

INTRODUCTION

¹⁷⁷Lu-DOTATATE peptide receptor radionuclide therapy (PRRT) is approved for treatment of progressive metastatic gastroenteropancreatic (GEP) neuroendocrine tumors (NETs). The NETTER-1 trial demonstrated that ¹⁷⁷Lu-DOTATATE increased progression-free survival compared with octreotide in patients with advanced, progressive, somatostatin-receptor-positive midgut NETs.¹ Here we report our single institution experience with PRRT.

MATERIALS AND METHODS

Demographic characteristics, clinical and laboratory values, and post-treatment outcomes of 195 patients who received ¹⁷⁷Lu-DOTATATE PRRT between 2018 and 2024, were reviewed. RECIST 1.1 and CTCAE version 5.0 guidelines were used to evaluate radiographic response and to grade treatment toxicities respectively.

Age (y)	67 (range, 23-87)
Sex	
Female	99 (51%)
Male	96 (49%)
Race	
White American	154 (79%)
Asian American	10 (5%)
African American	7 (4%)
Other	20 (10%)
Ethnicity	
Caucasian	142 (73%)
Hispanic	26 (13%)
Other	8% (range, 0-99%)
Ki-67 (median)	8%
Grade	
1	60 (31%)
2	101 (52%)
3	18 (9%)
# of PRRT cycles	
1 cycle	13 (7%)
2 cycles	31 (16%)
3 cycles	36 (18%)
4 cycles	115 (59%)
Functional tumor	89 (46%)
Non-Functional tumor	106 (54%)
Prior treatments	
SSAs	168 (86%)
Surgery	117 (60%)
Liver directed therapy	89 (46%)
Everolimus	52 (27%)
EBRT	47 (24%)
Capecitabine/Temozolomide	38 (19%)
Platinum-based chemotherapy	18 (9%)
Sunitinib	7 (3%)
Pembrolizumab	12 (6%)

Table 1: Patient demographics.

