Incorporating Elastomeric Balls For Use in Home IV (INFUSE)

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Background

- The Home Intravenous (IV) Program at Island Health implemented a Quality Improvement project introducing elastomeric balls as an alternative to administer antibiotics
- Successful use of elastomeric balls in the Hospital at Home Program facilitated interest in piloting this device in the Home IV Program
- Ideal devices for ambulatory infusions – portable, lightweight, easy to use, small size, silent operation
- Limited qualitative data on whether elastomeric balls can increase patient satisfaction, and reduce nursing and pharmacy workload

Objectives

To evaluate whether elastomeric balls can do the following:

- Increase patient satisfaction
- Reduce nursing and pharmacy workload in comparison to current drug delivery devices (IV bags, continuous ambulatory delivery device [CADD] pumps, syringes)

Methods

- Prospective, mixed methods design
- Convenient sample size
- Elastomeric balls piloted into the Home IV Program using ertapenem
- Data collection from November 2022 to March 2023

Informed Consent	• Nursing provided patients with introductory letters and collected consent forms
Data Collection	• Three separate electronic surveys with tailored questions to patients, nursing and pharmacy technicians • Surveys either emailed or conducted via phone call

Nursing Results (n = 3)

Patients who often or very frequently had the following concerns for self-administering their antibiotics (as reported by nursing):

- **100%** – Manual dexterity
- **67%** – Accessibility to home care nurses (patient residence location)

Elastomeric balls vs. **IV bags** and **CADD pumps**:

- Shorter patient education by **>20 minutes**
- Better overall satisfaction

Elastomeric balls vs. **syringes**:

- Average **same length** of patient education
- Better overall satisfaction

Quotes from Nurses

"The Elastomeric balls are so much better then teaching an IV bag gravity drip. Patients are already overwhelmed and often the drip puts them over the edge."

"Elastomeric balls are a significant help to discharging patients who have difficulty with dexterity or mobility and are unable to make it to nursing clinics for a RN to administer an IV gravity med. Both nursing and patients are VERY happy with the introduction of elastomeric balls"

Patient Results (n = 29)

- **59%** on ≥ 4 weeks of therapy
- **83%** had no home care nurse to help administer medications

Syringe (n = 15)
Compound time: 0.60 minutes (36 seconds)

Respondents who either agreed or strongly agreed:

- **93%** – easy instructions
- **100%** – acceptable size and shape
- **66%** – able to perform daily activities

Overall, **97%** were satisfied or very satisfied with this modality

Comments: easy to administer medications, instructions became easy within 3 days

CADD Pump (n = 3)
Compound time: 4.16 minutes

Respondents who either agreed or strongly agreed:

- **67%** – easy instructions
- **67%** – acceptable size and shape
- **100%** – able to perform daily activities

Overall, **100%** were satisfied or very satisfied with this modality

Comments: beeping, limited movement, heavy, lots of equipment, need to be tech savvy, couldn't shower

IV Bag (n = 5)
Compound time: 0.78 minutes (47 seconds)

Respondents who either agreed or strongly agreed:

- **40%** – easy instructions
- **100%** – acceptable size and shape
- **40%** – able to perform daily activities

Overall, **80%** were satisfied or very satisfied with this modality

Comments: lots of steps involved, need to ensure accurate rate of infusion, limited mobility

Elastomeric Ball (n = 6)
Compound time: 10.14 minutes

Respondents who either agreed or strongly agreed:

- **100%** – easy instructions
- **83%** – acceptable size and shape
- **83%** – able to perform daily activities

Overall, **100%** were satisfied or very satisfied with this modality

Comments: No hook-up to pole, improved quality of life, feel less like a patient, ease of use, allowed for baseline mobility

Pharmacy Technicians Results (n = 9)

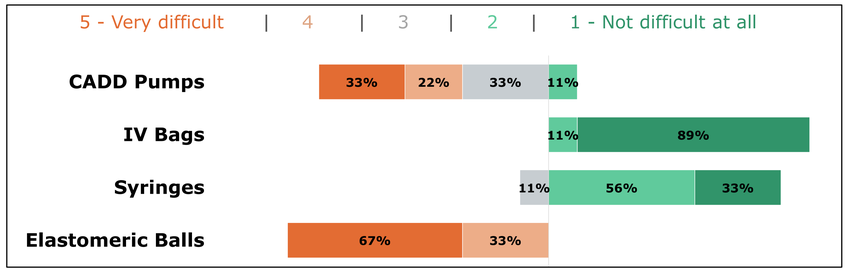

Figure 1. When asked to rate the level of difficulty in preparing the following drug delivery devices

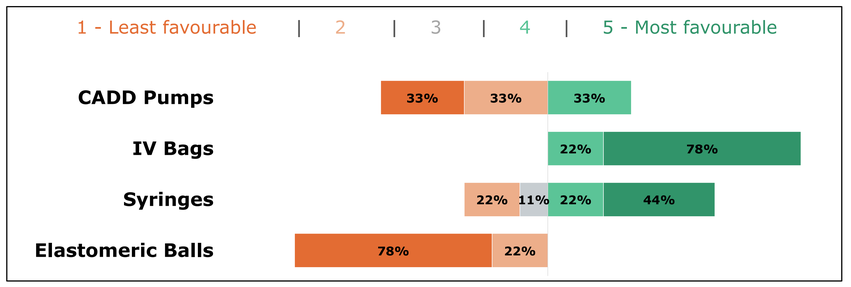

Figure 2. When asked to rate their preference towards preparing the following drug delivery devices

Quotes from Pharmacy Technicians

"Elastomeric balls are physically strenuous. Very hard on our hands when manual option is selected"

"There is quite a lot of resistance while injecting the solutions"

Discussion

- Big commitment for patients to self-administer IV antibiotics
- Limitations to current modalities that make elastomeric balls more advantageous for patients
  - Mobility, portability, quiet operation, ease of use
- Elastomeric balls reduced nursing workload
  - Shorter amount of time to educate patients
  - Increased overall satisfaction
- However, elastomeric balls were the most tedious and least preferred device to prepare by pharmacy technicians
  - Physically strenuous to compound

Limitations

- Small sample size – convenience sample
- Not designed for patients to compare devices
- Patients likely considered their peripherally inserted central catheter (PICC) line when answering the survey
- Recall and performance biases

Conclusion

- Elastomeric balls:
  - ☑ Increased patient satisfaction
  - ☑ Reduced nursing workload
  - ⚠ Increased pharmacy workload
- Next steps: investigate option to order prefilled elastomeric balls

References and Acknowledgements

References available upon request.

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