Implementation of the Four Hour Program at Royal Perth Hospital

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Government of Western Australia
Department of Health

- Emergency Physician and Clinical Toxicologist
- Head of Emergency Medicine RPH 2005-2008
- Clinical Chair of State Emergency Taskforce 2008
- Royal Perth Hospital Director of Clinical Reform and Improvement 2008-2011
- Executive Clinical Lead State Four Hour Program (WA Health System Improvement Unit) 2009-2011

Acknowledgements

- Kate Brockman
  - Royal Perth Hospital Facility Lead 2008-2011
- Dr Hannah Seymour
  - Consultant Geriatrician
  - Clinical Lead Four Hour Program RPH 2011
- Doris Lombardi
  - Director Operations RPH
- Kate Fatovich
  - Project Officer Royal Perth Hospital 2011-2012

Royal Perth Group

- Royal Perth Hospital
  - 583 beds
  - ED 80,000 presentations each year
  - State Adult Major Trauma Centre
  - Admission rate 45%
- Shenton Park Campus
  - 190 beds
  - State rehabilitation services
  - Elective orthopaedics
- Bentley Health Service
  - 224 beds
  - Tertiary mental health services
  - Aged care and rehabilitation
  - Community surgical and obstetric services

Baseline state mid-2008

- Average 166 presentations a day

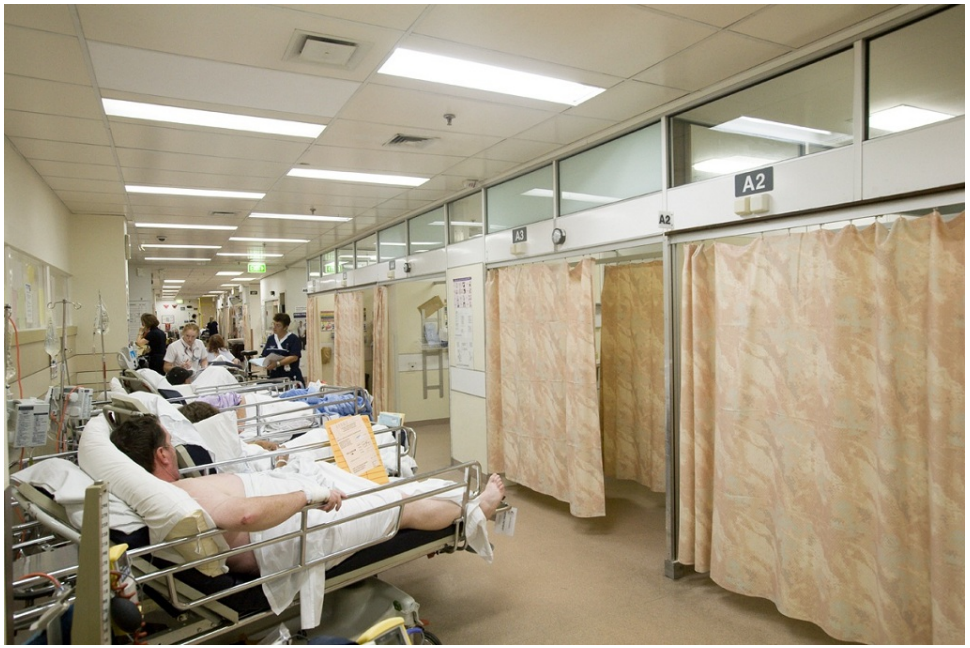
– Overall 40% (66 of 166) of presentations admitted or discharged within 4 hours

– 42% admission rate

– 52% of discharged within 4 hours

– 23% (16 of 70 admissions) per day admitted within 4 hours

– 50% of admissions (35 patients per day) stayed in the ED > 8 hours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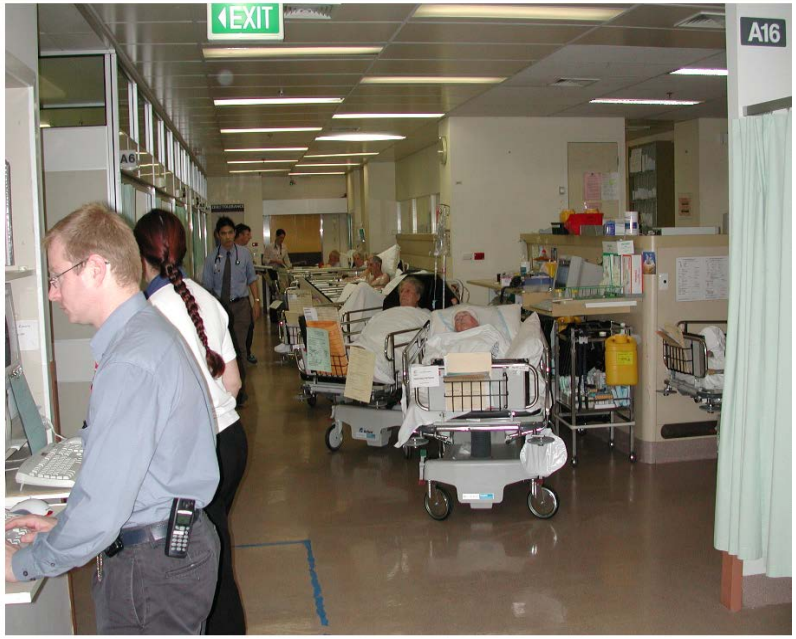
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Daily Emergency Access Report (two parts- 0730 global email daily)

Royal Perth Hospital Daily 4 Hour Rule Report

Compiled by the SMAHS Business Performance Unit

Data Extracted from EDIS daily at approximately 5am

Report period 26/09/2012 to 26/09/2012 inclusive. Report run on 27/09/2012

Destination	Within 4 Hours	Breaches	Total Cases	% Within 4 hours
Admitted	60	20	80	75.0 %
Discharged	103	2	105	98.1 %
Transferred	1	0	1	100.0 %
Unknown		1	1	0.0 %
Total	**164**	**23**	**187**	**87.7%**

(NOTE: Unknown = Breached patients still in ED at time of extract

How close were we?

To reach a target of 90% we needed another 5 patient(s) within 4 hours.

The median breach time for these patients: 41 mins.

Longest breach time: 52 mins.

Inpatient discharges	R1	R2	Total
by 10 am	20.41%	50.00%	23.64%
by 12 midday	38.78%	75.00%	42.73%

Ward	Within 4 Hours	Admitted	% Within 4 hours
10A	0	0	No Cases
10C/BMTU	0	0	No Cases
2K	1	1	100.0 %
4A	1	1	100.0 %
5G	3	4	75.0 %
5H	6	7	85.7 %
6A	0	2	0.0 %
6G	0	0	No Cases
6H	0	0	No Cases
7A/7B	6	8	75.0 %
8A	1	2	50.0 %
9A/9B	2	3	66.7 %
9C	1	2	50.0 %
AAU	15	18	83.3 %
BURNS	1	1	100.0 %
CCU/4F	3	5	60.0 %
EMW	10	10	100.0 %
HDA	1	1	100.0 %
ICUS/ICUG	1	1	100.0 %
STU/STUA	2	2	100.0 %

Division	Within 4 Hours	Admitted	% Within 4 Hrs
RP Cancer & Neurosciences Services	0	5	0.0 %
RP Critical Care	15	19	78.9 %
RP Medical Specialities	19	26	73.1 %
RP Mental Health	1	1	100.0 %
RP Surgical	17	20	85.0 %

Key	Red	Orange	Green
Target	<= 75%	between 75% and 84%	>= 85%

Opinions

- Access block has many contributing root causes across the whole hospital (and beyond). There is a wide literature describing the adverse effects of access block on patient outcomes
- Simultaneous challenge of increased demands on relatively fixed resources
- Attempts to improve access block by incremental change or generic solutions are seldom successful or sustainable
- A detailed diagnostic process is required to achieve a detailed quantitative understanding of the root causes of access block for your patients in your hospital

- Any lessons from the United Kingdom Four Hour Rule relevant to Western Australia pertained only to strategy and not solutions

- The strategy we learned from the UK and attempted emulate:
  - Strong consistent political and executive commitment, good governance and performance management
  - An urgent stretch target to drive innovation across the whole system
  - A collaborative patient-focused data-driven methodology to create solutions based on the identified root causes

- We decided that the change around the Four Hour Program needed a strong set of agreed values shared by staff and patients (the *why*)

- In our case…

  – Quality patient care is effective, safe, personal and timely

  – Every patient counts, and to them, every minute counts

  – The most important resource in health is its workforce

- Delivering access to inpatient services within four hours requires
  - Re-engineering of processes across the whole hospital
  - A much greater use of business intelligence
  - Clear accountability and performance management
  - Attention to detail

A large scale change initiative

- We established a state-wide governance structure
  - Standard teams
  - Regular structured reporting
  - Data dashboards

