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| **Supplemental Table S1** Interobserver Agreement Over Ventricular Parameters and Cohorts per Site |
|  |  |  | Bland-Altmann |  |  |
|  | Site | Corelab | Diff | LoA | Correlation | ICC |
| LV EF (%) |  |  |  |  |  |
| 1 | 48.6 ± 38.9 | 42.9 ± 43.4 | -1.6 | 11.0 | 0.94 | 0.98 |
| 2 | 57.0 ± 8.8 | 61.0 ± 9.0 | -4.5 | 12.4 | 0.68 | 0.79 |
| 3 | 60.8 ± 10.9 | 66.2 ± 15.1 | -1.5 | 11.3 | 0.92 | 0.94 |
| 4 | 59.1 ± 8.8 | 61.3 ± 12.7 | -3.2 | 12.0 | 0.74 | 0.91 |
| LV EDVi (ml/m2) |  |  |  |  |  |
| 1 | 144.4 ± 57.1 | 136.8 ± 53.9 | 3.1 | 10.9 | 0.98 | 0.99 |
| 2 | 81.9 ± 17.7 | 79.7 ± 16.1 | 1.5 | 8.2 | 0.92 | 0.98 |
| 3 | 82.1 ± 23.0 | 72.2 ± 22.5 | 6.9 | 8.5 | 0.96 | 0.99 |
| 4 | 90.5 ± 24.4 | 90.8 ± 26.4 | -0.1 | 7.8 | 0.95 | 0.99 |
| LV ESVi (ml/m2) |  |  |  |  |  |
| 1 | 105.8 ± 56.1 | 102.9 ± 50.9 | 1.5 | 14.5 | 0.98 | 0.99 |
| 2 | 34.9 ± 11.8 | 30.6 ± 13.6 | 4.1 | 9.3 | 0.80 | 0.93 |
| 3 | 33.3 ± 13.1 | 27.4 ± 13.8 | 4.3 | 7.3 | 0.92 | 0.98 |
| 4 | 35.5 ± 16.8 | 32.5 ± 17.7 | 2.5 | 10.8 | 0.90 | 0.97 |
| LVMi (g/m2) |  |  |  |  |  |
| 1 | 98.3 ± 38.4 | 102.7 ± 41.1 | -6.3 | 15.8 | 0.94 | 0.98 |
| 2 | 74.6 ± 47.7 | 77.4 ± 54.7 | -4.2 | 8.4 | 0.99 | 0.99 |
| 3 | 61.0 ± 26.3 | 73.3 ± 22.1 | -10.2 | 12.6 | 0.90 | 0.98 |
| 4 | 65.0 ± 15.0 | 64.0 ± 17.7 | -0.3 | 8.9 | 0.94 | 0.98 |
| LV rapid strain (%) |  |  |  |  |  |
| 1 | -13.3 ± 12.0 | -11.2 ± 12.7 | -0.7 | 4.0 | 0.94 | 0.98 |
| 2 | -13.4 ± 8.9 | -13.7 ± 8.9 | 0.5 | 2.2 | 0.97 | 0.99 |
| 3 | -15.6 ± 7.2 | -15.9 ± 7.2 | -0.1 | 3.8 | 0.90 | 0.96 |
| 4 | -16.5 ± 6.8 | -15.0 ± 7.6 | 0.0 | 3.2 | 0.93 | 0.96 |
| LV FT-GLS (%) |  |  |  |  |  |
| 1 | -14.5 ± 12.6 | -12.7 ± 12.5 | 0.3 | 2.9 | 0.97 | 0.99 |
| 2 | -14.2 ± 7.3 | -15.8 ± 7.5 | 1.0 | 2.7 | 0.91 | 0.97 |
| 3 | -16.1 ± 5.3 | -18.0 ± 5.4 | 1.0 | 4.0 | 0.87 | 0.93 |
| 4 | -17.0 ± 4.5 | -18.1 ± 3.7 | 0.7 | 3.7 | 0.80 | 0.92 |
| Diff, mean difference; LoA, limits of agreement; ICC, intraclass correlation coefficient; LV, Left ventricular; EF, ejection fraction; EDVi, end-diastolic volume index; ESVi, end-systolic volume index; LVMi, left ventricular mass index; FT-GLS, feature-tracking global longitudinal strain.Continuous parameters are expressed as median with interquartile ranges (Q3 - Q1). |

