



TORONTO EAST  
GENERAL HOSPITAL

# Reducing Co-administration of Proton Pump Inhibitors and Antimicrobials Through an Antibiotic Stewardship Program at a Large Urban Community Hospital

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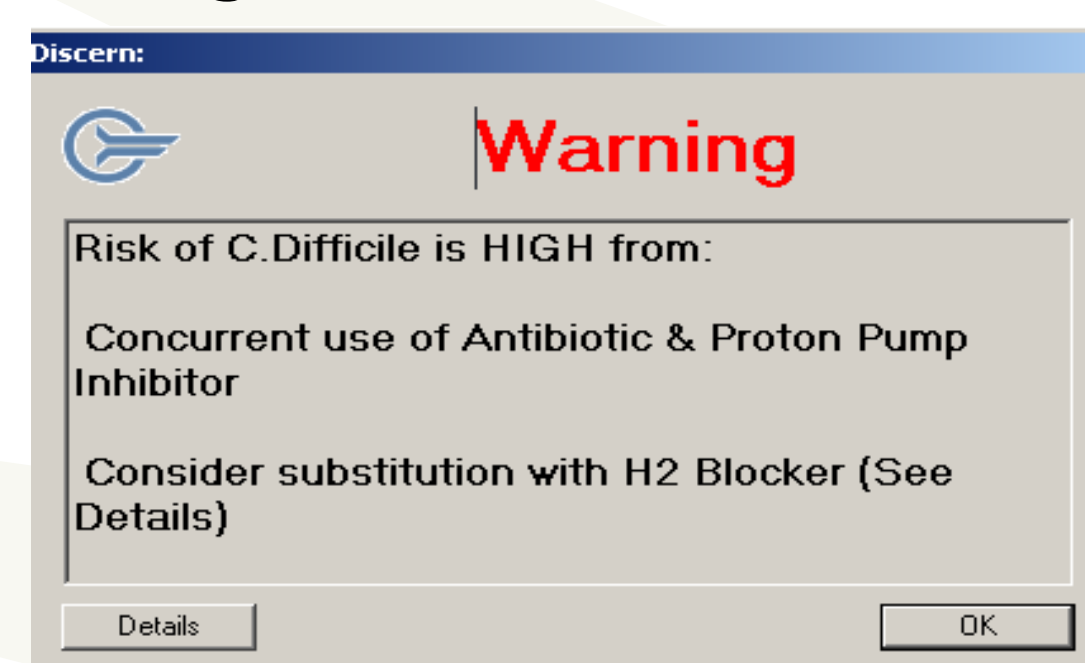
## BACKGROUND

Hospital-acquired *C. difficile* infection (HACDI) leads to significant patient morbidity, mortality, and increased health care costs. Strategies such as antimicrobial stewardship programs (ASP) have significantly reduced these risks; however, antimicrobials continue to be a necessity in many hospitalized patients. Co-administration of proton pump inhibitors (PPIs) and antimicrobials is associated with an increased risk of HACDI. Withholding chronic PPIs during antimicrobial use may be a valuable strategy to reduce the risk of HACDI yet strategies to reduce co-administration have not been formally evaluated to date. We evaluated two strategies to reduce co-administration of PPIs and high risk antimicrobials; an ASP initiated prospective audit and feedback mechanism and a real-time automated computer physician order entry (CPOE) alert.

## METHODS

A historical cohort study on two medical wards was completed at a 490 bed Canadian community teaching hospital. The study consisted of two 6 month intervals phased in between April 2011 and September 2012. In the first phase, a CPOE alert (see Figure 1) was created and implemented to fire at the point of physician medication order entry. The alert describes the potential increased risk of HACDI for patients on concomitant PPIs for non acute indications and high risk antibiotics. The second phase was an ASP initiated prospective audit and feedback expansion to the medical units where recommendations to reduce co-administration were made. Evaluation included baseline rates of PPI days on therapy (DOT), antibiotic-PPI DOT and HACDI. Rates of transfusions and GI consultations were also measured to assess for any negative effects. The baseline rates were then compared to post implementation of CPOE alert phase and introduction of an ASP initiated prospective audit and feedback phase.

