

Implementing a quality improvement initiative in a tertiary referral ICU; effect on the incidence of ventilator associated pneumonia (VAP)



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Outline

- Tertiary referral ICU?
- VAP?
- Quality Improvement Initiative?
- Interventions
- Results
- Message



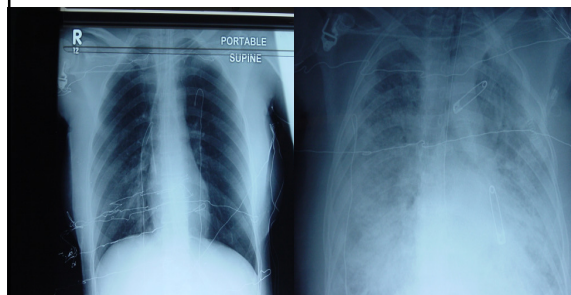
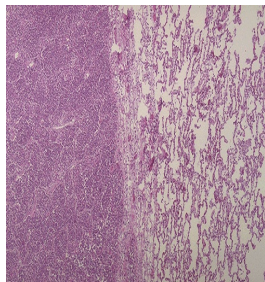
Context

- Tertiary referral (30% of admissions from elsewhere)
- 18 level 3 beds
- 2 unfunded spaces
- 800 level 3 admissions in 2008/9
- 90% admissions emergency/unplanned
- Level 3 occupancy 96%

- 8 level 2 beds
- 900 level 2 admissions
- Level 2 occupancy – 85%

Pneumonia

- respiratory disease characterized by inflammation of the lung parenchyma (excluding the bronchi) with congestion, caused by viruses or bacteria or irritants





Genesis of ventilator associated pneumonia (VAP)

1. Contamination of patient/equipment via ? hands of staff
2. Lying flat – encouraging reflux of gastric contents

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3. Pool of infected fluid aspirated into lungs

Reduction in VAP?

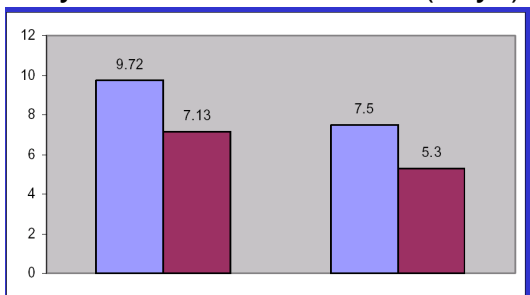
1. Contamination of patient/equipment via hands of staff
2. Lying flat – encouraging reflux of gastric contents
3. Pool of infected fluid aspirated into lungs

1. Hand hygiene/cross infection precautions
2. Sit patients up to 30-40 degrees as much as possible
3. Stop sedation daily – reduces period on ventilator

Ventilator Care Bundle

- Bed head elevation (Drakulovic 1999)
- DVT prophylaxis (Cook et al 2001)
- GI protection (Young and Lewis 2003)
- Daily sedation breaks (Kress 2000)

Effect of care bundle on ICU stay & time on ventilation (days)



University Hospitals Coventry and Warwickshire NHS Trust

ABOUT S.P.I.

- The Safer Patients Initiative is a programme aimed at improving patient safety in UK hospitals.
- Participating hospitals will work with the Institute for Healthcare Improvement (Boston, USA) and the Health Foundation (UK).



Targets

- Mortality 15% reduction
- Crash Calls 30%
- Anticoagulation ADEs 50%
- Adverse Events 30%
- MRSA BSI 50%
- Surgical Site Infections 50%
- VAP 300 days between
- Central Line BSI 300 days between
- Blood Sugars (ICU/HDU) 80% within range
- All processes greater 95% reliable or greater

How to judge quality of care?

- | Outcome | Process |
|---|---|
| <ul style="list-style-type: none"> • Mortality • LOS • Infection rates (VAP-BSI etc) • Adverse events (absence) | <ul style="list-style-type: none"> • Care bundle compliance • Blood sugar control • Daily goals • Re-intubation rates |

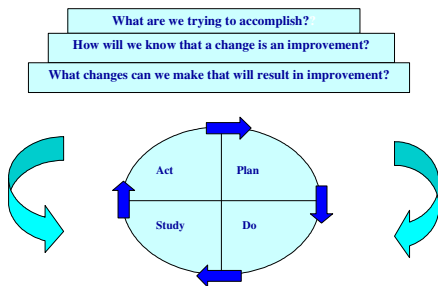
How to judge quality of care?

