

# The 31-gene expression profile test identifies patients with AJCC T1a (<0.8 mm) cutaneous melanoma at increased risk of 5-year melanoma-specific mortality

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## Background

- T1a cutaneous melanoma accounts for 75% of newly diagnosed tumors, with high associated survival rates; however, some patients with T1a tumors experience tumor recurrence and die from their disease.<sup>1</sup>
- Improved patient outcomes occur when disease progression is detected when the metastatic tumor burden is low. Thus, it is clinically important to identify high-risk patients within this T1a population so that management can be appropriately escalated (e.g., surveillance imaging, more frequent follow-up).
- The 31-gene expression profile (GEP) stratifies risk of sentinel lymph node positivity, recurrence, metastasis, and death for better risk-aligned management decisions.<sup>2-6</sup>

## Objective

**Assess the proportion of patients with T1a tumors who have a non-Class 1A 31-GEP result (i.e., Class 1B/2A or Class 2B) and the 5-year melanoma-specific mortality associated with each 31-GEP Class.**

## Methods

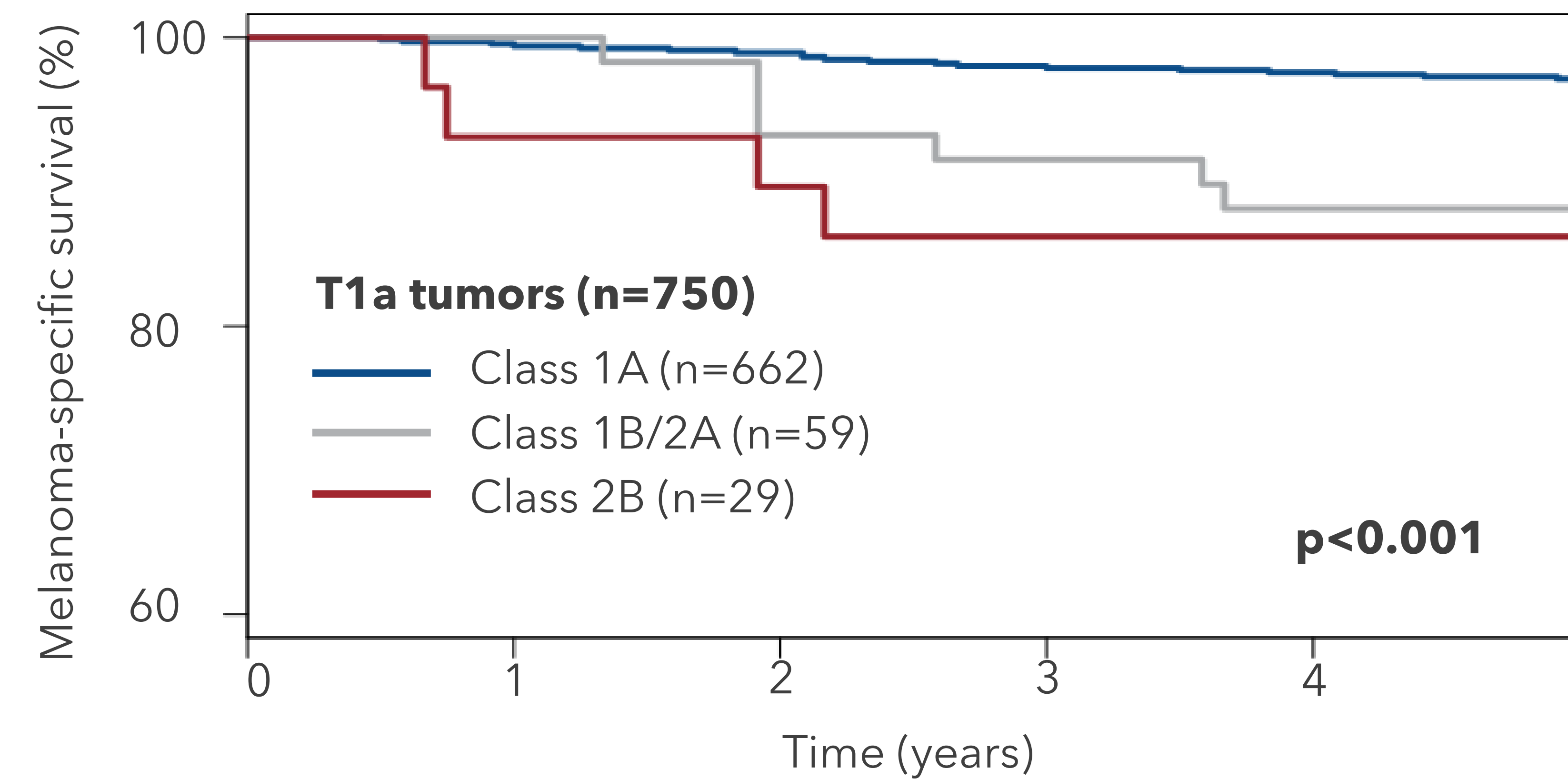
We analyzed patients with T1a tumors clinically tested with the 31-GEP who were diagnosed 2013-2019 and linked to the SEER registry database who had at least 5 years of follow up or died from their disease (n=750). Kaplan-Meier analysis was used to estimate 5-year melanoma-specific survival (MSS) rates, and differences between groups were compared using the log-rank test. Univariate analyses were conducted to identify predictors of melanoma-specific mortality.

