

Cardiology Length of Stay Improvement Project

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Problem Charter

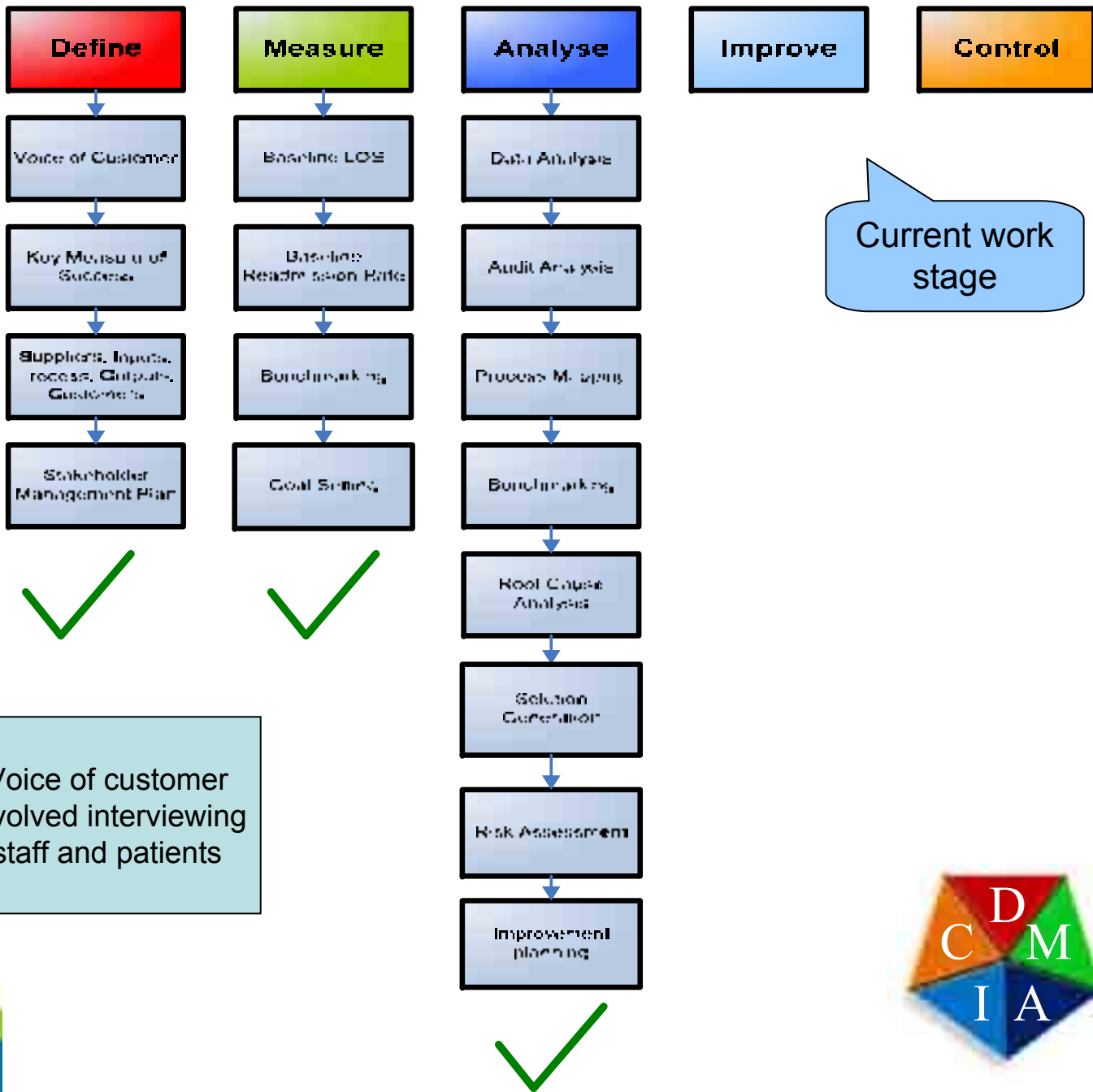
Problem

- The Cardiology Improvement Project was established to address the Length of Stay (LOS) of patients admitted with Acute Myocardial Infarction (AMI) requiring Percutaneous Intervention (PCI) - DRG F10Z. This includes patients who have sustained a STEMI and Non STEMI AMI.
- Health Round Table Benchmarking data (July – Dec 2008) demonstrated that the Royal Melbourne Hospital's LOS for this patient group exceeded that of the state average **6 days** compared to **4 days**.

