

K. Van Meensel (2) , S. Vandamme CNS (1,2) , D. Vanhauwaert MD, PhD (2,3) , W. Maenhoudt MD (2) , J. Van Lerbeirghe MD (1,2) , S. Du Four MD, PhD (2,3) , O. Van Damme MD (1,2)

(1) Movement Disorders Team, AZ Delta, Roeselare-Menen-Torhout, Belgium
(2) Department of neurosurgery, AZ Delta, Roeselare-Menen-Torhout, Belgium
(3) Academic consultant, Department of Human Structure and Repair, Ghent University

Introduction

Programming deep brain stimulation (DBS) systems remains a complex and time-consuming process that relies on iterative parameter adjustments to optimize clinical benefit. Advanced visualization and algorithm-assisted programming tools may improve efficiency and consistency of stimulation delivery. Illumina 3D™ (I3D, Boston Scientific, MA, USA) is a three-dimensional neuromodulation programming software designed to facilitate precise targeting of stimulation fields.

Material & methods

11 Patients (7 STN, 2 Gpi and 2 Vim-Czi) implanted with DBS systems for movement disorders underwent post-implant programming using I3D, which integrates three-dimensional lead visualization with algorithm-based stimulation field modelling. Clinical outcomes and stimulation settings were evaluated at baseline programming and during scheduled follow-up visits over a 6-month period.

Results

I3D guided programming was successfully completed in all patients. Programming sessions were completed efficiently, with reduced time compared to conventional programming workflows. No serious adverse events related to the software or stimulation parameters were observed. Stimulation configurations remained stable over the 6-month follow-up period. Clinical benefit was maintained throughout follow-up without evidence of loss of efficacy or delayed stimulation-related side effects.

Conclusion

DBS programming using I3D is safe, efficient and associated with stable stimulation parameters and sustained clinical outcomes over 6 months. Three-dimensional visualization and algorithm-assisted targeting may streamline DBS programming and support consistent therapeutic delivery.

