

AI Automatic Contouring – Clinically Proven to Save Time

Challenge

Radiation Oncology (RO) departments struggle to maintain profit margins due to recent changes in treatment code reimbursement models, budget constraints and staffing shortages. Organ at risk (OAR) contouring is a mandatory and resource intensive task. Inconsistent quality of Atlas-Based Automatic Segmentation (ABAS) solutions have prevented wide-spread adoption and OAR contouring remains a manual task in many clinics.

Solution

Machine Learning (ML)-based Artificial Intelligence (AI) technology is revolutionizing automatic contouring, providing a reliable solution with proven quality. Whereas ABAS relies on the accuracy of a set of tens of reference images in an atlas, AI autocontouring leverages the power of thousands of datasets used for training.

Clinical validation is critical to any evaluation of any AI autocontouring solution

Geometric analysis – Quantitative measurements of congruence to reference contours. Eg. Mean Distance-to-Agreement (MDA), Dice Similarity Coefficient (DSC) and Hausdorff Distance (HD).

User evaluation – Qualitative assessment of amount of edits required.

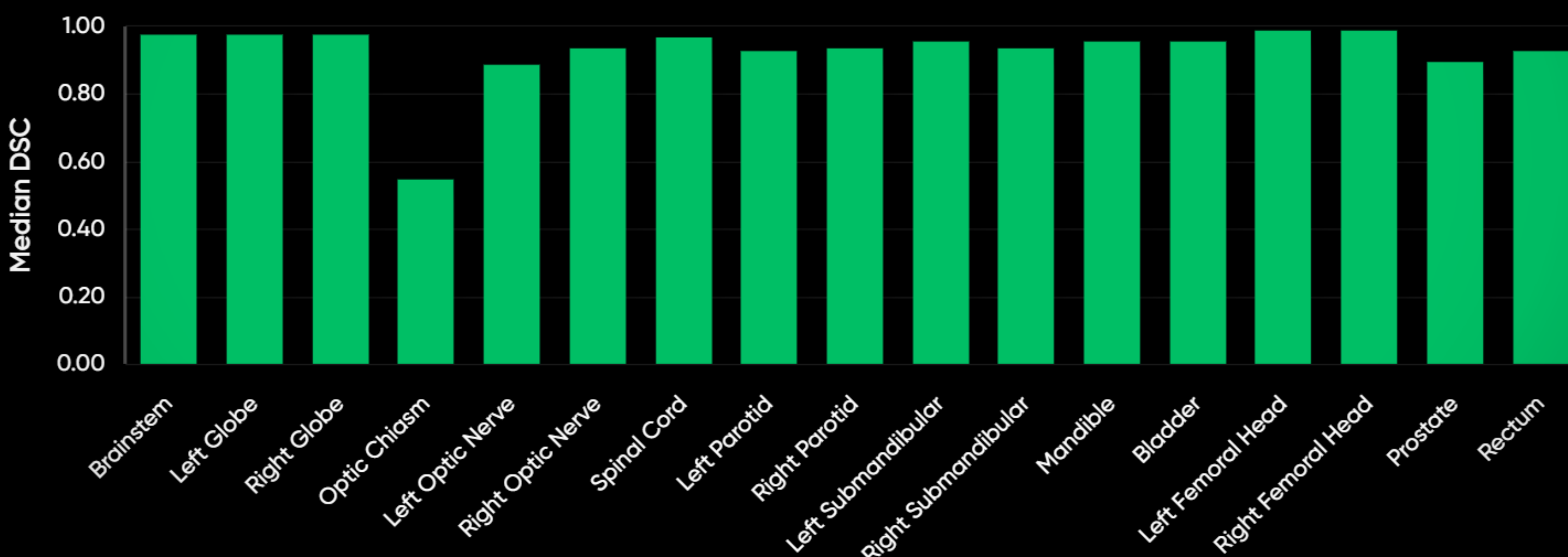
Time Savings – Primary value of autocontouring. Dependent on contour quality, processing speed and level of automation.

