

Implementation of Electrolytically Produced Sodium Hypochlorite Protocol Improved Peritonitis Rates

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Introduction

- Peritonitis is the most important complication in peritoneal dialysis (PD) patients.
- Peritonitis remains a major cause of PD technique failure.
- Clean exchange procedure and proper connection technique are essential in the prevention of peritonitis. However, touch contamination is still the leading cause of peritonitis.
- We implemented an infection control initiative following a protocol using electrolytically produced sodium hypochlorite to scrub transfer set connections before and after PD system connection and disconnection to minimize touch contamination (described by Funes et al, Annual Dialysis Conference 2009).

Objective

Peritonitis rates before and after implementation of the sodium hypochlorite protocol infection control initiative were compared to determine its effectiveness in decreasing the incidence of peritonitis.

Methods

Electrolytically produced sodium hypochlorite (Alcavis) protocol

- Don mask and wash hands
- Scrub transfer set using a 2 x 2 gauze soaked with electrolytically produced sodium hypochlorite (Alcavis 50) for 1 minute
- -5,500 ppm available chlorine
- Active ingredient: sodium hypochlorite (NaOCI) 0.55%
- Inert ingredients: sodium chloride (NaCl) 9.0%, purified water (H₂O)
- Allow transfer set to dry for 1 minute
- Remove minicap and connect immediately
- Repeat prior to disconnecting form the cycler or prior to manual exchange

Study Design

- Retrospective analysis
- Sodium hypochlorite (Alcavis) protocol was introduced in March 2010
- Data from > 12,000 PD patients from > 800 home dialysis facilities were analyzed
- Three-month rolling average peritonitis rates were assessed between January 2010 and August 2012
- Dialysis facilities reported reasons for PD patient losses monthly at quality improvement facility management meetings
- All positive peritoneal dialysate cultures were provided by DaVita Labs, DeLand, FL

Results

- The average time between peritonitis episodes increased from 33.0 months in January 2010 to 45.1 months in August 2012 (Figure 1).
- Comparison of the reasons for stopping PD before and after implementation of the protocol showed that transfer from PD to hemodialysis (HD) due to peritonitis and patient loss due to death decreased (Table 1).
- Transfer from PD to HD due to peritonitis dropped from 5.4% in December 2009 to 2.8% in November 2012.
- Patient loss due to death dropped from 11.0% in December 2009 to 9.1% in November 2012.
- A decrease in infections due to the most common Gram-positive organisms was observed over the study period (**Figure 2**):
- Methicillin-resistant Staphylococcus epidermidis (MRSE) infections were reduced by 27.6%
- Staphylococcus epidermidis infections were reduced by 18.6%
- Staphylococcus aureus infections were reduced by 28.3%

