

The Role of Intra-Aortic Balloon Pump Bridge Therapy at Resource Limited Institutions:

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INTRODUCTION

- The intra-aortic balloon pump is the most frequently used form of mechanical circulatory support worldwide, despite the advent of more robust forms of circulatory support.
- The 2012 IABP-SHOCK II Trial, did not find a mortality difference at 30 days (39.7% vs. 41.3%, p=0.67), 6 months (48.7% vs. 49.2%, p=0.91), or 1 year (51.8% vs. 51.4%, p=0.91) in the treatment of patients with acute myocardial infarction complicated by cardiogenic shock (AMI-CS)².
- The 2025 American College of Cardiology/ American Heart Association Guidelines give a Class 3 recommendation against routine IABP usage for the treatment of AMI-CS along with a 2A recommendation for IABP usage for heart failure secondary to mechanical complications of ACS¹.

PURPOSE

- The purpose of this study is...
- to characterize the indications for IABP usage at a community-based institution in the post IABP Shock 2 Era.
 - to study the IABP therapy in patients being transferred to higher level of care.
 - to characterize the impact of patient sex on IABP candidate selection.

METHOD

Manual chart review of retrospective data spanning from 2018 to 2023 was conducted on electronic medical records by two independent reviewer to identify **all adult patients who received IABP placement**.

Presence of co-morbidities, severity of coronary disease, and hemodynamic measurements were documented based on chart review

Differences between survivors and in-hospital mortalities were studied. Difference between the sexes were studied.

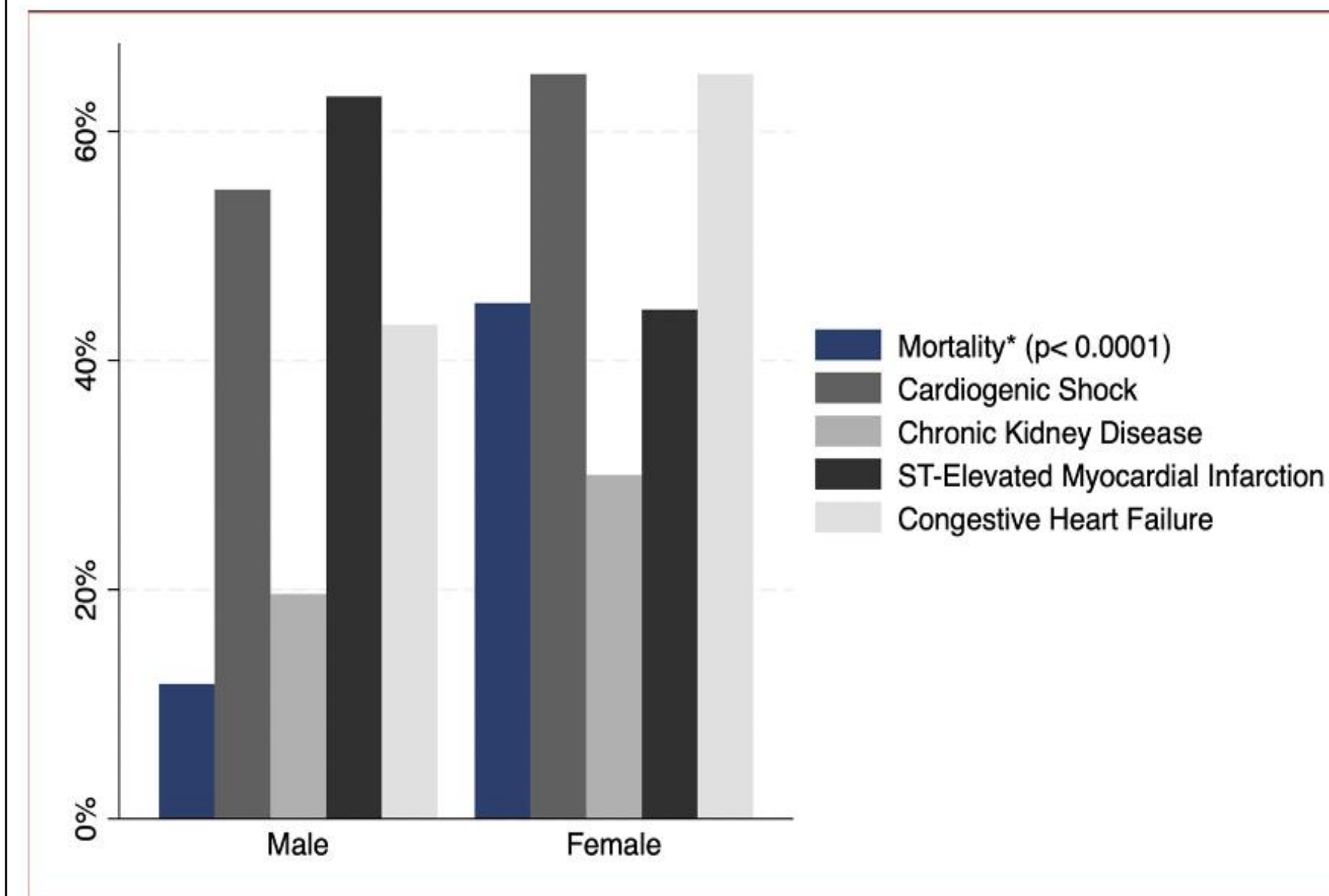
Significant differences between cohorts were found using the chi squared exact test and the Wilcoxon rank-sum test for categorical and continuous variables, respectively.