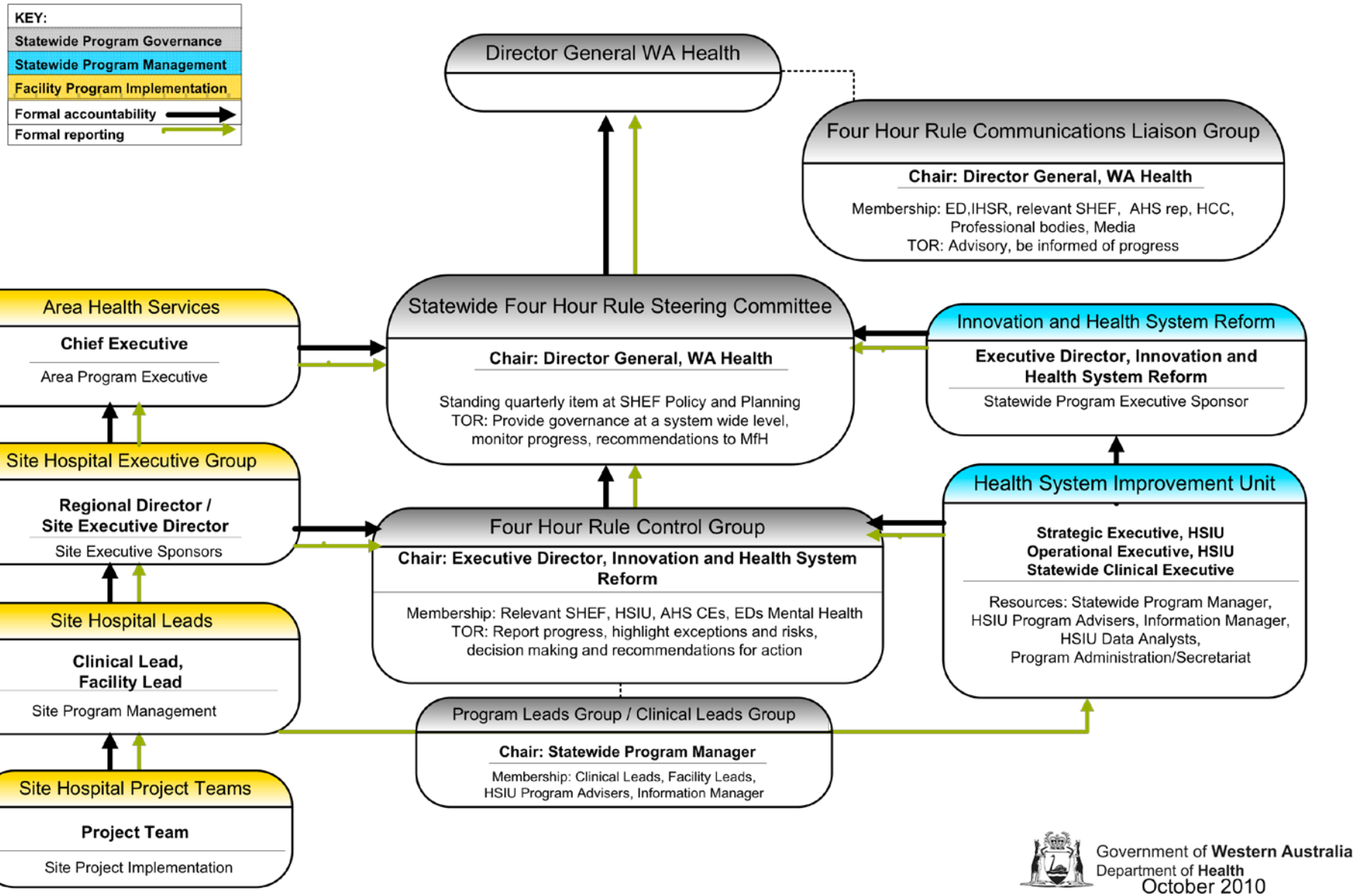
- Hospital teams followed a standard redesign methodology

- Many root causes highlighted problems with governance and organisational cultures
  - Roles and responsibilities
  - Accountability for change and performance

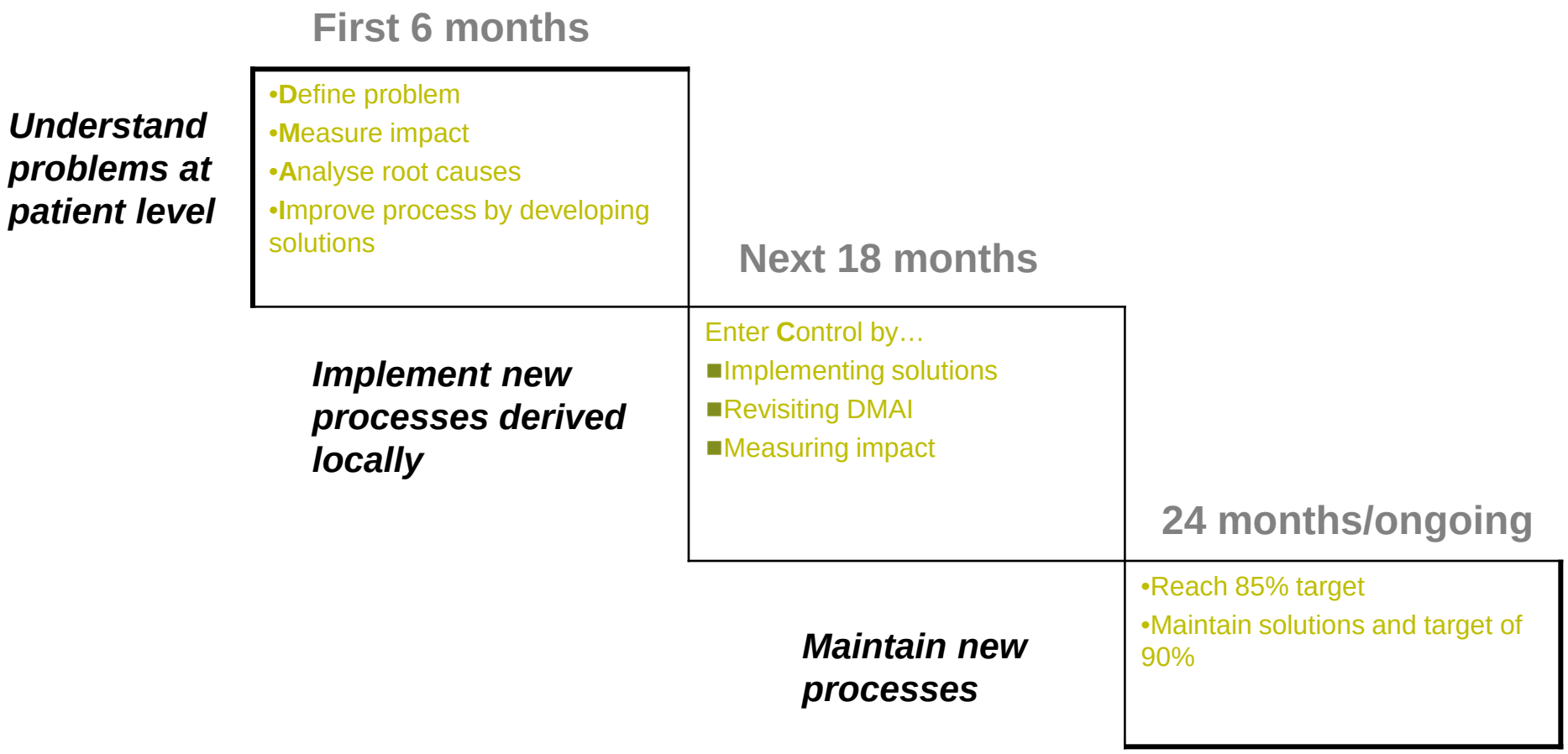
Western Australian Redesign Methodology

- Standardised; uses principles from 6 Sigma, Lean, project and change management
- Suited to large organisations and systems
- Centred on the patient's care and experience
- Incorporates the voice of the patient and staff
- Led by clinicians; decisions based on data
- Follows a 'DMAIC' process

State Four Hour Governance



The Three Year WA Four Hour Program



Resourcing

- Funded by the COAG National Partnership Agreement on Hospital and Health Workforce reform ($76M)
- Each of the 17 hospitals had
  - Clinical lead 0.2 FTE (3 years)
  - Facility program lead (3 years)
  - Seconded central program advisor (First 6 months)
  - Seconded central program data analyst (First 6 months)
- Sites submit business cases for non-recurrent spending to resource solutions derived from the redesign methodology
- Recurrent expenditure sourced from Area Health Service budgets

Spending at Royal Perth Hospital

- General Surgery Ward Renovation - $1.7M
- Renovation to Operations Centre in ED - $70K
- Ward computers - $15K
- Recurrent funding ED
  - 1 FTE consultant
  - 1 FTE Registrar
  - 3.5 FTE Nursing
  - 5 FTE Patient Support and Clerical
- Recurrent funding Acute (medical) Assessment Unit
  - 1.5 FTE consultant
  - 1 FTE Registrar
  - 2 FTE Clerical

Four Hour Statewide Dashboard

Delivering a Healthy WA

Dashboard indicators by group

Activity and Utilisation Measure
ED Attendances
Admissions from ED (Total)
Admissions from the ED (Mental Health)
% of ED attendances transferred to another hospital
System Integration and Change Measures
% ED attendances with LOE ≤ 4 hours (headline KPI)
% ED admissions with LOE ≤ 4 hours
% ED transfers with LOE ≤ 4 hours (Total)
% ED discharges with LOE ≤ 4 hours
% ED Attendances with LOE > 12 hours
% Admitted multiday patients discharged before 10:00am

Hospital Resources and Capacity Measures
No. of multiday beds
No. of same day beds (weekday)
No. of same day beds (weekend)
Multiday bed occupancy (%)
% Multiday beds occupied by patients admitted from ED
Ambulance Ramping (hours)

Four Hour Statewide Dashboard

Delivering a Healthy WA

Quality and Clinical Outcome Measures
Unplanned re-attendance to ED within 48 hours (%)
- Attendances (%)
- Patients (%)
In-hospital mortality for admissions from ED (%)
-Rate
-Standardised mortality ratio
No. of MRSA infections / 10,000 bed days
No. of Sentinel Events
No. of Complaints

