

CardiacStudy Player in Cardiology — Training Guide

Oct 17, 2026

About this guide

CardiacStudy Player is a Mac viewer for the DICOM studies cardiology runs on: cath angiograms, echo clips, cardiac CT/CTA and MR, ECGs and the reports that come with them. It is best used for **teaching, case review and conference preparation**, not for primary diagnosis.

This guide is for cardiology fellows, cath lab and echo staff, students and the educators who train them. Each section covers one part of a cardiology study and ends with what to watch out for.

Not for clinical use. CardiacStudy Player is not a certified medical device. Read and report from your clinical PACS or cath lab workstation; use CardiacStudy Player to review, teach and present.

It runs on macOS 15 or later (Apple silicon and Intel), needs no internet connection, and opens patient CDs, DICOMDIR folders and loose DICOM files directly.

Getting started

Install once, then open a patient CD or a PACS export folder; the app lists every run in the study within seconds.

Install

- Open **CardiacStudyPlayer.dmg**, drag CardiacStudy Player to Applications, and open it. It is signed and notarized by Apple, so no security warning appears.

Open a study

- **File → Open Study Folder...** (⌘⇧F): pick the CD or a folder. The app uses the disc's DICOMDIR when there is one; a plain folder of .dcm files (a typical CT/CTA PACS export) opens as one study.

- **File → Open DICOM File...** (⌘F): pick a single DICOM file or a DICOMDIR. When you pick a DICOMDIR file, macOS asks once for access to its folder so the images it lists can be read; choose that folder.
- Loading starts at once. The run list appears first; each run's frames decode the first time you select it.
- **File → Eject** unmounts the CD when you are done. Nothing is copied to disk.

Find your way around a study

- The **thumbnail strip** shows every run as a small filmstrip frame: cine runs, single images, CT/MR series, echo clips, ECG strips and reports.
- **Tab / Shift-Tab** steps to the next or previous run; the **Select:** menu above the strip jumps to any run by name. The keys work as soon as the app or a study opens.
- The info column shows patient name, ID, date of birth, study date and time, and for angiograms the **gantry angles** (LAO/RAO · CRA/CAU).
- Tick **Console** (or **View → Console**) to see one line per run, including how many frames or pages each holds. Text in the Input and Console boxes can be selected and copied but not edited.

Reviewing coronary angiograms

A cine run starts playing at its acquired frame rate the first time you select it; stop it and step frame by frame through the injection to judge a lesion. Each run keeps its own speed, window level, zoom and enhancement, so you can move between views without resetting anything.

Playback

Key	While playing	While stopped
Space	Stop	Play
→ / ←	Play forward / in reverse	Step one frame forward / back
↑ / ↓	Faster / slower by 1 fps	Faster / slower by 1 fps

- The run opens at its **source frame rate** (typically 7.5–30 fps on cath systems). Variable frame timing recorded in the file is reproduced.
- **Reset** returns to the source rate. Once you change the speed on one run, runs you have not adjusted adopt it.

- **Start** and **End** trim playback to the frames you care about, for example the filling phase of a single injection. Export then covers only that span.

Image quality

- **Width / Level** sliders adjust contrast and brightness from the raw pixel data. **Reset** beside them restores the file's own setting; the **Preset** menu offers any windows stored in the file.
- **Edge enhancement** (0.0–1.0) sharpens vessel borders. Start around 0.3; high values exaggerate noise and can make a smooth narrowing look irregular.
- Overlays and collimator shutters stored in the file are shown as the cath lab displayed them.

Zoom and roam

- Drag, or swipe with two fingers, to roam. Pinch, or ⌘ + scroll, to zoom at the cursor; ⌘-drag a box to zoom straight to a lesion.
- **View → Actual Size** (⌘0) shows the frame pixel for pixel; **View → Fit to Window** (⌘9) shows all of it. Double-click toggles between them. Tick **Force actual** to open every run at Actual Size.
- Zoom stays on while the run plays, so you can watch one segment through the whole cardiac cycle.

Reading projections

- The info column shows each run's gantry angle, for example **LAO 45 · CAU 25**. Use it to name the view (spider, RAO caudal, LAO cranial) and to check that a lesion has been seen in at least two orthogonal projections.
- Tab through the runs in order to follow the operator's sequence: left system views first, then right, then any ventriculogram.

DSA subtraction

Subtraction removes bone and soft tissue so only the contrast-filled vessel remains. In cardiology it helps most where the heart does not move: peripheral and renal runs, grafts and access vessels. On coronary runs, cardiac motion leaves ghosting, so use it for teaching how subtraction works rather than for reading the coronaries.

