Purpose:
To evaluate the relative plan quality of single-isocenter vs. multi-isocenter for radiosurgical treatment of multiple brain metastases

Methods:
Ten patients referred to stereotactic radiosurgery treatment for 2-3 lesions in the brain.
Two stereotactic radiosurgery plans were generated for each patient, First Plan using static beams and arcs for multi isocenter treatment plan and a second plan with one isocenter covering all lesions using static beams
All plans were generated using ergo++ software on Elekta synergy-s with beam modulator 16x21 cm with 4mm interdigitating leaves.
Plans were normalized to deliver a prescription dose to the 80% isodose-line

Results:

All plans were judged clinically acceptable, and no significant differences for OAR were observed in the dosimetry parameters. Nevertheless patient with different size of lesions and proximity to OAR had a different prescription dose which lead to much higher dose at the center of the lesion in the single iso plan compare to the multi isocenter plan and still kept very tight dose cover and gradient, in some cases the maximum dose was higher by 20% and average machine on time was 43.6± 9.58% higher, respectively .
Conclusions:
Our initial results suggest that single-isocenter plans can be utilized to deliver conformity equivalent to that of multiple isocenter techniques. Single isocenter radiosurgery for multiple targets can be efficiently delivered, and requiring less than one-half the beam time required for multiple isocenter set ups