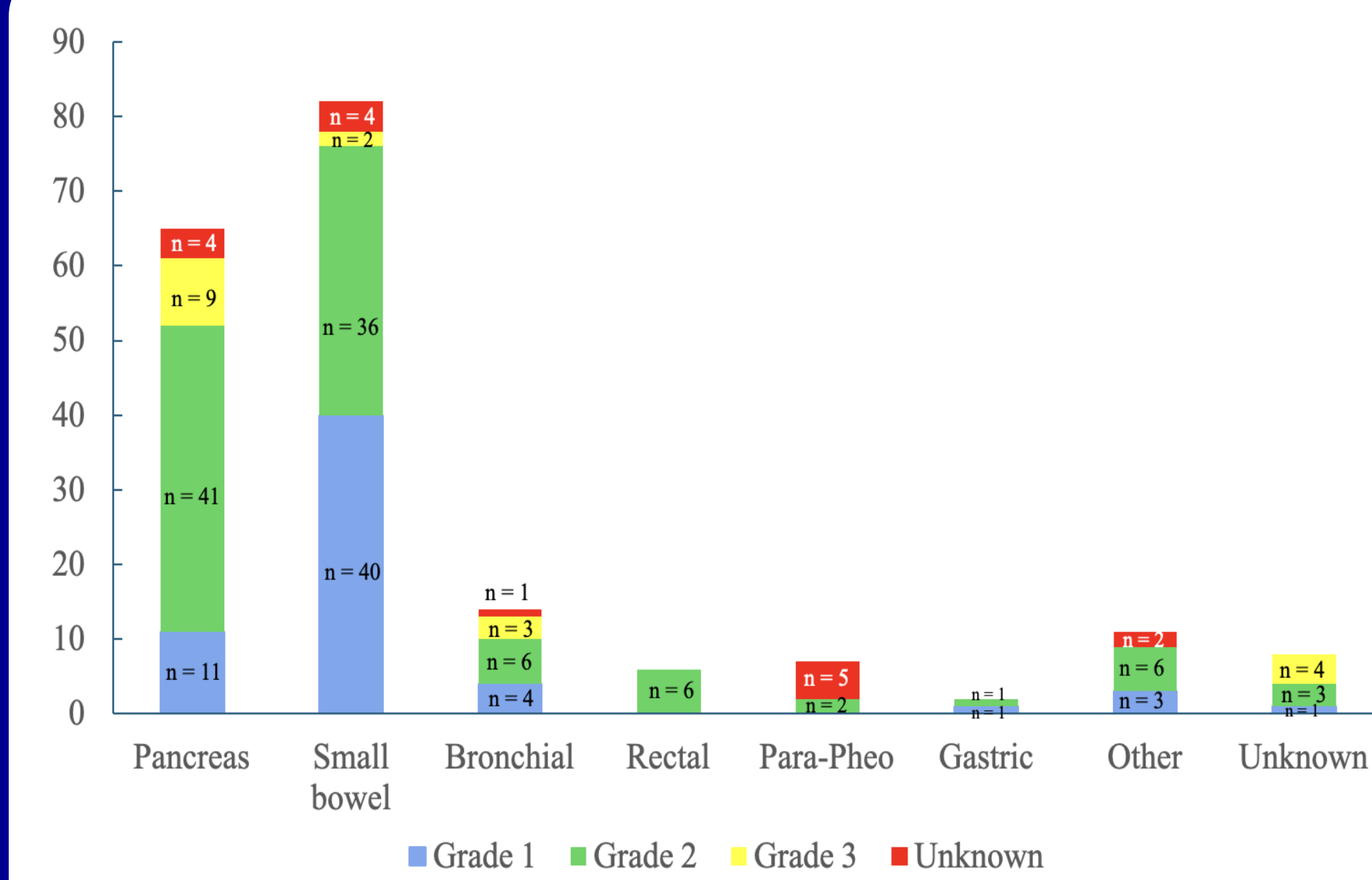


Figure 1: Breakdown of primary site and grading of NETs.