Kaplan Meier Survivor analysis was conducted on the entire cohort to study in-hospital mortality. Analysis was right-censored for patient discharge.

TABLE 1

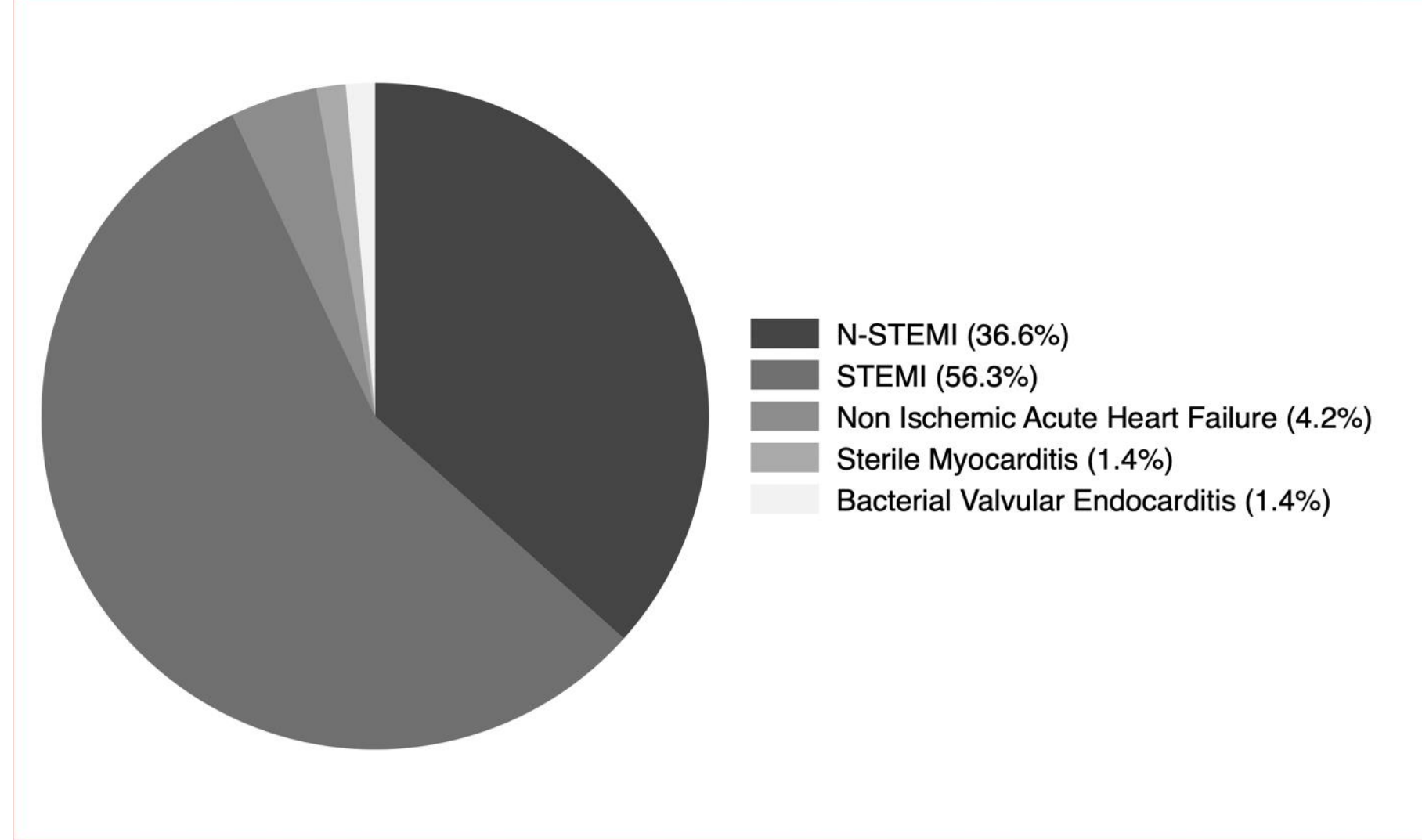
Demographic Information:	
Gender	51 male (71.8%) 20 female (28.2%)
Race:	
Age:	64.7 +/-13.3 [31-89]
Co-Morbidity Burden:	
Congestive Heart Failure:	33 (49.3%)
Chronic Kidney Disease:	16 (22.5%)
Diabetes:	30 (42.3%)
Hypertension:	43 (60.6%)
Hyperlipidemia:	30 (42.3%)
Current Smoker:	26 (36.6%)
Cardiovascular Characteristics:	
STEMI vs. NSTEMI	40 STEMI (56.3%) 26 NSTEMI (36.6%) 5 non-MI pathology (7.0%)
Triple Vessel Disease:	29(40.9%)
Left Main Disease:	13 (18.3%)
Ejection Fraction (%)	34. 2 +/-16.2 [10-65]
Low Ejection Fraction (<30%)	30 (40%)
Cardiogenic Shock	41 (57.8%)
Elevated Left Ventricular End Diastolic Pressure (>12 mm Hg)	47 (66.2%)
Prior Percutaneous Coronary Intervention (PCI)	18 (25.4%)
IABP Metrics:	
Duration of IABP Therapy (days):	3.4 +/- 2.4 [0-10]
Time Till Secondary Intervention [Excludes Index Procedure when IABP was Placed]:	4.86+/-7.3 [0-40]
Outcomes:	
In Hospital Mortality	15 (21.1%)
Morbidity:	31 (43.7%)
Access Site Complications:	8 (11.3%)
Cardiac Complications:	18 (25.4%)
Other Complications:	11 (15.5%)
Transfer to Tertiary Care Center:	29 (40.8%)
Bridged to CABG:	15 (21.1%)
Bridged to Heart Transplant	1 (1.4%)
Bridged to Advanced PCI:	5 (7.0%)
Bridged to Valve Surgery	1 (1.4%)
Bridge to Other Circulatory Support:	12 (16.9%)
Length of Stay (days)	12.1 +/-14.2 [1-77]

SEX BASED DIFFERENCES:



There were no significant differences in cardiogenic shock (p=0.44), chronic kidney disease (p=0.35), congestive heart failure (p=0.1), STEMI (p=0.08). However, there was a significant difference in In-Hospital Mortality with female patients exhibiting a higher mortality rate ((9) 45% vs. (6) 11.8%, p=0.004). *Not shown: Women were significantly older (p<0.0001). Men were significantly more often current smokers (p=0.03)*

INDICATIONS FOR IABP INSERTION:



In total, 40 patients received an IABP for diagnosis of STEMI. Next, 26 patients received an IABP for a diagnosis of N-STEMI. Of the remaining patients, 1 patient had bacterial endocarditis of the mitral valve, 1 patient had sterile myocarditis, and 3 patients had nonischemic acute heart failure.

SURVIVORS VS. MORTALITIES:

Variable:	Survivor (56)	Mortality (15)	Significance (p<0.05)
Demographic Information:			
Age:	61.6 +/- 12.7 [31-89]	76 +/-8.9 [60-89]	<0.0001
Co-morbidity Burden:			
Congestive Heart Failure:	23 (41.1%)	12 (80%)	0.009
Chronic Kidney Disease:	12 (21.4%)	4 (26.7%)	0.73
Diabetes:	24 (42.9%)	6 (40%)	1
Hypertension:	34 (60.7%)	9 (60%)	1
Hyperlipidemia:	23 (41.1%)	7 (46.7%)	0.77
Current Smoker:	22 (39.3%)	4 (26.7%)	0.55
Cardiovascular Characteristics:			
Presence of STEMI:	31 (55.4%)	9 (60.0%)	0.75
Triple Vessel Disease:	25 (44.6%)	4 (26.7%)	0.25
Left Main Disease:	9 (16.1%)	4 (26.7%)	0.45
Ejection Fraction (%)	35.8 +/- 15.2 [10-65]	30.5 +/- 18.4 [10-65]	0.17
Low Ejection Fraction (<30%)	21 (37.5%)	9 (60%)	0.15
Cardiogenic Shock	30 (53.6%)	11 (73.3%)	0.24
Elevated Left Ventricular End Diastolic Pressure (>12 mm Hg)	38 (57.9%)	9 (60%)	0.56
Prior PCI:	15 (26.8%)	3 (20%)	0.75
IABP Metrics:			
Duration of IABP Therapy (days):	3.6 +/-2.4 [1-10]	2.7 +/-2.1 [1-8]	0.13
Outcomes:			
Morbidity:	20 (35.7%)	11 (73.3%)	0.017
Transfer to Tertiary Center:	26 (46.4%)	3 (20%)	0.08

