

## Early Nutrition, Growth, and Outcomes – What is the Evidence?

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### Case Presentation

A 960-g female is born at 28 2/7 weeks gestational age. Birth weight plots between the 25-50th percentile. Length and head circumference also plot within normal limits. Diagnoses include respiratory distress syndrome and rule out sepsis and hyperbilirubinemia.

A central line is placed on date of birth and the patient is started on parenteral nutrition. The following table illustrates nutrition support during the first few days of life.

#### Nutrition Schedule

Day of Life	Parenteral Nutrition (PN)			Enteral Feeds of Human Milk	Notes/Comments
	Total Energy (kcal/kg/d)	Protein (g/kg/d)	Intralipid (g/kg/d)		
Birth	45	2	1	No	
1	60	2.5	1.5	No	
2	79	3.5	2	1 ml q 12 hrs	Minimal enteral feeds started
3	95	3.5	3	1.5 ml q 6 hrs	
4	100	3.5	3	1.5 ml q 3 hrs	

On day of life 5, the infant begins transitioning off central PN and onto enteral feedings of human milk.

Day of Life	Enteral Feeding Order	Human Milk Fortification	Notes/Comments
5	Advance by 1.5 ml q 6 hrs (0.3 ml/kg/hr)	No	CPN starts to be weaned
6	Continue advancement rate of 1.5 ml q 6 hrs	No	Feeding held x 1 for residual of 10 ml
7	Goal of 15 ml q 3 hrs reached (125 ml/kg/day)	22 kcals/oz	CPN discontinued
8	15 ml q 3 hrs	24 kcal/oz	
9	18 ml q 3 hrs (121 kcals/ 4.3 g protein)	24 kcal/oz	

At 4 weeks of age, she continues to tolerate full enteral feedings, but her weight plots below the 10th percentile on the growth chart.

## Discussion Items

- How would you classify her growth and how might her growth impact future neurodevelopmental outcomes?
- How might the protein content of human milk change over the lactation period and what adjustments might you have to make to its fortification?
- Was her parenteral and enteral intake within the nutritional guidelines recommended by Dr. Poindexter? If not, what would you have recommended differently to optimize growth and neurodevelopmental outcome?
- What growth curves are we currently using at our institution?
- How often are we monitoring and documenting weight gain, head circumference, and length?
- How are we diagnosing postnatal growth failure?
- How does our current practice compare to the suggested guidelines for intravenous amino acid, lipid, and calorie intake during the first week of life?
- What is our policy on enteral feeding initiation and advancement?
- Do we have standardized enteral feeding guidelines in place? If so, do we follow them?
- What are the barriers we face in meeting the suggested enteral and parenteral guidelines?
- Are we tracking any neurodevelopmental outcomes?

## Suggested Readings and Resources

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