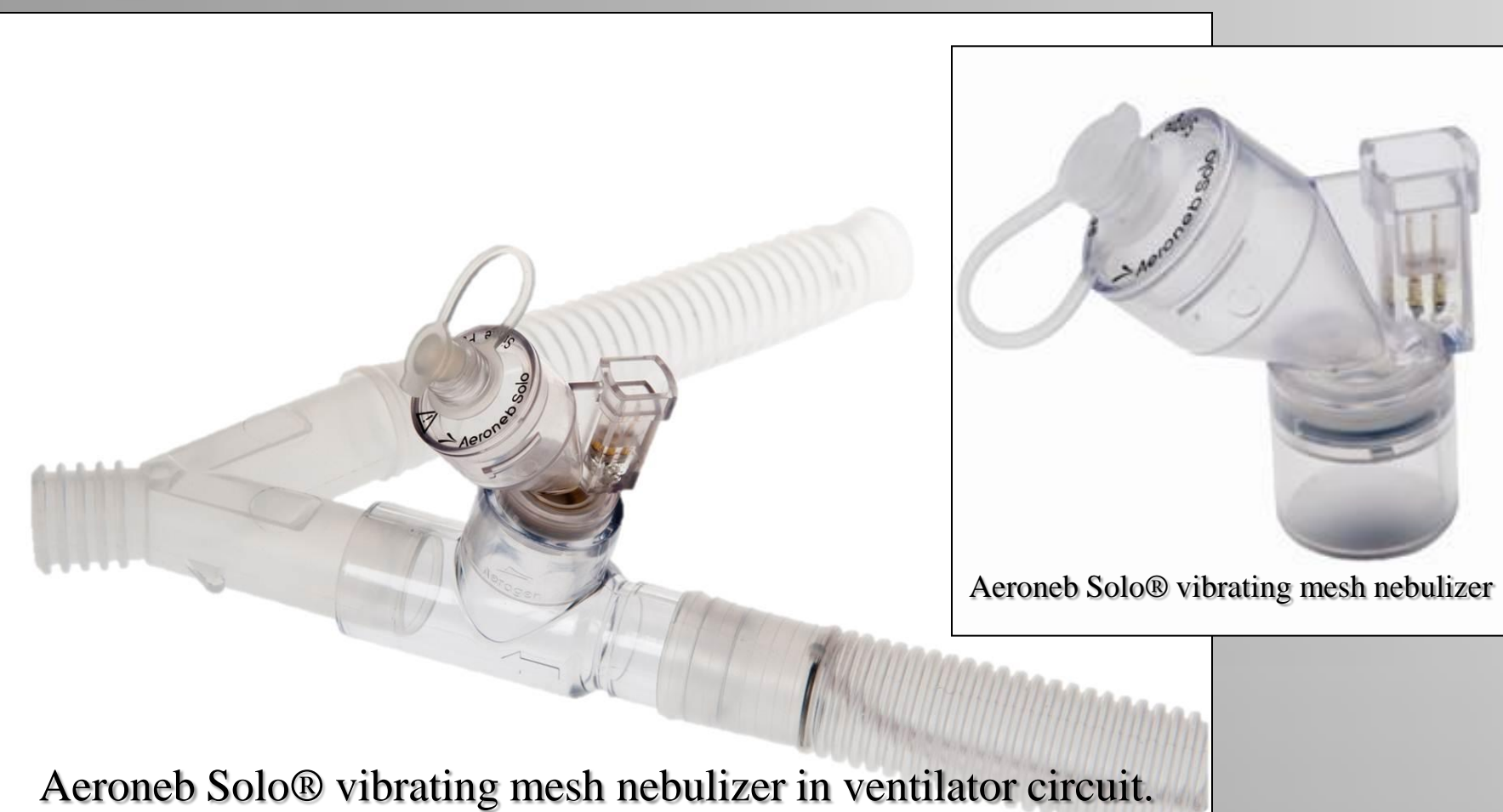


**PURPOSE**

- The administration of aerosol medications to mechanically ventilated patients can be accomplished through the use of propelled metered dose inhalers (pMDI) or by nebulization.
- Due to escalating cost of pMDI therapy and discontinuation of some pMDI products, alternative administration methods were evaluated.
- An analysis of albuterol, ipratropium, and albuterol/ipratropium pMDI purchases was completed using 2011 purchase data. It was discovered that 13 of the 112 long term acute care hospitals (LTACHs) accounted for 56% of pMDI purchases across the system.
- Prior attempts to convert these hospitals to jet nebulizers was unsuccessful. Respiratory staff preferred pMDI over standard jet nebulizers for the following reasons:
  - Potential infection risk caused by opening the circuit for administration
  - Extra air flow that causes the ventilator to alarm or alter the breathing pattern
  - Less medication would reach the patient due to particle size

**OBJECTIVES**

- To determine if an in-line vibrating mesh nebulizer can be used to replace pMDI in ventilator patients in the LTACH environment.
- To evaluate the overall cost savings with the elimination of pMDIs.
- To evaluate satisfaction of the respiratory therapist with education, rollout and use related to the conversion from pMDI to vibrating mesh nebulizers.