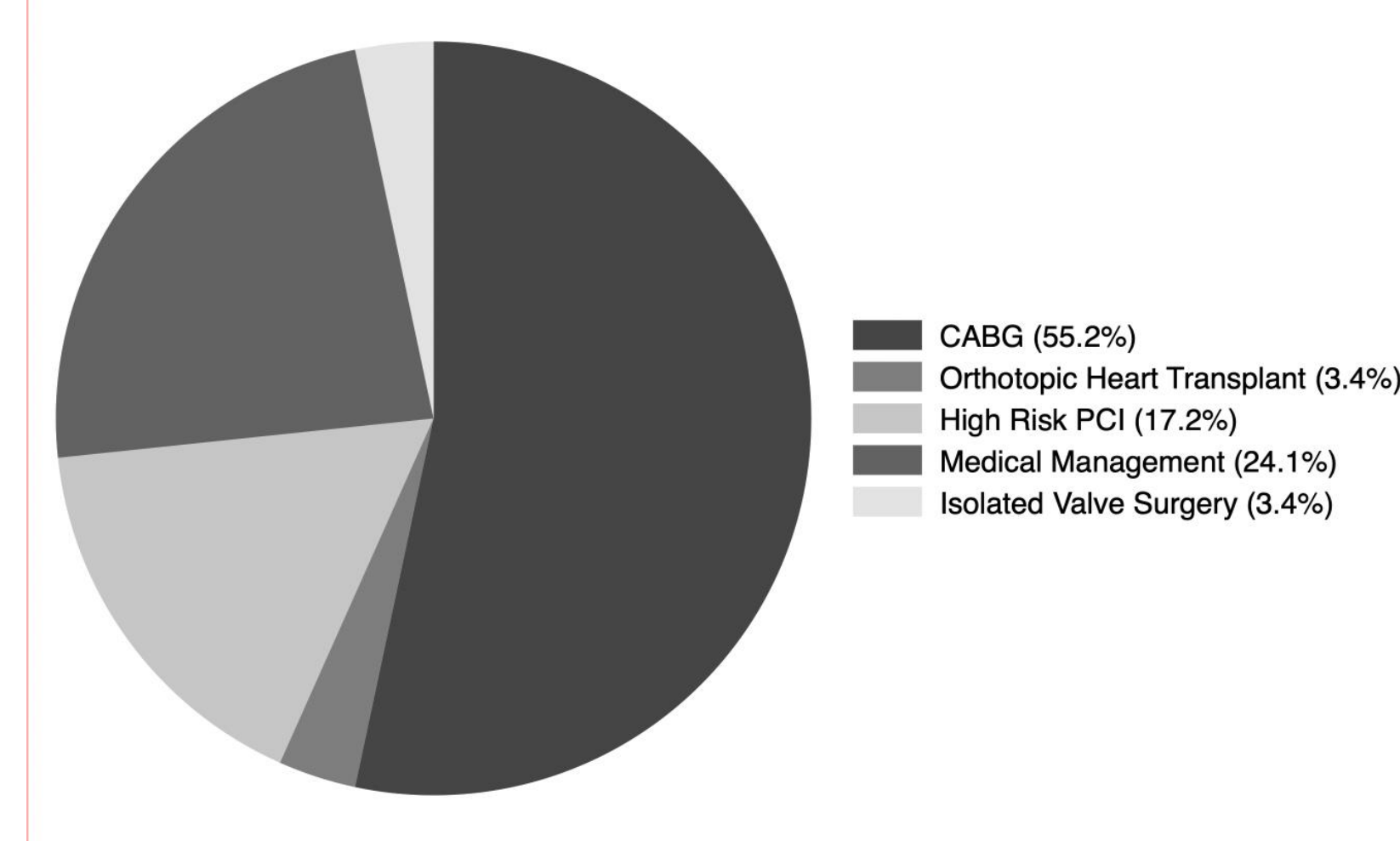
CONCLUSION:

In the post IABP-SHOCK II era, the intra-aortic balloon pump is still utilized as a temporary bridging mechanism to myocardial recovery in treated patients or to care escalation in patients being transferred to a better equipped hospital. Elderly women demonstrated higher rates of in-hospital mortality compared to the rest of the cohort. More study is required into the effects of sex and outcomes in IABP therapy.

REFERENCES:

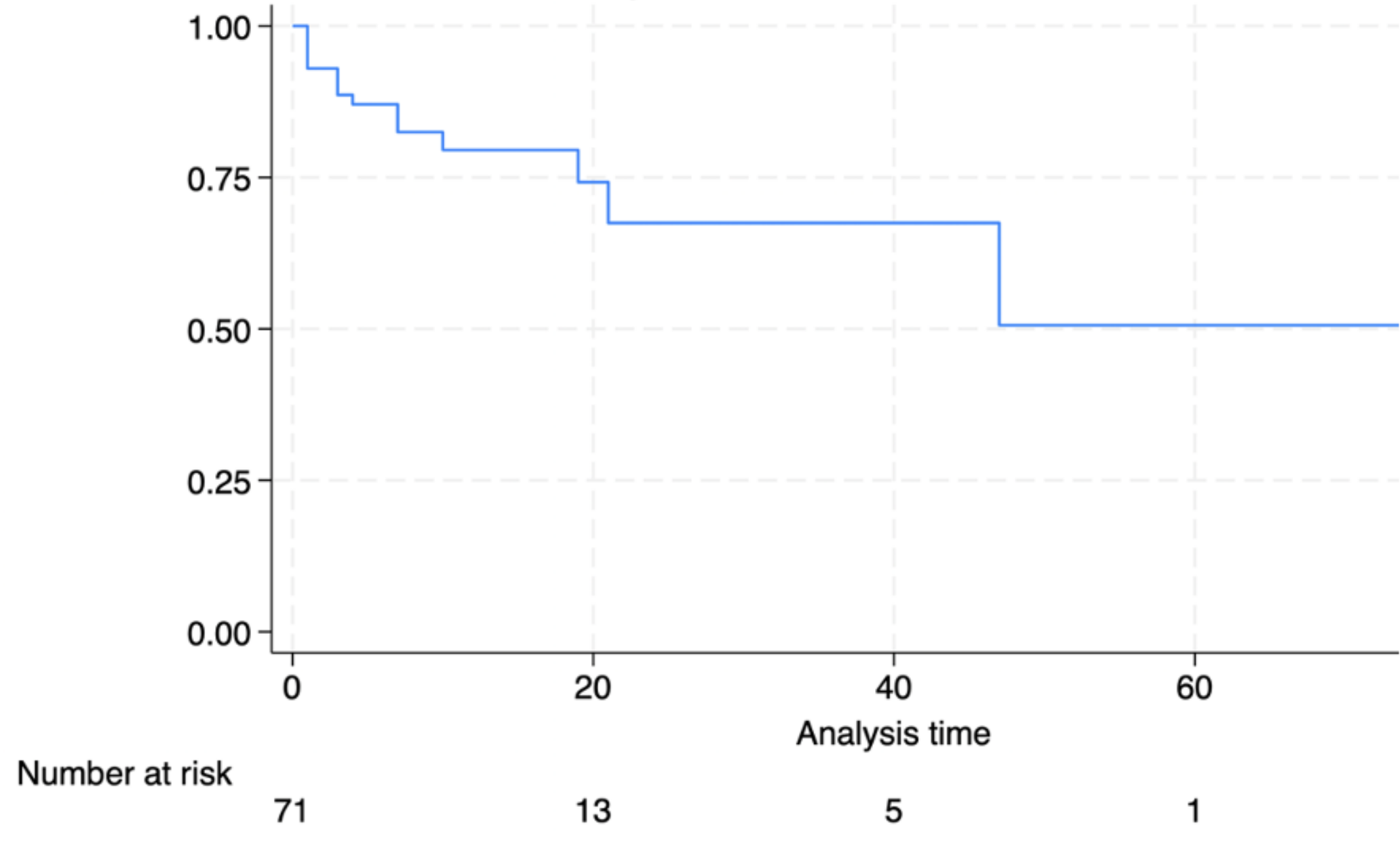
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FATE OF TRANSFERRED IABP PATIENTS:



In total, 29 patients were transferred to a tertiary care center. Of these patients, 16 (55.2 %) patients underwent CABG, 1 patient (3.5%) received a heart transplant, and 1 patient (3.5%) received an isolated valve repair. Of patients that did not receive surgical therapy, 5 patients (17.2%) received PCI therapy, and 7 patients (24.1%) patients received medical therapy.

KAPLAN MEIER SURVIVAL ANALYSIS:



Kaplan-Meier Survival Analysis of In-Hospital Mortality: Kaplan Meier Survival Curve of In-Hospital Mortality, censored for surviving patients at time of discharge. The survival curve demonstrated 88.5% survival at hospital day 4, 66.7% survival on hospital day 30, and 50% survival on hospital day 48.