Intraaxial brainstem surgeries are challenging. Many experience-based “safe entry zones (SEZs)” into brainstem lesions have been proposed in the existing literature. The evidence for each one seems limited. English-language publications were retrieved using PubMed/MEDLINE. Studies that focused only on cadaveric anatomy were also included, but the clinical case number was treated as zero. The clinical evidence level was defined as “case report” when the surgical case number was ≤ 5, “limited evidence” when there were more than 5 but less than 25 cases, and “credible evidence” when a publication presented more than 25 cases. Twenty-five out of 32 publications were included, and 21 different SEZs were found for the brainstem: six SEZs were located in the midbrain, 9 SEZs in the pons, and 6 SEZs in the medulla. Case report evidence was found for 10 SEZs, and limited evidence for 7 SEZs. Four SEZs were determined to be backed by credible evidence. The proposed SEZs came from initial cadaveric anatomy studies, followed by some published clinical experience. Only a few SEZs have elevated clinical evidence. The choice of the right approach into the brainstem remains a challenge in each case [1)].

1)
Yang Y, van Niftrik B, Ma X, Velz J, Wang S, Regli L, Bozinov O. Analysis of safe entry zones into the brainstem. Neurosurg Rev. 2019 Feb 6. doi: 10.1007/s10143-019-01081-9. [Epub ahead of print] PubMed PMID: 30726522.