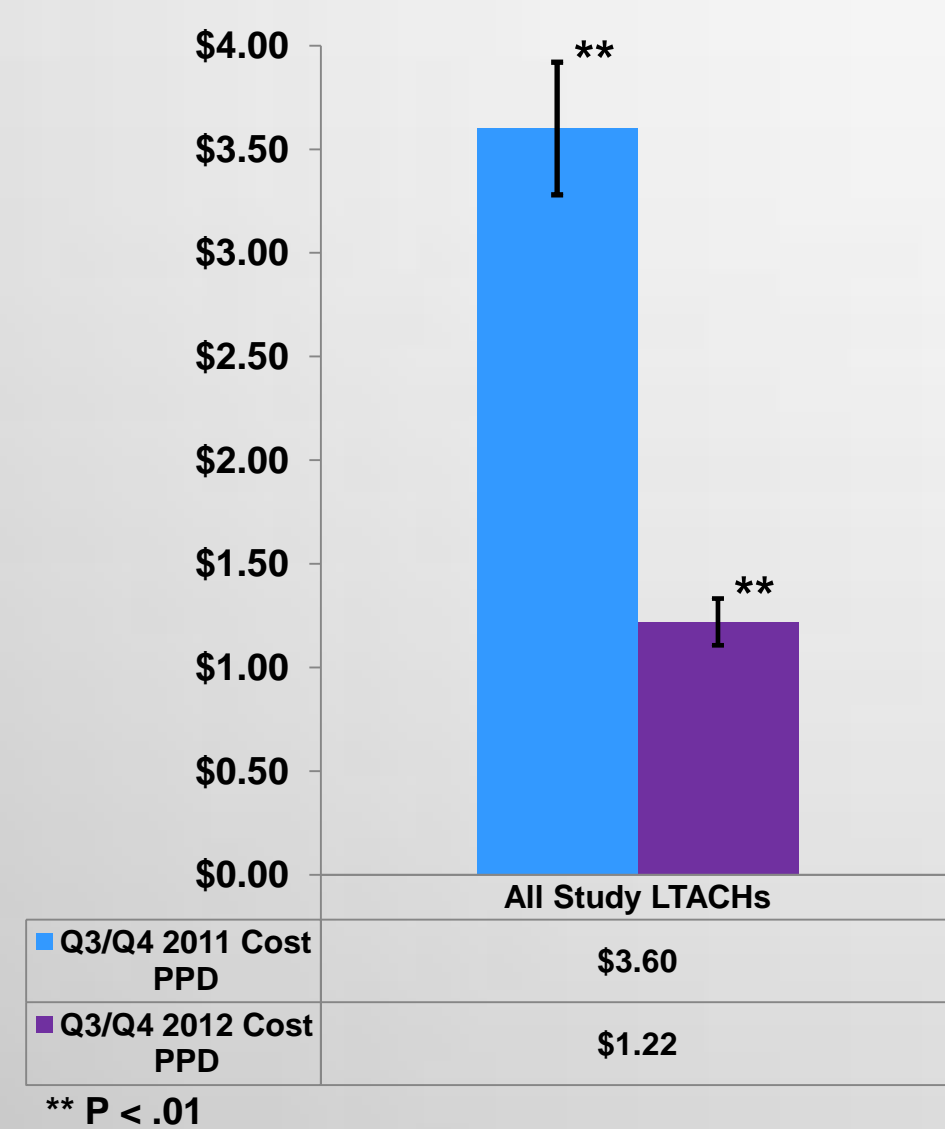
**METHODS**

- Based on the analysis of pMDI use, the 13 high-utilization hospitals were selected for this project.
- An in-line vibrating mesh nebulizer was introduced to these facilities during the 1<sup>st</sup> and 2<sup>nd</sup> Quarters of 2012 to be used exclusively, instead of pMDIs in ventilated patients.
- Costs in the 3<sup>rd</sup> and 4<sup>th</sup> Quarters of 2012 were compared to costs during the 3<sup>rd</sup> and 4<sup>th</sup> Quarters 2011.
- Following the six-month project, a survey was provided to the respiratory therapy staff to gather feedback on the process related to education, rollout, use and appropriateness of the vibrating mesh nebulizer.

