

Pediatric Formula



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Introduction



- *Infant* enteral formula can be comprised of human breast milk, as well as commercial product.
- *Pediatric* formula are designed for children from 1- 10 years of age who require tube feeding to meet nutrient needs.



Indication for Enteral Nutrition



1. who are unable to obtain more than 80% of caloric needs by moth.
2. who require an extended period of time to eat (i.e., more than 4 hours per day).
3. Children who are malnourished or show poor growth.





1. Supporting growth



2. Fussy eaters



3. For supplementation during illness



4. When chewing and swallowing hurts



5. Healthy and convenient snack between meals



6. Minimizing lactose intake

Preterm Infant Enteral Formula



1. Human Milk Fortifiers



- Preterm infants have increased needs for protein, mineral, and electrolyte to support the rapid growth.
- It is a powder that are mixed with human milk to increase the protein, mineral, electrolyte, and vitamin.
- Iron- containing HMF have 1.4 mg / 4 packets.

Kcal/ml	Kcal/fl oz	Protein g/L	CHO g/L	Fat g/L	Osmolality (mOsm/kg)
0.8	24	23-25	66-85	41-49	320-385

Example of Human Milk Fortifiers



- A peer-reviewed clinical study showed that Similac Human Milk Fortifier, a low iron fortifier, preserved the antibacterial activity of breast milk against *E. coli*, *Staph*.
- Human milk can be fortified with Similac Human Milk Fortifier until the low-birth-weight infant reaches a weight of approximately 3600 g (approximately 8 lb) or as directed by a doctor

2. Preterm Formula



- Increased in protein, mineral, electrolyte, and vitamin.
- Isotonic formula.

Kcal/ml	Kcal/fl oz	Protein g/L	CHO g/L	Fat g/L	Osmolality (mOsm/kg)
0.67-0.8	20-24	22-24	85-90	41-44	280-310

Example of Preterm Formula



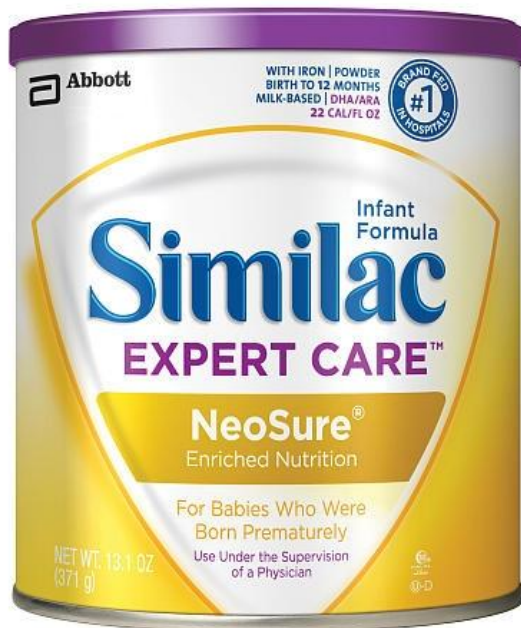
3. Preterm Discharge Formula



- Designed for preterm infants nearing hospital discharge and should be continued until 9-12 months corrected age.
- Hypotonic formula, 1.3 gm iron.

Kcal/ml	Kcal/fl oz	Protein g/L	CHO g/L	Fat g/L	Osmolality (mOsm/kg)
0.74	22	20	77	40	230-250