Figure 1. Cerner Alert



## RESULTS

Figure 2. Utilization of Proton Pump Inhibitors: Medical Wards

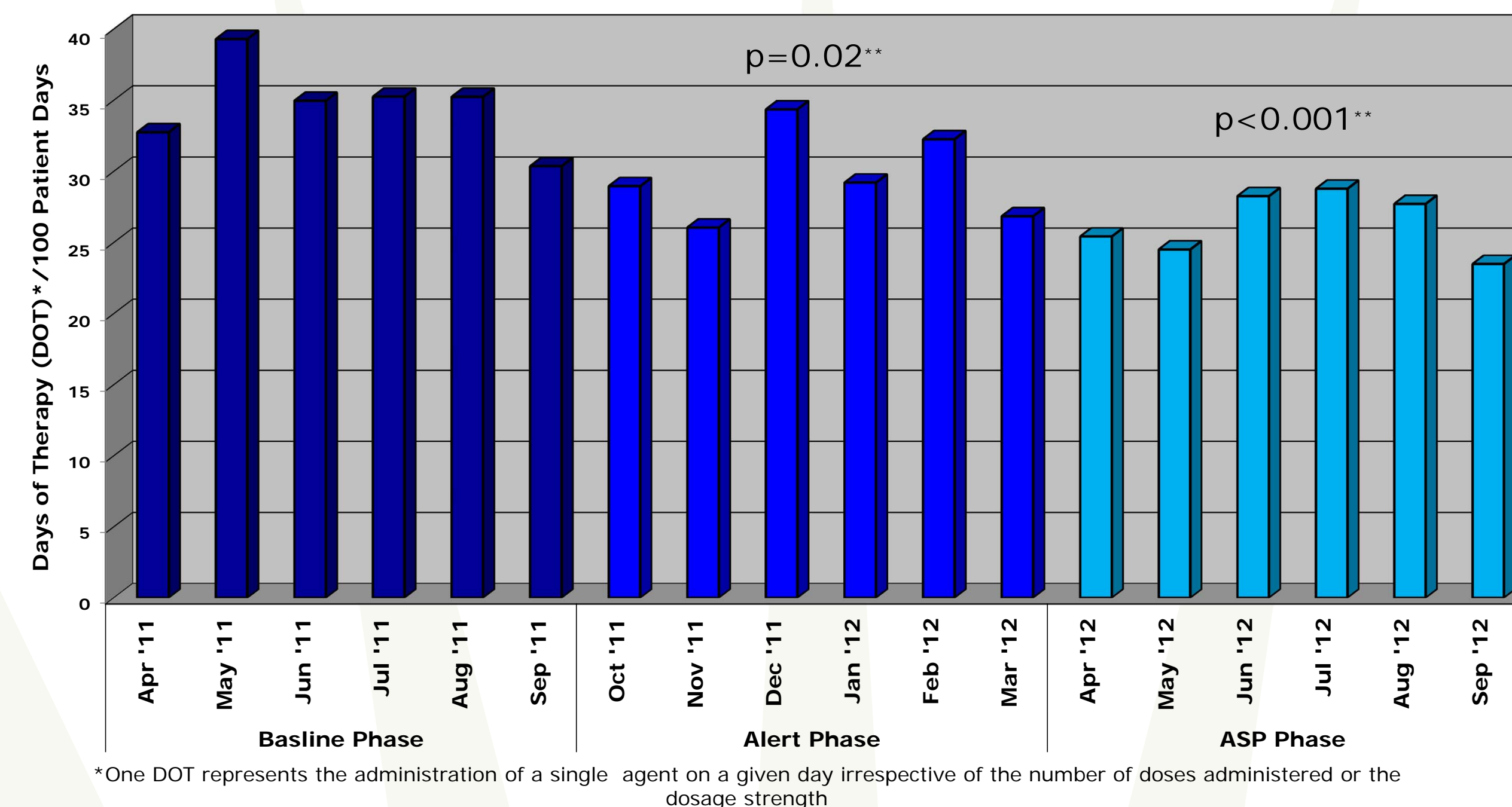
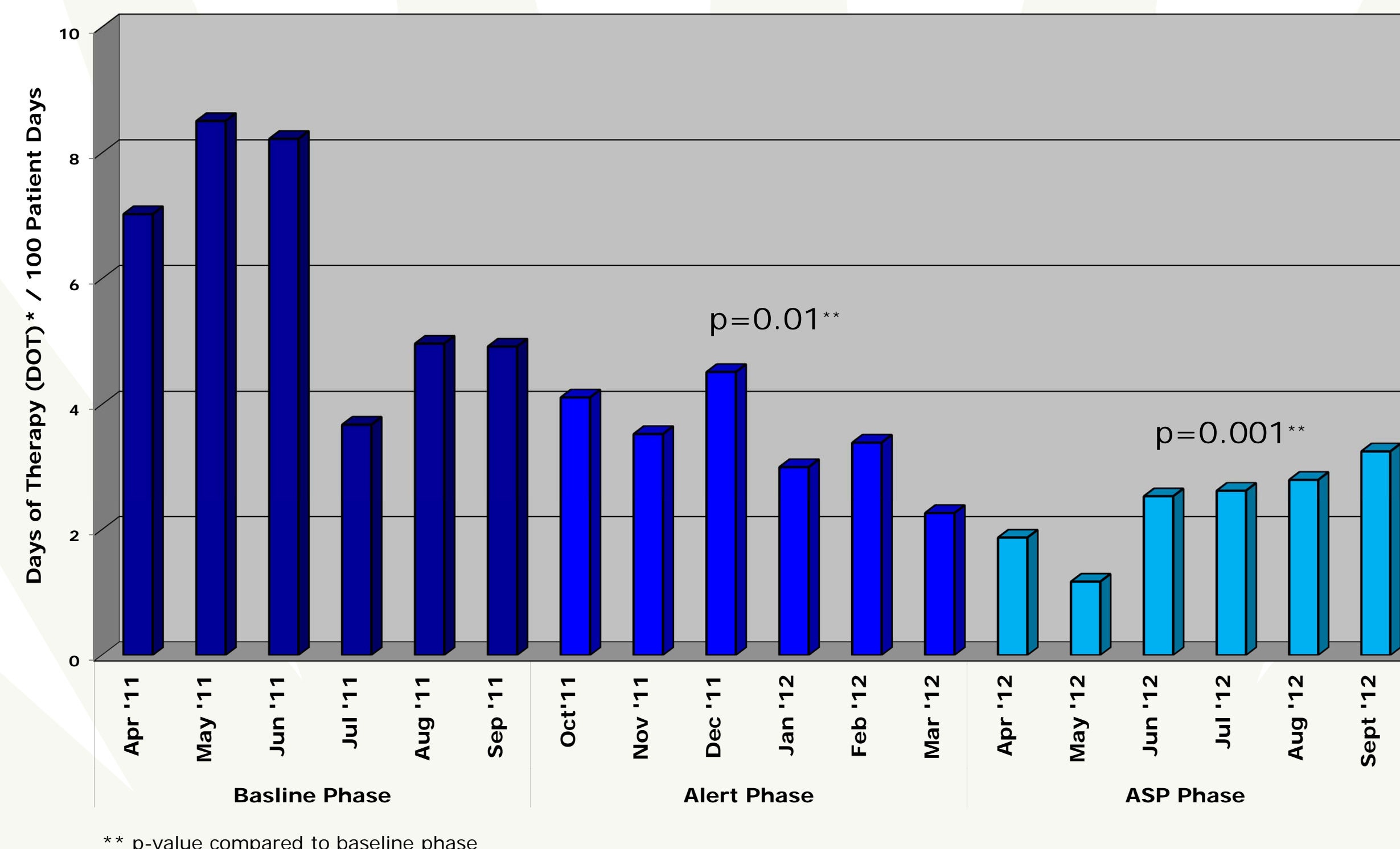


