Arterial LE/UE Guidance

Understanding the Exam

Arterial LE

An arterial lower extremity exam is performed to evaluate blood flow through the arteries in the leg. A doctor might order an Arterial LE scan for a patient who is experiencing leg pain. The test can indicate the presence of peripheral arterial disease, also known as atherosclerosis.

Typically, an ankle brachial index (ABI) test is performed, comparing the blood pressure in the upper and lower limbs. The ABI determines the ratio of the highest systolic pressure at the arm to the systolic pressure at the ankle. Typically, the patient lies down for about 10 minutes to equalize blood pressure in the arms and legs. Then, the blood pressure is taken in the arm and leg with a Doppler probe. If blood pressure is lower in the ankle than in the arm, that indicates PAD.

The exam typically lasts around 60 minutes.

Arterial UE

An Arterial UE exam is not performed often. It is similar to the Arterial LE exam but focuses on the arms instead of the legs. Also, instead of an ABI test, the Arterial UE exam includes a segmental pressures test.

Performing and Approving Users

		Required Credentials	Common Additional Credentials
Performed by	Vascular Sonographer	One of the following: • RVT (Registered Vascular technologist) • RVS (Registered Vascular Specialist) • RPhS (Registered Phlebology Sonographer)	• Registered Diagnostic Cardiac Sonographer (RDCS): Certified by the American Registry for Diagnostic Medical Sonography (ARDMS) • Registered Cardiac Sonographer (RCS): Certified by Cardiovascular Credentialing International (CCI)

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			• Cardiac-Interventional Radiography RT(CI) • Vascular-Interventional Radiography RT(VI) • Cardiovascular-Interventional Radiography RT(CV)
Read by	Cardiologist	Typically, board certified by the American Board of Internal Medicine (ABIM) or the American College of Cardiology (ACC) in internal medicine and at least one cardiac subspecialty.	RPVI certified by APCA
	Radiologist	ABR (American Board of Radiology) certified radiologists hold certifications in DR (diagnostic radiology) or IR/DR (interventional radiology/diagnostic radiology).	RPVI
	Vascular surgeon	VSB-ASB certified	RPVI

Facility Types

This type of study is performed in these facility types:

- Non-invasive vascular lab, private practice
- Non-invasive vascular lab, hospital-based
- Mobile imaging providers
- Imaging centers
- Office-based lab (OBL)
- Ambulatory surgery center (ASC)
- Office interventional suite (OIS)
- Hospital Cath labs/interventional suites

Worksheet : Arterial LE

Laterality

Selecting bilateral will include findings from both legs in the study. Choosing right or left will only include findings from the respective leg.

Protocol

There are 3 protocols to choose from.

- Duplex
- Graft
- Duplex with Exercise (When this protocol is chosen, the ABI tab will include exercise ABI fields)

Measurements and Observations

Abd Ao Tab

- Can add/remove this tab by selecting the vessel in the Configuration window.
- Techs flag any blatant abnormalities from the scan of the abdominal aorta, including stenosis, peak systolic velocity (PSV), end diastolic velocity (EDV), plaque and waveform at each vessel.
- Additionally, techs can document these same values pre- (proximal) and post- (distal) stenosis where stenosis is observed.
- Techs can also document the distance from the stenosis were the pre- and post- observations were made.

Right and Left Tabs

- Techs record observations from the scans of the left and right legs, including stenosis, peak systolic velocity (PSV), end diastolic velocity (EDV), plaque and waveform at each vessel.
- Additionally, techs can document these same values pre- (proximal) and post- (distal) stenosis where stenosis is observed.
- Techs can also document the distance from the stenosis were the pre- and post- observations were made., and amputation if observed. Documenting amputation disables artery fields that are not applicable and sets the amputation selection on the ABI tab as well.

MyChoice form options

- Indicate which arteries to include, by default, on the worksheet.
- Choose to have observations on plaque and/or waveform in the default configuration.
- Activate a ratio measurement field in the default configuration.
- Waveform trigger: Setting a waveform observation automatically sets all waveforms below. This can be turned off.

ABI Tab

MyChoice form options

- Options for ABI ranges and waveforms are available in a separate MyChoice ABI form.
- Selections made on the ABI form will be applied to ABI, Segmental Pressures, Arterial LE, and Abdominal Aorta worksheets.

Graft Tab

- Only present when Graft is the selected protocol.
- Techs record measurements and interact with the iDiagram to describe the graft.