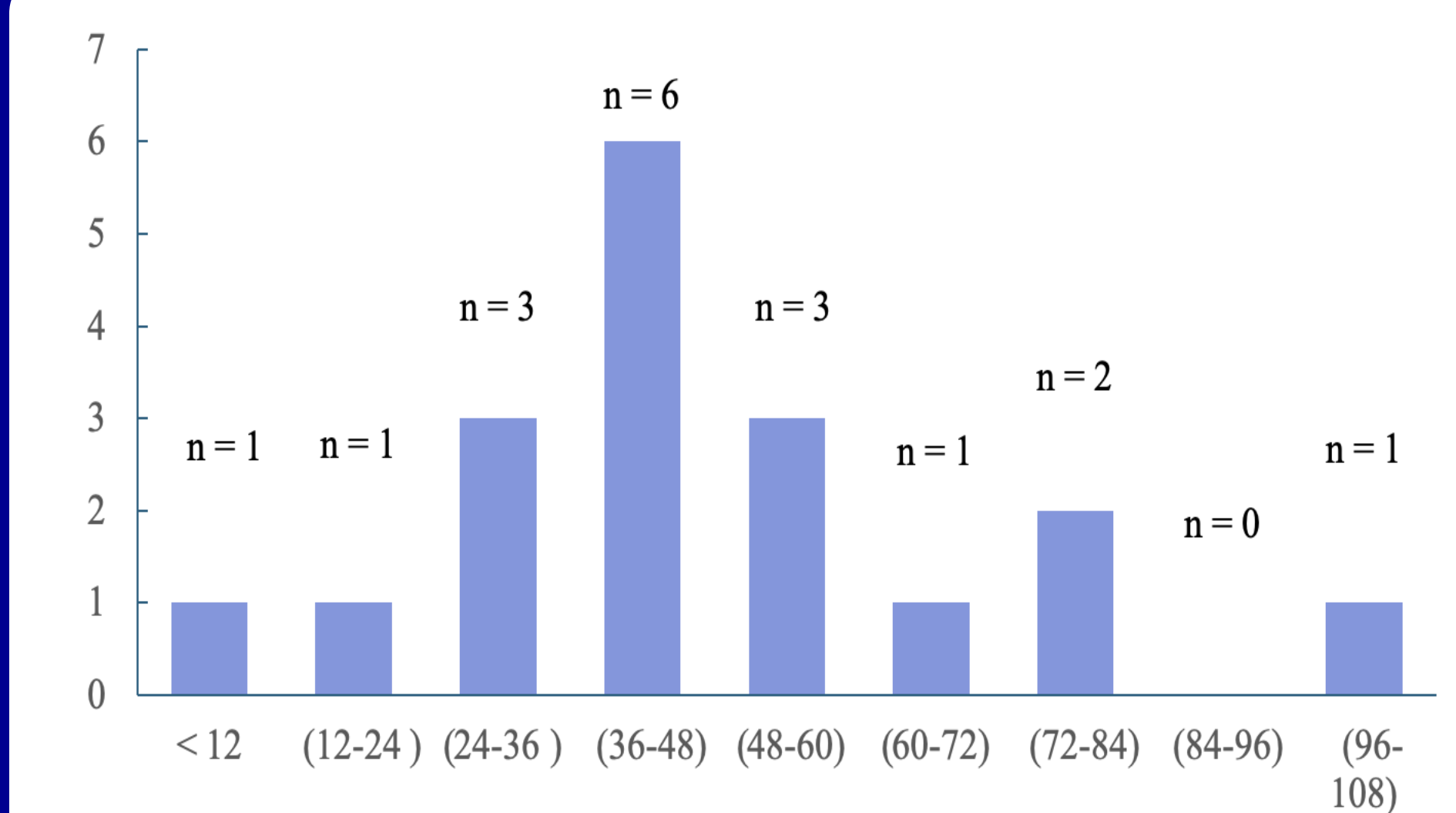


Figure 2: Breakdown of re-PRRT cases by disease control time (time interval in months from the first PRRT cycle to repeat PRRT cycle).

