hospitalization rates or Emergency Department visits. A principal component analysis was conducted to determine the EUROIA subscales. Internal reliability was established using Cronbach's alpha (α). Multivariable logistic regression analyses examined the EUROAI's clinical utility through associations between its subscales and clinical indices 12 months (KCCQ-OS and PASE). An exploratory binomial logistic regression analysis tested the association between EUROIA subscales and a composite index of incident hospitalization or ED visit. 117 CHF (median age=60.0 years) patients from the digital intervention arm of the CHF-CePPORT trial were included, 20.5% women and median KCCQ-OS=82.3 (interquartile range=67-93). The four identified subscales of the EUROIA were: Flourishing, Psychosocial Well-Being, Physical Well-Being, and Social Roles and Responsibilities. Internal reliability (α) was 0.76 at baseline and 0.81 at 12 months. Psychosocial (p=0.049) and Physical Well-Being (p=0.004) were significantly associated with 12-month KCCQ-OS scores. Flourishing was significantly associated with 12-month PASE scores (p=0.02). Incident all-cause hospitalization or ED visits were predicted by the Psychosocial (p=0.05) and Physical Well-Being (p=0.04) subscales.

CONCLUSION: This proof-of-concept study presents preliminary evidence to suggest that routine goal-directed behaviours that are reported to promote well-being may have therapeutic benefit. Subsequent research is required to establish prototypical categories of these behaviours and to establish their potential for prescriptive use in current health promotion programs.

Table 2: Baseline principal component analysis with varimax rotation for the EUROIA questionnaire

EUROIA 13 items	Factor Components			
	Flourishing	Psychosocial Well-being	Physical Well-being	Social Roles/ Responsibilities
Total variance (explained: 56.43%)	27.71%	11.58%	8.93%	8.21%
Do a special hobby or activity each week for personal satisfaction?	0.81			
Practice a skill so that you can aim to be excellent in an art, sport, craft, or learning activity?	0.81			
Do an activity each week that connects you to a greater purpose in life?	0.70			
Enjoy pleasurable experiences of life (e.g., fine foods, art, or travel)?	0.61			
Be of help to loved ones or those in need through your daily actions or words?		0.70		
Participate in social activities where you can feel close to family or friends?		0.67		
Maintain a close emotional or sexual relationship with your spouse or partner?		0.58		
Be physically active in your daily routine (e.g., walking, climbing stairs)?			0.76	
Exercise a few times each week (e.g., brisk walking, swimming)?			0.68	
Look and feel healthy and attractive?			0.58	
Manage your emotions so you were calm and relaxed as you went through each day?		*0.44*	*0.45*	
Continue to grow and be productive in your work or professional activities?				0.79
Fulfill your role and responsibilities to support your family?				0.77

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P096
ASSOCIATION OF DURATION AND INTENSITY OF EXERCISE WITH SEVERITY OF PHENOTYPIC EXPRESSION IN HYPERTROPHIC CARDIOMYOPATHY

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BACKGROUND: Hypertrophic Cardiomyopathy (HCM) is an inherited cardiomyopathy with incomplete penetrance and variable phenotypic expression. The factors influencing the severity of phenotypic expression remain unknown. HCM is an important cause of sudden cardiac death in athletes. However, exercise can potentially lead to significant, but reversible, left ventricular hypertrophy in patients without HCM (i.e. the "athletes heart"). Exercise restriction however, may lead to decreased quality of life, and increased traditional cardiac disease risk factors including hypertension and diabetes. In this study we aimed to assess the association between exercise duration and intensity and the severity of phenotypic expression in genotype positive HCM patients.

