
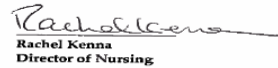


HANG TIMES OF ENTERAL FEEDS AND INFUSION EQUIPMENT (PLASTICS) FOR INPATIENTS IN OLC HC GUIDELINE


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1.0 Document and Guideline Purpose

- Document Purpose: The development of suitable guidance material on the handling of feeds and feeding equipment on the wards.
- Guideline Purpose. These guidelines aim to minimise the risk of acquiring infection from enteral feeds for this vulnerable group of patients

2.0 Introduction

- Sick children are at nutritional risk and it is important that they receive appropriate nutritional intake to meet their requirements. It is generally accepted that whenever possible, enteral nutrition (EN) is preferable to parenteral nutrition (PN) for adult and paediatric patients (ASPEN, 2009; Clinical Paediatric Dietetics, 2015).
- EN has many documented advantages, including improving the digestive, absorptive, immunological and nutritional status of the patient. However enteral feeding is not without risks. Such risks include nosocomial infections (e.g. pneumonia, bacteraemia, diarrhoea, and infectious enterocolitis) ^{being} linked to contaminated formulas or infusion sets (Okuma et al 2000, Himelright et al, 2002, ASPEN Practice Recommendations, 2009). These risks are exacerbated in critically ill children as many are immunocompromised (Grant, 2001).
- Contamination of enteral feeds with micro-organisms can occur at any point throughout their production, preparation, storage or administration. Enteral feedings can be given intermittently, as bolus feeds or continuously via a pump over longer periods. There are considerable variations in hang time recommendations throughout the literature with few studies conducted in the paediatric setting.
- Powdered Infant Formula (PIF) contaminated with harmful bacteria has been implicated as a source of illness in infants. In recent years, the emergence of disease associated with *Cronobacter spp* in PIF has necessitated a new risk assessment. Many in-patients will receive PIF while a large proportion of patients will receive ready to feed formula and sterile pack feeds.
- **Open Enteral System:** PIF, other reconstituted powdered feeds and ready-to-feed (RTF) liquid formulae are decanted into a feeding reservoir and infused via giving sets into a feeding tube (e.g. nasogastric, nasojejunal, gastrostomy). This is known as an open enteral system.
- **Closed Enteral System:** Sterile Pre Filled Pack Feeds can be attached directly to a giving set and are ready to administer. This system is referred to as a closed system.
- Foodborne diseases can affect all age groups in the population, however the following groups have been identified as higher risk groups based on international risk assessment (FAO/WHO, 2006):
- **Vulnerable group:** All infants (<12months of age)

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- **Most Vulnerable Group:** All infants <2months of age, particularly those who are preterm, low birth weight (<2.5kg) or immunocompromised.
- It is imperative that guidelines are developed on enteral feed hang times to assist all staff involved with the delivery of EN. The American Dietetic Association (ADA) recommend that a policy for hang time for formulas and feeding sets must be established locally for each facility (ADA, 2011).

3.0 Complications Associated With Enteral Feeding

- Microbial Contamination of feed and giving set
- Nosocomial Infections


4.0 Equipment

- Reservoirs: Nutricia™ 0.5litre Flocare (Rigid) Container, 1.3 Litre Flocare Top Fill Reservoir. Will be referred to as feeding reservoir throughout this document.
- Enteral feeding: Nutricia™ Flocare Infinity Pack Giving Sets. Will be referred to as feeding giving set throughout this document.
- Syringes, giving sets and adaptors used for gravity feeding

5.0 Procedure


See separate sections below for different types of feeds (5.1 – 5.5 inclusive)

