INTRODUCTION
The U.S. healthcare system loses $210 billion annually to needlessly expensive care. In monitoring CD4 counts of patients with HIV, the HIV Medicine Association together with the Choosing Wisely campaign recommend using a simple lymphocyte panel which shows CD4 absolute and percentage counts only. Complex lymphocyte panels, which may include CD3, CD4, CD8, and CD19 absolute and percentage counts, often do not offer more clinically valuable information, and are more expensive.

This study set out to determine the tests being used for this indication and its costs. It also looked into a way to decrease costs by increasing the rate of simple panel utilization to 95% or more.

METHODS
The study design was a before-and-after study conducted in two community-based teaching hospitals with total capacity of 418 inpatient beds, and an outpatient HIV/AIDS center. All lymphocyte subset panels ordered from March 2016 to March 2018 were included in the study. Intervention started on November 2017.

Simple panel was shown as the default test when CD4 test was ordered in the electronic health record while the complex panel was eventually phased out. Figure 1 shows the intervention to increase use of simple panels.

RESULTS
There was a total of 1,701 lymphocyte panels done during the study period. Majority were complex panels (85%, n=1,441). Outpatient orders constituted 94% (n=1,606) of requested panels, a vast majority of which were from the HIV/AIDS center of the hospitals.

Complex panels represented 99% (n=1,398) of tests ordered pre-intervention. The average cost of each test was $167.67. The healthcare system lost approximately $183,051 due to added expense of complex panels during this period.

In the post-intervention period, proportion of complex panels fell by 85% (95% CI 80.57-88.5, p < 0.0001). Average cost per test post-intervention lowered to $55.54. The mean difference was $112.13 and was statistically significant (95% CI 107.78-116.47, p < 0.0001). See Table 1.

Table 1: Comparison between Pre-intervention and Post-intervention

<table>
<thead>
<tr>
<th>Length of time</th>
<th>Pre-intervention</th>
<th>Post-intervention</th>
<th>Mean Difference</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
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<td>Complexity</td>
<td>Complexity</td>
<td>Simple panels</td>
<td>$112.13</td>
<td>107.78-116.47</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Test</td>
<td>Number of tests</td>
<td>1,401</td>
<td>300</td>
<td>14%</td>
<td>86%</td>
</tr>
<tr>
<td>Complex panels</td>
<td>Complex panels</td>
<td>99%</td>
<td>14%</td>
<td>15%</td>
<td>86%</td>
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<tr>
<td>Simple panels</td>
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CONCLUSIONS
Use of complex lymphocyte panels for monitoring CD4 count caused unnecessary expenses and resulted in significant losses for the healthcare system. It was noticed that even though healthcare providers were familiar with the recommendation, the cheaper test was not readily available in the computer ordering system. An efficient and effective intervention to increase the use of simple panels was to implement an opt-out policy. Simple panels are set as the default test unless the provider specifies otherwise. The intervention is projected to save approximately $95,761 in 2018.

REFERENCE