SUPPLEMENTAL MATERIAL

Figure S1. CONSORT diagram

3M TAVR Study (n=411) → S3i Registry (n= 1077)

- 126 non-TF excluded
- 223 unable to be linked to CMS

S3i Registry sample (n=728)

3M TAVR propensity matched (n=351) → S3i Registry propensity matched (n=351)

TF=transfemoral, CMS=Centers for Medicare and Medicaid Services
Figure S2. Standardized mean differences in baseline characteristics of the propensity-matched 3M and S3i populations before and after matching

SF 12 PCS=Short Form 12 Physical Component Summary, SF 12 MCS=Short Form 12 Mental Component Summary, LV=left ventricle, BMI=body mass index, COPD=chronic obstructive pulmonary disease, CABG=coronary artery bypass graft, PCI=percutaneous coronary intervention, STS=Society of Thoracic Surgeons, KCCQ12=Kansas City Cardiomyopathy Questionnaire 12.
Figure S3. Histogram with overlaid density curve of distribution of costs

A. Index hospitalization costs
B. Follow up costs
C. Total 30-day costs

![Total 30-Day Costs Diagram](image-url)
Table S1. Details of regression models of imputed costs based on CMS-linked S3i cohort

| Model dependent variable | Independent variables                                                                 | Model type                      | Model $R^2$ (for linear models) |
|--------------------------|--------------------------------------------------------------------------------------|---------------------------------|---------------------------------|
| Index hospitalization costs |                                                                                        |                                 |                                 |
| In-hospital non-procedure costs | Age, sex, ICU LOS, non-ICU LOS, bleeding, new pacemaker                              | Linear                          | 0.693                           |
| Index physician cost     | Age, sex, ICU LOS, non-ICU LOS, room time, stroke, bleeding, new pacemaker           | Linear                          | 0.640                           |
| Follow-up costs          |                                                                                        |                                 |                                 |
| Rehospitalization costs  | Age, sex, number of hospital days                                                    | Linear                          | 0.263                           |
| SNF/rehab costs          | Age, sex, number of SNF/rehab days                                                   | Linear                          | 0.246                           |
| Follow up outpatient services costs | Age, sex, history of carotid disease, history of atrial fibrillation, history of COPD, history of renal disease, major vascular complication, stroke, bleeding, new pacemaker, AKI | GLM with gamma distribution, log link |                                 |
| Follow up physician costs | Age, sex, history of carotid disease, history of atrial fibrillation, history of COPD, history of renal disease, major vascular complication, stroke, bleeding, new pacemaker, AKI | GLM with gamma distribution, log link |                                 |
| Home health aide/hospice costs | Age, sex, history of atrial fibrillation, history of COPD, history of renal disease, major vascular complication, stroke, bleeding, new pacemaker, AKI | GLM with gamma distribution, log link |                                 |

LOS=length of stay; SNF=skilled nursing facility, COPD=chronic obstructive pulmonary disease, AKI=acute kidney injury
Table S2. Baseline characteristics of the 3M-TAVR and transfemoral CMS-linked S3i populations

| Variable                                | 3M n (%) | S3i n (%) | Standardized difference |
|-----------------------------------------|----------|-----------|-------------------------|
| N                                       | 411 (100)| 728 (100) |                         |
| Age (yr) (mean±sd)                      | 81.8 ± 7.5| 82.5 ± 6.3| -0.100                  |
| Male Sex                                | 250 (60.8)| 456 (62.6)| -0.037                  |
| STS Risk Score (mean±sd)                | 5.4 ± 2.8 | 5.3 ± 1.3 | 0.031                   |
| BMI (mean±sd)                           | 27.6 ± 5.7| 28.5 ± 5.8| -0.163                  |
| Prior CABG                              | 95 (23.1)| 186 (25.5)| -0.057                  |
| Prior PCI                               | 119 (29.0)| 223 (30.6)| -0.037                  |
| Cerebral Vascular Accident             | 34 (8.3) | 62 (8.5)  | -0.009                  |
| Peripheral Vascular Disease            | 49 (11.9)| 175 (24.0)| -0.320                  |
| Diabetes Mellitus                       | 100 (24.3)| 234 (32.1)| -0.174                  |
| COPD                                    | 90 (21.9)| 196 (26.9)| -0.117                  |
| Atrial Fibrillation                     | 84 (20.4)| 273 (37.5)| -0.383                  |
| Permanent Pacemaker                     | 61 (14.8)| 102 (14.0)| 0.024                   |
| LV Ejection Fraction (mean±sd)          | 56.2 ± 9.8| 58.9 ± 12.6| -0.236                  |
| Porcelain Aorta                         | 15 (3.6) | 1 (0.1)   | 0.260                   |
| Renal Insufficiency                     | 12 (2.9) | 60 (8.2)  | -0.233                  |
| Carotid Disease                         | 21 (5.1) | 152 (20.9)| -0.482                  |
| Current smoker                          | 16 (3.9)| 15 (2.1)  | 0.108                   |
| KCCQ-12 Overall Summary Score (mean±sd) | 53.1 ± 22.2| 53.6 ± 21.5| -0.023                  |
| SF12 PCS (mean±sd)                      | 33.6 ± 9.6| 36.3 ± 8.4| -0.298                  |
| SF12 MCS (mean±sd)                      | 50.6 ± 10.8| 47.7 ± 11.3| 0.265                   |
| Anesthesia type                         |          |           |                         |
| Local/conscious sedation                | 403 (98.3)| 95 (13.1) |                         |
| General                                 | 7 (1.7) | 632 (86.9) | 3.338                   |

