**Purpose**: Investigate the benefits of intensity modulated arc therapy (IMAT) for pediatric brain tumors over non-coplanar IMRT.

**Method and Materials**: Nine pediatric patients with posterior fossa tumors, mean age 9.6 years (6.1-15.1), were treated with IMRT within the past year at our institution. For this study, each was re-planned with 54Gy to the PTV with five different methods: 8 field non-coplanar IMRT, single coplanar IMAT, double coplanar IMAT, single non-coplanar IMAT, and double non-coplanar IMAT. For each method, the dose to 95% of the PTV was held constant and the dose to surrounding critical structures were minimized. The plans were compared based on conformity index (CI), MUs, and dose to surrounding normal tissue.

**Results**: The body V₅ and brain D₅₀ for IMAT and double IMAT were reduced (p<0.01) compared to NC-IMRT. The body V₅₀ and D₅₀ to the cochlea were increased (p<0.01). For IMAT, the CI and MU were decreased (p=0.01). For NC-IMAT, the V₅ was increased (p=0.01) but the D₅₀ to the right cochlea and both temporal lobes was decreased (p=0.01). For double NC-IMAT, the body V₅₀, D₅₀ to both cochlea and temporal lobes were decreased (p<0.01), however the body V₅ and MU were increased (p<0.01). The CI for the double NC-IMAT was also improved (p=0.05). Four patients had NC-IMRT plans where both cochlea received greater than 25Gy; the average for these patients was 27.9Gy. The average dose was increased for the IMAT (32.7Gy p=0.01) and double IMAT (31.0Gy p=0.05). For the NC-IMAT, the dose decreased to 22.5Gy (p=0.03) and double NC-IMAT was also decreased (20.0Gy p<0.01).

**Conclusion**: Double NC-IMAT can improve treatment for pediatric posterior fossa tumors over non-coplanar IMRT, and this option may be able to provide dose reduction to certain critical structures. This method has merit and should be considered alongside IMRT for these patients.