Introduction
Oncology patients are predisposed to acquiring infections due to neutropenia caused by immunosuppressive agents. Antimicrobial agents, such as Zosyn (PTZ), are commonly used in treating these infections. PTZ is standardly infused (SI) as 2.25g, 3.375g, or 4.5g over 30 minutes every 6 to 8 hours. However, evidence has suggested that an extended infusion (EI) of PTZ 3.375g over 4 hours every 8 to 12 hours could lead to decreased morbidity and mortality, length of hospital stay, and cost. Therefore, we investigated the most efficient administration duration of this drug in order to provide the best clinical outcomes.

PICO Question
Population: Adult patients
Intervention: Extended Infusion of Zosyn
Comparison: Standard Infusion of Zosyn
Outcome: Decreased morbidity, mortality, length of hospital stay, and cost
Question: In adult oncology patients, is an extended infusion of Zosyn more effective than a standard infusion?

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<td>Brunetti et al. (2015)</td>
<td>Retrospective cohort study of 2,150 patients. 632 received EI of PTZ and 1,518 received SI.</td>
<td>Substitution of EI of PTZ was showed significant cost savings. Patients that received EI of PTZ reduced the cost per treatment course of PTZ by 13% compared to SI.</td>
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<td>Cutro et al. (2014)</td>
<td>Retrospective cohort study of 843 adult patients. Of that total, 662 patients received EI of PTZ and 181 patients received SI of PTZ.</td>
<td>Duration of PTZ therapy was shorter in EI group (5 days vs. 6 days) providing cost savings to hospitals. Patients with urinary or intra-abdominal infections had a lower mortality and clinical failure rates when receiving EI PTZ.</td>
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<td>Lodise, Lomaestro, &amp; Drusano (2007)</td>
<td>Retrospective cohort study of 194 adult patients at Albany Medical Center. Of that total, 92 patients received SI and 102 patients received EI.</td>
<td>EI group had significantly shorter hospital stay, significantly lower 14 day mortality rate, and substantial cost savings when compared to SI group of PTZ.</td>
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<td>Yang, Zhang, Zhou, Wang, &amp; Chen (2015)</td>
<td>Two reviewers extracted data using the same key words. Studies had to be comparative SI vs. EI. Meta-Analysis was done with Revman 5.2 software. A total of 14 articles met the study requirements.</td>
<td>The EI group had significantly higher cure rates and a lower mortality rate when compared to SI group of PTZ.</td>
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Methods
A literature search was conducted using PubMed database.

Keywords: extended infusion and piperacillin-tazobactam

Inclusion Criteria: Articles within 10 years, inpatient hospitals, and adult patients.

The initial search yielded 35 articles, 4 were included for this project. The remaining articles were discarded due to being published over 10 years ago and/or for including pediatric patient data.

Conclusions
Prolonged infusions of Zosyn (PTZ) can decrease morbidity, mortality, length of hospital stay, and overall cost effectiveness of treatment of adult patients. Based on these findings, the information can be applied in the oncology patient setting in order to provide positive clinical outcomes in neutropenic patients. However more research should be conducted in regards to EI of PTZ for neutropenic patients specifically.

References