Purpose Diffuse intrinsic pontine glioma (DIPG) is a brainstem malignancy with a median survival of < 1 year. The International and European Society for Pediatric Oncology DIPG Registries collaborated to compare clinical, radiologic, and histomolecular characteristics between short-term survivors (STSs) and long-term survivors (LTSs). Materials and Methods Data abstracted from registry databases included patients from North America, Australia, Germany, Austria, Switzerland, the Netherlands, Italy, France, the United Kingdom, and Croatia. Results Among 1,130 pediatric and young adults with radiographically confirmed DIPG, 122 (11%) were excluded. Of the 1,008 remaining patients, 101 (10%) were LTSs (survival ≥ 2 years). Median survival time was 11 months (interquartile range, 7.5 to 16 months), and 1-, 2-, 3-, 4-, and 5-year survival rates were 42.3% (95% CI, 38.1% to 44.1%), 9.6% (95% CI, 7.8% to 11.3%), 4.3% (95% CI, 3.2% to 5.8%), 3.2% (95% CI, 2.4% to 4.6%), and 2.2% (95% CI, 1.4% to 3.4%), respectively. LTSs, compared with STSs, more commonly presented at age < 3 or > 10 years (11% v 3% and 33% v 23%, respectively; P < .001) and with longer symptom duration ( P < .001). STSs, compared with LTSs, more commonly presented with cranial nerve palsy (83% v 73%, respectively; P = .008), ring enhancement (38% v 23%, respectively; P = .007), necrosis (42% v 26%, respectively; P = .009), and extrapontine extension (92% v 86%, respectively; P = .04). LTSs more commonly received systemic therapy at diagnosis (88% v 75% for STSs; P = .005). Biopsies and autopsies were performed in 299 patients (30%) and 77 patients (10%), respectively; 181 tumors (48%) were molecularly characterized. LTSs were more likely to harbor a HIST1H3B mutation (odds ratio, 1.28; 95% CI, 1.1 to 1.5; P = .002). Conclusion We report clinical, radiologic, and molecular factors that correlate with survival in children and young adults with DIPG, which are important for risk stratification in future clinical trials.