Angiography

Understanding the Exam

An angiogram is an x-ray examination that uses an injection of contrast material to produce images of the major blood vessels. Angiography is used to examine many areas of the body, including the brain, neck, heart, chest, abdomen, pelvis, and the extremities. Angiograms are typically used to diagnose and treat blood vessel conditions. Doctors may order an angiogram for patients who are at risk of heart attack or other heart problems. Findings are commonly used to diagnose arterial blockage, aneurysms, blood clots, and tumors.

Physicians may use angiography to check blood vessels after a surgery.

The exam usually lasts around an hour to an hour and a half.

Exam Workflow

Typically, there are 3-4 medical persons participating in an angiography procedure. The physician's role is to perform the necessary steps to introduce the catheter into the artery for the procedure. There is at least one, sometimes two, interventional radiology (IR) technologists in the room who assist the physician within the sterile field. The nurse is known as either a floater or a circulator. That role is to retrieve supplies, additional instruments, etc., and to document the procedure in its entirety. The Studycast Angiography WS allows the circulator to make all of the clinical notes, including medication administrations, during the procedure and have a preliminary report ready to generate as soon as the procedure is complete. Because the physician can review images and pathology and document findings as soon as the procedure ends, the workflow is efficient with no lag between procedure and finalization of the report.

Example

Patient presents to the IR suite for angiogram to determine if there is significant stenosis of the right lower extremity. Severe stenosis of multiple segments of the femoral artery are noted during the diagnostic run. Physician has circulator document stenotic segments, then removes the diagnostic catheter and inserts the stent catheter. The physician then

5510 Six Forks Road, Suite 200, Raleigh, NC 27609 U.S.A. Phone: 866.209.3393 Fax: 866.332.2719
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feeds the catheter to the affected area and deploys multiple stents. The circulator is responsible for documenting the type of stent used and how many. With no complications, the physician removes the catheter and guide wires and then applies a pressure device to close the wound. This is documented by the circulator. Now the physician goes to the designated reading station to review all images (if they are uploaded). The physician then either dictates the report or, more likely, waits to dictate later. The referring physician is notified, and the next patient is prepped. During a break in cases, the physician will try to get some of his/her dictation done, but more often than not, it waits until the end of the day, or even the next day, for completion.

Terminology

The following terms are often used incorrectly when talking about angiography. Please take care to use them correctly when speaking to clients.

Catheterization is the act of introducing a catheter into the arterial system for diagnostic testing purposes:

Angiogram is an image that is produced by the c-arm when the dye is injected into the arterial system.

Angiography is the actual procedure that is done to interrogate the circulatory system.

Performing and Approving Users

		Required Credentials	Common Additional Credentials
Performed by	Interventional 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 sub specialty.	
	Interventional Radiologist	ABR (American Board of Radiology) certified interventional radiologists hold certifications in IR/DR	

		(interventional radiology/diagnostic radiology).	
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 sub specialty.	

Facility Types

This type of study is performed in these facility types:

- Cardiovascular centers
- Community hospitals
- Outpatient imaging centers
- Office based labs (OBLs)
- University-affiliated teaching hospitals and medical institutions
- Government and private research institutes
- Medical imaging facilities

Worksheet

Protocol

The Studycast Angiography Worksheet includes these protocols:

- Abdominal Ao with Runoffs (Suprarenal)
- Abdominal Ao with Runoffs (Infrarenal)
- Abdominal
- Upper Extremity

Selecting a different protocol activates/deactivates certain sections of the iDiagram so that the vessels active on the iDiagram correspond with the active protocol.

Study Description

The study description appears as the title on the report. If left blank, the selected protocol will appear as the report title. Study descriptions can be saved in the select list and will be visible on future angiography studies in Studycast.

Laterality

Selecting bilateral will activate both sides of the iDiagram. Choosing right or left will only activate the respective side, and the laterality will display in the report header

Measurements and Observations

Procedure Statement

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

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.

Angiography Diagram Tab

- All observations are recorded on the iDiagram.
- Choose from the options to the left of the diagram that represent the observation, then select the segments where you want to apply the selected observation.

Findings

The worksheet has five findings sections, all of which support custom labels. Statements are auto-generated in the sub-section labeled Findings based on observations noted in the Angiography Diagram Tab.

The remaining four findings sections allow the user to build statements based on additional comments and preset favorites. Statements can still be rearranged, deleted by clicking the ‘x’ and added by free typing or dictating. Custom statements can be saved to a protocol-specific pick list for future use.

Demo/Training

Ask the client what sections are on their current angiography reports. Use this information to help them get started building out the additional comments/preset favorites.

*It's even more effective if you ask the client to send a sample of their current angiography reporting **before** the training so you can be better prepared to help the client set everything up to generate the report they want as efficiently as possible.*

Conclusions

Conclusion statements are built based on additional comments and preset favorites. Statements can still be rearranged, deleted by clicking the 'x' and added by free typing or dictating. Additional comments can be saved to a protocol-specific picklist for future use.

Demo/Training

In addition to covering the basic worksheet functionality, be sure to discuss the practical use of preset favorites in this worksheet. It will be important to show the client how to

1. Create a preset favorite with content in the "4 other findings" sections and conclusions, and with the angiography diagram findings section (sub-section labeled Findings) left blank
2. Select the preset favorite to start the worksheet
3. Then make all observation selections in the Angiography Diagram tab
4. Generate findings based on the Angiography Diagram tab

After you have demonstrated worksheet presets, show the technologist how multiple presets can be layered to add indications/procedure codes/diagnosis codes and other fields in that section. Walk through an example to demonstrate the practical use of this functionality.

Wrapping it up

With an understanding of how the user will use our template (based on feedback questions throughout training), walk the technologist or physician through completing one worksheet to recap the parts of the process relevant to them.

Report

Accreditation

Reports are designed to meet requirements from

- **ACR:** American College of Radiology

SWOT Analysis

Strengths	Weaknesses
1. Interactive diagram to show specifics of the angiographic procedure and any interventions that may have occurred during the procedure. 2. Ability to report on multiple procedures on the ipsilateral side of the body. 3. Reporting for both pre and post interventions on the same template. 4. Ability for the reading physician to customize conclusions to their specifications and save for future use. 5. Multi-use template to keep reporting consistent (Multiple protocols on the same template.)	1. Structured reporting not generated in all findings sections
Opportunities	**Threats**
1. Developing a more robust final report to reflect industry standard post-operative notes.	