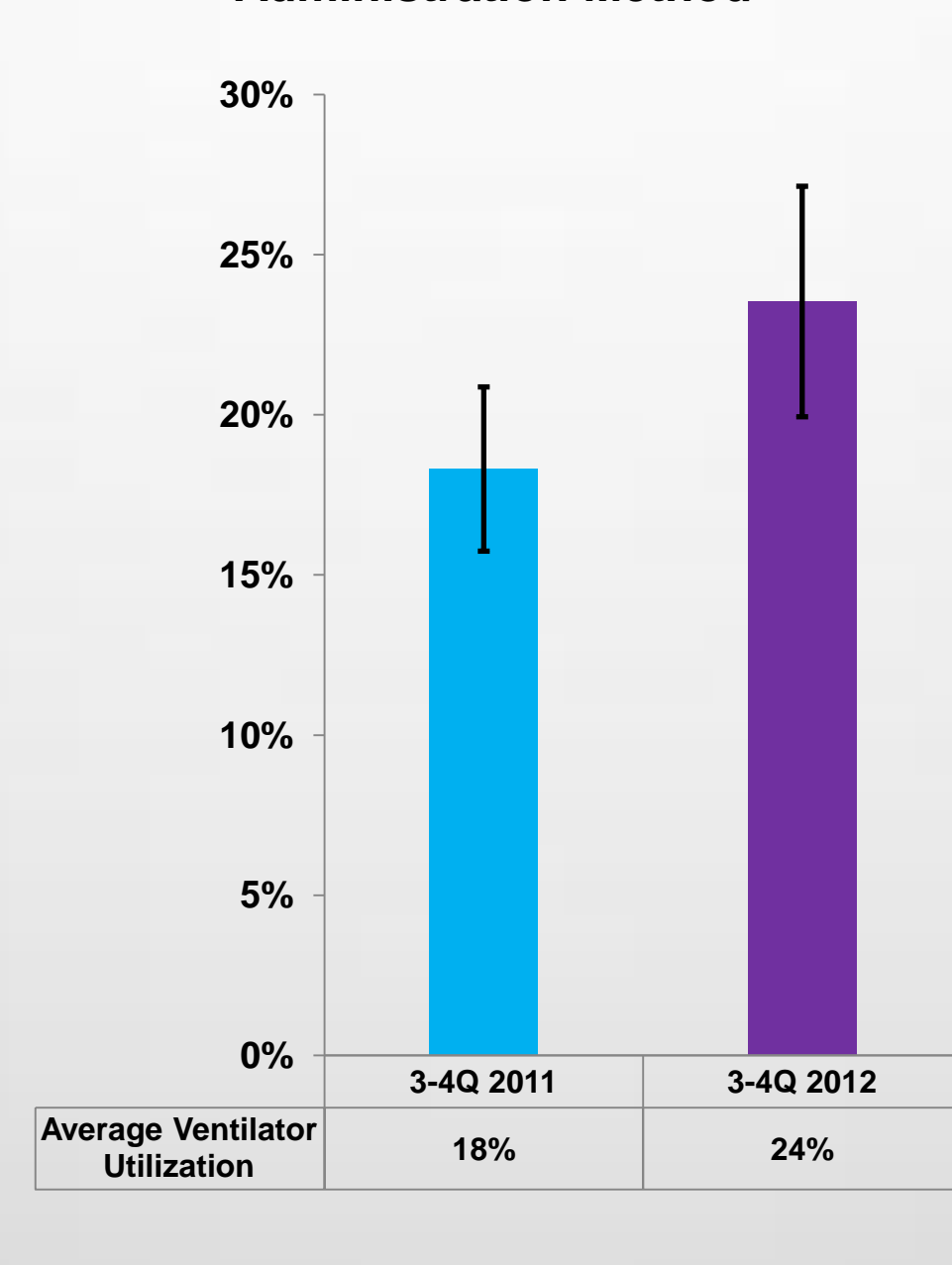
**Results**

- Pharmacy-related costs decreased 80% in the 3<sup>rd</sup> and 4<sup>th</sup> quarters of 2012 when compared to the 3<sup>rd</sup> and 4<sup>th</sup> quarters of 2011.
- Total hospital related (drug and nebulizer supply) costs decreased 65% when compared to the same period in 2011. Estimated savings of \$222,500 over the six-month period.
- Pharmacy savings over the six-month period was \$266,000 or 3.4% of the drug spend.
- The proportion of patients on mechanical ventilation did not decrease between the study timeframes.
- There was a slight increase in the proportion of patients successfully weaned from mechanical ventilation at the 13 hospitals for the two time periods studied, although the results were not statistically significant (Wilcoxon Signed Ranks Test).
- Respiratory therapists at the 13 participating LTACHs were surveyed following the six-month trial period in 3<sup>rd</sup> and 4<sup>th</sup> quarters of 2012.
  - 69% were “very satisfied” with the system.
  - 3% were “dissatisfied” or “very dissatisfied” with the system.
  - 83% chose the vibrating mesh nebulizer over standard jet nebulizers and pMDI as the best method to administer aerosol therapy.