Figure 1. Peritonitis Rates (Time Between Episodes) 2010 to 2012

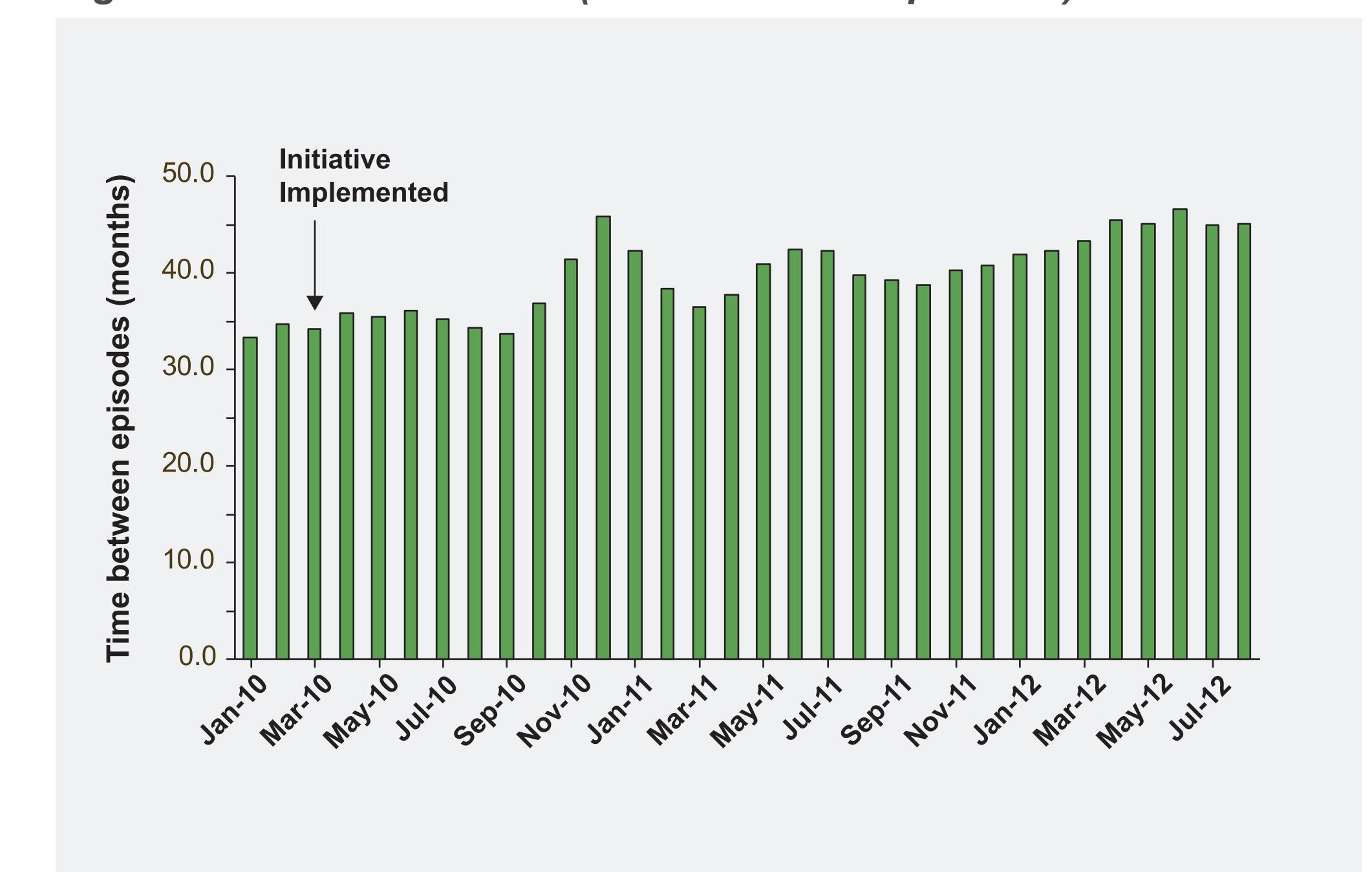
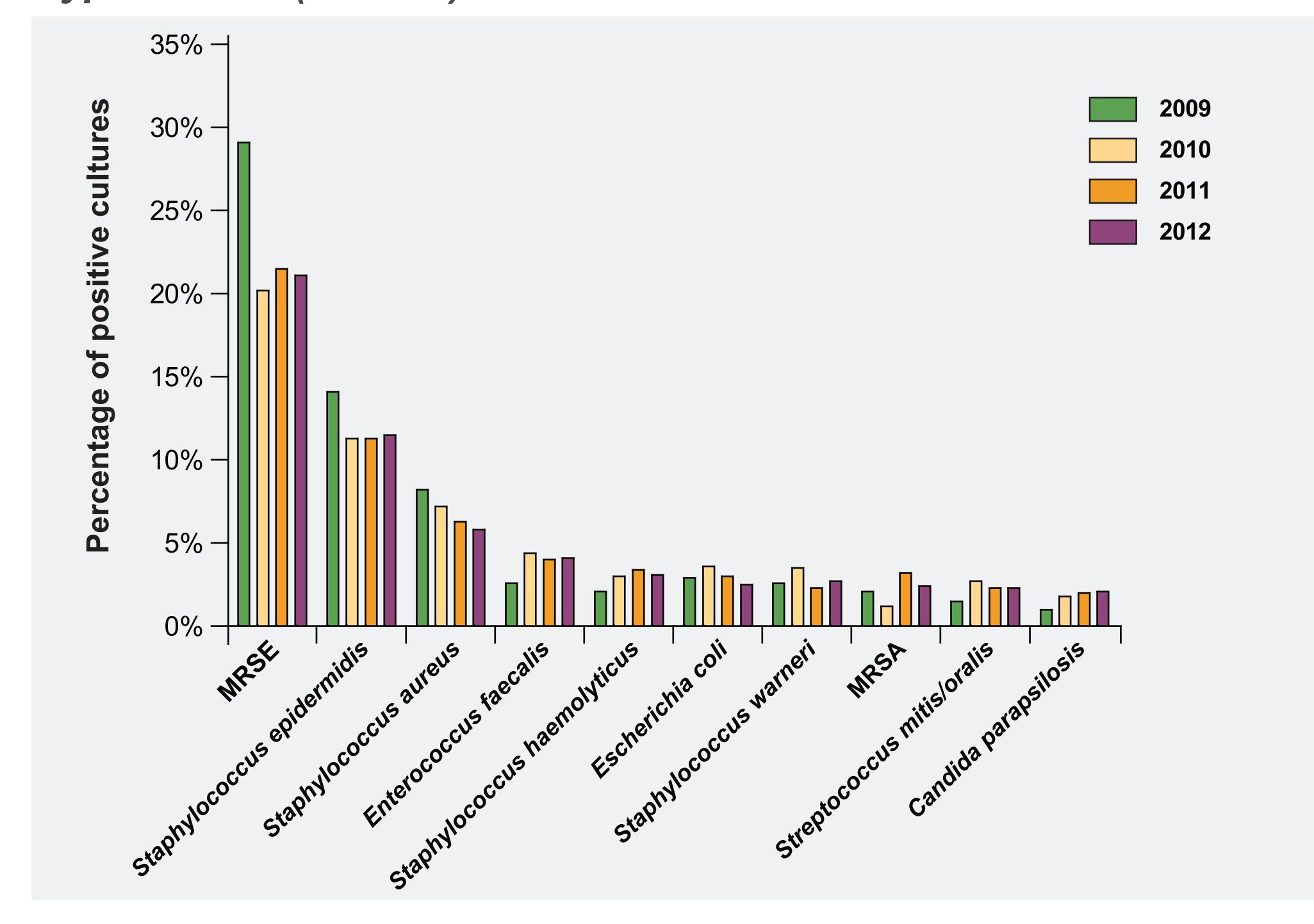


