Implementation of Intravenous Push Antibiotics in Response to a National Fluid Shortage

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Introduction

Hurricane Maria, in Puerto Rico, disrupted the nation's main suppliers of intravenous (IV) fluid infusion bags.

Shortage of IV fluid bags did not just affect patients in the hospital, but also the transitions of care programs where patients are discharged from the hospital to complete a prescribed IV antibiotic course in the outpatient setting.

Self-administered outpatient antimicrobial therapy (S-OPAT) program, at Parkland Hospital, is a program where uninsured patients requiring long-term IV antibiotics are taught to *self-administer* by infusion using *gravity*. More than 3000 patients to date have successfully completed the program.

Shortage of IV bags threatened S-OPAT program. We identified antibiotics that could safely be shifted from gravity infusion to IV push administration. By making this switch, a more concentrated solution is administered via a simple syringe in a single bolus.

Objectives

To safely administer IV antimicrobial treatment via IV push in an effort to limit unnecessary fluid usage during a national shortage of infusion bags.

Measure resource utilization around supplies needed with switch to IV push method.

Survey patients and nurses regarding satisfaction with switch to IV push method.

Methods

From November 1, 2017, patients enrolled in OPAT were trained to self-administer antibiotics by IV push instead of infusion.

Patients were followed in the Parkland OPAT clinic every week to monitor for treatment efficacy, PICC line maintenance and adverse events.

Supplies used by IV push program were compared with supplies needed for gravity infusion method to determine cost savings.

A survey to determine patient satisfaction was administered to patients who previously had finished a treatment course with IV gravity method and then with the new IV push method.

Results

200 patients completed antimicrobial therapy using the IV push method with 100% success rate and no reported adverse effects.

Estimated supply cost savings from using IV push compared to gravity method were as follows:

5,600 fewer IV fluid bag & 1,600 fewer IV tubing

50% fewer gloves and alcohol swabs

The global cost savings (including hospital stay and teaching time) was approximately $37,700 per patient.

Patient surveys indicate greater satisfaction with the new method primarily due to decreased infusion times, 30 minutes via traditional gravity infusion to 3-5 minutes with the new IV push method.

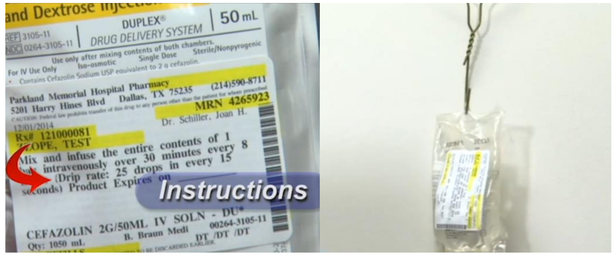

Figure 1: Old Method of Infusion by Gravity

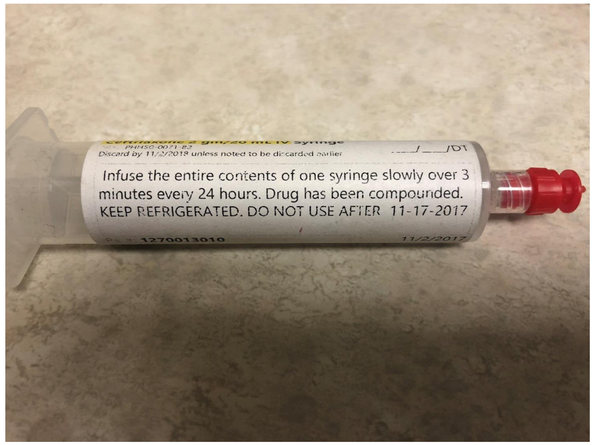

Figure 2: New Method of Infusion by IV Push

Conclusions

Out of necessity, Parkland Memorial Hospital was able to implement IV push as a safe, cost-effective, and viable alternative to traditional gravity administration of antibiotics and more than 200 unique treatment courses have been successfully administered using this method.

Estimated cost savings

$43,652 in infusion supplies & drug costs

$550,000 from decreased length of stay (faster teaching)

$9.62 million by continuing the program despite shortage of IV mini bags which avoided 25 hospital days per patient

Implications for Patient Care

IV push is a favorable alternative to administration via a pump or gravity due to time-savings, cost reduction, and convenience.

The results from our implementation of IV push suggest that expensive pumps and time consuming gravity administration may not be necessary for the safe, efficacious administration of IV antibiotics.

Figure 3: Benefits Summary