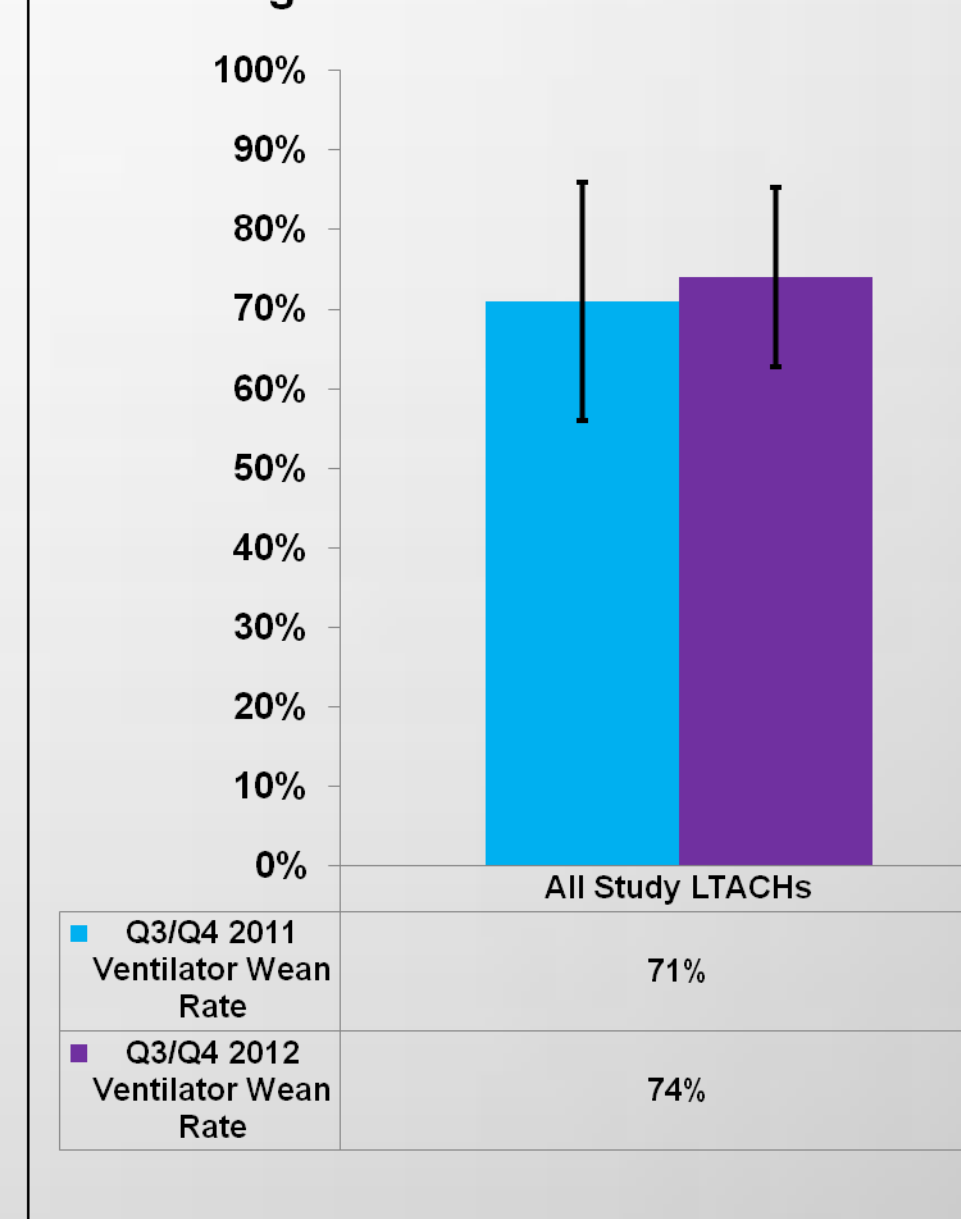
**Average Medication and Supply Cost per Patient Day for Albuterol/Ipratropium Therapy Before and After Change in Administration Method**



