Supplementary Figure 1. Analytic population

ARIC Visit 5 participants with diabetes (n = 2,251)

Demographic exclusions:
• Self-reported race other than white or black (n = 6)
• Blacks at Minneapolis or Washington County (n = 16)

Missing measurements:
• Missing smoking information (n = 175)
• Missing blood pressure measurement (n = 12)
• Missing cholesterol measurements (n = 28)
• Missing hypertension or cholesterol-lowering medication use (n = 30)
• Missing hemoglobin A1c (n = 3)
• Missing high-sensitivity cardiac troponin T or I (n = 4)
• Missing comorbidity information (n = 121)
• Missing frailty or dementia assessment (n = 3)

Analytic population with complete lab data (n = 1,853)
### Supplementary Table 1. Baseline characteristics of older adults with diabetes according to hs-cTnI categories, the Atherosclerosis Risk in Communities (ARIC) Study, Visit 5 (2011-2013), N=1,738

| hs-cTnI categories | Percentile range | <40th | 40th to <55th | 55th to <70th | 70th to <85th | ≥85th |
|--------------------|-----------------|-------|---------------|---------------|---------------|-------|
| N                  |                 | 727   | 270           | 281           | 296           | 279   |
| Visit 5 age, mean (SD) |               | 74.0 (4.5) | 76.0 (4.7) | 75.5 (5.0) | 77.4 (5.6) | 76.9 (5.6) |
| Male               |                 | 239 (32.9%) | 102 (37.8%) | 138 (49.1%) | 147 (49.7%) | 168 (60.2%) |
| Black race         |                 | 187 (25.7%) | 81 (30.0%) | 96 (34.2%) | 83 (28.0%) | 120 (43.0%) |
| Current smoker     |                 | 42 (5.8%) | 14 (5.2%) | 18 (6.4%) | 11 (3.7%) | 22 (7.9%) |
| **Blood pressure** |                 |       |               |               |               |       |
| Systolic           |                 | 127.5 (16.5) | 129.5 (18.5) | 132.0 (20.5) | 134.1 (19.6) | 132.8 (20.9) |
| Diastolic          |                 | 65.4 (10.2) | 64.7 (10.1) | 65.7 (10.8) | 64.7 (11.7) | 63.6 (11.9) |
| Hypertension medication use |           | 541 (74.4%) | 218 (80.7%) | 247 (87.9%) | 259 (87.5%) | 245 (87.8%) |
| Total cholesterol, mmol/L, mean (SD) |            | 4.5 (1.0) | 4.5 (1.0) | 4.2 (1.1) | 4.3 (1.1) | 4.3 (1.1) |
| HDL-Cholesterol, mmol/L, mean (SD) |            | 1.3 (0.3) | 1.2 (0.3) | 1.2 (0.3) | 1.2 (0.3) | 1.2 (0.3) |
| Cholesterol-lowering medication use |            | 491 (67.5%) | 181 (67.0%) | 214 (76.2%) | 210 (70.9%) | 202 (72.4%) |
| **ADA Comorbidities** |              |       |               |               |               |       |
| Coronary heart disease |             | 76 (10.5%) | 45 (16.7%) | 60 (21.4%) | 83 (28.0%) | 99 (35.5%) |
| Heart failure       |                 | 87 (12.0%) | 56 (20.7%) | 68 (24.2%) | 100 (33.8%) | 119 (42.7%) |
| Stroke              |                 | 22 (3.0%) | 14 (5.2%) | 16 (5.7%) | 23 (7.8%) | 23 (8.2%) |
| Arthritis           |                 | 496 (68.2%) | 202 (74.8%) | 198 (70.5%) | 222 (75.0%) | 210 (75.3%) |
| Cancer              |                 | 162 (22.3%) | 56 (20.7%) | 70 (24.9%) | 73 (24.7%) | 76 (27.2%) |
| Chronic Kidney Disease, Stage 3+ |           | 206 (28.3%) | 131 (48.5%) | 140 (49.8%) | 183 (61.8%) | 179 (64.2%) |
| Depression          |                 | 20 (2.8%) | 8 (3.0%) | 11 (3.9%) | 7 (2.4%) | 13 (4.7%) |
| Emphysema or COPD   |                 | 54 (7.4%) | 20 (7.4%) | 14 (5.0%) | 23 (7.8%) | 30 (10.8%) |
| History of hospitalized fall |           | 22 (3.0%) | 8 (3.0%) | 10 (3.6%) | 13 (4.4%) | 15 (5.4%) |
| History of severe hypoglycemia |          | 7 (1.0%) | 11 (4.1%) | 8 (2.8%) | 15 (5.1%) | 15 (5.4%) |
| Hypertension        |                 | 573 (78.8%) | 229 (84.8%) | 253 (90.0%) | 267 (90.2%) | 256 (91.8%) |