Quality Surveillance

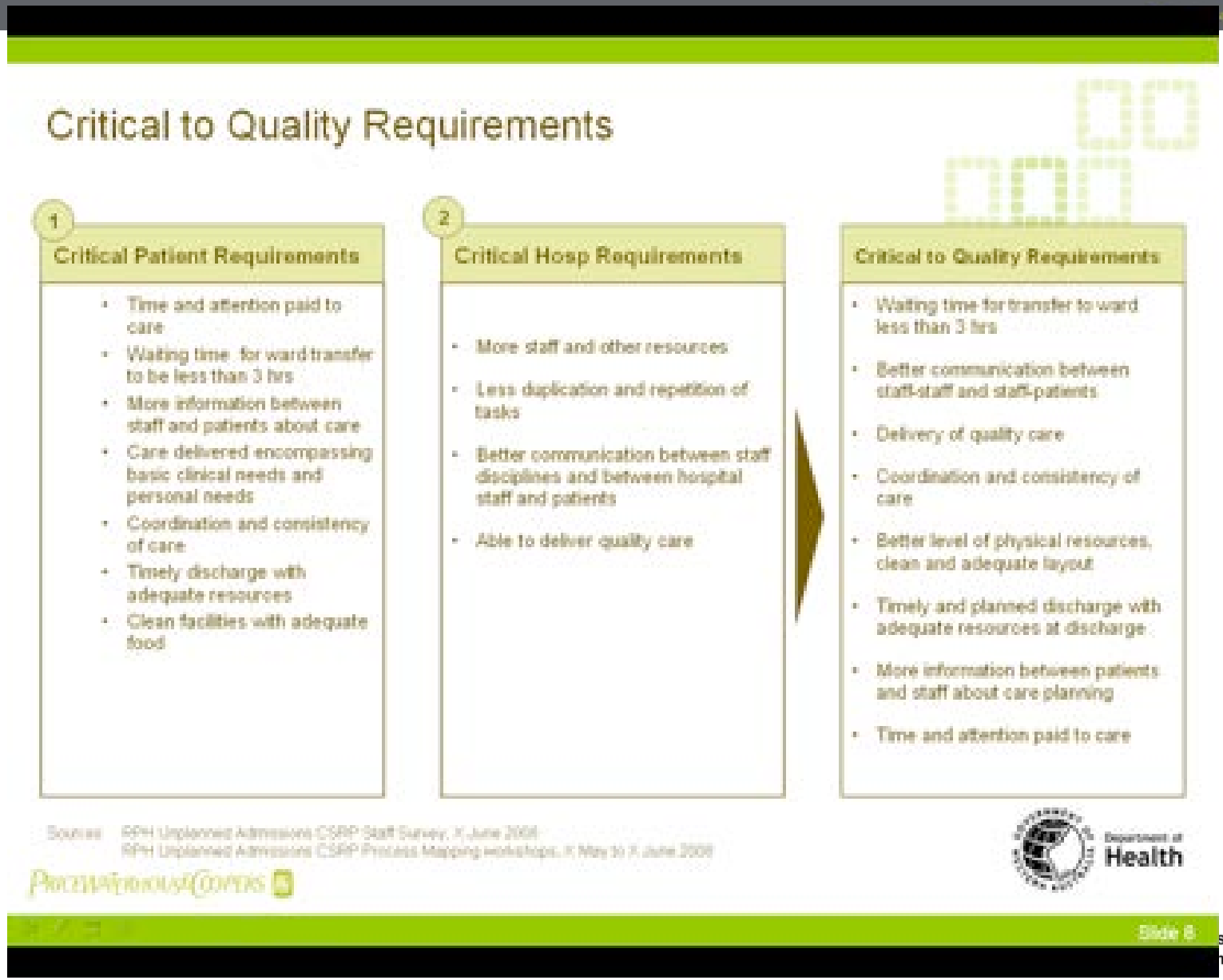
- Hospital quality and safety indicators
- Australian Council on Health Care Standards
- November 2009 Australian Health Ministers Agreement
  - Hospital standardised mortality ratio (HSMR)
  - Death in low-mortality Diagnosis Related Groups (DRGs)
  - In-hospital mortality rates for acute myocardial infarction, heart failure, stroke, fractured neck of femur and pneumonia
  - Unplanned hospital re-admissions of patients discharged following management of acute myocardial infarction, heart failure, knee and hip replacements, depression, schizophrenia and paediatric tonsillectomy and adenoidectomy
  - Healthcare associated *Staphylococcus aureus* bacteraemia, including MRSA

Define

- Patients presenting to the ED admitted, discharged or transferred within 4 hours (85%; 95% and 98% targets)

- Criteria critical to quality (staff and patients)
  - Mortality rate
  - ED representation rate 48 hours
  - MRSA infections
  - Hospital quality and safety indicators

Critical to quality requirements

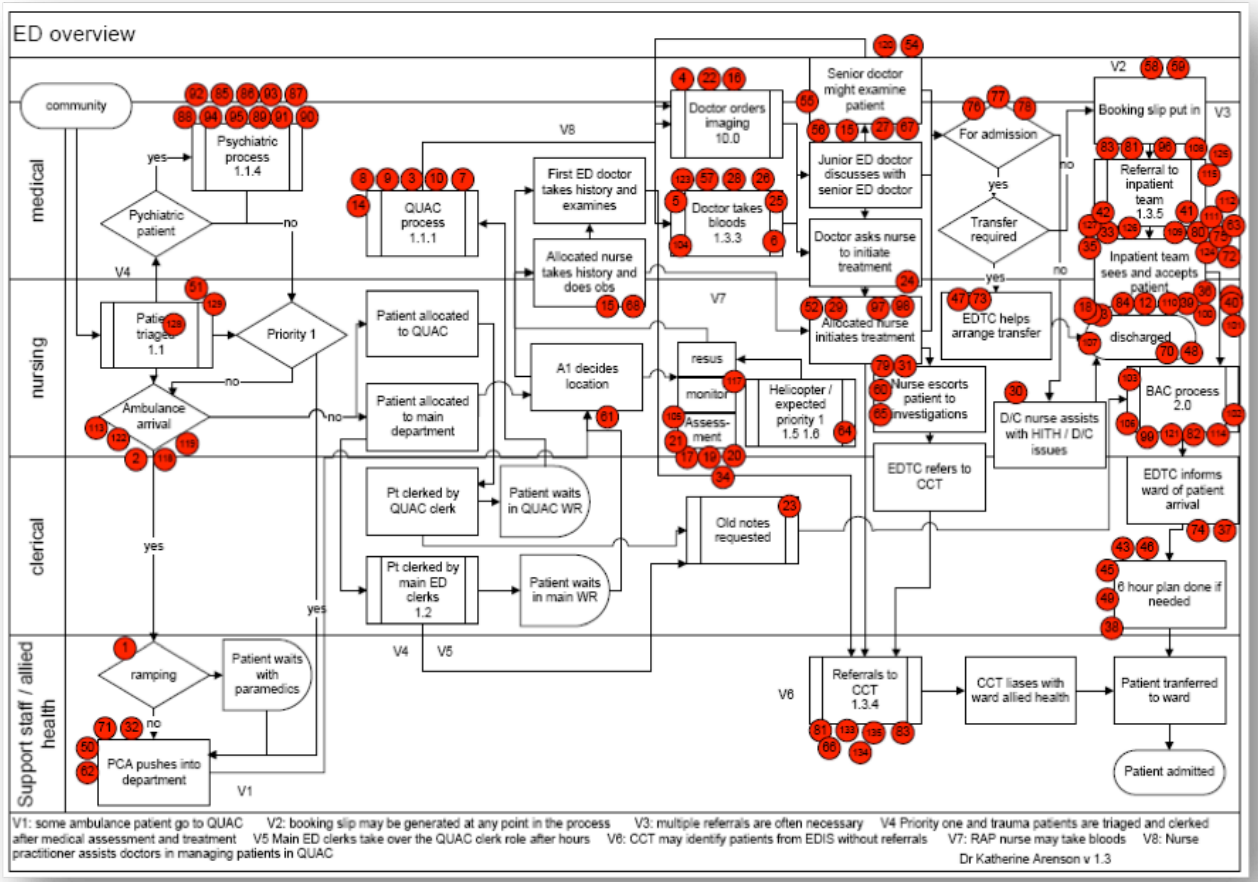


Define

Process maps

- Medical
- Surgical
- Psychiatry
- Emergency Medicine
- Critical care
- Bed management
- Ward management
- Discharge

