# DINH DƯỠNG VÀ TĂNG TRƯỞNG CỦA TRẺ SINH NON SAU XUẤT VIỆN

**BS.CK2 LÊ NGUYỄN NHẬT TRUNG**

**BỆNH VIỆN PHƯƠNG NAM**

# NỘI DUNG

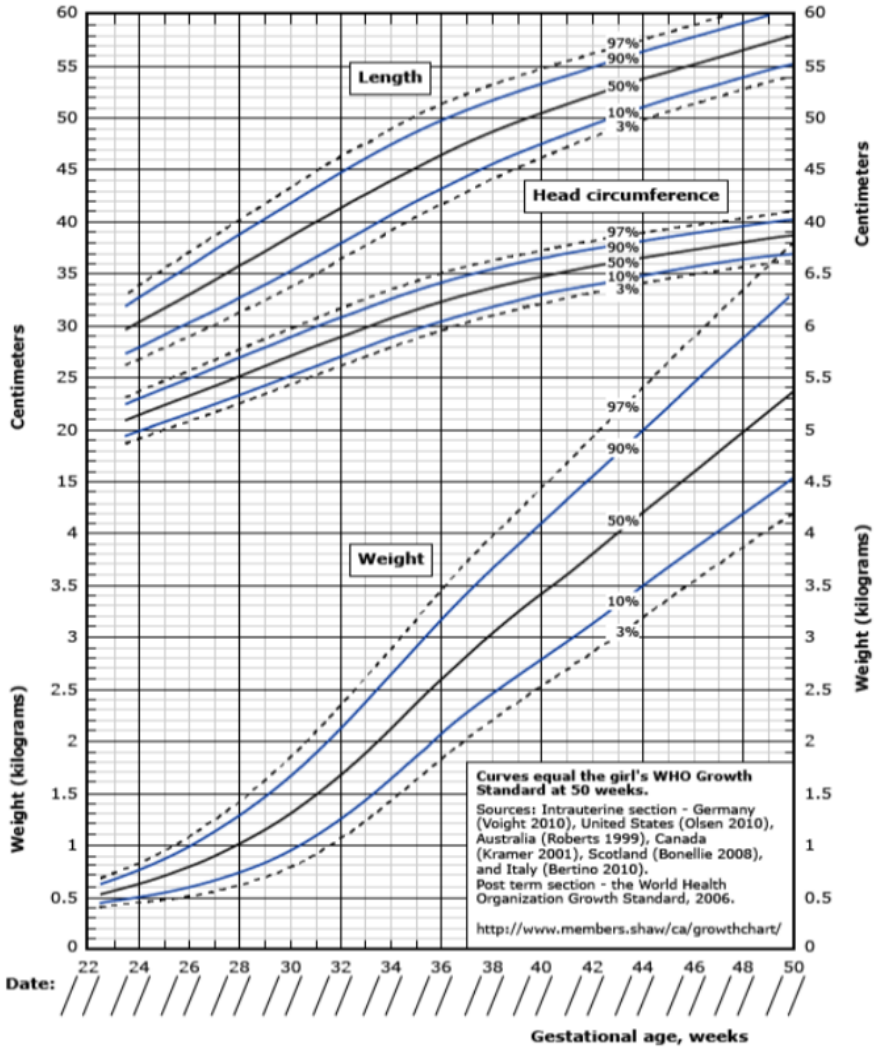
1. Các vấn đề cần đánh giá sau xuất viện
2. Vai trò dinh dưỡng và tăng trưởng trẻ sinh non và dự hậu
3. Vai trò sữa mẹ và sữa mẹ tăng cường
4. Đánh giá tăng trưởng và cách tiếp cận dinh dưỡng phù hợp

# Các vấn đề cần đánh giá sau xuất viện

- **Dinh dưỡng / Tăng trưởng**
- Các vấn đề hô hấp, tim mạch
- Sàng lọc thường quy và khi có nguy cơ
- Thiếu máu
- Thính giác/Thị giác
- Bệnh xương chuyển hóa
- Phát triển tâm thần kinh, vận động
- Tiêm chủng
- Khả năng chăm sóc của gia đình

# Tăng trưởng

- Tăng trưởng tối ưu trong 6 tháng đầu, tiên đoán dự hậu phát triển thần kinh
- Tăng trưởng sau sinh: mô hình hóa tăng trưởng trong tử cung (điều kiện lý tưởng)
- Trẻ rất non, tăng bắt kịp chu vi vòng đầu trong 6 tháng, cân nặng: 2–3 năm và chiều cao: sau 3 năm



