these regional abnormalities are mild, they may still provide the substrate for AF and therapeutic targets for ablation.

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P066
CARDIAC IMPLANTABLE ELECTRONIC DEVICE LEAD PERFORATION RATES, MANAGEMENT AND OUTCOMES

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BACKGROUND: Lead perforation after cardiovascular implantable electronic device (CIED) implant is an uncommon but well-recognized complication. There are no strong recommendations from society guidelines on management; indication for lead revision and pericardial drainage are usually decided by the treating clinicians.

METHODS AND RESULTS: A prospective registry of all CIED implant procedures was started at our institution in January 2007. The registry had a specific focus on prospectively identifying all CIED implant complications. Between April 2007 and September 2019, 10290 patients received a de novo CIED implant; 3737 (36%) were implantable cardioverter-defibrillators (ICD). There were 4704 atrial leads and 6514 ventricular pacemaker leads implanted. We identified 43 potential perforations from the registry and after chart review, 27 confirmed perforations were included in the study. Patient characteristics and management are shown in Table 1. Overall perforation rate occurred in 27/10920 implants (0.26%). The atrial perforation rate was 0.09%; there was no difference in ventricular perforation rate between ICD vs pacemakers (0.16% vs 0.25%, p=0.37). There was no difference in pacemaker lead perforation rate between active and passive leads (0.2% vs 0.16%, p=0.63). Perforation was diagnosed after a mean of 14.2±26.9 days following implant. Of the 27 patients, 13 (48%) underwent lead revision only, 4 (15%) underwent pericardiocentesis only, and 5 (19%) underwent both pericardiocentesis and lead revision. Five (19%) patients were managed conservatively. Among the 13 patients with a moderate or greater effusion, 4 were managed without pericardiocentesis. All 14 with either lead parameter change or diaphragmatic stimulation underwent lead revision. There were no recurrent cases of tamponade after the lead was pulled back and repositioned. In patients managed conservatively, there were no unplanned interventions. Importantly, there were no deaths, and no patients required sternotomy.

CONCLUSION: The rate of CIED lead perforation in our large experience was 27/10920 (0.26%) implants. A subset of patients can be managed safely conservatively (for example those with small pericardial effusion and without lead parameter changes or diaphragmatic stimulation); the remainder may require lead revision and/or pericardiocentesis. No patients in our study required sternotomy. There were no recurrent tamponades after the perforated lead was pulled back and repositioned.

Table 1: Patient characteristics.	
Female	14/27 (52%)
Age (mean, years)	72.7±9.4
On anticoagulation	10/27 (37%)
Time from implant to diagnosis (mean, days)	14.2±26.9
Perforated lead type	
Active implantable cardioverter-defibrillator	6/27
Passive pacemaker	7/27
Active pacemaker	14/27
Chamber perforated	
Ventricle	21/27
Atrium	3/27
Both	1/27
Unclear	2/27
Pericardial effusion:	
None	7/27
Trivial/small	7/27
Moderate	5/27
Large	8/27
Lead threshold changed	13/27 (48%)
Diaphragmatic stimulation	4/27 (15%)
Pericardiocentesis and lead repositioning	5/27
Pericardiocentesis only	4/27
Lead repositioned only	13/27
Conservative	5/27

P067
CARDIOLOGIST EVALUATION OF ELECTROCARDIOGRAM COLLECTED AT THE WAIST WITH TEXTILE ELECTRODES

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BACKGROUND: The Skiin Underwear is a wearable medical device in the form of undergarments that captures ECG signals using textile electrodes incorporated into a clothing item

and transmits them via Bluetooth between a removable wearable pod and a companion app on a phone. The purpose of this clinical evaluation performed at a cardiology clinic was to compare the quality of the ECG collected using the textile electrodes in a population of older adults with suspected or diagnosed cardiac conditions.

METHODS AND RESULTS: The assessment was performed using a Skiin Underwear band collecting 3 ECG channels with 5 electrodes: two right electrodes, two left electrodes, and one reference electrode (worn at the waist) concurrently the 12-lead ECG using gel adhesive single-use electrodes. Ten minutes recordings were collected with the patient supine and seated. One hundred participants were included: 63 males and 37 females, age of 63.6 ±10.4 years (42 to 86), BMI of 29.39 ±6.82 kg/m2, and waist circumference of 40.94 ±5.85 inches. 84 participants had Skiin and reference ECG that could be aligned for comparison. Non-readable ECG was attributed to participants having dry skin. Motion artifact was identified and excluded from the analysis. Proprietary Skiin R-peaks detection algorithm was used to identify individual QRS complexes on the ECG and remove ECG segments containing noise from analysis. The F1-score for QRS complexes detected using Skiin compared to the standard ECG was above 0.9 for 97% of participants while supine. This was numerically but not statistically better than with the patient sitting. Table 1 details F1-score and Recall for each channel and each position. There were no false-positives for R-peak detection outside of motion artifact segments. Forty three out of 84 participants had at least one arrhythmia labeled on the reference ECG, and Figure 1 illustrates how the Skiin ECG morphology and rhythm compare to the reference ECG.

