VALIDITY AND RELIABILITY OF SHORT-TERM HEART-RATE VARIABILITY FROM DISPOSABLE ELECTROCARDIOGRAPHY LEADS

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Background
The evaluation of heart rate variability (HRV) has become increasingly common, as a simple, non-invasive measure that is sensitive to physiological changes and can help to structure exercise training programmes, adaptation, and recovery. Novel single-use electrocardiography (ECG) leads have been developed to monitor HRV in clinical and rehabilitation settings.

Aim
This study assessed the validity and reliability of short-term HRV measures obtained from disposable ECG leads.

Methods
Thirty healthy subjects (mean age 33±10 years; 9 females) underwent five-minute resting HRV assessments using disposable (single use) ECG (Kendall DL™, Cardinal Health, USA) and a standard, reusable ECG leads (CardioExpress, Spacelabs Healthcare, USA). Time and frequency domain data from were analysed using Intraclass correlation coefficient (ICC) and Bland-Altman (B-A) analyses with p values <0.05 regarded as significant.

Results
The ICC with 95% confidence interval (CI) between disposable and reusable leads was excellent for time domain (R-R interval (ms); 0.99 (0.91,1.00), root mean square of successive normal R-R interval differences (RMSSD) (ms); 0.91 (0.76,0.96), SD of normal-to-normal R-R intervals (SDNN) (ms); 0.91 (0.68,0.97) and frequency domain (Low Frequency (LF) normalised units (nu); 0.90 (0.79,0.95), High Frequency (HF) nu; 0.91 (0.80,0.96), LF power (ms²); 0.89 (0.62,0.96), HF power (ms²); 0.90 (0.72,0.96) variables. The mean difference and upper and lower limits of agreement between disposable and reusable leads for time (<2.5±1.4%) and frequency (<5±1%) domain measures were acceptable. Repeated measures using disposable leads demonstrated excellent reproducibility (ICC 95% CI) for R-R interval (ms); 0.93 (0.85,0.97), RMSSD (ms); 0.93 (0.85,0.97), SDNN (ms); 0.88 (0.75,0.95), LF power (ms²); 0.87 (0.72,0.94), and HF power (ms²); 0.88 (0.73,0.94) with coefficient of variation ranging from 2.2%-5%.

Conclusion
Single-use Kendall DL™ ECG leads demonstrate a valid and reproducible tool for assessment of HRV. Disposable leads may also play an important role in infection control in clinical and rehabilitation settings.

Implementing a Home-based Cardiac Rehabilitation Programme for People with Heart Failure and their Caregivers: Findings from the SCOT: REACH-HF Study

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Background
Despite robust evidence and national guidance recommending cardiac rehabilitation (CR) for heart failure (HF), access remains poor, a situation magnified by COVID-19. The Rehabilitation Enablement in CHronic Heart Failure (REACH-HF) randomised controlled trial demonstrated the clinical and cost-effectiveness of a novel home-based CR self-management programme. The SCOT:REACH-HF study was