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INTRODUCTION

- **Small cell lung cancer (SCLC):** an aggressive subtype characterized by rapid disease progression and substantial treatment-related systemic deterioration^{1,2}.
- **Body composition:** commonly investigated as a prognostic imaging biomarker, yet most prior studies have relied on static measurements and predominantly involved non-small cell lung cancer or mixed cohorts^{3,4}.
- **AIM:** To determine whether longitudinal changes in CT-derived body composition metrics during first-line therapy provide incremental prognostic value beyond baseline measurements and routine clinical factors in patients with SCLC.

CONCLUSION

Among multiple CT-derived body composition metrics, treatment-related change in SMVI emerged as the most informative marker for OS in SCLC, providing incremental prognostic value beyond routine clinical factors.

METHODS

- **Patient enrollment flowchart** (Figure 1).
- **Body composition segmentation and analysis:** automated three-dimensional segmentation based on pre- and post-treatment chest CT images at the T1–T12 level⁵ (Figure 2).
- **Statistical analysis:** Cox proportional hazards models assessed associations with overall survival (OS). Nested models were compared using likelihood ratio tests, and time-dependent area under the curve (AUC) evaluated discrimination.

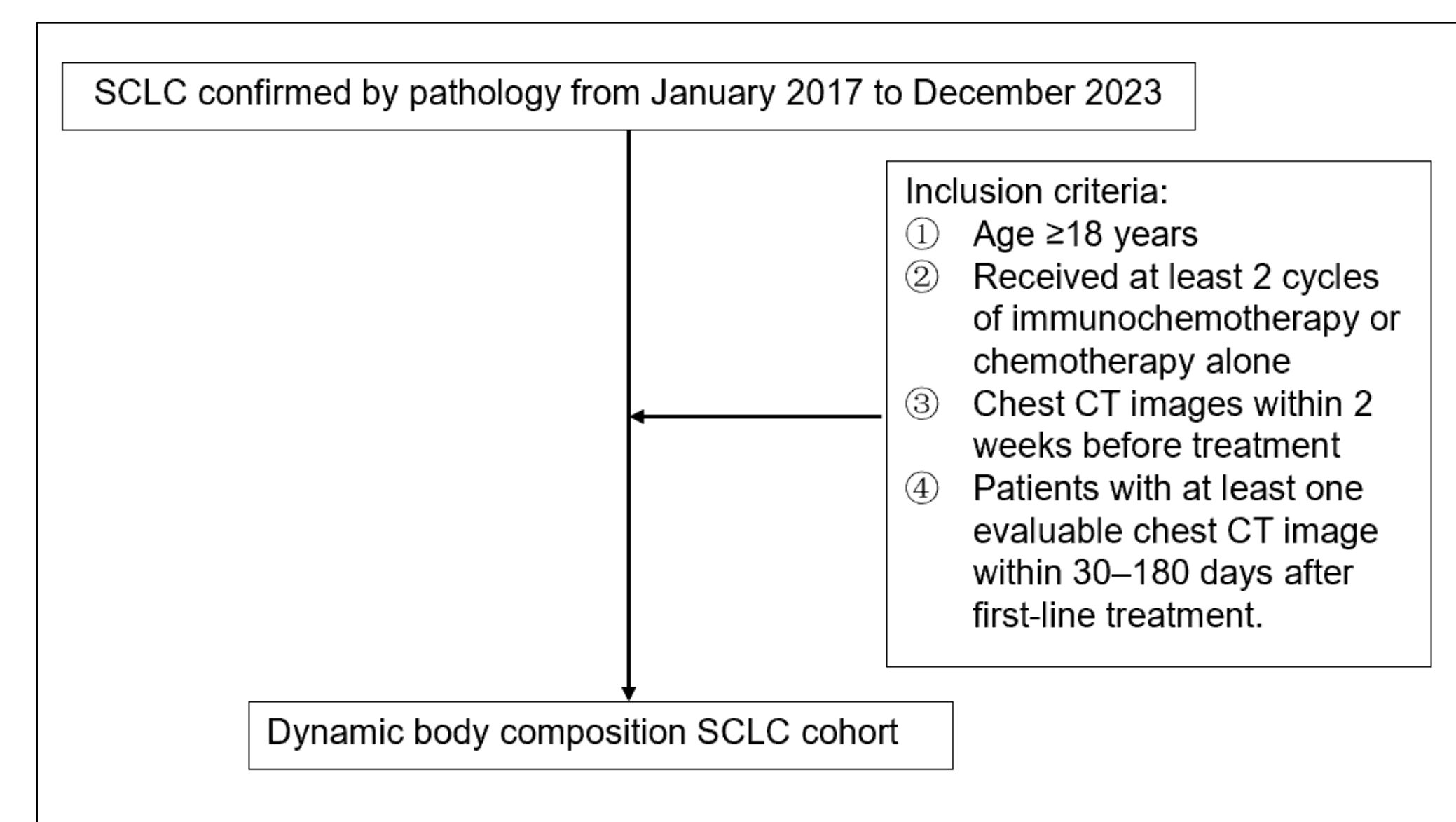


Figure 1: Patient enrollment flowchart

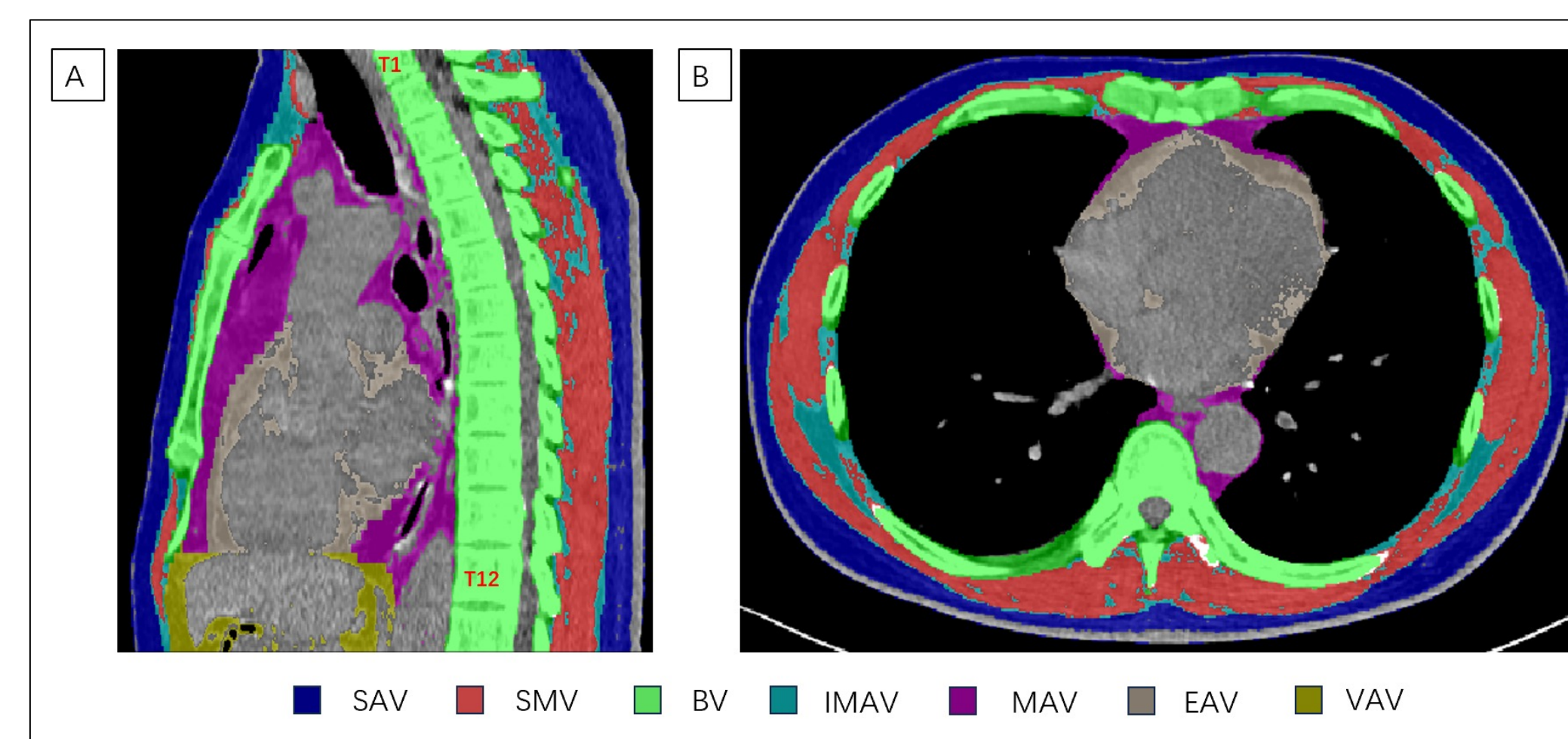


Figure 2: Body Composition Segmentation and Analysis

RESULTS

- **Study population and baseline Characteristics:** 595 patients (544 men; median age, 63 years [IQR, 56-68]). Median OS: 12.17 months (IQR, 8.23-40.80).
- **Univariable predictors of OS:** extensive-stage disease, poorer performance status, SAVI, VAVI, and percentage change in SMVI.
- **Multivariable clinical model:** extensive-stage disease, performance status, and chemoimmunotherapy were independent prognostic factors.
- **Percentage change in SMVI:** After adjustment for clinical variables, percentage change in SMVI remained the only parameter independently associated with OS (hazard ratio per 10% increase, 0.888; $P = .014$) and significantly improved model fit (likelihood ratio test: $\chi^2 = 8.479$, $P = .014$).
- **Time-dependent AUC Improvement:** modest but significant improvement after addition of SMVI change to the clinical model (1-year AUC, 0.692 vs 0.682; 3-year AUC, 0.703 vs 0.692) (Figure 3).