sd=standard deviation, STS=Society of Thoracic Surgeons, BMI=body mass index, CABG=coronary artery bypass grafting, PCI=percutaneous coronary intervention, COPD=chronic obstructive pulmonary disease, LV=left ventricle, PCS=physical component score, MCS=mental component score
**Table S3. In-hospital length of stay by days**

| Hospital Length of Stay | 3M-TAVR | S3i | Difference* (95% CI) † | P-Value |
|-------------------------|---------|-----|------------------------|---------|
| ICU, days               |         |     |                        |         |
| 0                       | 79 (22.5%) | 19 (5.4%) | 17.1% (12.1%, 22.1%) | < 0.001 |
| 1                       | 233 (66.4%) | 219 (62.4%) | 4.0% (-3.1%, 11.1%) | 0.269   |
| 2                       | 27 (7.7%) | 65 (18.5%) | -10.8% (-15.8%, -5.9%) | < 0.001 |
| 3+                      | 12 (3.4%) | 48 (13.7%) | -10.3% (-14.3%, -6.2%) | < 0.001 |
| Non-ICU, days           |         |     |                        |         |
| 0                       | 247 (70.4%) | 58 (16.5%) | 53.8% (47.7%, 60.0%) | < 0.001 |
| 1                       | 62 (17.7%) | 102 (29.1%) | -11.4% (-17.6%, -5.2%) | < 0.001 |
| 2                       | 21 (6.0%) | 88 (25.1%) | -19.1% (-24.3%, -13.9%) | < 0.001 |
| 3+                      | 21 (6.0%) | 103 (29.3%) | -23.4% (-28.7%, -18.0%) | < 0.001 |
| Total, days             |         |     |                        |         |
| 0                       | 1 (0.3%) | 0 (0.0%) | 0.3% (-0.3%, 0.8%) | 1.000   |
| 1                       | 260 (74.1%) | 21 (6.0%) | 68.1% (62.9%, 73.3%) | < 0.001 |
| 2                       | 53 (15.1%) | 104 (29.6%) | -14.5% (-20.6%, -8.5%) | < 0.001 |
| 3+                      | 37 (10.5%) | 226 (64.4%) | -53.8% (-59.8%, -47.9%) | < 0.001 |

ICU=intensive care unit
Table S4. Follow up hospitalizations, hospital days, and SNF/rehab days

