

FINANCIAL BENEFIT OF CLOSED VS. OPEN ENTERAL DELIVERY SYSTEM

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ABSTRACT

Background: Both closed and open enteral feeding delivery systems are used to feed patients who require an adjuvant route of nutrition support. The trend in clinical institutions is to provide closed system (CS) as the preferred route for enteral feeding delivery. CS has been shown to decrease contamination which may result in decreased diarrhea occurrence, and increased hang time, which may contribute to less wastage and ultimately cost savings. The objective of this research study was to identify whether implementing a CS would have an impact on diarrhea occurrence and formula waste in dollars.

Methods: Inclusion criteria for the study of formula waste consisted of 21 patients with the open system (OS) and 24 patients with the CS in adult intensive care units (ICUs) who received enteral nutrition (EN) over a 24-hour period. Data was collected by providing ICU nursing staff with a form that included the type of formula prescribed and the amount of formula wasted (if any). Inclusion criteria for the study of occurrence of diarrhea consisted of 18 patients in adult ICUs that received EN over a 3-day period. Data was collected per a computerized ICU nursing record that included the occurrence of diarrhea.

Results: With the OS, the amount of formula wasted was 12.8 liters (L) in a 24-hour period, with an estimated formula waste of \$174.63 per day and \$63,739.95 annually. With the CS, 2.9 L of formula were wasted, with an estimated formula waste of \$26.23 per day and \$9,573.95 annually. With the OS, an average of 35.42% of patients had diarrhea occurrence, and with the CS, an average of 57.41% of patients had diarrhea occurrence.

Conclusion: Implementing a CS as the preferred route for enteral feeding delivery does have a beneficial impact on formula waste in dollars. Changing to a closed system did not positively impact the occurrence of diarrhea.

RESULTS

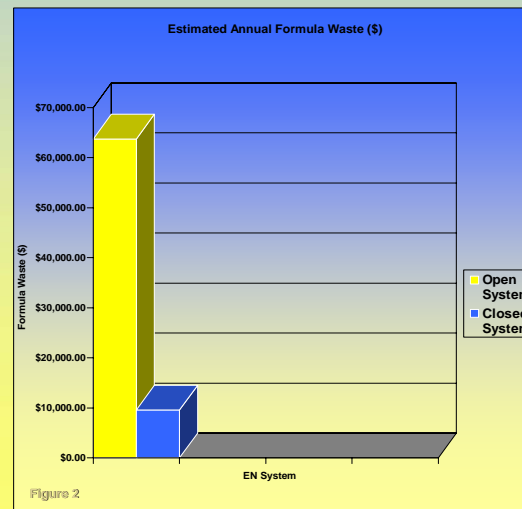
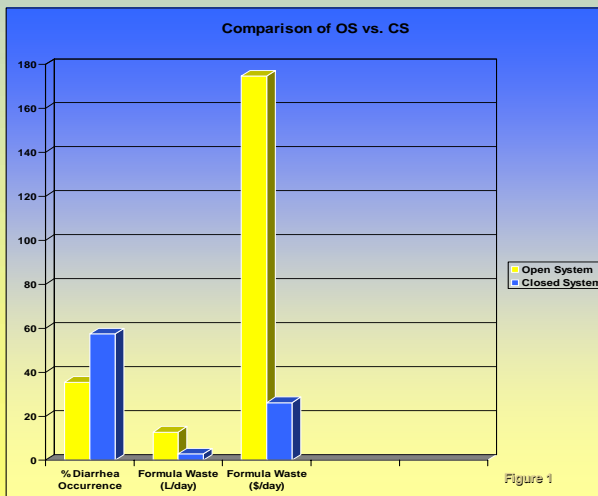
- ❖ In the OS, 12.8 liters of formula was wasted in a 24-hour period. In the CS, 2.9 liters of formula was wasted in a 24-hour period.
- ❖ Formula waste in the OS was an estimated \$174.63/day and \$63,739.95/year. Formula waste in the CS was an estimated \$26.23/day and \$9,573.95/year.
- ❖ In the OS, an average of 35.42% of patients had diarrhea occurrence and with the CS, an average of 57.41% of patients had diarrhea occurrence.

DISCUSSION

- ❖ Few studies have examined the potential financial benefits of CS vs. OS.
- ❖ A 1997 study by Moffitt, et al., concluded that cost savings can occur when enteral feeding delivery systems have a longer hang time of 48 hours compared to a 24-hour hang time. In our study, by switching to a CS, hang time was increased from 4 hours to 48 hours, resulting in decreased TF wastage and a dramatic financial savings.¹
- ❖ Several studies have indicated using a CS is associated with less contamination, which may result in decreased diarrhea occurrence. Our study found an increased diarrhea occurrence in the CS. The clinical definition of diarrhea is an increase in frequency of stooling >3 times per day or an increase in weight to >200 gm of stool per day.² Identification of actual diarrhea by nursing staff is often subjective. In our study, diarrhea occurrence was documented if "liquid stool" was recorded in the nursing record.^{1,3,4} Additionally, no other factors that may contribute to occurrence of diarrhea were evaluated, e.g. occurrence of *Clostridium difficile*, medications, type of formula, and specific disease states.

CONCLUSION & RECOMMENDATIONS

Clinical institutions would benefit from acquiring a CS, as TF formula waste in dollars is significantly decreased and will result in a cost savings for the institution. Our research shows that by switching from an OS to a CS results in an estimated savings of \$54,166 per year. Several studies support that there is a decrease in contamination when utilizing a CS, which may result in decreased diarrhea occurrence.^{1,3,4} Although our study had an increase in diarrhea occurrence with the CS, no other variables affecting diarrhea were examined. More studies should be conducted to determine how switching to a CS can have an impact on occurrence of diarrhea and potential financial benefits.



REFERENCES:

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