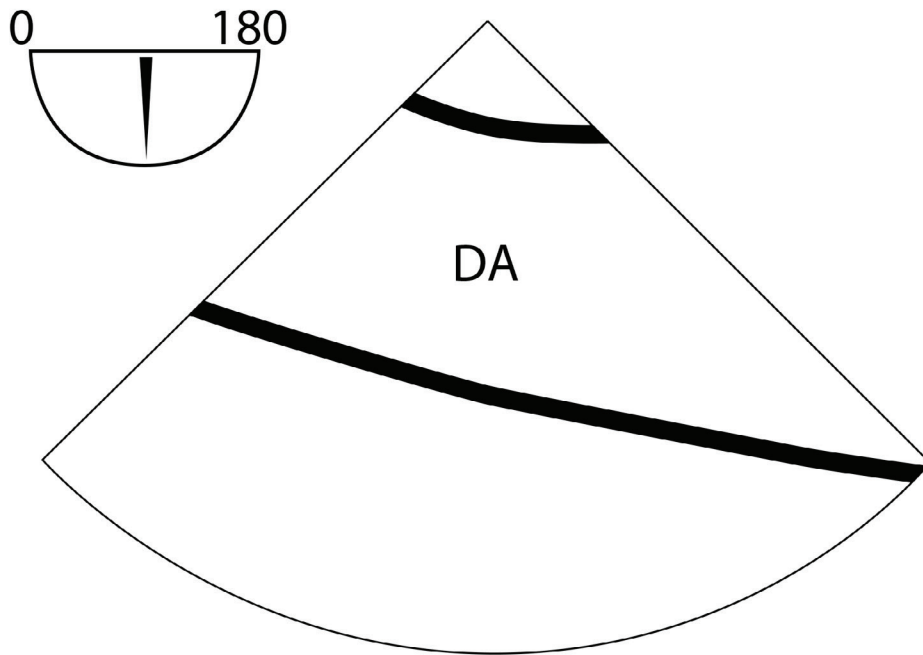| Structures to identify	To obtain this view	Diagnostic issues
AA: Ascending Aorta RPA: Right Pulmonary Artery	• Insert the probe to the ME, sector depth 8-10 cm, angle 0° • Find the ME AV LAX (120°) • Withdraw probe to bring the Right Pulmonary Artery in view • Decrease omniplane angle slightly by 10-20° to make the aortic wall symmetric	• Aortic Pathology • Pericardial Effusion • Pulmonary Embolus