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| **Supplemental Table S2** Interobserver Agreement Over Atrial Parameters and Cohorts per Site |
|  |  |  | Bland-Altmann |  |  |
|  | Site | Corelab | Diff | LoA | Correlation | ICC |
| LA EF (%) |  |  |  |  |  |
| 1 | 52.9 ± 24.7 | 46.9 ± 24.8 | 3.6 | 16.2 | 0.90 | 0.95 |
| 2 | 52.7 ± 23.0 | 51.1 ± 25.2 | -1.3 | 10.8 | 0.96 | 0.98 |
| 3 | 55.1 ± 23.1 | 53.5 ± 26.7 | 2.4 | 10.2 | 0.95 | 0.98 |
| 4 | 56.4 ± 17.3 | 56.3 ± 12.2 | 0.1 | 11.7 | 0.91 | 0.96 |
| LAV min (ml) |  |  |  |  |  |
| 1 | 37.3 ± 39.3 | 37.7 ± 42.1 | -2.7 | 17.5 | 0.96 | 0.98 |
| 2 | 38.2 ± 57.1 | 37.4 ± 55.0 | 2.1 | 11.0 | 0.99 | 0.99 |
| 3 | 29.9 ± 26.0 | 31.5 ± 29.5 | -2.9 | 15.1 | 0.95 | 0.97 |
| 4 | 32.2 ± 20.9 | 32.9 ± 22.4 | -0.3 | 10.1 | 0.97 | 0.98 |
| LAV max (ml) |  |  |  |  |  |
| 1 | 78.4 ± 38.7 | 80.0 ± 44.6 | 0.0 | 15.9 | 0.96 | 0.98 |
| 2 | 76.8 ± 57.0 | 76.4 ± 52.5 | 2.6 | 14.0 | 0.98 | 0.99 |
| 3 | 69.5 ± 30.5 | 67.7 ± 35.4 | 0.1 | 5.7 | 0.99 | 0.99 |
| 4 | 74.1 ± 35.3 | 73.0 ± 42.2 | 0.4 | 12.1 | 0.97 | 0.98 |
| RA EF (%) |  |  |  |  |  |
| 1 | 39.6 ± 25.8 | 41.7 ± 25.8 | -0.7 | 24.4 | 0.71 | 0.83 |
| 2 | 44.1 ± 22.7 | 40.9 ± 19.8 | 2.1 | 16.7 | 0.87 | 0.93 |
| 3 | 41.8 ± 17.2 | 40.3 ± 13.0 | 4.3 | 16.3 | 0.84 | 0.91 |
| 4 | 48 ± 15.6.0 | 47.9 ± 16.6 | 0.1 | 19.9 | 0.75 | 0.86 |
| RAV min (ml) |  |  |  |  |  |
| 1 | 43.8 ± 25.0 | 40.2 ± 31.3 | 2.8 | 12.0 | 0.96 | 0.98 |
| 2 | 36.8 ± 24.4 | 35.8 ± 24.8 | -1.5 | 14.8 | 0.97 | 0.98 |
| 3 | 43.0 ± 21.8 | 44.7 ± 21.1 | -2.9 | 16.4 | 0.91 | 0.95 |
| 4 | 36.6 ± 19.7 | 34.4 ± 16.0 | 1.0 | 14.9 | 0.93 | 0.96 |
| RAV max (ml) |  |  |  |  |  |
| 1 | 73.6 ± 31.6 | 72.8 ± 38.0 | 5.1 | 19.6 | 0.94 | 0.97 |
| 2 | 68.7 ± 38.4 | 70.3 ± 35.7 | -0.2 | 20.9 | 0.93 | 0.96 |
| 3 | 77.5 ± 35.6 | 72.7 ± 36.9 | 1.1 | 11.9 | 0.97 | 0.98 |
| 4 | 70.8 ± 23.3 | 62.4 ± 27.0 | 1.9 | 19.3 | 0.93 | 0.96 |
| LA rapid strain (%) |  |  |  |  |  |
| 1 | 21.6 ± 17.7 | 23.2 ± 23.2 | -2.3 | 24.4 | 0.81 | 0.89 |
