

**Title:** Identification of Patient characteristics which increase the likelihood of unscheduled re-admission or re-presentation to an Emergency Room.

**Introduction:** Readmissions are costly to the healthcare system, cause additional burden to the Emergency Rooms affecting wait-times, and are a negative experience for patients. There have been some studies to determine if there are patient factors which can predict readmissions, such as the LACE study.<sup>1</sup> The Society of Hospital Medicine is addressing high risk discharges as a part of their BOOST project on transitions of care and has identified a number of patient characteristics likely to cause risk for readmission. There are a relatively small number of studies to assess the validity of this tool to predict re-admission. As readmissions can depend on local availability of outpatient resources, a study of the patient characteristics which correlate with higher risk of readmission in our own particular setting was felt to be necessary as a first step toward reducing readmissions.

**Methodology:** A check box tool was developed using the “8 P” screening tool taken from the BOOST Project of the Society of Hospital Medicine<sup>2</sup> This tool was modified to take into consideration some of the risk factors identified with the LACE index<sup>1</sup>. We added an additional risk factor which was not found in either the LACE index or in the 8P tool following a search of the literature.

All full time Hospitalists at the PLC were encouraged to participate in the collection of data by completing the checkbox form after their comprehensive review of each patient on admission. The forms were collected and patients were tracked for 30 days following discharge. Any unscheduled readmissions, ER visits or deaths were recorded. Any patients who died were removed from the analysis of re-admission or re-presentation to ER

**Results:** This project identified that the patient characteristic the most likely to predict return to hospital within 30 days is a prior non-elective admission or two ER visits within the previous 6 months. These patients would have a 50% chance of returning to ER compared with 32% chance for all other patients studied. Once palliative care patients and patients who died were pulled from the analysis, the patient characteristics which are the next most likely to correlate with readmission are patients identified as having depression and patients on the identified problem medications. These had 30 day readmission rates of 20% each compared with 13% for all patients

Problem medications and poor health literacy are the most likely risk factors to correlate with an ER visit where no admission resulted at 21% each compared with 18% for all patients.

As patients with prior hospitalization were highly likely to return to hospital, these patients were further stratified to see if there were specific characteristics amongst these patients which correlated with higher risk. The four patient characteristics which correlated with higher risk of returning were patients on specific problem medications, principle diagnoses, poor patient support, and poor health care literacy.

**Conclusions and lessons learned:** With regard to the use of this risk assessment tool, physician acceptance and compliance was quite good. There were areas of ambiguity in the tool which I would clarify if continuing to use this tool, but overall I found the physicians were able to offer an opinion on

the patient characteristics based on their initial encounter in ER during admission. There were a few patient characteristics such as health care literacy and patient support which physicians felt they could better assess after a few days in hospital. As well, a few patients who did not initially fall under this tool's definition of palliative, did a few days into their admission when a more poor prognosis became more clear.

Overall this tool is practical to use, taking less than a minute to complete.

Further analysis of the correlations determined in this study needs to be undertaken to determine causality, and whether there are any remedies for the higher risk characteristics which may lead to avoidance of readmissions.

Where there are strong correlations between the identified patient characteristic and readmissions, this tool could be very powerful in directing resources more efficiently to the identified patients. Simply adding up the number of P's for each patient led to the interesting finding that 5 or more P's identified the 20% of patients who accounted for 70% of re-admissions. Ultimately, incorporating this tool into the SCM admission orders could electronically trigger a referral to the appropriate resource

1. Derivation and validation of an index to predict early death or unplanned readmission after discharge from hospital to the community. CMAJ 2010. DOI: 10.1503/cmaj.091117. Carl van Walraven MD, Irfan A. Dhalla MD, Chaim Bell MD, Edward Etchells MD, Ian G. Stiell MD, Kelly Zarnke MD, Peter C. Austin PhD, Alan J. Forster MD.
2. 8-P tool from BOOST Project, SHM. Available at [www.hospitalmedicine.org](http://www.hospitalmedicine.org), QI Resource room, BOOST Project.