

Forté  
**Postnatal™**

Science-based, Advanced Nutritional Support  
for Post Pregnancy and During Lactation

PREPARE / RECOVER

## postnatal product

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### Understanding the Nutritional Needs of Postnatal Women

The period following childbirth is an opportune time for women and the physicians responsible for their care to re-evaluate nutritional needs. The dietary guidelines published by the U.S. Department of Agriculture and endorsed by the American Dietetic Association, along with the adequate intake levels established by the Institute of Medicine, form the basis for nutritional guidance for postnatal women.

Risk factors for poor nutrition among postnatal women include extremes of maternal age, vegan or other restrictive dietary practices, excessive weight gain during pregnancy, deviations from ideal body weight, multiple gestation, history of eating disorders, and a short interconceptional interval. An adequate diet with appropriate supplementation of nutrient insufficiencies is important for ensuring the health of both the mother and the newborn.

#### Energy Needs of Breastfeeding

Women who breastfeed have increased an energy demand. An additional 500 kcal/day—for a total of 2,300-2,500 kcal/day—is recommended throughout breastfeeding.<sup>1</sup> A higher intake may be recommended for lactating women who are underweight, who exercise vigorously or who are breastfeeding more than one infant.<sup>2</sup> While some women restrict caloric intake after giving birth in an effort to lose weight, there is some evidence that diet-induced weight loss results in generalized bone loss—not just in those women who are postpartum, but in all women.<sup>3</sup>

#### Key Nutrients for Postpartum Women

Many women consume less than the recommended amounts of calcium, magnesium, zinc, vitamin B6 and folate in their diet. In rare cases, a new mother may continue taking a prenatal vitamin, but even if she does, prenatal supplements generally do not include a significant amount of calcium or other nutrients that are important for the postpartum woman.

#### Calcium

Calcium has a multitude of functions in the body, from aiding in muscle relaxation, blood coagulation, and nerve transmission, to promoting tooth and bone health and preventing osteoporosis. While some studies have found that a high-calcium diet may increase weight

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1- Association of Reproductive Health Professionals. Postpartum Counseling. Available at <http://www.arhp.org/publications-and-resources/quick-reference-guide-for-clinicians/postpartum-counseling/diet>.

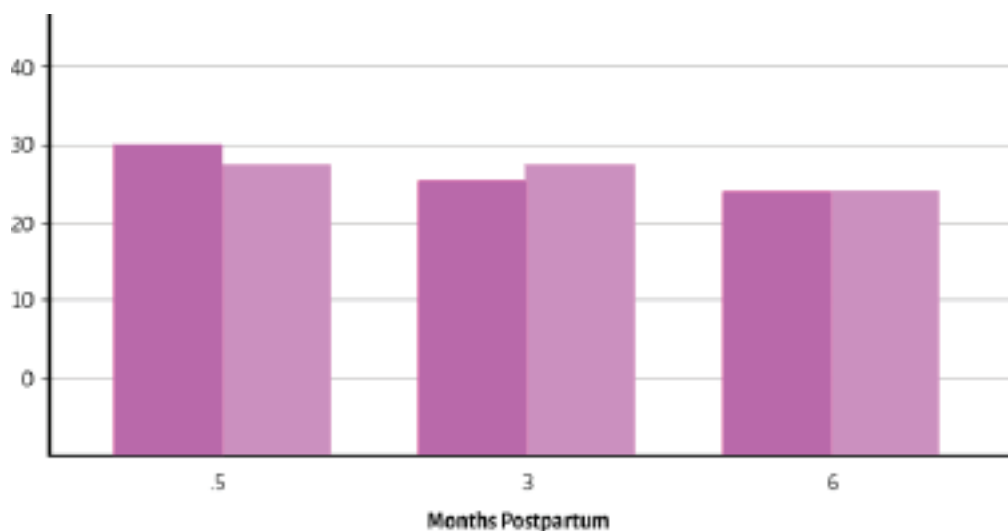
2- Institute of Medicine. Nutrition Services in Perinatal Care, 2nd ed. Washington DC, 1992.

