

PURPOSE

POLICY SCOPE: Applies to BC Children's Hospital.

To provide a policy for when and how home blenderized feeds can be used for inpatient services at BCCH (includes SHHC and MH).

When infant or enteral formula is required during an inpatient admission, commercial formula is provided by the hospital. Formula is selected from the Infant and Enteral Formulary which has been established to provide a wide range of nutritional products to meet the needs of most patients.

POLICY STATEMENTS

An order must be written for nutrition before food, beverages, infant or enteral formula can be dispensed to any patient admitted to hospital.

If a patient/parent/guardian wishes to feed a Home Blenderized Feed, they are responsible for the procurement, preparation, supply and transportation of the feed following food safe guidelines. The hospital is unable to prepare HBF.

All patients receiving HBF must meet the requirements in the Practice Guideline and are approved by the dietitian and medical care team. [Refer to attached document, Inpatient Use of Home Blenderized Feeds - Practice Guideline for Health Care Providers]. Only patients previously receiving HBF will be eligible for HBF while inpatients within BCCH.

Nursing staff will not support the administration of a HBF. A parent/guardian must be present at the hospital during the entire feed administration and is responsible for administering the HBF using a personal enteral feeding pump or syringe. Hospital pumps will not be used, altered or manipulated to administer HBF.

PROCEDURES

- 1.0 The RD/physician will confirm that the patient was consuming a HBF prior to admission.
- 2.0 The RD/physician will confirm the appropriateness of the HBF for the current hospital admission (Refer to attached document, Inpatient Use of Home Blenderized Feeds - Practice Guideline for Health Care Providers):
 - 2.1 The RD will evaluate the nutrition composition of the HBF and the nutritional adequacy compared to the patient nutrient requirements.
 - 2.2 The physician will evaluate the appropriateness of the HBF for the current medical situation, route of administration (gastric tube), the duration of feed times (<2 hours/administration, non-continuous administration), and the appropriateness of the feeding tube size (>14 French).
 - 2.3 If the HBF is appropriate and nutritionally adequate, the RD/physician will review the risks and benefits of using a HBF in hospital with the patient/parent/guardian.
 - 2.4 If the HBF is nutritionally inadequate or otherwise inappropriate, the RD/physician will review other options with the patient/parent/guardian. If a parent/guardian chooses to feed a HBF against medical advice, the RD/physician will document their assessments and discussions with family in a factual way according to documentation policy.

- 3.0 The RD and/or physician will review the patient/parent/guardian and hospital responsibilities with the appropriate person (Refer to attached document, Information for Parents – Using a Home Blenderized Feed in Hospital).
- 4.0 The parent/guardian will sign the informed consent document prior to provision of the HBF in hospital (Refer to attached document, Inpatient Use of Home Blenderized Feeds - Home Blenderized Feeds Consent Form).
- 5.0 The RD or physician will place the informed consent document in the chart.
- 6.0 The RD and/or physician will document their evaluations and outcome of discussions with the patient/parent/guardian according to established documentation policy.
- 7.0 The RD or physician will document the enteral feeding order for HBF in the provider order section of the chart according to policy PTN Nutrition Orders 01.012 and the appropriate notes section of the chart.
- 8.0 Nursing staff will assist the patient/parent/guardian to ensure HBF provided is labeled and stored on the inpatient unit according to standards described in the HBF Practice Guideline. The label will include:
 - 8.1 patient name
 - 8.2 medical record number
 - 8.3 contents will be named “home blenderized feed”
 - 8.4 the RN will confirm and label with an expiry date (24 hours from the time of preparation as noted by parent/guardian).
- 9.0 The parent/guardian will be present at all feeding times to administer the HBF to the patient.
- 10.0 The hospital will offer an appropriate commercial enteral feeding alternative in the case that a HBF is not available. The dietitian and medical team will discuss this option with patient/parent/guardian in advance of administration.

SITE APPLICABILITY

BC Children's Hospital
Sunny Hill Health Centre
BC Mental Health

PRACTICE LEVEL/COMPETENCIES

For enteral nutrition orders: The RD is a Registrant of the College of Dietitians of British Columbia, who is registered to practice Restricted Activity A and Restricted Activity C.

