ABSOLUTE PERFUSION RESERVE (T-020127)
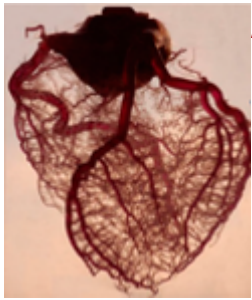
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T-020127

## Noninvasive Cardiovascular Imaging to Detect Coronary Microvascular Dysfunction

Ask
Experimental de-risking strategy Regulatory advice

Background: Fractional flow reserve (FFR) is the current gold standard for grading coronary artery stenoses; however, more recent studies have demonstrated no significant improvement in primary patient outcomes when using FFR while treating the blockages in a coronary artery. Microvascular disease is a likely confounding factor in FFR assessment limitations.
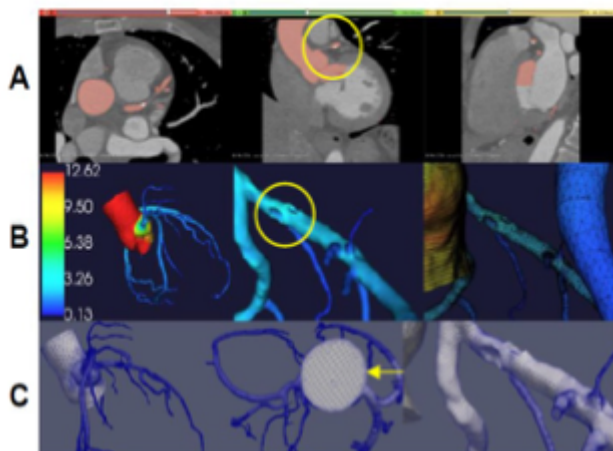
Workflow for semi-automated coronary 3D model generation

(A) Coronary segmentation using a 3D Slicer, (B) Surface mesh generation and postprocessing with color coding corresponding to vessel radius (in mm), and (C) 3D coronary mesh generation

Technology: To overcome the limitations of FFR, the inventors developed absolute perfusion reserve

(APR), which addresses the fundamental limitations of FFR by leveraging complementary information provided by heart imaging tests along with physiological-based computational fluid dynamics to directly account for patient variability in microvascular function, avoiding the simplified assumptions of FFR.

APR provides a **patient-specific, superior basis for decisions on invasive coronary therapy** compared to FFR, enabling accurate prediction in all patients of perfusion response to invasive coronary artery therapy.

Value Proposition: This innovative system serves as a diagnostic tool for coronary artery disease, enabling precise treatment selection by leveraging a multi-scale perfusion model of the cardiovascular system.

Key Benefits:

- Patient-specific quantification of microvascular disease severity and relative contribution of large versus small vessel disease to ischemia
- Accurate prediction of therapy response in patients with microvascular disease

Patent status: PCT Pub. No. WO2023/215758

Development Stage: *In vivo* rodent imaging