

SICS NUTRITION GROUP

Best practice statement for administering additional enteral water to enterally tube fed adult patients in Intensive Care Units

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Enteral tube feeding is an accepted method for the provision of nutrition in patients who, despite having a functioning gut, are unable to take food and fluid orally, or whose daily oral intake is not sufficient to meet their nutritional requirements¹.

The aims and objectives of the guidelines are:-

- To give comprehensive guidance on reducing the risks of bacterial contamination associated with administering enteral water to enterally tube fed patients.
- To reduce the incidence of morbidity and mortality of enterally tube fed patients caused by bacterial contamination of additional water.

RISK FACTORS

Contamination is a key concern as feeds and fluids can be contaminated with a variety of micro-organisms that are responsible for serious clinical infection¹. Possible sources of contamination in the enteral feeding system include¹⁻⁴:

- contamination of equipment
- poor hand hygiene
- inappropriate storage of feed
- misuse of equipment
- poorly designed equipment
- site problems
- cross infection
- contaminated feed (e.g. during preparation, dilution and decanting).

Bacterial contamination of feeds can cause pneumonia and septicaemia as well as gastrointestinal infections (e.g. salmonella)¹. Using pre-packaged, sterile, ready-to-use feeds and fluids eliminates some of the risks, however poor handling is the main cause of bacterial contamination of sterile enteral feeds¹.

GIVING ADDITIONAL WATER

If patients require water in addition to their tube feed it is important that this is administered safely.

Water is used for a variety of purposes during enteral feeding e.g. for flushing the tube, reconstituting powder feeds or hydration. However, the use of water is not without problems. The critically ill patient requiring artificial enteral feeding may be at higher risk from exposure to non-sterile products including water⁴.

- Contaminated tap water has been linked with many nosocomial infections in critically ill patients⁵⁻¹¹.
- Both bottled and distilled waters have also been reported to be contaminated with micro-organisms such as *Pseudomonas* spp^{12,13}.

Hydration via Pump

For hydration purposes sterile, ready to use water to which a giving set can be directly attached has a lower contamination risk and so is preferable to decanted sterile water^{1,2,4}.

Hanging non-sterile water is **not recommended** because of its increased risk of microbial contamination³⁻¹¹.

Hydration via Bolus Flushes

Research is limited on the type of water to be used for flushing however Padula et al suggest using sterile water to flush enteral tubes in critically ill patients particularly when tap water safety is unknown¹⁴.

Adding Water to Feed

This is **not recommended** as this will greatly increase the risk of bacterial contamination of the feed and is likely to lead to the inadequate delivery of nutrients^{3,15}.

SELECTION OF PRODUCTS/EQUIPMENT

When choosing an enteral feeding system, assess the risks of introducing bacterial contamination and consider the following:

- sterile, ready-to-use feeds to which a giving set can be directly attached have lower contamination rates and so they are preferable to those that need decanting, reconstituting or diluting
- bags or bottles have a lower risk of contamination than ring-pull cans
- a no touch technique should be used to ensure no physical contact with connections
- a recessed spike is preferable to a cutter or exposed spike on a giving set
- choose a system that requires the minimum number of connections; do not use three-way taps and avoid extension tubing where possible
- a giving set that has a medication port with a closure tap will reduce the number of times the set needs to be disconnected
- choose the largest volume container available to the closest you require
- All enteral feeding pumps should be cleaned regularly as per manufacturers' recommendations ^{1, 2, 3}.

Always take care to follow the manufacturer's instructions and adhere to local procedures and policies.

Hand hygiene

Effective hand decontamination is vital to control the spread of infections. Choose an appropriate method of hand decontamination for the procedure, according to your local policy.

REFERENCES

1. Community Practitioners and Health Visitors' Association. Enteral tube feeding. www.healthcare2z.org
2. Infection Control Nurses Association (2003). Enteral Feeding; Infection control guidelines.
3. Anderton A (2000) Microbial contamination of enteral tube feeds. How can we reduce the risk? PENG Group of the British Dietetic Association/Nutricia Clinical Care
4. Bankhead R et al (2009) Enteral Nutrition Practice Recommendations. *Journal of Parenteral and Enteral Nutrition*, **33** (2) 122-167
5. Smith HV, Rose JB (1980) Waterborne Cryptosporidium – current status, *Parasitology Today*, **14**: 14-22.
6. Glover N, Holtzman A, Aronson T et al (1994) The isolation and identification of mycobacterium avium complex (MAC) recovered from Los Angeles potable water, a possible source of infection in AIDS patients, *International Journal of Environmental Health Research*, **4**: 63-65.
7. Cooke RPD, Whymant-Morris A, Umasankar RS and Goddard SV (1998) Bacteria free water for automatic washer disinfectors: an impossible dream? *Journal of Hospital Infection*, **39**: 63-65.
8. Marrie TJ et al (1991) Control of endemic nosocomial legionnaires; disease by using sterile portable water for high risk patients. *Epidemiol Infect*, 107:591-605.
9. Venezia RA et al (1994) Nosocomial legionellosis associated with aspiration of nasogastric feedings diluted in tap water. *Infect Control Hosp Epidemiol*, 15:529-533.
10. Bert F et al (1998) Multi-resistant *Pseudomonas aeruginosa* outbreak associated with contaminated tap water in a neurosurgery intensive care unit. *J Hosp Infect*, 39:53-62.

11. Rogues AM et al (2007) Contribution of tap water to patient colonisation with *Pseudomonas aeruginosa* in a medical intensive care unit. *J Hosp Infect*, 67:72-78.
12. Favero MS, Carson LA, Bond WW and Petersen NJ (1971) *Pseudomonas aeruginosa*: growth in distilled water from hospitals, *Science*, **173**: 836-838.
13. Subcommittee on Microbiological Criteria (1985) An evaluation of the role of the microbiological criteria for foods and food ingredients, Committee on Food Protectionm food and Nutrition Board, National Research Council, Washington DC, National Academy Press.
14. Padula CA et al (2004) Enteral feedings: what the evidence says. *Am J Nurs*, 104:62-69.
15. Medical Devices Agency (2000) Enteral Feeding Systems, MDA SN2000(27).