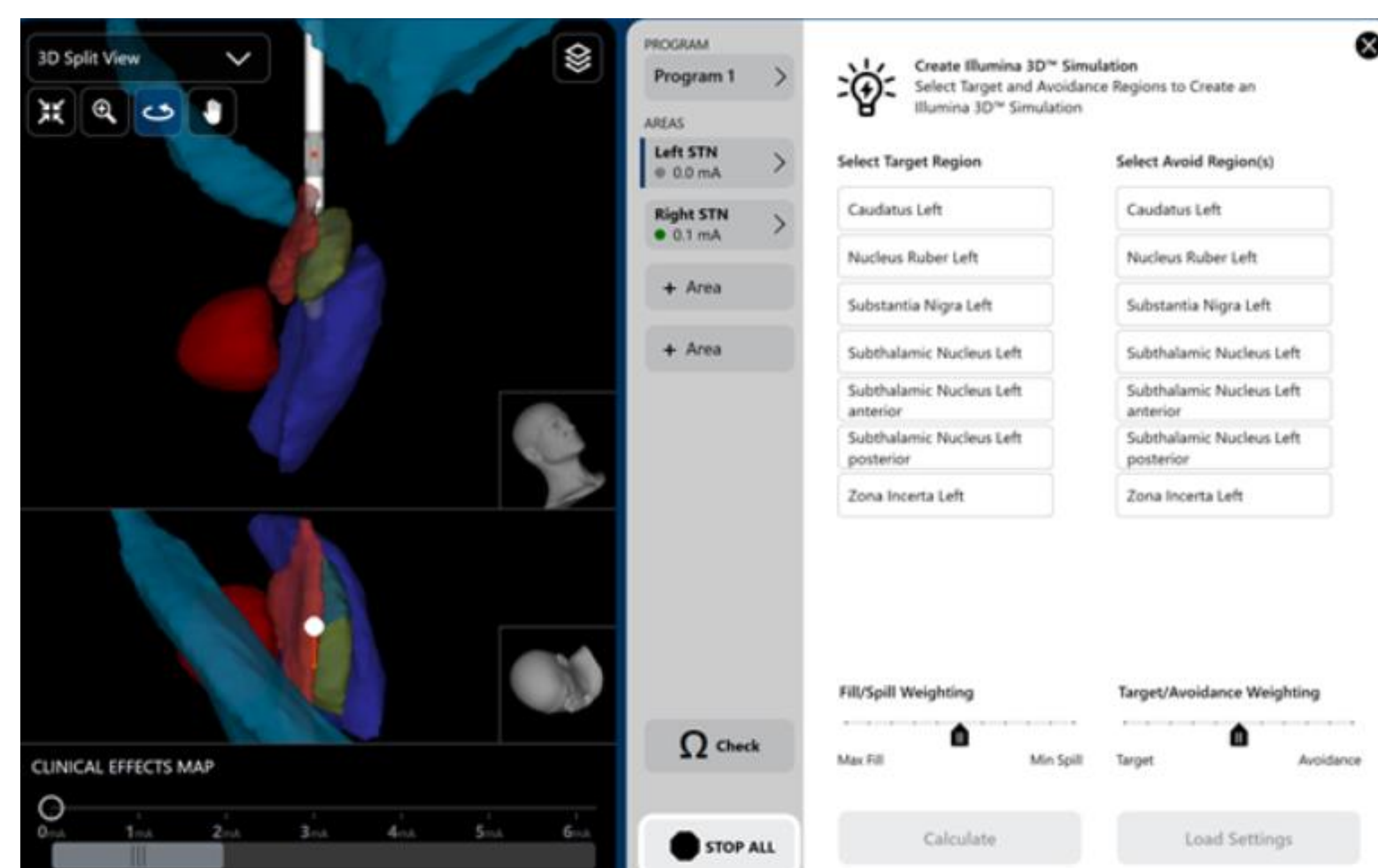


Figure 1 – Interface of Illumina 3D for selecting patient-specific target region(s) and avoidance region(s)