Interventions Tab

- Can document up to 4 stents, 2 atherectomies, and 2 balloon angioplasties.

Criteria Tab

MyChoice form options

- Option to display criteria table on final report.

iDiagram

- Allows users to identify graft material used
- Present on the Abd Ao, Right, Left, Interventions and Graft tabs.
- Annotations and notes can be made on the diagram and will appear on the report.

MyChoice form options

- Can include/exclude the diagram by default per protocol

Conclusions

MyChoice form options

- Indicate preferred statement for a ratio greater than 2.
- Can generate conclusion statement from Absent Waveform.

Worksheet : Arterial UE

The Arterial UE worksheet is similar to the Arterial LE worksheet, with the following notable differences.

Protocol

There are 2 protocols:

- Duplex
- Graft

Segmental Pressure Tab

The Segmental Pressure tab notes the waveform and blood pressure in each segment of the arm.

MyChoice form options

- Indicate which segmental pressure vessels to include, by default, on the worksheet.

Report

Accreditation

Reports are designed to meet requirements from

- **SVU:** Society for Vascular Ultrasound
- **IAC-vascular:** Intersocietal Accreditation commission
- **ACR:** American College of Radiology

Demo Path

Arterial LE

When training, insert this demo path after you have covered basic worksheet orientation.

The Studycast Arterial LE worksheet provides the ability to document PSV and EDV (velocities), waveforms, stenosis, and plaque observations, ABI results, and interventions.

Additionally, within both the Abdominal Aorta and Right and Left tabs, the worksheet allows the ability to document these same values pre- (proximal) and post- (distal) stenosis, as well as the distance from the stenosis where the pre- and post- observations were made. Demonstrate this feature by clicking on the + Stenosis button. In the Document Pre/Post Stenosis window, choose EIA and click Submit. Note the Prox to Sten and Dist to Sten fields that appear. Note that, to our knowledge, no other solution offers the ability to document pre- and post-stenosis values this way..

Ratios are automatically calculated on all tabs.Demonstrate that findings statements are generated based on these documented items. (Be sure that you have velocity values and waveform selections in multiple vessels.) Generating conclusions pulls down a summary of abnormalities documented in the findings.

Ask if the client performs interventions. If yes, demonstrate the Interventions tab. Note that you can document multiple stents, atherectomies, and balloon angioplasties. Demonstrate that there are two ways to document:

1. Click the intervention button and then click and drag on the diagram to add the intervention to multiple segments. The observations will automatically update to reflect the intervention you added to the diagram.
2. Document the intervention placement in the observation dropdowns. They will appear on the diagram in the respective segments.

Then, you can add the in-stent (or other intervention) velocities and waveforms. Show how this information is reflected in findings.

Choose the Graft protocol and note that a Graft tab appears where you can document information for multiple grafts, including location, type, and the velocity. Demonstrate that this functionality is similar to documenting interventions.

Show how to add annotations. Then open the report and note the that the annotations appear on the diagram. Show the 3 ways you can view the report.

The diagram can be included/excluded from the report by protocol (Graft protocol = default is included, Duplex protocol = default is excluded).

Arterial UE

If demoing the UE worksheet, ask if the client performs segmental pressures test. If yes, demonstrate within the tab.

Just like LE, show how to add annotations. Then open the report and note the that the annotations appear on the diagram. Show the 3 ways you can view the report.

SWOT Analysis

Strengths	Weaknesses
1. Ability to report on all segments of all arteries in the leg. 2. Ability to document pre- and post-stenosis including distance 3. Options to report graft placement and enter Doppler values. 4. Interactive diagram to display placement of grafts and material used. 5. Include ABI in report findings. 6. Areas for reporting vascular interventions and stents. 7. Interactive diagram that includes vascular interventions and stents.	1. Need Aorta in the location drop-down box for Ao-femoral bypass grafts. 2. No graft analysis finding statements generated on the worksheet, other than presence of graft. 3. Drop-down options for waveform include stent and this changes to triphasic once a value is entered in the PSV. IAC required proximal and distal stent values reported when stent is identified. Finding statement for stents simply says stent observed. 4. Reporting for LE interventions is important to vascular surgeons. Not having a complete graft interrogation option could be a disadvantage for SC.
Opportunities	**Threats**
1. Add procedures for graft imaging to procedure box in study quality box. There will be at least 4 options for graft identifiers. 2. Create finding statements specific for LE bypass grafts.	1. As more procedures move to outpatient facilities, labs will look for solutions that offer more robust documentation of interventions.