

# The Use of a Portable Syringe Infusion System for Antibiotic Infusions

## Contributing Authors:

William E. Miller, Jr., RPh<sup>1</sup> and Mala Crossley, BS, PharmD<sup>2</sup>  
<sup>1</sup>CarePoint Partners, a BioScrip company, <sup>2</sup>Crossley LLC

## Background:

The need for an inexpensive reusable infusion pump for the delivery of antibiotics to Louisiana Medicaid patients was identified. Louisiana Medicaid does not reimburse for elastomeric pumps. Intravenous push administration, rate controlled gravity infusion, stationary pumps, and ambulatory pumps are not always feasible based on drug or patient characteristics. Syringe pumps were identified as a potential option, with an evaluation conducted to compare available types, modes of operation (electronic vs. mechanical), syringe size, ease of operation, satisfaction, associated disposables and operating costs. A portable syringe infusion system was identified as the most cost effective, reusable, easy to operate infusion pump alternative for this evaluation.

## Purpose:

Evaluate a portable syringe infusion system as a viable option for antibiotic infusions based on economics, convenience, training, satisfaction, and patient safety.

## Methods:

Patient selection criteria included adult prescribed intravenous cephalosporins (such as ceftriaxone and cefazolin), every eight hours or less, for a duration of 2-6 weeks, and reimbursed by Louisiana Medicaid. After training of select staff by the FREEDOM60<sup>®</sup> pump manufacturer, additional staff were trained as the control group. Standardized data collection tools were used for patient interviews. Data collected in the pump evaluation included cost of use and reimbursement, ease of use, training time, portability, accuracy, general satisfaction, and overall pump safety. The rating scale used by patients was Very Poor, Poor, Fair, Good, and Very Good.

## Results:

There were 144 patients over a period of 3 months who met inclusion criteria. Cost savings achieved were approximately \$6/day for every eight hour dosing, compared to an elastomeric pump. Louisiana Medicaid reimburses for the portable syringe infusion system and supplies at approximately \$171/month, but will not cover elastomeric pumps. Time required to train home health agency (HHA) nurses was approximately 30 minutes. Training time for patients to achieve successful return demonstration was approximately 15-30 minutes. Initially, priming of the tubing was performed by the pharmacy, however this was changed to patient instruction after several reports of pump sets breaking off when refrigerated. No other safety issues were reported. Overall satisfaction rating from clinicians and patients for the portable syringe infusion system was Very Good.

## Discussion:

Patients and clinicians observed a number of advantages to the portable syringe infusion system, including convenience, portability, lightweight and easy to operate. Training time was considered reasonable by HHA and infusion pharmacy staff, although no direct comparison was performed with regards to other administration methods. The one issue that occurred at the start, broken pump sets that was associated with refrigeration, was rectified immediately and tubing manufacturer notified. This tubing issue did not cause any significant costs/unscheduled deliveries, or patient/clinician dissatisfaction.

## Conclusion:

The portable syringe infusion system is a cost effective, reimburseable alternative for anti-infective drug administration for Louisiana Medicaid patients.



## Patient Profile – Ages 18-56 years

There were 144 patients over a period of 3 months who met inclusion criteria.

S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5		27	28	29	30	31	1	2	1	2	3	4	5	6	7
6	7	8	9	10	11	12	3	4	5	6	7	8	9	8	9	10	11	12	13	14
13	14	15	16	17	18	19	10	11	12	13	14	15	16	15	16	17	18	19	20	21
20	21	22	23	24	25	26	17	18	19	20	21	22	23	22	23	24	25	26	27	28
27	28	29	30	31	1	2	24	25	26	27	28	29	30	29	30	31				

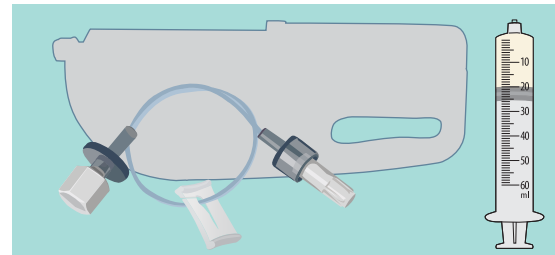
Therapy lasted from 2 to 6 weeks per patient.