3- Jensen LB, et al. Bone mineral changes in obese women during a moderate weight loss with and without calcium supplementation. J Bone Miner Res 2001;16(1):141-147.

loss in comparison with a low-calcium diet, the evidence is controversial and conflicting.<sup>4,5,6</sup>

If a woman is breastfeeding, she is transferring 250-350 milligrams of calcium to her baby per day through breast milk.<sup>7</sup> Numerous studies have demonstrated that bone loss occurs during breastfeeding, especially in the axial skeletal spine. However, this effect is transient and maternal bone mineral density is regained rapidly after weaning.<sup>7</sup> The rate and extent of bone recovery are influenced by the duration of lactation and postpartum amenorrhea, as well as by skeletal site. To date, pregnancy and lactation have not been associated with an increased risk of osteoporotic fracture.<sup>7</sup>

Figure 1. Effects of Calcium Supplements on Breast Milk Calcium Concentration<sup>8</sup>



American women consuming 720 mg/day of calcium supplemented with either 1000 mg of calcium/day (solid bars) or placebo (open bars) from 0.5 to 6 months postpartum.

The National Institutes of Health recommends a daily calcium allowance of 1,000 mg/day for lactating women ages 19 to 50.<sup>9</sup> Younger women may need 1,300 mg/day. However, calcium intake is insufficient among most female age groups in the U.S. Yet, studies have shown that high dose calcium supplementation (1,000 mg/day) has no impact on the calcium concentration of breast milk or on lactation-associated bone mineral changes in the spine, wrist or total body.<sup>10,11,12</sup> As such, a 400-800 mg/day dose of calcium to supplement dietary intake may be appropriate for achieving the recommended daily allowance, and should be given with 400-800 IU of vitamin D to facilitate absorption.

4- Heaney RP, Davies KM, Barger-Lux MJ. Calcium and weight: clinical studies. *J Am Coll Nutr* 2002;21(2):152S-155S.  
5- Zemel MB. The role of dairy foods in weight management. *J Am Coll Nutr* 2005;24(6 Suppl):537S-546S.  
6- Teegarden D. The influence of dairy product consumption on body composition. *J Nutr* 2005;135(12):2749-2752.  
7- Oliveri B, et al. Mineral and bone mass changes during pregnancy and lactation. *Nutrition* 2004;20(2):235-240.  
8- Kalkwarf HJ, et al. The effect of calcium supplementation on bone density during lactation and after weaning. *N Engl J Med* 1997;337:523-528.  
9- National Institutes of Health, Office of Dietary Supplements. Calcium: Dietary Supplement Fact Sheet. Available at <https://ods.od.nih.gov/factsheets/Calcium-HealthProfessional/>.  
10- Prentice A, et al. Calcium requirements of lactating Gambian mothers: effects of a calcium supplement on breast-milk calcium concentration, maternal bone mineral content and urinary calcium excretion. *Am J Clin Nutr* 1995;62:58-67.  
11- Cross NA, et al. Changes in bone mineral density and markers of bone remodeling during lactation and postweaning in women consuming high amounts of calcium. *J Bone Miner Res* 1995;10:1312-1320.  
12- Prentice, A. Calcium requirements of breast-feeding mothers. *Nutrition Reviews* 1998;56:124-130.

## Vitamin A

Vitamin A is essential for growth and differentiation of a variety of cells and tissues. Throughout the breastfeeding period, vitamin A plays an important role in the healthy development of the newborn, including lung maturation.<sup>13</sup> In fact, the American Pediatrics Association considers vitamin A to be one of the most critical vitamins during the postnatal period.

The recommended dietary allowance of vitamin A, according to the Food and Nutrition Board (FNB) at the Institute of Medicine (IOM) of the National Academies, is 1,200-1,300 mcg retinol activity equivalents (RAE) for postnatal women who are breastfeeding. The conversion of RAEs to IUs depends on the source of vitamin A. For example 900 mcg RAE is equivalent to:

- 3,000 IU, if the food or supplement source is pre-formed vitamin A (retinol)
- 6,000 IU of  $\beta$ -carotene from supplements
- 18,000 IU of  $\beta$ -carotene from food
- 36,000 IU of  $\beta$ -carotene or  $\beta$ -cryptoxanthin from food

Age	Male	Female	Pregnancy	Lactation
0-6 mo.	400 mcg RAE	400 mcg RAE		
7-12 mo.	500 mcg RAE	500 mcg RAE		
1-3 yrs	500 mcg RAE	500 mcg RAE		
4-8 yrs	500 mcg RAE	500 mcg RAE		
9-13 yrs	500 mcg RAE	500 mcg RAE		
14-18 yrs	500 mcg RAE	500 mcg RAE	500 mcg RAE	500 mcg RAE
19-50 yrs	500 mcg RAE	500 mcg RAE	500 mcg RAE	500 mcg RAE
51+ yrs	500 mcg RAE	500 mcg RAE		

Figure 2. Recommended Dietary Allowances for Vitamin A<sup>14</sup>

According to the National Health and Nutrition Examination Survey, the average daily dietary intake of vitamin A among Americans aged 2 years and older is 607 mcg RAE.<sup>15</sup> While frank vitamin A deficiency is rare in the U.S., postnatal women may need extra vitamin A to support their own metabolism.

