# MAIN FIGURES AND TABLES

**Figure 1.** Percent in-hospital mortality by quartiles of wait time for OHT after LVAD implantation and no OHT after LVAD implantation. Percent mortality for each quartile was calculated as number of deaths per quartile by total number of patients per quartile. LVAD, Left Ventricular Assist Device

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| Table 1. Baseline demographics for patients who waited 0-7 days, 8-31 days, 32-65 days, and ≥66 days for an Orthotopic Heart Transplant (OHT) after Left Ventricular Assist Device (LVAD) implantation | | | | | |
|  | **0-7 days (n = 41)** | **8-31 days (n = 38)** | **32-65 days (n = 42)** | **≥66 days  (n = 43)** | **No OHT**  **(n = 2036)** |
| Length of stay, mean ± SD | 39.3 ± 33.2 | 48.9 ± 25.6 | 85.8 ± 40.1 | 151.2 ± 52.6 | 37.1 ± 34.6 |
| Length of stay after OHT, mean ± SD | 23.8 ± 21.4 | 21.7 ± 15.8 | 27.6 ± 37.1 | 27.1 ± 22.8 | NA |
| Mortality, n (%) | 11 (26.8) | 5 (13.2) | 5 (11.9) | 5 (11.6) | 564 (27.3) |
| Age, mean ± SD | 50.6 ± 12.6 | 48.6 ± 12.7 | 47.4 ± 15.3 | 46.3 ± 13.1 | 55.4 ± 13.2 |
| Sex, n (%) | | | | | |
| Male | 33 (80.5) | 32 (84.2) | 35 (83.3) | 34 (79.1) | 1525 (74.9) |
| Female | 8 (19.5) | 6 (15.8) | 7 (16.7) | 9 (20.9) | 511 (25.1) |
| Race, n (%) | | | | | |
| White | 25 (61.0) | 19 (50.0) | 23 (54.8) | 22 (51.2) | 1185 (58.2) |
| Black | 3 (7.3) | 5 (13.2) | 8 (19.0) | 6 (14.0) | 330 (16.2) |
| Hispanic | 3 (7.3) | 7 (18.4) | 2 (4.8) | 5 (11.6) | 125 (6.1) |
| Asian/Pacific Islander | 2 (4.9) | 0 (0.0) | 1 (2.4) | 4 (9.3) | 44 (2.2) |
| Native American | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 5 (0.2) |
| Other or unknown | 8 (19.5) | 7 (18.4) | 8 (19.0) | 6 (14.0) | 347 (17.0) |
| Median household income, n (%) | | | | | |
| $1-24,999 | 4 (9.8) | 8 (21.1) | 8 (19.0) | 8 (18.6) | 447 (22.0) |
| $25,000-34,999 | 10 (24.4) | 10 (26.3) | 10 (23.8) | 7 (16.3) | 454 (22.3) |
| $35,000-44,999 | 12 (29.3) | 8 (21.1) | 10 (23.8) | 13 (30.2) | 509 (25.0) |
| $45,000 or more | 12 9 (29.3) | 12 (31.6) | 14 (33.3) | 14 (32.6) | 579 (28.4) |
| Unknown | 3 (7.3) | 0 (0.0) | 0 (0.0) | 1 (2.3) | 47 (2.3) |
| Comorbidities | | | | | |
| Diabetes | 8 (19.5) | 5 (13.2) | 4 (9.5) | 2 (4.7) | 373 (18.3) |
| Hyperlipidemia | 5 (12.2) | 2 (5.3) | 3 (7.1) | 3 (7.0) | 297 (14.6) |
| Hypertension | 5 (12.2) | 1 (2.6) | 2 (4.8) | 2 (4.7) | 291 (14.3) |
| History of smoking | 5 (12.2) | 2 (5.3) | 0 (0.0) | 0 (0.0) | 137 (6.7) |
| BMI ≥ 30 kg/m2 | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 96 (4.7) |
| Number of comorbid diagnoses, mean ± SD | 11.9 ± 3.1 | 12.3 ± 3.0 | 12.5 ± 3.2 | 12.5 ± 3.2 | 12.8 ± 2.9 |
| Location of hospital, n (%) | | | | | |
| Rural | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 17 (0.8) |
| Urban | 41 (100.0) | 38 (100.0) | 42 (100.0) | 43 (100.0) | 2017 (99.1) |
| Unknown | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 2 (0.1) |
| Size of hospital, n (%) | | | | | |
| Small | 4 (9.8) | 0 (0.0) | 0 (0.0) | 2 (4.7) | 32 (1.6) |
| Medium | 7 (17.0) | 6 (15.8) | 5 (11.9) | 0 (0.0) | 211 (10.4) |
| Large | 30 (73.2) | 32 (84.2) | 37 (88.1) | 41 (95.3) | 1791 (88.0) |
| Unknown | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 2 (0.1) |
| Teaching status of hospital, n (%) | | | | | |
| Nonteaching | 1 (2.4) | 1 (2.6) | 2 (4.8) | 1 (2.3) | 160 (7.9) |
| Teaching | 40 (97.6) | 37 (97.4) | 40 (95.2) | 42 (97.7) | 1874 (92.0) |
| Unknown | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 2 (0.1) |

