

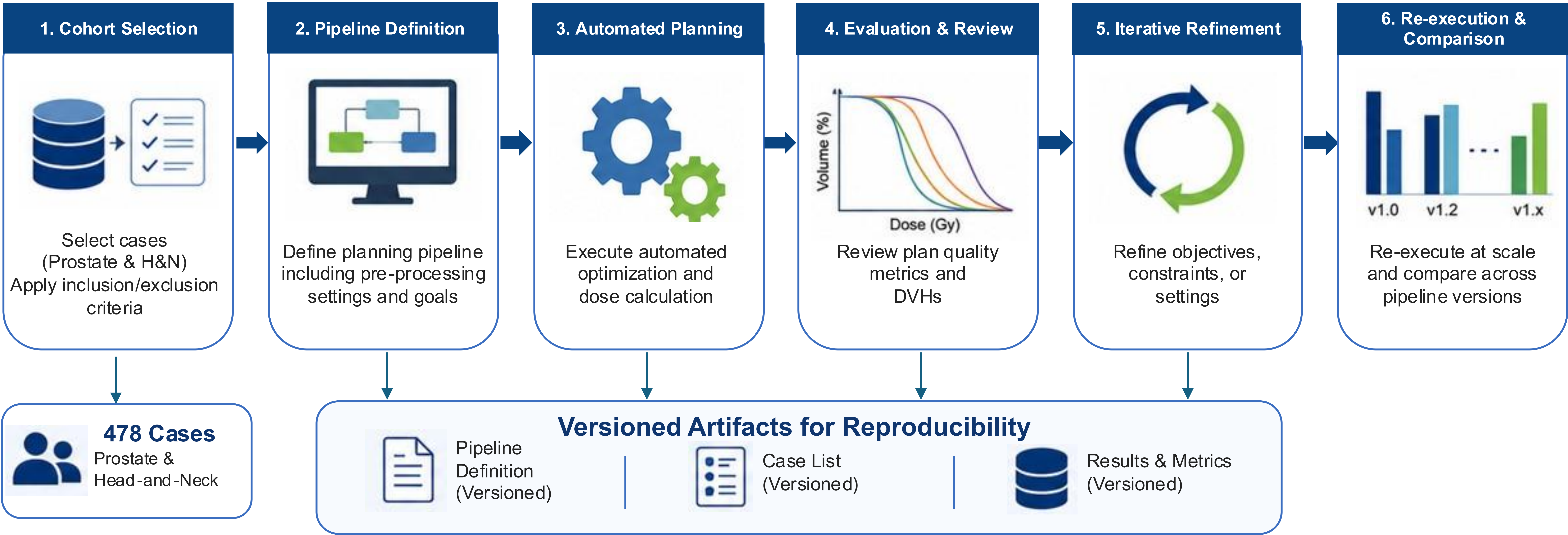
Introduction

Automated radiotherapy planning can improve efficiency and consistency but often requires specialized expertise to develop and maintain planning pipelines. These barriers can limit clinical adoption and large-scale evaluation of automated workflows.

Aim

To develop a dosimetrist-facing application that streamlines the creation, validation, and version-controlled management of automated radiotherapy treatment planning pipelines, enabling efficient retrospective evaluation of pipeline configurations across large patient cohorts.

Methods and Results



Efficient Initial Pipeline Creation

- Initial cohort selection and pipeline definition ((including pre-processing) required ~2 days on average

Iterative Refinement Driven by Automation

- Subsequent refinement typically required several additional days
- Driven primarily by automated plan optimization and dose calculation updates

Reproducible and Traceable

- Versioned pipeline and case-list artifacts enable reproducible cohort creation and evaluation

Reduced Manual Transcription

- Automated identifier validation minimizes manual entry and transcription errors

Scalable Re-execution for Comparison

- Supports efficient large cohort re-execution
- Enables robust comparison across pipeline versions

Table 1. Performance Summary

Metric	Value/Outcome
Cases Evaluated	478
Initial Pipeline Creation	~2 days
Refinement Strategy	Automated optimization & dose recalculation
Reproducibility	Version-controlled pipeline & case-list artifacts
Manual Effort	Reduced through automated identifier validation
Comparative Evaluation	Large-cohort re-execution across pipeline versions

Conclusion

AutoPlan-PipelineCreator streamlines automated planning pipeline development through standardized case identification, validation, and handoff. Version-controlled workflows support reproducible, scalable evaluation of pipeline changes across large patient cohorts within the Varian/ARIA environment.

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