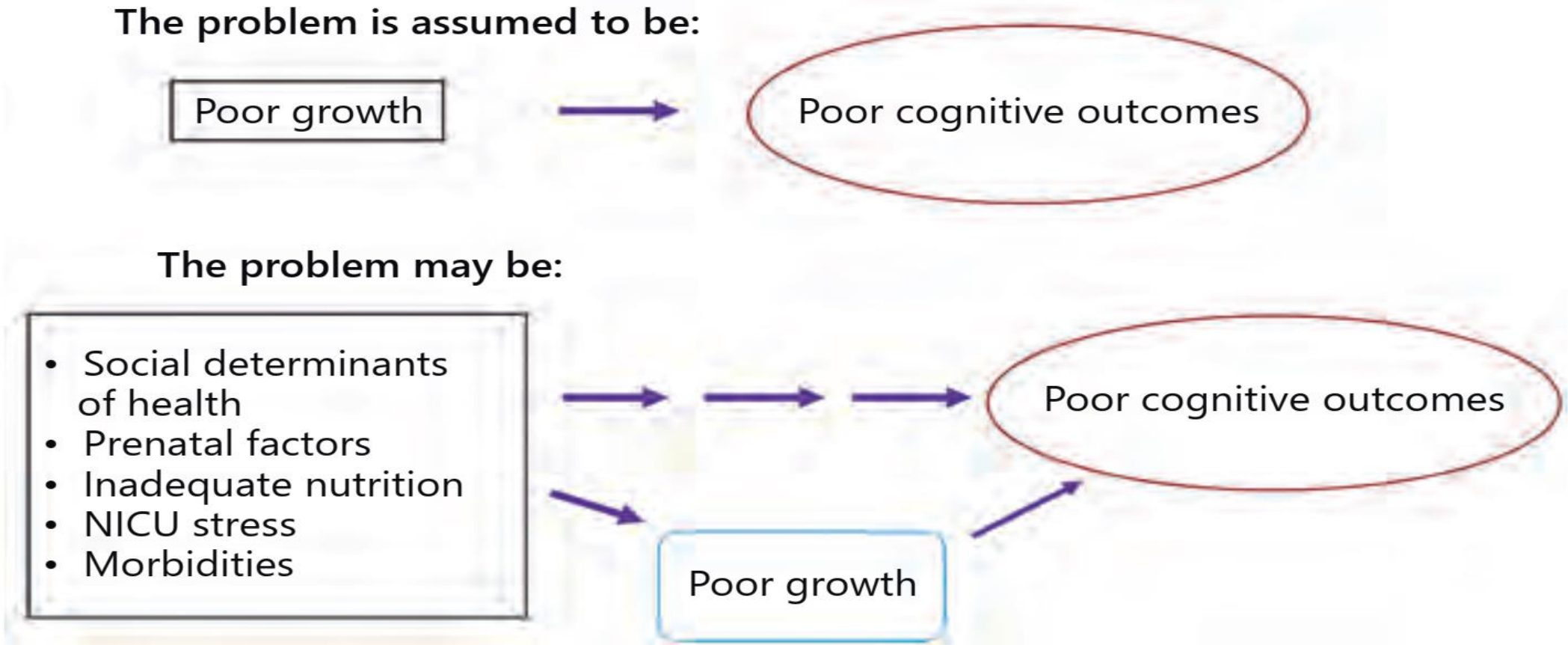

*Guellec I, Lapillonne A, Marret S, et al. Effect of intra- and extrauterine growth on long-term neurologic outcomes of very preterm infants. J Pediatr. 2016;175:93–99*

*Giuliani F, Cheikh Ismail L, Bertino E, et al. Monitoring postnatal growth of preterm infants: present and future. Am J Clin Nutr. 2016;103(2):635S–647S.*

