DESTINY and START
An update

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March 2017
ED Performance in the spotlight

Hospital emergency wait times: The best and worst performing hospitals in the state
DESTINY – Demand for Emergency Services Trend in Years 2010-14

- Funded by ACI
- State-wide ED data 2010-2014
- 11.8 million lines of linked data from EDDC
DESTINY

- Characterising and mapping ED demand
- Data modelling
- Prediction modelling
Studies to date


Studies to date


- Dinh MM¹, Berendsen Russell S², Bein KJ³, Statewide retrospective study of low acuity emergency presentations in New South Wales, Australia: who, what, where and why? *BMJ Open*. 2016 May 10;6(5)


- Bein KJ, Dinh MM et al. Hourly Emergency Activity Tracking HEAT maps *Emergency Medicine Australasia* Accepted October 2016 awaiting publication
Figure 2. Mean number of NSW ED presentations per hour from 2010 to 2014 (green denoting smaller numbers and red denoting larger numbers).
Parramatta Road Syndrome
Studies to date

- Berendsen Russell S, Bell N, Dinh MM. Triage, damned triaged...and statistics. Accepted Emergency Nursing Journal September 2016 awaiting publication

- Dinh MM et al. The Sydney Triage to Admission Risk Tool: Derivation and Internal validation study. BMC Emergency Medicine Feb 2017
Learnings from DESTINY

- Diagnostic coding in EDDC problematic
- 5000 presenting problems?
- Older patients with higher acuity driving demand for ED and representation rates – Models of care
- Low acuity not increasing
Disposition

- Critical decision in clinical care in ED
- Generally 1-2 hours for a workup and clinical reviews in ED
- 1-2 hours for an in-patient team to “accept” a patient
- How do we streamline, standardise and make this a data driven process?
Sick older patients with comorbidities – can we improve the process for them?

1.7 million ED presentations from Level 5 and 6 EDs 2013-14

Age Triage Category, presenting problem, admission within past 30 days, Arrival by Ambulance

Final prediction model AUC 0.82

Prospective validation underway – interim analysis (n=600) AUC 0.81
The Sydney Triage to Admission Risk Tool (START) to predict Emergency Department Disposition: A derivation and internal validation study using retrospective statewide data from New South Wales, Australia

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Abstract

\textbf{Background:} Disposition decisions are critical to the functioning of Emergency Departments. The objectives of the present study were to derive and internally validate a prediction model for inpatient admission from the Emergency Department to assist with triage, patient flow and clinical decision making.

\textbf{Methods:} This was a retrospective analysis of State-wide Emergency Department data in New South Wales, Australia. Adult patients (age \( \geq 16 \) years) were included if they presented to a Level five or six (tertiary level) Emergency Department in New South Wales, Australia between 2013 and 2014. The outcome of interest was in-patient admission from the Emergency Department. This included all admissions to short stay and medical assessment units and being transferred out to another hospital. Analyses were performed using logistic regression. Discrimination was assessed using area under curve and derived risk scores were plotted to assess calibration.

\textbf{Results:} 1,721,294 presentations from twenty three Level five or six hospitals were analysed. Of these 49.38\% were male and the mean (sd) age was 49.85 years (22.13). Level 6 hospitals accounted for 47.70\% of cases and 40.74\% of cases were classified as an in-patient admission based on their mode of separation. The final multivariable model including age, arrival by ambulance, triage category, previous admission and presenting problem had an AUC of 0.82 (99\% CI 0.81, 0.82).

\textbf{Conclusion:} By deriving and internally validating a risk score model to predict the need for in-patient admission based
Evaluation study

- Trial of START within SLHD
- START calculated at triage and communicated to senior ED clinicians to expedite decision making
- Does use of START reduce length of stay and ED performance?
- TRGS grant application $755,000 over two years
- Supported by ECI
Firstnet screenshot

High probability admission, call inpatient team, arrange bed