Alberta Health Services | University of Alberta | Covenant Health

Edmonton Zone Medicine Quality Council
Partnerships in Action
Strategic Clinical Improvement Committee

ED Consult Volumes and Predictive Factors for Delayed ED Consult to Decision to Admit for GIM in 2021

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Background:

- ED overcrowding and delays in admission have several important consequences, such as longer hospital stays, inability of patients to gain access to appropriate hospital beds , lost opportunities to treat patients and patients left without being seen. It is multifactorial and contributes to significant economic burden but also causes physician burnout and negatively impacts patient's care. One contributor to suboptimal ED patient flow could be admission decision delays (defined as admission decision > 4 hours by AHS).
- According to on Canadian based study, patients who experienced admission delay in the ED had 12.4% longer inpatient length of stay and incurred 11.0% higher inpatient cost compared to patients who were not delayed. A UK based retrospective study concluded that delays to hospital inpatient admission for patients in excess of 5 hours from time to arrival at the ED are associated with an increase in all-cause 30-day mortality.

Aim:

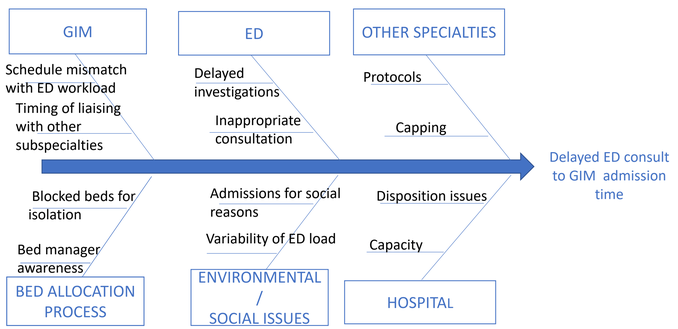
- To reduce the percentage of delayed GIM ED-consult to admission decision from 42.7% to 25% in 6 months.

Method:

- A retrospective chart audit of GIM admitted patients between January 2021 and December 2021 was completed.
- Reports were built in the local IT system called Connect Care to identify patients seen by the GIM ED Consult service.
- Logistic regression was performed to identify predictive factors for delayed (defined as a decision to admit of >4 hours) ED-consultation and to identify improvement intervention.

Building Understanding:

Cause and Effect Diagram: Identifying Root Causes and Areas of Opportunity.



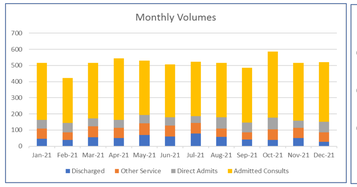
Potential root causes contributing to delays in timely admission in the hospital ED were identified and categorized into patient-related, physician-related, ED-related, and the healthcare system

Areas of Opportunity for GIM Department:

- Physician and resident staffing according to ED workload (as per data analysis).
- Discussion with other subspecialties to divide workload.
- Discussion with ED team to liaise with other appropriate services earlier (for example Geri , Family medicine).

Data Analysis:

A total of 5516 GIM ED-consultations were requested in 12 months,4173 were admitted. Of those admitted 42.7% were delayed. There were 666 direct admission. Total number of patients was 6182.



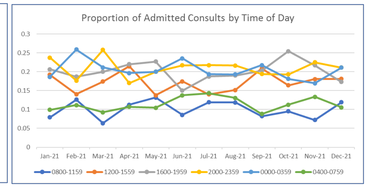


Table 2: Univariate Logistic Regression

Variables	Estimate	SE	P-value	Odd Ratio	95% CI (OR)	
Sex			0.57			
Male	-0.0177	0.0314	0.57	1	0.854	1.092
Age			<0.0001			
18-35	ref					
36-50	0.0176	0.0724	0.8	1.077	1.301	2.163
51-65	0.0923	0.0605	0.13	1.807	1.491	2.189
66-80	0.1542	0.0562	0.006	1.923	1.533	2.412
>=81	0.2355	0.0617	0.0001	2.086	1.648	2.64
Primary Diagnosis			<0.0001			
Infection	-0.016	0.0667	0.81	1	0.7	1.13
COVID	-0.2622	0.1166	<0.0001	0.381	0.278	0.503
Cardiac	0.0756	0.107	0.4799	0.974	0.723	1.313
Addiction & Mental Health	-0.3013	0.1144	<0.0001	0.547	0.401	0.746
Electrolytes and Metabolism	-0.104	0.1149	0.3656	0.814	0.596	1.112
Pulmonary	-0.1274	0.118	0.3198	0.803	0.585	1.103
Delirium	0.3019	0.1188	0.0111	1.222	0.889	1.68
Frailty	0.3537	0.1355	0.009	1.287	0.909	1.821
GI/Hepatic	-0.0277	0.1596	0.8623	0.879	0.594	1.299
Cancer	0.4301	0.168	0.0051	1.6	0.932	2.103
Renal	0.1604	0.1835	0.3822	1.061	0.686	1.64
Neurologic & Stroke	0.1982	0.2541	0.4351	1.101	0.617	1.965
Other	ref					