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| Incontinence          | 76 (10.5%) | 39 (14.4%) | 34 (12.1%) | 42 (14.2%) | 43 (15.4%) |
|-----------------------|------------|------------|------------|------------|------------|
| Geriatric syndromes   |            |            |            |            |            |
| Dementia              | 15 (2.1%)  | 13 (4.8%)  | 15 (5.3%)  | 23 (7.8%)  | 27 (9.7%)  |
| Frailty               | 41 (5.6%)  | 18 (6.7%)  | 31 (11.0%) | 58 (19.6%) | 44 (15.8%) |
| hs-cTnI, ng/L, median (Q1, Q3) | 2.1 (1.6, 2.5) | 3.4 (3.2, 3.7) | 4.5 (4.2, 4.9) | 6.7 (6.0, 7.8) | 16.7 (11.5, 27.3) |
| hs-cTnT, ng/L, median (Q1, Q3) | 9.0 (6.0, 12.0) | 11.0 (9.0, 16.0) | 13.0 (10.0, 19.0) | 16.5 (12.0, 22.0) | 26.0 (16.0, 40.0) |
| Hemoglobin A1c, %, mean(SD) | 6.5 (1.0)  | 6.6 (1.0)  | 6.7 (1.0)  | 6.7 (1.2)  | 6.8 (1.3)  |
| Diabetes medication use |            |            |            |            |            |
| No medication         | 335 (46.1%) | 119 (44.1%) | 102 (36.3%) | 119 (40.2%) | 98 (35.1%) |
| Oral(s) only          | 327 (45.0%) | 116 (43.0%) | 124 (44.1%) | 121 (40.9%) | 111 (39.8%) |
| Insulin only          | 30 (4.1%)  | 13 (4.8%)  | 22 (7.8%)  | 25 (8.4%)  | 43 (15.4%) |
| Insulin and oral(s)   | 35 (4.8%)  | 22 (8.1%)  | 33 (11.7%) | 31 (10.5%) | 27 (9.7%)  |

Abbreviations: COPD – chronic obstructive pulmonary disease; hs-cTnI – high-sensitivity cardiac troponin I; hs-cTnT – high-sensitivity cardiac troponin T
**Supplementary Table 2.** Baseline characteristics of older adults with diabetes according to hs-cTnT categories, the Atherosclerosis Risk in Communities (ARIC) Study, Visit 5 (2011-2013), N=1,738