SD, Standard Deviation; BMI, Body Mass Index; LVAD, Left Ventricular Assist Device; OHT, Orthotopic Heart Transplant

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| Table 2. Baseline demographics of all LVAD patients, LVAD patients from 1998-2005, and LVAD patients from 2006-2011. | | | | |
|  | **All LVADs (n = 2200)** | **1998-2005 (n = 589)** | **2006-2011 (n = 1611)** | **p-valuea** |
| Mortality, n (%) | 590 (26.5) | 253 (43.0) | 329 (20.4) | <0.001 |
| Same admission OHT, n (%) | 164 (7.5) | 102 (17.3) | 62 (3.8) | <0.001 |
| Length of stay, mean ± SD | 40.5 ± 38.9 | 44.7 ± 48.6 | 39.0 ± 34.6 | 0.008 |
| Age, mean ± SD | 53.4 ± 13.7 | 53.2 ± 13.4 | 55.4 ± 13.4 | <0.001 |
| Sex, n (%) | | | |  |
| Male | 1659 (75.4) | 433 (73.5) | 1226 (76.1) | 0.23 |
| Female | 541 (24.6) | 156 (26.5) | 385 (23.9) |  |
| Race, n (%) | | | | <0.001 |
| White | 1274 (57.9) | 327 (55.5) | 947 (58.8) |  |
| Black | 352 (16.0) | 62 (10.5) | 290 (18.0) |  |
| Hispanic | 142 (6.5) | 28 (4.8) | 114 (7.1) |  |
| Asian/Pacific Islander | 51 (2.3) | 13 (2.2) | 38 (2.4) |  |
| Native American | 5 (0.2) | 1 (0.2) | 4 (0.2) |  |
| Other or unknown | 376 (17.1) | 143 (24.3) | 148 (9.2) |  |
| Median household income, n (%) | | | | <0.001 |
| $1-24,999 | 475 (21.6) | 88 (14.9) | 387 (24.0) |  |
| $25,000-34,999 | 491 (22.3) | 126 (21.4) | 365 (22.7) |  |
| $35,000-44,999 | 552 (25.1) | 141 (23.9) | 411 (25.5) |  |
| $45,000 or more | 631 (28.7) | 214 (36.3) | 417 (25.9) |  |
| Unknown | 51 (2.3) | 20 (3.4) | 31 (2.4) |  |
| Comorbidities | | | |  |
| Diabetes | 391 (17.8) | 91 (15.4) | 300 (18.6) | 0.097 |
| Hyperlipidemia | 310 (14.1) | 61 (10.4) | 249 (15.5) | 0.003 |
| Hypertension | 309 (14.0) | 88 (14.9) | 221 (13.7) | 0.508 |
| History of smoking | 131 (6.0) | 29 (4.9) | 102 (6.3) | 0.257 |
| BMI ≥ 30 kg/m2 | 96 (4.4) | 12 (2.0) | 84 (5.2) | 0.002 |
| Number of comorbid diagnosis, mean ± SD | 12.7 ± 2.9 | 10.6 ± 2.9 | 13.5 ± 2.5 | <0.001 |
| Location of hospital, n (%) | | | | 0.73 |
| Rural | 17 (0.8) | 5 (0.8) | 12 (0.7) |  |
| Urban | 2181 (99.1) | 583 (99.0) | 1598 (99.2) |  |
| Unknown | 2 (0.1) | 1 (0.2) | 1 (0.1) |  |
| Size of hospital, n (%) | | | | 0.002 |
| Small | 38 (1.7) | 20 (3.4) | 18 (1.1) |  |
| Medium | 229 (10.4) | 67 (11.4) | 162 (10.1) |  |
| Large | 1931 (87.8) | 501 (85.1) | 1430 (88.8) |  |
| Unknown | 2 (0.1) | 1 (0.2) | 1 (0.1) |  |
| Teaching status of hospital, n (%) | | | | <0.001 |
| Nonteaching | 165 (7.5) | 75 (12.7) | 90 (5.6) |  |
| Teaching | 2033 (92.4) | 513 (87.1) | 1520 (94.4) |  |
| Unknown | 2 (0.1) | 1 (0.2) | 1 (0.1) |  |

aPairwise t-test or chi-square test for patients before 2006 and patients 2006 and afterwards.

