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Using 'reverse triage' to create hospital surge capacity: Royal Darwin Hospital's response to the Ashmore Reef disaster

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ABSTRACT

This report analyses the impact of reverse triage, as described by Kelen, to rapidly assess the need for continuing inpatient care and to expedite patient discharge to create surge capacity for disaster victims. The Royal Darwin Hospital was asked to take up to 30 casualties suffering from blast injuries from a boat carrying asylum seekers that had exploded 840 km west of Darwin. The hospital was full, with a backlog of cases awaiting admission in the emergency department. The Disaster Response Team convened at 10:00 to develop the surge capacity to admit up to 30 casualties. By 14:00, 56 beds (16% of capacity) were predicted to be available by 18:00. The special circumstances of a disaster enabled staff to suspend their usual activities and place a priority on triaging inpatients' suitability for discharge. The External Disaster Plan was activated and response protocols were followed. Normal elective activity was suspended. Multidisciplinary teams immediately assessed patients and completed the necessary clinical and administrative requirements to discharge them quickly. As per the Plan there was increased use of community care options: respite nursing home beds and community nursing services. Through a combination of cancellation of all planned admissions, discharging 19 patients at least 1 day earlier than planned and discharging all patients earlier in the day surge capacity was made available in Royal Darwin Hospital to accommodate blast victims. Notably, reverse triage resulted in no increase in clinical risk with only one patient who was discharged early returning for further treatment.

INTRODUCTION

This report analyses the impact of reverse triage, as described by Kelen,¹ to rapidly assess the need for continuing inpatient care and to expedite patient discharge to create surge capacity for disaster victims. Frykberg and Tepas² note that the experience in the management of mass casualties following a disaster is relatively sparse. Theoretical advice in the literature on disaster response planning dominates reports of actual responses. Kelen and McCarthy³ point out the 'science of surge' is relatively new. There are very few reports on how hospital bed surge capacity was developed in response to a disaster.

The Royal Darwin Hospital (RDH) is a 353-bed general hospital in the Northern Territory of Australia and the site of the National Critical Care and Trauma Response Centre. On 16 April 2009 at 08:40, RDH was asked to take up to 30 casualties suffering from blast injuries from a boat carrying

asylum seekers that had exploded 840 km west of Darwin. The hospital was full, with a backlog of cases awaiting admission in the emergency department. The Disaster Response Team convened at 10:00 to develop the surge capacity to admit up to 30 casualties. By 14:00, 56 beds (16% of capacity) were predicted to be available by 18:00.

METHODS

Potential mechanisms contributing to surge capacity were considered:

1. Decrease in new admissions.
2. Discharge of patients who would not otherwise have been discharged on the day.
3. Discharge earlier in the day.

Using the Electronic Health Record (EHR) the Patient Flow Manager (CA) grouped into four categories all admissions and discharges on 16 April 2009:

1. Planned discharged on 16 April.
2. Nil impact on beds.
3. Directly attributable to a response to the emergency.
4. Not classifiable.

Medical case notes were reviewed where the status was not clear (49 records). The EHR was reviewed for discharges due to emergency to determine whether patients had been re-admitted within 7 days of discharge.

RESULTS

The special circumstances of a disaster enabled staff to suspend their usual activities and place a priority on triaging inpatients' suitability for discharge. The External Disaster Plan (EDP) was activated and response protocols were followed. Normal elective activity was suspended. Multidisciplinary teams immediately assessed patients and completed the necessary clinical and administrative requirements to discharge them quickly. As per the EDP there was increased use of community care options: respite nursing home beds and community nursing services.

Nineteen of the discharges were assessed as directly attributable to actions taken on the day and would not otherwise have occurred (table 1).

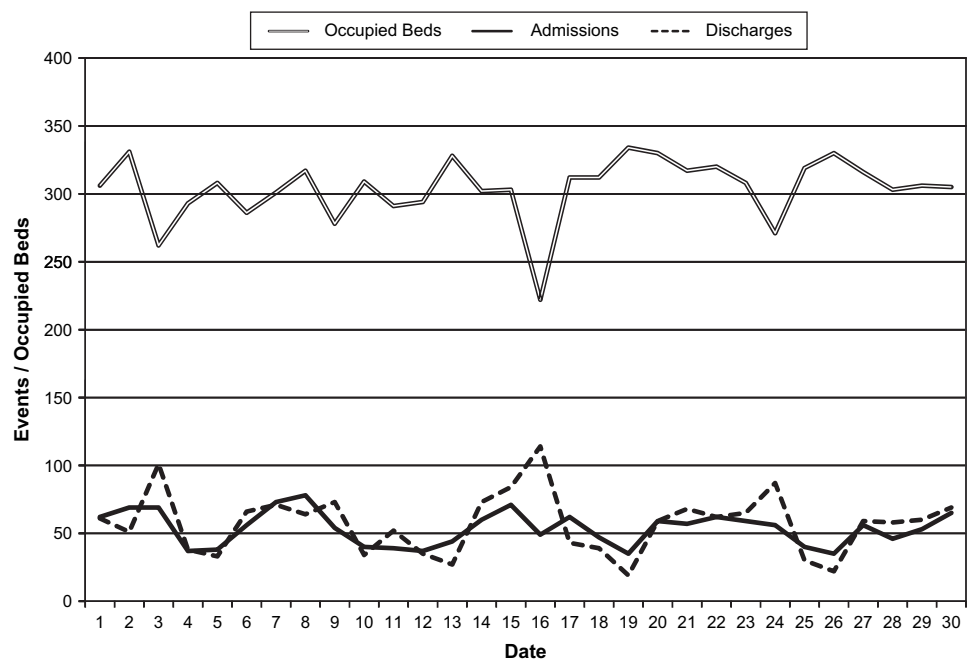
Table 1 Classification of discharges from RDH on April 16, 2009