| 2 | 21.4 ± 19.1 | 20.3 ± 22.6 | -1.5 | 19.2 | 0.82 | 0.90 |
| 3 | 25.9 ± 21.7 | 25.3 ± 20.1 | 1.1 | 12.3 | 0.93 | 0.96 |
| 4 | 26.5 ± 16.8 | 26.7 ± 20.4 | -2.0 | 13.6 | 0.94 | 0.97 |
| RA rapid strain (%) |  |  |  |  |  |
| 1 | 25.9 ± 20.4 | 28.7 ± 27.5 | -3.1 | 17.9 | 0.82 | 0.90 |
| 2 | 28.0 ± 18.6 | 30.9 ± 17.3 | 1.6 | 22.3 | 0.71 | 0.82 |
| 3 | 30.8 ± 18.9 | 29.3 ± 22.2 | 2.0 | 8.7 | 0.95 | 0.98 |
| 4 | 36.8 ± 12.8 | 36.8 ± 15.0 | 0.1 | 15.9 | 0.73 | 0.84 |
| Diff, mean difference; LoA, limits of agreement; ICC, intraclass correlation coefficient; LA, left atrial; EF, ejection fraction; LAV, left atrial volume; min, minimum; max, maximum; RA, right atrial; RAV right atrial volume.Continuous parameters are expressed as median with interquartile ranges (Q3 - Q1).  |

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| **Supplemental Table S3** Interobserver Agreement Over Ventricular Parameters and Sites per Cohort |
|  |  |  | Bland-Altmann |  |  |
|  | Sites | Corelab | Diff | LoA | Corr. | ICC |
| Hypertrophic disease phenotype |
| EF (%) | 57.6 ± 11.0 | 64.1 ± 12.4 | -6.4 | 14.9 | 0.80 | 0.89 |
| LV EDVi (ml/m2)\* | 72.8 ± 16.5 | 70.6 ± 19.2 | 2.3 | 9.8 | 0.96 | 0.98 |
| LV ESVi (ml/m2) | 32.4 ± 10.1 | 26.5 ± 6.6 | 5.9 | 10.6 | 0.89 | 0.94 |
| LVMi (g/m2)\* | 101.0 ± 28.5 | 106.4 ± 34.3 | -4.2 | 12.6 | 0.98 | 0.99 |
| LV rapid strain (%) | -10.0 ± 4.1 | -10.5 ± 3.9 | 0.5 | 3.0 | 0.93 | 0.96 |
| LV FT-GLS (%) | -12.5 ± 3.5 | -13.7 ± 3.7 | 1.3 | 3.4 | 0.89 | 0.94 |
| Dilated disease phenotype |
| EF (%) | 28.0 ± 26.3 | 27.2 ± 25.7 | 0.0 | 8.0 | 0.96 | 0.98 |
| LV EDVi (ml/m2) | 139.0 ± 39.7 | 138.0 ± 38.3 | 1.0 | 10.4 | 0.99 | 0.99 |
| LV ESVi (ml/m2) | 96.0 ± 34.7 | 95.4 ± 32.5 | 0.6 | 13.1 | 0.99 | 0.99 |
| LVMi (g/m2) | 92.2 ± 23.4 | 96.2 ± 26.7 | -4.0 | 15.4 | 0.96 | 0.98 |
| LV rapid strain (%) | -8.5 ± 4.4 | -7.8 ± 5.1 | -0.7 | 4.0 | 0.92 | 0.95 |
| LV FT-GLS (%)\* | -8.3 ± 8.1 | -8.6 ± 6.9 | 0.3 | 2.0 | 0.98 | 0.99 |
| Indistinct disease phenotype |
| EF (%) | 52.4 ± 13.1 | 52.0 ± 18.7 | 1.3 | 17.8 | 0.89 | 0.94 |
| LV EDVi (ml/m2) | 88.3 ± 22.4 | 82.0 ± 22.5 | 6.3 | 10.8 | 0.97 | 0.99 |
