Automated Plan/Chart Data Congruency Verification Between Raystation and RO-EMR Mosaiq in Compliance with MPPG 11.a

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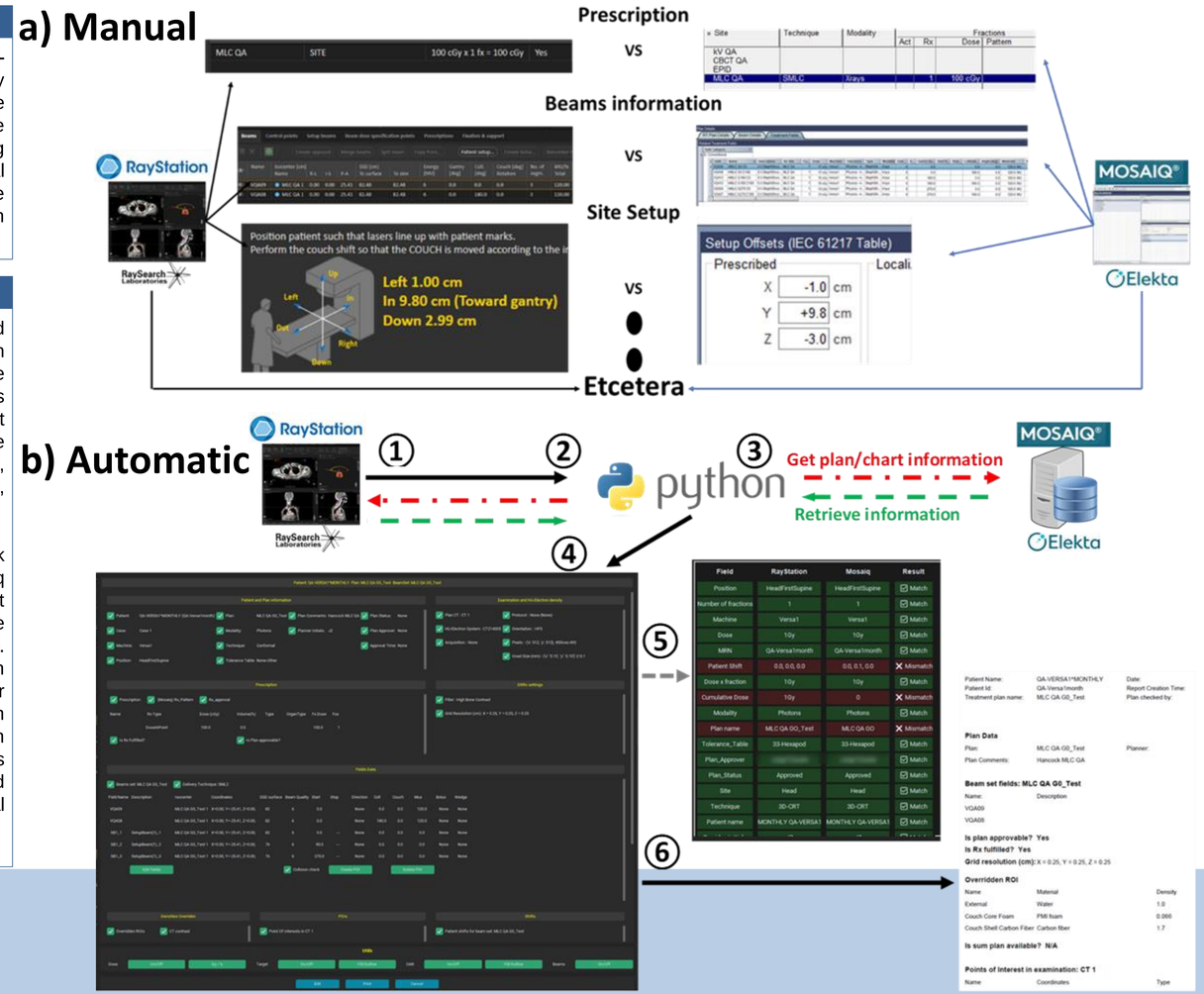
Introduction

Initial plan/chart review requires significant effort and can be labor-intensive, time-consuming, and error-prone. This is particularly challenging when working with non-integrated systems, such as the RayStation treatment planning system and the RO-EMR Mosaiq, where the planner is often responsible for manually transferring and verifying treatment delivery parameters into the RO-EMR. We automated the initial plan/chart review process using a Python interface developed with the RayStation Scripting API to assess data congruency between RayStation and RO-EMR Mosaiq.

Methods and Materials

Using the RayStation Scripting API, we developed a Python-based interface to directly compare photon and electron treatment plan parameters between the RO-EMR Mosaiq database (Ver. 3.2.2.1) and the RayStation treatment planning system (Ver. 2024A). The script evaluates the congruency of all relevant elements required for initial plan/chart review, as recommended by MPPG 11.a. These elements include, but are not limited to, prescription details and approval status, field parameters, treatment site setup, reference CT information, DRRs, tolerance tables, treatment schedule, dose tracking, and treatment machine configuration.

In the traditional manual workflow for performing an initial plan/chart check (Fig. a), clinical physicists open both RayStation and RO-EMR Mosaiq and manually compare information across the two interfaces to verify that the data match. With the proposed automated Python script (Fig. b), the medical physicist only needs to open RayStation and launch the script (1). The script retrieves the initial plan/chart information from both RayStation and the RO-EMR Mosaiq database server (2-3) and verifies their consistency. If all information matches, all check items are marked with green check marks (4), and the user has the option to print a verification report (6). If any discrepancies are found, a second window appears highlighting the differences (5). The comparison is performed automatically and almost instantaneously. Figures show partial screenshots of the interface and documentation.



Results

The automated script successfully identified discrepancies and verified consistency between RayStation and RO-EMR Mosaiq plan/chart data across all evaluated parameters. The implementation significantly reduced manual review time while improving consistency and minimizing the risk of transcription and human errors during initial plan/chart review.

Discussion

The automated evaluation of all MPPG 11.a items, including prescription data, field parameters, machine configuration, and treatment scheduling, provides a level of consistency and completeness beyond what is feasible with manual workflows. Using the RayStation Scripting API and Python, we developed a framework that directly compares treatment planning/chart data between the non-integrated system of RayStation and RO-EMR Mosaiq database.

The impact of this innovation lies in its ability to identify plan/chart discrepancies early, reducing transcription errors, enhancing patient safety, and decreasing the cognitive and time burden on clinical physicists. Additionally, the modular and extensible design establishes a scalable platform for future QA enhancements, allowing incorporation of additional checks and evolving guidelines. This work supports a transition toward more automated and reliable QA processes in routine clinical practice.

Conclusions

The RayStation Scripting API enables direct and automated comparison of plan/chart data between RayStation and RO-EMR Mosaiq in accordance with MPPG 11.a recommendations. This approach streamlines the initial plan/chart review process, reduces review time, and decreases the likelihood of errors. Additionally, the framework allows for expansion of verification checks due to full access to the RO-EMR Mosaiq database.

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