Global layer specific LS during exercise

	Rest (n=30)	Peak exercise (n=27)	Recovery (n=29)
GLS Endo %	-19.76±1.08	-26.21±0.97*	-23.28±0.9* **
GLS Mid %	-17.21±0.92†	-23.45±0.99*†	-21.21±0.76* **†
GLS Epi %	-15.09±0.96†‡	-19.92±1.01*†‡	-18.20±0.88* **‡
LSG	1.31±0.06	1.32±0.08	1.30±0.07

*Sig difference previous value (row); **sig difference initial value (row); †sig difference previous value (column); ‡sig difference initial value (column). Endo: endocardium, Mid: mid myocardium, Epi: epicardium.

Conclusions: This novel study identifies the normal LS response to ESE globally and segmentally in multiple myocardial layers. These measurements are feasible when image quality permits testing without trans-pulmonary contrast, providing normal values in response to exercise and recovery. Further studies comparing normal data with pathological conditions may provide useful clinical and prognostic data.

P6477

Prognostic value of non-invasive coronary flow velocity at rest during routine echocardiography: 3-year outcomes

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Background: Direct visualization of coronary arteries during echocardiography may help to diagnose significant coronary artery stenosis as has been previously described. However, there is a lack of information about the prognostic value of identifying local high velocities in coronary arteries. The purpose of the study was to define the cut-off value of local flow acceleration in the left main (LM), left anterior descending (LAD) or circumflex (Cx) coronary arteries for prognostic aims.

Methods: In a prospective, single-center, observational study, we evaluated 171 all-incoming patients (91 women, 58±13 years old) who underwent routine echocardiography with additional scans of coronary flow in left main, left descending and circumflex arteries to be included in the study. Fifty-eight patients (34%) had an established diagnosis of CAD before echocardiography. Cardiac death, non-fatal myocardial infarction (MI), and revascularization were defined as major adverse cardiac events (MACE). The period of follow-up was 3 years. To adjust for several risk factors, multivariable Cox analysis was performed.

Results: Over the follow-up period, the ability to contact fourteen patients was lost. Only maximal velocity in proximal portions of the arteries proved to be an independent prognostic predictor of death/MI (OR 1.02, 95% CI 1.00–1.03, P<0.02). The value of maximal velocity in proximal portions of the arteries (OR 1.02, 95% CI 1.01–1.04, P<0.005) and known of CAD (OR 0.97, 95% CI 0.94–0.99, P<0.0001) were independent predictors of cardiac death/MI/coronary artery bypass surgery.

ROC analysis demonstrated that the best cut-off point for maximal velocity in proximal portions of the arteries was 67 cm/s for predicting cardiac death/MI with a sensitivity of 100% and specificity of 73%, with an area under the ROC curve of 0.88, p<0.0001. The cut-off point for maximal velocity of 64 cm/s predicted cardiac death/MI/CABG with a sensitivity of 91% and specificity of 79%, with an area under the ROC curve of 0.90, p<0.0001. The cut-off point for maximal velocity of 64 cm/s predicted MACE with a sensitivity of 70%, specificity of 86%, and with an area under the ROC curve of 0.82, p<0.0001.

Conclusion: The cut-off value of 64 cm/s flow velocity in LM and/or proximal parts of LAD/Cx can divide patient population into groups with and without serious prognosis for coronary cardiac events over 3 years.

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Time-course of left ventricle function during mild therapeutic hypothermia in out-of-hospital cardiac arrest patients

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Background: Mild therapeutic hypothermia (MTH) is used to improved outcomes in comatose survivors of out-of-hospital cardiac arrest (OHCA). However, the time-course of left ventricle (LV) function and predictors of early improvement in LV function remain unknown.

Purpose: To evaluate LV ejection fraction (EF) and global longitudinal strain (GLS) on admission, during MTH and 24 hours after rewarming in OHCA patients by serial transthoracic echocardiography.

Methods: This is a substudy of a randomized trial evaluating xenon anaesthesia after cardiac arrest. Thirty-eight adult OHCA survivors with ventricular fibrillation or pulseless ventricular tachycardia as initial cardiac rhythm were studied. Patients received MTH with a target temperature of 33°C for 24 hours. Echocardiography (GE Vivid 9 or i) was done on admission to hospital, during MTH (24±4 hours after reaching the target temperature), and 24 hours after rewarming to assess EF (Simpson's method) and GLS. Patients were divided in two groups according to improved EF (≥5%, n=19) or no improvement in EF (<5%) from hospital arrival until 24 hours after rewarming.