Aims

- The project aims to reduce the median length of stay to 4 days for STEMI patients and 3 days for NSTEMI patients without compromising quality of patient care or current low readmission rates.





Voice of customer involved interviewing staff and patients

Project Progress



Aims, Baseline Metrics & Potential Benefits

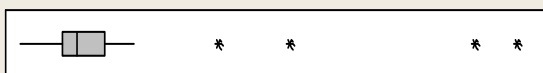
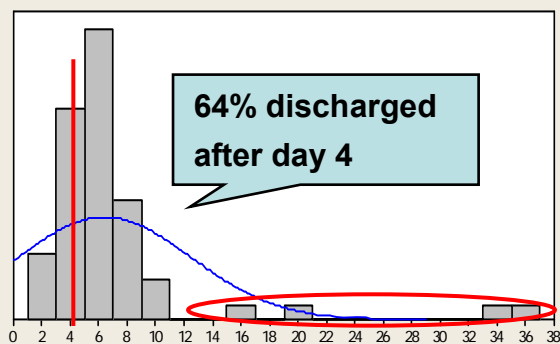
| Key Metrics | Baseline July- Dec 2008 | Aims | Potential Benefit |
|--------------------------------|--|---|--|
| Length of stay | <p>Total LOS mean- 5.9 days median- 5 days</p> <p>STEMI mean- 6.4 days median- 5 days</p> <p>NSTEMI mean- 5.5 days median- 5 days</p> | <p>Reduce the median LOS for STEMI and NSTEMI patients to:</p> <p>STEMI : 4 days</p> <p>NSTEMI : 3 days</p> | <p>Based on July- Dec 2008 outcomes, approximately 310 * cardiology beds days annually would be available if guidelines were met as specified.</p> |
| Adherence to guidelines | <p>STEMI 64% discharged after day 4</p> <p>NSTEMI 70% discharged after day 3</p> | <p>STEMI * 80% discharged by day 4</p> <p>NSTEMI * 95% discharged by day 3</p> | |
| Readmission rate | 3.4% re-admission rate | Less than 5% | |

Based on HRT data, RMH readmission rate is lower than national exemplar hospitals

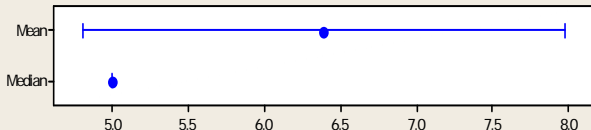
Baseline Data –Length of Stay

STEMI & NSTEMI July-Dec 2008

LOS Stemi July -Dec 2008



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 8.83
P-Value < 0.005

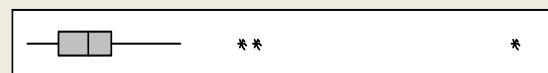
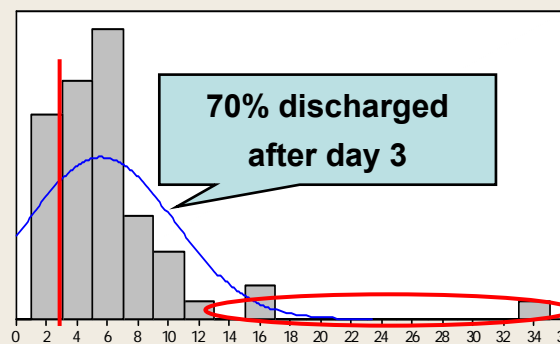
Mean 6.3898
StDev 6.0856
Variance 37.0351
Skewness 3.7193
Kurtosis 15.1663
N 59

Minimum 1.0000
1st Quartile 4.0000
Median 5.0000
3rd Quartile 7.0000
Maximum 36.0000

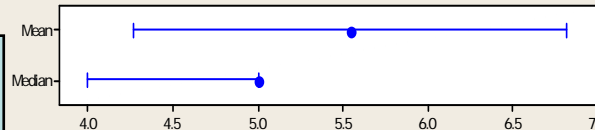
95% Confidence Interval for Mean
4.8039 7.9758
95% Confidence Interval for Median
5.0000 5.0000
95% Confidence Interval for StDev
5.1517 7.4364

