A 5-day-old girl is brought to the physician for her first checkup. She was born full term to a primigravid mother by uncomplicated vaginal delivery. She was discharged from the well-baby nursery 3 days ago. Since then, she has been breastfeeding exclusively every 1-3 hours for 15 minutes per breast. She has had 5-6 wet diapers and 3-4 "yellow, seedy" stools daily. Birth weight was 3402 g (7 lb 8 oz). Current weight is 3260 grams (7 lb 3 oz). On examination, the girl is awake and alert. The anterior fontanelle is open, soft, and flat. Her mucous membranes are moist and capillary refill is <2 seconds. Peeling of the hands and feet is seen, as is acrocyanosis. Her diaper is shown below.

Which of the following is the most appropriate next step in management of this patient?

- A. Continue current feeding regimen
- B. Fortification of breast milk with powdered formula
- C. Intravenous fluids
- D. Serum electrolytes

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- C. Intravenous fluids
- D. Serum electrolytes
- E. Supplementation with infant formula in addition to breastfeeding
- F. Supplementation with water in addition to breastfeeding
- G. Urinalysis

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Media Exhibit

Media Exhibit

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Which of the following is the most appropriate next step in management of this patient?

- ✔ A. Continue current feeding regimen [65%]
- B. Fortification of breast milk with powdered formula [3%]
- C. Intravenous fluids [2%]
- D. Serum electrolytes [4%]

Which of the following is the most appropriate next step in management of this patient?

- ✔ A. Continue current feeding regimen [65%]
- B. Fortification of breast milk with powdered formula [3%]
- C. Intravenous fluids [2%]
- D. Serum electrolytes [4%]
- E. Supplementation with infant formula in addition to breastfeeding [10%]
- F. Supplementation with water in addition to breastfeeding [1%]
- G. Urinalysis [15%]

Proceed to Next Item

**Explanation:** **User Id:** [redacted]

| Evaluation of neonatal hydration | | |
|---|---|---|
| **Signs of dehydration** | • Decreased wet diapers<br>• Absence of tears<br>• Sunken fontanelle<br>• Dry mucous membranes<br>• Decreased skin turgor<br>• Delayed capillary refill | |
| **Management of weight loss** | <7% | • Continue exclusive breastfeeding<br>• Follow-up at age 10-14 days to check that infant has regained birth weight |
| | ≥7% | • Assess for oromotor dysfunction<br>• Assess for lactation failure<br>• Daily weights<br>• Consider formula supplementation |

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This full-term newborn has a normal physical examination. Dry, flaky, peeling skin of the

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- F. Supplementation with water in addition to breastfeeding [1%]
- G. Urinalysis [15%]

Proceed to Next Item

**Explanation:** **User Id:** [redacted]

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| | | |
|---|---|---|
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This full-term newborn has a normal physical examination. Dry, flaky, peeling skin of the hands and feet is expected as the skin adjusts to the dry extrauterine environment. The appearance of "pink stains" or "brick dust" in neonatal diapers represent **uric acid crystals**. Uric acid excretion is especially high at birth and decreases until adolescence, when adult levels are observed. Uric acid crystals are commonly seen during the first week as the mother's milk is coming in, or in later months with the morning void after the infant begins to sleep through the night.

Although this patient's weight is ~4% decreased from birth, healthy neonates normally lose **up to 7% of their birth weight** in the **first 5 days** of life due to excretion of excess fluid acquired in utero and during labor. The weight loss is more pronounced in exclusively breastfed infants as the mother's milk supply gradually increases to meet infant demands. Frequent breastfeeding should be encouraged, and education about dehydration should be provided.

Signs of dehydration include dry mucous membranes, a sunken fontanelle, and decreased urine output. As a general rule, the number of wet diapers should equal age in days for the first week of life. For example, a 4-day-old neonate should have ≥4 wet diapers per day. After the first week, infants should have ≥6 wet diapers per day. **Birth weight should be regained by age 10-14 days**.

**(Choice B)** Breast milk fortified with powdered infant formula may be used for infants with failure to thrive or for preterm infants but is not recommended for physiologic neonatal weight loss.

**(Choice C)** Intravenous fluids should be reserved for dehydrated infants who cannot ingest adequate oral nutrition. This infant appears well hydrated, making intravenous fluids unnecessary.

**(Choice D)** Serum electrolytes, particularly serum sodium, can be used as a measure of dehydration. Infants who lose >7% of birth weight or appear dehydrated on examination are at risk for life-threatening hypernatremic dehydration. Laboratory testing is unnecessary for this well-hydrated neonate.

**(Choice E)** Formula supplementation can be considered in infants who have lost >7% of birth weight despite optimization of breastfeeding.

**(Choice F)** Infants have immature kidneys that cannot reabsorb sodium effectively. Plain water should never be given to infants age <6 months as it can dilute the blood, resulting in dangerous hyponatremia and seizures.

