**Readmission:** Occurs when patients return to the hospital due to further complications.

1 in 12 patients are readmitted within 30 days of leaving a hospital.

Patient Checklist

- CTAS: Canadian Triage and Acuity Scale is used to measure patient severity.

Current Readmission Rates by Province:

<table>
<thead>
<tr>
<th>Province</th>
<th>Readmission Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>9.2%</td>
</tr>
<tr>
<td>Ontario</td>
<td>10.3%</td>
</tr>
<tr>
<td>Quebec</td>
<td>9.2%</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>8.7%</td>
</tr>
<tr>
<td>Alberta</td>
<td>8.9%</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>8.7%</td>
</tr>
<tr>
<td>Manitoba</td>
<td>8.7%</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>8.6%</td>
</tr>
<tr>
<td>Newfoundland</td>
<td>8.4%</td>
</tr>
<tr>
<td>Prince Edward</td>
<td>8.2%</td>
</tr>
<tr>
<td>Yukon</td>
<td>8%</td>
</tr>
</tbody>
</table>

Canadian Average = 8.7%

**Project Objective:**

- Minimize the readmission rate
- Aid physicians in prioritizing patient admission and discharge decisions

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**Proposed Solution**

- **ICU Patient Flow Model**
  - Arrival: S_i, RLOS_i, RPr_i
  - Discharge: S_i, RLOS_i, RPr_i
  - Reroute: S_i, RLOS_i, RPr_i

**Proposed Policy**

- Considers patient severity and remaining length of stay simultaneously

Calculates the impact of each inpatient based on a Readmission Probability Matrix

- If RPr(S_i, RLOS_i) > min(RPr(S_j, RLOS_j)), then admit S_i and discharge the patient with the lowest RPr
- If RPr(S_i, RLOS_i) < min(RPr(S_j, RLOS_j)), then reroute S_i

**Readmission:**

- In Canada, readmissions cost the healthcare system $1.8 billion.
- 1 in 12 patients are readmitted within 30 days of leaving a hospital.
- Patients in a busy ICU stay 16% shorter than patients in a less busy ICU and 90% of ICUs do not have enough beds.

**Impact on Society**

- Reduce patient throughput:
  - Decrease readmission rate to 1 in 25
- Increase patient satisfaction
- Relative monetary cost savings of 16%

**References**