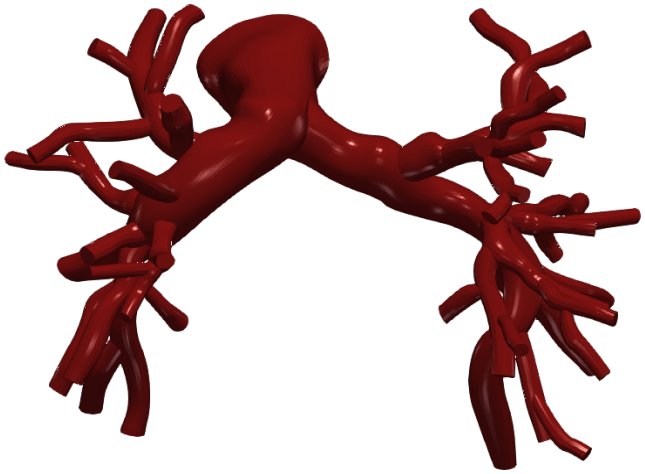
Vascular Model Repository Specifications Document



SU0248

Species	Human
Anatomy	Pulmonary
Disease	Healthy
Procedure	-

Clinical Significance and Background

Pulmonary

The pulmonary circulation involves blood flowing from the right ventricle of the heart into the pulmonary arteries. From the pulmonary arteries, the blood then reaches the lungs, performs a gas exchange, and then continues to the pulmonary veins which then lead to the left atrium of the heart.

By definition, an artery is a blood vessel that carries blood away from the heart. This usually means arteries carry oxygenated blood to the rest of the body, but since the pulmonary arteries are transporting blood from the right side of the heart to the lungs to perform respiration, that makes the pulmonary arteries the only arteries in the body that actually carry deoxygenated blood. Similarly, the pulmonary veins, which carry blood that has been freshly oxygenated from the lungs back to the heart, are the only veins that actually carry oxygenated blood.

Clinical Data

General Patient Data

Age (yrs)	9
Sex	Male

Specific Patient Data

Weight (kg)	31
Height (cm)	134
Qp (L/min)	4.59
RVEDV (ml)	109
RVESV (ml)	47

Notes

See DOI:1 and DOI:2 for more details. See below for information on the image data and boundary conditions associated with the model.

Image Modality: MRA, 4DMRI

Image Type: DICOM

Image Source: Lucille Packard Children's Hospital

Publications

See the following publications which include the featured model for more details:

Yang, W., Dong, M., Rabinovitch, M., Chan, F. P., Marsden, A. L., & Feinstein, J. A. (2019). Evolution of hemodynamic forces in the pulmonary tree with progressively worsening pulmonary arterial hypertension in pediatric patients. Biomechanics and modeling in mechanobiology, 18(3), 779-796. http://www.doi.org/10.1007/s10237-018-01114-0

Dong, M., Yang, W., Tamaresis, J. S., Chan, F. P., Zucker, E. J., Kumar, S., ... & Feinstein, J. A. (2020). Integrative Cardiovascular Physiology and Pathophysiology: Image-based scaling laws for somatic growth and pulmonary artery morphometry from infancy to adulthood. American Journal of Physiology-Heart and Circulatory Physiology, 319(2), H432. http://www.doi.org/10.1152/ajpheart.00123.2020

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