

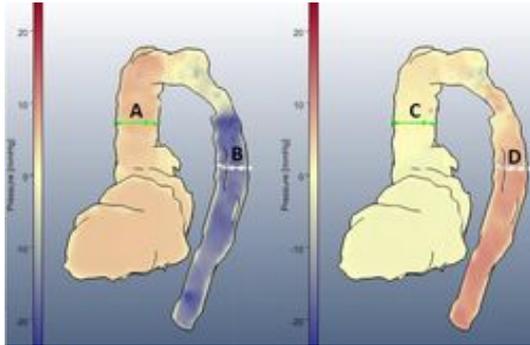
## Technology Offer

# Non-invasive cardiac pressure determination

Reference Number 32-00052

### Challenge

A quick and reliable method for non-invasive measuring of pressures and pressure gradients in the aorta is of importance for a variety of clinical use cases. For example, in coarctation of the aorta clinical guidelines recommend to commence treatment in the presence of a relevant pressure gradient. All currently available methods, however, have limited accuracy.



*Locations A and B represent the regions of interest (ROIs) in the ascending and descending aorta, respectively. C and D are the ROIs in the exact same location as A and B, but in a different time step. The net flow is maximum in points A and D. The color scale shows the approximate pressure value in each location.*

### Technology

The innovative method for non-invasively determining an absolute pressure difference in a cardiovascular vessel uses imaging data, e. g. derived from a 4D-VENC MRI sequence. The analysis therefore is based on high resolution three-dimensional anatomical and three-directional blood flow velocities ( $v_x$ ,  $v_y$ ,  $v_z$ ) data over the cardiac cycle from a proximal vessel portion, a distal vessel portion, and a vessel narrowing located in between. Thereby, the method allocates a preliminary relative pressure value to the first position (ascending aorta) and combines this value with time dependent velocity data to determine the pressure value in the second position (descending aorta). The difference of these two relative pressure values non-invasively results in an accurate time corrected absolute pressure difference across the CoA during a cardiac cycle.

### Commercial Opportunity

The patent protected technology is available for in-licensing. Further clinical validation can be realized in cooperation with an experienced university clinic in Germany.

### Development Status

The technology is clinically evaluated based on 20 patient data sets.

### Patent Situation

A priority claiming European patent application has been filed in September 2017, followed by a PCT application in 2018.