

SUPPLEMENTAL MATERIAL

**Preclinical Systolic and Diastolic Dysfunction in Metabolically Healthy
and Unhealthy Obese Individuals**

Supplemental Table 1. Association of global longitudinal strain with obesity with or without metabolic syndrome compared with healthy controls after additional adjustment for metabolic factors

| Model | OB/MS- vs controls | | OB/MS+ vs controls | |
|--------------------------------------|---------------------------------|-----------------|---------------------------------|-----------------|
| | β (s.e) | <i>P</i> | β (s.e) | <i>P</i> |
| Base model* | 2.5 (0.7) | 0.001 | 1.0 (0.3) | 0.001 |
| Base model + systolic blood pressure | 1.9 (0.8) | 0.015 | 0.7 (0.3) | 0.01 |
| Base model + waist circumference | 2.0 (0.8) | 0.02 | 0.5 (0.4) | 0.16 |
| Base model + fasting glucose | 2.3 (0.7) | 0.003 | 0.9 (0.3) | 0.002 |
| Base model + TG/HDL ratio | 1.9 (0.7) | 0.02 | 1.1 (0.3) | 0.001 |

*Adjusted for age, sex, race, heart rate

Supplemental Table 2. Sensitivity analysis excluding hypertensive individuals (n=96)

| | OB/MS- vs. controls | | OB/MS+ vs. controls | | OB/MS+ vs. OB/MS- | |
|--|----------------------------------|-----------------|----------------------------------|-----------------|----------------------------------|-----------------|
| | β (s.e)* | <i>P</i> | β (s.e)* | <i>P</i> | β (s.e)* | <i>P</i> |
| Left atrial diameter | 4.5 (1.3) | 0.001 | 2.6 (0.4) | <0.001 | | |
| Left ventricular end-diastolic dimension | | | | | -3.3 (0.9) | 0.001 |
| Left ventricular end-systolic dimension | | | | | -2.8 (1.0) | 0.004 |
| Relative wall thickness | | | 0.02 (0.01) | 0.04 | | |
| LV mass/height ^{2.7} | 7.7 (2.4) | 0.002 | 4.3 (1.0) | <0.001 | | |
| Mitral A-flow | 7.1 (3.2) | 0.03 | 5.3 (1.3) | <0.001 | | |
| Mitral E/A ratio | | | -0.11 (0.04) | 0.005 | | |
| Isovolumic relaxation time | | | 5.5 (1.9) | 0.006 | | |
| Mitral e' (cm/s) | | | | | -0.9 (0.4) | 0.03 |
| E/e' ratio | | | | | | |
| Global longitudinal strain | 2.0 (0.8) | 0.02 | | | | |
| Time-based dyssynchrony | 10.2 (3.9) | 0.01 | 5.8 (1.7) | 0.001 | | |

* β estimate represents difference in echocardiographic characteristic between two groups after adjustment for age, sex, race, and heart rate. Regression models with $P > 0.05$ for differences between groups are not displayed.

Supplemental Table 3. Sensitivity analysis excluding diabetic individuals (n=57)

| | OB/MS- vs. controls | | OB/MS+ vs. controls | | OB/MS+ vs. OB/MS- | |
|--|----------------------------------|-----------------|----------------------------------|-----------------|----------------------------------|-----------------|
| | β (s.e)* | <i>P</i> | β (s.e)* | <i>P</i> | β (s.e)* | <i>P</i> |
| Left atrial diameter | 5.7 (1.2) | <0.001 | 3.0 (0.4) | <0.001 | | |
| Left ventricular end-diastolic dimension | 3.7 (1.1) | 0.002 | | | -2.3 (0.9) | 0.007 |
| Left ventricular end-systolic dimension | 2.8 (1.0) | 0.008 | | | -2.5 (0.8) | 0.003 |
| Relative wall thickness | | | 0.03 (0.01) | 0.003 | | |
| LV mass/height ^{2.7} | 11.2 (2.5) | <0.001 | 5.3 (1.0) | <0.001 | | |
| Mitral A-flow | 8.1 (3.2) | 0.01 | 7.0 (1.2) | <0.001 | | |
| Mitral E/A ratio | | | -0.12 (0.03) | <0.001 | | |
| Isovolumic relaxation time | | | 5.7 (1.8) | 0.002 | | |
| Mitral e' (cm/s) | | | -0.8 (0.2) | 0.001 | -1.1 (0.4) | 0.01 |
| E/e' ratio | 1.0 (0.5) | 0.04 | 0.9 (0.3) | 0.001 | 1.1 (0.5) | 0.01 |
| Global longitudinal strain | 2.5 (0.7) | 0.001 | 0.8 (0.3) | 0.01 | | |
| Time-based dyssynchrony | 10.8 (3.3) | 0.002 | 7.3 (1.4) | <0.001 | | |

* β estimate represents difference in echocardiographic characteristic between two groups after adjustment for age, sex, race, heart rate. Regression models with $P > 0.05$ for differences between groups are not displayed.