CONCLUSION: This is the first clinical assessment comparing performance of ECG collection using textile electrodes at the waist compared to the conventional ECG. With the static patient who is sitting or supine, textile electrodes reproduce detection of QRS complexes and arrhythmia with a great level of accuracy compared to the clinical standard.

Table 1: F1-score and Recall of R-peak detection from each channel of Skiin textile ECG; and % of the 10 minutes of recording classified as Motion artifacts (and excluded from R-peak detection analysis).

	Posture	Lying down	Seated
F1-score Ch1	Median	**1.000**	**0.998**
	Min, Max	0.005, 1.000	0.494, 1.000
F1-score Ch2	Median	**0.999**	**0.994**
	Min, Max	0.043, 1.000	0.000, 1.000
F1-score Ch3	Median	**0.998**	**0.995**
	Min, Max	0.952, 1.000	0.000, 1.000
Recall Ch1	Median	**1.000**	**0.996**
	Min, Max	0.003, 1.000	0.328, 1.000
Recall Ch2	Median	**0.997**	**0.988**
	Min, Max	0.022, 1.000	0.000, 1.000
Recall Ch3	Median	**0.996**	**0.990**
	Min, Max	0.908, 1.000	0.000, 1.000
Motion artifacts section (%)	Mean ±Std. dev.	8.6 ±11.4	27.8 ±27.0

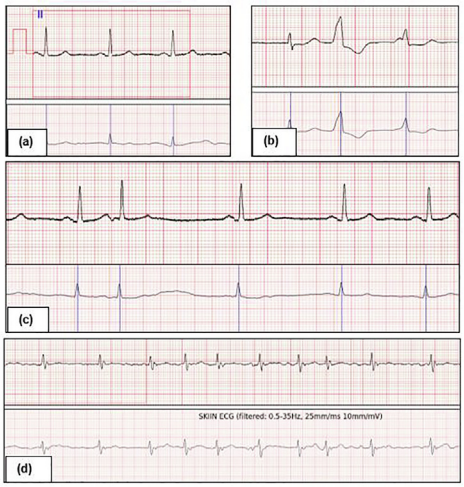

Figure 1 - ECG measured by the gold standard system with gel at the chest (Standard ECG, Lead II, top) and Skiin underwear band at the waist (pseudo-Lead I, bottom) during: (a) sinus rhythm, (b) Premature Ventricular Contractions, (c) Premature Atrial Contractions, and (d) Atrial fibrillation.

P068
COMMUNITY-TO-INSTITUTION ATHLETIC CARDIOVASCULAR SCREENING: VALIDATION OF AN ELECTROCARDIOGRAM WORKFLOW MODEL

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BACKGROUND: To prevent sudden cardiac death in young athletes, many sporting organizations and institutions require that athletes undergo pre-participation screening (PPS). The inclusion of electrocardiogram (ECG) testing in PPS remains controversial due to cost implications, resource requirements, and the potential for inaccurate interpretations. At most centres, ECGs are performed internally by health care professionals trained in the interpretation of athlete-specific ECG findings. Since 2017, Queen's University has implemented a PPS workflow model which outsources ECG requisitions to the local care networks of athletes undergoing screening, thus reducing institutional costs and resource expenditure. The objective of this study was to evaluate the accuracy of ECG interpretation within this workflow model by comparing interpretations between community physicians (i.e. any physician outside of Queen's University) and an institutional sports cardiologist.

METHODS AND RESULTS: This was a retrospective, single-centre observational study of all athletes undergoing cardiovascular PPS at Queen's University between 2017-2021 (n=1,100). A total of 740 athlete ECGs met the inclusion criteria and were reinterpreted by a sports cardiologist using the International Criteria athletic ECG recommendation (gold-standard). Percent agreement and Cohen's kappa statistic were used to compare community physician ECG interpretations with gold-standard interpretations. Among this sample of young athletes (mean age: 18.5 years, female: 39.6%), a self-reported history of syncope (12.7%), angina (1.5%), dyspnea (1.3%), and familial cardiac complications