

# Vascular Model Repository

## Specifications Document



0189\_0001

<b>Species</b>	Human
<b>Anatomy</b>	Coronary
<b>Disease</b>	Coronary Heart Disease
<b>Procedure</b>	Coronary Artery Bypass Graft

# Clinical Significance and Background

## Coronary

Coronary arteries supply blood to the heart muscle. Like all other tissues in the body, the heart muscle needs oxygen-rich blood to function. Also, oxygen-depleted blood must be carried away. The coronary arteries wrap around the outside of the heart. Small branches dive into the heart muscle to bring it blood. The two main coronary arteries are the left main and right coronary arteries.

The left main coronary artery (LCMA) supplies blood to the left side of the heart muscle (the left ventricle and left atrium). The left main coronary then divides into branches: The left anterior descending artery which supplies blood to the front of the left side of the heart and the circumflex artery which encircles the heart muscle supplies blood to the outer side and back of the heart.

The right coronary artery (RCA) supplies blood to the right ventricle, the right atrium, and the SA (sinoatrial) and AV (atrioventricular) nodes, which regulate the heart rhythm. The right coronary artery divides into smaller branches, including the right posterior descending artery and the acute marginal artery. Together with the left anterior descending artery, the right coronary artery helps supply blood to the middle or septum of the heart.

## Coronary Heart Disease

Coronary heart disease is a type of heart disease where the arteries of the heart cannot deliver enough oxygen-rich blood to the heart. The cause of coronary heart disease depends on the type. Coronary artery disease is often caused by cholesterol, a waxy substance that builds up inside the lining of the coronary arteries forming plaque. This buildup can partially or totally block blood flow in the large arteries of the heart.

## Coronary Artery Bypass Graft

Coronary artery bypass graft surgery (CABG) is a procedure used to treat coronary artery disease. One way to treat the blocked or narrowed arteries is to bypass the blocked portion of the coronary artery with a piece of a healthy blood vessel from elsewhere in your body. Blood vessels, or grafts, used for the bypass procedure may be pieces of a vein from your leg or an artery in your chest. An artery from your wrist

may also be used. Your doctor attaches one end of the graft above the blockage and the other end below the blockage. Blood bypasses the blockage by going through the new graft to reach the heart muscle.

## Clinical Data

### General Patient Data

Age (yrs)	72
Sex	Female

### Specific Patient Data

Heart Rate (beats/min)	46
Stroke Volume (mL)	80

## Notes

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

**Image Modality:** CT

**Image Type:** DICOM

**Image Source:** UCSD

**Image Manufacturer:** GE MEDICAL SYSTEMS

## Publications

There are no publications associated with the featured model.

# 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.