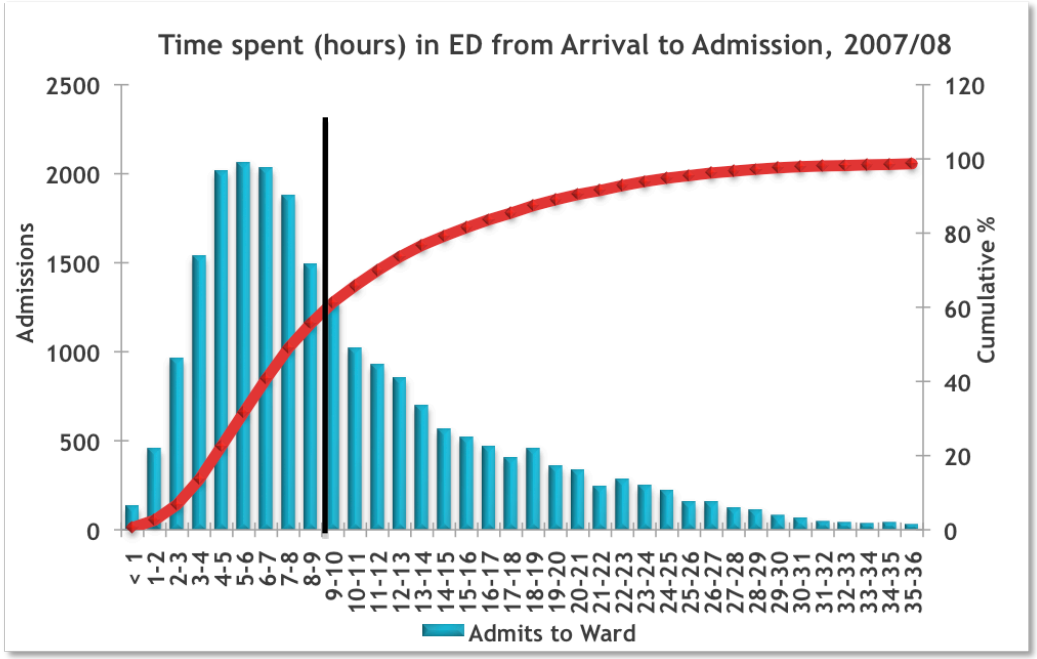
Define



808 issues pertaining to patient flow were identified and classified

Measure

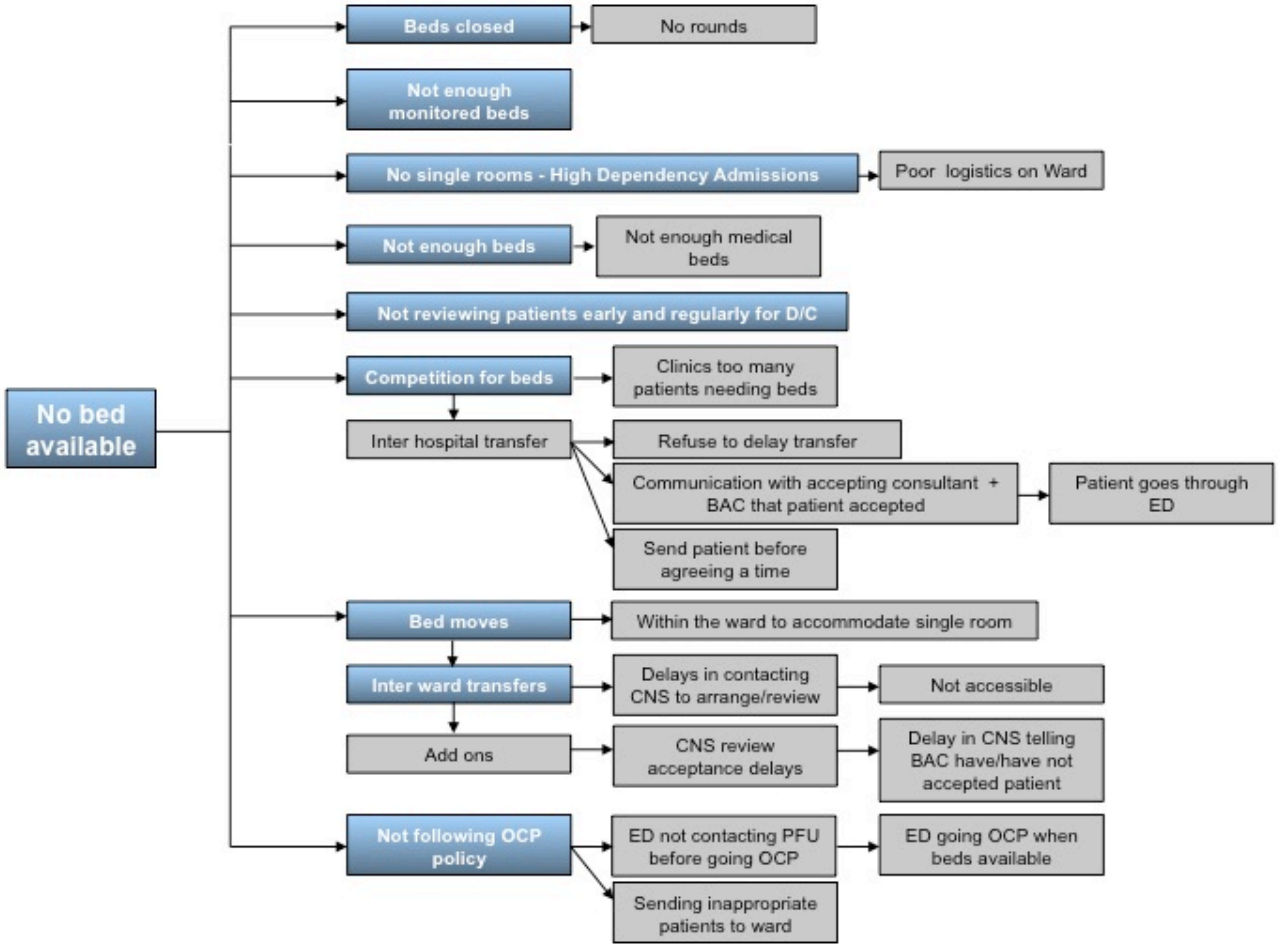
- Baseline ‘level 1 data’ demonstrating normal business across all domains of hospital operations
- 24/7 five day time-and-motion study performed



132 measures analysed across the hospital pertaining to flow

Analyse

- Root cause analysis to determine underlying causes of of measured problems
- 5 whys
- Inter-relationship diagrams
- $y = f(x^1 + x^2 + x^3 + x^n)$
- Null hypothesis testing using data


No bed available
Beds closed
No rounds
Not enough monitored beds
No single rooms - High Dependency Admissions
Poor logistics on Ward
Not enough beds
Not enough medical beds
Not reviewing patients early and regularly for D/C
Competition for beds
Clinics too many patients needing beds
Inter hospital transfer
Refuse to delay transfer
Communication with accepting consultant + BAC that patient accepted
Patient goes through ED
Send patient before agreeing a time
Bed moves
Within the ward to accommodate single room
Inter ward transfers
Delays in contacting CNS to arrange/review
Not accessible
Add ons
CNS review acceptance delays
Delay in CNS telling BAC have/have not accepted patient
Not following OCP policy
ED not contacting PFU before going OCP
ED going OCP when beds available
Sending inappropriate patients to ward

Root Causes- Emergency Medicine

- No process for allocation of new patients to medical staff
  - Median time triage-doctor September 2008 46 minutes
  - No accountability for who would see the next patient waiting and when
  - Senior medical staff: no clear role agreement or accountability as to they patients saw and when
- Poor communication
  - Between different grades of medical staff
  - Medical-nursing
- Multiple personnel responsible for patient flow in the ED
  - Who is in charge?
- Mismatch between workload and staff roster profiles

Root Causes- Inpatient Referrals

- Multiple referrals to inpatient teams; inpatient teams often refer ED patients to each other

– 30% of admissions had multiple inpatient team referrals

– ED LOS 11.2 hours *v.* 6.52 hours ($p<0.05$)

- Inpatient teams have competing workloads and ED usually lower priority

- Inpatient teams take longer to see patients in ED if referral made by junior doctor (extra 28 minutes; $p<0.003$)

Root Causes- Bed Allocation

- Retrospective centralized bed management without access to accurate data. No predictive analysis
- Intra-hospital bed moves (>50% of bed movements are across different wards)
- Lack of business rules around bed allocation
  - Beds kept empty at night while patients wait in ED
- Poor communication between ‘managers’
- No clinicians accountable for access performance

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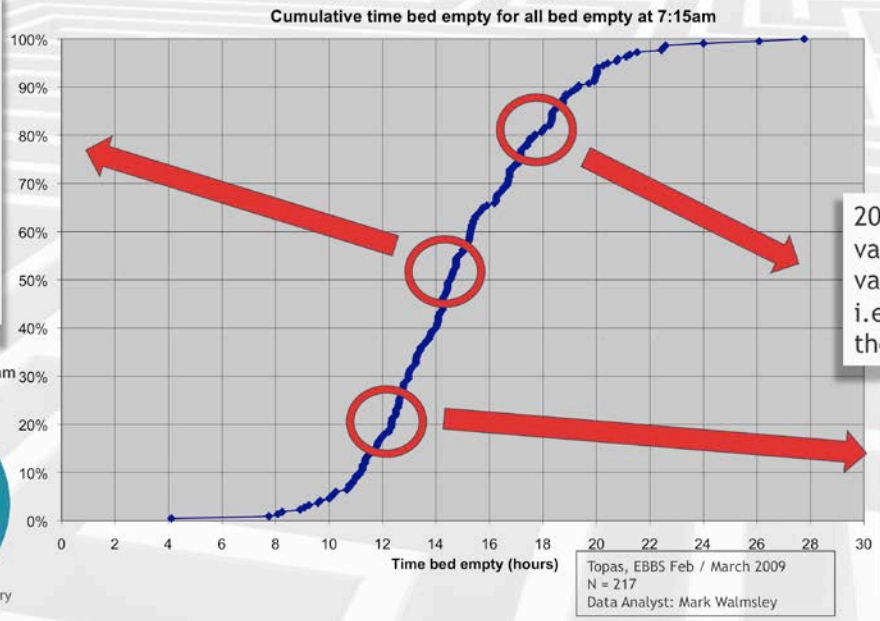
Hypothesis

Royal Perth Hospital

H1: The majority of beds that are vacant at 7:15 am have been vacant since the previous afternoon

Ho: The majority of beds that are vacant at 7:15 am have not been vacant since the previous afternoon

50% of beds that are vacant at 7:15 have been vacant for over 14.5 hrs i.e. since before 16:45 the previous day

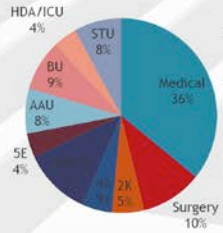


There are on average 10 empty beds at 7:15am across the hospital

20% of beds that are vacant at 7:15 have been vacant for over 17.5 hrs i.e. since before 13:45 the previous day

80% of beds that are vacant at 7:15 have been vacant for over 12.3 hrs i.e. since before 18:45 the previous day

Bed Type vacant at 7:15am



Conclusion:

The majority (80%) of beds that are vacant at 7:15 have been vacant since the previous evening