Mean affected by presence of outliers

Length of Stay NSTEMI July-Dec 08



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 4.61
P-Value < 0.005

Mean 5.5439
StDev 4.7961
Variance 23.0025
Skewness 3.7395
Kurtosis 19.1078
N 57

Minimum 1.0000
1st Quartile 3.0000
Median 5.0000
3rd Quartile 6.5000
Maximum 33.0000

95% Confidence Interval for Mean
4.2713 6.8164
95% Confidence Interval for Median
4.0000 5.0000
95% Confidence Interval for StDev
4.0491 5.8836

STEMI: Mean LOS 6.3 Median 5

NSTEMI: Mean LOS 5.5 Median 5

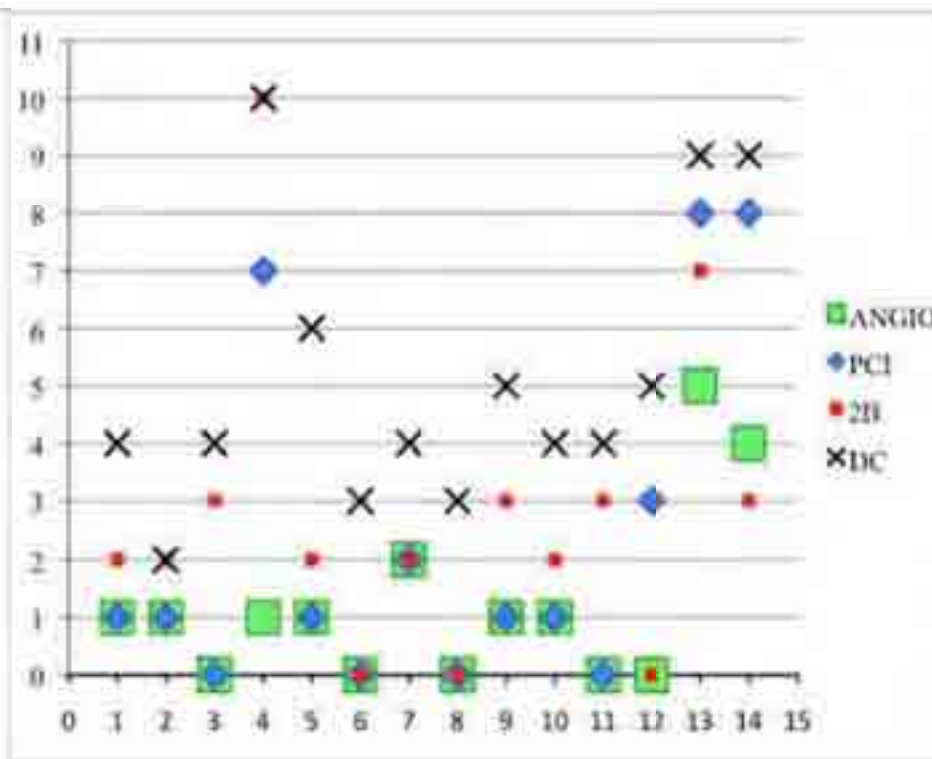
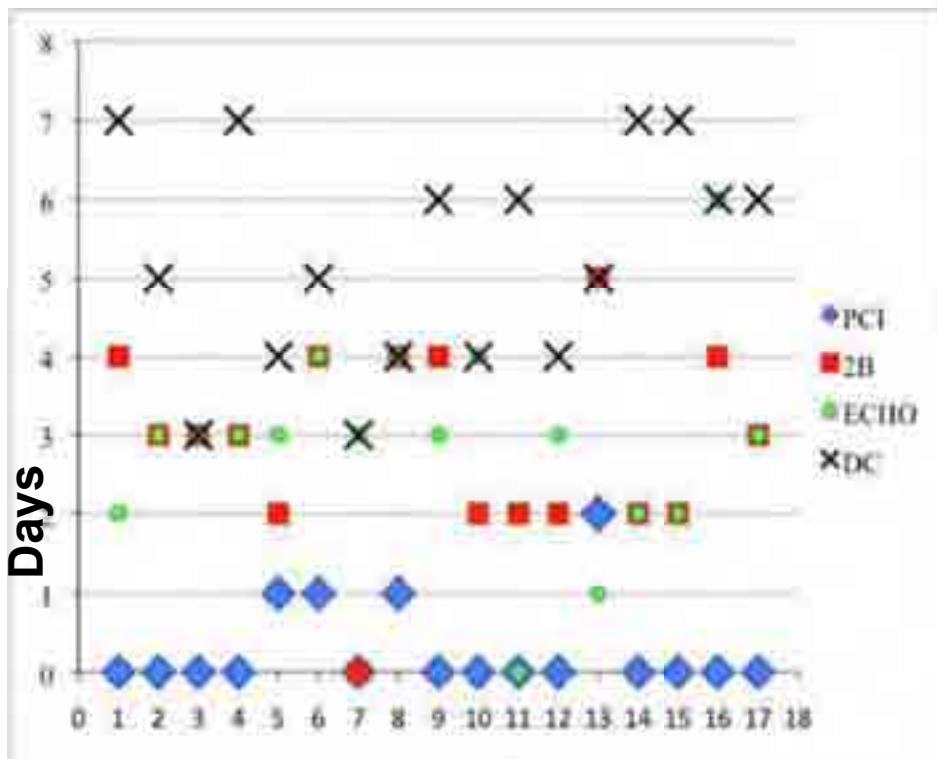