A-View ® ENDOTRACHEAL BALLOON CATHETER

7. ME Ascending Aorta SAX

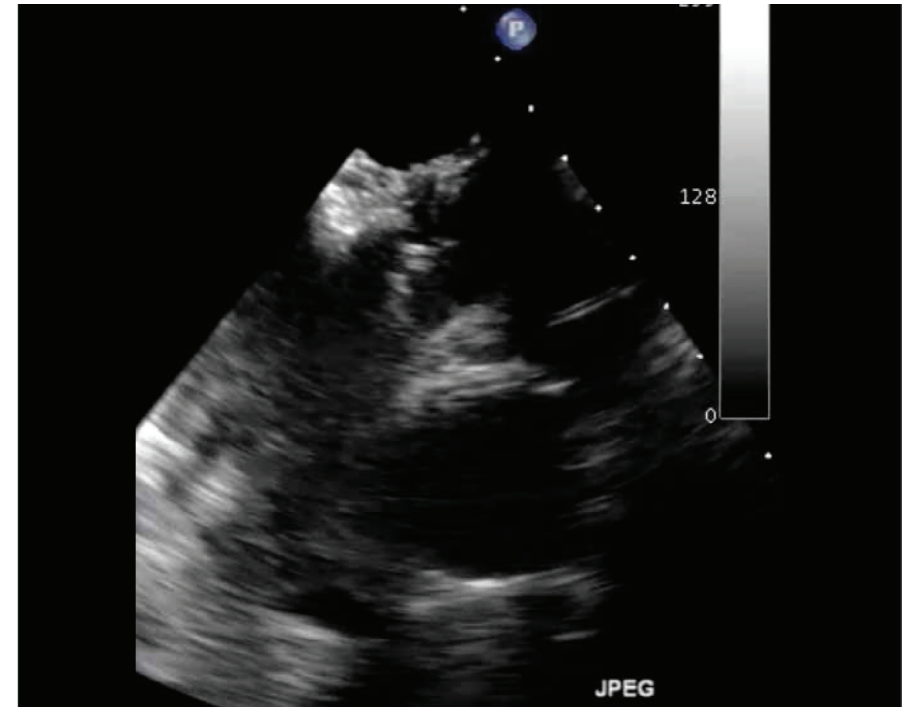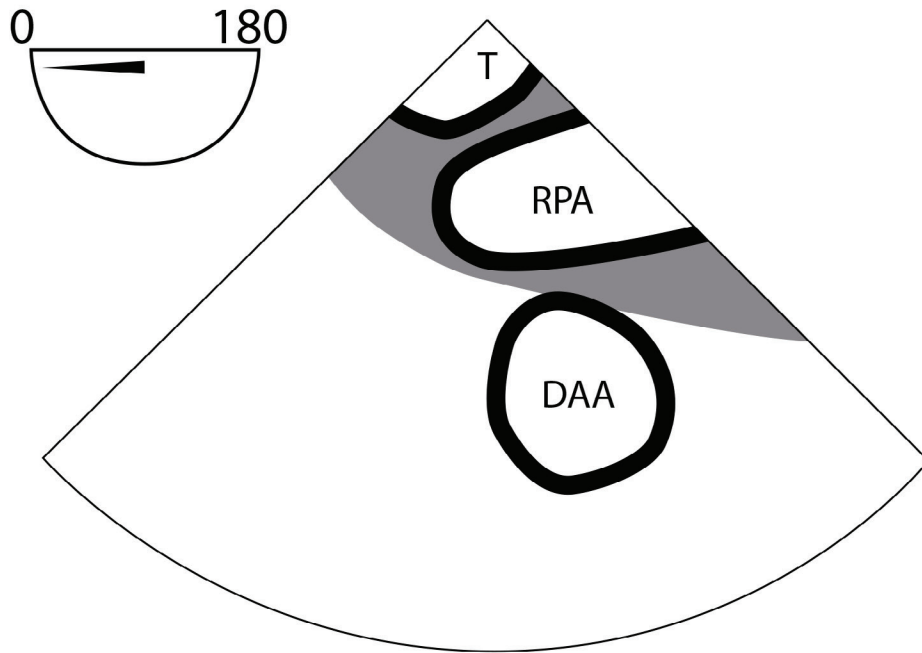| Structures to identify	To obtain this view	Diagnostic issues
AA: Ascending Aorta RPA: Right Pulmonary Artery	• Insert the probe to the ME, sector depth 8-10 cm, angle 0° • Find the ME AV LAX (120°) • Withdraw probe to bring the Right Pulmonary Artery in view • Decrease omniplane angle slightly by 10-20° to make the aortic wall symmetric	• Aortic Pathology • Pericardial Effusion • Pulmonary Embolus

8. ME Ascending Aorta LAX

Structures to identify	To obtain this view	Diagnostic issues
AA: Ascending Aorta RPA: Right Pulmonary Artery	• Insert the probe to the ME, sector depth 8-10 cm, angle 0° • Find the ME AV LAX (120°) • Withdraw probe to bring the Right Pulmonary Artery in view • Decrease omniplane angle slightly by 10-20° to make the aortic wall symmetric	• Aortic Pathology • Pericardial Effusion • Pulmonary Embolus

