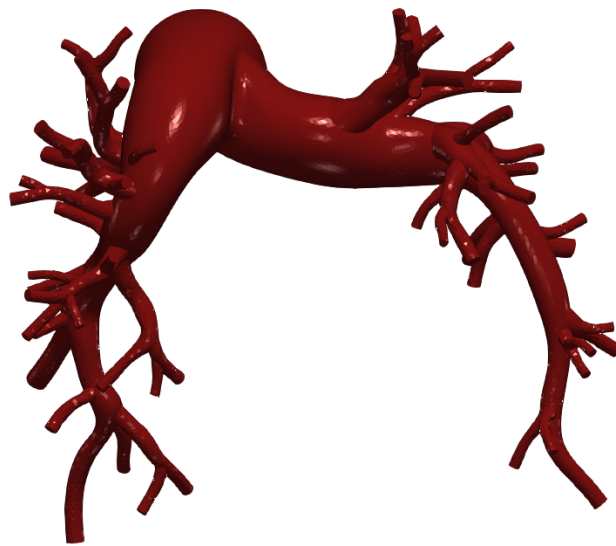


# Vascular Model Repository

## Specifications Document



0088\_1001

<b>Species</b>	Human
<b>Anatomy</b>	Pulmonary
<b>Disease</b>	Pulmonary Arterial Hypertension
<b>Procedure</b>	-

# Clinical Significance and Background

## Pulmonary

The pulmonary arteries are blood vessels that carry systemic venous blood returning to the right side of the heart through to the microcirculation of the lungs. Unlike in other organs where arteries supply oxygenated blood, the blood carried by the pulmonary arteries is deoxygenated, as it is venous blood returning to the heart. The main pulmonary arteries emerge from the right side of the heart, and then split into smaller arteries that progressively divide and become arterioles, eventually narrowing into the capillary microcirculation of the lungs where gas exchange occurs.

## Pulmonary Arterial Hypertension

Pulmonary hypertension is a type of high blood pressure that affects the arteries in the lungs and the right side of the heart. In one form of pulmonary hypertension, called pulmonary arterial hypertension (PAH), blood vessels in the lungs are narrowed, blocked or destroyed. The damage slows blood flow through the lungs, and blood pressure in the lung arteries rises. The heart must work harder to pump blood through the lungs. The extra effort eventually causes the heart muscle to become weak and fail. Changes in the cells that line the pulmonary arteries can cause the walls of the arteries to become stiff, swollen and thick. These changes may slow down or block blood flow through the lungs, causing pulmonary hypertension.

# Clinical Data

## General Patient Data

Age (yrs)	19
Sex	Female

## Specific Patient Data

BSA (m <sup>2</sup> )	1.58
P pulm SP cath	95
P pulm DP cath	45
P pulm MP cath	67

# Notes

See below for information on the image data and boundary conditions associated with the model.

**Image Modality:** MR

**Image Type:** DICOM

**Image Source:** TLAB

**Image Manufacturer:** GE MEDICAL SYSTEMS

**Boundary Conditions:** Refer to boundary conditions in the SimVascular file.

## Publications

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

Tang, B. T., Pickard, S. S., Chan, F. P., Tsao, P. S., Taylor, C. A., & Feinstein, J. A. (2012). Wall shear stress is decreased in the pulmonary arteries of patients with pulmonary arterial hypertension: an image-based, computational fluid dynamics study. *Pulmonary circulation*, 2(4), 470-476.  
<https://www.doi.org/10.4103/2045-8932.105035>

# License

Copyright (c) Stanford University, the Regents of the University of California, Open Source Medical Software Corporation, and other parties.

All Rights Reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this data to use the data for research and development purposes subject to the following conditions:

The above copyright notice and the README-COPYRIGHT file shall be included in all copies of any portion of this data. Whenever reasonable and possible in publications and presentations when this data is used in whole or part, please include an acknowledgement similar to the following:

"The data used herein was provided in whole or in part with Federal funds from the National Library of Medicine under Grant No. R01LM013120, and the National Heart, Lung, and Blood Institute, National Institutes of Health, Department of Health and Human Services, under Contract No. HHSN268201100035C"

AND/OR

N.M. Wilson, A.K. Ortiz, and A.B. Johnson, "The Vascular Model Repository: A Public Resource of Medical Imaging Data and Blood Flow Simulation Results," J. Med. Devices 7(4), 040923 (Dec 05, 2013) doi:10.1115/1.4025983.

AND/OR

Reference the official website for this data: [www.vascularmodel.com](http://www.vascularmodel.com)

THE DATA IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE DATA OR THE USE OR OTHER DEALINGS IN THE DATA.