Root Causes- Ward Process and Discharge

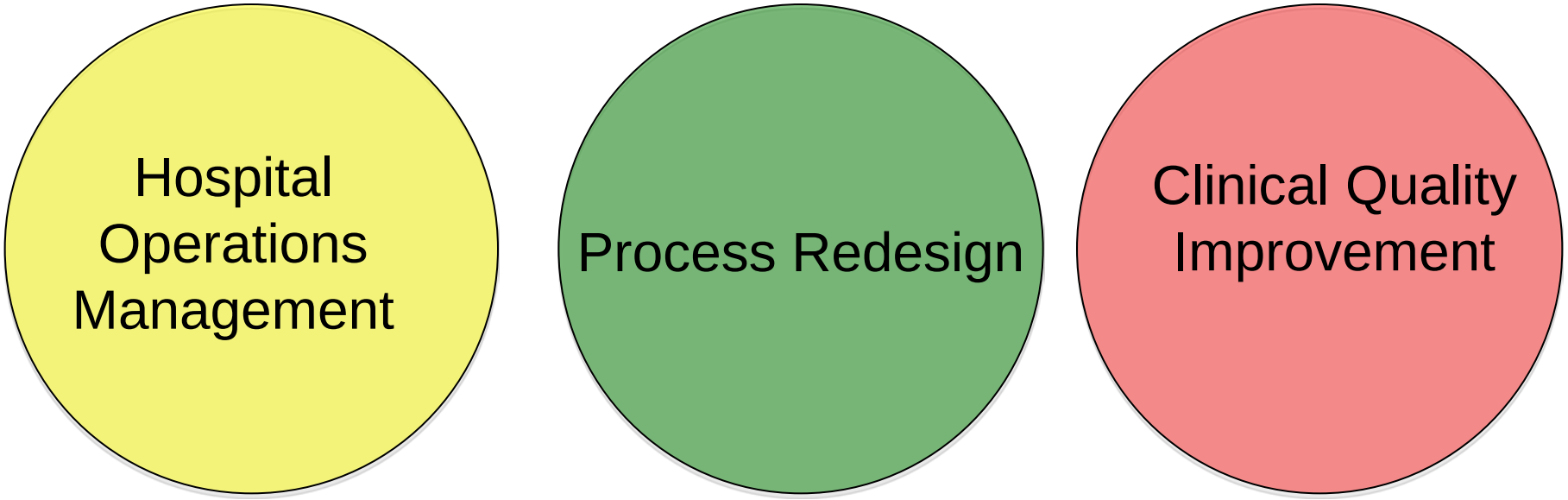
- Poor leadership, management and accountability for all staff working in the ward. Roles and responsibilities ill-defined
- Poor discharge planning and documentation
  - 40% of patients had an estimated date of discharge
  - 15% of patients had a clear plan documented
- Poor discharge communication
  - Between staff
  - With patients- 58% of patients being discharged were not told until the day of discharge
- Afternoon ward rounds and discharges
- Ward bed turn-around times (time from departure of one patient to arrival of the next patient in the same bed; mean 4 hours 12 minutes)

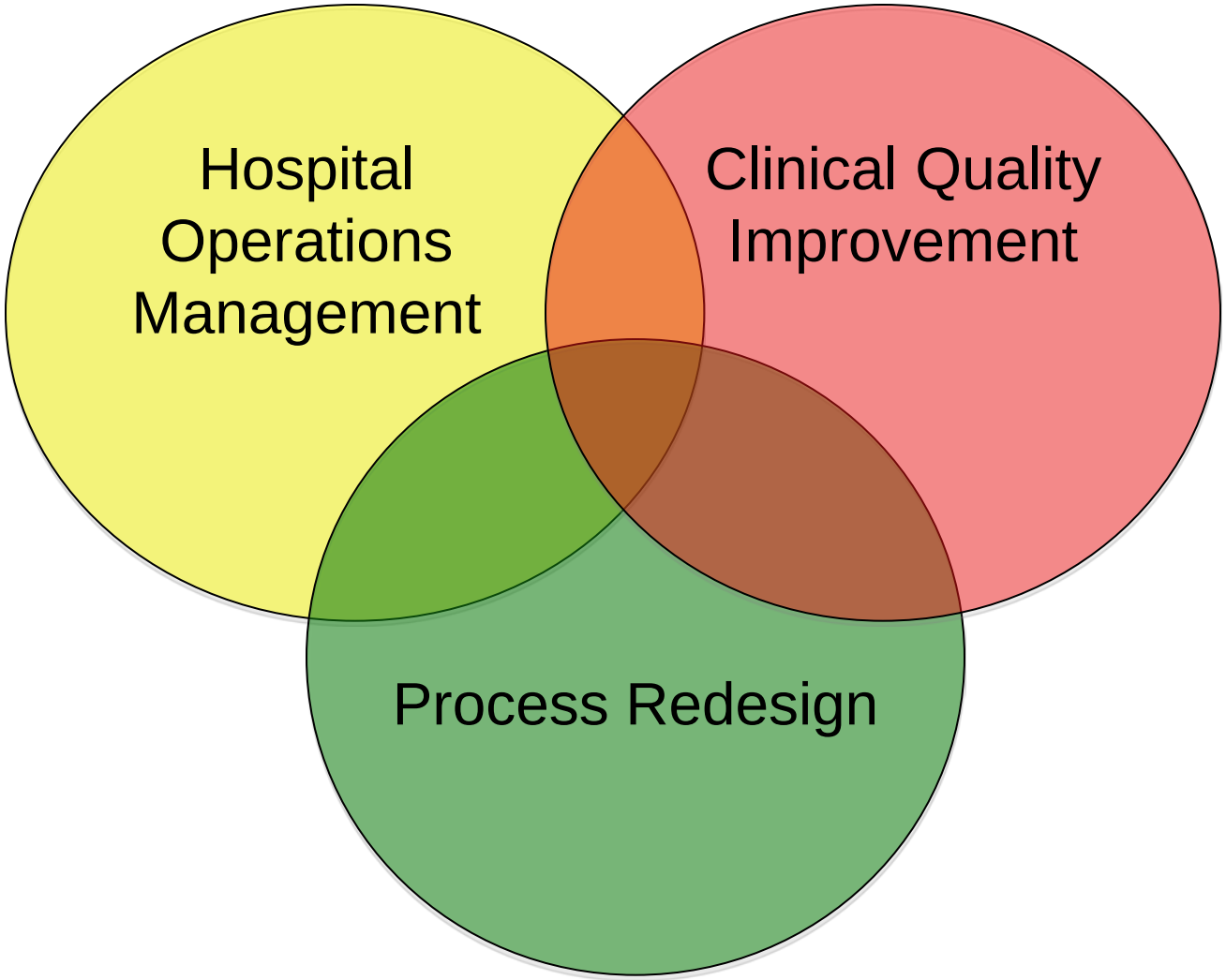
Emergency Department Solutions

- Team-based care
  - Every team led by a senior doctor decision maker
  - A nurse on every team
  - Patients allocated to a team on arrival
  - 30 minute and 2 hour time KPIs
- Consultant-led ambulatory care stream
- ATS 3-5 seen in order of arrival
- Inpatient registrars not authorized to decline admissions
- ED admission to ward one hour after referral if stable
- Emergency Medicine Ward

Major Solutions- Royal Perth Hospital

- **Home wards**
  - Re-allocation of bed resources
  - Quarterly bed plans with monthly review
- **Ward leadership program**
  - Roles and responsibilities defined
  - Leadership training
- **Predictive bed management and ward pull**
  - Daily management meeting
  - Three day capacity-building plans
  - Patient bed allocation and pull to ward devolved to ward staff
  - Operations management streamlined
- **Discharge**
  - Visual management systems
  - Criteria or event-led discharge
  - Long stay committee
- **Surgery**
  - Theatre allocation and utilization
  - Anaesthetic-surgical teams
  - Emergency-elective management
- **Imaging**
  - Clinical liaison roles
  - Prioritization
- **Quality display dashboards**
  - Every clinical area and locally managed
  - Public