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**(Choice G)** Parents should be reassured that urinary uric acid crystals rarely represent a disorder of purine metabolism (eg, Lesch-Nyhan syndrome). No workup is necessary if the infant is feeding, growing, and urinating normally.

**Educational objective:**
Healthy infants normally lose up to 7% of birth weight in the first 5 days of life. No treatment is required, and exclusive breastfeeding should be continued. Birth weight should be regained by age 10-14 days.

**References:**

1. Neonatal weight loss in breast and formula fed infants.
2. First-day weight loss predicts eventual weight nadir for breastfeeding newborns.
3. Postnatal weight loss in term infants: what is normal and do growth charts allow for it?
4. Breastfeeding and the use of human milk.
5. Physiological weight loss in the breastfed neonate: a systematic review.

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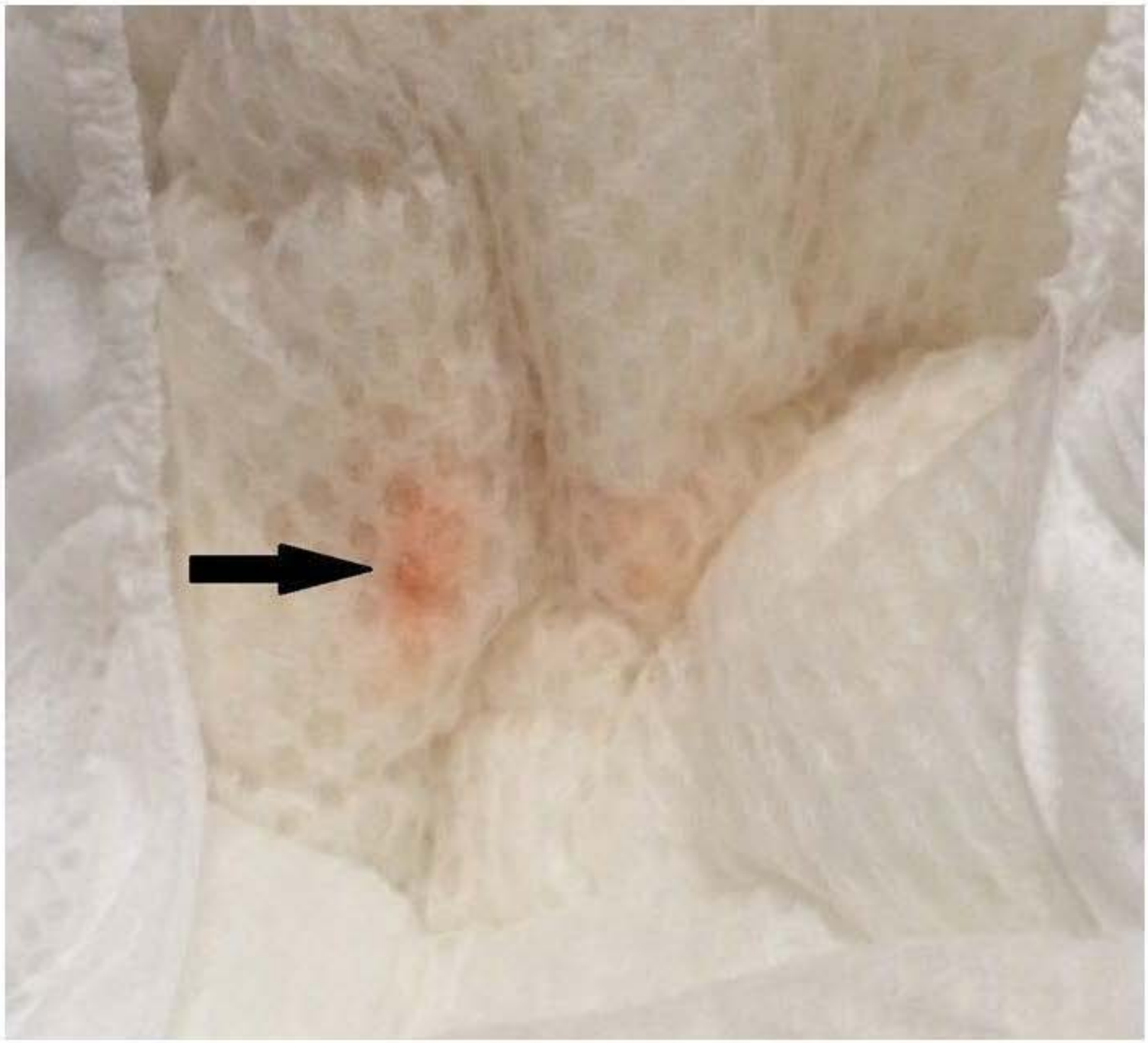
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