| Resource Use (count/patient) | 3M-TAVR       | S3i           | Difference (95% CI)* | P-Value |
|------------------------------|---------------|---------------|----------------------|---------|
| **Total hospitalizations**   |               |               |                      |         |
| 0                            | 315 (89.7%)   | 321 (91.5%)   | -1.7% (-6.0%, 2.6%)  | 0.437   |
| 1                            | 31 (8.8%)     | 26 (7.4%)     | 1.4% (-2.6%, 5.5%)   | 0.489   |
| 2                            | 4 (1.1%)      | 4 (1.1%)      | 0.0% (-1.6%, 1.6%)   | 1.000   |
| 3+                           | 1 (0.3%)      | 0 (0.0%)      | 0.3% (-0.3%, 0.8%)   | 1.000   |
| **CV hospitalizations**      |               |               |                      |         |
| 0                            | 334 (95.2%)   | 334 (95.2%)   | 0.0% (-3.2%, 3.2%)   | 1.000   |
| 1                            | 13 (3.7%)     | 17 (4.8%)     | -1.1% (-4.1%, 1.9%)  | 0.455   |
| 2                            | 4 (1.1%)      | 0 (0.0%)      | 1.1% (0.0%, 2.3%)    | 0.123   |
| 3+                           | 0 (0.0%)      | 0 (0.0%)      | 0.0% (0.0%, 0.0%)    |         |
| **Non-CV hospitalizations**  |               |               |                      |         |
| 0                            | 331 (94.3%)   | 336 (95.7%)   | -1.4% (-4.6%, 1.8%)  | 0.385   |
| 1                            | 19 (5.4%)     | 13 (3.7%)     | 1.7% (-1.4%, 4.8%)   | 0.277   |
| 2                            | 1 (0.3%)      | 2 (0.6%)      | -0.3% (-1.2%, 0.7%)  | 1.000   |
| 3+                           | 0 (0.0%)      | 0 (0.0%)      | 0.0% (0.0%, 0.0%)    | 0.385   |
| **Hospital days**            |               |               |                      |         |
| 0                            | 318 (90.6%)   | 321 (91.5%)   | -0.9% (-5.1%, 3.4%)  | 0.691   |
| 1-3                          | 15 (4.3%)     | 14 (4.0%)     | 0.3% (-2.7%, 3.2%)   | 0.849   |
| 4-7                          | 9 (2.6%)      | 10 (2.8%)     | -0.3% (-2.7%, 2.1%)  | 0.816   |
| 8+                           | 9 (2.6%)      | 6 (1.7%)      | 0.9% (-1.3%, 3.0%)   | 0.433   |
| **Rehab/SNF days**           |               |               |                      |         |
| 0                            | 344 (98.0%)   | 313 (89.2%)   | 8.8% (5.3%, 12.4%)   | < 0.001 |
| 1-7                          | 3 (0.9%)      | 10 (2.8%)     | -2.0% (-4.0%, 0.0%)  | 0.050   |
| 8-14                         | 0 (0.0%)      | 13 (3.7%)     | -3.7% (-5.7%, -1.7%) | < 0.001 |
| 15+                          | 4 (1.1%)      | 15 (4.3%)     | -3.1% (-5.5%, -0.7%) | 0.010   |
### Table S5. Cumulative costs (index hospitalization to 30 days)

|                          | 3M (N=351)          | S3i (N = 351)          | Difference [S3i- 3M TAVR] (95% CI)* | P-Value |
|--------------------------|----------------------|------------------------|-------------------------------------|---------|
| **Index Hospitalization, $** |                      |                        |                                     |         |
| Mean ± SD                | 45,595 ± 6344        | 56,438 ± 12,967        | -10,843 (-12,314, -9252)            | <0.001  |
| Median                   | 43,291               | 52,372                 |                                     |         |
| **Follow-Up (Discharge to 30 days), $** |                      |                        |                                     |         |
| Mean ± SD                | 3830 ± 6258          | 4291 ± 6986            | -462 (-1432, 472)                   | 0.358   |
| Median                   | 1784                 | 1281                   |                                     |         |
| **Total (Index to 30 days), $** |                      |                        |                                     |         |
| Mean ± SD                | 49,425 ± 9381        | 60,729 ± 15745         | -11,305 (-13,138, -9378)            | <0.001  |
| Median                   | 45,175               | 55,646                 |                                     |         |

*95% CI of cost difference and p-values derived via bootstrapping.

Index hospitalization and follow up costs each trimmed at 99th percentile prior to summation.
Table S6. In-hospital resource use and costs - sensitivity analysis, hospitalization and physician costs for the S3i group based on regression models instead of actual costs

