

Business Case for Ventilator Associated Pneumonia

November 15, 2005

Submitted by Barb Averyt

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Executive Summary

This proposal request is on behalf of the Medical Intensive Care Unit (MICU) at Acme Hospital. The MICU seeks to implement a Ventilator Associated Pneumonia (VAP) protocol that will be utilized on every ventilated patient. This protocol will require minimal resources once implemented; however a project manager is indicated during the initial phase (part time for 9 months). This request is for the financial support of the project manager and expenses associated with the project.

Background: The Institute of Healthcare Improvement (IHI) has launched a nationwide effort, 100 K Lives, whose goal is to save 100, 000 lives in 18 months (Jan 1, 2005 - June 14, 2006) through the implementation of six interventions. This proposal is specific to one of those interventions – Ventilator Associated Pneumonia (VAP) bundle. The VAP bundle is already established and written by the IHI in collaboration with many other hospitals and recognized as a standard of care. There are four distinct elements that must be instituted, referred to as a bundle.

- Elevation of the head of the bed,
- A daily sedation vacation and daily formal assessment of readiness for weaning.
- Prophylaxis against deep venous thrombosis unless contraindicated, and
- Prophylaxis against peptic ulcer disease.

Our success will be determined by having all four elements of the protocol initiated.

Community Standards:

The VAP bundle has proven to save lives. This is documented in hospitals across the country and throughout literature. To date, we are aware of six Arizona hospitals that have implemented VAP. Two of the six shared that since implementing the VAP bundle, the incidence of VAP in their ICUs has reduced to one case in the past 6 months. Their prior occurrence was 15 cases per quarter for one hospital and 13 for the other.

Benefits:

Implementing the VAP bundle protocol has many positive implications. As this report will demonstrate there is a very positive return on investment (see Financial section), however, there are other benefits that are equally positive. They are:

- As media becomes aware of the 100 K Lives campaign, we feel that health plans and employer groups will begin to ask hospitals if they have instituted any or all of the six interventions that have proven to save lives. We want to be able to say, “Yes!”.
- The MICU staff has requested we implement the VAP bundle. By approving this proposal, Acme Hospital demonstrates empowerment to staff and morale is boosted in the MICU.
- Management’s commitment to quality and patient safety would be clearly demonstrated
- Acme would be up to standards with proven measures that save lives.

We feel this is a win-win proposal.

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Service and Our Mission

This proposal is for the financial support needed for the development, training, implementation and monitoring of the VAP bundle in the MICU. Due to the impact that the 100 K Lives campaign is having upon this country, the VAP bundle is quickly becoming a standard of care. Evidenced based literature is present and substantiates that the VAP bundle saves lives and money. Our mission statement indicates Acme Hospital will provide **high quality** care in a **cost sensitive** environment. Implementing the VAP bundle underscores and supports those two elements of our Mission Statement. Additionally, the VAP bundle has been proven to save lives in 95% of the cases when implemented correctly. This certainly supports and furthers our mission, strategic plan and commitment to patient safety.

Acme Hospital Mission Statement

To provide a full spectrum of high quality, wellness oriented healthcare in an organized, cost sensitive and customer oriented academic environment.

Market

On a national level, VAP is the leading cause of death among hospital-acquired infections. Studies cited by the IHI indicate VAP occurs in 9-15% of ventilated patients and of those who get it, about half die. According to the Centers for Disease Control and Prevention, a VAP patient's ICU stay is prolonged by an average of 4.3 - 6.1 days and results in excess costs of around \$40,000 per patient.

Last quarter (Q1, 2005) Acme Hospital's MICU had 102 admissions and 12 patients developed VAP. In an audit performed on those records, data showed their LOS was extended by 4.7 days in the MICU and resulted in excess costs of \$32,000 (average). Not only do those cases have reduced net revenue, it also impacts the overall census for the MICU by having those beds occupied for extended days. By implementing the VAP bundle we will experience decreased cost per case and decreased LOS in the MICU that will directly impact patient flow and bed utilization.

Business Model

Nationally, VAP extends the ICU LOS by an average of 5 days and increases cost by \$40,000 per stay. Hospitals across the nation who have implemented the VAP bundle are experiencing reductions in occurrence as great as 95%. As stated earlier, our audit of 1 Q 2005 MICU patients showed we had 12 cases of VAP. In those 12 cases, the ICU stay was extended an average of 4.7 days and excess cost of \$32,000. Four of the patients that had VAP died. We feel this demonstrates a need for Acme Hospital to implement the VAP bundle, however, if the VAP bundle is not implemented correctly, the potential of the impact will not be fully realized.