ACTION	RATIONALE & REFERENCE
<p>5.1</p> <ul style="list-style-type: none"> • Powdered Infant Formulae (PIF) and Reconstituted Powdered Feeds • PIF and powdered Feeds reconstituted in the formula room must be used within 4 hours of removal from the fridge. • Always check the label and date on bottle before using. • The feeding giving set and feeding reservoir must be changed every 4 hours. 	<ul style="list-style-type: none"> • <i>Rationale to prevent contamination of feeds with bacteria.</i> • PIF and Reconstituted Powdered Feeds are non-sterile and may occasionally contain pathogens that can cause serious illness. • <i>Salmonella enterica</i> and <i>Cronobacter spp</i> are organisms present in PIF with a demonstrated causality of illness in infants and are therefore of most concern (FAO/WHO, 2006). • Feeds will equilibrate with ambient temperature. When feed temperature exceeds 4°C bacteria could grow to sufficient numbers in the feed to cause illness (FSAI, 2012). • The feeding set is sterile at the start of feeding but after 2 hours fat and protein deposits will build up on the feeding equipment. Bacteria that may be present in the feed could adhere to these deposits and grow forming a sticky layer (bio film) that can develop in time into growing communities of bacteria. If fresh feed is then put into the previously used equipment then the new feed will be contaminated with bacteria. (FSAI, 2012).

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	<ul style="list-style-type: none"> • These biofilms can be extremely difficult to remove during cleaning if equipment is reused. Consequently, it is safer to use clean and sterile feeding equipment for each fresh feed • (FSAI, 2012). • A maximum hang time of 4 hours is a compromise between practicality and the time within which bacteria could grow. The FSAI have recommended restricting hang times to 2 hours (FSAI, 2012). The consensus for inpatients has been to restrict hang times for PIF (feeds and equipment) to 4 hours. This complies with Crest 2004 Guidelines, ASPEN 2009 and the 2011 American Dietetic Association Guidelines.
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ACTION	RATIONALE & REFERENCE
<p>5.2</p> <ul style="list-style-type: none"> • Ready to Feed Liquid Formula • Ready to feed liquid formulae must be used within 4 hours of removal from fridge. Always check the label and expiry date on bottle before using. • The feeding giving set and feeding reservoir must be changed every 4 hours. 	<ul style="list-style-type: none"> • <i>Rationale to prevent contamination of feeds with bacteria.</i> • Ready to Feed Liquid formula is heat-treated by the manufacturer to kill <i>Cronobacter spp</i> and any other pathogenic bacteria (FSAI, 2012). • When feed is decanted from its container, it becomes non-sterile. • Feed will equilibrate with ambient temperature. When feed temperature exceeds 4°C bacteria could grow to sufficient numbers in the feed to cause illness (FSAI, 2012).
<p>5.3</p> <ul style="list-style-type: none"> • Expressed Breast Milk (EBM) • EBM must be used within 4 hours of removal from the fridge. Always check the name on the EBM bottle and dates on label before using. • The feeding giving set and feeding reservoir must be changed every 4 hours. • Fresh, unmodified EBM must be used within 48 hours of expressing • Frozen EBM must be used within 24 hours of defrosting 	<ul style="list-style-type: none"> • <i>Rationale to prevent contamination of feeds with bacteria.</i> • Expressed Breast Milk is not sterile. It will equilibrate with ambient temperature. When milk temperature exceeds 4°C bacteria could grow to sufficient numbers in the feed to cause illness (FSAI, 2012) • A maximum hang time of 4 hours has been set for EBM feeds, giving sets and feeding containers (American Dietetic Association, 2011; ASPEN, 2009)

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<ul style="list-style-type: none"> • EBM fortified or supplemented at ward level must be used within 2 hours • EBM fortified or supplemented in the formula room must be kept refrigerated and used within 24 hours 	
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ACTION	RATIONALE & REFERENCE
<p>5.4</p> <ul style="list-style-type: none"> • Closed System: Sterile Pre Filled Pack Feeds • Pre Filled Pack Feeds may be hung for a maximum period of 24 hours if a child is being fed continuously. • For Bolus Feeds using the pack system. • Always use the Infinity Pack giving set. This is the giving set used in OLCHC. • Always leave the giving set connected to the pack between bolus feeds. • Packs can be left hanging between feeds • Use a new giving set every time the pack is changed. • Minimize the number of disconnections (i.e. disconnection of the giving set from the NG/PEG tube). • When disconnecting the giving set from the feeding tube (i.e. NG/PEG) use aseptic techniques. Replace clear cap on the purple end of the giving set between feeds. Do not discard purple tip or clear cap when setting up feeds. 	<ul style="list-style-type: none"> • <i>Rationale to prevent contamination of feeds with bacteria.</i> • Sterile Pre Filled Pack (Ready to feed) Feeds such as Infatrini™, Nutrini™ and Nutrison™ have been heat-treated by the manufacturer to kill bacteria that could cause gastro-intestinal illnesses. • Sterile feed containers remain free of bacterial contamination in closed systems for at least 24 hour (ASPEN Practice Recommendations, 2009) • The feed or feeding set could become contaminated with bacteria when the feeding system handled is manipulated (ASPEN Practice Recommendations, 2009) • There is no need to keep the pack and giving set refrigerated between feeds.