A-View® ENDOTRACHEAL BALLOON CATHETER

A-View® Endotracheal Balloon Catheter
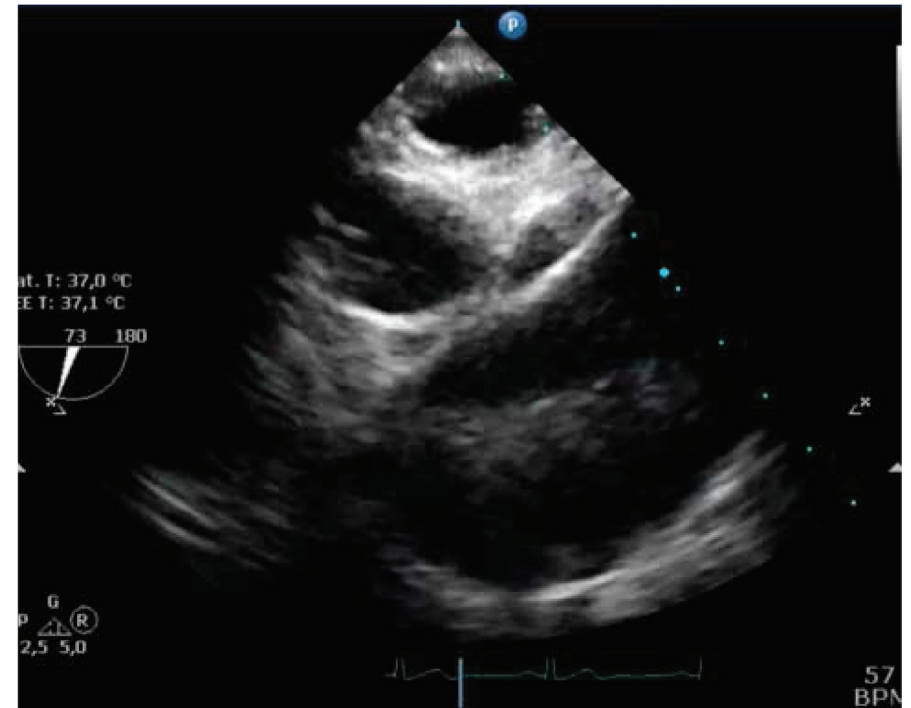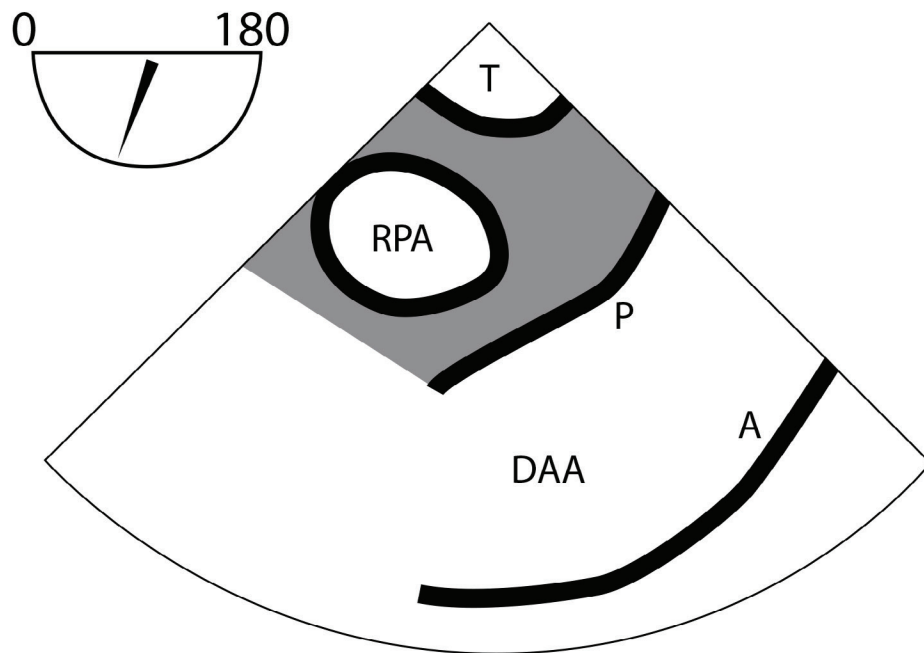
Getting Started