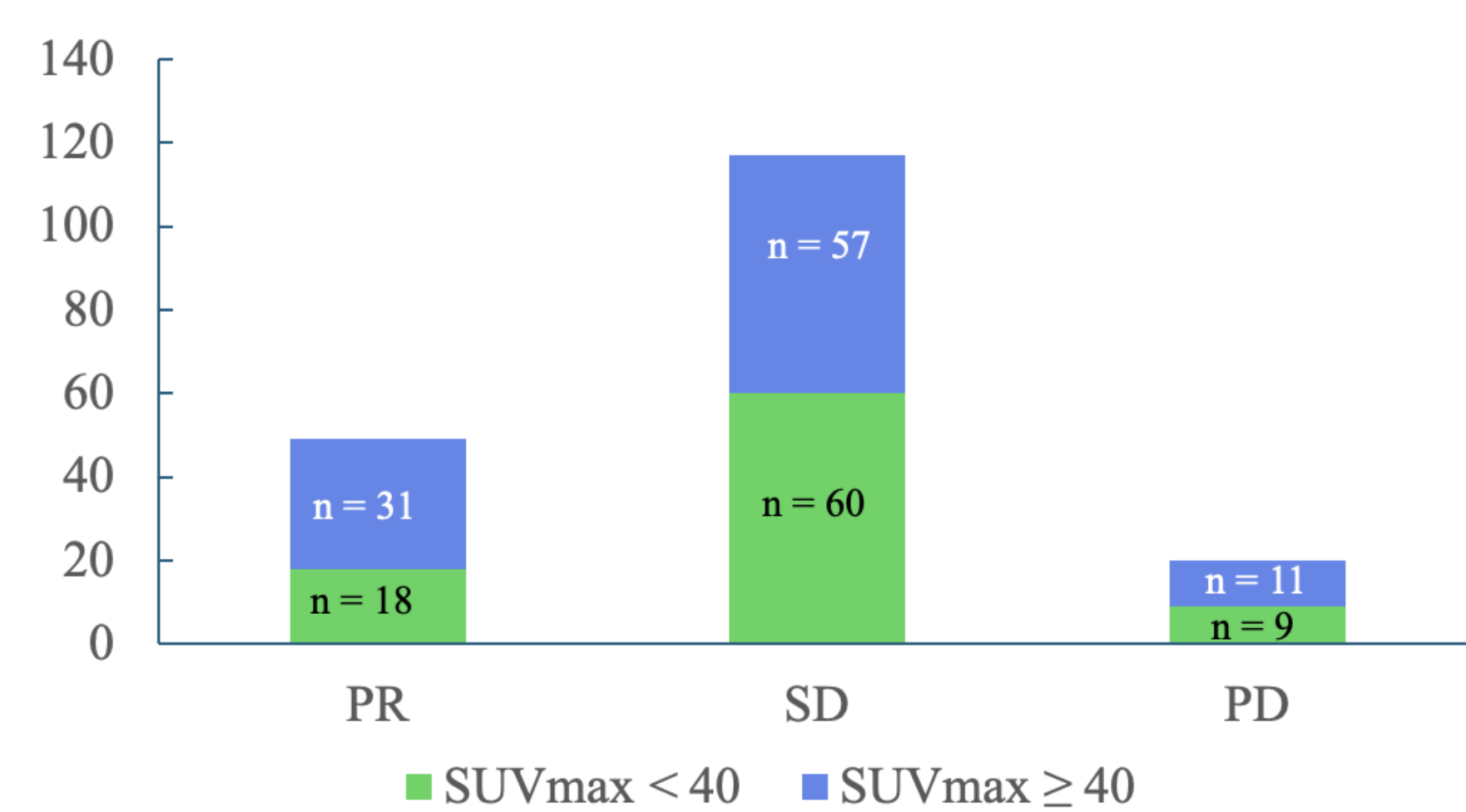


Figure 3: Breakdown of RECIST response by SUVmax.

	Baseline				After PRRT			
	G1	G2	G3	G4	G1	G2	G3	G4
Anemia	110	8	0	0	117	31	10	0
Thrombocytopenia	29	0	0	0	81	16	6	0
Leukopenia	34	3	0	0	74	26	8	0
Kidney disease	10	22	2	0	12	22	8	2
AML	0	0	0	0	0	0	0	2

Table 2: Grading of toxicities based on CTCAE version 5.0.

RESULTS

- Median follow-up was 21 months.
- The median and mean SUVmax of the hottest lesion on DOTATATE-PET was 41.9 and 51.5 (IQR 28.3-60.3).
- The most common side effects were marrow toxicity and kidney disease. Two patients developed AML (Table 2).
 - During treatment, WBC decreased by 29% ± 28%, platelets by 36% ± 27% and Hemoglobin by 11% ± 12% .
 - eGFR fell by an average of 7% ± 28% at any point in time after treatment.
- The best radiographic response rates: 0 (0%) CR, 49 (25%) PR, 117 (60%) SD, 20 (10%) PD, and 9 (5%) no RECIST measurable disease.
 - There was a trend to a higher response (ie PR) in patients with a higher SUVmax, but it was not statistically significant (Figure 3).
- Higher grade tumors and PNETs had a shorter overall PFS and OS (Figure 4).
 - The median PFS for patients ≥ 70 years old was 28 (19-38) months, and for patients < 70 years old was 24 (20-31) months p= 0.459.
 - 142 (72%) patients were kept on SSAs after PRRT. 19 (10%) patients were re-treated.