**Table 1. Patient Demographics**

Descriptor	Class 1A (n=662)	Class 1B/2A (n=59)	Class 2B (n=29)	Combined (n=750)
<b>Age, median (range)</b>	58 (16-87)	62 (29-85)	67 (29-86)	59 (16-87)
<b>Male</b>	335 (50.6%)	29 (49.2%)	15 (51.7%)	379 (50.5%)
<b>AJCC stage</b>				
Stage IA	651 (98.3%)	54 (91.5%)	27 (93.1%)	732 (97.6%)
Stage III	11 (1.7%)	5 (8.5%)	2 (6.9%)	18 (2.4%)
<b>Mitotic rate</b>	0 (0-8)	0 (0-10)	0.5 (0-10)	0 (0-10)
<b>Location</b>				
Head/neck	102 (15.4%)	11 (18.6%)	6 (20.7%)	119 (15.9%)
Lower extremity	114 (17.2%)	16 (27.1%)	4 (13.8%)	134 (17.9%)
Upper extremity	177 (26.7%)	18 (30.5%)	10 (34.5%)	205 (27.3%)
Trunk	262 (39.6%)	14 (23.7%)	9 (31.0%)	285 (38.0%)
Not specified	7 (1.1%)	0 (0%)	0 (0%)	7 (0.9%)
<b>Melanoma-specific mortality</b>				
Yes	19 (2.9%)	7 (11.9%)	4 (13.8%)	30 (4.0%)
No	643 (97.1%)	52 (88.1%)	25 (86.2%)	720 (96.0%)

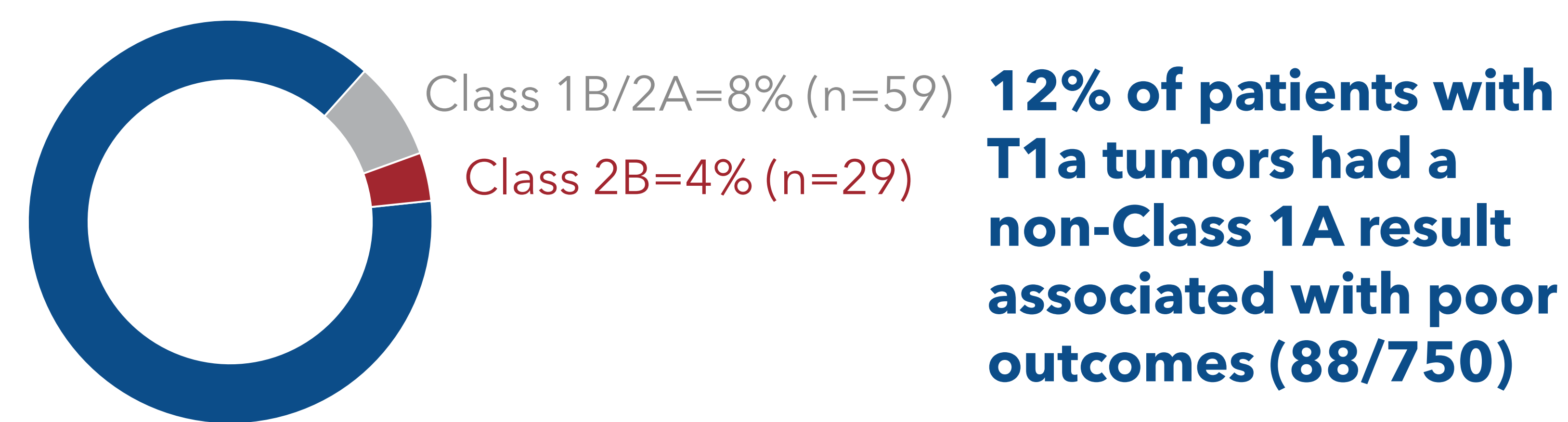
## Results

**Figure 1. The 31-GEP identifies patients with T1a tumors at higher risk of melanoma-specific mortality (Class 1B and higher), similar to survival rates in higher stages**



Group	5-year MSS (95% CI)
<b>Class 1A</b>	97.1% (95.9-98.4%)
<b>Class 1B/2A</b>	88.1% (80.3-96.8%)
<b>Class 2B</b>	86.2% (74.5-99.7%)
All T2b tumors	82.4% (74.2-91.6%)
All stage IIA CM	85.1% (79.3-90.0%)

**Figure 2. A clinically meaningful proportion of patients with T1a tumors have a higher-risk 31-GEP result**



## References

1. Miller KD, et al. CA Cancer J Clin 2022. 2. Durgham RA, et al. Cancers 2024. 3. Podlipnik S, et al. Cancers 2024. 4. Hsueh EC, et al. JCO Precision Oncology 2021. 5. Yamamoto M, et al. Curr Med Res Opin 2023. 6. Bailey CN, et al. JCO Precis Oncol 2023.

**Table 2. The 31-GEP is a significant predictor of melanoma-specific mortality in multivariable analysis**

Group	HR (95% CI)
Class 1A	Reference
Class 1B/2A	2.04 (0.75-5.51)
Class 2B	3.30 (1.12-9.76)
Age	1.10 (1.06-1.14)
Stage IA	Reference
Stage III	12.30 (3.12-48.40)

## Clinical Impact

- Patients with T1a tumors and a 31-GEP Class 1B/2A or Class 2B result are at higher risk of melanoma-specific death and would benefit from increased surveillance management and follow-up to improve outcomes.
- Even among a traditionally low-risk population, the 31-GEP can have a significant impact on understanding a patient's prognosis, helping guide more informed, risk-aligned care.

## Conclusions

- Among CM patients with T1a tumors, a substantial proportion (>10%) have a 31-GEP result that indicates elevated mortality risk.
- Patients with Class 1B/2A or Class 2B results have elevated risk of melanoma-specific mortality similar to rates in higher stages.

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