The National Emergency Access Target (NEAT): can quality go with timeliness?

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Abstract

Objective: To report the experience of implementing a 4-hour-rule program.

Design, setting and participants: A 3-year whole-of-hospital clinical service redesign program in a tertiary paediatric hospital in Western Australia, involving all patients presenting to the emergency department (ED) from 1 January 2009 to 31 December 2011.

Main outcome measures: Percentage of patients admitted, discharged or transferred from the ED within 4 hours of arrival at triage, and percentage of patients discharged from inpatient wards before 10 am.

Results: The percentage of patients admitted, discharged or transferred within 4 hours of arrival at the ED increased from 87% in 2009 to 95% in 2011. Safety and quality measures, including the admission rate from the ED, unplanned reattendances at the ED within 48 hours of discharge, patient complaints and inhospital mortality, remained unchanged. The percentage of patients discharged from inpatient wards before 10 am increased from 18% in 2009 to 30% in 2011.

Conclusions: The introduction of a 4-hour-rule program has resulted in improved timeliness of care for patients throughout the hospital, both in the ED and inpatient wards, with no adverse impact on the quality and safety of clinical care.

Increasing demand on health services during times of austerity has necessitated examination of the way we deliver health care.[1,2] In 2008, Western Australian tertiary hospital emergency departments (EDs) were experiencing the highest rates of access block (the percentage of patients who wait longer than 8 hours for an inpatient bed) in the country.[3,4] The well documented relationship between access block and poor health outcomes for patients,[5-9] coupled with adverse media and public opinion about Western Australia's public hospitals, demanded a significant response. A Minister for Health delegation travelled to the United Kingdom to examine National Health Service (NHS) reforms,[10,11] to learn from their successes to improve health care delivery in WA. Subsequently, in April 2009, the Four Hour Rule (FHR) Program was launched in WA.[12] Stage 1 of the program involved the state's four tertiary public hospitals: Princess Margaret Hospital for Children, Royal Perth Hospital, Sir Charles Gairdner Hospital and Fremantle Hospital.

WA hospitals were initially set the same final FHR target as hospitals in the UK, which was that 98% of all patients presenting to their ED should be admitted, discharged or transferred within 4 hours of arrival. However, key differences between the two programs were that the WA FHR program had a clear and defined focus on monitoring patient safety and quality outcomes, that there were no financial incentives or sanctions for hospitals that achieved or failed to achieve the set targets, and the launch coincided with a challenging time in global finances. This presented a compelling need to examine systems and processes, so, while limited funding was made available to support change initiatives, it was agreed there would be no allocation of recurrent funding, meaning no additional beds or staff. In June 2010, the UK government introduced a suite of new clinical quality indicators and reduced their FHR target to 95%.[13] The purpose of these new indicators, which were very similar to those already being monitored in WA's FHR program, was to broaden the measurement of quality to cover effectiveness of treatment and patient satisfaction.

The aim of WA's FHR program was to improve patients' experience and quality of care by reducing delays in the ED and streamlining processes throughout the hospital. With the recent introduction of the National Emergency Access Target (NEAT),[14] we report our experience of establishing a successful FHR program.

Methods

Princess Margaret Hospital for Children (PMH) in Perth, WA, is a 220-bed tertiary paediatric hospital, that has more than 65 000 presentations to the ED annually. The FHR program used a clinical services redesign model, based on principles from Six Sigma and "lean thinking". Clinical services redesign is a proven, rigorous international model used in large complex organisations.[15-17] The model is data-driven and consumer-(ie, patient-) focused. Six Sigma is a disciplined, data-driven approach for eliminating defects in processes.[18] The Six Sigma improvement model consists of five phases: Define, Measure, Analyse, Improve and Control (DMAIC). Lean is a collection of tools and principles that aim to improve health services by eliminating waste, adding value to processes and allowing continuous improvement.[19]

The FHR program commenced in April 2009 with a strictly time-limited 6-month diagnostic phase, followed by the implementation of solutions over 18 months. While the FHR program office led the DMAIC process, each step, including all solutions, were determined, developed and implemented by hospital staff. The program targets were for 85% of patients attending the ED to be admitted, discharged or transferred within 4 hours of arrival by April 2010, 95% by October 2010 and 98% by April 2011.