CTAS			0.0031			
CTAS 1	-0.295	0.123	0.0164	0.606	0.361	1.015
CTAS 2	-0.0472	0.0756	0.5328	0.776	0.499	1.206
CTAS 3	0.1357	0.0749	0.0699	0.932	0.6	1.446
CTAS 4&5	ref					
Consult Order Hour			<0.0001			
0000-0359 HR	ref					
0400-0759 HR	0.1796	0.0827	0.0293	1.013	0.808	1.27
0800-1159 HR	-0.1351	0.0883	0.126	0.739	0.583	0.939
1200-1559 HR	-0.3909	0.0753	<0.0001	0.373	0.661	0.781
1600-1959 HR	0.00838	0.0657	0.8984	0.854	0.705	1.034
2000-2359 HR	0.1713	0.0644	0.0078	1.005	0.831	1.214
LACE & Readmission Score			<0.0001			
<55	ref					
55-63	-0.0395	0.0542	0.466	1.306	1.094	1.561
64-73	0.3264	0.0543	0.0502	1.552	1.265	1.906
>=74	0.2398	0.0534	<0.0001	1.727	1.448	2.06

This graph shows monthly data for Admitted Consults, broken down by Time of the Day of the Consult Request Order.

Result:

- Predictive factors (p-value <0.05) for delayed admission decision were age over 65-years; primary diagnoses delirium, frailty, and malignancy; a LACE Readmission Score ≥74; and time of consult request between 0400-0759 and 2000-2359
- Factors associated with admission decision time of <4 hours included time of consult request between 1200-1559; a CTAS score of 1; and primary diagnoses of COVID-19 infection and Addiction &Mental Health
- Weakness: Only looked at time of consult to time of admission order in CC – does not consider "laying eyes" on the patient and initiation of the consult.

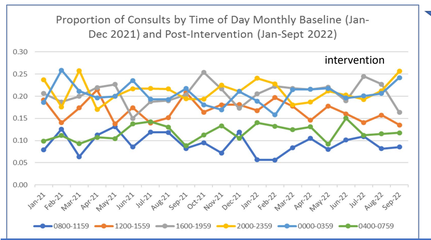
Act to improve:

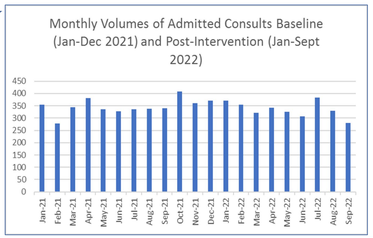
- Following Interventions were chosen based on data analysis.

Discussion with Family medicine dept to increase their bed/team capacity	Communication pathway for ED to communicate with Family Medicine directly	Meetings with ED to focus on involving timely and appropriate referral to other specialties	Prioritizing seeing complicated patients to determine disposition earlier
Single systems needing admission directed to subspecialty (such as Pneumonia, COPD, Asthma, Unilateral Pleural effusion have been directed to pulmonary)	For patient actively receiving CCI treatment, ED to contact Oncology first	Bed Manager awareness re: HCT and Geri beds	Staffing for GIM according to the ER flow, in order to expedite timely admissions to GIM

Post Intervention Results:

There was no obvious change/improvement found. January 2022 was the start of the Pulmonary Service and the Family Medicine Service expanding their capacity to admit some of the patients that would have otherwise been admitted to GIM. However, this intervention did not seem to decrease the number of GIM Consults from the ED, or to improve GIM Admission Decision times.

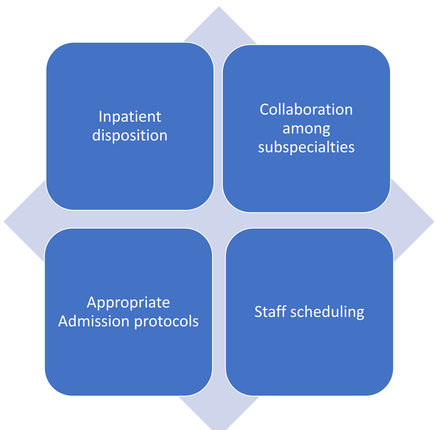




Lessons learned:

Based on post intervention data the reason for no improvement was inability to directly address any of the root causes of the problems that we had found during our baseline data analysis. Effective changes require collective efforts and understanding among GIM subspecialties, Family medicine, ED and hospital administration.

Next Steps:



PATIENTS:
Delay in admission has a direct negative impact on patient's health and in some studies suggest higher mortality. Improving ED flow with prompt and appropriate admission will result in better outcome and patient satisfaction.

ALBERTANS:
Wait times for admission from the emergency room are ~ 32.6 hours across Canada. Those attending emergency rooms in the city of Edmonton have a long wait time ~ 38.1 hours to be admitted. This is one of three regions in Canada with long wait times. Reducing this wait time will result in zonal health care capacity.

HEALTHCARE SYSTEM:
Delays to admission from the ED are associated with increased Inpatient LOS as well as cost. Improving patient flow through the ED will reduce hospital costs and improve quality of care.

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References:
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