As vitamin A is fat soluble, the body stores excess amounts—primarily in the liver—and these levels can accumulate. While large supplemental doses of  $\beta$ -carotene are not associated with toxicity, excess preformed vitamin A can lead to adverse effects, such as dizziness, nausea, headaches, skin irritation, bone and joint pain, coma, and even death.<sup>14</sup>

## Vitamin D

Maintaining vitamin D status is important for both breastfeeding mothers and nursing infants, and recent reports have shown a resurgence of rickets in infancy, particularly among African American infants who were breastfed.<sup>16</sup> While the recommended daily allowance of vitamin D during lactation has been set at 400 IU/day, this level of intake may be insufficient for meeting

13- Strobel M, Tinz J, Biesalski H-K. The importance of  $\beta$ -carotene as a source of vitamin A with special regard to pregnant and breastfeeding women. Eur J Nutr 2007;46(Suppl 1):1/1-1/20.

14- Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium and Zinc. Washington, DC: National Academy Press; 2001.

15- U.S. Department of Agriculture, Agricultural Research Service. What We Eat in America, 2007-2008.

16- Kreiter SR, et al. Nutritional rickets in African American breast-fed infants. J Pediatr 2000;137:153-157.

postnatal nutritional demands. In one study, high-dose (2,000 or 4,000 IU/day) vitamin D supplementation given to lactating women for a period of three months safely increased circulating 25-hydroxyvitamin D [25(OH)D] concentrations. Vitamin D supplementation also increased the vitamin D content of the milk produced by postnatal women and the circulating 25(OH)D<sub>2</sub> concentrations in nursing infants, preventing hypovitaminosis D and nutritional rickets. Based on this study, a maternal intake of 4000 IU/day of vitamin D would achieve substantial progress toward improving both maternal and neonatal nutritional vitamin D status.<sup>17</sup>

### **Iron**

In the postnatal period, dietary requirements for iron return to pre-pregnancy levels of 15 milligrams per day. However, postpartum anemia is possible for any woman who has recently given birth. If blood loss is higher than usual during vaginal delivery or the interval between pregnancies is less than two years, postnatal iron supplementation may be indicated. In the context of a low hemoglobin or hematocrit, and if other causes of anemia have been ruled out, oral supplementation with 60 to 120 milligrams of iron may be appropriate.

### **Zinc**

Zinc is an essential trace mineral that supports the immune system and protects the body from damage caused by free radicals. Pregnancy affects how the body absorbs zinc, so new mothers often display zinc deficiency or insufficiency. A study conducted by the Australian Maternal and Child Health Service found that postnatal women who received zinc supplementation had improved energy levels, while their babies had a lower incidence and severity of infant colic.

### **Choline**

Choline, a micronutrient found in food, was officially recognized as an essential nutrient by IOM in 1998.<sup>18</sup> Choline is necessary for a wide range of complex, critical functions in the body, from neurotransmitter synthesis and cell membrane signalling to lipid transport and methyl-group metabolism. It plays important roles in fetal brain and memory development, and its importance extends into adulthood and old age. In a study of healthy adults deprived of dietary choline, 77 percent of men and 80 percent of postmenopausal women developed subclinical organ dysfunction.<sup>19</sup>

The FNB recommends choline intake of 425 mg/day for women aged 19 and older and 550 mg/day for men aged 19 and older. Although choline is found in a variety of foods, including eggs, milk, and wheat germ, mean choline intake for older children, men and women fall far below the adequate intake level established by the IOM.<sup>20</sup> Of note, up to 50 percent of the population carry genetic variations that make it necessary to consume choline at levels greater than the adequate intake. During lactation, the body's demand for choline is even higher, and the recommended adequate intake for women who are breastfeeding is 550 mg/day. As human milk is rich in choline, with amounts ranging from 104-156 mg/L, lactation further increases maternal demand, which can result in extended depletion of tissue choline stores.<sup>21,22</sup>

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17- Hollis BW, Wagner CL. Vitamin D requirements during lactation: high-dose maternal supplementation as therapy to prevent hypovitaminosis D for both the mother and the nursing infant. *Am J Clin Nutr* 2004;80(Suppl):1752S-1758S.