SD, Standard Deviation; BMI, Body Mass Index; LVAD, Left Ventricular Assist Device; OHT, Orthotopic Heart Transplant

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| Table 3. Complications in hospitalized patients with or without same admission Orthotopic Heart Transplant (OHT) after Left Ventricular Assist Device (LVAD) | | | | |
|  | **Early OHT (n = 41)** | **Late OHT (n = 123)** | **OHT- (n = 2036)** | **Total (n = 2200)** |
| Acute renal failure | 24 (58.5) | 64 (52.0) | 963 (47.3) | 1051 (47.8) |
| Reoperation | 28 (68.3) | 87 (70.7) | 803 (39.4) | 918 (41.7) |
| Bleeding requiring transfusion | 7 (17.1) | 30 (24.4) | 780 (38.3) | 817 (37.1) |
| Acute respiratory failure | 8 (19.5) | 37 (30.1) | 518 (25.4) | 563 (25.6) |
| Sepsis | 2 (4.9) | 17 (13.8) | 233 (11.4) | 252 (11.5) |
| Postoperative cardiac complication | 7 (17.1) | 15 (12.2) | 234 (11.5) | 256 (11.6) |
| Acute liver failure | 3 (7.3) | 9 (7.3) | 224 (11.0) | 236 (10.7) |
| Device failure | 0 (0.0) | 4 (3.3) | 62 (3.0) | 66 (3.0) |
| Stroke | 1 (2.4) | 1 (0.8) | 53 (2.6) | 55 (2.5) |

\*All pairwise comparisons of early vs. late OHT were not statistically significant (p > 0.05).

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| Table 4. A generalized multivariate linear model to evaluate post-LVAD OHT mortality. Positive estimates reflect positive association with increased mortality. | | | |
|  | **Regression coefficient** | **Standard Error** | **p-value** |
| Age | 0.003 | 0.002 | 0.158 |
| Female sex | 0.071 | 0.075 | 0.342 |
| Caucasian race | -0.010 | 0.027 | 0.695 |
| Median household income | 0.013 | 0.027 | 0.638 |
| Number of comorbidities | 0.006 | 0.010 | 0.518 |
| Years 1998-2005 | 0.096 | 0.060 | 0.113 |
| Early OHT | 0.200 | 0.067 | 0.004\* |

\*p-value < 0.05

# SUPPLEMENTARY TABLES

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| Supplementary Table 1. ICD9 codes of diagnosis and procedures | |
| Diagnosis/Procedure | **ICD9 Code(s)** |
| Left ventricular assist device | 3766 |
| Orthotopic heart transplant | 3751, 375 |
| Swan-Ganz catheterization | 8964 |
| Diabetes | 25000-25099 |
| Disorders of lipoid metabolism | 2720-2729 |
| Hypertension | 4010-4019 |
| History of or current use of tobacco | V1582, 3051 |
| BMI ≥ 30 kg/m2 | 27800, 27801 |
| Reoperation | 3403, 3764, 3479, 341, 3749 |
| Sepsis | 99591, 99592 |
| Acute respiratory failure | 51881 |
| Postoperative cardiac complication | 9971, 4294 |
| Acute renal failure | 5845-5849 |
| Postoperative bleeding | 4513, 4523, 9904, 9905, 9907, 9909 |
| Stroke | 43491 |
| Acute liver failure | 570 |
| Device failure | 99609 |

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| Supplementary Table 2. Baseline demographics between LVADs from our sample dataset and all adult (≥ 18 years old) LVADs in the National Inpatient Sample (NIS) | | | |
|  | **Sample LVADs (n = 2200)** | **Total NIS LVADs (n = 3219)** | **p-value** |
| Mortality, n (%) | 590 (26.5) | 564(27.0) | 0.968 |
| Same admission OHT, n (%) | 164 (7.5) | 267 (8.3) | 0.241 |
| Length of stay, mean ± SD | 40.5 ± 38.9 | 41.2 ± 40.2 | 0.548 |
| Age, mean ± SD | 53.4 ± 13.7 | 54.5 ± 13.3 | 0.412 |
| Sex, n (%) | | | 0.691 |
| Male | 1659 (75.4) | 2434 (75.9) |  |
| Female | 541 (24.6) | 772 (24.1) |  |
| Race, n (%) | | | <0.001 |
| White | 1274 (57.9) | 1742 (54.3) |  |
| Black | 352 (16.0) | 444 (13.9) |  |
| Hispanic | 142 (6.5) | 169 (5.3) |  |
| Asian/Pacific Islander | 51 (2.3) | 57 (1.8) |  |
| Native American | 5 (0.2) | 11 (0.3) |  |
| Other or unknown | 376 (17.1) | 783 (24.4) |  |
| Median household income, n (%) | | | 0.571 |
| $1-24,999 | 475 (21.6) | 637 (19.9) |  |
| $25,000-34,999 | 491 (22.3) | 738 (23.1) |  |
| $35,000-44,999 | 552 (25.1) | 832 (25.8) |  |
| $45,000 or more | 631 (28.7) | 932 (29.1) |  |
| Unknown | 51 (2.3) | 67 (2.1) |  |
| Comorbidities | | |  |
| Diabetes | 392 (17.8) | 535 (16.6) | 0.266 |
| Hyperlipidemia | 310 (14.1) | 420 (13.0) | 0.287 |
| Hypertension | 301 (13.7) | 418 (13.0) | 0.483 |
| History of smoking | 144 (6.5) | 201 (6.2) | 0.697 |
| BMI ≥ 30 kg/m2 | 96 (4.4) | 130 (4.0) | 0.604 |
| Number of comorbid diagnosis, mean ± SD | 12.7 ± 2.9 | 12.4 ± 3.0 | 0.945 |
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SD, Standard Deviation; BMI, Body Mass Index; LVAD, Left Ventricular Assist Device; OHT, Orthotopic Heart Transplant