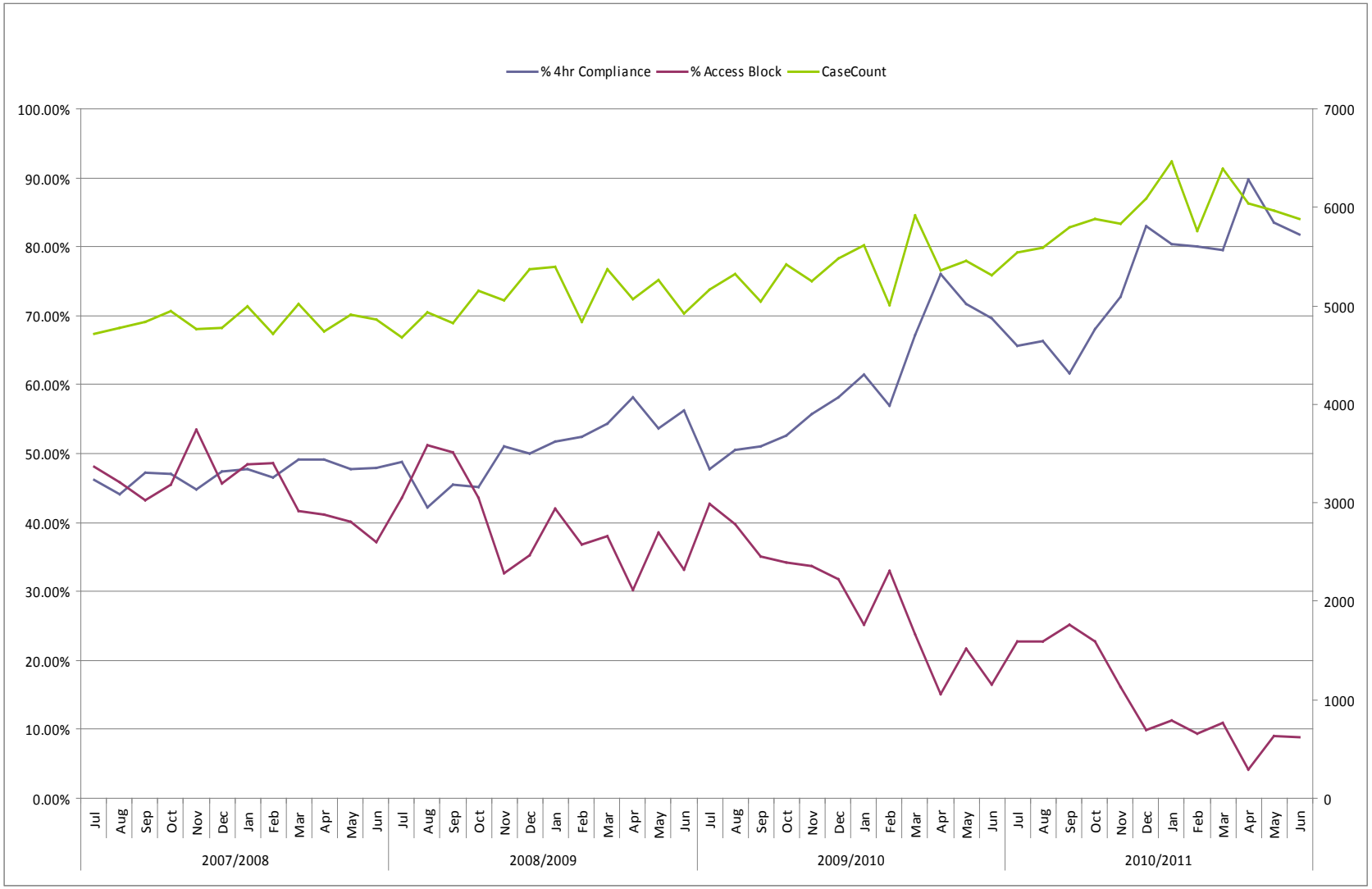

Hospital Operations Management
Process Redesign
Clinical Quality Improvement


Hospital Operations Management
Clinical Quality Improvement
Process Redesign

Vertical Integration of Quality Improvement

- Ward quality boards
- Hospital electronic displays
- Peak governance committees
- Area Health Service strategies
- State strategic planning

Royal Perth Hospital: ED Presentations, Access Block and Four Hour Target Performance July 2008-July 2011

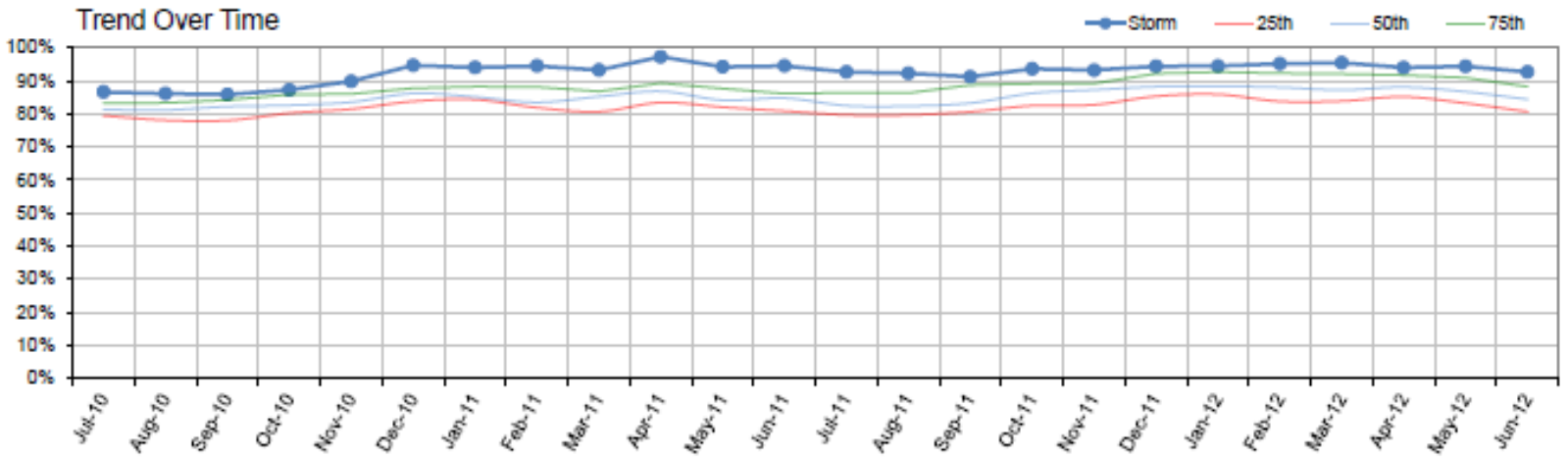


Health Round Table Data RPH ED 2012

Delivering a Healthy WA

Time Spent In ED C5.0: % of patients departing ED within 8 hours

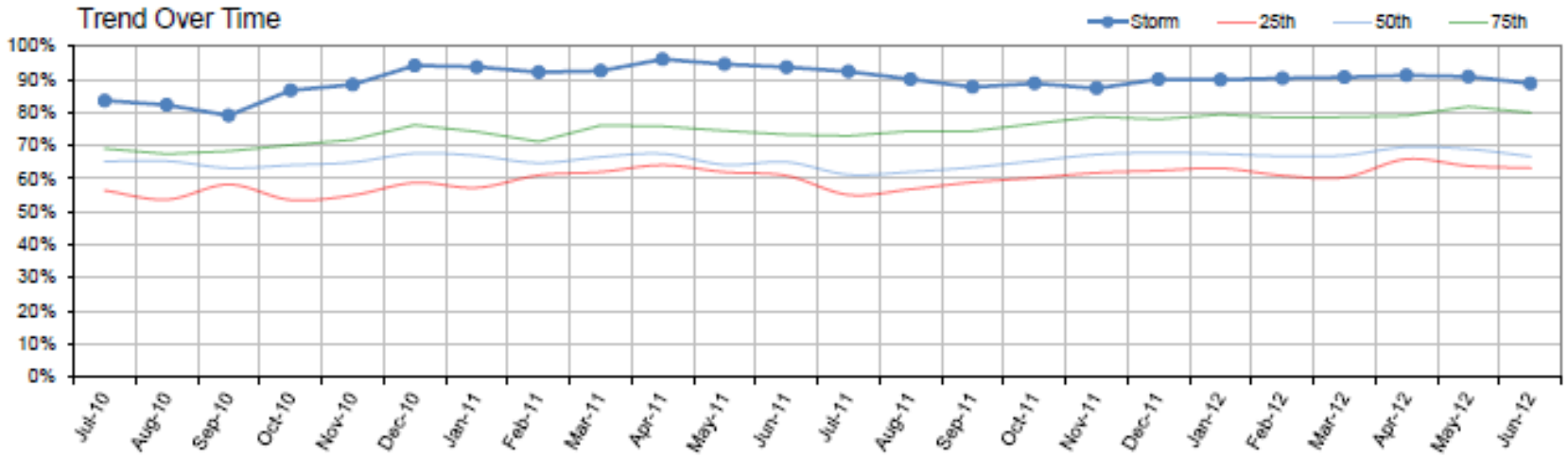
All patients, whether discharged home by ED or transferred to a ward