DEFINITIONS

Restricted Activity A: design, compound or dispense therapeutic diets where nutrition is administered through enteral means.

- “compound” means to mix ingredients for enteral nutrition.
- “design” means the selection of appropriate ingredients for enteral nutrition.
- “dispense” means to fill a prescription for enteral nutrition.
- “enteral” means administration of a nutritional substance to a patient by means of a feeding tube into the gastrointestinal tract.

Restricted Activity C

If a substance is being administered by instillation through enteral means, the RD:

- physically manipulates or adjusts the enteral delivery device or system.

EQUIPMENT

N/A

PROCEDURES

N/A

DOCUMENTATION

Nutrition Orders by Dietitians PTN.01.012

REFERENCES

College of Dietitians of British Columbia, Schedule B: CDBC Standards of Practice.

College of Dietitians of British Columbia, Interpretive Guide: Restricted Activities.

Introduction

Homemade enteral formula can be a safe and nutritious alternative to commercial formula however metabolic, mechanical and microbial concerns need to be addressed using home blenderized tube feeding (HBF). These practice guidelines are intended to help health professionals to support their patients who choose to use HBF in place of commercial formula while enteral feeding at home.

Some families choose to provide HBF as an alternative to a commercial formula for enteral tube feeding. To date there is limited evidence supporting the clinical benefits of homemade formula over commercial formula. The proposed benefits of a homemade formula include additional nutrition such as phytonutrients⁽¹⁾, decreased gagging and retching⁽²⁾ and improved transition to oral diets.⁽²⁾

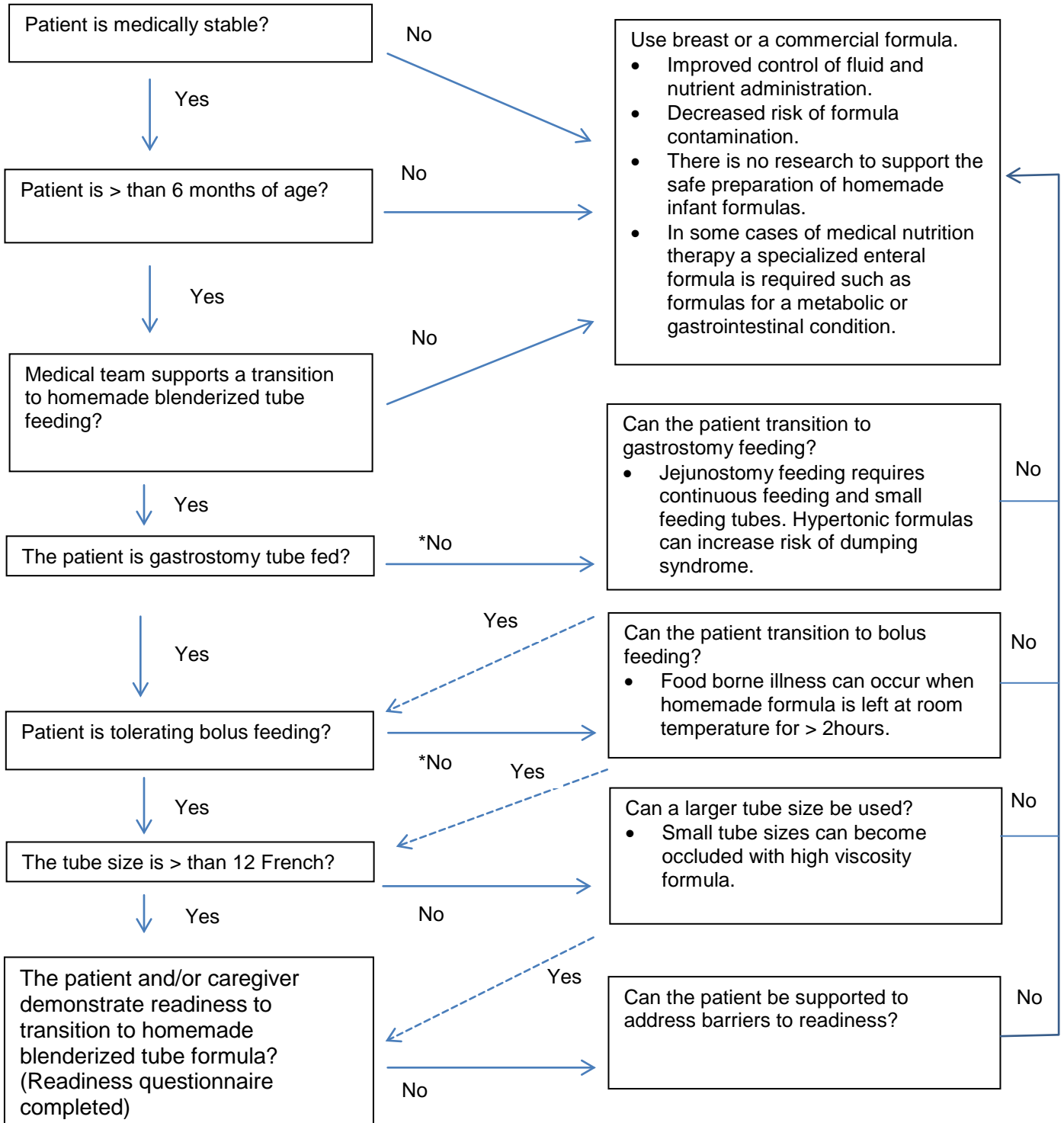
The risks associated with HBF formula include: microbial contamination, tube occlusion, nutritional inadequacies and hyperosmotic formulas.^(3,4) To minimize the known risks, HBF need to be prepared, stored and administered according to standard food safety practices, blended to a fully liquid consistency and assessed for nutritional adequacy.

