Can cardiac output be measured from a pulmonary CT circulation time series?
S Yee, E Scalzetti, K Ogden, SUNY Upstate Medical University, Syracuse, NY

Reference:

A. CT image and analysis

B. The delayed time series determined by fitting and measured time series at ascending aorta (AA) and descending aorta (DA)

C. The delayed time series of AA and the measured time series of DA for subject 2

Fig A: superior vena cava (SVC), ascending aorta (AA), descending aorta (DA) and pulmonary artery (PA) are shown in the image. Circular ROI was drawn to measure the area and the radius of the AA and DA. The distance between the AA and DA was also measured to estimate the volume of aortic arch. Fig B: The dotted line is the fitted curve to closely match the measured DA time series while convolving the AA time series with the varying degree of exponential delay curve. The curve fitting produced the estimated delay constant of 2.68 sec. Fig C: The time series curves, one for DA and the other for fitted delayed AA, from another subject. They show the fitting to estimate the delay time works well.

The geometrical info measured in this study (in the order of subject 1 and 2)
The diameters of ascending aorta: 2.98 and 2.91 cm, the diameters of descending aorta: 1.90 and 2.56 cm, the distances between cross sections of AA and DA: 8.75 and 6.45 cm.