Baseline Data - Adherence to Guidelines

Audit 31 Histories

STEMI: Good adherence to PCI guideline

NSTEMI: Variation in admission to discharge process



STEMI N= 17

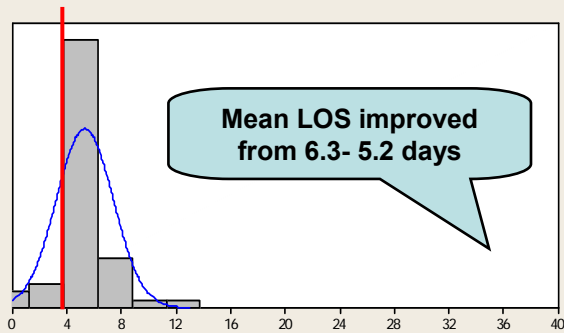
NSTEMI N= 14

Stage 1: Improvements to date. Jan- June 09

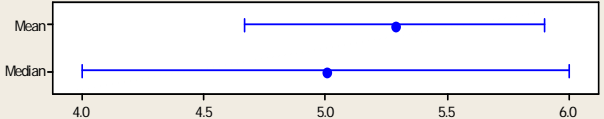
January 2009 - Patient guidelines reinforced amongst cardiology team

- Total median LOS improved from 5 days to 4 days

LOS for STEMI Jan - June 09



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 1.76
P-Value < 0.005

Mean 5.2826
StDev 2.0834
Variance 4.3406
Skewness 1.22379
Kurtosis 4.21094
N 46

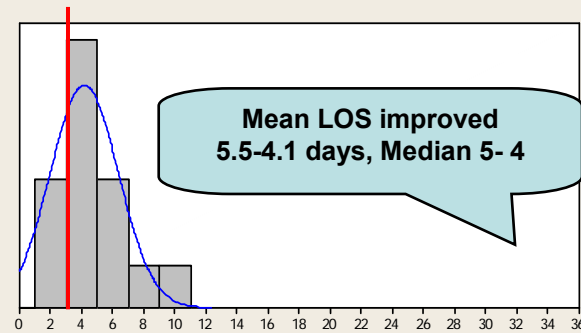
Minimum 1.0000
1st Quartile 4.0000
Median 5.0000
3rd Quartile 6.0000
Maximum 13.0000

95% Confidence Interval for Mean
4.6639 5.9013

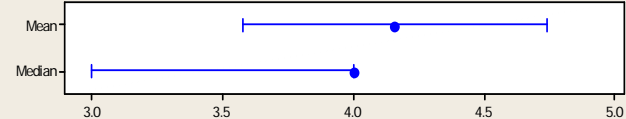
95% Confidence Interval for Median
4.0000 6.0000

95% Confidence Interval for StDev
1.7281 2.6241

Length of Stay NSTEMI Jan - June 09



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 1.58
P-Value < 0.005

Mean 4.1579
StDev 2.1941
Variance 4.8139
Skewness 0.884989
Kurtosis 0.791406
N 57

Minimum 1.0000
1st Quartile 3.0000
Median 4.0000
3rd Quartile 5.0000
Maximum 10.0000

