

## Answers to Pediatric Nutrition Quiz:

1. B. The American Academy of Pediatrics (AAP) recommends that the introduction of solids be delayed until 4 to 6 months of age. The reason for that is to allow infants to develop the motor skills necessary to clearly indicate hunger or satiety. There is some evidence that spooning food into infants who lacks the skills to show if he or she is no longer hungry may increase the likelihood that the child will learn to overeat. This becomes more important issue in light of the increasing prevalence of obesity in childhood.
2. E. A relatively high fat intake should continue throughout infancy to ensure adequate caloric intake and to provide substrate for central nervous system growth. Because of its low caloric density and high protein and electrolyte load, low-fat milk is not recommended by the AAP until age 2 years.
3. A. Most of food aspiration occurs in children 3 years of age and younger. Two thirds of the recovered food items are clearly inappropriate food for infants and young children (such as nuts, popcorn, and candy), but one fourth of the items are vegetables and fruits, suggesting a continued need for supervision to prevent choking.
4. D. The AAP recommends delaying the introduction of fresh milk until 12 months of age. Early use of cow's milk increase the risk of iron deficiency because of the low concentration and bio-availability of iron in milk, and because fresh cow's milk induces occult fecal blood loss in young infants.
5. C. Breast milk is low in vitamin K. Prior to the widespread use of vitamin K prophylaxis in hospitals, classic hemorrhagic disease of the newborn affected 0.25% to 1.7% of term infants. This has been almost eliminated by parenteral administration of vitamin K at birth. This form of hemorrhagic disease most often presents with intra-cranial bleeding and causes severe morbidity and mortality. Factors contributing to the development of the late bleeding include diarrhea and antibiotic administration. Breast fed infants are at risk for iron deficiency anemia because the iron in breast milk, although well absorbed, is inadequate. Some breast- fed infants deplete their iron stores by 4 to 6 months of age and could develop biochemical evidence of iron deficiency anemia by 9 months of age. Iron fortification of formulas has resulted in significant decrease in the prevalence of childhood anemia.
6. C. Please refer to table 1. The explanation for this question:  $1000\text{cc}$  (for the first  $10\text{ Kg}$ ) +  $50\text{cc} \times 2 = 1100\text{ cc}$ . For IVF calculation you can use the rule 4, 2, 1 which is  $4\text{cc/Kg/ Hour}$  for the first  $10\text{ kg}$ ,  $2\text{ cc/Kg /Hour}$  for ( $11\text{-}20\text{ kg}$ ) and  $1\text{ cc/Kg /Hour}$  for ( $21\text{ kg}$  and above). Therefore, the IVF rate for this  $12\text{ Kg}$  infant is  $(4\text{cc} \times 10\text{ Kg}) + (2\text{cc} \times 2\text{ Kg}) = 44\text{cc/hour}$ .

Table 1

Maintenance Fluid Requirements for Children	
Weight (kg)	Volume (per day)
Preterm (< 1,000)	140-150 cc/kg
1-10	100 cc/kg
11-20	1,000 cc + 50 cc/kg for each kg above 10 kg
20-50	1,500 cc + 20 cc/kg for each kg above 20 kg
>50	3,000 cc

7. E. For infants younger than 1 year of age, special elemental formulas are available in which the source of protein is a hydrolyzed casein or amino acids. The fat blend is a mixture of medium-chain and long-chain triglycerides, whereas the carbohydrate content is mostly corn syrup solids. These formulas are commonly used in situations where the gastrointestinal tract is compromised, as in the case of postgastroenteritis malabsorption syndrome (partial villus atrophy causing decrease in the ability to digest and absorb nutrients). On the other hand, patients with fat malabsorption and cholestatic liver disease require formula, which contains high amount of medium-chain triglycerides.
8. C. Portagen is a formula that contains the highest amount of medium-chain triglyceride oil (85%), and is most commonly used for patients with fat malabsorption and cholestatic liver disease (see table 2. composition of special infant formulas).

Table 2.

Composition of Special Infant Formulas		
Formula	Protein	Fat
Alimentum	Casein hydrolysate	MCT (50%)/LCFA
Pregestimil	Casein hydrolysate	MCT (55%)/LCFA
Portagen	Na+ hydrolysate	MCT (8%)/LCFA
Neocate Infant	Amino acids	LCFA/MCT

*MCT = medium-chain triglyceride; LCF = long-chain fatty acid; SHS = Scientific Hospital, Inc.;*

9. D. The best indicator for appropriate feeding is adequate weight gain. Infants typically gain 1 oz per day for the first few months of life (this is after the first 10 days of life when they could lose up to 10% of their birth weight). Urine output (about 6-7 wet diapers per day) is a good measurement of adequate fluid intake. Calories count could be used to assure adequate nutrition by comparing the calories required versus the calories taken by the infant (see table 3.)

Table 3

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Caloric Requirements for Parenteral  
Nutrition for Children

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Age (yrs)	kcal/kg/d
Preterm neonate	85-150
Term neonate	100-120
Infants	80-100
1-3	75-90
4-6	65-75
7-10	55-75
10-18	40-60

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*Clinical Tip: Quick assessment of appropriate amount of formula for an infant:*

The number of oz given every 4 hours = Weight in KG

Example: A 3 Kg baby should be given 3 oz of formula every 4 hours.

Calories count= 3 Kg x 120 cal per day = 360 calories

360 calories / 20 cal per oz = 18 oz

18 oz / 6 (feeding every 4 hours) = 3 oz