Strategic Clinical Improvement Committee
Partnerships in Action

University of Alberta Hospital-high-users of Acute Care: A Deeper Dive Into Predictive Patient And System Factors

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DEFINE OPPORTUNITY

Background, Problem Statement and Aim Statement:

According to the CIHI definition, High- Cost Users (HCUs) are patients with at least three admissions and a cumulative length of stay of greater than 30 days in 365 days. We identified 167 'high-user' patients at the University of Alberta Hospital (UAH) with three or more admissions from Sept 2015-Sep 2016 using DiMR data. Only 124 of these high-users met the CIHI High-Cost User definition and subsequently underwent chart review to analyze patient characteristics including social profile, community supports and comorbidities.

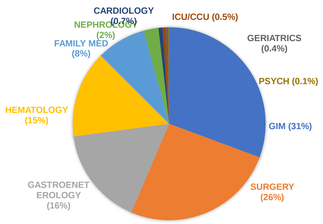
Aim Statement: The overall aim of this project is to reduce readmission rates in Internal Medicine patients by using a patient-centered approach. Our objective is to study high-cost users of acute care, develop a tool to predict patients who will be HCUs, identify targetable factors and design one or more quality improvement interventions to target modifiable factors.

BUILD UNDERSTANDING

Process Assessment:

Admission Profile:

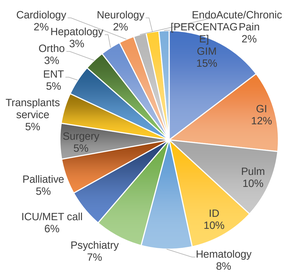
- 56% were males and 52% were older than 60 years
- Number of admissions over the year ranged from 3 to 11 with a maximum cumulative Length of Stay (cLOS) of 219. 53% of high-users had a cLOS between 30-90 days and those with 4-6 admissions made up for 80% of the total cumulative LOS. Of the high-user admissions, 31% were to General Internal Medicine (GIM) wards, 26% to surgical specialties, 16% to Gastroenterology, 15% to Hematology, and 8% to Family Medicine (Graph 1).
- 59% of the 2015-16 high-users were admitted to hospital in 2015 and 41% in 2014 indicating that there is a longitudinal pattern of high use in about half the patients.
- Chart reviews of HCUs delved into clinical services involved either as an admitting or consulting service (Graph 2). For 85% of HCUs, 1 to 4 services were involved during their last admission, the remaining 15% had 5-10 services involved. Further analysis is required to understand why after several re-admissions, fewer consultations were required; though we postulate it may be because a diagnosis has been established by that point.



GRAPH 1: Distribution of High User admissions

Social Profile and Community Supports:

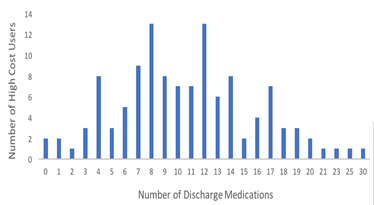
- Only 5% of HCU had no fixed address, 75% of HCUs were living at home at the time of last admission, 10% in LTC, and 8% in supportive living.
- 50% of HCUs were dependent for ADLs and iADLs, thus emphasizing the need for community care supports for high-users. The most common inter-professional care enlisted in the community included Home Care (55% of HCUs), Occupational Therapy (19%), Respiratory Therapy (16%), Nursing (13%), Physiotherapy (13%) and Palliative (11%). 18% of HCUs were seen by the Palliative Community Consult Team and 27% were seen or followed at the Cross Cancer Institute.
- Family Physician attachment amongst the high-users was assessed to determine if they had access to appropriate follow-up. 97% listed a physician as their Primary Care contact; 89% reported a GP while others reported GIM, Pulmonary/CF, Psychiatry, Palliative or other specialists.
- 90% of patients had a discharge summary dictated on Netcare for their last admission prior to Sep 2016.



GRAPH 2: Services frequently involved in HCU admissions and consults

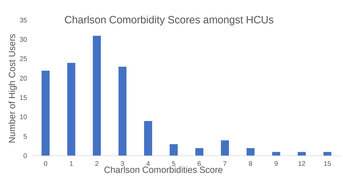
Medical Profile:

- Gastrointestinal, Cardiovascular, Infectious Diseases, and Pulmonary were the most common categories of comorbidities seen in High-Cost Users.
- Most common comorbidities: CHF, A.fib/A.flutter, HTN, diabetes without end organ damage, hypothyroid, GERD, thrombosis, GI infection, UTI/pyelonephritis, AKI, CKD, dyslipidemia, anxiety, depression, substance abuse, COPD and pneumonia.
- Medications: 77% of HCUs had ≥7 discharge medications; the majority (59%) were prescribed 7 to 14 medications at the time of last admission (Graph 3). As hypothesized, HCUs have long medication lists which may be a targetable, predictive factor.
- Did not find an increased pattern of Charlson Comorbidities in these HCUs. 95% of HCUs had 0-3 Charlson Comorbidities and 88% had a Charlson Comorbidity score of 0 to 4. Thus, a greater Charlson Comorbidity Score is not necessarily predictive in this HCU population (Graph 4).
- On the other hand, 82% of HCUs had a LACE score ≥ 11 indicating that higher LACE scores may be predictive of HCUs (Graph 5).