## economics

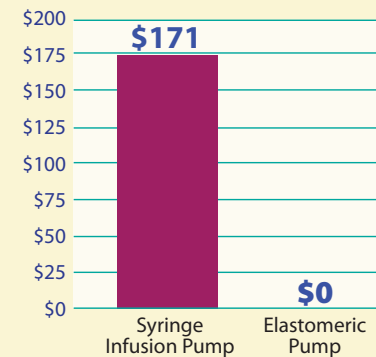
Total cost of goods savings using the syringe infusion pump for 144 patients was between \$12,000 and \$36,000 for the duration of the study.

### Cost Savings with Syringe Infusion Pump

Cost savings achieved were approximately \$6/day for every eight hour dosing, compared to an elastomeric pump.



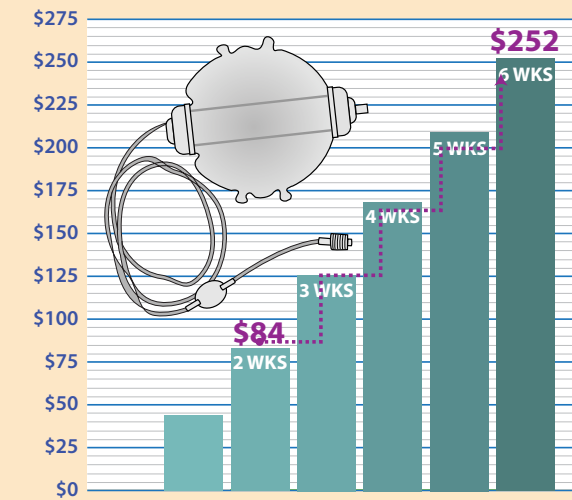
### Monthly Medicaid Reimbursement



### Increasing Expense of Elastomerics – Per Patient

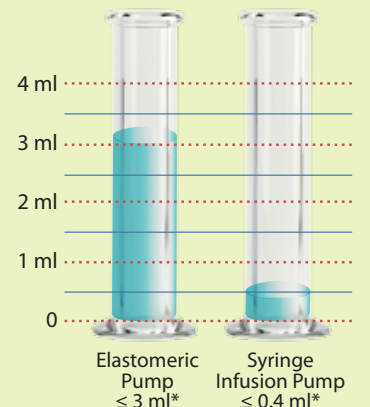
**\$6 More at 3x Dose/Day:**

\$6/day = \$84 (over 2 weeks) to \$253 (over 6 weeks)



## Residual Volume

The elastomeric retains 7.5X more volume than the syringe system.\*



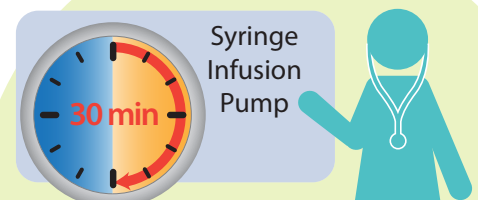
\*Based on manufacturer information

## training

Patients and clinicians observed a number of advantages to the portable syringe infusion system, including convenience, portability, ease of operation and the pump's light weight.

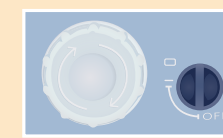
### Agency Training

Time required to train home health agency (HHA) nurses was approximately 30 minutes.



### Patient Training

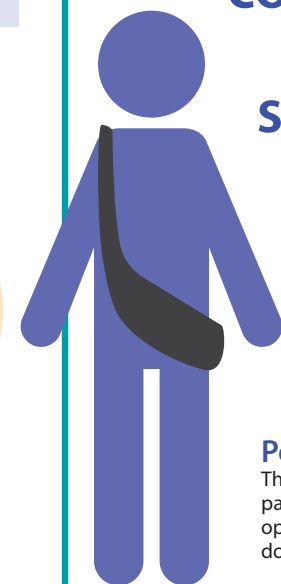
Training time for patients to achieve successful return demonstration was approximately 15-30 minutes.



Syringe infusion system has only two controls for patients to operate.



## convenience satisfaction



### Portability

The syringe infusion pump offers patients a safe and convenient option to be ambulatory while doing their therapy.

## patient safety

**Disclosure:** Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:

William E. Miller, Jr., RPh: CarePoint Partners, a BioScrip company; Mala Crossley, BS, PharmD: Crossley LLC

This poster was funded by RMS Medical Products, a dba of Repro-Med Systems, Inc.