DMAIC methods

Define phase (5 weeks): The "patient journey" was critically examined and mapped from arrival at triage to discharge from hospital. Open forums were attended by more than 300 hospital staff; their purpose was to map current processes and identify key issues (the "voice of the organisation"). We also collected

1 Quality measures for the Four Hour Rule Program at Princess Margaret Hospital, Perth, Western Australia, 2009 to 2011

Measure	2009	2010	2011
Emergency department (ED) attendances	60 060	65 818	67 473
Admissions from ED	11 174	11 372	11 505
Rate of admissions from ED (95% CI)	18.60% (18.29%–18.92%)	17.28% (16.99%–17.57%)	17.05% (16.77%–17.34%)
Unplanned reattendances within 48 hours	352	339	428
Rate of unplanned reattendances (95% CI)	0.59% (0.53%–0.65%)	0.52% (0.46%–0.57%)	0.63% (0.58%–0.70%)
Patient complaints	21	29	30
Rate of patient complaints (95% CI)	0.03% (0.02%–0.05%)	0.04% (0.03%–0.06%)	0.04% (0.03%–0.06%)
Inhospital mortality for admissions from ED	9	16	10
Rate of inhospital mortality for admissions from ED (95% CI)	0.08% (0.04%–0.15%)	0.14% (0.08%–0.22%)	0.09% (0.04%–0.16%)

information from children, adolescents and families about their experiences (the "voice of the patient").

Measure phase (6 weeks): After the collection of baseline data, we developed a data measurement plan, including key high-level and low-level measures relating to the patient journey.

Analyse phase (6 weeks): We determined root causes of all major issues, generated, and then tested hypotheses using data and statistical analyses, to validate or refute each root cause.

Improve phase (7 weeks): Hospital staff determined solutions to the root cause of each issue. Implementation plans and business cases were developed, presented to the hospital Executive and submitted to the Department of Health (DoH) to be considered for funding.

Control phase (18 months): Solutions were implemented, with an eventual shift in focus from change management to expected performance, and integration of solutions into normal hospital business.

Personnel

An FHR program office was established, employing one full-time equivalent (FTE) Program Lead (senior registered nurse), a 0.2 FTE Clinical Lead (paediatrician), and one FTE Project Officer. A data analyst and program adviser were seconded from the DoH during the first 6 months of the program. Members of the program office and key senior staff received training in clinical services redesign methods. Clinical staff from areas of the hospital that would be making changes were identified and invited to join solution groups. Each solution group appointed a chairperson, who was responsible for leading the change and was assigned a member of the hospital Executive, who was accountable for implementing the change.

Governance

Strong governance was required to provide clarity and direction around roles, responsibilities and the authority to implement solutions. The FHR program governance structure considered and clearly articulated how the FHR program aligned with PMH's current and future organisational structure, as well as with the structure of WA Health.

Outcome measures and data analysis

Key outcome measures included the overall FHR percentage (ie, percentage of all patients presenting to the ED whose management complied with the FHR), and the percentages of patients admitted, discharged or transferred from the ED for whom this happened within 4 hours of arrival at triage, and the percentage of patients discharged from inpatient wards before 10 am and 12 pm. Critical countermeasures (Box 1) were also reported to ensure that any potential adverse effects of the program were apparent immediately. The Princess Margaret Hospital Ethics Committee approved the reporting of this study (ethics number, 3637).

Results

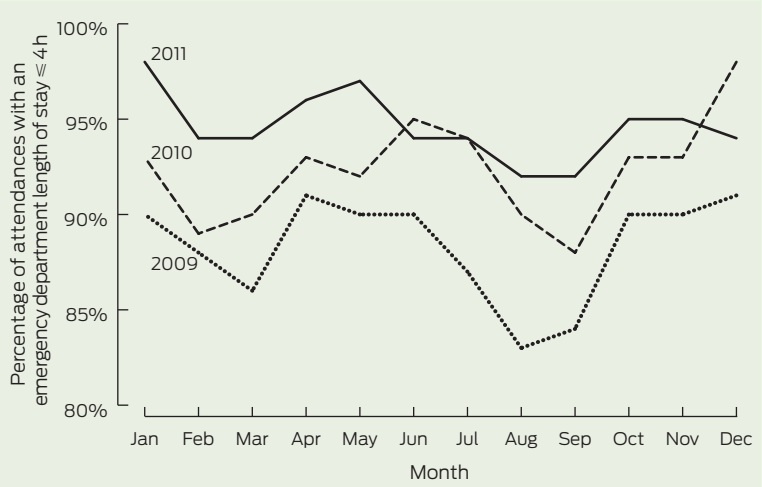
The overall FHR performance at PMH increased steadily over the first 3 years of the program, averaging 87% in 2009 and 95% in 2011 (Box 2). The increase in overall performance resulted from improvements in both the percentage of patients being admitted to hospital within 4 hours (62% in 2009; 74% in 2010; and 80% in 2011), and those being discharged home from the ED within 4 hours (94% in 2009; 96% in 2010; and 98% in 2011).