For hospitalized patients, refer to the BC Children's Hospital Policy, information for parents and consent form.

Determining appropriate candidates for HBF

Understanding the risks and benefits of HBF is essential in determining clinical appropriateness of homemade enteral formula in place of commercial formula. Refer to the 'Algorithm for determining appropriate candidates for HBF' to support decision making on page 2. In some situations patients may choose to use HBF despite clinical readiness, in these cases, health providers should clearly communicate and document the associated risks.

Algorithm for Determining Appropriate Candidates for HBF



* In some circumstances jejunostomy feeds and/or continuous feeds have been used following safe food handling guidelines however this is not a recommended practice

Planning a HBF

A Registered Dietitian (RD) should be consulted to support patients in planning a nutritionally complete HBF. Utilizing a computerized nutrient analysis program such as “Food Processor” available at BC Children’s Hospital can help verify nutritional adequacy.

Some families may choose to prepare the same HBF formula everyday however variety within food groups helps to diversity nutrients. Using a personalized HBF template can help to ensure nutrition needs are met while supporting nutrient variety.

Steps to planning a HBF formula:

1. Complete a full nutrition assessment to determine macro- and micro- nutrient needs, fluid requirements and tube feeding schedule. Note food allergies, family dietary preferences as well as any potential food/drug interactions.
2. Confirm patient/caregiver goals. Some families choose to make a full transition to HBFs while others choose to make 1-2 meals or snacks as HBFs with the rest of the nutrition as commercial formula.
3. Using Canada’s Food Guide (or Homemade Blended Formula Worksheets ⁽⁵⁾), prepare a template of the food group servings needed daily. In some cases, not all food group servings will be met and additional macro- or micronutrient supplementation may be needed.
4. With the patient/caregiver create some example recipes for HBF.
5. Complete a nutrient analysis of several blends. Assess macronutrient distribution and compare micronutrient intake to dietary reference intakes. In many cases additional salt should be considered as many HBFs use whole foods with very little sodium.
6. Add additional water to blends or provide as flushes to ensure daily free water needs are met.

