

# Association between GLIM-diagnosed malnutrition and overall survival in cancer patients: insights from a large cohort study using CT-based muscle mass evaluation

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## Abstract

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Despite debilitating consequences, cancer-associated malnutrition often goes under-detected due to the lack of a standardised diagnostic tool <sup>(1)</sup>. The Global Leadership Initiative on Malnutrition (GLIM) criteria was established in 2018 in order to standardise the diagnosis of malnutrition globally <sup>(2)</sup>. The aim of this study was to determine the association between GLIM-diagnosed malnutrition and overall survival in a large cohort of patients with mixed-cancer types. This is the first study to stratify patients according to treatment intent and is one of the largest studies to identify reduced muscle mass using gold-standard CT analysis of body composition.

Patients receiving anti-cancer treatment for solid tumours were enrolled in a cross-sectional study to examine nutritional status between 2011-2016. The GLIM criteria was retrospectively applied. CT images at the third lumbar vertebrae (L3) were used to quantify skeletal muscle index and categorised according to previously published cut-points. Survival analysis was carried out using Kaplan-Meier curves and Cox-Regression.

Of 1405 patients enrolled, 52.5% were male. Mean age was 62 years (SD:12 years). The most common cancer diagnosis was gastrointestinal (44.5%) and 60.3% had metastatic disease. In total, 40.4% of participants were diagnosed with GLIM-malnutrition (14.8% had stage 1 moderate and 25.6% had stage 2 severe malnutrition). Median follow-up time was 102.4 months (95% CI 99.6–105.2 months). Median survival for those without malnutrition was 30.4 months (95% CI 23.5–37.2 months), versus 11.0 months (95% CI 6.6 – 15.4 months  $p<0.001$ ) for those with stage 1 moderate and 10.0 months (95% CI 8.1–11.9 months  $p<0.001$ ) for stage 2 severe malnutrition. Multivariate-analysis (controlling for gender, age, cancer site, GLIM-malnutrition and treatment intent) demonstrated a hazard ratio (HR) of death of 1.499 (95% CI 1.233–1.822,  $p<0.001$ ) for stage 1 moderate and HR 1.548 (1.322–1.800,  $p<0.001$ ) for stage 2 severe-malnutrition. The prevalence of stage 2 severe malnutrition was significantly higher in the palliative cohort (receiving supportive measures) (32.7%) when compared to patients being treated with curative intent (18.2%,  $p=0.004$ ).

This study is one of the largest studies to date which uses CT analysis to accurately identify reduced muscle mass and confirms that the GLIM criteria can be used to predict overall survival in a large mixed-cancer cohort. These findings suggest that malnutrition, regardless of GLIM severity ranking has a significant impact on overall survival. Future research should focus on determining oncology specific cut-points for the GLIM criteria.

## References

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