

# Accelerated Discharge Process Following Percutaneous Coronary Intervention (PCI) for Patients with Non-ST Elevation Acute Coronary Syndromes

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## Background

- Coronary heart disease (CHD) is the leading cause of death in US and costs will increase to \$800 billion annually by 2030
- Costs for hospitalization of NSTEMI-ACS patients: \$19,000/patient (2009 figures)
- Discharge process not standardized & leads to management variability and increases LOS
- Streamlined care systems permitting accelerated discharge after PCI:
  - Reduce hospital expenditure through reduction in length of stay (LOS)<sup>1,2</sup>
  - Do not increase adverse events or rehospitalization<sup>2</sup>

## Aims

- Determine if streamlined discharge process reduces LOS.
- Determine whether a NSTEMI-ACS PCI streamlined discharge process impacts major adverse cardiac events (MACE) and re-hospitalization rates.
- Determine provider utilization of the NSTEMI-ACS PCI streamlined discharge process.

## Methods

- Design:** Quality improvement pre-post study
- Sample:** Convenience sample of low risk adult patients post-PCI for NSTEMI-ACS in a southeastern heart hospital
- Data Collection:**
- Collection of historical control data
  - Educational intervention to educate providers and staff on the accelerated discharge protocol
- Intervention:**
- Interactive one-time educational session with weekly email reminders

## Results

**Table 1. Clinical Characteristics of NSTEMI-ACS and Low Risk Patients.**

Characteristic	NSTEMI-ACS Group			Low Risk Group		
	Historical Control (N=67)	Implementation (N=63)	P=	Historical Control (N=25)	Implementation (N=25)	P=
Age, y	64±12	61±11	0.19	63±11	64±10	0.89
Male Gender	36 (54)	38 (60)	0.44	15 (60)	15 (60)	1
Body Mass Index	32±8	30±7	0.34	31±7	30±7	0.82
Diabetes	32 (48)	32 (51)	0.73	8 (32)	8 (32)	1
Hypertension	66 (99)	62 (98)	0.97	25 (100)	25 (100)	1
Current Smoking	21 (31)	15 (24)	0.23	6 (24)	4 (16)	0.48
African-American Race	31 (46)	25 (40)	0.45	10 (40)	7 (28)	0.37
Hyperlipidemia	53 (79)	53 (84)	0.46	20 (80)	22 (88)	0.44
Chronic Kidney Disease	16 (24)	14 (22)	0.82	2 (8)	1 (4)	0.55
Radial Access Site	50 (75)	49 (78)	0.48	18 (72)	24 (96)	0.02
Unstable Angina	29 (43)	19 (30)	0.12	12 (48)	7 (28)	0.15
NSTEMI	38 (57)	44 (70)	0.08	13 (52)	18 (72)	0.15
Peak Troponin I	3.6±11	8.1±21	0.14	0.73±1.2	0.86±1.3	0.74

Abbreviations: NSTEMI-ACS, non-ST elevation acute coronary syndrome; NSTEMI, non-ST elevation myocardial infarction

**Table 2. Accelerated discharge process reduces LOS in Low Risk Group.**

Variable	NSTEMI-ACS Group			Low Risk Group		
	Historical Control (N=67)	Implementation (N=63)	P=	Historical Control (N=25)	Implementation (N=25)	P=
SDD Patients	4 (6)	13 (21)	0.01	2 (8)	9 (36)	0.02
Hospital LOS						
Mean	70:17±67:37	82:24±100:08	0.09	50:54±24:03	41:43±17:57	0.14
Median	47:29	45:09		46:21	39:47	
PCI LOS						
Mean	36:51±39:57	43:47±59:54	0.04	22:28±5:52	17:29±8:25	0.003
Median	25:47	24:02		23:57	20:47	