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| Supplementary Table 3. Baseline demographics of all LVAD patients, LVAD patients who underwent OHT, and LVAD patients who did not undergo OHT | | | |
|  | **All LVADs (n = 2200)** | **OHT- (n = 2036)** | **OHT+  (n = 164)** |
| Mortality, n (%) | 590 (26.5) | 564 (27.3) | 26 (15.9) |
| Length of stay, mean ± SD | 40.5 ± 38.9 | 37.1 ± 34.6 | 82.8 ± 59.3 |
| Age, mean ± SD | 53.4 ± 13.7 | 55.4 ± 13.2 | 48.2 ± 13.5 |
| Sex, n (%) | | | |
| Male | 1659 (75.4) | 1525 (74.9) | 134 (81.7) |
| Female | 541 (24.6) | 511 (25.1) | 30 (18.3) |
| Race, n (%) | | | |
| White | 1274 (57.9) | 1185 (58.2) | 89 (54.3) |
| Black | 352 (16.0) | 330 (16.2) | 22 (13.4) |
| Hispanic | 142 (6.5) | 125 (6.1) | 17 (10.4) |
| Asian/Pacific Islander | 51 (2.3) | 44 (2.2) | 7 (4.3) |
| Native American | 5 (0.2) | 5 (0.2) | 0 (0.0) |
| Other or unknown | 376 (17.1) | 347 (17.0) | 29 (17.7) |
| Median household income, n (%) | | | |
| $1-24,999 | 475 (21.6) | 447 (22.0) | 28 (17.1) |
| $25,000-34,999 | 491 (22.3) | 454 (22.3) | 37 (22.6) |
| $35,000-44,999 | 552 (25.1) | 509 (25.0) | 43 (26.2) |
| $45,000 or more | 631 (28.7) | 579 (28.4) | 52 (31.7) |
| Unknown | 51 (2.3) | 47 (2.3) | 4 (2.4) |
| Comorbidities | | | |
| Diabetes | 392 (17.8) | 373 (18.3) | 19 (11.6) |
| Hyperlipidemia | 310 (14.1) | 297 (14.6) | 13 (7.9) |
| Hypertension | 301 (13.7) | 291 (14.3) | 10 (6.1) |
| History of smoking | 144 (6.5) | 137 (6.7) | 7 (4.3) |
| BMI ≥ 30 kg/m2 | 96 (4.4) | 96 (4.7) | 0 (0.0) |
| Number of comorbid diagnosis, mean ± SD | 12.7 ± 2.9 | 12.8 ± 2.9 | 12.3 ± 3.1 |
| Location of hospital, n (%) | | | |
| Rural | 17 (0.8) | 17 (0.8) | 0 (0.0) |
| Urban | 2181 (99.1) | 2017 (99.1) | 164 (100.0) |
| Unknown | 2 (0.1) | 2 (0.1) | 0 (0.0) |
| Size of hospital, n (%) | | | |
| Small | 38 (1.7) | 32 (1.6) | 6 (3.7) |
| Medium | 229 (10.4) | 211 (10.4) | 18 (11.0) |
| Large | 1931 (87.8) | 1791 (88.0) | 140 (85.4) |
| Unknown | 2 (0.1) | 2 (0.1) | 0 (0.0) |
| Teaching status of hospital, n (%) | | | |
| Nonteaching | 165 (7.5) | 160 (7.9) | 5 (3.0) |
| Teaching | 2033 (92.4) | 1874 (92.0) | 159 (97.0) |
| Unknown | 2 (0.1) | 2 (0.1) | 0 (0.0) |

SD, Standard Deviation; BMI, Body Mass Index; LVAD, Left Ventricular Assist Device; OHT, Orthotopic Heart Transplant