1. If the file already names a mask frame, the run opens subtracted and **View → Subtracted (DSA)** just toggles it.

2. Otherwise, step to a frame **before contrast arrives** and choose **View → Use Current Frame as DSA Mask**. The run switches to the subtracted view.
3. If the patient moved, bright and dark edges appear around bone. Hold **Option** and press the arrow keys to slide the mask one pixel at a time; add **Shift** for 0.1-pixel steps. **View → Nudge DSA Mask → Reset Shift** undoes it.
4. Choose a different frame the same way to re-mask, or **View → Remove DSA Mask** to go back to the native image.

Window level re-centres for the subtracted image. Export and Copy take whichever view is on screen.

Measuring

The caliper gives a distance in millimetres. On angiograms, calibrate on the catheter first; the automatic scale is only an estimate. Treat every measurement as a teaching approximation, not a QCA result.

Caliper Tool (View → Caliper Tool)

- Click one edge, then the other. The line is labelled in mm; a third click starts a new measurement. Zoom in first for precise placement.
- Drags still zoom and roam, so you can move around between clicks.

Where the scale comes from

Run type	Scale	How far to trust it
Angiogram, calibrated on catheter	Your catheter calibration	Best available; still subject to foreshortening
Angiogram, not calibrated	Estimate from detector size and geometry, shown as ~N mm	Assumes the vessel is at isocentre; wrong when it is not
Echo	Ultrasound region calibration stored in the file	Good for 2D distances in that region
CT / MR	Pixel spacing in the file	Good in-plane

Calibrate on the catheter (View → Calibrate Caliper..., with the Caliper Tool on)

1. Zoom in on a straight segment of catheter, near the lesion's depth.

2. Measure across the shaft and choose its French size (for example 6 F = 2.0 mm), or enter a custom length.
3. The calibration overrides the estimate for that run and is remembered.

Good uses: reference vessel diameter, lesion length, stent sizing exercises, LV and aortic dimensions on echo. Do not use it for percent-stenosis decisions on real patients; there is no edge detection or QCA.

ROI (export boundary)

An ROI does not measure anything. It trims what leaves the app, so burned-in patient details at the image edge are cut from exports and copies. To read a run without the dimming, press ⌘R (View → Hide ROI); its exports still keep the ROI. See **Patient privacy**.

Other cardiac data in a study

One disc often holds far more than the cine runs. CardiacStudy Player shows all of it in the same strip, so a case can be reviewed end to end in one window.

Data	How it appears	How you move through it	Cardiology use
Echo clips (US)	Cine runs at native size and shape, no black bars	Same playback keys as angiograms	Review LV function, valves and effusions alongside the cath
Cardiac CT / CTA	One run per series, slices in anatomical order	← / → or the slider, one slice at a time (no cine)	Coronary CTA before or after a cath; W/L Preset menu when the file has several windows
Multi-phase CTA	One run per cardiac phase, labelled e.g. "75% · 0.625 mm"	← / → per slice; Tab between phases	Compare a diastolic and a systolic reconstruction
Cardiac MR	One run per series; multi-echo series split per echo	← / → per slice	Anatomy and function stacks

Data	How it appears	How you move through it	Cardiology use
ECG and hemodynamic waveforms	Calibrated lead strips on an ECG-paper grid	← / → page by page	Rhythm and pressure tracings recorded with the case
Structured reports (cath, QCA, hemodynamics)	Read-only pages of the report's contents	← / → page by page	Compare your reading with the official one
PDF reports (dose, procedure summary)	Rendered pages	← / → page by page	Dose and procedure details
Presentation states	The image with the saved window, crop and markup applied	← / → page by page	See what another reader annotated; the plain image stays available beside it
3D renderings (volume, MIP)	Colour still images, one run per series	Tab between views	Show coronary anatomy in context for teaching

Reports, waveforms and presentation states can be zoomed and copied, but they do not play and are never exported as movies. To also open a PDF report in Preview, tick that option in **CardiacStudy Player → Settings....** 4D beating-heart CT (phases played as a cine) is not supported yet.

Teaching workflows

Three features turn a disc into teaching material: Quiz Mode for reading cold, Copy for still frames, and QuickTime export for cine loops in a talk.

Quiz Mode: read the case before seeing the answer (View → Quiz Mode)

1. Turn on Quiz Mode. The study's own reports and annotated views are hidden, and a Quiz panel opens with **Cath**, **Echo** and **Vascular** tabs.
2. Review the runs and fill in one finding at a time, for example vessel, segment, severity. **Use caliper** fills a numeric field from your last caliper measurement.
3. Press **Add Finding** after each one. Most cases have several.
4. Press **Reveal Report** to compare your findings with the official report; **Hide Report** puts it away again.

5. **Save Findings...** writes your findings and notes to a JSON file (it suggests a Students folder) that a supervisor can review. Switching studies, leaving Quiz Mode or quitting with unsaved findings asks you to save first.

