

The Philips logo is displayed in a white rounded rectangle with a blue gradient at the bottom. The background of the entire top section is a photograph of surgeons in an operating room, wearing blue scrubs and purple surgical caps, looking at a monitor.

IVUS

Low contrast IVUS guided EVAR workflow

Quick reference aortic applications

1 Femoral access

Insert an introducer sheath (min. 8.5F) through percutaneous or open femoral access.

2 Wire placement

Advance a soft .035" guide wire to the area of interest.

3 IVUS catheter preparation

Prepare the Visions PV .035 IVUS catheter by flushing the guide wire lumen, and then wipe down the entire working length with sterile heparinized normal saline.

Connect the catheter to the imaging system's Patient Interface Module (PIM).

4 Advancement of IVUS catheter

Advance the catheter to the distal thoracic aorta or midthoracic vertebra. If desired, a wire exchange to a stiff wire can be made through the IVUS catheter at the Y-connector.

5 Pullback for branch identification and landing zone assessment

Identify major branches based on expected anatomy starting with the celiac artery.

Identify the renal vein and rotate the IVUS image so the renal vein is at 12 o'clock. This can be done using the IVUS adjust image menu. For patients with a renal vein anterior to the renal artery (the majority), this will orient the image so that the 12 o'clock position is anterior.

Record a manual pullback, bookmarking the lowest renal artery, aortic bifurcation, internal iliac artery, and any other areas of interest, such as any thrombus or calcium that may affect your landing zone.

During imaging, mark the fluoro screen or place a needle on the patient's drape to co-register key IVUS and fluoroscopic locations; for example, just below the lowest renal artery or just above the internal iliac artery. The largest part of the radiopaque IVUS transducer corresponds to the image location. To maintain consistency, the image intensifier should be at the angle to be used for stent-graft deployment.

6 Diameter measurements

Measure diameters of proximal neck and common iliac artery proximal to the internal iliac artery. Measure inner-to-inner or outer-to-outer based on the requirements of the stent-graft to be used. Measurements can be done by returning to previously placed bookmarks or can be done in live mode by using the freeze command on the frame you wish to use for measurement.

One advantage of using the recorded pullback is that a staff member can work on the diameters while the operator continues on to the next step. After taking a measurement, annotate the frame and then save the frame for documentation.

7 Length measurements

Length measurements can be acquired using the Visions PV .035 IVUS catheter's radiopaque or inked markers.

Radiopaque

In Step 4, during IVUS imaging, either a needle was placed through the patient's drape or the fluoro screen was marked to correspond to the location just below the lowest renal artery, and this was repeated for other landmarks as needed such as the proximal neck, aortic bifurcation, and internal iliac artery. Now, length measurements can be made by readvancing the centimeter marked IVUS catheter and counting the radiopaque markers. No contrast is needed for these length measurements.

Inked

Identify the lowest renal on IVUS. Pull back the IVUS while maintaining a hold on the catheter at the mark closest to the sheath when the image was at the renals. When visualizing the aortic bifurcation on IVUS, count the marks between the pinched mark and the sheath. Keep the sheath stationary. Repeat to determine length between the bifurcation and the internal iliac artery. No contrast is needed for these length measurements.

8 Stent-graft sizing

Use IVUS measurements to confirm your choice of device size. Follow stent-graft manufacturer instructions for sizing.

9 Main body deployment

Deploy the main body of the stent-graft below lowest renal artery as previously marked, per the manufacturer's instructions for use.

A small dose of diluted contrast can be hand injected to confirm location of graft relative to the renal artery prior to deployment.

10 Contralateral limb deployment

Through the access site on the contralateral side, cannulate the gate with a soft wire. IVUS may be used to confirm diameter and length measurements or the contralateral limb, and to ensure the wire is within the stent-graft before adding the limb. Observing stent-graft material surrounding the IVUS catheter in the IVUS images confirms the wire is in the gate.

Prior to deploying the limb, a hand flush with a small dose of contrast may be done through the sidearm of the introducer sheath to confirm internal iliac artery location.

11 Confirmation of result

IVUS may be used to identify the presence of graft kinking, folding, or abnormal motion that might predispose to luminal narrowing, embolization, type I endoleak, or graft thrombosis.

A completion angiogram may confirm absence of type I endoleak. If results are not satisfactory, post-dilate or add additional stent-graft components as needed. Remove the wire and sheath per standard interventional procedure.

Disclaimer: These workflow instructions are general low contrast procedures for illustrative purposes only and were developed in consultation with Jacques Kpodonu, MD. The inclusion and ordering of steps may vary according to the particular patient presentation, goals of using IVUS in the case, and particular treatment devices used. Please consult stent-graft manufacturers' instructions for use. Philips representatives are not permitted to provide clinical guidance to clinicians.