Implementation – Ease and speed of implementation, hardware requirements, security, impact to workflow.

Evidence

Accuracy – Multiple studies have found >0.90 dice similarity coefficient (DSC) and sub 2mm Hausdorff Distance scores.* OAR and lymph node contour quality found to be at the level of interobserver variability.

**Structure dependent*



Wong et al. (2021)

User evaluation – Expert users find the majority of structures across different tumor sites require minimal to no editing prior to approval.

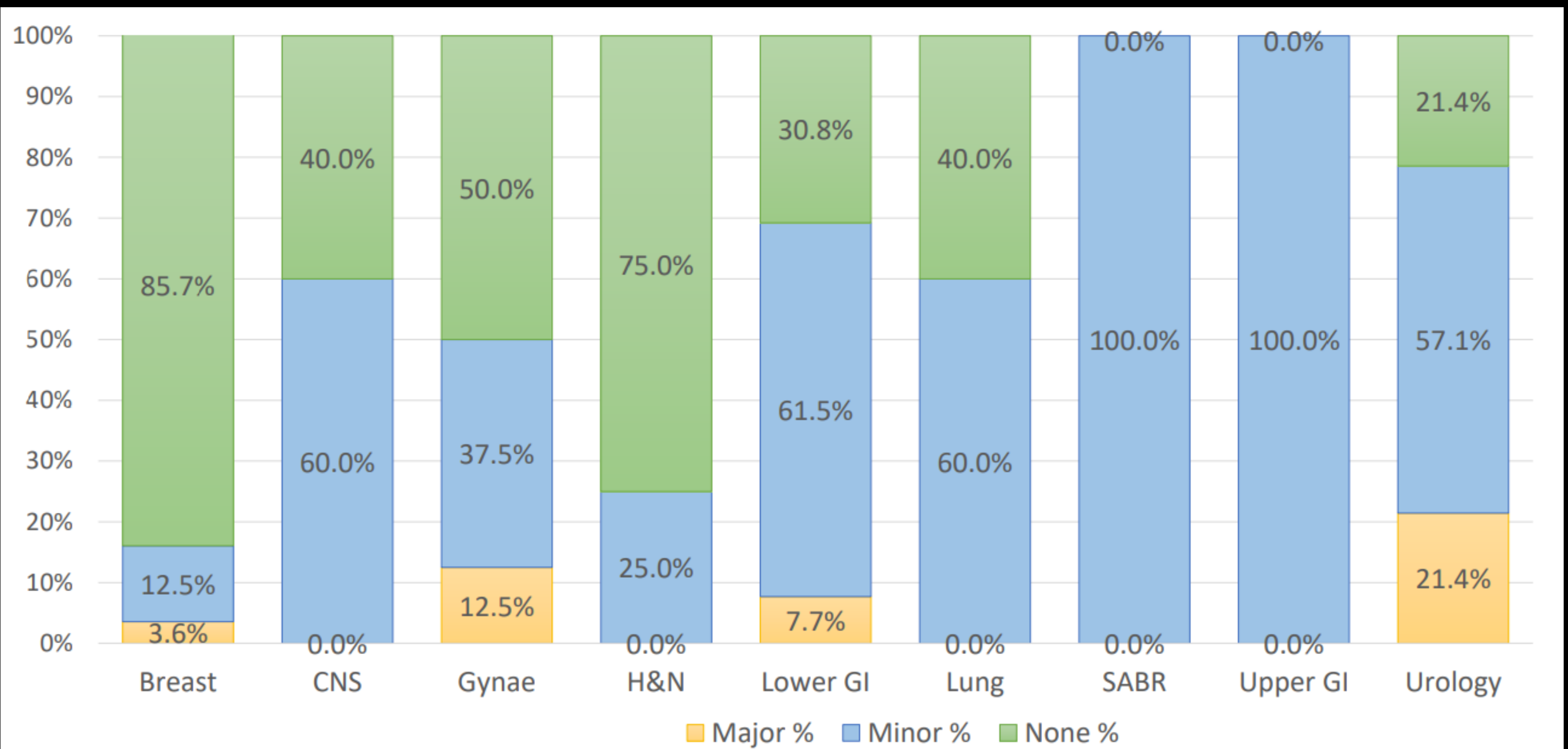


Figure 4. Auto-segmented OaR reviewed by site

Coughlan et al. (2022)