18- Institute of Medicine, Food and Nutrition Board. *Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin and Choline*. Washington, DC: National Academies Press; 1998.

19- Fischer L, et al. Sex and menopausal status influence human dietary requirements for the nutrient choline. *Am J Clin Nutr* 2007;85:1275-1285.

20- Zeisel SH, da Costa K-A. Choline: an essential nutrient for public health. *Nutr Rev* 2009;67(11):615-623.

21- Ilicol YO, et al. Choline status in newborns, infants, children, breast-feeding women, breast-fed infants and human breast milk. *J Nutr Biochem* 2005;16:489-499.

22- Steegers-Theunissen R, et al. Maternal hyperhomocysteinemia: a risk factor for neural-tube defects? *Metabolism* 1994;4:1475-1480.

## Providing Nutritional Support to Postnatal Women

The postpartum period is a time when women tend to be receptive to health counseling, creating an excellent opportunity to promote lifelong habits to ensure optimum nutrition. Since most women who eat a typical American diet do not get all their necessary nutrients from food, Forté Elements—the industry leader in pharmaceutical-grade Mediceutical supplements—has developed a postnatal supplement to address the nutritional needs of women who have just given birth.

### Forté Elements Postnatal Supplement

An emerging category in nutrient supplementation, a Mediceutical is a nutritional support system that provides condition-specific combinations of vitamins, minerals, amino acids and other nutrients for common clinical conditions, such as pregnancy and the postpartum period. Unlike nutraceuticals, Mediceuticals are subject to strict guidelines for quality and safety and are supported by evidence-based research. In order to qualify as a mediceutical, a supplement must:

1. Be formulated to support a specific health condition or situation
2. Contain only non-synthetic, pharmaceutical-grade ingredients that are Generally Recognized as Safe (GRAS)
3. Contain elements that have been validated by clinical research for the specific health condition or situation, as published in peer-reviewed journals
4. Conform to pharmaceutical grade dosage standards for the specific health condition or situation
5. Be produced in FDA-compliant manufacturing facilities using pharmaceutical-grade manufacturing practices
6. Be accompanied by a Certificate of Analysis confirming that product ingredients meet the mediceutical standard and are as listed on the product label

The Forté Elements Postnatal supplement contains appropriate, but not excessive, amounts of the nutrients postnatal women need to support their own health, as well as the health of their breast-fed infant.

## Supplement Facts

Serving Size 1 Pack (3 Capsules)  
Servings Per Container 60

### Amount Per Serving

	% Daily Value*
<b>Vitamin A</b> (Beta-Carotene and Acetate) 2000 IU	40%
<b>Vitamin C</b> (Ascorbic Acid) 50mg	83%
<b>Vitamin D</b> (Cholecalciferol) 1000 IU	250%
<b>Vitamin E</b> (d-Alpha Tocopheryl) 15 IU	50%
<b>Vitamin K</b> (Fat Soluble) 12.5mcg	16%
<b>Thiamin (Vitamin B1)</b> 1.75mg	117%
<b>Riboflavin (Vitamin B2)</b> 2.5mg	147%
<b>Niacin (Vitamin B3)</b> 10mg	50%
<b>Vitamin B6 (Pyridoxine)</b> 2.5mg	125%
<b>Folic Acid</b> 400mcg	100%
<b>Vitamin B12 (Cyanocobalamin)</b> 7mcg	117%
<b>Biotin</b> 50mcg	17%
<b>Pantothenic Acid</b> 5mg	50%
<b>Calcium (as Carbonate and Phosphate)</b> 400mg	40%
<b>Iron (Fumarate)</b> 15mg	83%
<b>Phosphorus (Calcium Phosphate)</b> 40mg	4%
<b>Iodine</b> 75mcg	50%
<b>Magnesium (Hydroxide)</b> 50mg	25%
<b>Zinc (Sulfate)</b> 12.5mg	83%
<b>Selenium</b> 35mcg	50%
<b>Copper (Sulfate)</b> 1mg	50%
<b>Manganese (Sulfate)</b> 1.15mg	58%
<b>Chromium (Polynicotinate)</b> 10mcg	8%
<b>Potassium (Chloride)</b> 40mg	1%

**Proprietary Blend** 615mg \*\*

Choline Bitartrate, L-Lysine, Boron.