Table 1. Annualized Reasons for Stopping Peritoneal Dialysis

	Dec 2009	Nov 2012
Transfer to non-DaVita facility	4.1%	3.1%
Transfer from PD to HD		
Peritonitis	5.4%	2.8%
Catheter infection	1.2%	0.9%
Catheter problems	3.5%	2.9%
Inadequate dialysis	2.2%	1.6%
Other medical reason	6.7%	5.8%
Psychosocial	2.5%	2.3%
Patient decision to discontinue	1.0%	1.4%
Involuntary discharge	0.2%	0.1%
Lost to follow up	0.4%	0.2%
Recovered function	1.1%	1.0%
Transplant	7.7%	5.2%
Death	11.0%	9.1%
Total	47.8%	36.5%
Total (excluding transplants)	40.1%	31.3%

Figure 2. Distribution of the 10 Most Common Infectious Organisms Before and After Implementation of the Sodium Hypochlorite (Alcavis) Protocol



Conclusions

- The electrolytically produced sodium hypochlorite (Alcavis 50) protocol has lead to a major improvement in peritonitis rates.
- This improvement is largely due to a decrease in Gram-positive infectious episodes and presumably represents a decrease in touch contamination.
- The use of sodium hypochlorite is a simple, cost-effective strategy to decrease episodes of peritonitis and their sequelae, including technique failure and death.

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