Post-Implementation Analysis of the Impact of Intravenous Automation Systems on Health-System Pharmacy Operations

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Post-implementation Analysis of Impact of Intravenous Automation Systems on Health-system Pharmacy Operations

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Background

• Many health systems have implemented some form of IV automation or compounding systems in their clean rooms.
• IV admixture automation is one of the most recent areas where technology has been added to pharmacy workflow.
• Manufacturers tout that automated systems reduce the number of errors making it all the way to the patient.
• Goals prior to automation implementation typically include: reducing pharmacy errors, improving accuracy, and improving productivity and workflow.
• IV errors may lead to severe consequences up to and including death of the patient.
• Currently, there is limited published literature or reports addressing the outcomes from this area of automation.
Types of IV Room Automation

RIVA® IV Room Automation

Health Robotics IV Station®
Objectives

• Review key areas assessed by pharmacies prior to implementation and experiences realized following intravenous automation system implementation.
• Analyze whether health systems achieved goals of improved quality, safety, productivity, and a projected financial impact post implementation.
Methodology

- A questionnaire was developed and deployed anonymously using the Qualtrics® online survey platform.
- The questionnaire consisted of 45 questions in 4 key areas: quality; medication safety; productivity; and financial impact.
- The questionnaire was sent via direct email to approximately 200 targeted facilities across the United States.
- Respondents were also solicited using the ASHP Practice management discussion board and databases that contain pharmacy management information in mid to large size health-systems.
- Screening questions were used to eliminate participants that had no automation in their IV rooms.
- Approved by Marshall University IRB (IRBNet ID# 1045531-1).
Results

- 39 of 82 respondents (48%) met inclusion criteria.
- 20 of 34 respondents (59%) have had automation installed in the IV room for at least 3 years.
- 6 of 27 respondents (22%) were able to provide feedback related to break-even costs or fiscal return.
- 5 of 11 (45%) indicated no savings were realized related to IV room automation.
- 9 of 38 (24%) respondents indicated the systems helped automate dispensing of more than 300 IV products per day.
- 9 of 15 (60%) respondents indicated that no staffing changes were made, and 1 reported a decrease in staffing as a result of the automation.
- 10 of 15 (67%) respondents indicated IV automation increased the time to perform IV admixture tasks.
Which IV automation product(s) did you implement?

- DoseEdge: 10
- Other: 9
- Med Keeper: 4
- BD - Cato: 3
- Apoteka USA: 2
- Aesynt / Health Robotics: 1
- ARxIUM's Reva: 1
- Baxter Healthcare - Intellifill IV: 1
- Omnicell: 1
Did the IV automation technology go through a formal ROI prior to purchase and implementation at your site?
Did the Pro Forma predict any decrease in medication errors during routine preparation of IV medications?

Number of Respondents

<table>
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<th>Yes</th>
<th>No</th>
<th>Do not know</th>
</tr>
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<tbody>
<tr>
<td>10</td>
<td>1</td>
<td>4</td>
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What was the predicted decrease in medication errors during routine preparation of IV medication following implementation of IV automation?
What was the change, if any, in the actual rate of medication errors following IV admixture automation?
Discussion and Implications

- Most respondents were unaware or their site did not use a formal ROI analysis or on-going assessment of fiscal impact associated with IV room automation.
- Lack of an ROI process may indicate direct cost savings is not a primary consideration and opportunity exists to better quantify savings associated with IV automation.
- Most respondents indicated projected medication error reduction pre-implementation but few knew the projected or actual reduction post-implementation.
- Lack of staff changes indicate this technology may have aided in meeting higher volumes and expansion goals.
- A limitation to this survey was the low number of respondents.
Follow-Up on Pilot Survey (Future Research)

- Identify challenges to getting an IV automation project approved / funded
- Identify strategies that helped overcome challenges in implementation
- Identify observable measured outcomes to assess financial impact and patient safety impact of automated IV devices
- Develop best practice recommendations
Questions and Discussion

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