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## Bacterial Contamination of Tube Feedings

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Mathus-Vliegen and colleagues from the Department of Gastroenterology and Hepatology, the Academic Medical Center, University of Amsterdam, The Netherlands, conducted a study to investigate the microbial contamination rate of 1-L feeding bottles and newly designed administration sets over hanging times of 24 hours in the ICU. The investigation was a prospective observational cohort study of patients admitted to the ICU of a university hospital. The subjects included all consecutive patients fed via a nasojejunal tube for at least 4 days. Cultures were performed of feeding bottles, administration sets, and gastric and tracheobronchial aspirates at days 0, 1, 2, 4, and 7.

Four percent of feeding bottles and 74% of infusion sets contained >100 colony-forming units (CFU)/mL. Gastric and bronchial aspirates were positive in 90% and 92%, respectively. Bacterial counts of feeding bottles were 10<sup>2</sup> to 10<sup>5</sup> CFU/mL. The main bacteria isolated included *Enterobacter cloacae*, *Klebsiella oxytoca*, and enterococci. One third of all bacteria grown from cultures obtained from feeding bottles, administration sets, stomachs, and lungs belonged to the *Enterobacteriaceae* family, which was responsible for the nosocomial infections in the ICU.

None of the 1-L feeding bottles with a hanging time of 19 to 24 hours were contaminated. Only bottles that had to be exchanged because of need for a faster rate of infusion proved to be contaminated, apparently without clinical consequences. With time and

the increasing severity of disease, the administration sets became contaminated at an increasingly faster rate and with higher bacterial counts, mainly through retrograde growth of endogenous bacteria. The final step of bottle contamination might have been the bacterial transfer by nurses' hands.

The authors concluded that, despite an almost ideal design of the enteral-nutrition delivery system, there was a 4% contamination rate of initially sterile feedings with clinically relevant bacteria. The fact that only manipulated systems showed bacterial growth are of concern.

FROM: Mathus-Vliegen LM, Binnekade JM, de Haan RJ. Bacterial contamination of ready-to-use 1-L feeding bottles and administration sets in severely compromised intensive care patients. *Crit Care Med* 2000;28:67-73.