

# Comparison of new accelerated sequences and standard sequences in cardiac magnetic resonance for the evaluation of cardiac function parameters and mass

<b>Submission date</b> 15/10/2020	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
<b>Registration date</b> 20/11/2020	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
<b>Last Edited</b> 18/07/2022	<b>Condition category</b> Circulatory System	<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

The assessment of cardiac (heart) function by cardiac magnetic resonance (CMR) is considered the most precise and reproducible method. A major drawback is the long acquisition time, so researchers want to apply new and faster scan techniques. The aim of this study is to show that compressed sensing sequences can be used to assess heart function in less time. This will facilitate the workflow and increase patient comfort while giving a clinically equivalent assessment of the heart.

### Who can participate?

Patients having a CMR scan at the Helios Klinikum Berlin-Buch who are aged 18 or older and do not have an irregular heart rhythm

### What does the study involve?

The study compares standard sequences and new faster sequences for the acquisition of CMR images, both obtained during a routine scan.

### What are the possible benefits and risks of participating?

None

### Where is the study run from?

Working Group on Cardiovascular Magnetic Resonance, Experimental and Clinical Research Center, a joint cooperation between the Charité University Medicine Berlin and the Max-Delbrueck Center for Molecular Medicine, and HELIOS Klinikum Berlin Buch, Department of Cardiology and Nephrology, Berlin, Germany

### When is the study starting and how long is it expected to run for?

April 2019 to June 2020

Who is funding the study?

Charité – Universitätsmedizin Berlin (Charité University Medicine Berlin) (Germany)

Who is the main contact?

Prof. Dr med. Jeanette Schulz-Menger

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## Contact information

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## **Additional identifiers**

## **Study information**

### **Scientific Title**

Evaluation of Compressed Sensing techniques in MRI for the determination of cardiac function Parameters compared to Established Segmentation Sequences (ECSPRESS)

### **Acronym**

ECSPRESS

### **Study objectives**

A retrospective study of accelerated cine sequences in comparison to standard cine sequences to show that there are no relevant clinical differences in the quantitative evaluation of left and right ventricular function parameters and mass.

### **Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

Submission pending, ethical committee of the Charité Medical Faculty (Charité – Universitätsmedizin Berlin, Campus Charité Mitte, Charitéplatz 1, 10117 Berlin, Germany; +49 (0) 30 450 517 222; ethikkommission@charite.de)

### **Study design**

Retrospective observational cohort study

### **Primary study design**

Observational

### **Study type(s)**

Diagnostic

### **Health condition(s) or problem(s) studied**

Patients with different cardiac diseases with an indication for cardiac MRI

### **Interventions**

The researchers screened the PACS system for CMR scans obtained between May 2019 and July 2020 where new accelerated compressed sensing sequences were used. Cine images from the standard reference method steady-state precession and the compressed sensing techniques are

analyzed using CVI42 software (Circle Cardiovascular Imaging Inc., Calgary, Canada) to assess the cardiac morphology. Statistical analyses are performed using IBM SPSS Statistic version 23 (IBM, Armonk, US). The researchers calculate mean values and standard deviation (SD) for demographic parameters, LV and RV function. Images are rated using subjective and objective quality criteria. Differences were considered statistically significant at  $p < 0.05$ .

### **Intervention Type**

Device

### **Phase**

Not Applicable

### **Primary outcome(s)**

Quantitative evaluation of left and right ventricular function parameters and mass (LVEF, LVSV, LVEDV, LVESV, LVM, RVEF, RVSV, RVEDV, RVDSV) measured by compressed sensing sequences and standard cine sequences with cardiac magnetic resonance after the scan

### **Key secondary outcome(s)**

1. Subjective and objective quality criteria of the cine images measured using standardized criteria after acquisition
2. Time for each acquisition and per slice measured using the DICOM tags after the images are obtained

### **Completion date**

30/06/2020

## **Eligibility**

### **Key inclusion criteria**

1. Indication for cardiac magnetic resonance
2. Age >18 years

### **Participant type(s)**

Patient

### **Healthy volunteers allowed**

No

### **Age group**

Adult

### **Lower age limit**

18 years

### **Sex**

All

### **Total final enrolment**

175

**Key exclusion criteria**

1. Arrhythmia during the scan
2. No acquired reference cine method

**Date of first enrolment**

01/05/2019

**Date of final enrolment**

29/05/2020

**Locations****Countries of recruitment**

Germany

**Study participating centre**

**Helios Klinikum Berlin-Buch**

Schwanebecker Chaussee 50

Berlin

Germany

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**Sponsor information****Organisation**

Charité University Medicine Berlin

**Funder(s)****Funder type**

University/education

**Funder Name**

Charité – Universitätsmedizin Berlin

**Alternative Name(s)**

Medical School - Charité - University Medicine Berlin

**Funding Body Type**

Private sector organisation

**Funding Body Subtype**

For-profit companies (industry)

## Location

Germany

# Results and Publications

## Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are not expected to be made available due to the data protection laws in Germany. However, upon request the methodology and dataset structure can be shared.

## IPD sharing plan summary

Not expected to be made available

## Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>		14/07/2022	18/07/2022	Yes	No