

# Seamless Clinical Implementation of Autocontour ZeroClick

L. M. Bickley, PhD<sup>1</sup>; P. Pater, PhD MCCPM<sup>1,2</sup>

<sup>1</sup>Medical Physics Unit, Gerald Bronfman Department of Oncology, McGill University

<sup>2</sup>Department of Medical Physics, McGill University Health Centre

## ABSTRACT

In prevision of the change from Limbus Contour v1.8 to AutoContour ZeroClick v2.7 the MUHC was given a non-clinical version of ZeroClick v2.7 to test with the main goals of the testing being to compare workflows, assess performance of Limbus Contour models in ZeroClick and to compare differences in computational time.

A QA test phantom was created using a total of 29 anonymized patient scans to assess any differences in workflow, computational time and contour differences. DICE scores were used to assess overlap between contours for both Limbus Contour v1.8 and ZeroClick v2.7.

135 different organs were contoured over 12 different workflow templates. A total of 620 structures were contoured by Limbus Contour v1.8 and 610 by ZeroClick v2.7. The majority of these structures (82%) had a DICE score of greater than 0.7 indicating good to excellent overlap.

## INTRODUCTION

Current clinical segmentation protocol at the McGill University Health Centre (MUHC) uses Limbus Contour v1.8. Segmentation occurs in the background within 10 – 15 minutes of CT acquisition. The segmentation protocol is as follows:



Manual verification of OAR contours are performed, and an in-house script is used for template management. In 2024 LimbusAI was acquired by Radformation<sup>1</sup> with the eventual goal of combining features from both LimbusAI v1.8 and Radformation's own contouring software AutoContour. In prevision of the eventual change, the MUHC were given access to a non-clinical version of AutoContour ZeroClick v2.7 for testing.

The main goals of this project were as follows:

- Compare Limbus Contour v1.8 and ZeroClick v2.7 workflows
- Compare computation times
- Assess the performance of Limbus Contour models in ZeroClick v2.7

## METHODS AND MATERIALS

Contouring was performed on clinical computers (see Table 1 for hardware specifications) with Limbus Contour and ZeroClick installed on premises.

A QA test patient was created using 17 anonymized patient scans. Scans sent to both Limbus Contour and ZeroClick for contouring with workflow templates automatically selected. After contouring, the scans were anonymized and DICE scores were calculated for each individual structure. Table 2 provides a summary of DICE criteria.

Computational time was compared using an additional 12 patient scans. Contours were from LimbusAI and ZeroClick using site-specific workflow templates and whole-body templates. The ratio of time taken for each site-specific template and whole-body template was taken.

| Software            | Operating System                                   | Processor                                                    |
|---------------------|----------------------------------------------------|--------------------------------------------------------------|
| Limbus Contour v1.8 | Windows 10 Enterprise ver 22H2 OS Build 19045.6691 | Intel core i5-6500T CPU @2.50 GHz, 8.00 GB RAM               |
| ZeroClick v2.7      | Windows Server 2022 ver 21H2 OS Build 20348.2461   | Intel Xeno Silver 4410Y CPU @2.00 GHz processor, 64.0 GB RAM |

Table 1. Technical specifications of clinical computers used for testing

## RESULTS

Table 3 shows the results of the computational time assessment.

A total of 135 different organs were contoured over 17 anonymized patient scans and 12 different workflow templates for a total of 620 structures in Limbus Contour v1.8 and 610 contours in ZeroClick v2.7. Figure 2 shows the breakdown of the DICE scores comparing overlap of contours between ZeroClick and Limbus Contour.

| Workflow Template Selected | Average Time (s) | Ratio (ZeroClick:Limbus) |
|----------------------------|------------------|--------------------------|
| Abdo Chest (n=7)           | 750±273          | 0.690                    |
| Brain (n=1)                | 115              | 0.417                    |
| Brain CK (n=1)             | 103              | 0.465                    |
| Breast (n=1)               | 389              | 1.049                    |
| Pelvis (n=1)               | 250              | 0.432                    |
| Head and Neck (n=1)        | 159              | 0.755                    |
| Whole Body (n=12)          | 864±248          | 0.813                    |

Table 3. Computational Time Results

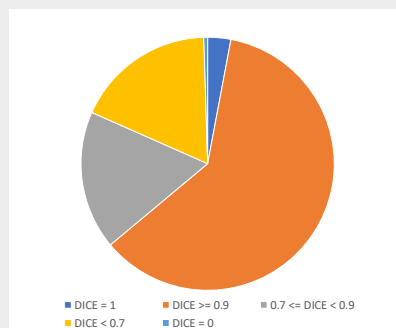


Figure 1. Distribution of DICE scores comparing overlap of contours between ZeroClick v2.7 beta and Limbus Contour 1.8.

## DISCUSSION

The majority (82%) of contours had a DICE score of >0.7 (see Figure 1) indicating good to excellent overlap and show that any imported Limbus Contour models perform similarly in ZeroClick. However, 10 less structures were contoured (610 for ZeroClick vs 620 for Limbus Contour). This was likely the result of updated models present in ZeroClick.

Overall, ZeroClick was significantly faster than Limbus Contour.

Installation of ZeroClick was easy and straightforward with minimal intervention needed from the Radformation team. Workflows were virtually identical, with workflow templates, contouring templates and various settings being able to be imported directly into ZeroClick from Limbus Contour insuring a seamless transition. The web-based application (Figure 2) is also accessible to anyone in the clinic, allowing for easier troubleshooting.

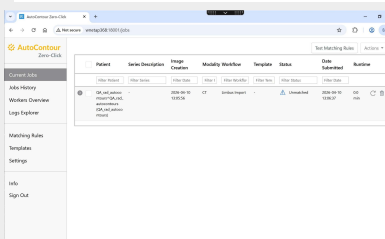


Figure 2. Web-based application interface for AutoContour v2.7

## CONCLUSIONS

LimbusAI and ZeroClick performed similarly, with 82% of generated contours having a DICE score of >0.7 indicating good to excellent overlap. Similarly, computational time was significantly reduced. Both these outcomes combined point to the transition from Limbus Contour to ZeroClick to be seamless. Actual installation of ZeroClick was straightforward, and any needed settings and templates could be easily imported from Limbus Contour. However, these analyses were performed on a limited set of data and further testing may be needed.

## REFERENCES

- [1] "Radformation to Accelerate AI-Based Solutions with Limbus AI Acquisition" Radformation, May 1 2024. Melanie Benoit <https://radformation.com/press/radformation-limbus-acquisition>
- [2] Doodan P J, et al. "A clinical evaluation of the performance of five commercial artificial intelligence contouring systems for radiotherapy" *Frontiers in Oncology*, vol 13, 2023, pp 1215098.
- [3] Goddard L, et al. "Evaluation of multiple-vendor AI autocontouring solutions" *Radiation Oncology*, vol 19, no 1, 2024, pp 68.
- [4] Grossi, C. et al. "Can Deep Learning-Based Auto-Contouring Software Achieve Accurate Pelvic Volume Delineation in Volumetric Image-Guided Radiotherapy for Prostate Cancer? A Preliminary Multicentric Analysis" – more dice scores
- [5] Tibbounes-Antonazzi A, et al. "Trade-off of different deep learning-based auto-segmentation approaches for treatment planning of pediatric craniospinal irradiation autocontouring of OARs for pediatric CNS Medical Physics", vol 52, 2025, pp 3541 – 3556.