

Venous Lower Extremity

Understanding the Exam

A venous lower extremity ultrasound exam is designed to assess the veins in the lower extremity, including the external iliac, common femoral, femoral, popliteal, gastrocnemius, posterior tibial, peroneal, greater saphenous and small saphenous veins.

Demo/Training

Looking for a default setting for demonstrating Venous LE, use the sample protocol suggested by IAC for a Venous reflux exam: CFV, SFJ, Prox, mid and distal FV, GSV, Pop, SSV. These are the locations IAC suggests you image in a default protocol, additionally, IAC recommends diameter measurements be included for the SFJ, GSV prox thigh, GSV at knee, AASV and SSV at SPJ – so you might want to add those veins as well.

Venous LE exams are performed to determine if the patient may have a deep vein thrombosis, to assess the patient for reflux and to complete a general assessment of the blood flow in the veins in the leg. Sometimes a Venous LE exam is performed as high as the IVC. This exam requires the technologist to acquire images throughout the leg, acquire measurements of the vein dimensions and measure any reflux. It can take 45 minutes to complete the exam. While exams are performed bilaterally, they are performed unilaterally almost as often.

Demo/Training

Per IAC requirements, when you perform a bilateral lower extremity exam, you should also evaluate the contralateral CFV.

The vascular technologists performing Venous LE exams for a vascular surgeon may be held to a higher standard than those performing the same exam for a primary care physician, for example. Often the expectation is for them to perform a high volume of exams in a single day and provide very detailed documentation in the exam. When presented with the opportunity to train or support these Studycast clients, taking the time to understand

their workflow, and understand how the template can be used to improve efficiency for them can make a significant difference.

Demo/Training

If they are scanning 12-15 patients per day and you can save them 3 minutes per exam, you have really made an impact on their day – and their appreciation of the Studycast system.

Performing and Approving Users

		Required Credentials	Common Additional Credentials
Performed by	Vascular sonographer	will either be credentialed through Cardiovascular Credentialing International or the American Registry for Diagnostic Medical Sonography and will hold certification as RVT (Registered Vascular Technologist), RVS (Registered Vascular Specialist) or RPhS (Registered Phlebology Sonographer).	
Read by		RVPI (Registered Physician in Vascular Interpretation)	

Facility Types

The facilities on this list perform vascular exams and procedures but only those marked with an * are likely to perform Venous LE exams. The rest are likely to perform other imaging such as Xray Angiography using a C-Arm (Angio) or Intravascular ultrasound (IVUS, a.k.a. Venous Intervention).

- Vein Centers*
- 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

A facility that is accredited in vascular technology may be accredited through IAC (Intersocietal Accreditation Commission) or the ACR (American College of Radiology).

Worksheet

Laterality

Selecting Laterality of Right or Left will deactivate all vessels for the other side except for Common Femoral Vein (CFV) which always remains active.

Procedures

Canned text describing the Procedure appears on the report. Studycast has 6 defaults to choose from but we can add custom Procedures for them if needed.

The procedure statement on the report is affected by

- Selecting an item from the procedure dropdown list
- Checking or unchecking the informed consent option
- Indicating a contrast agent was used
- Setting the patient position

The client can add custom procedure statements to this list. If the client wants to do so, be sure they understand how the picklist language fits into the procedure statement. Often vascular labs prefer a detailed procedure statement. Asking about this is very important.

Demo/Training

Additionally, showing them **where** the procedure statement appears on the report can be meaningful.

Configuration

Allows you to select the vessels you want to comment on for the exam. Also allows you to choose the Observation and Measurement columns you want on the worksheet.

Demo/Training

Critical item: It is important to state that if a sonographer is adjusting the configuration on every exam, it is likely not setup correctly for them.

Protocols

For each of the 6 protocols, a client can set the following default items:

- Veins
- Observations
- Measurements
- Custom report title
- Patient position

Demo/Training

The client can select a default protocol, so that the worksheet opens to the protocol used most often at the facility. Additionally, through study type codes, the study type and protocol can be set upon uploading of the exam

IVC/Left/Right tabs

- The worksheet is designed to allow you to document the left and right legs separately and you can also include the IVC if your lab includes IVC assessment in one of your LE exams. By default, IVC is included in two protocols: abdominal venous and illiocaval.
- At the top of each observation column you can set the same observation for all vessels.

MyChoice form options

- There are options available for each Observation list.

Interactive diagram

- The interactive diagram is enabled/disabled per protocol via MyChoices. The checkbox allows this setting to be overridden.
- The client will want to understand how the Competency observation list (which can be changed per protocol, via MyChoices) is linked to the interactive diagram.
- Via MyChoices, the client can choose to display any **one** measurement value on the interactive diagram. The client might value one measurement over another depending on the type of exam (protocol) and type of facility. Also, it is important that the client consider all other options regarding measurements appearing on the report when making this decision.
- The diagram has an optional posterior view. If added, the diagram will include both the anterior and posterior views.

