

DEVELOPMENT OF A NOVEL ONLINE ATLAS OF CARDIAC MRI ANATOMY

Douglas Pierce MD, MS; Cary Squires MD; Stephane L. Desouches DO; Christopher Bennett MD; Antonio Sosa-Lozano MD
 Department of Radiology, Section of Cardiothoracic imaging, Medical College of Wisconsin Affiliated Hospitals. Milwaukee, WI

BACKGROUND AND RATIONALE

Cardiac magnetic resonance (CMR) is increasingly used in clinical practice. Radiology trainees encountering CMR must learn to interpret challenging anatomy in unfamiliar projections. However, unlike other modalities and body parts, there is no freely accessible and comprehensive atlas of CMR anatomy on the internet.

Seeing this need, we have developed and implemented a novel CMR web atlas. Our aim is to facilitate radiology residents' identification of anatomical structures in orthogonal projections and accelerate the process of learning to discern normal and abnormal structures.

MATERIALS AND METHODS

- CMR images in axial and orthogonal views were acquired from healthy normal subjects.
- Images were deidentified, exported from PACS as .jpeg files, and labelled.
- A simple HTML interface was designed linking each image or series of images to a central homepage (Figures 1).
- A permanent URL was made available to radiology and cardiology trainees at our institution.

RESULTS

Accessible at a single permanent URL, the atlas comprises 106 unique HTML pages. Single images in 2 chamber, 3 chamber, 4 chamber, and left ventricular outflow tract projections are presented, as well as image stacks in the short axis, axial, aortic root, and aortic arch projections. Localizer images provide reference lines on each page. Labels can be hidden or toggled between cardiac and extracardiac structures.

The atlas has been well-received among faculty and trainees, and initial feedback from both has been positive.

DISCUSSION

This represents the initial pilot effort demonstrating the need for a CMR atlas and the feasibility of its creation. It was developed to address a known gap in the accepted standard of diagnostic radiology CMR training curricula. Large scale distribution with a single URL is easy and practical.

Our hope is that this atlas will enhance the resident and fellow training experience in ways previously unaddressed. Future survey work involves quantifying the utility of the atlas with pre- and post-atlas anatomy quizzes and self-evaluations.

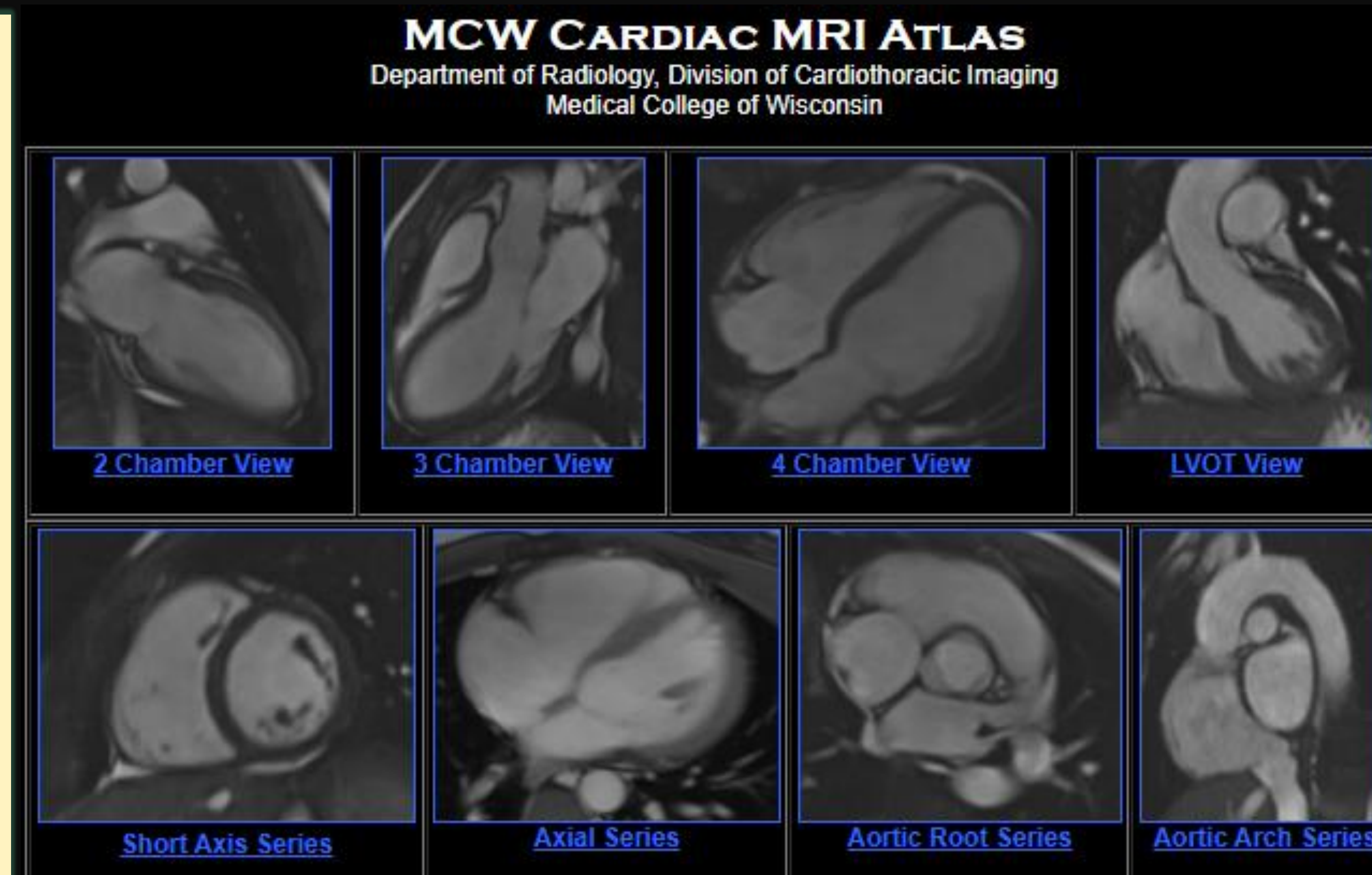


Fig 1 – Main homepage with links to the various images and series.