95% Confidence Interval for Mean
3.5757 4.7401

95% Confidence Interval for Median
3.0000 4.0000

95% Confidence Interval for StDev
1.8523 2.6916

Less outliers in both groups compared to '08

STEMI: Mean 5.3 Median 5

NSTEMI: Mean 4.1 Median 4

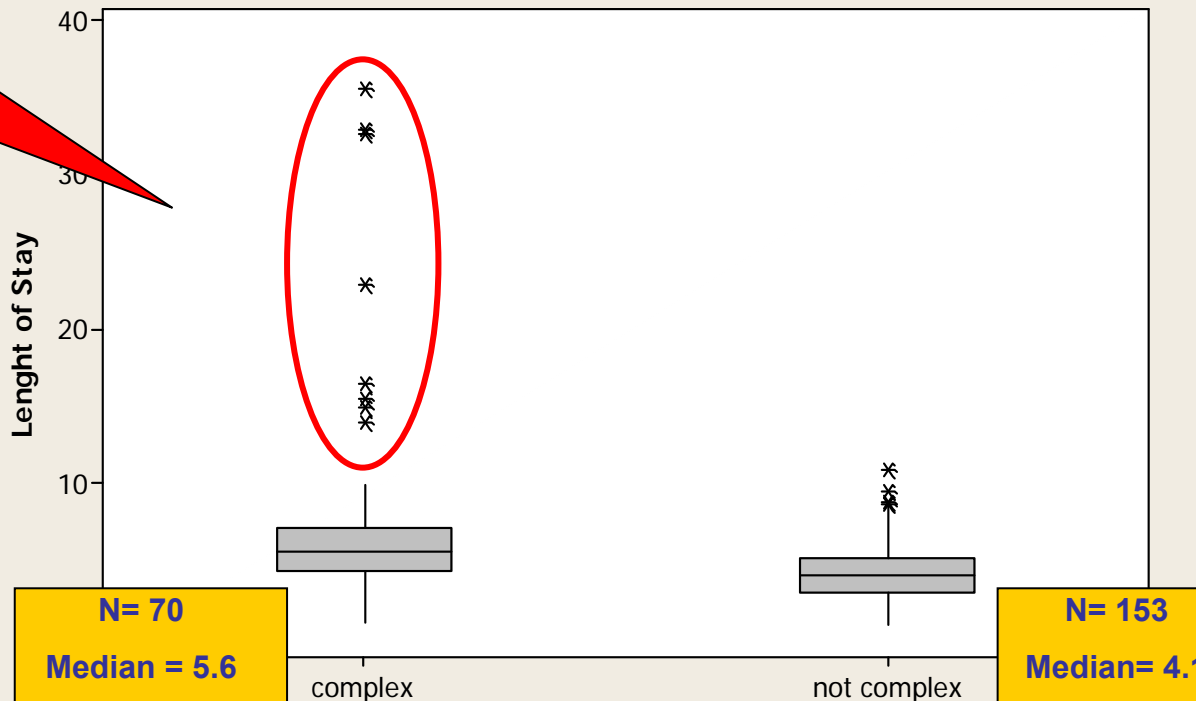
Data Analysis - Patient Complexity

Complex Patient: has at least one disease from each of 3 or more categories as defined by the Health Round Table

- According to the Health Round Table, 59% of patients are higher complexity at RMH, 34% more than the 4 exemplar hospitals. (based on Complexity & Co morbidity Analysis)

We are less able to control the LOS of Complex Patients

Length of Stay of Complex versus Non Complex Patients



N= 70

Median = 5.6

Mean = 7.4

Range 1- 36

complex

N= 153

Median= 4.1

Mean = 4.3

Range 1- 11

not complex

Audit Analysis : What contributes to a Short or Long Length of Stay?