Example Recipe ⁽¹¹⁾

Grains: ½ cup cooked quinoa, ½ cup cooked brown rice, 1 slice of whole wheat bread

Vegetables and Fruit: ½ cup carrots, ½ cup broccoli, ½ cup banana, ½ cup plums

Milk/Alternatives: 2 cups milk

Meat/Alternatives: 1/4 cup chickpeas, 1 ounce roast beef

Fat: 1 Tbsp Canola oil

Other: 1 Tbsp cooking molasses 1/3 tsp table salt

Nutrient	DRI Requirements for children 1-3 years	Daily Intake
Calories (kcal)	950-1050	1050
Protein (g)	15	41 (15%)
Carbohydrates (g)	100-130	139 (53%)
Fat (g)	30-40	38 (32%)
Dietary Fibre *	19	16
Vitamin A –RAE (µg)	300	742
Vitamin B1 (Thiamine) (mg)	0.5	0.5
Vitamin B2 (Riboflavin) (mg)	0.5	0.5
Vitamin B3 (Niacin) (mg)	5	6.6
Vitamin B6 (mg)	0.5	1.1
Vitamin B12 (mg)	0.9	0.83
Vitamin C (mg)	15	70
Vitamin D (IU)	600	200+ 400 (supplement)
Vitamin E (alpha-toco) (mg)	6	5.5
Folate (mcg)	150	173
Pantothenic Acid (mg)	2	2.4
Calcium (mg)	700	780
Copper (mg)	0.34	1.6
Iron (mg)	7	6.2
Magnesium (mg)	80	229
Phosphorus (mg)	460	440
Potassium (mg)	3000	1445
Sodium (mg)	1000	950
Zinc (mg)	3	5.8

Equipment to prepare, store and administer a HBF

Preparation equipment:

1. Blender. A commercial grade blender is recommended in order to use a variety of foods while ensuring foods are blended to a thin enough consistency to avoid tube occlusion. Some manufacturers of commercial grade blenders offer a medical discount. Families and healthcare professional can contact the company for more information.
 - a. Blendtec - <http://www.blendtec.com/>
 - b. Vitamix - <https://www.vitamix.ca/>
2. Kitchen space, measuring cups, sink.
3. Strainer or fine sieve if an industrial blender is unavailable. In some cases, a sieve may also be needed for seedy foods such as berries even with the use of an industrial grade blender.

Storage equipment:

1. Extra refrigeration and freezer space.
2. Airtight storage containers for storing formula.
3. Labels for storage containers.

Administering a HBTF:

1. Syringes.
 - a. Many families prefer a large syringe (60 mL) however in some cases smaller syringes (20 or 35 mL) can be easier to administer thicker blends but increase the time spent feeding.
2. Bolus extension set for low-profile gastrostomy tubes (when syringe feeding).
3. Feeding pump or gravity feeding set if not syringe feeding.

Preparation, blenderizing and storing a HBF

Preparation, storage and administration of HBF requires safe food handling practices. Food borne illness can occur when harmful bacteria or viruses are spread from food to people. Extra precautions should be taken for people at higher risk of food borne illness such as: seniors, children under 2 years of age and pregnant women as well as people with chronic or autoimmune diseases, people who are asplenic, or people taking immune suppressing medications.⁽⁶⁾

Patients and caregivers should be taught standard safe food handling practices for blenderizing a HBF:

1. Wash and dry hands before preparing and administering all HBF.⁽⁹⁾
 - a. Scrub all parts of hands with soap for at least 20 seconds.⁽⁷⁾
 - b. Rinse with warm water and dry with a clean cloth or paper towel.⁽⁷⁾
2. Wash and sanitize cooking surfaces and equipment prior to use.
 - a. To avoid cross contamination use separate cutting boards and utensils for raw foods and ready-to-eat foods.⁽¹⁸⁾
 - b. Wash cutting boards and utensils with hot soapy water and sanitize before reusing them.
 - c. To prepare a sanitizing solution at home, combine 5 ml of household bleach into 1 liter (4 cups) of water. Allow the sanitizer to sit on the surface of cooking utensils for at least 1 minute before wiping off.⁽⁷⁾
3. Wash all fresh fruits and vegetables. People with weakened immune system should use cooked fruits and vegetables.⁽⁸⁾
4. All meat, fish, poultry and eggs should be cooked to the appropriate temperature (see Table 1 below) before used in enteral formula.⁽⁷⁾
5. Cool all heated food within 2 hours of cooking. Do not leave food to cool at room temperature for more than 2 hours.⁽⁷⁾
6. Following the recipe guidelines, the HBF should be blended to a liquid consistency using a commercial grade blender or a standard household blender and then a sieve to strain lumps and seeds.
7. Store all formula in a refrigerator (<4°C, 40°F) or freezer (-18°C, 0°F).
 - a. Time for storage in refrigerator – 48 hours.
 - b. Time for storage in freezer – 1 month.
8. Thaw foods in the refrigerator or under cold running water. Bacteria left in foods after cooking can grow rapidly when food is cooled. HBF should be reheated to at least 74°C can kill harmful bacteria.
9. Avoid having HBF at room temperature for > 2 hours. Discard any HBF that has been left out for > 2 hours.

Table 1: Safe internal Cooking Temperatures ⁽¹⁰⁾

Meat, poultry, eggs and fish	Temperature
Beef, veal and lamb	77°C (170°F)
Pork	71°C (160 °F)
Poultry & game birds – pieces	74°C (165°F)
Poultry & game birds – whole	82°C (180°F)
Egg/Egg dishes	74°C (165°F)
Fish	70°C (158°F)
Shell fish	74°C (165°F)
Other (hot dogs, stuffing, leftovers)	74°C (165°F)

Administering HBF:

The following steps should be taken to avoid mechanical complications:

1. Use aseptic technique when administering HBF including ensuring proper hand hygiene and a clean surface area and equipment are used.
2. Feed according to individualized tube feeding schedule.
3. Gravity and syringe feeding is encouraged over pump feeding to ensure that HBF is only at room temperature for <2 hours. Feeding pumps can be used with a fully liquidized formula but can become easily occluded with lumps or high viscosity formula.
4. Wash all feeding equipment (syringes, bolus adaptors, feeding bags) after providing HBF.

Emergency Planning for Patients on HBF

Emergencies can happen at any time. Children with tube feeds have special health needs that take additional planning in times of emergencies. In addition to usual emergency planning with home enteral nutrition, the following points should be discussed with families order to be prepared for emergency situations.

1. Friends and family members trained in tube feeding:

Name:

Contact:

2. Commercial formula to use in case of emergency or during hospitalization:

Feeding volume and rate as of _____ (date):

3. Extra water and pureed/strained infant foods stored at home for hydration and nutrition.

Teaching Checklist for HBF

Patients and/or families should receive teaching on the following prior to transitioning to HBF:

- Appropriate patient candidates for HBF
- Equipment and supplies
- Nutrition guidelines and HBF recipe template
- Preparation, blenderizing and Storing HBF
- Administration of HBF
- Emergency Planning

Helpful Resources for Families

- *The Homemade Blended Formula Handbook*, by Marsha Dunn Klein and Suzanne Evans Morris, 2007, Mealttime Notions LLC
- *Complete Tube Feeding: Everything You Need to Know about Tube Feeding, Tube Nutrition and Blended Diets*, by Eric Aadhaar O’Gorman, 2012
- The Oley Foundation – Blenderized diet pros and cons.
<http://oley.org/?page=MakeYourOwnFoodTF>
- Seattle Children’s Hospital, Patient and Family Education: Homemade Blended Tube Feeding Handout.
- Feeding Tube Awareness Foundation – Blenderized diet.
<http://www.feedingtubeawareness.org/Blenderized-Diet.html>
- Food for Tubies – online resource group. <http://www.foodfortubies.org/>

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Information for Parents - Using a Home Blenderized Feed (HBF) in Hospital

Background:

At our hospitals, we respect the central role of a family in a child's life. You are a part of your child's health team, and together we will work together to make sure that your child has safe and nutritious feeds during their hospital stay.