Discharge classification	No of discharges
Discharge would probably have occurred	86
Nil impact on beds (day case & renal dialysis)	103
Directly attributable to a response to emergency	19
Not able to classify	3
Total	211

RDH, Royal Darwin Hospital.

Short report

Figure 1 Admissions, discharges and occupied beds in Royal Darwin Hospital for April 2009.



Seven of those patients whose discharge was a response to the emergency were readmitted of whom one was for continued treatment for the original condition.

Figure 1 below shows that reduced occupancy on 16 April was due predominantly to an increase in discharges rather than a decrease in admissions. The number of admissions on 16 April was not unusual, but lower than the previous day. Therefore the difference between discharges to admissions was greater resulting in increased bed availability.

Figure 2 illustrates that in addition to an increase in the number of people discharged on 16 April discharges occurred earlier in the day.

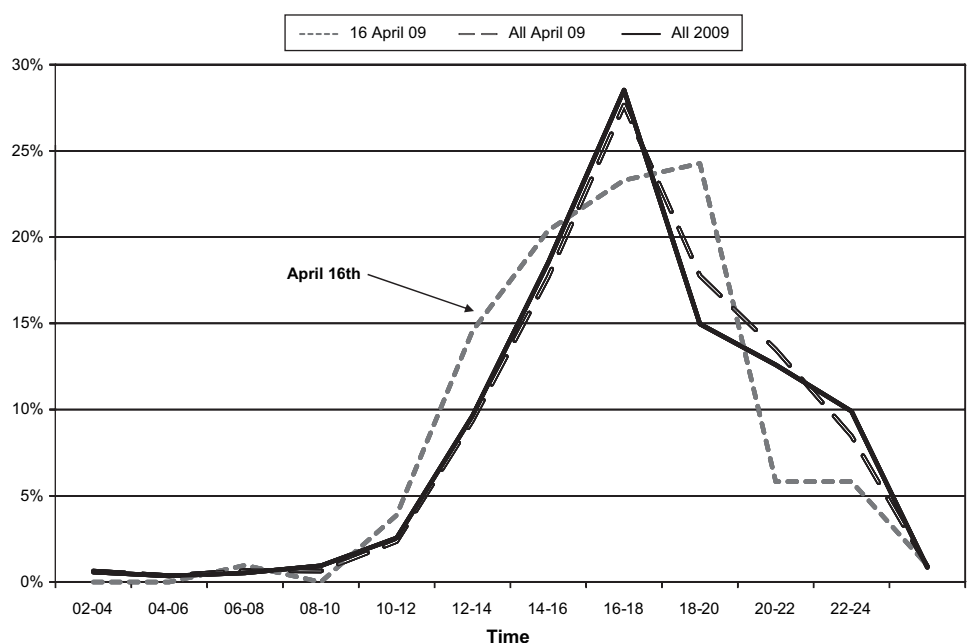
DISCUSSION

Kirschenbaum *et al*⁴ describe freeing 50 of the 550 beds during the 2001 New York terrorist attack. Gutierrez de Caballos *et al*⁵ describe quickly emptying 161 of 1800 beds in responding to the

Madrid terrorist bombings. By what means the surge capacity was achieved and whether there were any repercussions from early discharge of patients is not the focus of these papers. Aylwin *et al*⁶ describes the development of surge capacity for operating theatres and ICU beds following the London Underground bombing but again how this was achieved is not the focus of the paper.

Through a combination of cancellation of all planned admissions, discharging 19 patients at least 1 day earlier than planned and discharging all patients earlier in the day surge capacity was made available in RDH to accommodate blast victims. Notably, reverse triage resulted in no increase in clinical risk with only one patient who was discharged early returning for further treatment. With the 'dwindling supply of empty beds' as noted by DeLia and Wood⁷ the ability of hospitals to rapidly free up occupied bed capacity, without hazard to patients, assumes increasing importance.

Figure 2 Royal Darwin Hospital Discharges by time of day.



Competing interests This research and paper was written as a part of my paid employment with the Department of Health and Families, Northern Territory government (PS).

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