



Non Invasive Imaging (Echocardiography, Nuclear, PET, MR and CT)

THE IMPACT OF RIGOROUS QUALITY IMPROVEMENT ON 3D ECHOCARDIOGRAPHY IMAGE AND DATA QUALITY IN AN INTERNATIONAL MULTISITE RANDOMIZED TRIAL

Poster Contributions

Poster Hall, Hall C

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Background: Image quality is critical to the data consistency and completeness required for multicenter research. Core labs improve measurement quality but little is known about best practices in fostering image quality. For PRESERVATION 1, we designed and tested the impact of a novel, real time core lab-site Quality Improvement (QI) interaction on image quality and measurability.

Methods: PRESERVATION 1 (N=303; 61 sites) was an international randomized trial of STEMI patients whose primary endpoint was echo (3D or 2D) change in LV volume (LVV) from baseline to 6 months. The QI process consisted of initial site training with hands-on demonstration, site sonographer certification based on image quality, benchmarked quarterly feedback on image quality, and retraining as needed. To assess the impact of this QI process, a primary QI endpoint of measureable subject echo pairs (baseline + 6 months) for LVV and secondary endpoint of site quarterly measurability score were used. Median regression determined the association between site characteristics and quarterly measurability scores. Wilcoxon rank sum test assessed differences in measurability scores between sites which completed indicated retraining and those who didn't.

Results: Measurable echo pairs were obtained in 279 subjects (92%). Of these, 74% were obtained by 3D; 26% by 2D. Median site quarterly 3D measurability score was 69% (IQR: 50-94). Multivariable predictors of high 3D quarterly measurability scores were not needing retraining ($p=0.01$), few queries ($p<0.001$), early certification ($p=0.04$), and high enrollment ($p=0.03$). Among 41 sites whose low score ($<85\%$) indicated a need for 3D retraining, those completing it ($n=15$) increased measurability scores in the following quarter after retraining vs. those who did not retrain ($n=26$) (13.4% vs. 2.3% respectively; $p=0.004$), but improvement was not sustained.

Conclusions: A novel, rigorous QI process is time consuming but feasible. It resulted in a high proportion of measureable 3D echo data compared to historical controls, and the ability to use echo data as a primary trial endpoint. Such processes may be essential to generate high quality imaging data in randomized trials.