| AMI Type | Short LOS | Longer LOS |
|----------|--|---|
| STEMI | <ul style="list-style-type: none"> ◆Country Patient ◆ECHO conducted by day 3 | <ul style="list-style-type: none"> ◆ Not sending the patient home when ready (adhering too strictly to the guideline) ◆Patient remained an inpatient for 2nd PCI instead of discharging and rebooking patient electively ◆Awaiting ECHO ◆Clinical Indications- E.g. Requires discharge anticoagulation therapy, VT/ Non sustained VT, IV hand infection requiring antibiotics, INR not therapeutic ◆Indecision regarding surgical/medical management |
| NSTEMI | <ul style="list-style-type: none"> ◆Angio & PCI conducted day of admission (includes country and ED admissions) ◆Country patient who had a period of Inpatient stay prior to transfer ◆OP vs. IP ECHO | <ul style="list-style-type: none"> ◆Awaiting ECHO ◆Need for ECHO identified Fri morning WR- not done till Monday ◆Patient placed on specific consultant's list instead of defaulting to next available PCI list ◆Patient remained an inpatient for 2nd PCI instead of discharging and rebooking patient electively ◆Clinical Indications- Awaiting INR levels (Mech Aortic Valve) required medical management for clot prior to PCI ◆Admitted on the weekend ◆Awaiting audit meeting for medical decision |

Benchmarking

The Canberra Hospital
Head of Cardiology & CNC CCU

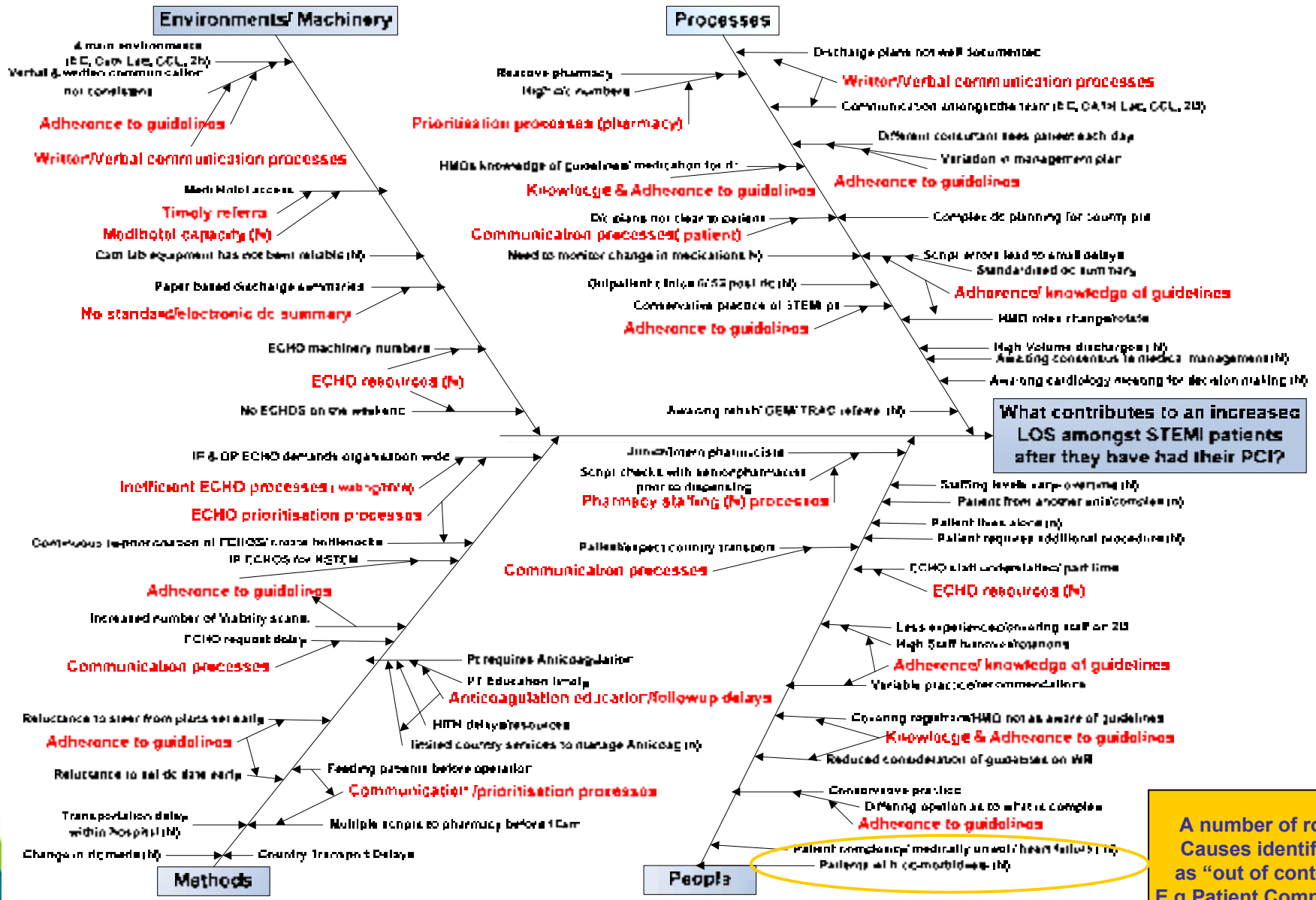
- Aim: Non-STEMI patients into the Cath lab on the day of admission (Achieved in approx 50% of patients)
- All patients have their PCI at the same procedure as their diagnostic angiogram
- Patient flow is not guided by written protocols
- Significant proportion of patients referred from other hospitals. Not transferred until Cath lab space is confirmed.
- Patients can wait up to 3-4 days for transfer to Canberra Hospital
- For NSTEMI weekend admissions, angiograms are conducted on Monday's