When your child is in hospital, you may want to continue feeding him or her your home blenderized feed. Depending on the medical situation of your child, using a home blenderized feed in hospital may or may not be safe. If it is safe for your child to have their home blenderized feed, you may be asked to prepare the feed at home and bring it to the hospital because the hospital's kitchen is unable to make home blenderized feeds. If you are unable to prepare it, the hospital will offer you alternatives for feeding your child.

What you can expect:

Before using a home blenderized feed in hospital, the medical team must review with you whether or not it is medically appropriate to continue with this type of feed. There are many factors that must be assessed.

Before using a home blenderized feed in hospital, the medical team will review:

- Medical appropriateness of using a home blenderized formula - Is the formula safe for your child during this hospital admission?
 - Sometimes medical problems may mean that a home blenderized feeds cannot be used safely for your child.
 - Your child's medical team will review the medical situation, and discuss the specific medical problem and the safety of a home blenderized feed with you.
- Nutritional needs of your child compared to the nutritional content of the feed - will your child meet their nutritional requirements and expected growth using this feed?
 - You will need to provide a sample recipe for analysis
 - The dietitian will analyze the nutritional composition of the feed and compare it to your child's needs.
 - The dietitian will review with you the nutritional appropriateness of the feed for use in the current admission.
 - Note: To prepare for planned or unplanned hospital admissions families are encourage to have a copy of their recipe and if possible a nutritional analysis of the feed

- Alternative and complementary products used in the feed – what alternative and complementary products are in the feed and are there are complications that may occur if using this feed?
 - You will need to provide a detailed list of products that are added to the feed. The medical team will review alternative and complementary products in the feed.
 - Some products may be safe, and others may interact with drugs that your child is receiving in hospital. The medical team will discuss the safety of products with you.
- How your child will be fed
 - Hospital pumps cannot be used to provide a home blenderized feed
 - Bolus feeds are recommended or you may use your own enteral feeding pump

If your home blenderized feed is safe for use, the medical team will review with you what you need to do in hospital to feed your child a home blenderized feed. A consent form will be provided for you to review and sign.

You will be asked to prepare the home blenderized feed and bring it to the hospital for your child. This is because the hospital's kitchen is unable to make home blenderized feeds. If you are unable to prepare it, the hospital will offer you a commercial formula.

If you have any questions, please ask your child's health care providers. We are committed to partnering with you in the care of your child to make sure that your child has safe and nutritious feeds during their hospital stay.

Inpatient Use of Home Blenderized Feeds – Home Blenderized Feeds (HBF) Consent Form



Patient Label

Home Blenderized Feeds Consent Form

I, _____ Patient or Legal Representative consent to the
(print name)
following for my child _____. I understand I have been given the option to continue
with our home blenderized feeds (HBF) during my child's hospital stay. This may change if my child's
medical condition changes.

I understand and agree to prepare the HBF at my home and bring them to hospital as I understand that the
hospital's kitchen is unable to make HBF for my child. I understand that hospital staff will not administer
HBF to my child or use hospital pumps for this purpose while in hospital. I understand and agree to be
present at all times during all HBF when being administered to my child.

Risks

I have reviewed the potential risks with the medical team. I understand there may be risks associated with
HBF, including:

- i. Risk of not meeting nutrition requirements:
 - a. There is potential for error in preparation of HBFs. This may increase the risk that my child may not receive nutrition that meets their needs.
- ii. Risk of infection:
 - a. Unlike commercially sterilized formulas, HBF are not sterile therefore there is a risk that bacteria may grow in a HBF preparation.
- iii. Risk of contamination:
 - a. HBF will not be prepared at the hospital and as such there is a greater risk of contamination and/or spoilage during home preparation, transportation and storage.
- iv. HBF can only be used for bolus feeds no more than 2 hours at a time.
- v. Providing a constant supply of HBF may be difficult depending on my accommodations; if I am unable to provide a continuous supply of HBF I will allow the hospital to provide and administer a commercial formula for my child.

Benefits

I understand there is limited evidence that homemade formula eg. HBFs are more nutritious than
commercial formula. The benefits of homemade formula may include increased intake of phytonutrients,
decreased gagging associated with feeding and improved transition to oral diets.