1. Find the ME Ascending Aorta SAX view, withdraw the probe to the UE, sector depth 10 cm, angle 30°

2. Anteflex probe slightly

3. Withdraw the probe till entering the blind spot area

4. Leave the probe in this position and insert the A-View®

5. Proceed to obtain the following 6 views

A-View® ENDOTRACHEAL BALLOON CATHETER

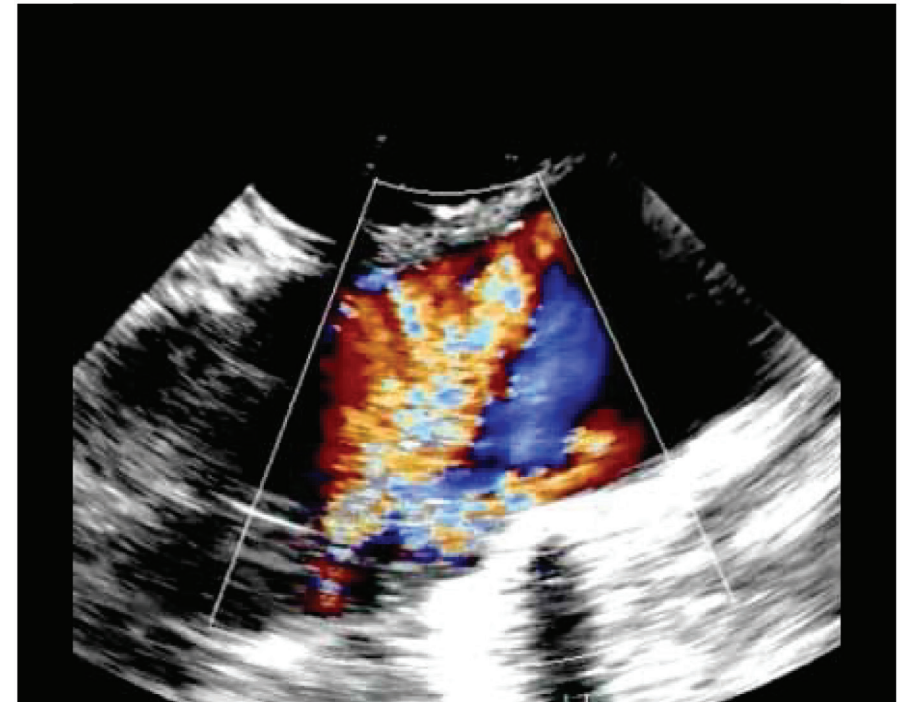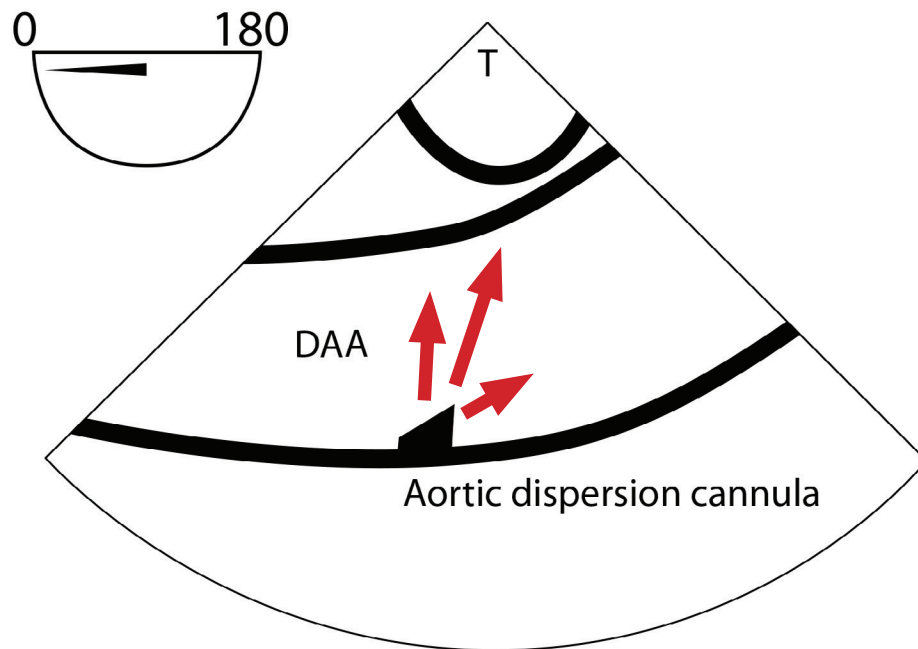# 9. UE Distal Ascending Aorta SAX A-View®

