

## Formula Preparation, Storage and Use

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### Critical Points

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- All infant formula is provided by the hospital as a ready-to-feed product or mixed in the designated formula room.
- Powdered formulas for patient consumption is not to be prepared on the unit or in patient rooms.
- Notify Nutrition and Food Services (NFS) supervisor or Materiel Services for any concerns regarding formula integrity, expiration, or recalls.
- Two patient identifiers and the formula order should be verified against EHR for current formula order prior to every feeding.
- Medications may be added to formula for an individual feeding by the RN using aseptic technique at bedside. (Medication is scanned into the MAR per nursing procedure [Medication Administration](#).)
- Adding flavorings to infant formulas is not recommended. All requests require Registered Dietician (RD) approval.

### Supplies

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- Formula as determined by provider order.

## Formula Preparation, Storage and Use (*Continued*)

### Procedure

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#### FEEDING ORDERS

- Obtain MD/NP order for formula type, caloric concentration, amount, frequency, additives and route of feeding.
- Each bulk label for prepared formula from the formula room will include:
  1. Patient name
  2. MRN
  3. Patient location
  4. Formula name + additives
  5. Caloric density
  6. Par volume
  7. Volume in container
  8. Expiration date and time
  9. FOR ENTERAL USE ONLY
  10. Refrigerate until use.

#### PREPARATION AND HANDLING

- Check expiration date on ready to feed bottle and label of formula room prepared formula.
  - Inspect contents for integrity.
  - Notify RD or NFS supervisor before discarding damaged or expired formula. Formula must be discarded in such a way as to prevent human consumption.
- Handle individual feedings dispensed from sealed bottles/cans, or containers of formula mixed in the formula room, using aseptic technique, on a clean, dry, disinfected surface.
- Aseptic technique must be practiced in the preparation or addition of additives to all infant formulas.
  - This is defined as use of hand hygiene in conjunction with “no-touch” technique (avoiding contact contamination by skin, clothing, work surfaces, equipment and other environmental objects).
- Remove container from refrigerator immediately before use and return as soon as possible after dispensing.
- Dispense bulk formula into clean, individual feeding bottle.
- Never return formula to bulk container.

#### WARMING

- Do not leave refrigerated formulas on counter to bring to room temperature.
- Limit warming time for oral or bolus feedings to no more than 15 minutes.
- Do not warm formula for continuous feedings.
- Never use microwave ovens to warm formula.
- Warm formulas to room temperature in a water free bottle warmer or clean warm water bath.
  - If using a water bath, water temperature should be comfortable to touch and water level below the level of the nipple ring.

## Formula Preparation, Storage and Use (*Continued*)

### STORAGE

- Do not freeze prepared infant formulas.
- Check expiration date. Formula prepared by the diet kitchen, or other opened formula, expire in 24 hours.
- Store formula in bedside Penguin or designated formula refrigerators.
- Do not store formula with other food.
  - Formula and breast milk may be stored together in the Penguin or in separate bins in designated formula refrigerators.
- Store infant formulas and pumped breast milk in a secure area with limited access.
- Ensure refrigerators used to store infant formula on patient care units maintain temperature. Refrigerators are continuously monitored by an electronic system. Nursing staff are responsible to respond to out of range alerts.
- Do not return ready to feed formula taken into a patient room to the storage area or use for another patient unless properly cleaned and sanitized.
- Do not store cleaning supplies near formula products.