The Austin Hospital

- Aim: Non-STEMI patients into Cath lab day of admission. Achieved in a large number of cases. All within 24 hours.
- PCI done at time of diagnostic angiogram
- No written protocols
- 5 O/P clinics weekly allowing early review of discharged patients
- Non STEMI weekend presentations-angiogram is done Mon am, unless unstable

Benchmarking conducted with Health Round Table exemplar hospitals to assist in identifying root causes to our longer Length of Stay and assist in solution generation

Root Cause Analysis Length of Stay - STEMI



A number of root Causes identified as "out of control" E.g Patient Complexity

Prioritisation Matrix - Root Causes

Delay in wait listing Friday + Weekend
NSTEMI admits

Consultant does not assess the NSTEMI
pt in ED.

process to manage 'add ons' / electives not
standardised

pt placed on consultant next list not next
available

Variation in staff knowledge/implementation of
guidelines.

'Strict' adherence to guidelines

Echo resources

Echo process inefficiencies

Written + Verbal communication processes

Bed blocks

Pharmacy processes/resources

Anticoagulation Therapy follow up

No electronic d/c summary/scripts

Potential for
biggest impacts



Root Causes and Solutions

| Root Cause | Solution |
|---|---|
| 1. Knowledge & adherence to guidelines | 1.Revision of guidelines 2.Implementation of Care Plan 3.Discharge planning stamp 4.Education/ Audit Forums 5.KPI/ Visual Management * Emphasis on the implementation of guidelines by senior staff |
| 2. Lack of standard processes to waitlist NSTEMI for Angio +/- PCI | 6.Daily consultant ward round begins in ED progressing to CCU 7.Standard process to waitlist NSTEMI for Monday procedure 8.Catheter Lab prioritisation process & whiteboard 9.Angio to PCI defaults to next available list |
| 3. Verbal & written communication processes | 3.Discharge planning stamp 2.Implementation of Care Plan 10.Discharge planning whiteboard redesign 5.KPIs/ Visual Management |
| 4.ECHO Delays | 11.Allocated times for CCU/2B ECHOS 12.Standard communication processes with ECHO Techs 10.Use of discharge planning whiteboard 13.ECHO forms within admission pack 14.ECHO improvement project |



Controls to prevent readmission & maximise quality of patient care

Current Practice

Letter to GP
GP follow up within 2 weeks emphasised
Educational material provided
Cardiac Rehabilitation Referrals
Verbal Nursing, Pharmacy & Medical Education

Follow up phone calls

2E staff to contact patient day one post discharge to discuss medication management, prompt GP contact and ensure a rehabilitation referral has been made

Cardiac Rehabilitation Audit

Cardiac rehab team to interview patients regarding cardiac and medication management
Audit whether they have had GP contact within 2 weeks of discharge

Readmission Rate

Readmission rate to be reported on as part of KPIs

How do we ensure that reducing length of stay does not negatively impact our patients?



Summary

- Overall reduction in Median LOS from **5 to 4 days** and Mean LOS from **5.9 to 4.6 days** January to June 2009.
- **Goal:** Reduce the median Length of Stay for STEMI patients to 4 days and NSTEMI patients to 3 days.
- The biggest gains to be made are amongst the lower complexity patients.
- We have less control in influencing the length of stay of complex high co-morbidity patients.
- Senior staff will need to lead change for improvements to have significant impact.
- Readmission rate and quality of patient care should not be compromised. Controls to maintain a low readmission rate will be incorporated into our solutions.