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<ul style="list-style-type: none"> Before reconnecting the giving set to the feeding tube for the next bolus, press the “fill set” button on the Infinity pump to flush out the 10-15mls of feed in the tube and refill with new feed from the pack. 	<ul style="list-style-type: none"> This will flush out any contamination in the distal end of the giving set
5.5 <ul style="list-style-type: none"> Gravity infused Feeds (via syringe/reservoir) The syringe/reservoir must be changed after each feed 	<ul style="list-style-type: none"> <i>Rationale to prevent contamination of feeds with bacteria.</i> Feed residues may remain on the syringe and provide a medium for bacterial growth. Syringes are single use only and should not be re-used

6.0 Points to Note


Additional Points to Note:

- Feeds and plastics should always be handled and administered aseptically (ASPEN, 2009)
- The hands of the health care worker, carer and/or patient should be
- thoroughly washed under warm running water using liquid soap, rinsed
- and dried thoroughly, preferably with paper towels, before: -
 - Preparing feeds.
 - Assembling systems.
 - Any subsequent manipulation of the system. (CREST 2004)


7.0 Summary: Guidelines on the Hang Time of Enteral Feeds & Plastics for Inpatients

Feeds and plastics should always be handled using a non-touch aseptic technique. Always check the label and date on bottle before using.

System	Max Hang Time of Giving Set Pack/ Reservoir	Max Hang Time of Feed	Comment
Sterile Pre Filled Pack Feeds or Closed Systems (e.g. Infatrini™, Nutrini™, Tentrini™ and Nutrison™ range of feeds)	24hours	24hours	<ul style="list-style-type: none"> <u>Pack feeds and Closed Systems</u> <u>Pack feeds</u> may be hung for a maximum period of 24 hours if child is being fed continuously (ASPEN 2009). For Bolus Feeds using the pack system. Use the Infinity Pack giving set (this is the giving set used In OLCHC). Always leave the giving set

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			<p>connected to the pack between bolus feeds.</p> <ul style="list-style-type: none"> • Packs can be left hanging between feeds. • Use a new giving set every time the pack is changed. • Try to minimize the number of disconnections • When disconnecting the giving set from the feeding tube (i.e. NG/PEG) use aseptic techniques. • Replace clear cap on the purple end of the giving set between feeds. Do not discard purple tip or clear cap when setting up feeds • Before reconnecting the giving set to the NG/PEG tube for the next bolus feed, press the “fill set” button on the Infinity pump to flush out the 10-15mls of feed in the tube and refill with new feed from the pack. This will flush out any contamination in the distal end of the giving set
Powdered infant formulae and other reconstituted powdered Feeds	4 hours	4 hours	<ul style="list-style-type: none"> • These feeds are non-sterile.
Ready to feed infant formulae	4 hours	4 hours	<ul style="list-style-type: none"> • When these feeds are decanted they become non-sterile.
EBM	4 hours	4 hours	<ul style="list-style-type: none"> • Always check the name on the EBM bottle and dates on label before using. • Fresh, unmodified EBM must be used within 48 hours of expressing • Frozen EBM must be used within 24 hours of defrosting • EBM fortified or supplemented at ward level must be used within 2 hours • EBM fortified or supplemented in the formula room must be used within 24 hours
Bolus Syringe Feeds that remain on Reservoir	Change with each feed.	Gravity Infusion	Change with every feed irrespective of feed type.

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