The Define phase of DMAIC identified more than 400 issues, with common themes including duplication of processes, lack of resources, mismatch between demand and availability of key services, poor communication and inadequate discharge planning. After grouping, 30 major issues remained. These were measured to determine their size and impact, followed by root-cause analysis and generation of solutions (Box 3).

ED attendances increased by 12.3% from 2009 to 2011 (Box 1). During this period, the admission rate from the ED fell, but with the increase in ED attendances, the total number of patients admitted increased marginally. There was no significant change in the percentage of unplanned reattendances to the ED within 48 hours of discharge, the percentage of patient complaints or inhospital mortality. In addition, the number of elective surgeries performed at PMH increased by 9% from 2009 to 2011.

The mean time from patients arriving at triage to being seen by an ED doctor did not change (44 minutes in 2009; 47 minutes in 2010; and 46 minutes in 2011). There was a reduction in the time from being seen by a doctor to the decision to admit being made (96 minutes in 2009; 84 minutes in 2010; and 79 minutes in 2011) and in the time from the decision to admit to the patient departing the ED (109

2 Overall Four Hour Rule Program performance at Princess Margaret Hospital, Perth, Western Australia, 2009 to 2011



minutes in 2009; 66 minutes in 2010; and 46 minutes in 2011).

In response to UK studies suggesting that some patients were being "pushed" out of EDs just before the 4-hour target, with a spike in ED departures between 3.5 hours and 4 hours,[20-22] we used a critical countermeasure, with a weekly figure showing the total time each patient spent in the ED (Box 4, A). In 2011, the median length of stay for all patients attending the ED was less than 2 hours, with only a small spike in activity before the 4-hour mark. For patients being admitted to hospital in 2011, 30% departed the ED within 2 hours, 60% within 3 hours and 80% within 4 hours of arrival. Access block fell from 2.4% in 2009 to 0.6% in 2011.

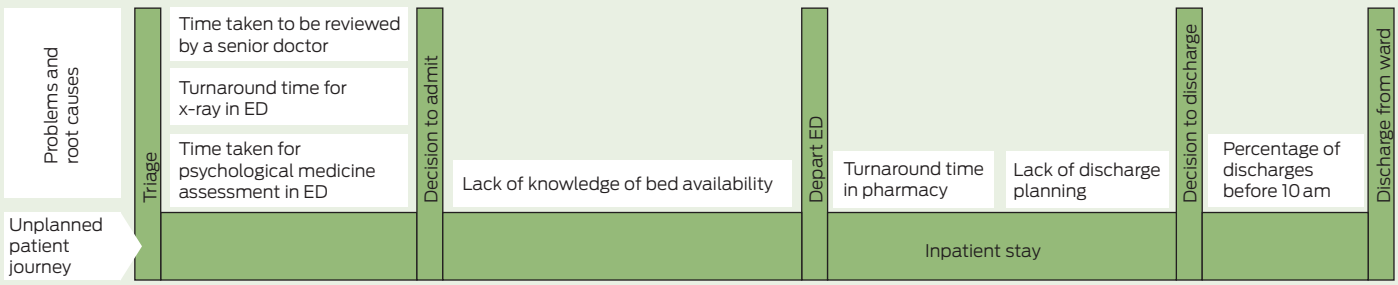
The key factor contributing to the improvement in patients being admitted from the ED within 4 hours was the increase in the percentage of patients being discharged home from an inpatient bed before 10 am. In April 2009, only 18% of all patients discharged home on a particular day were discharged before 10 am, with 50% still occupying their bed at 3 pm. PMH now consistently discharges over 30% of all patients before 10 am and 55% by 12 pm (Box 4, B).

Discussion

The FHR is a powerful change-management tool that has driven the redesign of processes and clinical services throughout PMH, improving the timeliness of care for patients presenting to the ED without any detriment to clinical care.

