Safely Identifying Emergency Department Patients with Acute Chest Pain for Early Discharge: The HEART Pathway Accelerated Diagnostic Protocol

Supplemental Materials:

Supplemental Table 1.
Sensitivity analyses conducted using various assumptions for patients with incomplete follow-up data did not substantively change aORs for safety outcomes.

Sensitivity Analysis for 30 Day Death/AMI Composite Outcome

Analysis	Pre Death AMI%	Post Death AMI %	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
No Imputation	6.9%	7.4%	1.07 (0.91-1.27)	1.24 (1.03-1.48)
Patients with loss to follow up excluded	7.7%	8.5%	1.12 (0.95, 1.32)	1.28 (1.07, 1.54)
Imputation based on separate pre and post event rates in patients with complete variables	7.6%	8.5%	1.12 (0.95, 1.32)	1.28 (1.07, 1.53)
Imputation event rate based off pre-implementation cohort event rate	7.6%	8.4%	1.10 (0.93, 1.31)	1.26 (1.05, 1.51)
Imputation based on predicted event rate from covariates	7.5%	8.1%	1.09 (0.92, 1.29)	1.26 (1.05, 1.51)
Imputation based on pre and post cohort event rates in patients and predicted event rates based on covariates	7.4%	8.2%	1.11 (0.94, 1.31)	1.29 (1.07, 1.55)
Imputation based on the event rate in patients with events identified only by claims data	7.0%	7.4%	1.07 (0.91, 1.27)	1.23 (1.03, 1.48)

Supplemental Table 2.

A sensitivity analysis excluding all patients accrued by use of the EHR ACS flowsheet (patients without chest pain selected by the provider) from analysis did not meaningfully change event rates.

Event rates in the Pre- and Post-implementation cohorts excluding patients accrued by EHR ACS flow sheet use.

Outcomes	Pre N= 3576 (%)	Post N= 3728 (%)	Unadjusted Odds Ratio (95% CI)	Adjusted* Odds Ratio (95% CI)
Safety				
Index visit				
Death	7 (0.2)	14 (0.4)	1.92 (0.77-4.77)	1.95 (0.77-4.99)
MI	209 (5.8)	281 (7.5)	**1.31 (1.09-1.58)**	**1.34 (1.10-1.63)**
Revascularization	117 (3.3)	143 (3.8)	1.18 (0.92-1.51)	1.18 (0.91-1.53)
Death + MI	215 (6)	291 (7.8)	**1.32 (1.10-1.59)**	**1.35 (1.11-1.64)**
Death + MI + Revascularization	253 (7.1)	319 (8.6)	**1.23 (1.04-1.46)**	**1.25 (1.04-1.50)**
Follow-up period				
Death	35 (1)	18 (0.5)	**0.49 (0.28-0.87)**	**0.51 (0.28-0.91)**
MI	18 (0.5)	27 (0.7)	1.44 (0.79-2.62)	1.54 (0.84-2.82)
Revascularization	25 (0.7)	35 (0.9)	1.35 (0.80-2.25)	1.40 (0.83-2.37)
Death + MI	48 (1.3)	43 (1.2)	0.86 (0.57-1.30)	0.90 (0.59-1.38)
Death + MI + Revascularization	67 (1.9)	67 (1.8)	0.96 (0.68-1.35)	0.99 (0.70-1.41)
30 day (Index+ follow up)				
Death	42 (1.2)	32 (0.9)	0.73 (0.46-1.16)	0.76 (0.47-1.22)
MI	221 (6.2)	291 (7.8)	**1.29 (1.07-1.54)**	**1.32 (1.09-1.60)**
Revascularization	141 (3.9)	177 (4.7)	1.21 (0.97-1.52)	1.24 (0.98-1.58)
Death + MI	254 (7.1)	314 (8.4)	**1.20 (1.01-1.43)**	**1.23 (1.02-1.47)**
Death + MI + Revascularization	297 (8.3)	353 (9.5)	1.15 (0.98-1.36)	1.18 (0.99-1.40)
Utilization				
Index visit				
Hospitalization	2166 (60.6)	2083 (55.9)	**0.82 (0.75-0.90)**	**0.78 (0.70-0.87)**
Early discharge	1323 (37)	1546 (41.5)	**1.21 (1.10-1.33)**	**1.26 (1.13-1.40)**
Objective Cardiac Testing	1113 (31.1)	1090 (29.2)	0.91 (0.83-1.01)	**0.89 (0.80-0.99)**
Follow-up period				
Hospitalization	233 (6.5)	225 (6)	0.92 (0.76-1.11)	0.93 (0.77-1.13)
Objective Cardiac Testing	196 (5.5)	174 (4.7)	0.84 (0.68-1.04)	0.85 (0.68-1.05)
30 day (Index+ follow up)				
Hospitalization	2219 (62.1)	2134 (57.2)	**0.82 (0.75-0.90)**	**0.78 (0.70-0.86)**
Objective Cardiac Testing	1246 (34.8)	1221 (32.8)	0.91 (0.83-1.00)	**0.89 (0.80-0.99)**