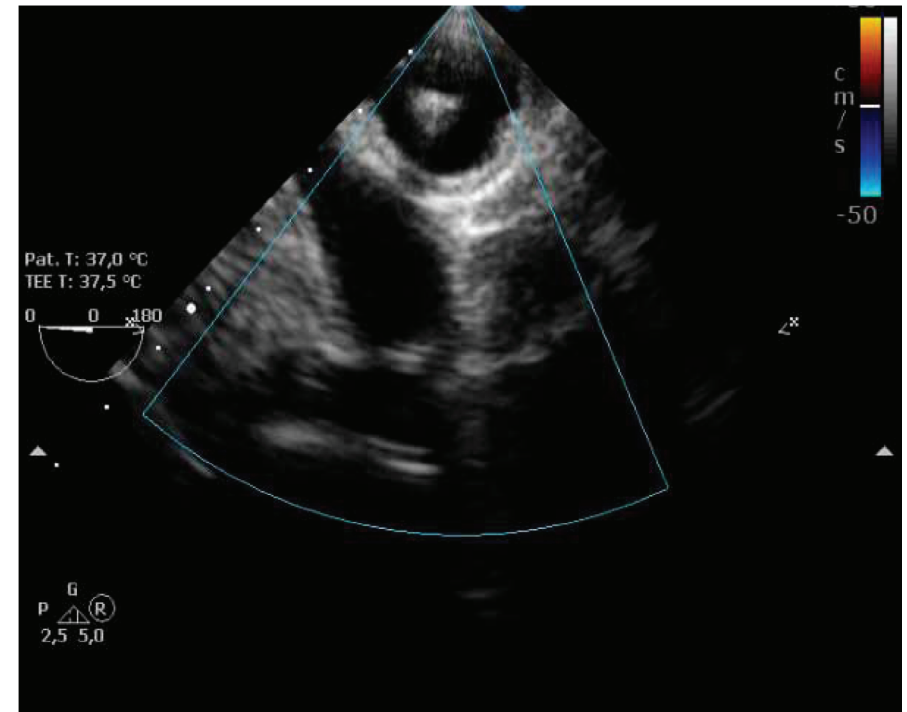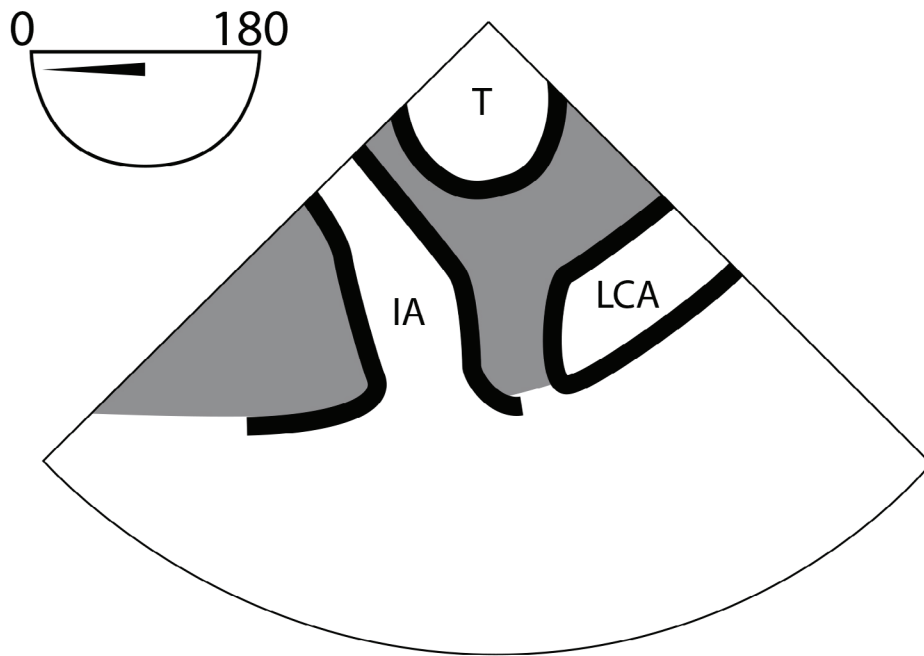| Structures to identify	To obtain this view	Diagnostic issues
DAA: Distal Ascending Aorta RPA: Right Pulmonary Artery T: Trachea with A-View	• Find ME AA SAX • Withdraw probe slightly to UE position, with the sector depth 10 cm, angle 0-30° • The trachea will become visible or the right or left bronchus • Keep the Aorta centered before rotate to 60° • Aorta will become visible as a tube directed to the right upper screen position	• Atherosclerotic Disease • Aortic Dissection • Pulmonary Embolus