### ADMINISTRATION

1. Clean top of formula can or nursette with clean, damp paper towel prior to opening.
2. Label ready to feed formula with date and time upon opening.
3. Combine, as needed, two ready-to-feed products at the bedside to make the following concentrations:
  - 21.5 kcal/oz. Similac ([recipe 1:1](#) 19 kcal/oz. : 24 kcal oz. ready to feed)
  - 22 kcal/oz. Enfamil, Pregestimil, Similac Special Care ([recipe 1:1](#) 20 kcal/oz. : 24 kcal oz. ready to feed)
  - 27 kcal/oz. Similac Special Care ([recipe 1:1](#) 24 kcal/oz.:30 kcal/oz.)
4. For infants being nipple fed pour appropriate amount of bulk formula into separate bottle or place nipple directly onto ready-to-feed nursette.
5. Keep nipple covered with plastic wrapping until ready to feed.
6. When using a separate bottle for feeding infant, store any unused formula remaining in nursette in the refrigerator for up to 24 hours.
7. Discard infant formula remaining in the feeding bottle one hour after the start of nipple feeding.
8. Tube feeding administration system: assemble on clean, dry, disinfected surface. Avoid touch contamination of any portion of feeding system that will be in contact with the feeding.
9. Label enteral feeding set up bag/syringe pump with: contents, date and time, Formula administration via an enteral feeding set: ensure maximum hang-time of 4 hours.
  - Empty all formula from feeding bag before adding formula at 4 hours.
10. Flush tubing with sterile water or air after intermittent feeds or medications.
11. Delivery set up change:
  - Change enteral bag and tubing every 24 hours.
  - For syringe pump feedings change syringe and tubing every 4 hours.
12. Disinfect feeding-pump housing before initial use by each patient and every 24 hours.

## Formula Preparation, Storage and Use (*Continued*)

### FORMULA BROUGHT FROM HOME

- Formula brought from home for use in the hospital is discouraged. Refer to [Medical Center Policy 6.06.10 Patient Food Brought from Outside the Hospital](#).
- Not permitted:
  - Probiotic formulas
  - Homemade formulas
- Use only commercial formulas from the UCSF Formulary. NFS will make a reasonable effort to special order non-formulary products when deemed medically necessary.
  - Special orders may take up to 5 business days to arrive. Upon delivery NFS will replace the amount used from patient's home supply (within reason).

### DISCHARGE PLANNING

- Inform family that NFS does not provide formula for discharge.
- Family and case managers are responsible for securing a supply for discharge starting with day of discharge.
- In an emergency, and if an adequate supply is available in house, the NFS RD supervisor may approve up to a 2-day supply.
  - Follow the NFS Sample Formula Distribution policy for purposes of tracking.
  - Formula lot number and expiration date must be documented in the medical record.

### POWDER FORMULA USE DISCHARGE TEACHING

- UCSF Benioff Children's Hospital recognizes the need for powdered formula to be used for teaching purposes with patients and families prior to discharge. When family needs to be taught preparation of formula using powder:
  1. RD will provide appropriate recipe for home use and a can of powdered formula labeled "For Teaching Purposes Only."
    - a. Powdered formula used for demonstration may not be the one the patient has been prescribed. This is for demonstration only.
  2. RD will demonstrate correct measuring and mixing of formula and water.
  3. Parents will return demonstrate their ability to make the formula correctly.
  4. Finished product must be discarded and cannot be used for patient consumption.
  5. Refer to [Appendix A](#) – Mixing Instructions for Concentrated Infant Formulas at Home.
    - a. Note: RD provides individual formula specific recipes whenever possible. Appendix recipes are for reference only.

## Formula Preparation, Storage and Use (*Continued*)

### References

Level of Evidence (FAME*)	E4	Groh-Wargo, S., Thompson, M., & Cox, J. (Eds.) (2016) <i>Pocket Guide to Neonatal Nutrition</i> (2 <sup>nd</sup> Ed.). Chicago, IL; Academy of Nutrition and Dietetics.
	E4	Steele, C. & Collins, E.A. (Eds.) (2018). <i>Infant Feedings: Guidelines for preparation of formula and breast milk in health care facilities</i> . (3 <sup>rd</sup> Ed.) Chicago, IL: Academy of Nutrition and Dietetics
* FAME Scale details: See nursing policy <a href="#">Policy, Procedure, &amp; Competency Development, Review, &amp; Approval</a>		

