700 bed tertiary care medical center. Strong Health is a Trauma Center, Transplant Center (bone marrow, kidney, liver & heart). 4 adult ICU’s: MICU (17 beds), SICU (14 beds), Burn/Trauma (17 beds), and Cardiovascular ICU (14 beds)
IHI Patient Safety Initiative

- URMC/Strong Health partnered with the collaborative members of the Institute for Healthcare Improvement to promote a culture of patient safety and improve outcomes for patients by improving the quality of our health care delivery.

- 1st Patient Safety Initiative 2003
  - Implement a Ventilator Bundle
    - Reduce Ventilator-associated Pneumonia
VENTILATOR BUNDLE

- Elevate HOB 30 degrees unless contraindicated
- Sedation Vacation
  - Turn off sedation until patient is able to follow commands or is fully awake.
- DVT Prophylaxis
- PUD Prophylaxis
- Daily assessment for readiness to wean
  - Structured Oral Care and Mobility were added as adjunct therapies to enhance effectiveness of bundle

IHI.org 2003, Ricart, Lorente, Diaz et al. 2003
VAP CRITERIA

- > 48 hours on ventilator
  - At least 3 out of 5:
    - Radiographic evidence of new or progressive infiltrates
    - Fever
    - Leuckocytosis
    - Change in sputum (color and/or amount)
    - Worsening $O_2$ requirements

* Final determination of VAP diagnosis is made by the attending physician

IHI.org 2003, CDC 2004
Medical Intensive Care Unit

- **Pilot Unit**
  - 17 bed ICU
    - Population includes patients commonly diagnosed with: Sepsis, ARDS, Respiratory Failure, Pneumonia, TB, CVA, GI Bleed, Pancreatitis and Drug Overdose
- **ICU Intensivist Provider Care Model**
  - Closed Unit
- **Admit 1,100 patients/year**
- **70% of patients require mechanical ventilation**
Ventilator Bundle
Implementation Plan

- Team Formation
- Education
- Implementation
- Communication
- Reporting Data
- Developing Champions
Implementation Process

Team Members

Multidisciplinary in Scope

- Director of Adult Critical Care
- Associate Director of Critical Care Nursing
- Adult Critical Care Project Manager
- MICU Nurse Manager
- RN Care Coordinator
- Respiratory Therapist
- Pharmacy
- Critical Care Nursing Staff
Implementation Process cont’d

- **Staff Education**
  - Presentation of evidence-based findings/information about VAP to establish a solid foundation for support of the initiative
  - Extensive initial education campaign to introduce ventilator bundle initiative
  - Monthly educational presentations for the first 3 months for reinforcement
  - Regularly scheduled in-services/poster presentations
  - Ongoing 1:1 staff education and reinforcement
  - Ventilator Bundle education is included in unit orientation for staff and residents
Establish forums for open Communication

- Staff meetings
  - Two times each week
- Individual discussions
  - Daily Walk Rounds
- Critical Care Quality Council
  - Initiative updates reported monthly
- Leadership Safety Rounds
  - Monthly
Implementation Process, cont’d

- **Daily Goal Sheet**
  - Vital to implementation of the ventilator bundle
  - Checklist with prompts for patient care priorities that were addressed each day during daily morning rounds by physicians, residents, nurses and the care coordinator
  - Extensive modifications were required before final approval from the healthcare team
  - Now part of the resident daily progress note and nursing plan of care
Implementation Process cont’d

- Team Meetings
  - Weekly
  - Review data results
  - Problem solving
  - Planning
  - Plan Do Study Act Cycles (Model for Improvement)
  - Accountability
Barriers

- Resistance to practice change
  - Physicians
    - Lack of buy-in
  - Daily Goal Sheets time consuming
  - Individual practice preferences
  - Skepticism about results of research and evidence provided to support the initiative
  - Staff
    - Need to learn new protocols
    - Concern about compromised patient safety with sedation vacation
    - Practice boundary issues between Respiratory Therapy and Nursing when RT-Driven Weaning Protocol was implemented
Barriers, cont’d

- **Perceived increased workload**
  - Staff - more paperwork
  - More time and effort required

- **Another QI project that will go away**
  - Why are we doing this?
  - Is this just another improvement project that will fall by the wayside?
Our Ventilator Bundle Challenges

- **HOB Noncompliance**
  - Inaccurate perception of 30 degrees
  - Posted bedside signs and measurement cues
  - HOB position documentation required on Flow Sheet

- **Sedation Vacation**
  - Nursing Resistance (perceived risk to patient safety)
  - Medical Director appealed to staff to develop a nurse-driven sedation

- **Daily Assessment for Ability to Wean**
  - Mechanical Ventilator Liberation Protocol presented issues of practice boundaries between Nursing and Respiratory Therapy
  - Extensive in-services, 1:1 education and reinforcement required before successful implementation achieved
Practice Changes During Ventilator Bundle Implementation

- **Protocols/ Guidelines**
  - Revision of Mechanical Ventilator Orders/ Guidelines
  - Nurse-driven Sedation/ Delirium/ Sleep Wake Protocol
  - Respiratory Therapist-driven Weaning Protocol
  - Structured Oral Care Protocol for ventilator patients
  - Mobility Guidelines (Carried out a pilot study and implemented a Lift Team)
  - Glucose Management Protocol
  - Daily Goal Sheet incorporated into daily resident note
  - Adult Critical Care Goal Sheet/ Nursing Care Plan
Results

MICU VAP RATE
(# VAP/Vent Days x 1,000)

Structured Oral Care Protocol Implemented
Results

MICU Ventilator Bundle Compliance
All Components Completed

Rate

Dates

Nov-02  Feb-03  May-03  Aug-03  Nov-03  Feb-04  May-04  Aug-04  Nov-04  Feb-05  May-05  Aug-05  Nov-05  Feb-06  May-06  Aug-06  Nov-06  Feb-07  May-07

MICU
Results

MICU Sedation Days

Days Per Month

Dates

- MICU
- Linear (MICU)
Benefits of our Initiative: Reduction in LOS $$$$ and Lives Saved

- Average cost of ICU day ~ $2,000/day
- Decrease LOS from 7.5 days to 6 days (1.5 days/patient)
- 1100 patients/year
- 1,650 days saved per year
- $3,300,000 saved per year
- (Plus beds available for elective cases)
- Mortality rate associated with VAP high