| LV ESVi (ml/m2) | 43.8 ± 20.1 | 40.2 ± 14.3 | 3.6 | 10.8 | 0.97 | 0.99 |
| LVMi (g/m2) | 65.2 ± 13.6 | 74.2 ± 11.3 | -9.0 | 14.7 | 0.83 | 0.90 |
| LV rapid strain (%) | -13.2 ± 4.2 | -12.4 ± 5.9 | -1.1 | 5.3 | 0.92 | 0.93 |
| LV FT-GLS (%) | -14.3 ± 3.6 | -14.5 ± 5.2 | -0.1 | 4.8 | 0.93 | 0.92 |
| Healthy controls |  |  |  |  |  |
| EF (%) | 61.5 ± 4.7 | 63.6 ± 5.9 | -2.5 | 8.3 | 0.79 | 0.85 |
| LV EDVi (ml/m2) | 86.4 ± 11.7 | 83.2 ± 13 | 3.2 | 9.5 | 0.93 | 0.96 |
| LV ESVi (ml/m2) | 33.4 ± 20.7 | 30.5 ± 12.9 | 2.9 | 7.4 | 0.88 | 0.93 |
| LVMi (g/m2) | 57.4 ± 8.7 | 62.9 ± 10.2 | -5.5 | 12.2 | 0.79 | 0.88 |
| LV rapid strain (%) | -17.1 ± 2.3 | -17.1 ± 2.4 | 0.0 | 2.9 | 0.83 | 0.90 |
| LV FT-GLS (%)\* | -18.2 ± 2.3 | -18.8 ± 2.6 | 0.8 | 3.4 | 0.68 | 0.81 |
| Diff, mean difference; LoA, limits of agreement; ICC, intraclass correlation coefficient; LV, left ventricular; EF, ejection fraction; EDVi, end-diastolic volume index; ESVi, end-systolic volume index; LVMi, left ventricular mass index; FT-GLS, feature-tracking global longitudinal strain.Continuous parameters are expressed as mean ± standard deviation. \*variable not normally distributed, reported as median ± quartile deviation (Q3-Q1). |

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| **Supplemental Table S4** Interobserver Agreement Over Atrial Parameters and Sites per Cohort |
|  |  |  | Bland-Altmann |  |  |
|  | Sites | Corelab | Diff | LoA | Corr. | ICC |
| Hypertrophic disease phenotype |
| LA EF (%) | 39.1 ± 16.2 | 38.3 ± 15.7 | 0.8 | 6.2 | 0.98 | 0.99 |
| LAV min (ml) | 60.5 ± 26.9 | 60.3 ± 25.5 | 0.2 | 10.3 | 0.98 | 0.99 |
| LAV max (ml) | 96.9 ± 28.3 | 95.8 ± 24.1 | 1.1 | 11.0 | 0.98 | 0.99 |
| RA EF (%)\* | 37.9 ± 32.4 | 40.2 ± 35.2 | -0.8 | 13.5 | 0.93 | 0.96 |
| RAV min (ml)\* | 38.5 ± 28.7 | 38.5 ± 32.0 | -1.5 | 14.6 | 0.97 | 0.99 |
| RAV max (ml) | 71.4 ± 31.1 | 73.8 ± 31.7 | -2.4 | 16.5 | 0.96 | 0.98 |
| LA rapid strain (%) | 15.2 ± 9.1 | 14.8 ± 9.1 | 0.3 | 5.7 | 0.95 | 0.97 |
| RA rapid strain (%) | 24.3 ± 13.2 | 24.0 ± 13.9 | 0.3 | 8.6 | 0.95 | 0.97 |
| Dilated disease phenotype |
| LA EF (%) | 38.9 ± 18.3 | 36.8 ± 16.9 | 2.7 | 18.7 | 0.86 | 0.92 |