### Procedure History

Author:	Tara James, RN, Case Manager; Maria Hetherton, RD; Laurie Nathan
Originated:	06/2003
Resources:	Maria Hetherton, RD, CSP
Reviewed:	10/06: Maria Hetherton, RD; Laurie Nathan, RN,, Assistant Nurse Manager; Liz McMillan, RD; Lisa Boice, RD 10/11: Maria Hetherton, RD; Barbara Bratton, RN, MSN, PNP 2/14: Maria Hetherton, RD; Linda LeFrak, RN, MS, CNS; Anne Boyle, RD 8/16: Maria Hetherton, RD, CSP; Ami Bhow, RD; Kim Johnston, RN, RNC-NIC, Unit Director 12/18: Maria Hetherton, RD, CSP; Ami Bhow, RD; Kim Johnston, RN, RNC-NIC, Unit Director

## Formula Preparation, Storage and Use (*Continued*)

### Appendix A: Mixing Instructions for Infant Formula at Home

These recipes may be used for standard infant formulas (milk- and soy-based), Nutramigen, and Pregestimil powder. They assume that 20 kcal/oz. is reconstituted from powder in the ratio of 1 scoop (provided in the can) of powder to 2 fluid ounces of water or concentrated liquid mixed 1:1 with water.

#### FORMULA MADE FROM POWDER†

Concentration	Water (oz.)	Level Scoops	Final Volume (oz.)
20 kcal/oz.	2	1	2.2
22 kcal/oz.	5.5	3	6.1
24 kcal/oz.	5	3	5.7
27 kcal/oz.	4.25	3	4.9
30 kcal/oz.	5	4	5.9

† These recipes are not applicable for Similac Neosure, EnfaCare or Neocate. They are also not appropriate for ANY of the Similac OptiGro products that are 19 kcal/oz. for standard concentration.

#### SIMILAC OPTIGRO FORMULAS MADE FROM POWDER † †

Concentration	Water (oz.)	Level Scoops	Final Volume (oz.)
19 kcal/oz.	2	1	~2.2
22 kcal/oz.	7	4	~7.9
24 kcal/oz.	7.75	5	~9.1
27 kcal/oz.	6.75	5	~7.8
30 kcal/oz.	6	5	~7.1

††19 kcal/oz. for standard concentration.

Always read package directions for proper handling of powdered formula. (i.e., packed versus unpacked scoop)

NOTE: Large volume recipes should be calculated by the RD for each individual formula due to significant variation in grams/cup and displacement.

## Formula Preparation, Storage and Use (*Continued*)

### FORMULA MADE FROM CONCENTRATED LIQUID

Concentration	Water (oz.)	Concentrate (oz.)	Final Volume (oz.)
20 kcal/oz.	1	1	2
22 kcal/oz.	2	2.5	4.5
24 kcal/oz.	2	3	5
27 kcal/oz.	1	2	3
30 kcal/oz.	1	3	4

### FORMULA MADE FROM CONCENTRATED LIQUID (LARGE VOLUME)

Concentration	Water (oz.)	Concentrate (oz.)	Final Volume (oz.)
20 kcal/oz.	13	13	26
22 kcal/oz.	10.5	13	23.5
24 kcal/oz.	8.5	13	21.5
27 kcal/oz.	6	13	19
30 kcal/oz.	4	13	17

## Formula Preparation, Storage and Use (*Continued*)

### **SIMILAC NEOSURE (ABBOTT)/ENFACARE (MEAD JOHNSON)**

Concentration	Water (oz.)	Level Scoops	Final Volume (oz.)
20 kcal/oz.	4.5	2	5
22 kcal/oz.	4	2	4.5
24 kcal/oz.	5.5	3	6
27 kcal/oz.	8	5	9
30 kcal/oz.	4.25	3	5

### **NEOCATE INFANT (SHS)**

Concentration	Water (oz.)	Level Scoops	Final Volume (oz.)
20 kcal/oz. *	3	3	3.3
22 kcal/oz.	4.5	5	5
24 kcal/oz.	2.5	3	2.8
27 kcal/oz.	5	7	5.8
30 kcal/oz.	2.5	4	2.9

\*Per manufacturer, displacement is not accounted for. To make larger volumes, the cup recipe is suggested.