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Financial

Expense:

This proposal asks for financial support of \$20,503.90 for nine months. The request is broken down as follows:

~ One day a week staff RN for nine months to serve as project manager ¹ .	\$12,654.90
~ Education materials for staff ²	\$ 410.00
~ Wages for 6 hours of mandatory in-service by all MICU RN and RT staff ³	\$ 6,150.00
~ Food expense to present program at Critical Care Committee lunch ⁴	\$ 225.00
~ Food expense to present program at Medical Director Dinner ⁵	\$ 407.00
~ Contingency fund for unanticipated expenses	\$ 250.00

Revenue/ Impact:

To calculate our net revenue we utilized the numbers from our 1 Q 2005 chart audit and National averages for savings per patient:

- Acme General VAP costs average of \$32,000 per patient.
- Studies indicate that hospitals that comply with 100% of the bundle items < 95% of the time reduce VAP rates by 40% and eventually narrow their rate to nearly non-existent.
- 1 Q 2005 VAP cases = 12

2006 1 st quarter savings:	\$ 0	(Program development)
2006 2 nd quarter savings:	\$ 96,000.	(25% compliance = 3 cases impacted)
2006 3 rd quarter savings	\$ 192,000.	(50% compliance = 6 cases impacted)
2006 4 th quarter savings	\$ 288,000.	(75% compliance = 9 cases impacted)
2006 Total savings:	\$ 576,000	

Nine month proposal expense: \$ 20,503.90 (January 2006 – September 2006)

2006 Net revenue \$ 555,496.10

Team

This has already been proposed to the CNO and met her approval. Dr. Smith, a pulmonologist, has agreed to be our physician champion. Sally Jones, a clinical pharmacist, Linda Wright, the

¹ Calculated at RN hourly rate of \$27.25 for 12 hours/week for 4.3 weeks per month for 9 months = \$12, 654.90

² MICU RN staff (21), Resp. Therapy staff (10), extras for new staff or travelers (10) for total of 41 sets at \$10.00 ea.

³ Calculated at average of \$25.00 per hour per staff for 41 current staff. New hires will get info during orientation.

⁴ \$11.25 per person for 20 people

⁵ \$18.50 per person for 22 people

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infectious disease nurse, Tina York, Director of Resp. Therapy and Jim Baker, QI Director, have agreed to participate on the team for this initiative as well as staff of the MICU.

Project Planning

VAP bundles include four specific interventions that must all be utilized, hence the word “bundle”. When all four interventions are used there is a 95% incident reduction rate. To effectively implement the VAP bundle we are asking for an MICU staff RN to be off patient care assignment 12 hours per week for a period of nine months for “project management” duties. Tasks will include

- chart audits (pre and post implementation so we can accurately measure our success);
- team facilitation in importing the VAP bundle from concept to implementation;
- developing teaching & communication tools for staff (respiratory therapy, nursing, pharmacy and physician interaction);
- work 1:1 with staff (respiratory and nursing) so all are aware, trained and competent;
- develop a module for the new RN hire orientation manual so the gains can be maintained;
- develop a module for the Travelers RN orientation manual so the gains can be maintained;
- present the program at the Critical Care Committee lunch and Medical Director Dinner for approval;
- provide monthly status reports at the Quality Council meeting.

- The following chart demonstrates a timeline for this project.

Activity - 2006	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Prgm Developmnt	●	●	●									
Initial Training				●	●							
Implement					●	●	●	●	●	●	●	●
Cont. Training						●	●	●	●	●	●	●
Financial Impact							●	●	●	●	●	●
Measure Results	●	●	●	●	●	●	●	●	●	●	●	●

Please note the following:

- **Program Development** will include identification of team members, development of a Charter, development of a library of evidence based research articles for reference, team research into how Acme implements the VAP bundle program, Policy and Procedure changes, education materials, etc.

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- **Initial Training** will introduce the concepts and methods of VAP bundle to Nursing and Respiratory staff departments . This will occur over two months with Dr Smith presenting to medical staff during the same time period.
- **Implementation** will occur in a graduated fashion with one nurse, one respiratory therapist and one patient – a small test of change. Once successful, the implementation will be fanned out to other staff. During the final week of training all staff should be implementing the VAP bundle
- **Continued Training** will occur throughout the remainder of the project period and will be driven very specifically by staff feedback, observations and audit results.
- **Financial Impact** is not to be expected until implementation has occurred. Because of learning curve, we anticipate a graduated impact as compliance increases.
 - Quarter 2 - 25 % compliance = 3 cases impacted
 - Quarter 3 - 50 % compliance = 6 cases impacted
 - Quarter 4 - 75 % compliance = 9 cases impacted
 - 2007 – 100 % compliance
- **Measure Results** is being performed monthly so we are well aware of the impact of VAP bundle before, during and after the project management. At the end of 2006, monitoring will continue through the QI department.

Conclusion

We hope this information is satisfactory and complete. Should you have any questions in the material presented the contact information for clarification is below. We are hoping to obtain approval for this proposal by December 15, 2006 so the project start time can be scheduled for Jan. 1 , 2006. Let me thank you in advance for your thoughtful consideration.

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