

1) I COUGH

Boston Medical Center

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WINNING
ENTRY

PROJECT DESCRIPTION

A multidisciplinary team developed a strategy to reduce pulmonary complications based on comprehensive patient and family education and a set of standardized electronic physician orders to specify early postoperative mobilization and pulmonary care in response to National Surgical Quality Improvement Program (NSQIP) data showing that the hospital was a high outlier for all measured postoperative pulmonary complications. Designated by the acronym I COUGH, the program emphasizes Incentive spirometry, Coughing and deep breathing, Oral care (brushing teeth and using mouthwash twice daily), Understanding (patient and family education), Getting out of bed at least 3 times daily, and Head-of-bed elevation. Pain control was another important component, essential to the mobilization goals. Nursing and physician education promoted a culture of mobilization and other I COUGH interventions. I COUGH was implemented for all general surgery and vascular surgery patients at the hospital in August 2010. It was the first and only effort to date to combine the above described interventions into a single, comprehensive protocol designed to mitigate the most common risk factors for non-ventilator hospital-acquired pneumonia and other complications. The simple, low-cost and low-tech program has proven effective in reducing both the incidence of postoperative pulmonary complications and reducing cost of care.

OUTCOMES ACHIEVED

- Decrease in postoperative pneumonia—incidence fell from 2.6% (1569 cases) to 1.6% in the year after I COUGH's implementation (1542 cases; $p = .09$)
- Decrease in unplanned intubations—incidence fell from 2.0% before I COUGH (1569 cases) to 1.2% after (1542 cases; $p = .09$)
- Improved nursing practice
- Prior to implementation, only 19.6% of 250 patients were in chair or walking at the time of audit; afterwards, 69.1% were out of bed ($p < .001$)
- Before I COUGH, only 52.8% of patients had incentive spirometer within reach, while after implementation 77.2% did ($p < .001$)
- Savings of at least \$3 million over two years, given that the average pulmonary complications costs between \$20,000 and \$52,000
- Low cost to implement—only piece of equipment is a \$1.50 incentive spirometer

LESSONS LEARNED

1. Patient and family education is key—both must take an active part in the patient's recovery
 - Provide brochures, posters, and informational video in multiple languages
 - Stress importance of interventions for achieving good postoperative outcomes
 - Introduce I COUGH in pre-procedure clinic, reinforce in preoperative holding area, AND instruct again after operation
 - Ensure pain controlled so patient can take deep breaths, cough, and get out of bed to sit in chair and walk through hallway
2. Successful implementation requires staff commitment and engagement
 - Educate across all levels—leadership, physicians, house staff, nurses
 - Articulate to staff expectations for implementation
 - Make it a part of the culture
 - Solicit feedback for what works and what doesn't to adjust the program accordingly
3. Audit practice to ensure compliance and sustained success; visit patients after operation assess whether:
 - They are in bed, sitting in chair or walking at time of visit
 - There is incentive spirometer within reach
 - The head of bed is elevated more than 30 degrees