| LAV min (ml)\* | 45.7 ± 42.7 | 56.8 ± 42.6 | -3.4 | 20.0 | 0.95 | 0.97 |
| LAV max (ml) | 89.2 ± 24.6 | 90.2 ± 21.1 | -0.9 | 16.8 | 0.96 | 0.98 |
| RA EF (%) | 31.6 ± 15.3 | 30.9 ± 18.8 | 0.7 | 19.8 | 0.84 | 0.90 |
| RAV min (ml)\* | 42.6 ± 22.2 | 40.7 ± 32.9 | 1.6 | 14.1 | 0.97 | 0.98 |
| RAV max (ml) | 74.6 ± 26.2 | 71.1 ± 27.2 | 3.6 | 16.8 | 0.95 | 0.97 |
| LA rapid strain (%)\* | 14.7 ± 16.7 | 17.7 ± 18.1 | -4.0 | 19.2 | 0.84 | 0.92 |
| RA rapid strain (%) | 22.1 ± 13.1 | 24.0 ± 14.2 | -2.1 | 17.7 | 0.79 | 0.88 |
| Indistinct disease phenotype |
| LA EF (%) | 44.7 ± 15.9 | 42.4 ± 19.8 | 2.3 | 15.8 | 0.92 | 0.95 |
| LAV min (ml)\* | 33.1 ± 38.5 | 31.5 ± 35.7 | -3.3 | 15.6 | 0.98 | 0.99 |
| LAV max (ml) | 78.5 ± 35.8 | 80.1 ± 34.7 | -1.6 | 6.4 | 0.99 | 0.99 |
| RA EF (%) | 39.1 ± 10.1 | 34.4 ± 18.1 | 4.7 | 23.0 | 0.80 | 0.81 |
| RAV min (ml) | 49.9 ± 20.6 | 52.5 ± 21.9 | -2.6 | 18.3 | 0.91 | 0.95 |
| RAV max (ml) | 81.8 ± 25.9 | 81.6 ± 26.1 | 0.2 | 10.2 | 0.98 | 0.99 |
| LA rapid strain (%)\* | 20.4 ± 15.0 | 16.0 ± 16.4 | -1.5 | 20.4 | 0.92 | 0.96 |
| RA rapid strain (%) | 26.6 ± 9.1 | 21.9 ± 10.6 | 4.7 | 14.3 | 0.74 | 0.84 |
| Healthy controls |  |  |  |  |  |
| LA EF (%) | 60.1 ± 8.7 | 59.3 ± 9.4 | 0.6 | 12.2 | 0.77 | 0.87 |
| LAV min (ml)\* | 24.9 ± 14.5 | 24.2 ± 15.5 | -0.3 | 12.7 | 0.84 | 0.91 |
| LAV max (ml) | 64.4 ± 29.7 | 63.0 ± 28.9 | 1.6 | 11.9 | 0.94 | 0.97 |
| RA EF (%) | 48.2 ± 11.9 | 46.0 ± 10.5 | 2.4 | 21.6 | 0.51 | 0.68 |
| RAV min (ml)\* | 36.8 ± 20.6 | 36.6 ± 19.3 | 0.2 | 15.1 | 0.90 | 0.95 |
| RAV max (ml)\* | 73.7 ± 39.6 | 73.8 ± 24.1 | 3.7 | 19.6 | 0.92 | 0.96 |
| LA rapid strain (%)\* | 31.4 ± 20.8 | 36.6 ± 18.0 | -0.8 | 20.8 | 0.81 | 0.89 |
| RA rapid strain (%)\* | 34.4 ± 15.1 | 37.4 ± 10.8 | 0.2 | 20.0 | 0.59 | 0.74 |
| Diff, mean difference; LoA, limits of agreement; ICC, intraclass correlation coefficient; LA, left atrial; EF, ejection fraction; LAV, left atrial volume; min, minimum; max, maximum; RA, right atrial; RAV right atrial volumeContinuous parameters are expressed as mean ± standard deviation. \*variable not normally distributed, reported as median ± quartile deviation (Q3-Q1) |