Evaluation of critical care nurses' adherence to the principles of infection prevention and control when providing respiratory care to ventilated ICU patients.

Ciampoli N.[1,2], Bouchoucha S[2].,Currey, J[2], Hutchinson AF.[1,2]

1. Deakin University, Geelong. Centre for Quality and Patient Safety Research-Epworth HealthCare Partnership.
2. Deakin University, Geelong. School of Nursing and Midwifery, Victoria

Background

The prevention of Hospital Acquired Infections (HAIs) such as Ventilator Associated Pneumonia (VAP) and Ventilator Associated Bronchiolitis (VAB) has been identified as a priority area for improvement (Australian Commission on Quality and Safety in Healthcare 2012). Micro-aspiration of oropharyngeal secretions and cross contamination from clinicians' hands and clothing have been identified as two key sources of infection in intubated patients. Prevention of micro-aspiration by oral decontamination, strict maintenance of ETT cuff pressures and strict adherence to IPC may therefore help decrease the rate of VAP and VAB in ICU patients.

Aim

The aim of this study was to explore critical care nurses' knowledge of and adherence to the principles of infection prevention and control when providing care to intubated patients. To address this aim the following outcomes were assessed: (1) Provision of mouth care and preventions of micro-aspiration, (3) Implementation of VAP prevention strategies and, (3) adherence to IPC standards.

Methods

Following ethics approval, a multiple methods research project was undertaken across four major metropolitan ICUs (2 private and 2 public) involving three phases:

(1) surveying critical care nurses to explore their knowledge of respiratory care,
(2) observation of respiratory care delivery in ICU,
(3) chart audit to measure documentation of respiratory care delivery.

Data Analysis: Results were analysed using descriptive statistics, differences between nurses working in public versus private ICUs and between medical versus surgical admissions were compared using chi square tests.

Results

Respiratory care provision of 26 nurses was observed (average duration of 4 hours), 36 chart audits were completed and 45 critical nurses returned the survey.

Mouth care and prevention of micro-aspiration

Staff Survey: The majority of ICU nurses thought that mouth care should be performed at least 2 hourly for all intubated patients (Fig 1). Critical care nurses working in the private versus public ICUs were more likely to report that they would perform two hourly mouth care for patients with oral candida (63% vs 16%), p = .002, or large amounts of oral secretions (37% vs 11%), p = .044.

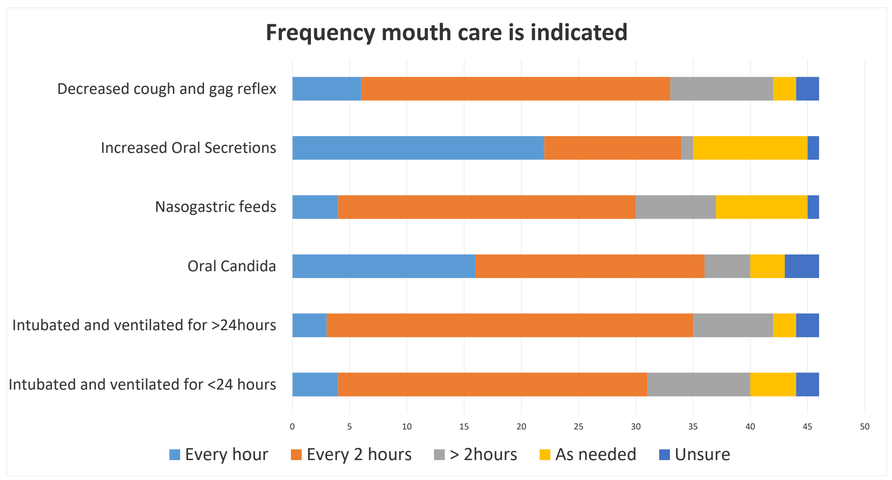

Figure 1 ICU Nurses' opinion on how frequency mouth care should be performed

Observation and Audit: Only 6 (35%) episodes of mouth care for general medical patients were observed. The patient chart audit showed that at least one episode of mouth care in a 24 hour period was documented for 14 (61%) of general medical versus 4 (29%) surgical patients, p = .057. Based on the chart audit the average frequency of mouth care for medical ICU patients was 2.2 (SD 1.3) / 12 hours versus 1.5 /12 hours (SD 0.70) for surgical patients, p > .05.

Endotracheal extubation

Prevention of micro aspiration of upper airway micro-organisms is an important aspect of the extubation procedure. Planned endotracheal extubation was observed for 5 patients. Staff washed their hands prior to the procedure for 2 (40%) of patients. Oropharyngeal suctioning was performed for 4 (80%) of patients prior to ETT extubation and 3 (60%) patients following extubation (Fig. 2).

