

**Inter-rater reliability of the ASA Physical Status score designation between Anaesthesiologists  
and Surgeons and its correlation with patient outcomes**

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**Abstract (297 words)(250 words)**

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**Aim:** The American Society of Anaesthesiologists physical status classification (ASA) score assesses the preoperative health of patients and is used clinically for risk scoring and in healthcare systems for benchmarking purposes. It has shown poor inter-rater reliability (IRR) in studies utilising hypothetical scenarios and there remains a paucity of real-world data on the subject. Our study examines the IRR of the ASA score between surgeons and anaesthesiologists in clinical practice, as well as factors and outcomes associated with discordant scores.

**Methodology:** This retrospective cohort study was conducted in a tertiary academic medical centre on 46284 patients undergoing elective surgery between January 2017 and December 2019. We included patients who were 18 years old and above undergoing elective surgery, excluding cardiac surgery, transplant surgery or surgery for burns injuries. We assessed the IRR of the ASA score between surgeons and anaesthesiologists preoperatively using Cohen's weighted  $\kappa$ . We also examined factors associated with score discordance and analyzed the discriminative power of the two scores for 30-day, 1-year mortality, and ICU admission using logistic regression models.

**Results:** The ASA score showed moderate IRR ( $\kappa$  0.53) between surgeons and anaesthesiologists. 15098 patients (32.6%) had discordant scores, of which 79.4% had a lower ASA score rated by the surgeon. We found significant associations between discordant scores and anaesthesiologist-assessed comorbidities, patient age and race. Patients with discordant scores had a higher chance of 30-day mortality (0.7% vs 0.4%,  $p < 0.0001$ ), 1-year mortality (4.6% vs 3.1%,  $p < 0.0001$ ), and ICU admission >24 hours (2.5% vs 1.5%,  $p < 0.0001$ ). Anaesthesiologist-assigned ASA scores showed higher discriminative power for mortality.

**Conclusions:** There is moderate IRR between surgeons and anaesthesiologists. Anaesthesiologist-assigned scores showed better discriminative power for mortality outcomes. Significant associations between score discordance and adverse patient outcomes suggest the need for improved standardisation of ASA scoring.