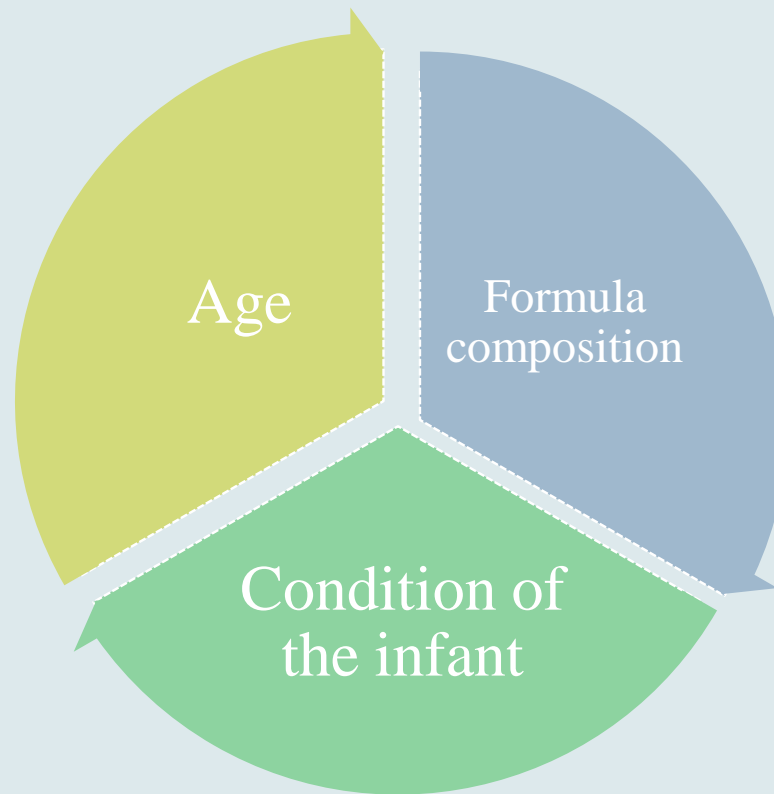
Example of Preterm Discharge Formula



Infant Enteral Formulas



Selection of infant formula can be based on



1- Standard Cow's Milk - Based



- Indicated as routine feeding for infants if breast milk is not available or if supply is inadequate.
- Isotonic, lactose is the main CHO source.

Kcal/ml	Kcal/fl oz	Protein g/L	CHO g/L	Fat g/L
0.67 – 0.8	20 - 24	14	71- 75	34-36

Example of standard formula



0 – 6 month



0 – 12 month



0 – 3 month



0 – 6 month



6 month and above

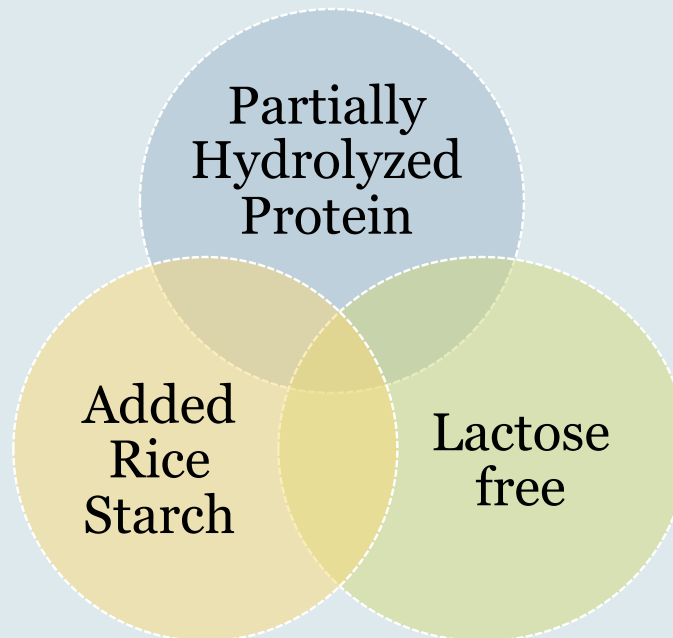


0 – 12 month

2- Term formula Designed for Symptom of intolerance

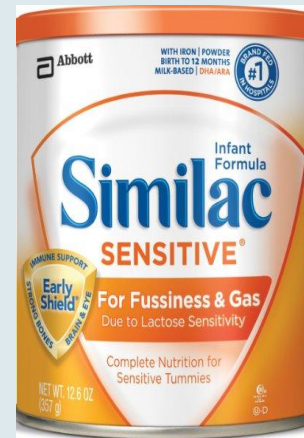


- ❖ Intolerance such as spitting up or fussiness.
- ❖ Appropriate for the full term infant.
- ❖ Modifications include :



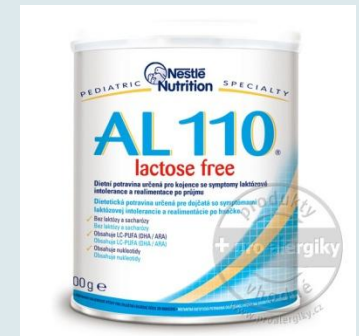
A. Partially Hydrolyzed Protein

- Not considered hypoallergenic & are not intended to be used for treatment of any allergic condition or disease.
- These formulas may be indicated for spitting up or fussiness.



B. Lactose - Free

- Including soy formula.
- Indicated in infants with suspected transient lactase deficiency secondary to gastroenteritis or prolonged diarrhea.
- Not indicated in galactosemia. (why???)



C. Added Rice Starch

- ❑ Are standard milk based infant formula designed to thicken in the acidic environment of the stomach to decrease spitting up episodes, GERD.
- ❑ Not substitutes for thickened formula indicated for risk of aspiration.