Educators can tailor the form: **Edit Template...** saves a template built from the study's own report fields, so later cases from the same cath lab system use the same form. **Revert to Built-in** removes it.

Still frames for slides (Edit → Copy, ⌘C)

- Stop on the frame with the best opacification, zoom to the lesion, and press ⌘C. Paste straight into Keynote, PowerPoint or an email.
- Copy takes what is inside the frame outline, with your zoom, window level and enhancement applied. With Hide ROI on (⌘R), it takes the Review pane exactly as displayed instead.

Cine loops for a talk (File → Export QuickTime)

- **Current Run...** saves the run on screen as a .mov; **All Runs...** and **Only Multiframe Runs...** save the whole study to a folder.
- The movie matches the screen: window level, zoom, enhancement, DSA view and Start/End trim all carry over. Tick **Export full frame (ignore zoom and pan)** to ignore zoom.
- Set a slower frame rate in the export dialog to let an audience follow a fast injection.
- In **CardiacStudy Player** → **Settings...** (⌘,), tick **Name exported movies by run number** so file names (01.mov, 02.mov...) cannot carry patient identifiers.

Patient privacy

Cardiology discs carry real patient identifiers, often burned into the image itself.

CardiacStudy Player does not de-identify DICOM files; it only lets you keep identifiers out of what you copy and export.

- **Where identifiers hide:** the info column (name, ID, date of birth), text burned into the edges of cath and echo frames, report and PDF pages, ECG headers, and source file names.
- **Trim burned-in text with an ROI.** Hold **Shift** over the image and drag a side of the frame outline inward. The excluded band dims on screen and is cut from every copy and export. Shift-click removes it. **Edit → Apply ROI to All Runs** copies it to every run; **Edit**

→ **Remove All ROIs** clears them. Hide ROI (⌘R) is the exception: it makes ⌘C copy the whole visible image of that run, burned-in text included, so switch back with ⌘R before copying for a talk. Exports always keep the ROI.

- **Name movies by run number** (see Teaching workflows), not by source file name.
- **Do not screenshot the whole window** for slides: the info column shows the patient's name. Use ⌘C instead.
- **Check every exported frame** before it goes into a talk. Echo frames in particular carry name and date in the header bar.
- **Use de-identified studies for teaching sets** wherever possible, and follow your institution's rules for using patient images in education.

Suggested training exercises

A 60-minute session covers the core skills with one de-identified diagnostic cath study, ideally one that also has an echo or a report.

#	Exercise	Skills practised	Time
1	Open the disc and name every run's projection from its gantry angles	Opening studies, Tab/Select, reading LAO/RAO · CRA/CAU	10 min
2	Find the culprit lesion and show it in two orthogonal views at Actual Size	Playback, frame stepping, zoom and roam	10 min
3	Optimise one run: window level, edge enhancement, Start/End trim to one injection	Image quality controls	5 min
4	Calibrate on the catheter, then measure reference diameter and lesion length; compare with the uncalibrated ~mm estimate	Caliper, Calibrate Caliper	10 min
5	Read the case in Quiz Mode, add findings, then Reveal Report and discuss differences	Quiz Mode, structured reports	15 min
6	Build a two-slide case summary: one copied still and one exported loop, with burned-in text trimmed	Copy, QuickTime export, ROI, privacy	10 min

For a peripheral or renal case, add a DSA exercise: mask before contrast, then fix motion ghosting with Option-arrow shifts.

Quick reference

Help → Keyboard Shortcuts... in the app lists every binding.

Action	Keys	Where
Open study folder or CD	⌘ ↑ F	File menu
Open DICOM file or DICOMDIR	⌘ F	File menu
Next / previous run	Tab / Shift-Tab	Thumbnail strip
Play / stop	Space	Review
Step frame, slice or page	← / → (stopped)	Review
Play reverse / forward	← / → (playing)	Review
Faster / slower	↑ / ↓	Review
Actual Size / Fit to Window	⌘ 0 / ⌘ 9, or double-click	View menu
Zoom in / out	⌘ + / ⌘ –, pinch, or ⌘ + scroll	View menu
Zoom to a box	⌘-drag	Review
Roam	Drag, or two-finger swipe	Review
Set or clear ROI	Shift-drag a side / Shift-click	Review
Hide / show ROI (this run)	⌘ R	View menu
Copy frame	⌘ C	Edit menu
Nudge DSA mask	Option-arrows (add Shift for 0.1 px)	View → Nudge DSA Mask
Caliper, Calibrate Caliper, Quiz Mode	—	View menu
Export movie	—	File → Export QuickTime

Action	Keys	Where
Settings	⌘,	CardiacStudy Player menu

Questions or problems: see williamshillsoftware.com/cardiacstudy-player, email support@williamshillsoftware.com, or use the link in **About CardiacStudy Player**.