Introduction:
The role of hyperoxia during oxygen administration in sepsis mortality remains uncertain and controversial.[1, 2] We hypothesized that the duration of hyperoxia while ventilated in the ICU was associated with increased in-hospital expiration in septic patients.

Methods:
The Medical Information Mart for Intensive Care database (MIMIC-III), containing data for ~60,000 ICU admissions at Beth Israel Deaconess Medical Center from 2001 to 2012, was used to derive a cohort of ventilated sepsis patients.[3] Hyperoxia was defined as arterial oxygen saturation by pulse oximetry (SpO2) >98%. Extracted SpO2 were transformed to estimate time spent hyperoxic. Patients were grouped by hyperoxic duration into bins derived from quartiles of the hyperoxic duration. Group 1 (lowest quartile) was taken as the reference. The association between hyperoxic group and in-hospital mortality was examined by logistic regression.

Results:
Of the 46,476 patients in MIMIC-III, 2,591 met criteria for inclusion. After adjustment for for age, gender, ethnicity, unit type, length of stay, duration of ventilation, disease severity, burden of comorbidity, and the use of vasopressors, hyperoxic group 4 was significantly associated with in-hospital mortality (OR = 2.47, p = 0.004, 95%CI: [1.35, 4.59]), as was group 3 (OR = 1.93, p = 0. 013, 95%CI: [1.16, 3.28]). Group 2 was not associated (OR = .84, p = 0. 564, 95%CI: [0.46, 1.53]). Figure 1 summarises these results.

Conclusion:
Odds of in-hospital death were nearly double and more than double in group 3 and 4 respectively, and we conclude that longer durations of hyperoxia are associated with increased in-hospital mortality in sepsis patients.

References:

Image 1:
Adjusted OR for in-hospital expiration for the hyperoxic groups as compared to group 1 (lowest quartile of hyperoxic duration).