Figure 3. Co-administration of Proton Pump Inhibitors and Antimicrobials: Medical Wards



\*\* p-value compared to baseline phase

PPI utilization was found to decrease significantly from baseline with the alert phase and was further significantly decreased with the ASP phase (Figure 2). Baseline antibiotic-PPI DOT/100 PD was 6.2. This decreased by 55.8% to 3.5 DOT/100 PD after the alert phase. The ASP phase observed a further 38.2% decrease in antibiotic-PPI DOT ( $p = 0.03$ ) (Figure 3). There was no change in HACDI/1000 patient days (Figure 4). Finally, there were no negative impacts as indicated by no change in GI consultation nor blood transfusion rates (Figure 5).

## RESULTS

Figure 4. Comparison of Hospital Acquired *Clostridium difficile* Rates: Medical Wards

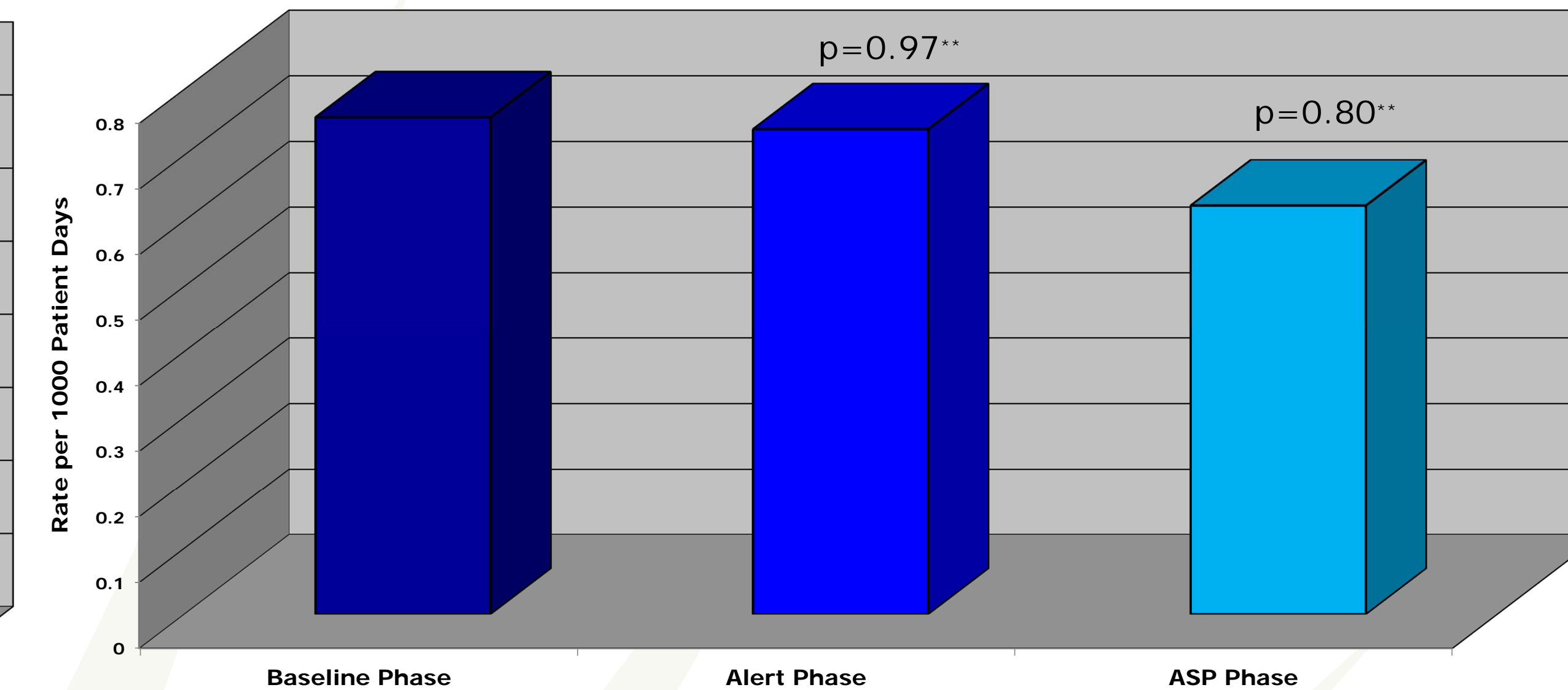
