After a stroke, some people develop homonymous hemianopia, which means they lose vision on the same side in both eyes. This can make it harder to notice things on one side, find objects, and move safely in daily life.

In this study, 15 stroke survivors with homonymous hemianopia completed 6 weeks of audiovisual training using virtual reality (VR). The training combined visual targets with sound cues, for 30 minutes a day, 5 days a week. We measured performance before and after training, and we also took brain scans to see whether the training was linked to changes in brain structure and brain communication.

After training, participants responded faster on reaction-time tasks. Brain scans suggested changes in areas and pathways that were not directly damaged by the stroke. Using diffusion tensor imaging (DTI), a type of MRI scan that provides information about the structure of white matter, we found patterns consistent with improved organisation of some surviving pathways, particularly in visual regions and deeper relay areas. We also examined functional connectivity (FC), which describes how strongly different brain regions work together over time. The results showed stronger communication between visual brain areas and regions involved in processing sound and visual information.

Overall, the findings suggest that immersive audiovisual VR training may help stroke survivors with visual field loss by improving speed of responses and engaging remaining brain networks. Further research is needed to confirm how these brain changes relate to everyday improvements and to test the approach in larger groups.