- | Outcome | Process |
|---|---|
| <ul style="list-style-type: none"> • This is what matters to patients • BUT comparisons depend on risk adjustment - which is not an exact science | <ul style="list-style-type: none"> • Independent of case-mix or outcome • Reflects the reliability of an organization's systems • Requires collection of data on elements of process |

What to measure, audit or compare?

If you wish to improve outcome you need to look at process and try to make it better / reliable

Model for Improvement

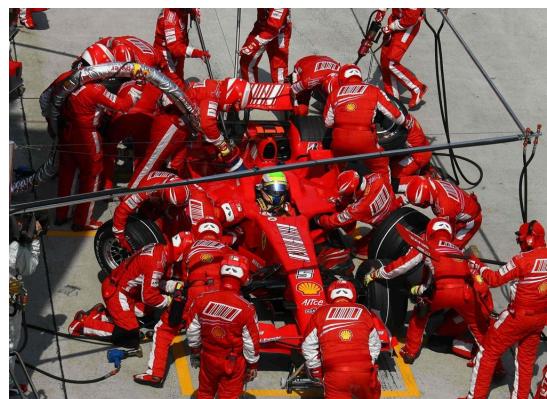


PDSA Cycle

- **Plan** List the tasks needed to set up this test of change. Predict what will happen.
- **Do** Describe what actually happened when you ran the test. Test with one doctor/one nurse/one patient.
- **Study** Describe the measured results and how they compared with predictions.
- **Act** Describe what modifications to the plan will be made for the next cycle from what you have learnt.

Design of processes

- Staff in clinical area review existing processes and make small changes which (they think) will produce improvement.
- Use of rapid PDSA cycles to produce sustainable change
- Measurement to check that change represent improvement.
- Clinical staff use arrangements that they designed.
- Testing (ToC) can happen quickly



Interventions to reduce VAP rate


- Ventilator Bundle
- Hand hygiene
- General infective control
- Leadership involvement

Interventions to reduce VAP rate

- **Ventilator Bundle**
 1. Daily audit by nurses
 2. Agreed exclusions
 3. Audit on ward rounds
 4. Discussion and resolution on ward round
- **Hand hygiene**
 1. Observational audit
 2. Audit built into weekly routine
 3. Audit presented by professional group
- **Leadership involvement**
 1. Clinical
 2. Managerial

VAP

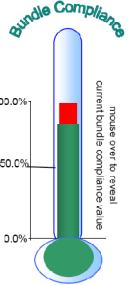
- Definition & Aim
- Arrangements to measure frequency of VAP
- Interventions
 - Care bundle
 - Hand hygiene
 - leadership
- PDSA cycles
- Rapid feedback of results (previous month)
 - Compliance with interventions
 - VAP rate



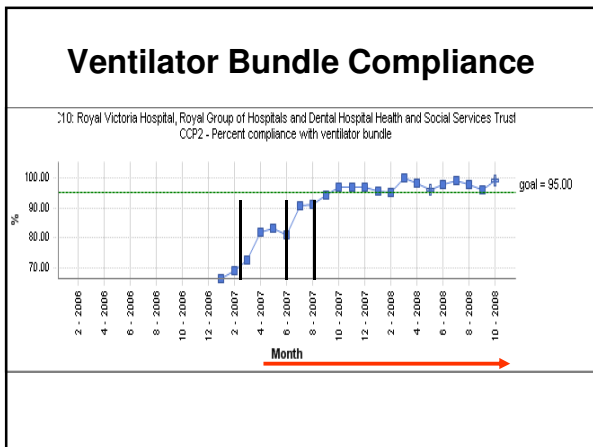
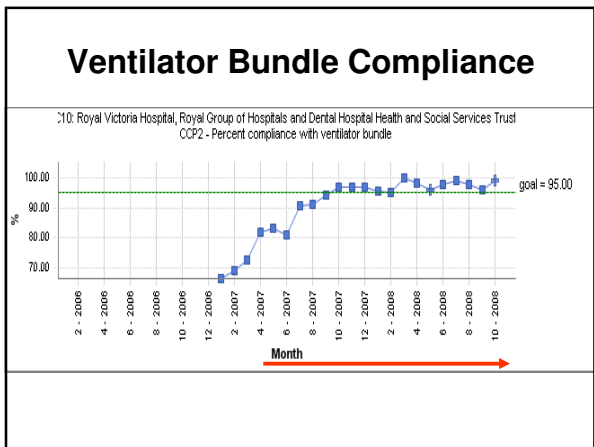
Feedback

Bundle Compliance	
Total Number of patient Observations	477
Total Compliant with all Elements of CareBundle	400
Bundle Compliance %	83.9%

Element Compliance %	
GU Prophylaxis	98.5%
Patient Observations	470
DVT prophylaxis	93.9%
Patient Observations	448
40° tilt	95.2%
Patient Observations	454
Sedation Hold	96.0%
Patient Observations	458



What happened?