\*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

**OTHER INGREDIENTS:** GELATIN(CAPSULE), MAGNESIUM STEARATE AND SILICA. CONTAINS: FISH.

**WARNING:** ACCIDENTAL OVERDOSE OF IRON-CONTAINING PRODUCTS IS A LEADING CAUSE OF FATAL POISONING IN CHILDREN UNDER 6. KEEP THIS PRODUCT OUT OF REACH OF CHILDREN. IN CASE OF ACCIDENTAL OVERDOSE, CALL A DOCTOR OR POISON CONTROL CENTER IMMEDIATELY.

## Supplement Facts

Serving Size 1 Softgel  
Servings Per Container 60

### Amount Per Serving

	% Daily Value*
<b>Calories</b> 10	<1%
Calories from Fat 10	
<b>Total Fat</b> 1g	<2%
Polyunsaturated Fat 0.5g	**
<b>Vitamin E</b> 1.1 IU	4%
(d-Alpha Tocopherol plus d-Alpha, d-Beta, d-Gamma, & d-Delta)	
<b>Fish Oil</b> 1,000mg	**
EPA (Eicosapentaenoic Acid) 180mg	**
DHA (Docosahexaenoic Acid) 120mg	**

\*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.  
\*\*Daily Value not established.

**OTHER INGREDIENTS:** GELATIN AND GLYCERIN

**THIS STATEMENT HAS NOT BEEN EVALUATED BY THE FDA. THIS PRODUCT IS NOT INTENDED TO DIAGNOSE, TREAT, CURE, OR PREVENT ANY DISEASE**

For example, the FNB has established upper intake levels for preformed vitamin A. These levels are applicable to both food and supplement intakes, and take into account the risk of liver abnormalities in adults and a range of toxic effects in infants and children. Formulated by licensed physicians, the Forté Elements Postnatal supplement contains an appropriate combination of pre-formed and provitamin A to prevent vitamin A deficiency, without the risk of hypervitaminosis.

**Figure 3. Tolerable Upper Intake Levels for Preformed Vitamin A<sup>23\*</sup>**

Age	Male	Female	Pregnancy	Lactation
0-12 months	600 mcg RAE (2,000 IU)	600 mcg RAE (2,000 IU)		
1-3 yrs	600 mcg RAE (2,000 IU)	600 mcg RAE (2,000 IU)		
4-8 yrs	900 mcg RAE (3,000 IU)	900 mcg RAE (3,000 IU)		
9-13 yrs	1,700 mcg RAE (5,667 IU)	1,700 mcg RAE (5,667 IU)		
14-18 yrs	2,800 mcg RAE (9,333 IU)	2,800 mcg RAE (9,333 IU)	2,800 mcg RAE (9,333 IU)	2,800 mcg RAE (9,333 IU)
19+ yrs	3,000 mcg RAE (10,000 IU)	3,000 mcg RAE (10,000 IU)	3,000 mcg RAE (10,000 IU)	3,000 mcg RAE (10,000 IU)

*\*These ULs, expressed in mcg and in IUS (where 1mcg = 3.33 IU), only apply to products from animal sources and supplements whose vitamin A comes entirely from retinol or ester forms, such as retinyl palmitate. However, many dietary supplements (such as multivitamins) do not provide all of their vitamin A as retinol or its ester forms. For example, the vitamin A in some supplements consists partly or entirely of beta-carotene or other provitamin A carotenoids. In such cases, the percentage of retinol or retinyl ester in the supplement should be used to determine whether an individual's vitamin A intake exceeds the UL. For example, a supplement labeled as containing 10,000 UI of vitamin A with 60% from beta-carotene (and therefore 40% from retinol or retinyl ester) provides 4,000 UI of preformed vitamin A. That amount is above the UL for children from birth to 13 years but below the UL for adolescents and adults.*

The Forté Elements Postnatal supplement contains folate and B vitamins, which can help stave off postpartum depression. It also contains choline, an essential micronutrient that is often overlooked by physicians when making nutritional recommendations. Among obstetrician/gynecologists who care for the women with the greatest choline needs, only about 6 percent are likely to recommend choline.<sup>24</sup> Forté Elements' careful attention to the specific nutritional needs of postnatal women is reflected in this inclusion of choline in its supplement formulation. In addition, Forté Elements Postnatal supplement contains appropriate amounts of supplemental magnesium, vitamin K, and boron—lesser known dietary insufficiencies that are nevertheless important for good health during the postnatal period and beyond.

23- Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium and Zinc. Washington, DC: National Academy Press; 2001.

24- StrategyOne Health Professionals Survey. April 2007.



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A fusion of science and practical medical experience  
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