

## Respiratory Failure That Develops During Hospitalization: A Comparison of Medical vs. Surgical Medicare Patients

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Respiratory failure (RF) that develops during a hospitalization is associated with a high morbidity and mortality. These events occur in various hospital settings and often, preceding respiratory compromise and acute decompensation are not anticipated. Using CMS administrative claims data we investigated RF that occurred >24 hours after hospital admission and compared patients who had surgical and medical inpatient stays.

**Methods:** 5% Medicare Standard Analytical Files for inpatient admissions to short term acute care hospitals from January 1, 2012 to December 31, 2014 were analyzed by The Moran Company. All inpatient claims had either: an ICD-9 procedure code for ventilation (ICD-9 93.90, 96.7x, 96.04) or an ICD-9 diagnosis code for acute respiratory failure (518.51, 518.52, 518.53, 518.81, 518.82, 518.84, 799.1x). On any day starting with the 2nd inpatient day, patients with  $\geq 1$  physician visit with an ICD-9 diagnosis for respiratory failure (518.81, 518.82, 518.84, 518.51, 518.52, 518.54, 799.1x) or a CPT code for critical care or ventilator management (99291, 99292, 94002, 94003, or 94660) were analyzed. Claims were classified into 2 cohorts; surgical and medical DRGs and these two groups were compared. Data is presented as mean  $\pm$  S.D.

**Results:** We identified 30,548 patients (mean age 72.9 yrs.  $\pm$  12.2; (49.3 % male 50.7% female) who developed respiratory failure >24 hours after hospital admission. 16,653 (54.5%) had a medical inpatient stay and 13,895 patients (45.5%) had a surgical inpatient stay. The mean age of the medical group was 73.2 yrs.  $\pm$  12.8; and for surgical, 72.4 $\pm$  11.6. In-hospital mortality was greater for medical (32.7%) than surgical patients (25.1) (P<0.0001). During the 30 days post discharge period, medical mortality was 15.3%% vs. 9.8%%, surgical.(P<0.0001). Both groups had a high rate of intubation; medical patients had more non-invasive mechanical ventilation (33% vs. 14%) (P<0.001). In the previous year the majority in both groups showed evidence of a prior hospitalization; medical patients were more likely to have been in a skilled nursing facility (26% vs. 16% resp.) (P<0.001)

**Conclusion:** Medicare patients who develop respiratory failure during a hospitalization have high healthcare utilization before the index hospitalization.

Both medical and surgical groups had an unacceptably high hospital and 30 day post-hospital mortality. We suggest that respiratory compromise in hospitalized patients be carefully studied with a focus on early identification and preventive strategies to reduce respiratory failure that develops in the hospital.