# AI assistance improves reader agreement and reading efficiency in intracranial aneurysm detection

**Miwoo Lee[1],** Gucheol Jung[1], Hanna Kim[1]

1 Clinical Research team, DEEPNOID Inc, Korea , Republic of

**PURPOSE :**

AI assistance can improve diagnostic performance for intracranial aneurysm detection on time-of-flight MR angiography (TOF-MRA). However, its effect on inter-reader consistency and reading efficiency across different experience levels remains unclear. This study evaluated the effect of AI assistance on inter-reader agreement, agreement with the reference standard, and reading time.

**METERIALS AND METHOD :**

Six readers independently interpreted 641 TOF-MRA examinations under unassisted and AI-assisted conditions. The reference standard for aneurysm presence and lesion location was established independently from the study readers. Inter-reader agreement for aneurysm presence was assessed with Fleiss' kappa, and agreement with the reference standard was assessed with Cohen's kappa. Changes between conditions were estimated using paired bootstrap 95% confidence intervals, and reading time was compared with paired nonparametric tests. Exploratory analyses by experience group evaluated AI-related decision patterns, including true-positive rescue.

**RESULTS :**

AI assistance increased inter-reader agreement, with Fleiss' kappa improving from 0.358 to 0.792 (delta, 0.434; 95% CI, 0.396–0.472). Agreement with the reference standard improved across most readers, with the largest gain in non-neurovascular experts (mean Cohen's kappa, 0.127 to 0.760), followed by neurovascular trainees (0.696 to 0.819), while board-certified neurovascular experts remained high with minimal change (0.847 to 0.844). Within-group pairwise agreement increased in trainees and non-neurovascular experts. AI assistance also reduced reading time across all experience groups, with median paired percentage reductions of 50%, 40.2%, and 50% in board-certified experts, trainees, and non-neurovascular experts, respectively. The true-positive rescue effect was greatest in non-neurovascular experts (mean, 0.555), compared with trainees (0.264) and board-certified experts (0.151).

**CONCLUSION :**

AI assistance improved inter-reader agreement, increased agreement with the reference standard in most readers, and shortened reading time for intracranial aneurysm detection on TOF-MRA. These effects were most pronounced in readers without neurovascular subspecialty expertise, suggesting that AI assistance may reduce interpretation variability, promote more standardized image interpretation, and support efficient aneurysm detection across readers with different experience levels.