

The Impact of Technology in Sterile IV Compounding and Chemotherapy



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Background

Sterile IV compounding is a critical pharmacy practice that demands precision, safety, and compliance with USP <797> and USP <800> standards. Traditional manual compounding, though effective, carries risks like contamination, human error, and inefficient workflow. Emerging technologies are transforming the field by enhancing accuracy, traceability, and safety in both hazardous and non-hazardous compounding environments.

Objective(s)

- Describe key technologies used in IV oncology compounding.
- Highlight benefits for **patient safety, pharmacy workflow, and compliance.**
- Discuss challenges and future direction.

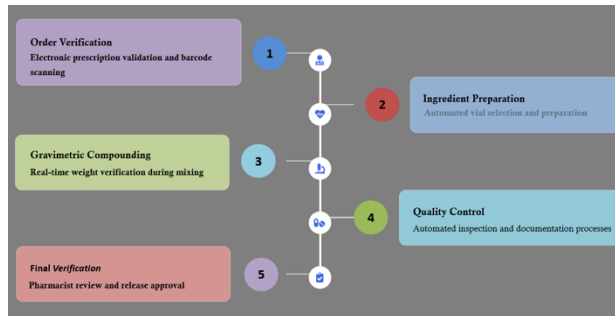
Methods

Study Design: Review of current sterile compounding technologies.

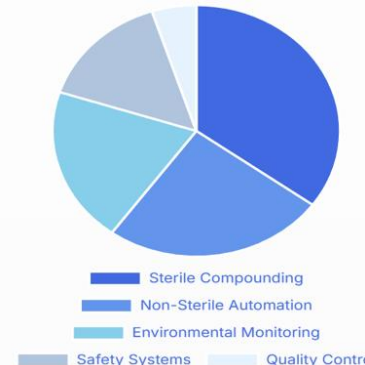
Data Collection: Institutional case studies and peer-reviewed literature.

Technologies Reviewed: Gravimetric verification, automated compounding devices (ACDs), barcode scanning, camera-based validation, and cleanroom monitoring.

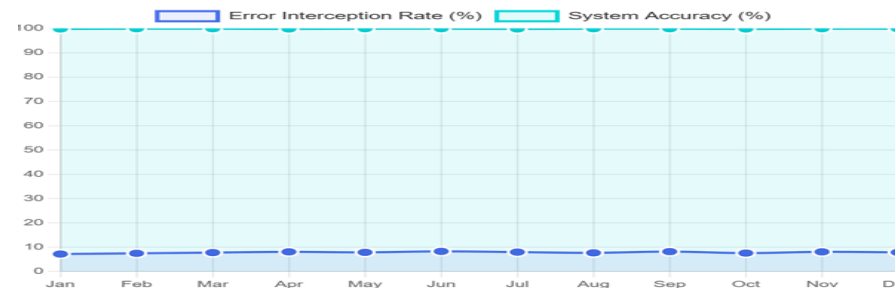
Analysis Methods: Performance outcomes assessed for accuracy, safety, and error reduction.



Automated Compounding Workflow



Technology Adoption



Technology Impact on Error Reduction

Results / Discussion

Technological innovations have significantly improved compounding accuracy (up to 99.9% with gravimetric systems) and reduced preparation time by 30-50%, which enhances patient safety, reduces medication errors, and improves workflow efficiency and regulatory compliance.

Conclusion

- The workflow graphic shows how technology streamlines the compounding process.
- The pie chart indicates sterile compounding and non-sterile automation are the largest market segments.
- The graph demonstrates high system accuracy and a consistent 7.89% error interception rate.

Reference(s)

