### BACKGROUND
- Acute Lymphoblastic Leukemia/Lymphoma (ALL/LBL) are the most common forms of cancer amongst the pediatric population, accounting for more than 30% of all cancer cases in this age group.
- While not originally, survival rates have currently have drastically increased, with current cure rates around 90%.
- An integral component of treatment protocols for these disease states involves agents that work by depleting cellular asparagine concentrations.
- The first of these agents was native Escherichia coli-derived L-asparaginase, but it has since been replaced with Pegaspargase.
- Pegaspargase, a pegylated form of the native compound, has revolutionized the care that patients now receive due to its lower emetogenicity potential, enhanced circulation time and less frequent administration.
- While pegaspargase is an effective and necessary component of ALL treatment regimens, it is complicated with the potential for infusion reactions and antibody-mediated hypersensitivity reactions.
- Differentiating between the ammonia-based infusion reactions and hypersensitivity reactions remains challenging, but is very important for the care of the patients.
- Previously, true hypersensitivity reactions would lead to substitution of treatment with erwinia asparaginase. Erwinia asparaginase requires multiple doses for each dose of pegaspargase, has a much higher cost and is frequently impacted by manufacturer production shortages.

### OBJECTIVE
- In late 2019, the hospital decided to alter the way in which they administered pegaspargase to decrease the incidence that they were seeing in-system-wide infusion-related reactions.
- Previously, pegaspargase had been administered as an infusion over 1-hour. Moving forwards, infusions would be done over 2-hours while being concurrently given with maintenance fluids.
- Primary Objective: Compare the incidence of infusion-related reactions prior to implementation of new administration techniques.
- Secondary Objective: Comparing the severity and presentation of reactions experienced.
- Assessing the outcomes of reactions that were experienced.

### METHODS
- Retrospective chart review.
- Patients were divided into two groups, taking place before the institutional changes were made and subsequently after.
  - The Pre-Group involved patients over a 1-year span from May 1st, 2018 to April 30th, 2019.
  - The Post-Group involved patients over a 1-year span from August 1st, 2019 to July 31st, 2020.
- In the Post-Group, patients had to have had two doses of pegaspargase while also being given maintenance fluids at the same time as PEG.

### RESULTS

#### Baseline Demographics

<table>
<thead>
<tr>
<th></th>
<th>Pre-Group (n%)</th>
<th>Post-Group (n%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Patients</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>Females</td>
<td>8 (42%)</td>
<td>9 (50%)</td>
</tr>
<tr>
<td>Age Range</td>
<td>11 mos – 17 yrs</td>
<td>2 yrs 11 mos – 18 yrs</td>
</tr>
<tr>
<td>Median Age</td>
<td>13 yrs</td>
<td>11 yrs 1 mo</td>
</tr>
<tr>
<td>Pre-B Cell Standard Risk</td>
<td>3 (15.8%)</td>
<td>4 (22.2%)</td>
</tr>
<tr>
<td>Pre-B Cell High Risk</td>
<td>10 (52.6%)</td>
<td>8 (44.4%)</td>
</tr>
<tr>
<td>Pre-B Cell with Trisomy 21</td>
<td>5 (26.3%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>T Cell</td>
<td>1 (5.3%)</td>
<td>5 (27.8%)</td>
</tr>
<tr>
<td>B Cell</td>
<td>0 (0%)</td>
<td>1 (5.6%)</td>
</tr>
</tbody>
</table>

#### Reaction Incidence

- **Post-Group:** 17%
- **Pre-Group:** 26%

#### Reaction Presentation

- **Infusion Reaction:**
  - Pre-Group: 20%
  - Post-Group: 66.60%
- **Allergic Reaction:**
  - Pre-Group: 80%
  - Post-Group: 33.30%

### CONCLUSION
- Over comparable time spans, there was an observed difference in incidence of infusion reactions following administration changes.
- Reaction severities were similar between both groups, while the presentation in the Post-Group was more typical of true hypersensitivity reactions.
- Future studies with larger patient populations, not limited in duration should be conducted to establish the true significance that these changes have had.