Intrathecal Antibiotic Use Changes: A Quality Improvement Application

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Introduction

Ventriculoperitoneal shunt surgeries remain the most common operations performed in pediatric neurosurgery, and few interventions have been found to decrease infection rates. Intrathecal antibiotics during shunt insertion were not found to lower infection rates, but at our institution the operating room pharmacy continued to supply them during shunt procedures at the request of neurosurgical staff. Production of these medications is time- and labor-intensive, requiring the pharmacist to individually prepare each sample in a sterile fume hood. This study presents results of a process-improvement project to reduce waste of intra-operative intrathecal antibiotics.

Methods

The neurosurgery team designed a workflow redesign to target behaviors of surgeons, operating room nurses, and pharmacists. First, preference cards were reviewed to remove intrathecal antibiotics. Second, educational materials were disseminated to udpate operative staff on the process of intrathecal antibiotic preparation and dispensation. The efficacy was assessed with retrospective review of the electronic medical record.

Results

Of cases performed in the 12 months before the intervention compared to the 12 months after, 112 (64%) versus 67 (52.8%) had at least one sample of antibiotics prepared by pharmacy, and 57 (32.6%) versus 32 (25.2%) resulted in the utilization of the provided antibiotics. In the year prior to intervention, 136 of 376 (36.2%) distributions of antibiotics were administered, while it was 9 of 258 (34.5%) the following year.

Conclusions

We show that a process improvement and educational intervention for neurosurgeons and peri-operative staff reduced medicine and cost waste, and resulted in more appropriate use of medical resources. With increasing national focus on medical spending and cost effectiveness, it is imperative that all perioperative staff are educated on effective and ineffective interventions. This will lead to time and cost efficiency, with resources allocated for therapies and procedures that improve patient outcomes while avoiding those that use labor and resources without patient benefit.

Learning Objectives

- Injection of intrathecal antibiotics during shunt placement does not decrease rate of infection

- education of surgeons and peri-operative staff can decrease labor and product waste, and improve operative cost effectiveness

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