Health Round Table Data RPH ED 2012

Time Spent In ED C6.2: % of patients departing ED within 4hours

Patients discharged directly home by ED

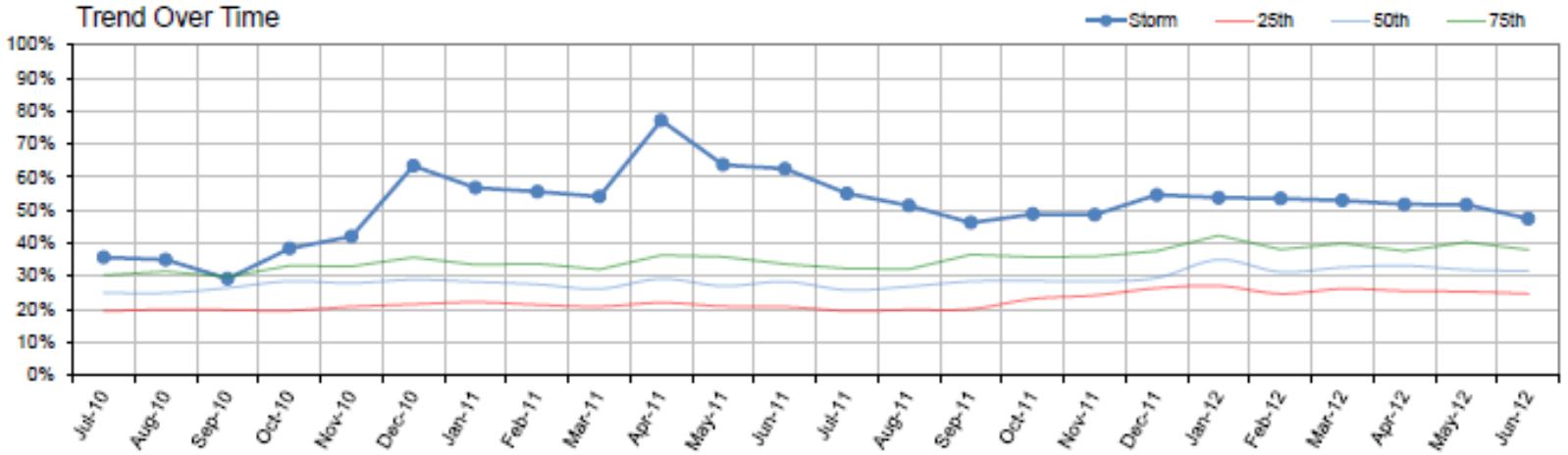


Health Round Table Data RPH ED 2012

Delivering a Healthy WA

Time Spent In ED C7.2: % of patients departing ED within 4 hours

Patients who were transferred to a ward in the hospital



Health Round Table Data RPH ED 2012

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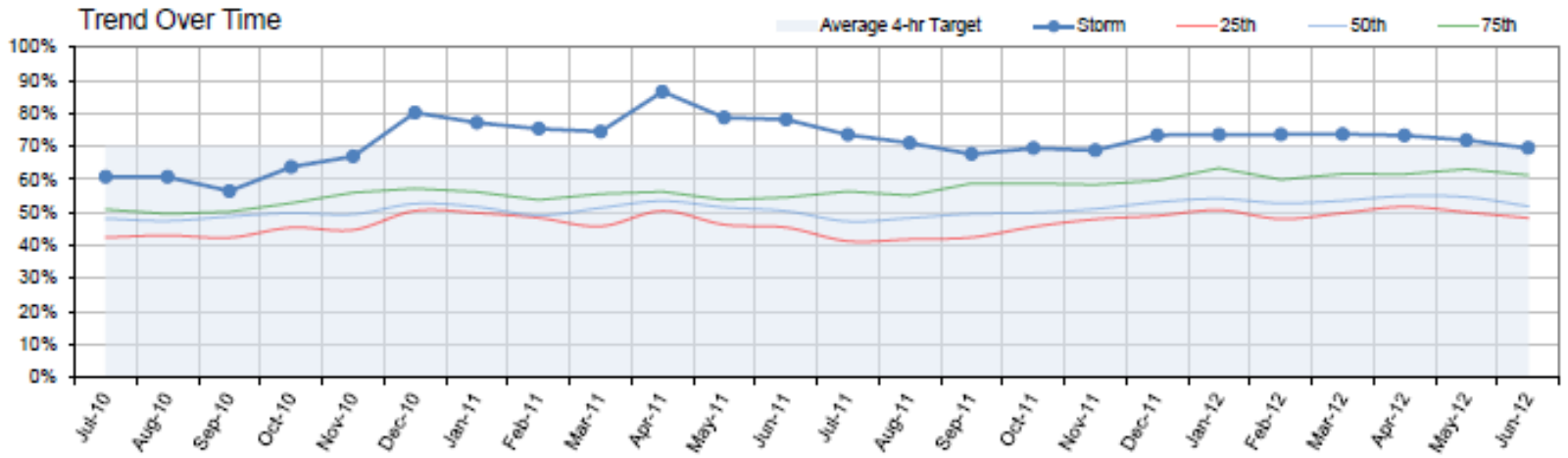
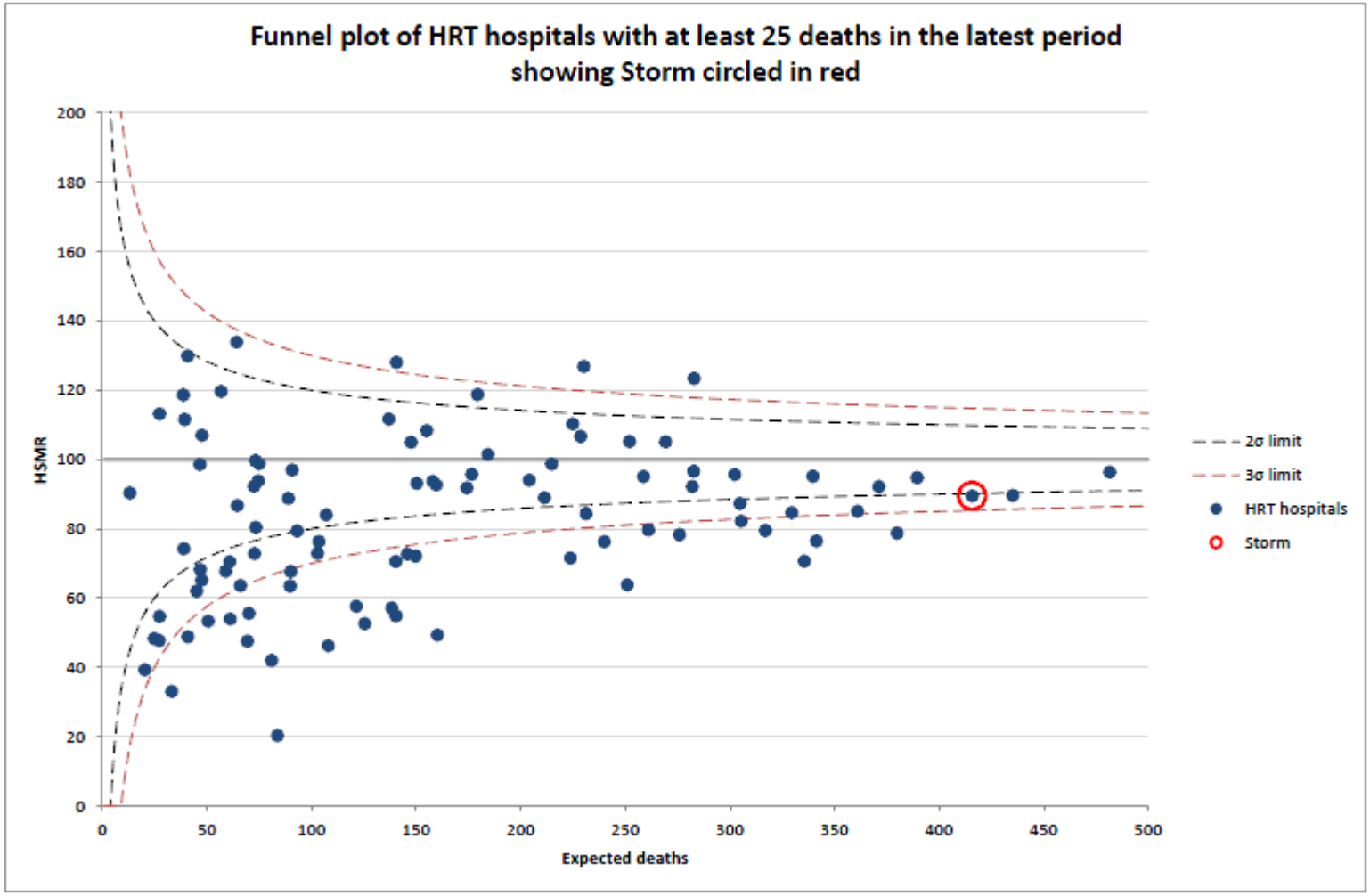
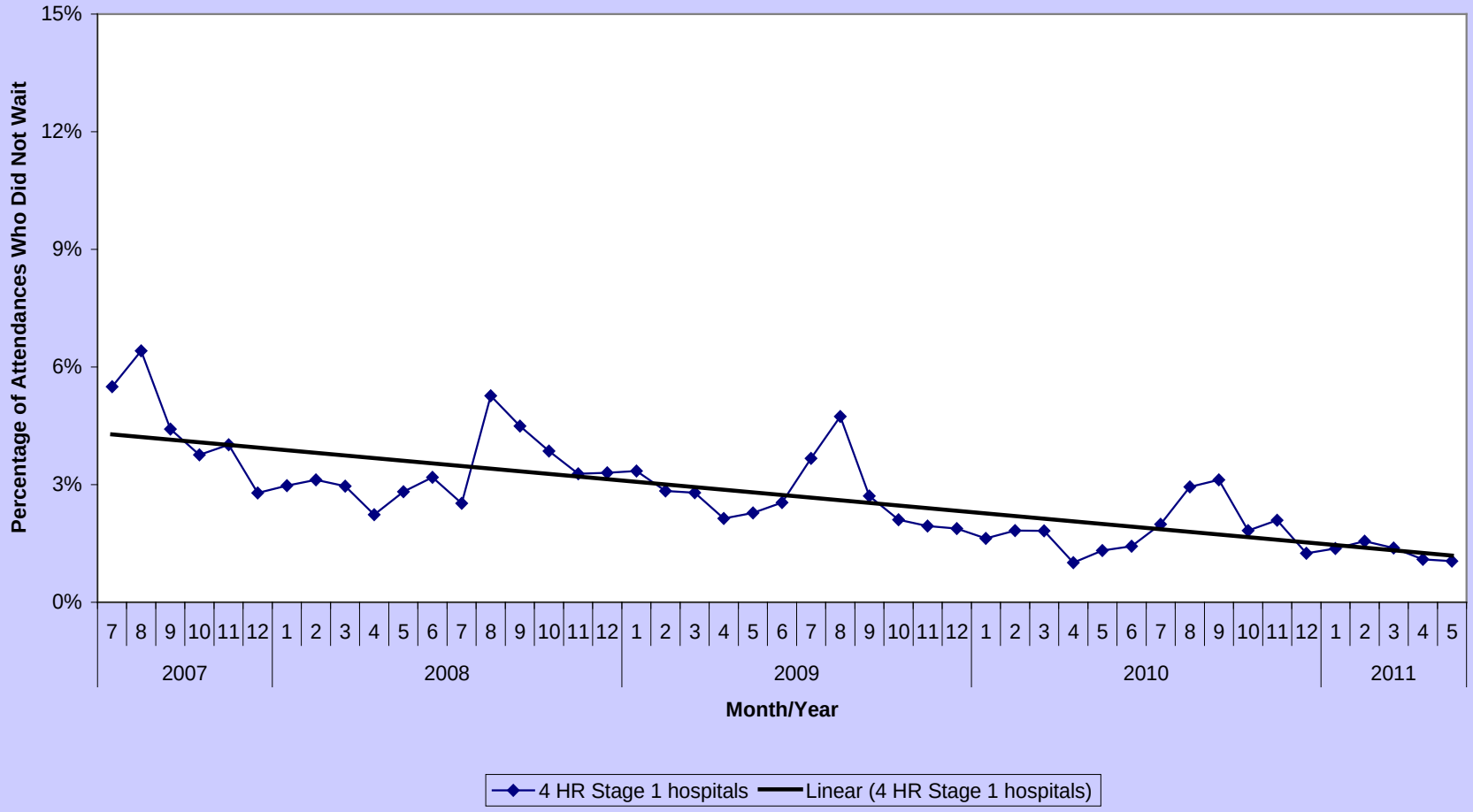
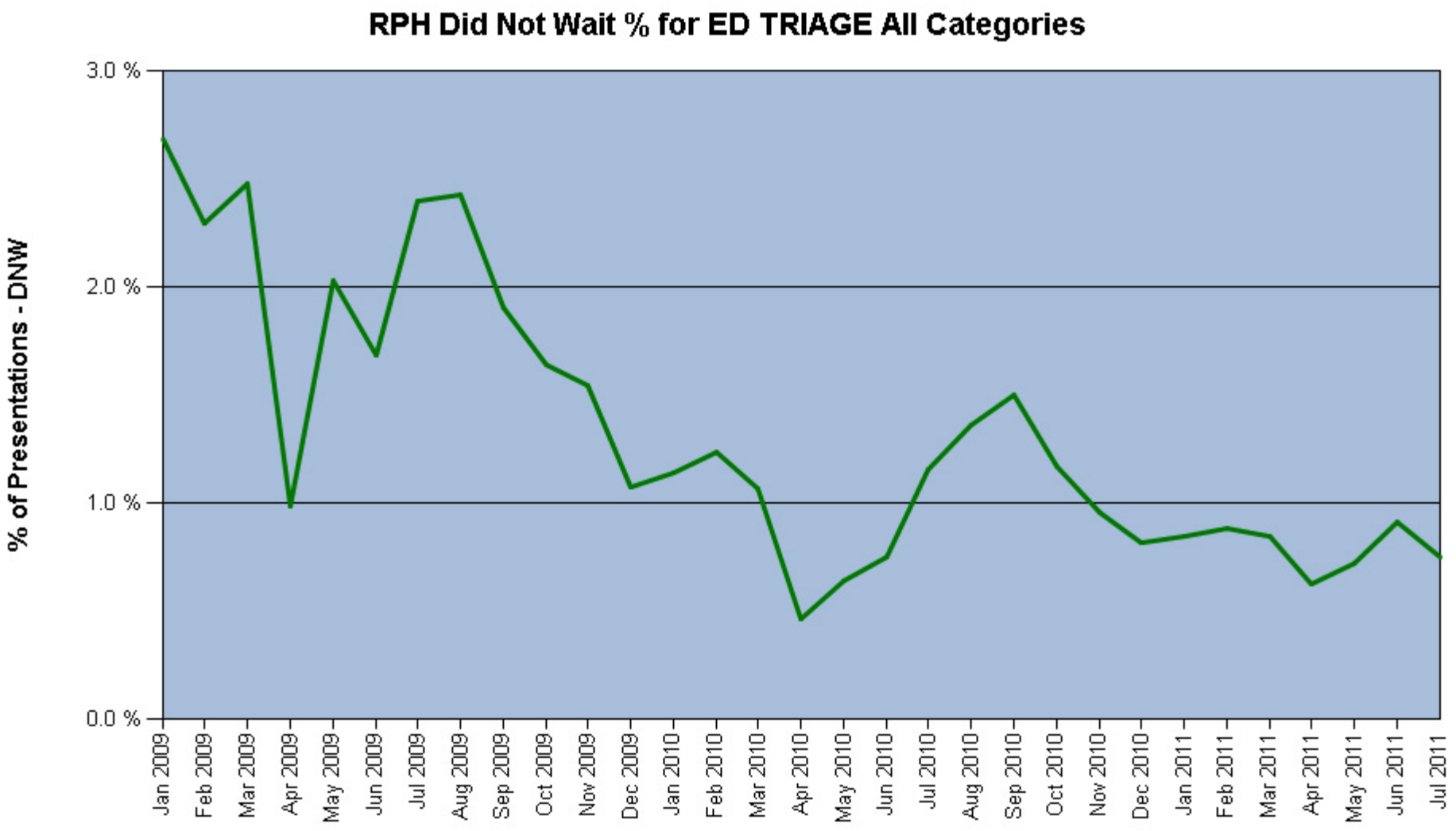