A-View®

A-View® ENDOTRACHEAL BALLOON CATHETER

10. UE Distal Ascending Aorta LAX A-View®

Structures to identify	To obtain this view	Diagnostic issues
DAA: Distal Ascending Aorta T: Trachea with A-View	• Find UE DAA SAX (0°) view, sector depth 6 -8 cm • Keep the trachea centered • Only move the probe, A-View remains in the same location • Use color Doppler to verify arterial flow	• Atherosclerotic Disease • Aortic Dissection • Extracorporeal Circulation (ECC) • Vascular Devices (cannulation and flow)

A-View® ENDOTRACHEAL BALLOON CATHETER

11. UE Aortic Arch SAX A-View®

0   180

T

DAA

Aortic dispersion cannula

A-View®

Structures to identify	To obtain this view	Diagnostic issues
DA: Upper part of the Descending Aorta T: Trachea with A-View	• Find the UE Aortic Arch, position sector depth 6-8cm, angle 0° • Keep the trachea centered • Only move the probe, A-View remains at the same location • Use color Doppler to verify arterial flow	• Aortic Atherosclerosis • Aortic Dissection • Extracorporeal Circulation (ECC) • Vascular Devices (cannulation and flow)

A-View® ENDOTRACHEAL BALLOON CATHETER

12. UE Branch Vessels LAX A-View®

Structures to identify	To obtain this view	Diagnostic issues
IA: Innominate Artery LCA: Left Carotid Artery T: Trachea with A-View	• Find the UE Aortic Arch LAX (0°) view • Position sector depth 6-8 cm, withdraw the probe slightly • Use color Doppler to verify arterial flow	• Atherosclerotic Disease • Aortic Dissection • Extracorporeal Circulation (ECC) • Antegrade Cerebral Perfusion

A-View® ENDOTRACHEAL BALLOON CATHETER

13. UE Innominate Artery LAX A-View®

Structures to identify	To obtain this view	Diagnostic issues
IA: Innominate Artery T: Trachea with A-View	• Find the UE Aortic Arch LAX (0°) view • Position sector depth 6-8 cm, witdraw the probe slightly and turn probe to the right • Use color Doppler to verify arterial flow	• Atherosclerotic Disease • Aortic Dissection • Extracorporeal Circulation (ECC) • Antegrade Cerebral Perfusion • Vascular Devices

A-View®

DeRoyal®
Improving Care. Improving Business.

A-View® ENDOTRACHEAL BALLOON CATHETER

14. UE Left Carotid A-View®

A-View®

Structures to identify	To obtain this view	Diagnostic issues
LCA: Left Carotid Artery T: Trachea with A-View	• Find the UE Aortic Arch LAX (0°) view • Slightly withdraw and rotate the probe to the left • Use color Doppler to verify arterial flow	• Atherosclerotic Disease • Aortic Dissection • Extracorporeal Circulation (ECC) • Antegrade Cerebral Perfusion • Vascular Devices

A-View® ENDOTRACHEAL BALLOON CATHETER

Advanced user guidance

Below suggestions address specific situations. Please consult the "Instructions for Use" for routine application of A-View®.

