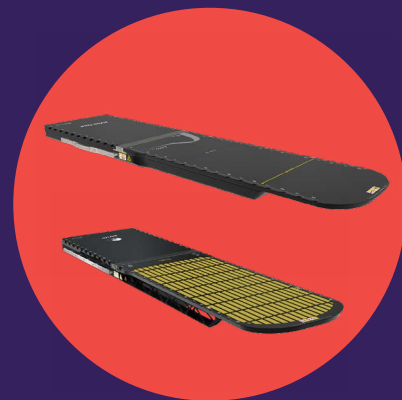


Automatic Couch Position Calculation Using Eclipse Scripting For External Beam Radiotherapy



FULL ARTICLE



Authors: Wang, Hesheng; Rea, Anthony; Rudek, Benedikt; Che, Tin; McCarthy, Allison; Barbee, David. Wang, H., Rea, A., Rudek, B., Chen, T., McCarthy, A. and Barbee, D. (2021), [Automatic couch position calculation using eclipse scripting for external beam radiotherapy](#). J Appl Clin Med Phys, 22: 77-84.

OBJECTIVE

To automate treatment couch position calculation in Varian Eclipse for CQ Medical's **kVue™** and **DoseMax™** couchtops using Virtual Indexing™, reducing setup errors and improving consistency in radiation treatment.

SUMMARY

This study developed and validated an Eclipse-embedded scripting method that automatically detects couch-top reference BBs on simulation CT to pre-calculate treatment couch coordinates before the first fraction. The clinical evaluation included:

- 122 EBRT patients treated on the kVue couchtop
- 55 SBRT patients treated on the DoseMax couchtop

Comparisons were made between the script-calculated couch positions vs. couch positions captured after both initial and daily image-guided setup.

CLINICAL IMPACTS

- Automated BB detection eliminates manual reference selection, reducing user-dependent setup errors.
- Pre-calculated couch coordinates streamline first-day setup and support safer baseline verification.
- Integration within Eclipse TPS increases efficiency of patient setup workflow.

KEY TAKEAWAYS

- 🎯 **ACCURACY** Automatic detection matched manual BB localization within 1mm and produced couch position differences typically ≤ 5 mm vertical/lateral.
- 🔄 **REPRODUCIBILITY** 95-96% of calculated positions were within 1-2 cm of mean daily treatment positions across all treatment sites.
- ⌚ **EFFICIENCY** The automated script streamlines setup, reducing manual tasks and potential human error.