METHODS AND RESULTS: Participants with a confirmed pathogenic genetic variant were recruited through the HCM clinic at Toronto General Hospital. Patients were asked to answer a structured phone questionnaire regarding routine physical activity since the age of 10. Metabolic equivalent (MET) hours were calculated using standardized estimates based on activity type. Endurance training was defined as dynamic exercise estimated to be at an intensity of >70% of maximal oxygen consumption. Echocardiographic, cardiac magnetic resonance (CMR), and outcome data, including septal reduction interventions and atrial fibrillation, was retrospectively collected from patient charts. A total of 109 participants (43 male, 66 female) from 55 families were recruited. In those that were phenotype positive (90/109), average age at diagnosis was 35.6 (+/- 16.7), with an average maximal wall thickness of 17.8mm (+/- 4.9), and average late-gadolinium-enhancement (LGE) percentage of 7.0% (+/- 8.9%) in the 61 that had had CMR. No association was identified between average MET-hours per year of exercise or duration of endurance training and markers of phenotype severity including age at diagnosis, left atrial diameter, maximal wall thickness, LV mass or LGE percentage. Similarly, no difference in these parameters was demonstrated when participants were stratified by not meeting, meeting, or exceeding AHA guideline recommendations for exercise. This was true for exercise done up to the age of 20, up to the age of 30, or up to the time of follow-up (Table 1). Within family clusters, there were no examples of exercise associated with disease outcomes (Figure 1).

CONCLUSION: In this retrospective study of gene-positive HCM patients, we found no association between exercise intensity and duration and severity of HCM phenotypic expression. These findings are important for physician-patient discussions and support the recent trend towards more permissive exercise restrictions in HCM.

	Up to Age 20				Up to Age 30				Above the Age of 30			
	Not meeting AHA	Meeting AHA	Exceeding AHA	p	Not meeting AHA	Meeting AHA	Exceeding AHA	p	Not meeting AHA	Meeting AHA	Exceeding AHA	p
N	37	17	50		37	22	28		53	7	21	
Phenotype Neg	3	5	8	0.13	2	5	3	0.25	6	1	2	0.94
Average Age at Phe+ (mean)	40.6 (16.2)	37.0 (23.8)	33.1 (14.0)	0.51	42.8 (15.5)	40.2 (18.1)	36.3 (11.7)	0.64	41.3 (15.8)	38.7 (10.5)	39.4 (14.8)	0.61
LAD (mm, mean)	42.3 (7.1)	37.7 (5.7)	41.0 (6.0)	0.03	42.2 (7.1)	39.7 (6.9)	41.1 (5.8)	0.28	41.5 (6.8)	41.0 (11.6)	40.3 (4.5)	0.90
MWT (mm, mean)	18.0 (5.1)	17.1 (6.7)	15.8 (4.9)	0.40	18.1 (5.1)	16.1 (6.2)	16.5 (5.2)	0.13	17.2 (5.8)	16.4 (6.2)	17.6 (4.7)	0.79
LV Massi (g, mean)	67.5 (30.1)	55.3 (19.9)	61.5 (18.3)	0.14	64.3 (30.5)	56.4 (16.5)	62.3 (19.2)	0.40	64.2 (28.1)	60.7 (20.7)	60.7 (20.0)	0.94
LGE % (median)	3.2 (6.1)	3.1 (5.4)	7.7 (10.8)	0.16	6.0 (6.2)	6.7 (8.5)	9.7 (12.9)	0.84	9.3 (10.6)	8/9 (4.2)	2.9 (4.2)	0.67

Figure 1: Phenotypic expression stratified by exercise volume through different age groups. Exercise volume is divided into those that were not meeting, meeting and those exceeding AHA guideline recommendations for exercise. (433.33 – 866.66 MET-hours per year).

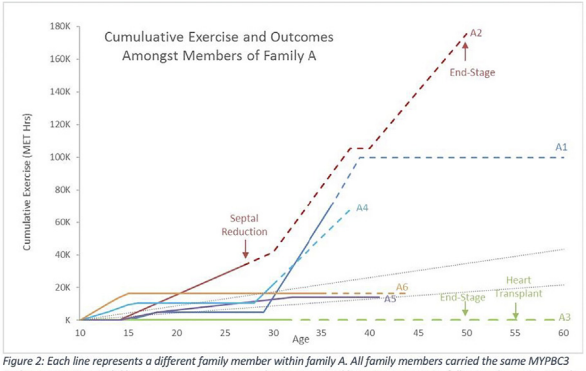

Figure 2: Each line represents a different family member within family A. All family members carried the same MYPBC3 pathogenic variant. Solid lines represent time prior to diagnosis. Dotted lines represent time following diagnosis. Grey lines represent AHA recommended range for physical activity of 500-1000 MET-minutes of moderate-to-vigorous physical activity per week. (The 2018 Physical Activity Guidelines Advisory Committee Scientific Report.

