Introduction:
Acute ill patients are prone to critical illness anaemia, a multifactorial condition with potential contribution of iatrogenic anaemia defined as lowered Hb due to large/frequent venepunctions. Decline in Hb is most pronounced in the first 3 days of ICU stay. It correlates with the need for RBC transfusion, but the impact on patient outcome is uncertain. The aim of this study was to determine impact of phlebotomy on change in Hb (ΔHb), and correlation of ΔHb with need for transfusion, presence of central venous catheter (CVC) and patient outcome.

Methods:
Single-center, prospective cohort study enrolling 202 patients during 3 months was performed in a medical ICU at Clinical Hospital Sveti Duh, Zagreb, Croatia. E, Hct and Hb values were obtained on day 1 and 7. Presence of CVC, need for RBC transfusion and outcome were recorded. Primary outcome was overall survival (OS).

Results:
Although no significant association of the ΔHb with OS (OR=0.99; 95% CI 0.97-1.00; p=0.238) was observed, both baseline and day 7 Hb were significantly associated with OS (OR=1.01; 95% CI 1.00-1.02; p=0.049; OR=1.05; 95% CI 1.02-1.08; p<0.001). CVC presence was associated with more pronounced ΔHb (11% compared to 6% without CVC; Mann-Whitney test; p=0.018). Total volume of extracted blood was significant predictor of transfusion need (OR=1.01; 95% CI 1.01-1.01; p<0.001). Hb, E and Htc significantly decreased during 7 days. Median Hb lowered for 11% (p=0.001). Percentage of patients with Hb level below the anaemia threshold increased for 26 percentage points.

Conclusion:
Critical illness anaemia is an unexplained phenomenon. Impact of phlebotomy is hard to unequivocally determine since there are many confounders. The change in Hb levels during ICU stay correlates with the need for transfusion that could cause immunomodulation and potentially adverse outcome. Every effort should be made to maintain adequate Hb levels and lower the risk of iatrogenic anemia.