Critical to the success of the program has been the improvement in timely discharge of patients from

3 Findings from the Six Sigma improvement method, Define, Measure, Analyse, Improve and Control



Solution components

- Establish streaming of patients with minor injuries, with management by dedicated ED staff
- Build a minor injuries clinical area within the ED
- Have the ED shift coordinator act as a single point of contact in the ED for the MIT
- Have an MIT on site in the hospital after hours and on weekends
- Build a psychological assessment area within the ED
- Have psychological liaison nurses situated within the ED
- Establish an ED flow coordinator position to help manage the flow of patients
- Establish clear roles and responsibilities for all hospital medical staff in managing patients admitted from the ED

- Improve communication between the ED and the HCM
- Provide overnight medical registrar cover for inpatient wards to free ED doctors of this responsibility
- Establish a new, clear, bed-management policy
- Carry out non-urgent investigations and procedures on wards rather than in the ED
- Establish a new policy to make use of the ED short-stay unit more efficient
- Establish a new policy to clarify criteria for the use of isolation cubicles
- Increase the transfer of inpatients back to their local general hospitals for ongoing clinical care whenever appropriate
- Improve processes for patients requiring a surgical subspecialty review in the ED
- Extend the hours of service for the virology department
- Update hospital escalation policy for managing patient demand and beds

- Have a senior pharmacist screen medication charts, and ensure wards submit a discharge advice slip with the expected time of discharge of the patient so the pharmacist can prioritise workload, and improve the timely delivery of patient discharge medications back to the ward
- Computerise the logging of pharmacy activity to allow wards to track progress of discharge medications
- Employ a discharge planning project officer to help improve discharge processes by developing and assisting in the implementation of discharge policy, patient-on-leave policy, isolation policy, a discharge information sheet for families and the EDD
- Schedule weekly breach (of four-hour rule) meetings
- Provide administrative support for ward CNMs, allowing them to spend more time overseeing and supporting their staff in the clinical care of patients on the ward

- Establish a new hospital-wide policy of discharging patients by 10 am
- Require the ward to page both the HCM and PCA on patient discharge
- Delineate the role of PCAs to prioritise bed cleaning
- Extend pharmacy hours
- Establish criteria-led discharge of patients for whom this is deemed appropriate by medical staff

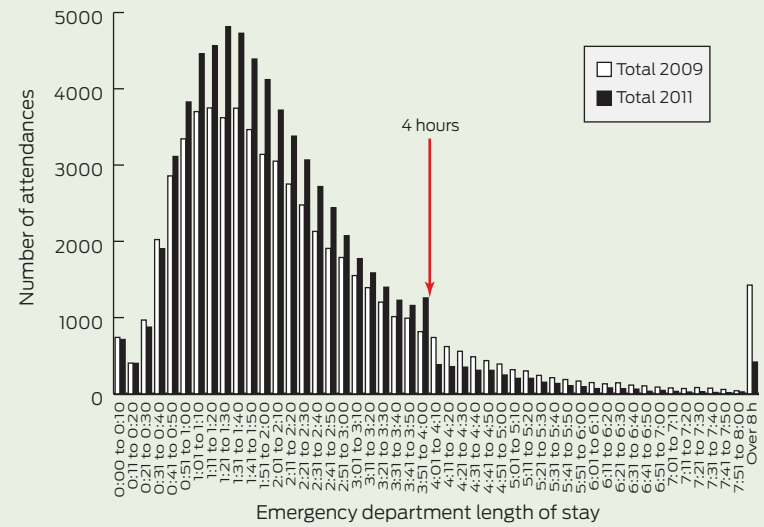
CNM = clinical nurse manager. ED = emergency department. EDD = estimated date of discharge. HCM = hospital clinical manager. MIT = medical imaging technologist. PCA = personal care assistant. ◆

inpatient wards. During the Define phase of DMAIC, one parent noted: "it is harder to get discharged from PMH than it is to get admitted". This was a consistent complaint from families, prompting a major focus on improving discharge processes. There are now a predictable number of discharges before 10 am and 12 pm each day, allowing the Patient Flow Unit to plan more accurately for the predictable admissions from the ED and for elective surgery. Importantly, the improvements in early discharges were achieved without resorting to establishing a discharge lounge (an area where patients who are clinically fit for discharge wait pending arrival of their discharge medications, equipment or transport), as families made it clear that once their child was considered well enough to be discharged, they wanted to go home and not be moved to another part of the hospital.