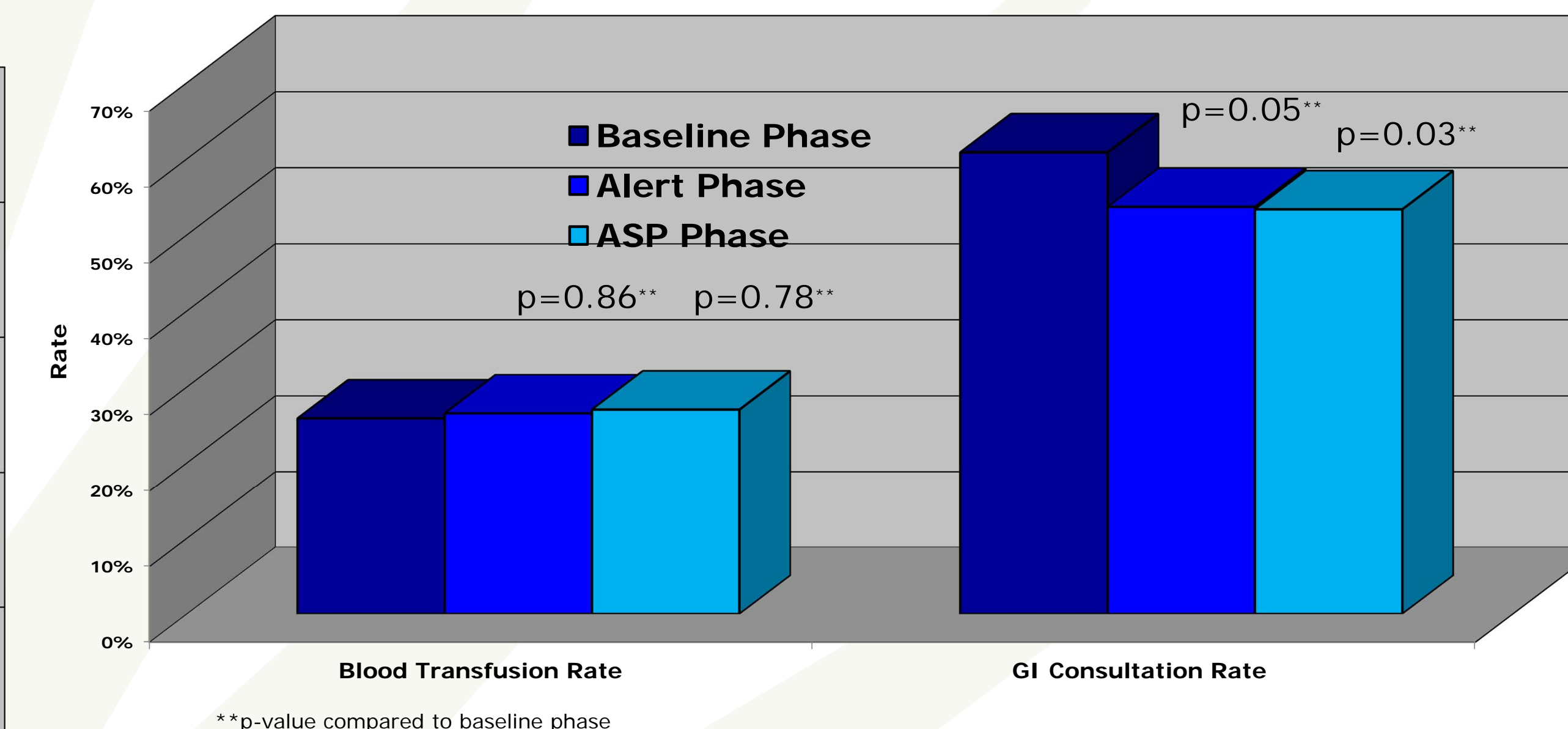


Figure 5. Comparison of Patient Safety Metrics: Medical Wards



\*\*p-value compared to baseline phase

## CONCLUSION

ASP programs are designed to optimize antimicrobial use. Limiting collateral damage from antimicrobial exposure though prevention of co-administration of PPIs and antimicrobials is not a traditional activity of an ASP, yet could be incorporated into prospective audit and feedback practices. Antibiotic-PPI DOT was reduced by 55.8% utilizing a CPOE alert and was further reduced by 38.2% after an ASP was introduced. These results demonstrate that a CPOE alert is an effective and simple method to decrease co-administration, but an ASP with a knowledge translation component offers further additional benefit.

Above all, we care