| Percentile range | <40th | 40th to <55th | 55th to <70th | 70th to <85th | ≥85th |
|------------------|-------|---------------|---------------|---------------|-------|
| N                | 741   | 228           | 319           | 286           | 279   |
| Visit 5 age, mean (SD) | 73.8 (4.3) | 75.7 (4.8) | 76.1 (5.3) | 76.7 (5.1) | 78.1 (5.6) |
| Male             | 192 (25.9%) | 87 (38.2%) | 153 (48.0%) | 169 (59.1%) | 193 (69.2%) |
| Black race       | 204 (27.5%) | 73 (32.0%) | 103 (32.3%) | 88 (30.8%) | 99 (35.5%) |
| Current smoker   | 52 (7.0%) | 11 (4.8%) | 13 (4.1%) | 16 (5.6%) | 15 (5.4%) |
| Blood pressure   |       |               |               |               |       |
| Systolic         | 129.4 (17.8) | 132.0 (19.4) | 130.1 (18.6) | 131.1 (19.7) | 130.8 (20.2) |
| Diastolic        | 66.1 (10.2) | 65.3 (11.2) | 65.5 (11.1) | 63.8 (10.3) | 62.1 (11.8) |
| Hypertension medication use | 574 (77.5%) | 182 (79.8%) | 268 (84.0%) | 246 (86.0%) | 240 (86.0%) |
| Total cholesterol, mmol/L, mean (SD) | 4.5 (1.1) | 4.5 (1.0) | 4.3 (1.0) | 4.2 (1.0) | 4.2 (1.2) |
| HDL-Cholesterol, mmol/L, mean (SD) | 1.3 (0.3) | 1.3 (0.3) | 1.2 (0.3) | 1.2 (0.3) | 1.1 (0.3) |
| Cholesterol-lowering medication use | 493 (66.5%) | 159 (69.7%) | 224 (70.2%) | 209 (73.1%) | 213 (76.3%) |
| ADA Comorbidities |       |               |               |               |       |
| Coronary heart disease | 81 (10.9%) | 42 (18.4%) | 59 (18.5%) | 78 (27.3%) | 103 (36.9%) |
| Heart failure     | 104 (14.0%) | 51 (22.4%) | 68 (21.3%) | 78 (27.3%) | 129 (46.2%) |
| Stroke            | 24 (3.2%) | 5 (2.2%) | 23 (7.2%) | 19 (6.6%) | 27 (9.7%) |
| Arthritis         | 521 (70.3%) | 155 (68.0%) | 232 (72.7%) | 205 (71.7%) | 215 (77.1%) |
| Cancer            | 145 (19.6%) | 52 (22.8%) | 82 (25.7%) | 71 (24.8%) | 87 (31.2%) |
| Chronic Kidney Disease, Stage 3+ | 210 (28.3%) | 93 (40.8%) | 158 (49.5%) | 169 (59.1%) | 209 (74.9%) |
| Depression        | 24 (3.2%) | 5 (2.2%) | 8 (2.5%) | 9 (3.1%) | 13 (4.7%) |
| Emphysema or COPD | 50 (6.7%) | 16 (7.0%) | 21 (6.6%) | 22 (7.7%) | 32 (11.5%) |
| History of hospitalized fall | 20 (2.7%) | 9 (3.9%) | 12 (3.8%) | 12 (4.2%) | 15 (5.4%) |
| History of severe hypoglycemia | 10 (1.3%) | 8 (3.5%) | 8 (2.5%) | 9 (3.1%) | 21 (7.5%) |
| Hypertension      | 602 (81.2%) | 195 (85.5%) | 275 (86.2%) | 256 (89.5%) | 250 (89.6%) |
### SUPPLEMENTARY DATA

| Incontinence | 79 (10.7%) | 27 (11.8%) | 42 (13.2%) | 38 (13.3%) | 48 (17.2%) |
|--------------|------------|------------|------------|------------|------------|

#### Geriatric syndromes

| Dementia     | 20 (2.7%)  | 11 (4.8%)  | 16 (5.0%)  | 15 (5.2%)  | 31 (11.1%) |
|--------------|------------|------------|------------|------------|------------|
| Frailty      | 39 (5.3%)  | 22 (9.6%)  | 28 (8.8%)  | 49 (17.1%) | 54 (19.4%) |

| hs-cTnl, ng/L, median (Q1, Q3) | 2.5 (1.8, 3.6) | 3.6 (2.5, 5.1) | 4.0 (2.7, 5.7) | 5.3 (3.6, 8.3) | 10.0 (5.3, 20.9) |
|------------------------------|----------------|----------------|----------------|----------------|------------------|
| hs-cTnT, ng/L, median (Q1, Q3) | 7.0 (5.0, 9.0) | 11.0 (11.0, 12.0) | 14.0 (13.0, 15.0) | 20.0 (18.0, 22.0) | 35.0 (29.0, 47.0) |
| Hemoglobin A1c, %, mean(SD)  | 6.4 (1.0)     | 6.6 (1.1)     | 6.6 (1.1)     | 6.8 (1.2)     | 6.8 (1.3)        |

