

# Full Automation of Head-And-Neck Contouring, VMAT Planning, and Independent Plan Checks

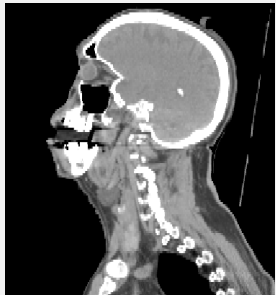
Presenting Author: Rachel McCarroll Session Title: Knowledge-based Treatment Planning Date and Time: Wednesday 8/1, 10:15AM — 12:15PM

**Challenge:** ~60,000 radiation therapy staff needed in low- and middle-income countries by 2020

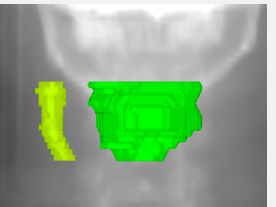
**Proposed Solution:** Automate the treatment planning process for head-and-neck

## Required Information

1. Patient Information
2. Patient CT Scan



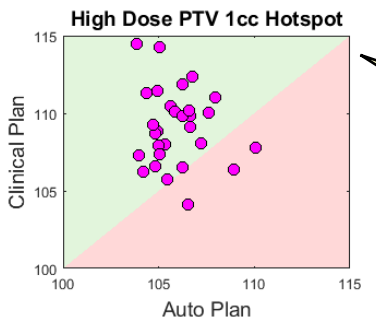
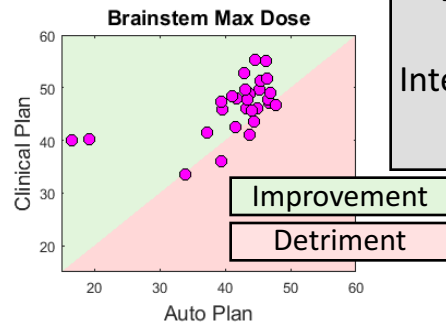
3. Manually delineated Primary and Nodal GTVs



**Preliminary Steps**  
 Marked Isocenter Detection  
 Treatment Isocenter Selection  
 CT Pre-processing

Planning on unedited autocontoured OARs has little significant dosimetric impact!

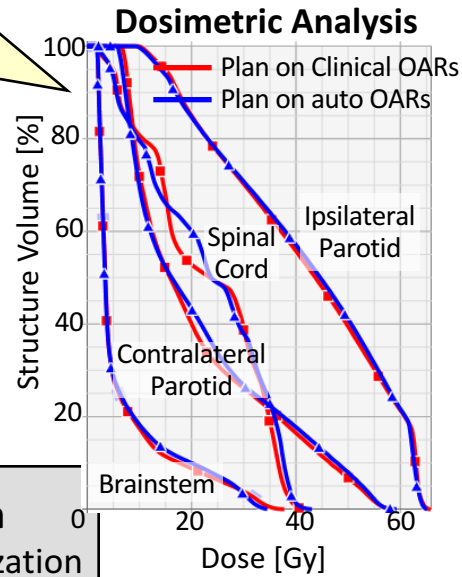
**Automatic Contouring**  
 Normal Tissues  
 Intermediate/Low-Dose Targets  
 Planning Structures



**Plan Optimization**  
 Knowledge Based Optimization  
 Dose Calculation  
 Plan Normalization

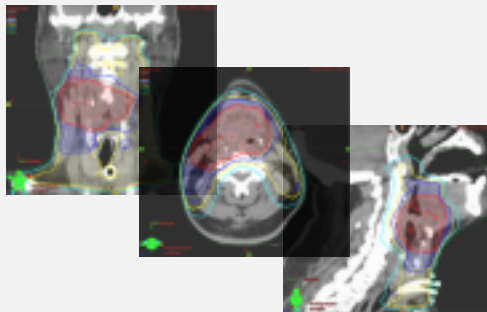
Autoplans outperform plans from RTOG 0522!

**Plan Finalization**  
 Plan Documentation  
 Automated Plan Checks



## Autoplan Output

1. Treatment Plan



2. Plan Document

Plan Name	Plan ID	Plan Type	Plan Date	Plan Time	Plan User
Plan 1	1000001	VMAT	2018-08-01	10:15	RM
Plan 2	1000002	VMAT	2018-08-01	10:15	RM
Plan 3	1000003	VMAT	2018-08-01	10:15	RM

Check	Status	Description	CFail	CFail
Automatic Isocenter Check	Pass	Isocenter Location Check	Pass	CFail
Automatic Treatment Check	Pass	Isocenter Beam Name Check	Pass	CFail
PTV Dose Check	Pass	Isocenter Dose Rate Check	Pass	CFail
OAR Dose Check	Pass	Isocenter Dose Fraction Check	Pass	CFail