To verify positioning of the A-View

The optimal position of the A-View® catheter is in the distal trachea and the left main bronchus, although this correlation to the position of the aorta might vary according to patient anatomy. Below image shows the position of A-View® in the trachea and the left main bronchus. (A) Placement into the left main bronchus, (B) TEE view of carina, and (C) placement into the right main bronchus.
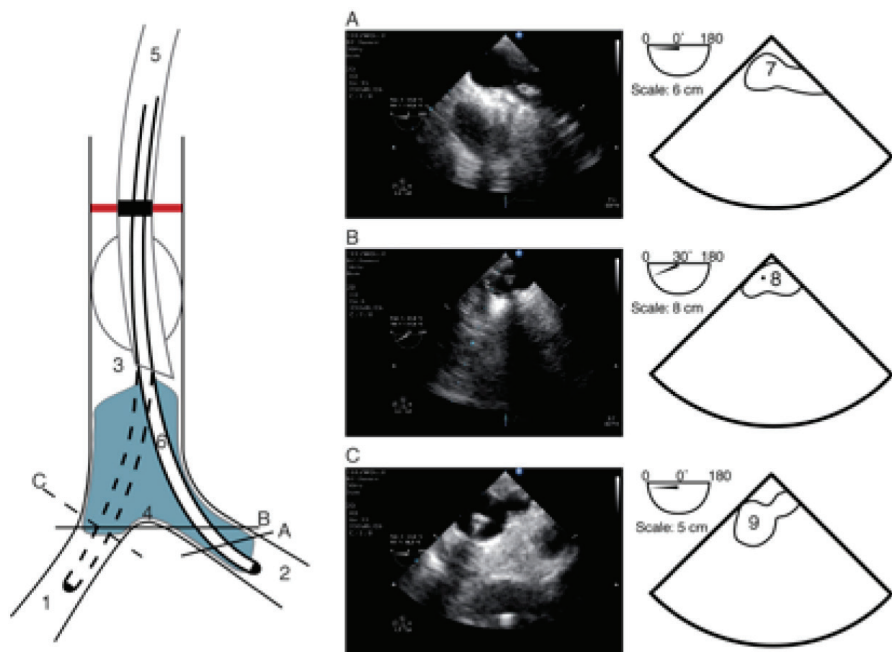
Legend:
1. Right main bronchus
2. Left main bronchus
3. Trachea
4. Carina
5. ET tube
6. A-View®
7. A-View® into the left main bronchus
8. A-View® at the carina
9. A-View® into the right main bronchus

Difficulties to obtain distal ascending aorta views?

Check the following:
1. **Is the A-View® balloon adequately filled?** Obtain an echo view of the trachea, the balloon should be aligned with the trachea wall, without any space in between. Adding additional saline should result in improved views.
2. **Is the ET tube inserted too deep?** In case of a small patient e.g. short trachea, not enough room is left outside the ET tube for the balloon to be correctly positioned / inflated
3. **Is the A-View® located in the right or left main bronchus?**
   a) In short patients, view from the main bronchus is most effective
   b) In tall patients, view through the carina or trachea is suggested
4. **Is the aorta positioning altered?** For example a retracting sling around the aorta or a cross-clamp can impeed TEE effectiveness.

Difficulties to obtain the aortic arch and branch vessels?

For a targeted anatomy, the A-View® balloon and TEE probe must be aligned to obtain effective views. If the TEE probe is sufficiently retracted cranially and still no accurate view can be obtained; the A-View® catheter might be placed too deep. This might be due to a short trachea (e.g. small stature of the patient) or the ET tube being positioned too deep.

To enable the missing views:
1. Empty the A-View® balloon
2. Empty the ET cuff
3. Withdraw the ET tube 2-3 cm
4. Retract the A-View® catheter 2-3 cm, align the 24 cm mark on A-View® and ET tube
5. Refill the A-View® sufficiently
6. Obtain the view: position TEE probe according to the guidelines

A-View®

A-View® ® ENDOTRACHEAL BALLOON CATHETER

A-View®
PROTOCOL

MINIMAL
ADJUSTMENTS

BETTER
OUTCOMES

A-View®
Endotracheal Ballon Catheter

DeRoyal®
Improving Care. Improving Business.®