#### Diabetes medication use

| No medication     | 363 (49.0%) | 101 (44.3%) | 125 (39.2%) | 94 (32.9%) | 90 (32.3%) |
|--------------------|-------------|-------------|-------------|------------|------------|
| Oral(s) only       | 313 (42.2%) | 100 (43.9%) | 145 (45.5%) | 131 (45.8%)| 110 (39.4%)|
| Insulin only       | 29 (3.9%)   | 10 (4.4%)   | 22 (6.9%)   | 25 (8.7%)  | 47 (16.8%) |
| Insulin and oral(s)| 36 (4.9%)   | 17 (7.5%)   | 27 (8.5%)   | 36 (12.6%) | 32 (11.5%) |

**Abbreviations:** COPD – chronic obstructive pulmonary disease; hs-cTnl – high-sensitivity cardiac troponin I; hs-cTnT – high-sensitivity cardiac troponin T
Supplementary Figure 2. Hazard ratios (95% confidence interval) of the association of hs-cTnI and hs-cTnT percentile categories with all-cause mortality among those without prevalent cardiovascular disease (N = 1,212), adjusted for age, male sex, race-center, current smoking, systolic blood pressure, diastolic blood pressure, anti-hypertensive medication use, total cholesterol, HDL-cholesterol, cholesterol-lowering medication use, and hemoglobin A1c.
**Supplementary Table 3.** Sensitivity, specificity, likelihood ratios (LR) positive predictive value (PPV) and negative predictive value (NPV) associated with representative hs-cTnl and hs-cTnT cutpoints at the 90th, 95th, and 99th percentile in the ARIC cohort with diabetes (N= 1,853).

|       | Cutpoint | Sensitivity | Specificity | LR+ | LR- | PPV | NPV |
|-------|----------|-------------|-------------|-----|-----|-----|-----|
| **hs-cTnl** |          |             |             |     |     |     |     |
|       | 12.9 ng/L | 22%         | 93%         | 3.4 | 0.8 | 49% | 80% |
|       | 23.0 ng/L | 11%         | 97%         | 3.5 | 0.9 | 51% | 79% |
|       | 67.9 ng/mL| 2%          | 99%         | 3.1 | 1.0 | 47% | 79% |
| **hs-cTnT** |          |             |             |     |     |     |     |
|       | 30.0 ng/L | 27%         | 94%         | 4.5 | 0.8 | 57% | 82% |
|       | 41.0 ng/L | 15%         | 98%         | 6.5 | 0.9 | 65% | 80% |
|       | 76.0 ng/mL| 4%          | 99.7%       | 12.9| 1.0 | 76% | 78% |
**Supplementary Table 4.** Percent (95% confidence interval) reclassified based on addition of hs-cTnI or hs-cTnT to base models for all-cause mortality.

| Base Model* | Died | Did not die | Weighted NRI (compared to base model) |
|-------------|------|-------------|--------------------------------------|
|             | Increased Predicted Risk | Decreased Predicted Risk | Increased Predicted Risk | Decreased Predicted Risk |
| + comorbidity burden (≥3 comorbidities) | 17.3 (15.5, 19.0) | 5.3 (4.3, 6.3) | 42.1 (39.8, 44.5) | 35.2 (33.0, 37.4) | 0.06 (0.001, 0.11) |
| + hs-cTnI ≥ 85th percentile | 7.7 (6.5, 9.0) | 14.8 (13.3, 16.4) | 15.4 (13.8, 17.1) | 61.9 (59.6, 64.2) | 0.39 (0.34, 0.44) |
| + log2(hs-cTnI) | 11.3 (9.9, 12.7) | 11.3 (9.8, 12.7) | 25.3 (23.3, 27.2) | 52.1 (49.8, 54.4) | 0.30 (0.24, 0.35) |
| + hs-cTnT ≥ 85th percentile | 9.0 (7.6, 10.3) | 13.6 (12.1, 15.1) | 20.6 (18.8, 22.3) | 56.8 (54.6, 59.0) | 0.31 (0.26, 0.36) |
| + log2(hs-cTnT) | 12.5 (11.0, 13.9) | 10.1 (8.7, 11.4) | 27.7 (25.7, 29.7) | 49.6 (47.4, 52.0) | 0.26 (0.21, 0.32) |