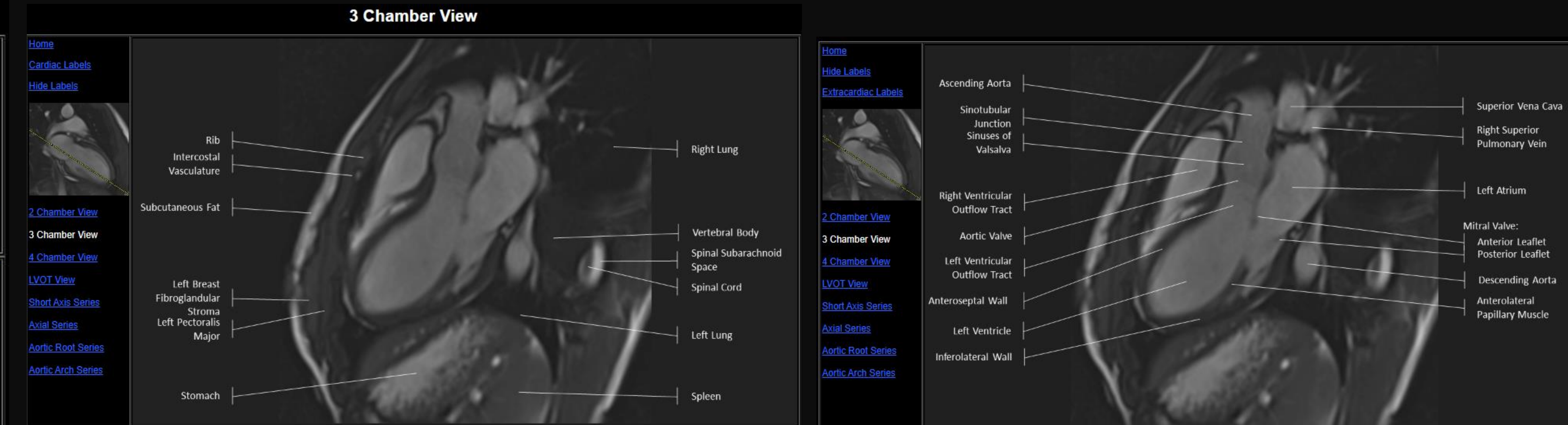


Fig 2 – Sample pages of the 3-chamber view with extracardiac (left) and cardiac (right) labels applied. Labels are toggled on and off via links along the upper left side of the page. Links along the lower left side communicate with other images and series in the atlas. A localizer image shows the level of 3-chamber section in the 2-chamber projection.

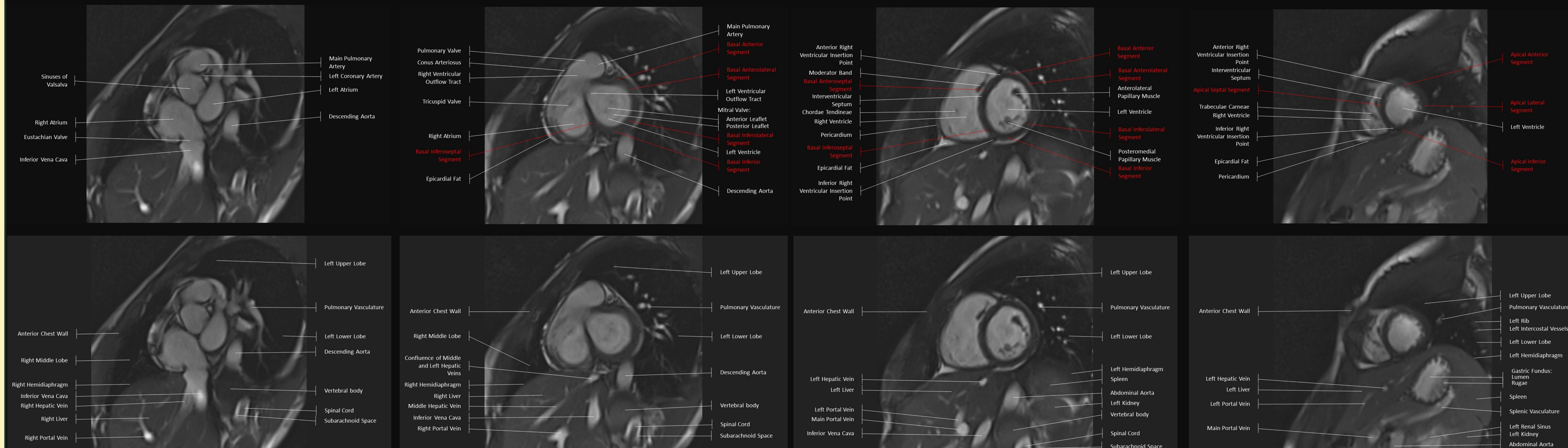


Fig 3 – Sample pages from the short axis series. Cardiac (top row) and extracardiac (bottom row) structures are labeled. Image series were constructed such that a user could easily scroll by clicking through them. A true axial series, an aortic root series, and an aortic arch series were also included in the atlas.

Access to the MCW Cardiac MRI Atlas is free and available at this QR code or by e-mailing the primary author, Douglas Pierce MD, at dcpierce@mcw.edu.