Hand Hygiene

Standard

- Apron
- Hand washing (agreed method) before and after patient contact *or*
- Gloves before and removed after
- Target >95%

Hand Hygiene

Standard

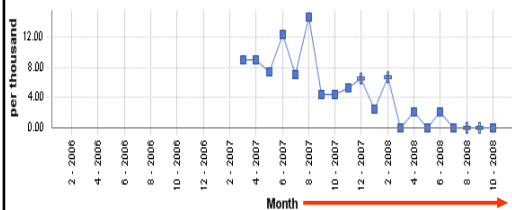
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Compliance

- May 07 – 42%
- July 07 – 84%
- Sept 07 – 93%
- Nov 07 – 96%

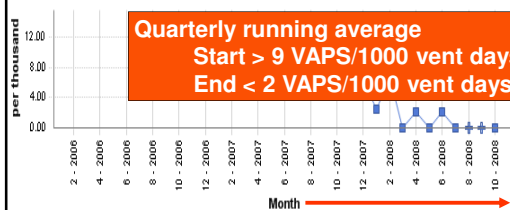
VAP Rate

C10: Royal Victoria Hospital, Royal Group of Hospitals and Dental Hospital Health and Social Services Trust
CC01 - VAP Rate



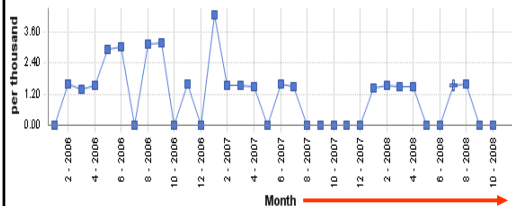
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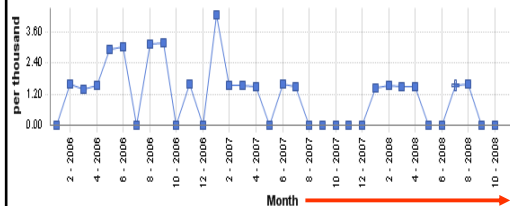
MRSA Bloodstream Infection Rate

C10: Royal Victoria Hospital, Royal Group of Hospitals and Dental Hospital Health and Social Services Trust
CC04 - MRSA Bloodstream Infection Rate

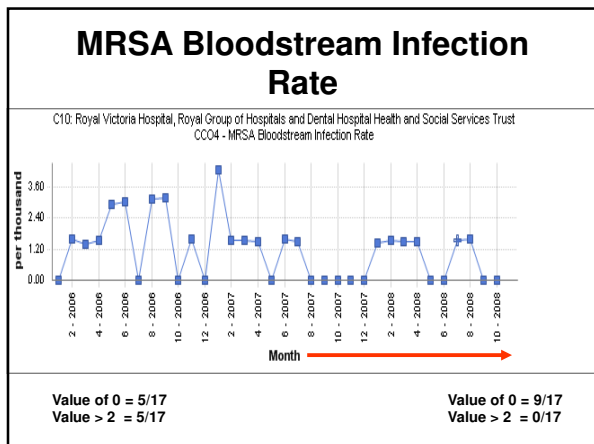


MRSA Bloodstream Infection Rate

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CC04 - MRSA Bloodstream Infection Rate



Value of 0 = 5/17
 Value > 2 = 5/17



What is the message?

To reduce VAP (and potentially other HCAs) we need to develop a unit culture in which;

- Proven strategies in the literature are implemented successfully
- Behaviour aimed at prevention of HCAI is always of a high standard

Making sure that patients get the care that we intend by implementing changes in practice..... rather than distributing a guideline/policy and assuming it "just gets done".

Thanks to...

- All medical, nursing and technical staff of the ICU but particularly...
- Joanna McCormick (Nurse Consultant CC)
- Conor Campbell (Patient safety Officer)
- Hilda Cruikshanks (Infection Surveillance)
- Paul Caddell (ICU Charge Nurse)
- Noel Breslin (ICU Staff Nurse)
- Ed Smyth (Consultant Microbiologist)
- Patricia Donnelly (Divisional Director)
- Tony Stevens (Medical Director)