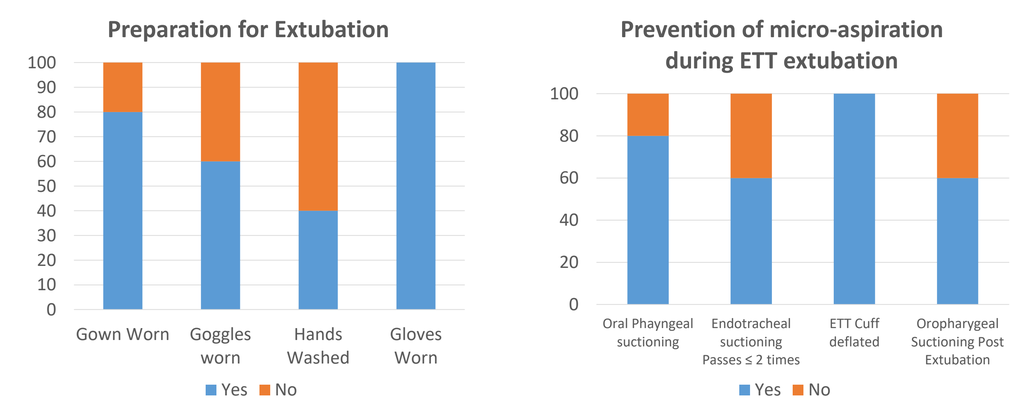

Figure 2 Adherence to IPC and micro-aspiration prevention during ETT extubation

Implementation of VAP prevention strategies

Amongst general ICU patients 89% were positioned with the head of the bed 30 degrees In (67%) of cardiac surgery patients the head of bed was not raised within 30 minutes of return to ICU from theatre (Fig. 3).

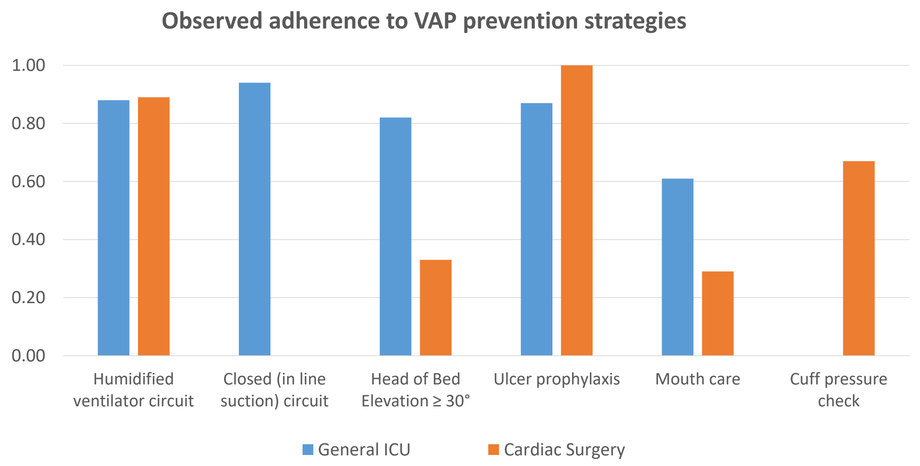

Figure 3 Implementation of VAP prevention strategies

Adherence IPC standards when providing general respiratory care.

Observations revealed:

- 2 nurses (12%) washed their hands once prior to the procedure,
- 15 nurses (90%) donned plastic gloves without prior hand hygiene
- 4 nurses (24%) did not use personal protective equipment such as goggles
- 6 nurses (35%) wore a plastic apron during respiratory care provision.

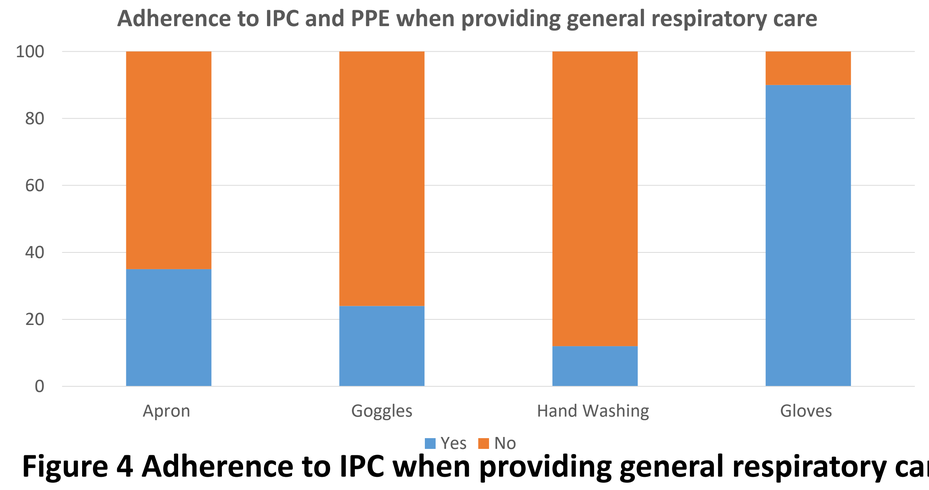

Figure 4 Adherence to IPC when providing general respiratory care

Conclusion

Variability in nurses' adherence to evidence-based practices was found on survey, practice and interview. Gaps were identified in the implementation of strategies such as regular mouth care, cuff pressure checks and oropharyngeal suctioning that prevent micro-aspiration of upper airway secretions and colonisation of the lower airway with new pathogens. Measures to assist staff to improve respiratory care to prevent HAI are required, with acknowledgement of high levels of adherence in specific aspects of care.