* Models adjusted for the following variables: age, gender, race, ethnicity, body mass index (BMI), emergency department location, insurance status, smoking, history of coronary artery disease, diabetes, hyperlipidemia, hypertension, cerebrovascular disease, peripheral vascular disease, chronic obstructive pulmonary disorder, chronic kidney disease, and cancer (excludes non-melanoma skin cancer).

Supplemental Table 3.

Sensitivity analysis excluding all patients accrued by use of the EHR ACS flowsheet (patients without chest pain selected by the provider) from analysis did not meaningfully change odds ratios.

Odds ratios for the primary analysis compared to the sensitivity analysis of excluding patients accrued via EHR ACS flowsheet.

Outcomes	Primary Analysis	Patients accrued by EHR ACS Flowsheet Excluded
	Adjusted* Odds Ratio (95% CI)	Adjusted* Odds Ratio (95% CI)
Safety		
<u>Index visit</u>		
Death	2.01 (0.79-5.10)	1.95 (0.77-4.99)
MI	**1.36 (1.12-1.65)**	**1.34 (1.10-1.63)**
Revascularization	1.17 (0.90-1.52)	1.18 (0.91-1.53)
Death + MI	**1.37 (1.13-1.66)**	**1.35 (1.11-1.64)**
Death + MI + Revascularization	**1.25 (1.04-1.50)**	**1.25 (1.04-1.50)**
<u>Follow-up period</u>		
Death	**0.49 (0.28-0.86)**	**0.51 (0.28-0.91)**
MI	1.55 (0.85-2.83)	1.54 (0.84-2.82)
Revascularization	1.43 (0.85-2.42)	1.40 (0.83-2.37)
Death + MI	0.88 (0.58-1.33)	0.90 (0.59-1.38)
Death + MI + Revascularization	0.98 (0.70-1.39)	0.99 (0.70-1.41)
<u>30 day (Index+ follow up)</u>		
Death	0.73 (0.46-1.16)	0.76 (0.47-1.22)
MI	**1.34 (1.11-1.62)**	**1.32 (1.09-1.60)**
Revascularization	1.23 (0.97-1.57)	1.24 (0.98-1.58)
Death + MI	**1.24 (1.03-1.48)**	**1.23 (1.02-1.47)**
Death + MI + Revascularization	1.17 (0.99-1.39)	1.18 (0.99-1.40)
Utilization		
<u>Index visit</u>		
Hospitalization	**0.80 (0.72-0.88)**	**0.78 (0.70-0.87)**
Early discharge	**1.24 (1.12-1.37)**	**1.26 (1.13-1.40)**
Objective Cardiac Testing	**0.90 (0.81-0.99)**	**0.89 (0.80-0.99)**
<u>Follow-up period</u>		
Hospitalization	0.92 (0.76-1.11)	0.93 (0.77-1.13)
Objective Cardiac Testing	0.86 (0.70-1.06)	0.85 (0.68-1.05)
<u>30 day (Index+ follow up)</u>		
Hospitalization	**0.79 (0.71-0.87)**	**0.78 (0.70-0.86)**
Objective Cardiac Testing	**0.89 (0.81-0.99)**	**0.89 (0.80-0.99)**

* Models adjusted for the following variables: age, gender, race, ethnicity, body mass index (BMI), emergency department location, insurance status, smoking, history of coronary artery disease, diabetes, hyperlipidemia, hypertension, cerebrovascular disease, peripheral vascular disease, chronic obstructive pulmonary disorder, chronic kidney disease, and cancer (excludes non-melanoma skin cancer).