Mortality- Health Round Table Data RPH 2012



Proportion of Attendances Who Did Not Wait To Be Seen at Stage 1 Four Hour Rule Hospitals, July 2007 to May 2011




RPH Did Not Wait % for ED TRIAGE All Categories
% of Presentations - DNW
3.0 %
2.0 %
1.0 %
0.0 %
Jan 2009
Feb 2009
Mar 2009
Apr 2009
May 2009
Jun 2009
Jul 2009
Aug 2009
Sep 2009
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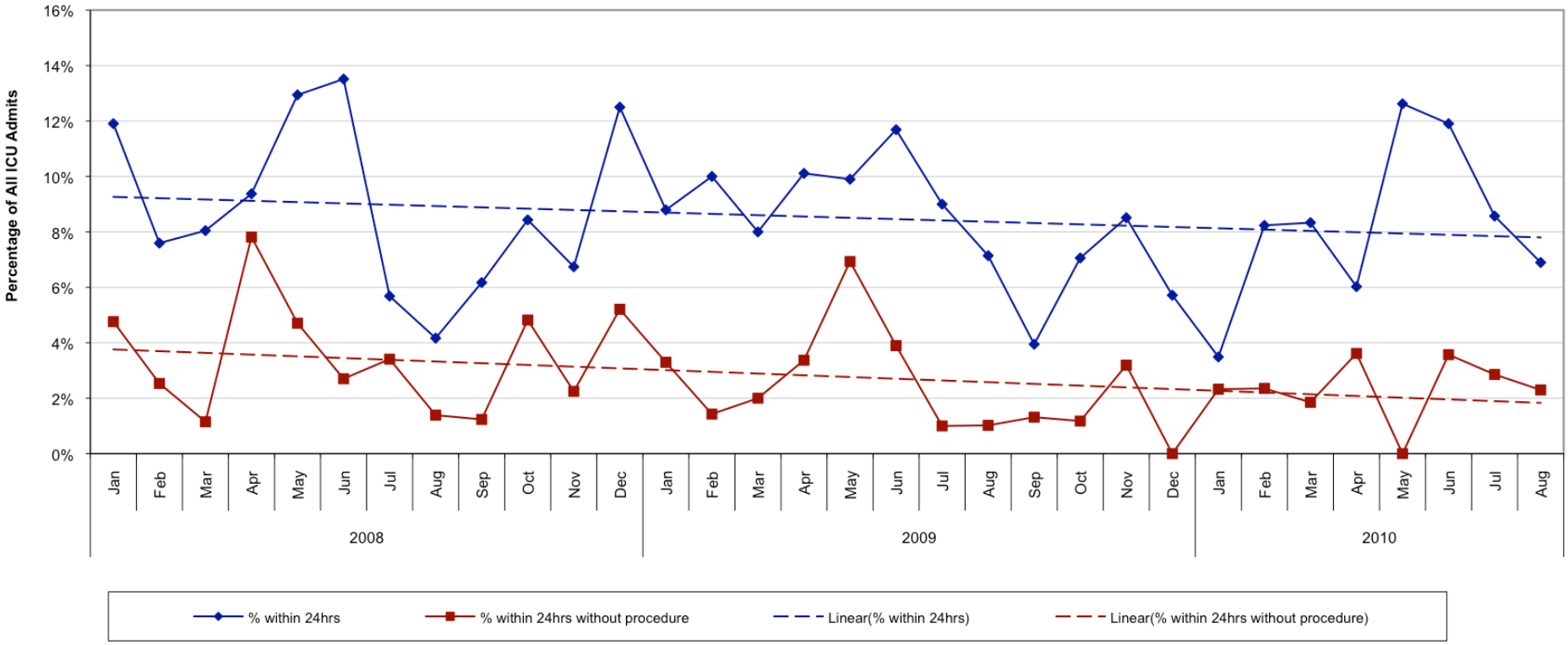
Royal Perth Hospital ICU Admission rate within 24 hours of unplanned admission to general ward



Stokes Report November 2012

Delivering a Healthy WA

Better patient outcomes in a number areas

- No evidence of increased mortality
- No evidence of adverse effects due to patients being transferred to a wards prematurely
- No evidence of increased ED or hospital readmission rates
- No evidence of infection control issues

Issues identified

- Junior doctors not having a voice
- Junior doctor work pressure (poor support from consultants)
- Training
- Heterogeneous infection control and cleaning practices
- Patient support staff
- Operating theatre efficiency RPH
- Endorsed Acute Medical and Surgical Units

- If I was to do it again I would start with an analysis of the hospital's organisational culture

- Does it have the characteristics of a high performing organisation?
  - Clear shared values
  - Seeking value (patient focused)
  - Devolved leadership and decision-making
  - Clear roles and lines of accountability, but integrated teamwork
  - Absolute transparency about performance
  - Decisions based on data
  - Action orientated culture
  - Clear leadership and management training
  - Succession planning

From 75% to 90%

- Long stay patients and movement to subacute settings
- Refinement of existing models
  - Acute Medical Unit
  - Emergency Medical Ward
  - Admission avoidance (ambulatory sensitive conditions)
- Service-line reporting and service line management
- Greater predictive bed management
- Operating theatre productivity
- Improved elective waitlist management

Challenges

- Managing expectations
  - “Four Hour Rule” nomenclature
  - Lightening rod for any and all issues
  - Movement towards target cannot start from the first day

- Regional areas
  - Resourcing
  - Logistics
  - Delivery of training on site

Challenges

- Communicating the need for change
  - Talking about ‘why’; not ‘what’ and ‘how’
- Emergency Medicine
- ‘There is no they’
- The role of Clinical Lead
- Capacity arguments
- Resource bargaining
- Executive visibility
- Data analysis and performance management

Essential

- Strong and visible leadership
- Quality improvement and patient focus throughout the program from inception
- Ambitious timeframes to drive change
- Use of a redesign methodology and project management (don’t jump to solutions)
- Standardised reporting and support structures via a central team; an ‘impartial’ reference point for sites and executives

“A wall of sponge rubber six months thick”

Doug Aberle
Former CEO Western Power