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Background

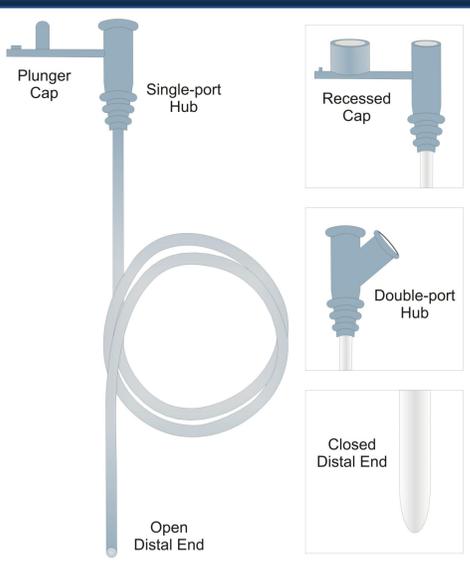
Infants admitted to the neonatal intensive care unit (NICU) often encounter feeding difficulties that require gavage feeding assistance. Gavage tube feeding is a viable alternative for providing these infants with the nutrition they need for successful growth and development. Several components of the EFTs may be susceptible to bacterial growth. Multiple design variations are commercially available. However, there is limited research to support whether EFT design contributes to bacterial colonization and overgrowth.

Objectives

To compare in vitro bacterial overgrowth of design components in commercially available 8 French EFTs, including the proximal hub (H), cap (C), and distal end (DE) outlet.

Methods

- EFTs inoculated with 2:1 mixture 24 kcal/oz premature formula and saliva.
- 75% humidified isolette at 34°C
- EFTs removed and sectioned at 3, 24 or 72 hours.
- Bacterial colony forming units (CFUs) measured.
- Statistical analysis performed.
 - CFUs standardized to a percentage of maximum growth as a function of time and location.
 - Two-tailed t-test

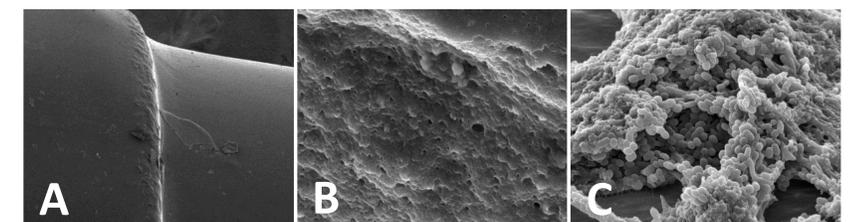
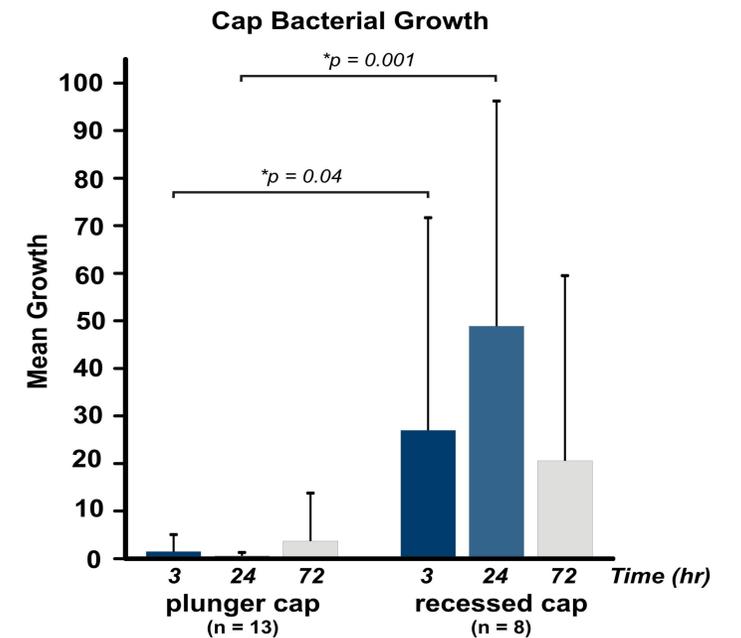
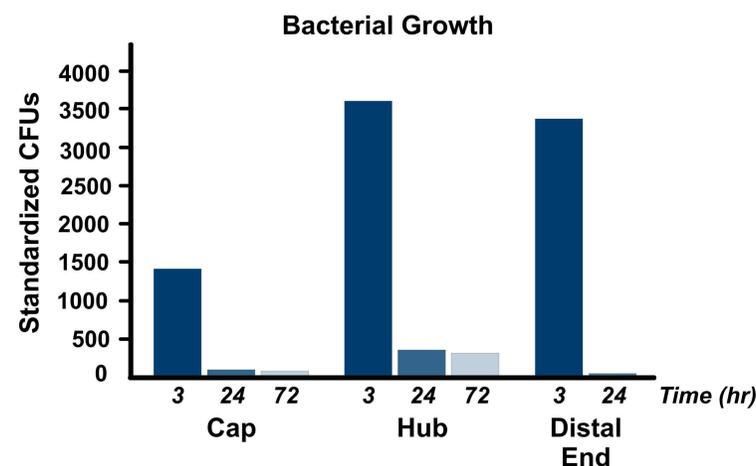


EFT Types Analyzed

Cap	Hub	Distal
Recessed	Y-Type	Closed
Plunger	Single	Open
Plunger	Single	Open
Plunger	Single	Closed
Recessed	Single	Closed

Results

- Most overall bacterial growth occurred in the first 3 hours.
- Bacterial growth decreased at 24 and 72 hours.
- Highest level of growth in hub and distal end was at 3 hours.
- Bacterial growth in recessed cap significantly greater than plunger.
- This trend continued up to 72 hours.
- The bacterial growth waned after 24 hours in plunger cap.
- Growth in the recessed cap peaked at 24 hours.



Electron microscopy (EM) images of bacterial growth in the EFT caps 3 h after inoculation and incubation. Plunger caps (A & B) and a recessed cap (C). There are several bacteria present on the recessed cap pictured in C.

Conclusions and Future Studies

- Most significant bacterial growth was in the first 3 hours on all components.
- Differences in growth did not exist with various hub or distal end designs.
- Bacterial growth did vary significantly between recessed cap and plunger cap.
- The recessed cap growth was significantly more than the plunger cap at 3 and 24 hours.

Though studies are needed to prove the association of bacterial contamination of EFTs and nosocomial infections or NEC, there seems to be some potential for a connection. If a recessed cap increases the risk of bacterial translocation, the design of EFTs and/or their daily maintenance should be directed towards preventing an increased risk to fragile infants.