Introduction:
Up to 40% of surgical oncologic patients receive red blood cells (RBC) to treat anemia. We aim to determine the potential impact of anemia and red blood cells (RBC) transfusion on post-operative complications and mortality in oncologic surgical critically ill patients.

Methods:
Retrospective, single center study. Adults admitted to intensive care unit (ICU) after surgery for cancer with a high risk of bleeding were eligible. Multivariate analyses were performed to determine whether anemia and/or RBC transfusion were associated with post-operative complications and/or in-hospital mortality.

Results:
From January 2017 to December 2018, 287 oncologic patients were admitted to ICU, 49.5% of the patients had anemia based on the World Health Organization (WHO) definition; 69 (24%) had moderate anemia (Hb < 10 g/dL and ≥ 8g/dL) and 32 patients (12.5%) had severe anemia (Hb < 8 g/dL). RBC were given to 19.6% of the patients. Patients exposed to moderate-to-severe anemia had more post-operative complications. Patients who received RBC transfusion had also more post-operative complications including renal failure (0.9% vs. 19.6%; p < 0.001), thromboembolic events (2.2% vs. 8.9%; p = 0.039), and infections (13.5% vs. 41.1%; p < 0.001) compared to non-transfused patients. Multivariate analysis found an independent association between moderate (OR 15.03 [2.73 – 282.3]; p < 0.001) and severe anemia (OR 16.65 [2.71 – 325.7]; p = 0.011) and post-operative complications (Figure A). The association between RBC transfusion and adverse events also remained after adjustment (OR 4.3 [2.2 – 8.8]; p < 0.001) (Figure B).

Conclusion:
In oncologic surgical critically ill patients, there was an independent association between anemia (even moderate anemia) or RBC transfusion and patient outcomes. Our findings highlight the need for further research to determine the optimal transfusion strategy in surgical oncologic patients.
Figures: Multivariate analysis analyzing the risk factors for the primary outcome (severe post-operative complications and/or mortality) including anemia (A) or transfusion (B). (CKD: Chronic Kidney Disease)