* Age, male sex, race-center, current smoking, systolic blood pressure, diastolic blood pressure, anti-hypertensive medication use, total cholesterol, HDL-cholesterol, cholesterol-lowering medication use, and hemoglobin A1c

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**Supplementary Table 5.** Percent (95% confidence interval) reclassified based on addition of hs-cTnI or hs-cTnT to base models with comorbidity burden for all-cause mortality

|                           | Died Increased Predicted Risk | Died Decreased Predicted Risk | Did not die Increased Predicted Risk | Did not die Decreased Predicted Risk | Weighted NRI |
|---------------------------|--------------------------------|--------------------------------|--------------------------------------|--------------------------------------|--------------|
| Base Model* with comorbidity burden (≥3 comorbidities) |                                 |                                |                                      |                                      |              |
| + hs-cTnI ≥ 85th percentile | 7.6 (6.4, 8.8)                  | 14.9 (13.4, 16.5)              | 18.8 (17.0, 20.6)                    | 58.6 (56.3, 60.9)                    | 0.32 (0.26, 0.37) |
| + log2(hs-cTnI)            | 11.2 (9.8, 12.6)                | 11.4 (10.0, 12.8)              | 27.3 (25.3, 29.3)                    | 50.0 (47.7, 52.3)                    | 0.24 (0.19, 0.30) |
| + hs-cTnT ≥ 85th percentile | 9.3 (7.9, 10.6)                 | 13.3 (11.8, 14.8)              | 25.5 (23.6, 27.4)                    | 51.9 (49.6, 54.1)                    | 0.22 (0.16, 0.27) |
| + log2(hs-cTnT)            | 12.4 (10.9, 13.8)               | 10.2 (8.9, 11.5)               | 29.4 (27.3, 31.5)                    | 47.9 (45.6, 50.3)                    | 0.23 (0.18, 0.29) |
| Base Model* with comorbidity burden (≥3 comorbidities or dementia or frailty) |                                 |                                |                                      |                                      |              |
| + hs-cTnI ≥ 85th percentile | 7.6 (6.3, 8.8)                  | 15.0 (13.3, 16.7)              | 18.8 (17.1, 20.6)                    | 58.5 (56.3, 60.7)                    | 0.32 (0.27, 0.36) |
| + log2(hs-cTnI)            | 11.1 (9.7, 12.5)                | 11.5 (10.1, 12.9)              | 27.4 (25.3, 29.4)                    | 50.0 (47.6, 52.3)                    | 0.24 (0.18, 0.29) |
| + hs-cTnT ≥ 85th percentile | 9.1 (7.8, 10.5)                 | 13.4 (11.9, 15.0)              | 25.0 (23.2, 26.9)                    | 52.3 (50.0, 54.6)                    | 0.22 (0.17, 0.27) |
| + log2(hs-cTnT)            | 12.3 (10.8, 13.8)               | 10.3 (8.9, 11.6)               | 29.4 (27.3, 31.5)                    | 47.9 (45.6, 50.3)                    | 0.23 (0.17, 0.28) |

* Age, male sex, race-center, current smoking, systolic blood pressure, diastolic blood pressure, anti-hypertensive medication use, total cholesterol, HDL-cholesterol, cholesterol-lowering medication use, and hemoglobin A1c
**Supplementary Figure 3.** Hazard ratios (95% confidence interval) of all-cause mortality associated with cross-categories of high hs-cTnT or high hs-cTnI and high comorbidity burden or dementia or frailty, adjusted for age, male sex, race-center, smoking, systolic blood pressure, diastolic blood pressure, anti-hypertensive medication use, total cholesterol, HDL-cholesterol, cholesterol-lowering medication use, and hemoglobin A1c.