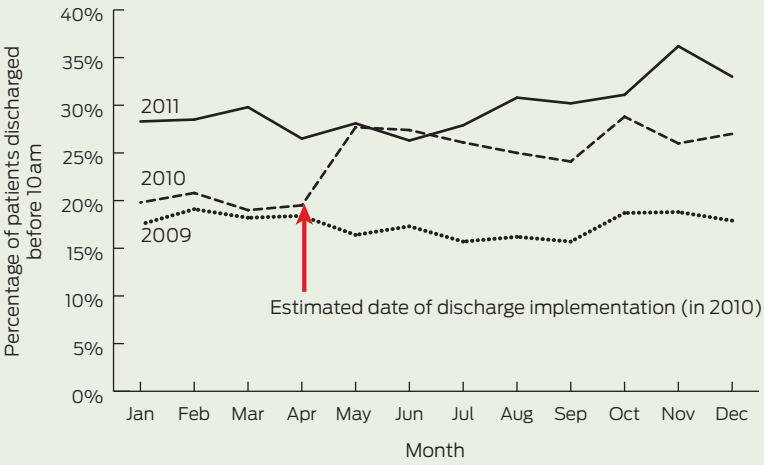
A UK study comparing performance of hospitals close to the border between England (where waiting time targets existed) and Wales (where such targets did not), showed that patients attending English hospitals faced shorter ED waiting times and had lower mortality rates than those attending Welsh hospitals,[23] consistent with the recent finding of reduced mortality rates in WA hospitals after the FHR program was introduced.[8] However, there remains much debate about the pros and cons of setting targets in health, with advocates suggesting they have the potential to drive hospital-wide change and scep-

4 Additional measures of Four Hour Rule Program performance at Princess Margaret Hospital, Perth, Western Australia

A: Length of stay in the emergency department, 2009 and 2011



B: Percentage of patients discharged before 10 am, 2009 to 2011



5 Top 10 lessons learned in implementing a 4-hour-rule program

- Ensure the focus for change is hospital-wide and involve as many people from all areas of the hospital as possible.
- Stay true to the methods and resist all temptation to "jump to solutions".
- Ensure accurate data are available in real time, and share it with all hospital staff.
- Identify and engage local champions for change.
- Ensure solutions are created and developed by staff working at grassroots level in the areas requiring change.
- Ensure there is strong governance with clear responsibility and accountability for all solutions.
- Ensure the hospital executive view the program as a priority.
- Improving discharge processes is the most effective way to reduce access block in the emergency department.
- To effect real change, targets must be a challenge to achieve.
- Ensure there are simple ways for clinical staff to raise issues or concerns in an open and non-confrontational manner. ◆

tics fearing adverse consequences, such as gaming and the neglect of areas not subject to targets.[22,24,25] The strong leadership of WA's FHR program, the emphasis on monitoring performance across all areas of the hospital and the lack of financial incentives for achieving "the target", have been important factors in reducing the likelihood of adverse outcomes. In addition, while clinical staff were actively involved in the redesign process, helping to determine the direction of change, the hospital Executive made the program part of their core business and were accountable for the implementation of change.[26]

Good data are critical to any clinical services redesign program. The data collected at PMH was a key and powerful enabler in effecting change. It provided a clear picture of how the hospital was performing at baseline, and allowed many myths to be dispelled by using accurate, specific and clinically meaningful data that were available on a daily basis. A weekly 30-minute clinical and operational meeting has been crucial to the ongoing success of the FHR program. Representatives from all relevant hospital wards and departments attend to review weekly statistics and analyse reasons for breaches of the 4-hour

target, allowing continual finetuning of processes.

Our study has some limitations. Our experience and results in a tertiary paediatric hospital may not be reproducible in mixed or adult tertiary hospitals where higher admission rates, patients with multiple comorbid conditions, and dependence on community services to facilitate the discharge of elderly patients, create a greater challenge.[12] In addition, the quality measures that we reported were relatively limited and may not have identified all the changes (positive and negative) resulting from the FHR program accurately.

The FHR program provided a unique opportunity to redesign aspects of the patient journey, resulting in significant and sustained benefits for patients and staff. The focus of the redesign program must remain on improving the quality of care for patients, rather than on achieving "the target". The top 10 lessons we learned are summarised in Box 5.

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