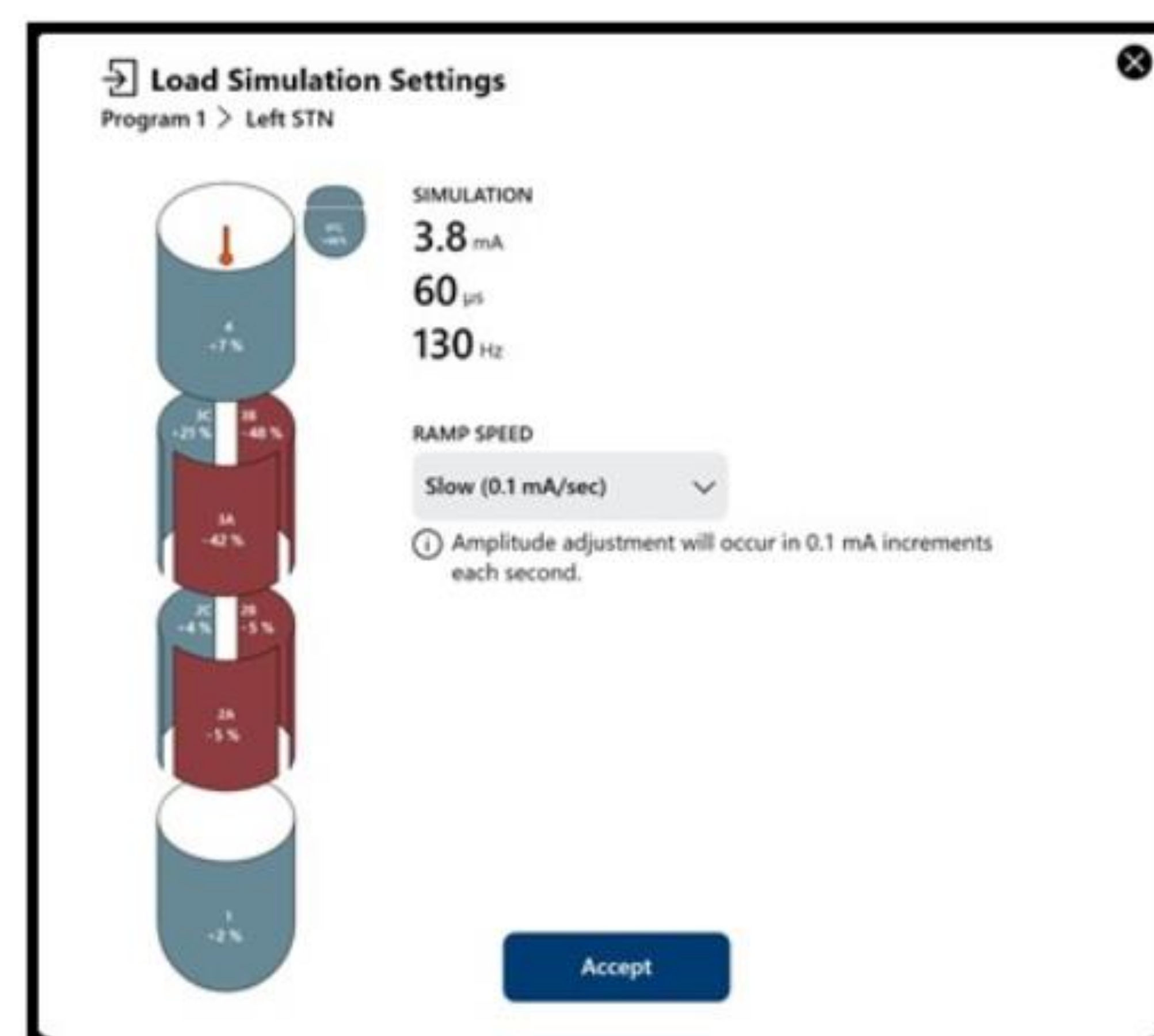


Figure 2 – A patient-specific stimulation plan generated by Illumina 3D

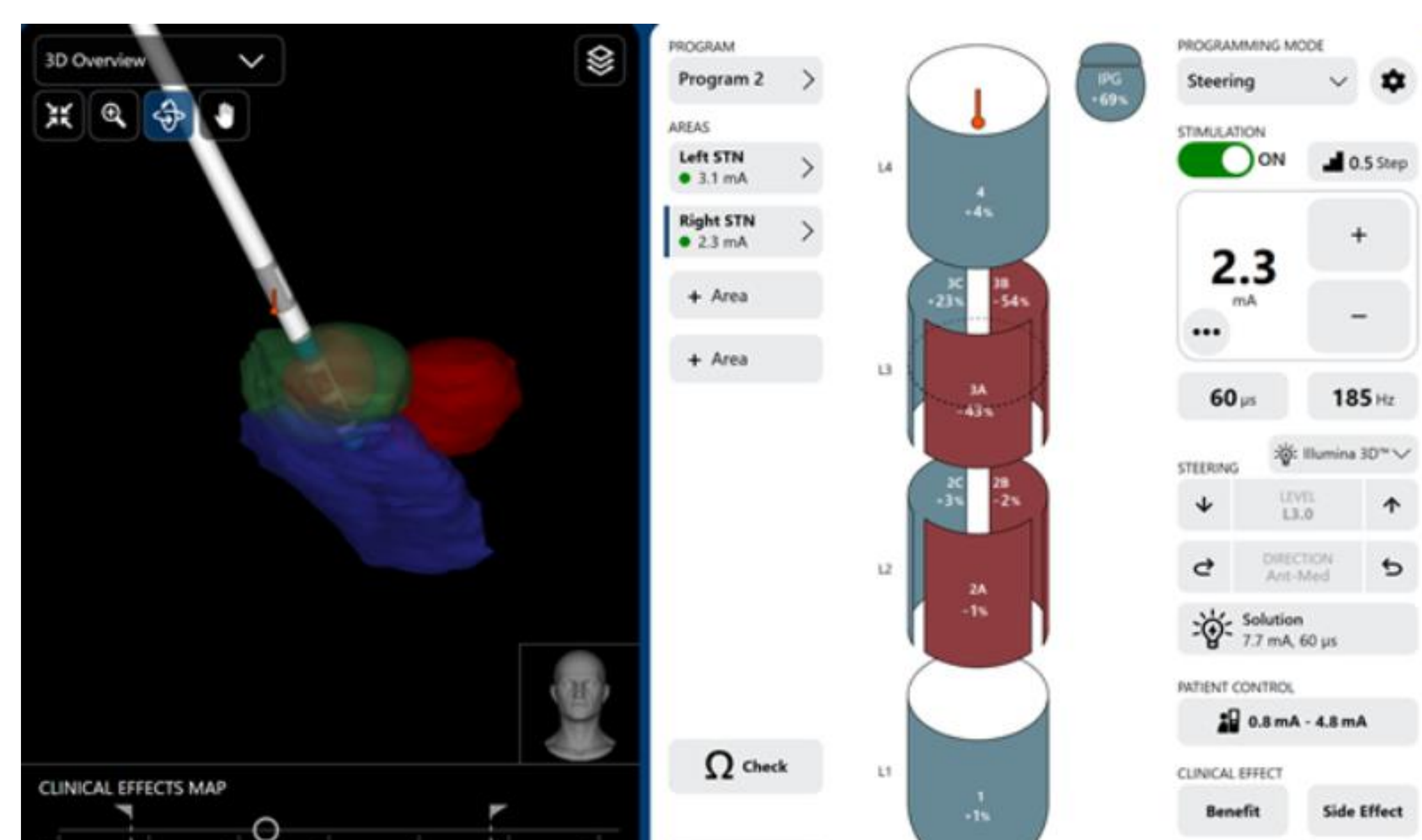


Figure 3 – Interface for making adjustments to the stimulation plan generated by Illumina 3D