**Table 3. Impact of Accelerated Discharge Process on 30-Day Outcomes.**

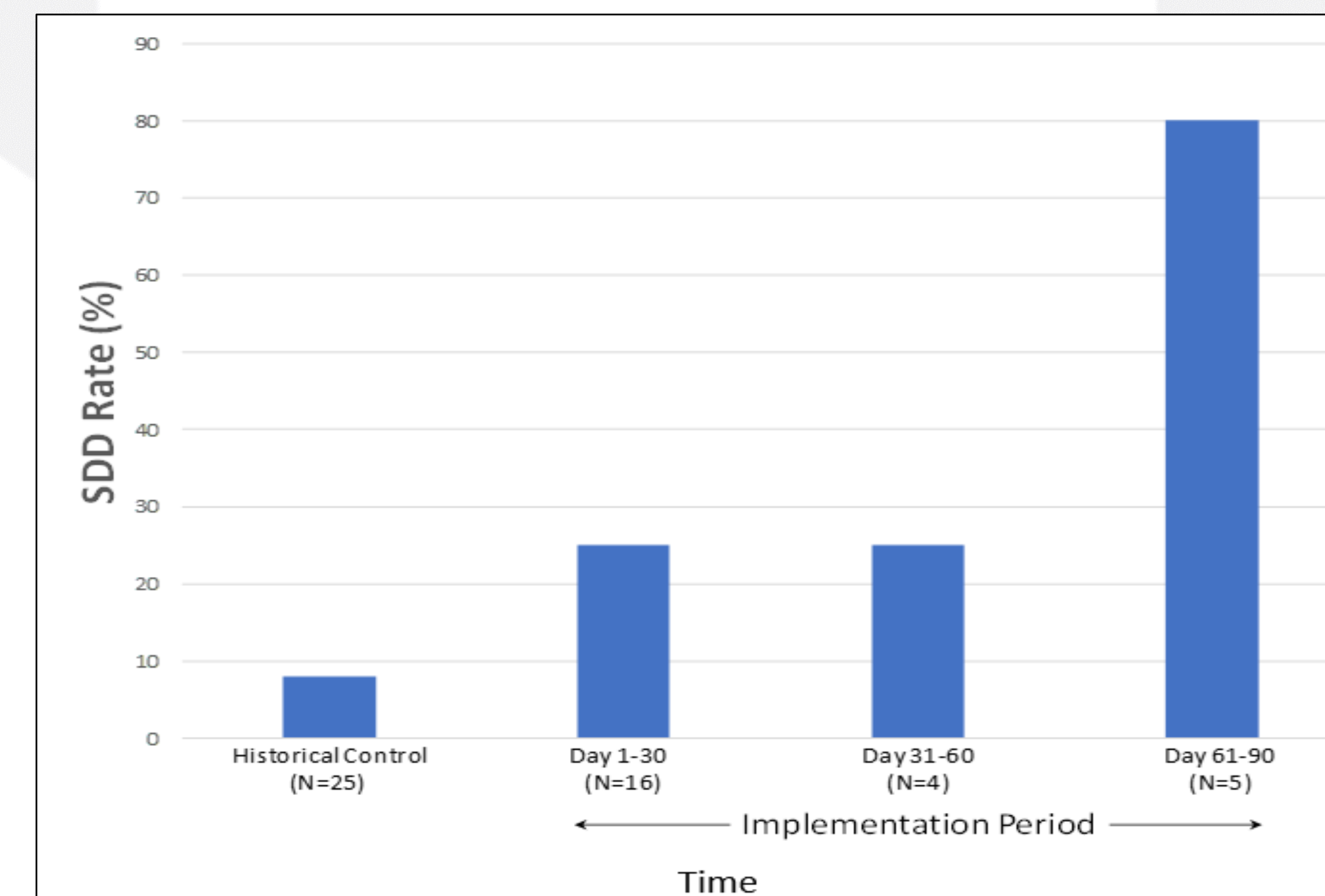
Variable	Historical Control (N=25)	Implementation (N=25)	P=
Composite Mortality	3 (12)	5 (20)	0.25
Myocardial Infarction	0	0	
Major Bleeding	1 (4)	0	0.6
Rehospitalization	3 (12)	5 (20)	0.25

**Table 4. Association of SDD with 30-Day Outcomes.**

Variable	SDD+ (N=11)	SDD- (N=39)	P=
Composite Mortality	3 (27)	5 (13)	0.25
Myocardial Infarction	0	0	
Major Bleeding	0	1 (3)	0.6
Rehospitalization	3 (27)	5 (13)	0.25

Abbreviations: SDD, same-day discharge

**Figure 1. Proportion of Patients Discharged on Same Day as PCI.**



## Discussion

- Accelerated discharge process decreased PCI LOS in low risk group. Total hospital LOS not reduced likely due to sample size
- Mean (not median) hospital and PCI LOS in NSTEMI-ACS groups longer during the implementation period
  - Reflects relatively few patients with comorbid disease
  - Implementation period patients with higher troponins and more with NSTEMI
- Increased protocol utilization during implementation period attributed to one-on-one peer coaching
- Reeducation of criteria by a peer and email reminders provided necessary means that ultimately increased utilization of the SDD protocol
- Data restricted to cases performed by employed group, limiting value of the QI to the entire organization

## Conclusions

- Project demonstrates that implementation of an accelerated discharge process reduces post-PCI LOS without compromising outcomes including re-hospitalization
- Keys to the successful implementation:
  - Acceptance from key-stakeholders
  - Partnership with an academic interventional cardiologist who served as a peer-to-peer coach
- Future directions: catheterization laboratory scheduling process
  - Prioritizing patients meeting low-risk discharge criteria for early scheduling
  - Empower nurses to identify patients