Real-World Impact

“Limbus has **reduced the time** spent contouring by our dosimetrists and physicians **by 75% and 55%** respectively. We are subsequently **starting our IMRT and SBRT patients days earlier** than planned while providing dosimetry more time to focus on planning and optimizing. The ease of use, speed and accuracy has made Limbus AI the most **indispensable software** tool in our clinic.”

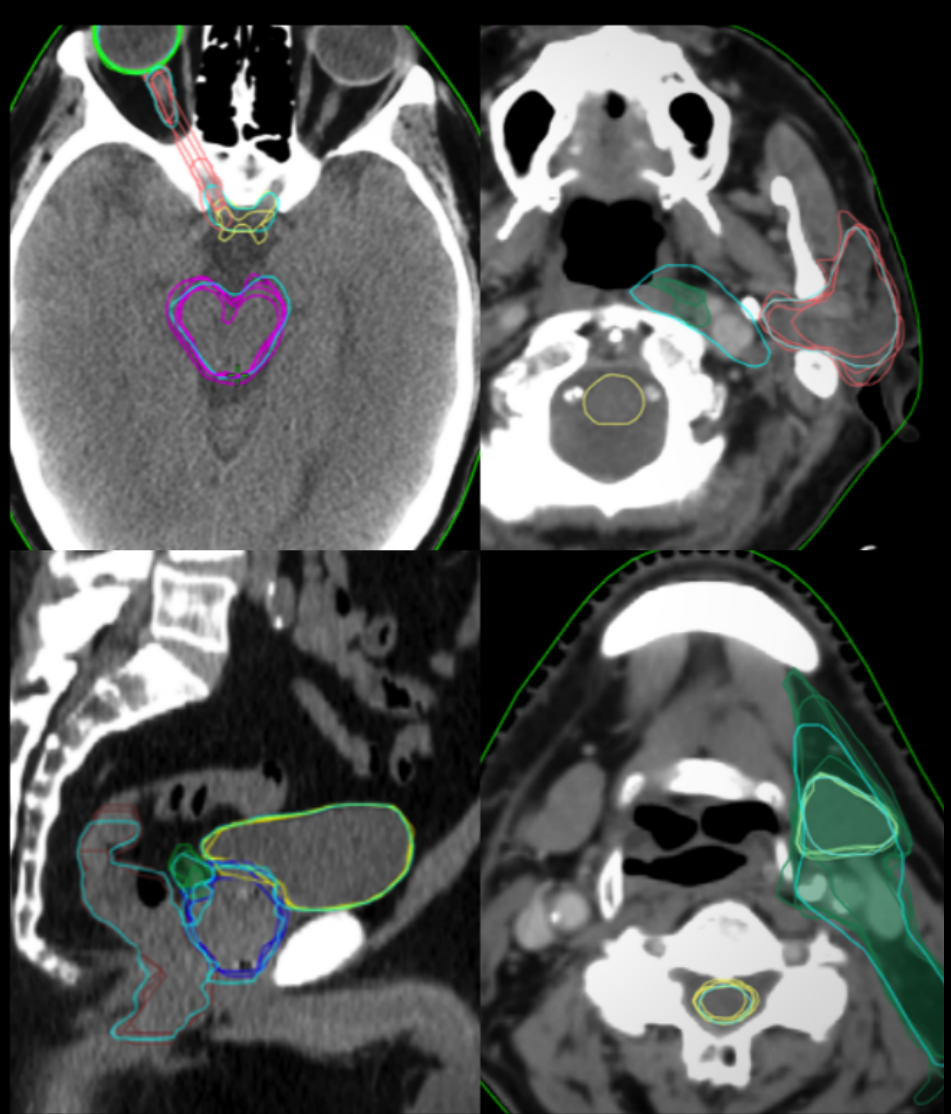
Joe Dise – Landauer Medical Physics, Missouri Baptist

“It takes the Limbus Contour application <3 minutes to auto-segment using the most complex template (...), compared to ~1.5 hours of clinician time required for manual outlining. (...) this is based on the processing power of a standard office desktop PC – **no special servers or GPU is required**. For the 125 patients in this study, we estimate this equates to a total saving of ~200 hours of consultant time.”