P097
BALLISTOCARDIOGRAPHY TO CHARACTERIZE PULMONARY ARTERY PRESSURE IN ADVANCED HEART FAILURE PATIENTS AND HEALTHY ADULTS

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BACKGROUND: Remote monitoring to manage heart failure (HF) at home can reduce readmission rates. Notably the implantable CardioMEMS device that measures pulmonary artery pressure (PAP) has proven effective but is both invasive and costly. Our goal is to develop smart home sensors that can monitor HF patients non-invasively and without requiring active patient engagement. The objective of this study is the development and evaluation of ballistocardiography (BCG) as a candidate technology for non-invasive, autonomous monitoring of PAP for HF patients.

METHODS AND RESULTS: BCG records the recoil force generated by the heart during ejection. The force generated by rapid ejection of the blood with each cardiac cycle yields micro-oscillations in the recorded BCG signal. Force and acceleration are equivalent in BCG given that the mass of the blood is assumed constant. Figure-A shows a healthy BCG signal in acceleration. A method for recording BCG has been developed that does not require electrodes, skin contact, or interaction with external devices. In healthy subjects, the dominant vector of acceleration is recorded as the J-wave, which represents the rapid increase in blood velocity with ejection (Figure-B). Fragmentation of J-wave (Figure-C) has been reported to emerge due to dyssynchronous ejection between the left and right ventricles (Figure-D). Increased afterload due to elevated PAP may increase dyssynchronous biventricular ejection and increase fragmentation of the J-wave. Five patients with advanced HF were recruited to undergo BCG recording on the same day as they underwent clinically indicated right heart catheterization. BCG was recorded while standing for 90 seconds. Mean PAPs of the patients were 19, 41, 30, 40, and 43 mmHg. Six healthy controls were also recruited to undergo BCG recordings. J-wave fragmentation was observed in HF patients with elevated PAPs (Figure-E). Compared to healthy controls (Figure-F), we also observed increased beat-to-beat variation and prolongation of signal duration based on visual inspection. These behaviours were not observed in the HF patient with normal PAP and healthy controls.

CONCLUSION: Preliminary observations support the possibility that J-wave fragmentation of BCG signal recordings may identify increased PAP in HF patients.

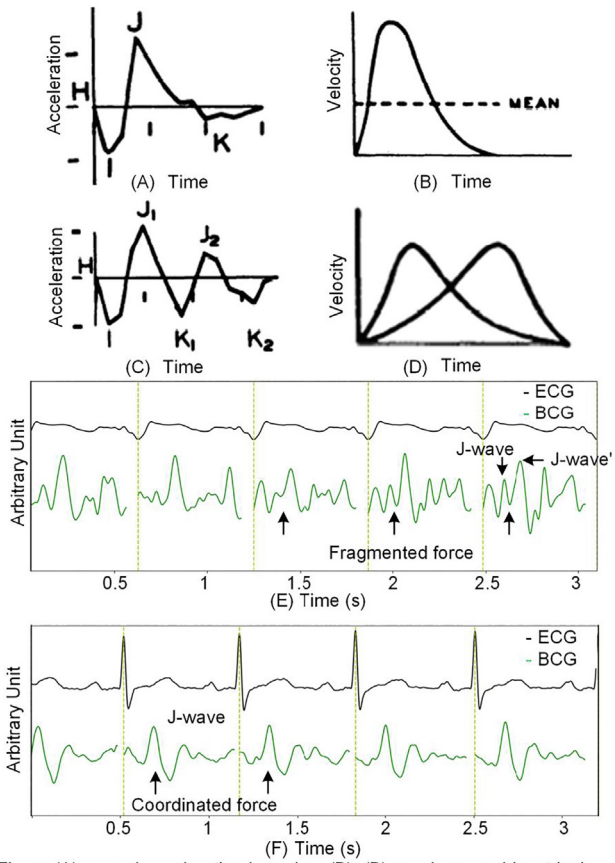

Figure (A) normal acceleration based on (B), (B) synchronous biventricular velocity generation, (C) fragmentation of the J-wave, (D) dyssynchronous biventricular velocity generation, (E) BCG tracing from a HF patient with pulmonary hypertension (75Y, M, mean PAP: 41mmHg), (F) BCG tracing from a healthy control (24Y, F). (E) and (F) have the same vertical scale.

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