Results: Mean age of patients included was 58±11 years, 70% were male, 39% with STEMI, and average time to return of spontaneous circulation 24±6 min. Compared with on arrival to hospital, there was significant improvements in EF (39±10% vs. 45±4%, p=0.007) and GLS (-8.5±3.8% vs. -12.2±4.0%, p=0.0002) 24 hours after rewarming. During MTH, EF was comparable to that on arrival (42±12% p=0.15), but GLS had already improved (-10.6±2.6%, p=0.02). Compared with patients with no improvement in EF, patients who improved EF by ≥5% had lower EF (43±10% vs. 33%±8%, p=0.004) and GLS (-10.0±3.4% vs. -7.0±3.4%, p=0.008) on admission, but those were comparable during MTH (EF 41±11% vs. 44±12%, p=0.28 and GLS -11±4% vs. -11±4%, p=0.45) and after rewarming (EF 43±9% vs. 47±12%, p=0.20 and GLS -11±4% vs. -13±5%, p=0.26). There were no significant differences in the number of STEMI patients (p=0.74), the number of patients those had an angiography procedure (p=0.78), and mean arterial pressure (p=0.2) among the groups.

Conclusion: There is a significant improvement in LV systolic function after OHCA. Most of the improvement in EF and GLS occur during the first 24 hours after admission and EF and GLS during MTH appear to be predictive of LV function after rewarming.

Funding Acknowledgements: The Academy of Finland

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Right cavities dimensions: echocardiographic reference values and differences according to gender and anthropometric variables

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Introduction: The prognostic value of the dimensions of the right cavities in various pathologies is important; however the normal reference values are scarce in the literature and evidence usually come from patients included as control groups in different kind of investigations.

Purpose: Our objective is to determine the reference values of the right cavities in a healthy population, estimate different values between genders, index them to anthropometric variables and evaluate inter- and intra-observer variability.

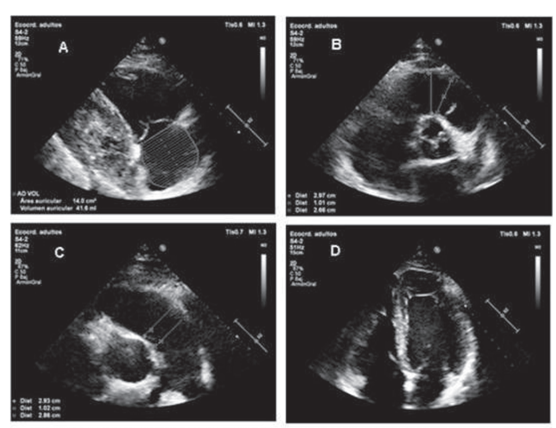
Methods: Healthy patients (p), ≥16 years old, of both genders were prospectively included. Strict exclusion criteria were applied. Clinical consultation, blood test, ergometric test, chest x-ray and echocardiogram were performed, the latter one following de American Society of Echocardiography recommendations. Right heart's dimensions and function were evaluated through 22 different variables; some of them can be seen in Figure 1. Inter- and intra-observer variability was tested in a subgroup of 40 p.

Results: From March 2014 to January 2017, 438 p were included, 55.2% (n=242)

Table 1

Variable	Total	Male	Female	Total/SC	M/BSA	F/BSA
RVO1^2 (mm)	27 (24–30)	28 (25–31)	25 (23–28)*	^{1}15±2,3	14,6±2	15,6±2*
TR^2 (mm)	29 (26–32)	30 (26–33)	27 (25–30)*	^{2}16 (14–17,6)	15,7 (13,7–17)	16,7 (15,2–17,9)
RVD2^2 (mm)	30 (27–34)	32 (29–36)	28,5 (26–31)*	^{1}17±2,9	16,9±3	17,5 ± -2,7*
RV thickness^2 (mm)	4 (3,7–4,8)	4,2 (3,7–5)	4 (3,6–4,4)	^{1}2±0,4	2,2±0,4	2,4±0,44*
RA Vol^2 (ml)	40 (33–49)	42 (36–53)	37 (30–45)*	^{1}23±6	23±6	22,8±6,6
PR^2 (mm)	20 (18–22)	20 (18–23)	19 (18–21)*	^{1}11,2±2	10,6±1,9	11,9±1.9*

^{1}Mean ± SD. ^{2}Median – interquartile range. *p≤0.05. TR: tricuspid valve ring; RVD: right ventricle diameter; RVO: right ventricle outflow; RAVol: right atrium volume; PR: pulmonary ring.



A: VolAD 1: assessing from right ventricle inflow view and rotating the transducer to avoid the Inferior Cava vein and the Coronary Sinus. **B:** SAX view (diastole) measuring RVO1 (perpendicular to the aortic valve central coaptation point) and RVO2 (1cm below the pulmonary ring plane). **C:** SAX view (end-systole) measuring pulmonary ring and Pulmonary artery. **D:** 4 chamber view with a correct visualization of the lateral right ventricle wall, ventricular septum and apex avoiding foreshortening.

Figure 1