Simon Coughlan, NHS UK – Royal Devon Exeter

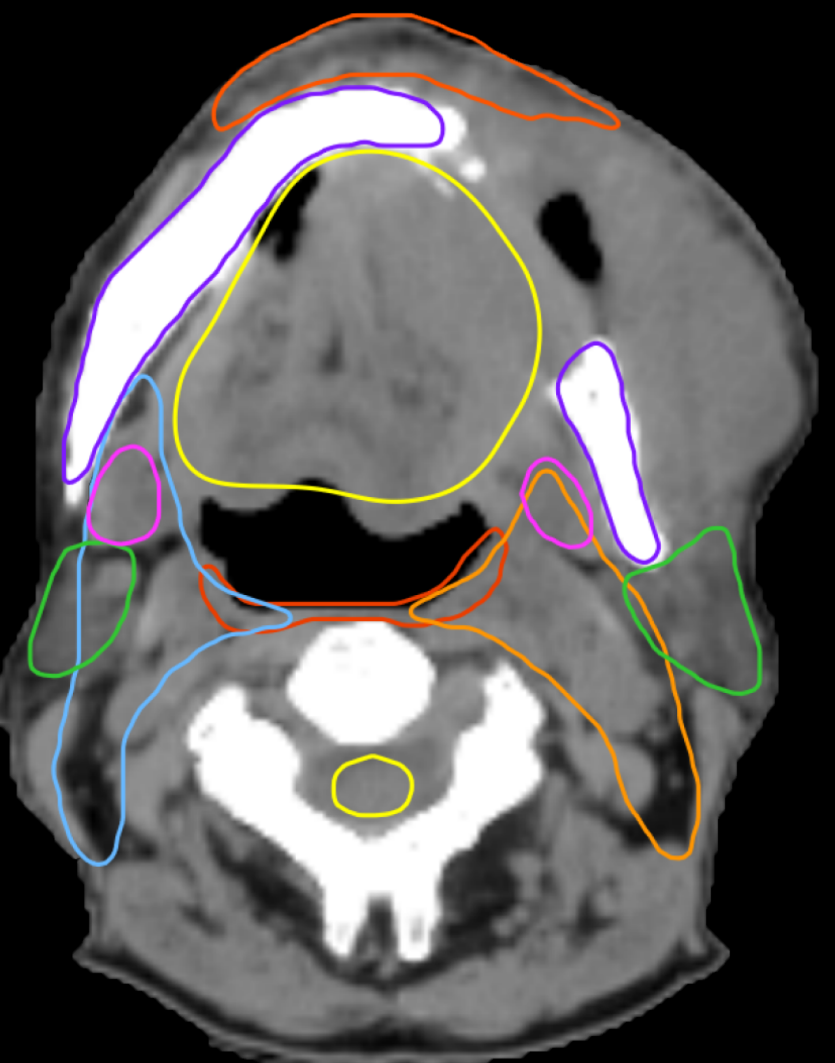
Conclusion

AI-based autocontouring is a clinically proven and financially viable option that should be considered by any Radiation Oncology clinic. The ROI has been demonstrated in clinics around the world and Limbus Contour will save clinics significant time.



“well-trained deep learning contouring models were associated with a positive user experience and did not require any degree of manual editing that would appear to inhibit their usability”

Wong et al. (2002)



Coughlan et al. (2022). Qualitative evaluation of auto-segmented structures for radiotherapy planning using peer review guidelines. British Institute of Radiology

Wong et al. (2021). Implementation of deep learning-based auto-segmentation for radiotherapy planning structures: a workflow study at two cancer centers. Radiation Oncology