Demo/Training

The Demo site has different report options so you can demonstrate variations for the client. The reflux time will appear in findings. It can also appear if the measurements are selected to appear on the report via MyChoices. Additionally, it can appear on the interactive diagram.

With an understanding of all locations the reflux time and AP and T vein dimensions can appear, what makes the most sense for this client?

(Vein depth and distance from SPJ are options for the one measurement that can appear on the interactive diagram as well.)

Findings

Demo/Training

Ensuring a client understands how to create a “Normal” report for a given study type is critical. When a worksheet is first opened, it will likely be in the normal state and require two clicks:

1. Generate all for findings
2. Generate for conclusions

Ask what percentage of this study type is normal and make the point that for that percentage of exams, the Studycast worksheet is extremely efficient.

- **Normal All** generates a Findings statement indicating *“There is no evidence of deep venous thrombosis in the [right/left] lower extremity.”*
- **Clear All** generates no Findings statement at all

Demo/Training

To illustrate how findings statements are impacted by Normal vs. Blank observation:

1. Set laterality to bilateral
2. On left, clear all observations
3. On right, normal all observations
4. Set Compressibility, Spontaneity, Augmentation and Competency to Absent for the CFV on both left and right
5. Generate all findings

This allows you to point out that if the observation is blank, no statement is generated. If the observation is Normal, a statement is generated to comment on the vein regarding the selected observation.

Which of these options does the client prefer for the Normal state?

- We can set the default Observations for a column/entire grid to blank or Normal by Protocol

Grouping of Finding Statements

There are 4 paragraphs of findings statements generated based on observation selections.

- Compressibility paragraph generates a statement per vessel with an observation selected.

- Thrombosis paragraph generates a statement per vessel with an observation selected.
- Spontaneity, Augmentation and Phasicity paragraph generates a statement per vessel with any observation selected.
- Competency paragraph generates a reflux statement per vessel with an observation selected. The competency paragraph will include the values for reflux time if a value is present in the reflux time field.
- By default, if more than 3 vessels have the same observation, the findings statements will not list each vein but instead will note the finding is present in the “lower extremity.” (can be changed via MyChoices).

MyChoice form options

- Option to print the AP and T measurements in findings statements will result in a 5th paragraph being generated that documents the vein dimensions.
- Options are available with variations in the wording and level of detail in the findings.

Demo/Training

The demo site studies in the VASCULARMED division have a few options implemented that allow you to demonstrate some of the variations.

Conclusions

Three conclusion statements are generated:

- DVT Statement
- Compressibility/Thrombosis, appended with Spontaneity/Augmentation/Phasicity
- Competency

The conclusion statements are either normal or based on the most severe abnormality used to generate the corresponding statement.

- The >3 vessels with the same abnormal Observation logic applies to Conclusions as well. (MyChoices option to list each vessel)

- Conclusion will be generated based on the Compressibility (if abnormal) and most severe Thrombosis.
- Observations for most severe Spontaneity, Phasicity and Augmentation are appended to the end of the Compressibility/Thrombosis statement.

MyChoice form options

- There is a MyChoices option that produces Short Conclusions. This option results in **only** the following conclusion statements being generated:
 - Thrombosis statement – based on most severe thrombosis documented per side (if more than 3 are the same statement will say 'lower extremity' rather than vessel). Sample: *Acute thrombus of the common femoral vein.*
 - Competency statement – Statement generated based on competency observations. Sample: *There is reflux present in the common femoral and profunda veins, consistent with insufficiency.*

Demo/Training

Making a choice about the conclusions can significantly impact the facility because if the interpreting physician is not satisfied with the conclusions, it could result in unnecessary manual entry.

Report

Options available for each Protocol on what sections/information you want to appear on the report.

- Diagram
- Measurements
- Observation Grid

You can choose one measurement to appear next to the vessel on the report diagram.

Demo/Training

The final report is the tangible product of the facilities work. Ensuring the client is happy with the report options is very critical.

SWOT Analysis

Strengths	Weaknesses
<ol style="list-style-type: none"> 1. Custom procedure statements 2. Flexibility to set up template based on lab protocols for up to 6 LE venous exams (6 protocols) 3. Options for observation lists 4. Interactive diagram is data driven and supports annotation and option to print measurements on diagram 5. Findings can be very detailed or more succinct based on client preferences 6. Conclusions summarize abnormalities 7. Reflux times are printed in the findings statements, which is often required for reimbursement 8. Ability to print one of the measurements on the interactive diagram 	<ol style="list-style-type: none"> 1. While the template offers great flexibility, facilities need to use the statements as they are generated to benefit from the efficiency of the template. 2. If a facility has been using handwritten/hand-drawn templates, our worksheet can feel more limited.
Opportunities	Threats
<ol style="list-style-type: none"> 1. Other PACS do not offer configuration options. The flexibility in our worksheet provides for a cleaner template. 2. The flexibility to format the report per protocol is a great advantage. It's important to have samples available to demonstrate this detail. 	