**Average Ventilator Utilization Before and After Change in Administration Method**

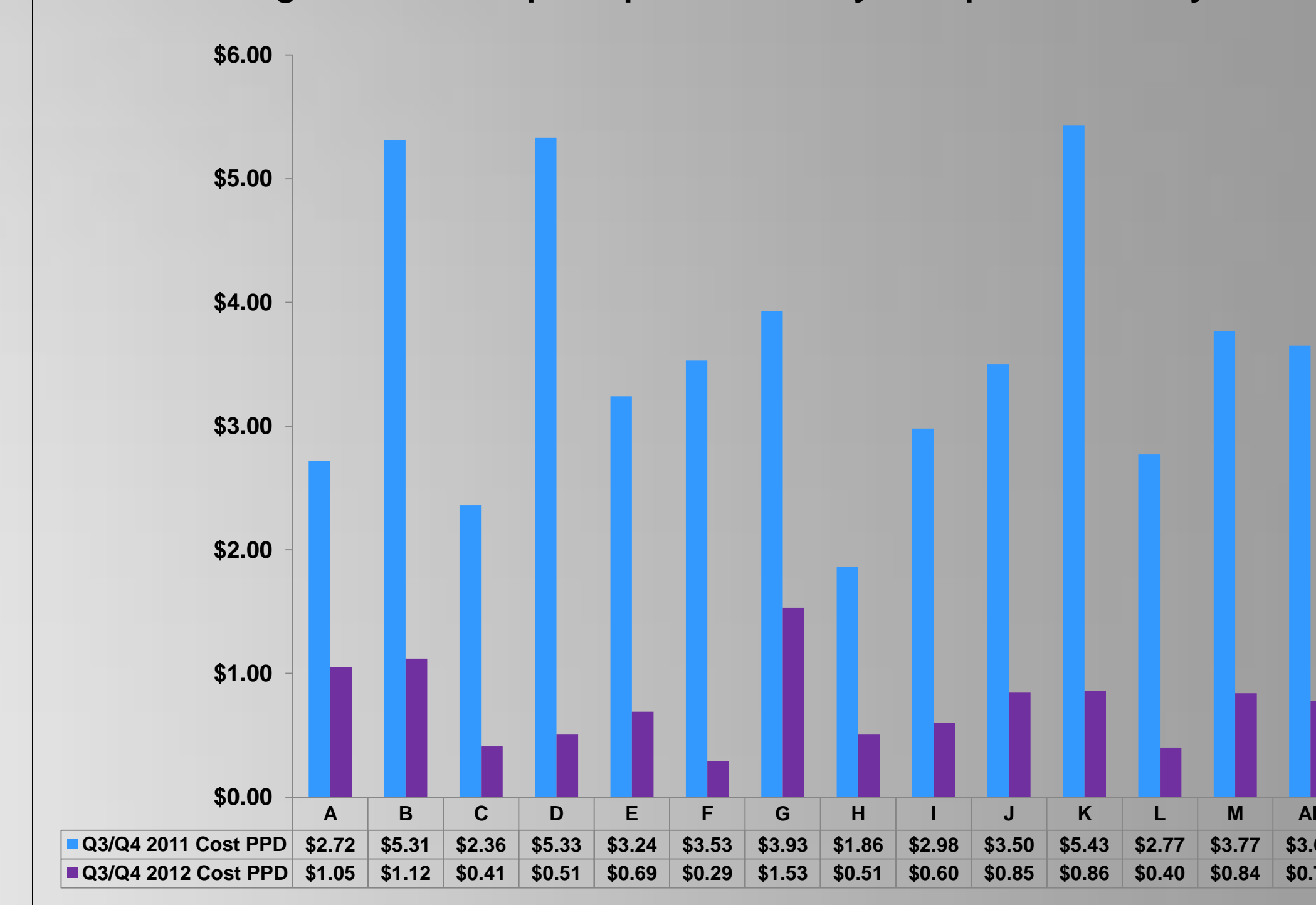


**Average Proportion of Ventilator Patients Weaned from Mechanical Ventilation Before and After Change in Administration Method**



**RESULTS, CONTINUED**

**Change in Albuterol/Ipratropium Pharmacy Cost per Patient Day**



**CONCLUSIONS**

The conversion of a historically pMDI administering hospital to a nebulizer can be facilitated with the coordination of pharmacy and respiratory therapy. A change in normal practice can be accomplished with little dissatisfaction from the staff affected by the change. The use of nebulized solutions can be a more cost effective alternative to the escalating cost of pMDI products and resolve issues with ventilator incompatibility of newer soft puff MDIs.

**DISCLOSURES**

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation. The following personnel are Select Medical employees with no financial or personal relationship with commercial entities:

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