

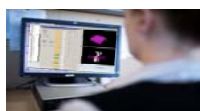


Automated IMRT Treatment Planning using Expedited Constrained Hierarchical Optimization (ECHO): Retrospective Study and Clinical Implementation

Masoud Zarepisheh, Linda Hong, Ying Zhou, Jung Hun Oh, James G. Mechalakos, Margie A. Hunt, Gig S. Mageras, and Joseph O. Deasy
Memorial Sloan Kettering Cancer Center, NY



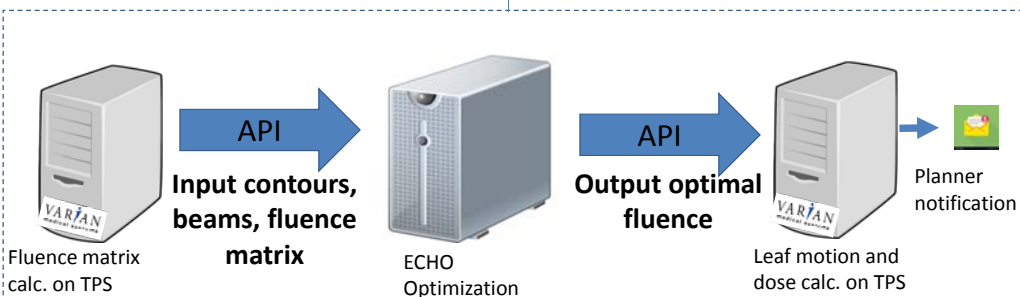
CLINICAL WORKFLOW



Planner runs ECHO plug-in From TPS

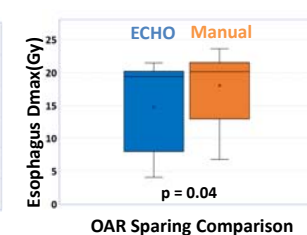
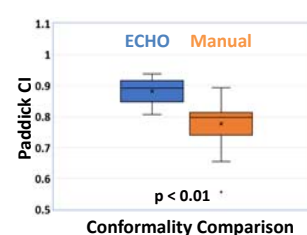
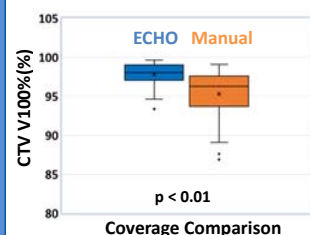
MSKCC ECHO

Planner evaluates the plan



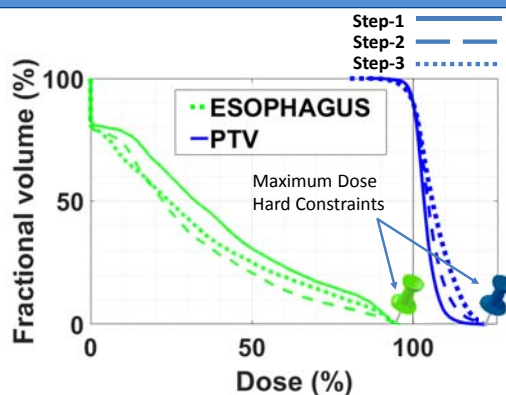
RETROSPECTIVE STUDY: ECHO V.S. MANUAL

❖ 76 PARASPINAL SBRT CASES



MSKCC ECHO OPTIMIZATION

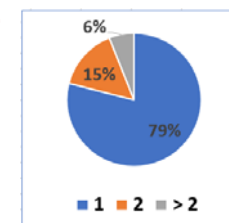
- ❖ **Step-1:** Maximize PTV coverage, while respecting all maximum/mean dose hard constraints
- ❖ **Step-2:** Minimize OAR dose, while relaxing Step-1 results
- ❖ **Step-3:** Maximize fluence smoothness, while relaxing Step-1 and 2 results



CLINICAL IMPLEMENTATION

- ❖ APRIL(2017)-JUNE (2018)
- ❖ OVER 500 SBRT CASES TREATED
- ❖ ALL PLANS MET CLINICAL CRITERIA

Number of Runs to produce accepted Plan



Total Time to Create ECHO Plan