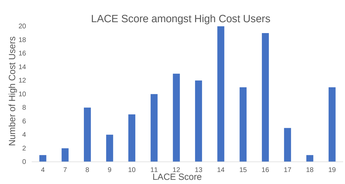


GRAPH 3: Number of Discharge Medications Prescribed to HCUs

GRAPH 4



GRAPH 5



ACT TO IMPROVE

Arising Improvement Opportunity/Selection:

1. Develop algorithm/scoring system for the prediction of High-Cost Users

Based on our characterization of high-cost users, predictive factors could include male gender, age ≥ 60 years, admissions in prior consecutive years, dependence for ADLs and iADLs, requiring home-care and/or other inter-professional care, identified high-risk comorbidities, ≥7 discharge medications, LACE score, etc.

2. QI projects on in-patient ward surrounding intensive medication reconciliation for HCUs

77% of HCUs had ≥7 discharge medications. In identified specialty services with the highest number of re-admissions, a potential QI project may be undertaken to review long medication lists and initiate de-prescribing practices in collaboration with pharmacy.

3. Intensive disposition and community resource integration for HCUs

A high proportion of HCUs are dependent on community supports. 50% were dependent for ADLs and iADLs and >50% received home care, 10% lived in LTC and 8% in supportive living while 5% had no fixed address. Once a patient is flagged as a high-cost user, need to put resources into transitioning and ensuring safe disposition and community integration.

4. Consider trial of 'Virtual Ward Model' for transition of HCUs to the community

"Virtual wards" are transitions in the community where outpatients receive care coordination by an inter-professional team and direct care via telephone calls, home or clinic visits. Identifying appropriate patients for this type of intervention is essential for success.

5. QI project to close the gap on family physician attachment and admission updates

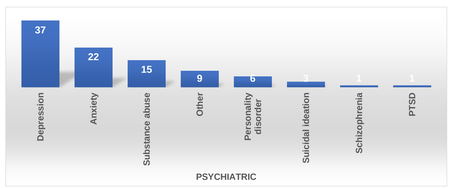
89% of HCUs reported a Family Physician as their primary care contact. The next phase of the review will undertake assessment of Family Physician use. For those without primary care with a family practitioner we need to ensure that this connection happens prior to discharge and aim for 100% discharge summaries for HCUs (90% available in this analysis).

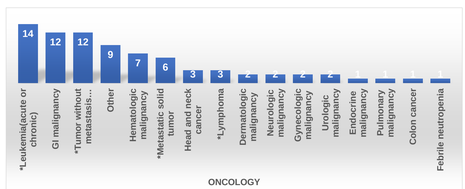
6. QI project on appropriateness of admitting/consulting services for HCUs

HCUs are complex patients and may be followed by up to 10 services during one admission. For 85% of HCUs, 1 to 4 services were involved during their last admission. Appropriate sub-specialty care, follow-up and proper communication and integration is critical in these patients.

7. QI project to connect HCUs to Mental Health resources in the community

Depression (30% of HCUs), anxiety (18%) and substance abuse (12%) were prominent comorbidities amongst HCUs. Ensuring access to mental health resources in the community might provide benefit to some HCUs.





SUSTAIN RESULTS

Reinforce Ownership, Measurement, & Continuous Improvement:

Next step: Survey of Family Physicians of High-Cost Users

Primary care physicians of HCUs will be surveyed to obtain quality input on patient health behaviors and attitudes to healthcare and recommendations for preventing readmissions. Upon determination of area of opportunity a PDSA cycle will be developed that includes a measurement plan.

Next step: Define category of high-users with high ED visits in addition to re-admissions

Characterization of high-cost users has revealed that in addition to high number of admissions and greater cLOS, high number of ED visits and non-UAH admissions might also be a predictive factor. Thus, a future direction would be to identify high-users based on recurrent ED visits in addition to re-admissions.

MANAGE CHANGE

Collaboration & Communication Strategies:

- Development of an inter-professional team including physicians, residents, medical students, operational leaders, quality consultants and a data analyst
- Complete data analysis and share the findings with salient medical and operational stakeholders to prioritize the opportunity areas and determine next steps
- Review the literature on similar undertakings at other institutions and learn from their observations

SHARE

Lessons Learned:

- Although extensive chart audits are time consuming, the information gained is vital to understanding and improving the health journey
- Inter-professional collaboration is integral to the design & implementation of such projects
- Every high-user patient has a unique story. A distinct interplay of patient and system factors influences re-admissions in these high-users

Reference: Jeffs, L., I. Dhalla, R. Cardoso and C.M. Bell. 2014. "The Perspectives of Patients, Family Members and Healthcare Professionals on Readmissions: Preventable or Inevitable?" *Journal of Interprofessional Care* 28(6): 507–12.