3. Soy- Based Formula



- Indicated for infant with galactosemia or hereditary lactose deficiency or infant with vegetarian parent who want a plant – based formula for their children.
- Not effective for treatment of colic.
- Hypotonic formula.

Kcal/ml	Kcal/fl oz	Protein g/L	CHO g/L	Fat g/L	Osmolality (mOsm/kg)
0.67	20	16 - 19	68 - 74	34-36	200

Example of Soy- Based Formula



0 – 12 month



0 – 12 month

4. Semi-Elemental and Elemental Formula



- **Indication for each formula vary**

1. contain hydrolyzed protein and LCT for cow milk or soy protein allergy.
2. Hydrolyzed protein and LCT and MCT for cow milk or soy protein allergy + malabsorption such as bowel syndrome or cystic fibrosis.
3. Free A.A & low to moderate MCTs for infant who continue to demonstrate allergic symptom on extensively hydrolyzed protein formula.

Kcal/ml	Kcal/fl oz	Protein g/L	CHO g/L	Fat g/L	Osmolality (mOsm/kg)
0.67	20	18-21	68 - 91	35 - 46	320- 500

Example of Semi-Elemental and Elemental Formula



0 – 12 month



0 – 12 month



0 – 12 month



0 – 12 month

5. Low Electrolyte/ Mineral Formula



- ✿ For renal disease.
- ✿ Hypocalcemia & hyperphosphatemia are complication in infant with renal disease.
- ✿ Isotonic formula, whey protein concentrate.
- ✿ Low in iron.

Kcal/ml	Kcal/fl oz	Protein g/L	CHO g/L	Fat g/L	Osmolality (mOsm/kg)
0.67	20	15	68	56	280

Example of Low Electrolyte/ Mineral Formula



6. Infant Formula with Increased Nutrient Density



- For infant require fluid restriction.
- Can be produced by concentrating formulas or by including modular nutrient additives of CHO, protein, or fat.
- CHO modulars are hypertonic → increase osmolality.
- Fat modular is isotonic.



7. Amino Acid Based Formula



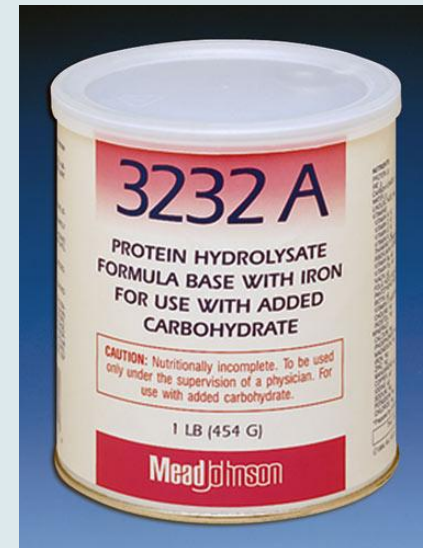
- Used for extreme protein hypersensitivity or when intolerance symptoms persist on an extensively hydrolyzed formula.
- Transitioning from parenteral to enteral feedings.
- short bowel syndrome.



8. Carbohydrate Free



Designed for the management of CHO metabolism disorders and CHO malabsorption.



9. Reduced Fat/ Modified Fat



- Used in conditions of decrease bile salts, fat malabsorption, defective lymphatic transport of fat, chylothorax.
- Due to the risk of EFAD, these formulas should only be used under the supervision.



Pediatric Enteral Formulas



1. General- purpose Formula



- Are isotonic.
- All products contain at least one source of cow's milk protein.

Kcal/ml	Kcal/fl oz	Protein g/L	CHO g/L	Fat g/L	Osmolality (m0sm/kg)	Fiber (g/L)
1 – 1.5	30	30-38	110-138	37-50	335-380	4.4-8

Example of General- purpose Formula



2. Semi-Elemental or Elemental Formula



- Designed for 1-10 y/o children with severe protein allergies, malabsorption and GI tract impairment.
- Osmolality of these formula is typically high.

Kcal/ml	Kcal/fl oz	Protein g/L	CHO g/L	Fat g/L	Osmolality (mOsm/kg)
0.8-1	20-30	24-32	107-138	24-49	260- 820

Example of Semi-Elemental and Elemental Formula



3. High MCT Formula



- Designed for children with fat maldigestion, malabsorption.
- Isotonic formula.

Kcal/ml	Fat %/Kcal	Osmolality (mOsm/kg)
1	25-40	270-370

thank
you