|                          | 3M-TAVR     | S3i        | Difference* (95% CI) † | P-Value |
|--------------------------|-------------|------------|------------------------|---------|
| General Anesthesia, %    | 1.4         | 88.0       | -86.6 (81.4, 89.0)     | <0.001  |
| Procedure Duration       |             |            |                        |         |
| Skin-to-Skin Time, mins  | 50.2 ± 26.8 | 77.2 ± 37.5| -27.0 (-31.8, -22.2)  | < 0.001 |
| Total Room Time, mins    | 114.7 ± 30.1| 180.8 ± 50.0| -66.1 (-72.2, -60.0)  | < 0.001 |
| Hospital Length of Stay  |             |            |                        |         |
| ICU, days                | 1.1 ± 2.1   | 1.6 ± 1.7  | -0.5 (-0.8, -0.3)     | < 0.001 |
| Non-ICU, days            | 0.6 ± 1.3   | 2.3 ± 2.7  | -1.7 (-2, -1.4)       | < 0.001 |
| Total, days              | 1.6 ± 2.3   | 3.9 ± 3.3  | -2.2 (-2.6, -1.8)     | < 0.001 |
| Risk Adjusted Costs‡     |             |            |                        |         |
| Index Procedure, $       | 37,991 ± 1596| 39,542 ± 2394| -1551 (-1859, -1243) | <0.001  |
| Hospitalization, $       | 5612 ± 10399| 13,520 ± 12,398| -7908 (-9395, -6290) | <0.001  |
| Physician Fees, $        | 2573 ± 634  | 3204 ± 865 | -631 (-734, -521)    | <0.001  |
| Total, $§                | 45,595 ± 6344| 55,989 ± 12751| -10,394 (-11,811, -8814) | <0.001  |

*Absolute differences reported as 3M-TAVR minus S3i
†95% CIs for cost differences and p-values derived via bootstrapping
§Total costs trimmed at 99th percentile for overall cost

ICU = intensive care unit; mins = minutes
Table S7. Follow up and cumulative resource use and costs (through 30 days) - sensitivity analysis, costs for the S3i group using regression models instead of actual costs

| Resource Use (count/patient)                      | 3M-TAVR (Mean ± SD) | S3i (Mean ± SD) | Difference (95% CI)† | P-Value   |
|--------------------------------------------------|---------------------|-----------------|----------------------|-----------|
| Total hospitalizations                            | 0.12 ± 0.38         | 0.10 ± 0.33     | 0.023 (-0.03, 0.08) | 0.436     |
| CV hospitalizations                               | 0.06 ± 0.28         | 0.05 ± 0.22     | 0.01 (-0.03, 0.05)  | 0.973     |
| Non-CV hospitalizations                           | 0.06 ± 0.26         | 0.05 ± 0.24     | 0.01 (-0.03, 0.05)  | 0.393     |
| Hospital days                                     | 0.6 ± 3.2           | 0.4 ± 1.7       | 0.2 (-0.2, 0.6)     | 0.683     |
| Rehab/SNF days                                    | 0.4 ± 3.6           | 1.4 ± 4.5       | -0.9 (-1.6, -0.3)   | <.001     |

| Costs, $                                          |                     |                 |                     |           |
|---------------------------------------------------|---------------------|-----------------|---------------------|-----------|
| Total hospitalizations                            | 1976 ± 7395         | 1412 ± 4945     | 564 (-384, 1495)    | 0.244     |
| CV hospitalizations                               | 1088 ± 6326         | 825 ± 3939      | 263 (-451, 1109)    | 0.552     |
| Non-CV hospitalizations                           | 888 ± 3821          | 587 ± 3009      | 301 (-209, 790)     | 0.294     |
| Rehab/SNF stays                                   | 290 ± 2286          | 1051 ± 3235     | -761 (-1157, -340)  | <0.001    |
| Outpatient services                               | 382 ± 64            | 258 ± 201       | 124 (103, 147)      | <0.001    |
| Other†                                            | 820 ± 448           | 398 ± 530       | 422 (352, 497)      | <0.001    |
| Physician fees                                    | 613 ± 132           | 560 ± 255       | 53 (21, 81)         | <0.001    |

| Total follow-up cost‡                            |                     |                 |                     |           |
|---------------------------------------------------|---------------------|-----------------|---------------------|-----------|
| Mean ± SD                                         | 3707 ± 5652         | 3634 ± 6006     | 73 (-782, 905)      | 0.914     |
| Median                                            | 1784                | 1102            |                     |           |

| Cumulative costs                                  |                     |                 |                     |           |
|---------------------------------------------------|---------------------|-----------------|---------------------|-----------|
| Total 30-day costs                                |                     |                 |                     |           |
| Mean ± SD                                         | 49,302 ± 8937       | 59,623 ± 15,655 | -10,321 (-12,136, -8417) | <0.001|
| Median                                            | 45,175              | 54,518          |                     |           |

*95% CI for cost differences and p-values derived via bootstrapping
†Other costs include hospice and home health aide services
‡Risk adjusted using propensity matching. Trimmed at 99th percentile for overall cost

MI= myocardial infarction; SNF = skilled nursing facility; CV = cardiovascular