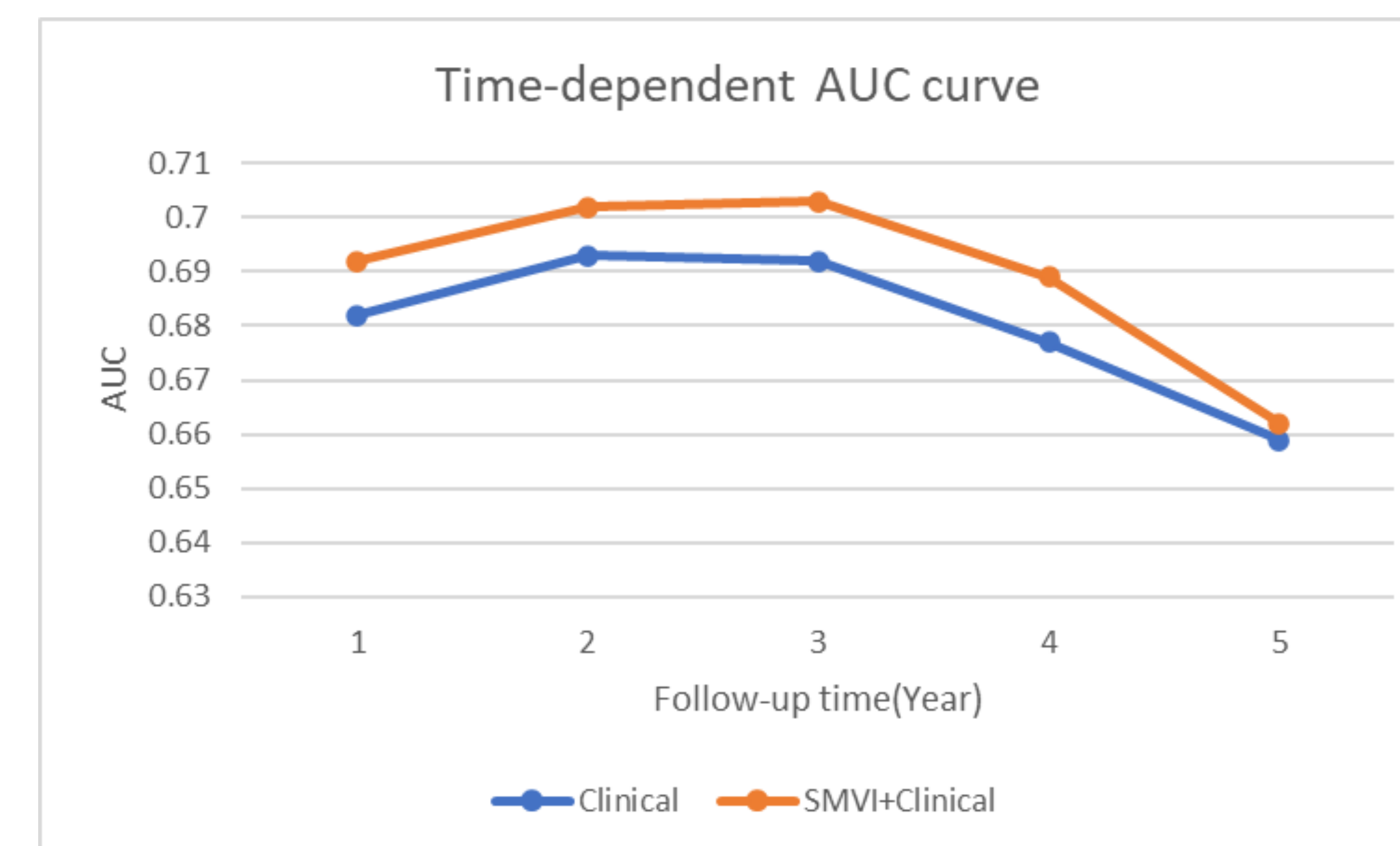


Figure 3: Time-dependent AUC of clinical model and SMVI+clinical model

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