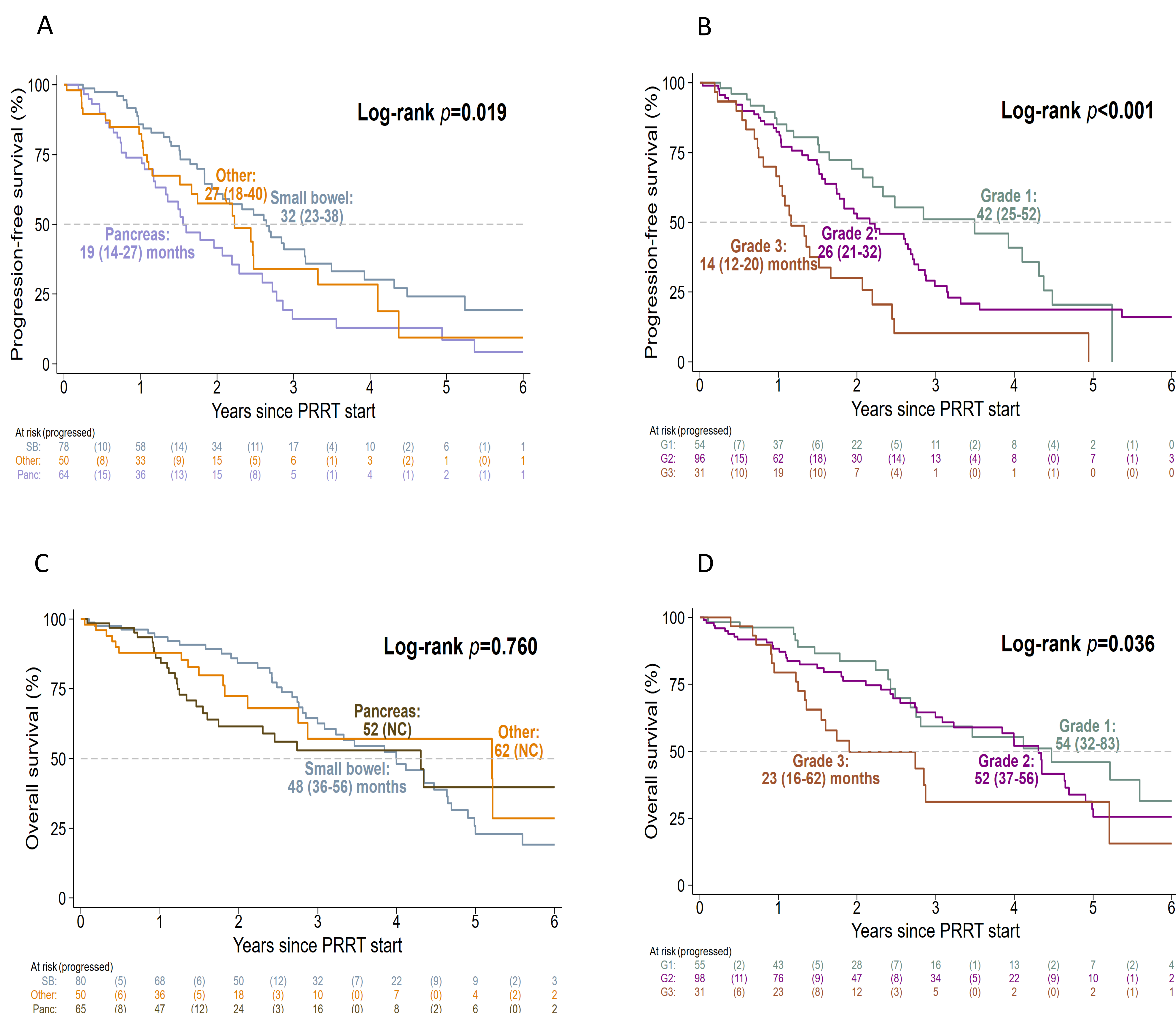


Figure 4: A. PFS by primary tumor. B. PFS by grade. C. OS by primary tumor. D. OS by grade.

CONCLUSION

- Patients with higher-grade disease experienced shorter PFS.
- PNET had shorter PFS compared to SBNET.
- Grade 3 tumors had a shorter OS and PFS compared to Grade 1 and Grade 2 tumors.
- Age did not significantly impact PFS, with older patients having similar PFS to younger patients.
- The most common toxicity was marrow toxicity, and two patients developed acute myeloid leukemia after treatment.

REFERENCES

1. Strosberg J et al. N Eng J Med 2017;376:125-35.

