

# MRI-BASED MULTIPARAMETRIC CARDIAC STRAIN ANALYSIS OF MYOCARDIAL VIABILITY

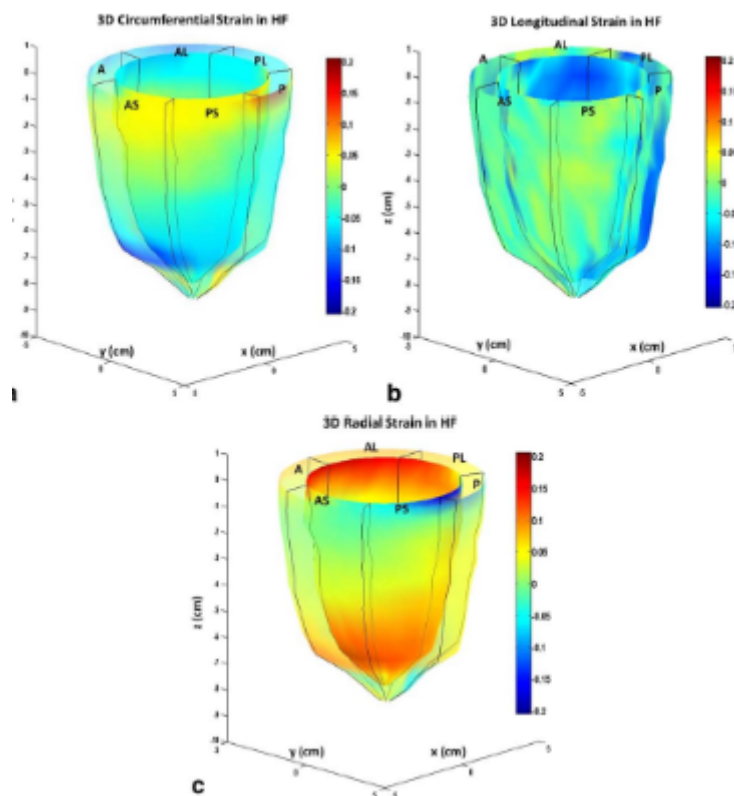
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T-006692

**Background:** Assessing left ventricle (LV) cardiac contractile function is a good indicator of overall heart health and is used to determine which patients are good candidates for revascularization surgery. With over 3 million new coronary artery disease patients annually and over 1 million annual revascularization surgeries in the US, there is need for an improved, non-invasive technique to quantitatively assess LV contractile function.

**Technology Description:** A team led by Dr. Michael Pasque has developed cardiac MRI-based multiparametric strain analysis techniques to provide quantitative assessments of LV contractile function. The patented techniques and Normal Human Strain Database may be used as a screening mechanism to non-invasively assess heart function or to assess cardiac tissue viability to inform revascularization surgeries.



## Key Advantages:

- Uses **non-invasive** MRI imaging to assess heart function
- Provides an **objective, quantitative** measure of LV contractile function
- Provides **localized information**

## Publications:

- Henn, M. C., Cupps, B. P., Kar, J., Kulshrestha, K., Koerner, D., Braverman, A. C., & Pasque, M. K. (2015). [Quantifying “normalized” regional left ventricular contractile function in ischemic coronary artery disease](#). *The Journal of thoracic and cardiovascular surgery*, 150(1), 240-246.
- Kar, J., Knutsen, A. K., Cupps, B. P., Zhong, X., & Pasque, M. K. (2015). [Three-dimensional regional strain computation method with displacement encoding with stimulated echoes \(DENSE\) in non-ischemic, non-valvular dilated cardiomyopathy patients and healthy subjects validated by tagged MRI](#). *Journal of Magnetic Resonance Imaging*, 41(2), 386-396.
- Cupps, B. P., Taggar, A. K., Reynolds, L. M., Lawton, J. S., & Pasque, M. K. (2010). [Regional myocardial contractile function: multiparametric strain mapping](#). *Interactive cardiovascular and thoracic surgery*, 10(6), 953-957.
- Henn, M. C., Lawrance, C. P., Kar, J., Cupps, B. P., Kulshrestha, K., Koerner, D., ... & Pasque, M. K. (2015). [Dilated cardiomyopathy: normalized multiparametric myocardial strain predicts contractile recovery](#). *The Annals of thoracic surgery*, 100(4), 1284-1291.

## Intellectual Property:

- [Method for quantitatively mapping myocardial contractile function with magnetic resonance based multiparametric strain analysis](#) (US Patent No. 9,176,211; WUSTL Case #T006692)
- [Systems and methods for measuring cardiac strain](#) (Published PCT WO2016065159, Allowed claims in the U.S.; WUSTL Case #T014564)