| Study | Study design/ country | Characteristics: Number, GA/BW, SGA/AGA | Age at follow-up | Measure-ment | Age at developmental test | Neurodevelop-mental assessment | Main results |
|---|---|---|---|---|---|---|---|
| Han et al.[28] 2021 | Retrospective, Korea | 2,961 BW<1,500 g | 4-6, 9-12, 18-24, 30-36, 42-48 and 54-60 months | HT, WT, HC | 54-60 months | K-DST | Poor growth at 60 months of age showed significantly poor developmental outcomes. Children with PVL had small HC (OR, 1.91) and poor developmental screening results (OR, 2.89). |
| Yoon et al.[35] 2021 | Retrospective, Korea | 430,541 BW subgroup; <1,000 g, 1,000–1,499 g, 1,500–1,999 g, 2,000–2,499 g, 2,500–4,500 g | 4–6, 9–12, 18–24, 30–36, 42–48, and 54–60 months | HT, WT, HC | 54-60 months | K-DST | Increased risk of poor developmental results at 60 months in the infants with poor WT, HT, and HC growth. Infants with poor HC at 60 months of age had poor developmental results (OR, 1.81) |
| Song et al.[34] 2020 | Retrospective, Korea | 122 BW<1,500 g or GA<32 weeks, SGA 29/AGA 93 | PMA 35 weeks, 4, 18 months PCA | HT, WT, HC | 18 Months CA | BSID III | HC at 4 months CA was an important factor of favorable neurodevelopmental outcomes, and HC growth spurt between PMA 35 weeks and 4 months CA in preterm AGAs |
| Sicard et al.[55] 2017 | Prospective, France | 4,046 ≤34 Weeks GA | Hospital discharge | HC | 2 Years CA | | HC at birth and HC *z* score between birth and discharge are associated to neurodevelop-mental outcome at 2 years |
| Ghods et al.[56] 2011 | Retrospective, Austria | 173 VLBW | 3, 6. 9. 12., 24 Months CA and 40, 54, 66 months | HC | 2 Years | Neuromotor assessments, BSID II | Most HC catch-up occurred between birth and 3 months CA. There is a close relation between HC growth and neurodevelopmental outcome. |
| Franz et al.[44] 2009 | Prospective, Germany | 219 <30 Weeks GA and BW <1,500 g | At discharge | WT, HC | 5.4 Years | KABC test CP | Motor development was associated with growth from birth to discharge. Cognitive develop-ment was associated with BW, early neonatal WT gain, and postdischarge HC growth. |

*Lim J, et al. Growth pattern of preterm infant, Clin Exp Pediatr Vol. 65, No. 1, 1–9, 2022*

# Causal diagram for neonatal outcomes




*Koletzko, B., Nutritional care of preterm infants : scientific basis and practical guidelines, Karger 2021*

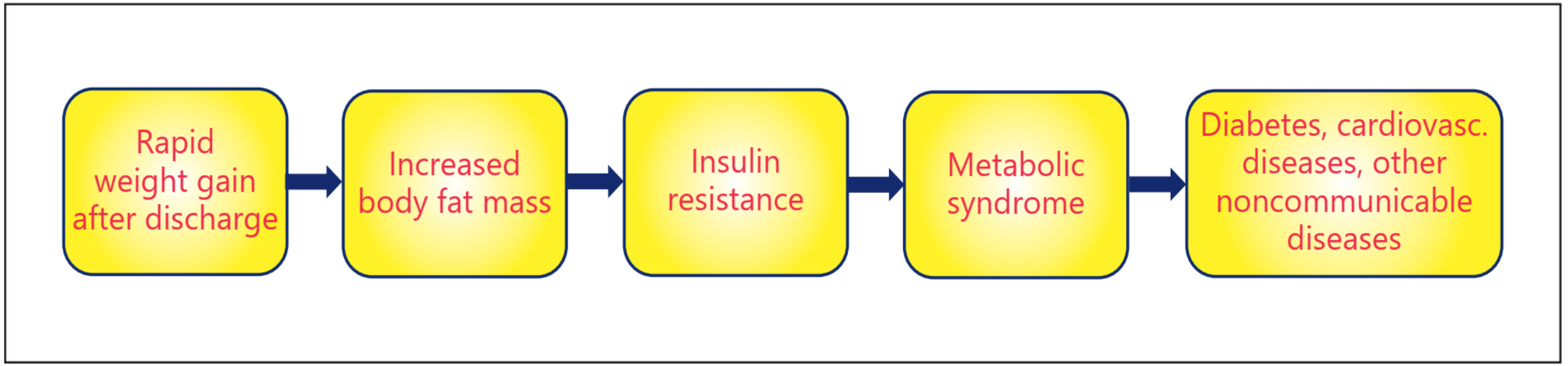



**Fig. 2.** An excessive supply of "empty calories" can induce rapid weight gain with increased body fat deposition, which is a risk factor for insulin resistance that predisposes to the development of later metabolic syndrome and an increased risk for noncommunicable diseases such as diabetes and cardiovascular disorders.

*Koletzko B, ed. Nutritional Care of Preterm Infants. 2nd ed. Karger; 2021*

DOI: 10.1002/jpen.2568

REVIEW

# Nutrition guidelines for preterm infants: A systematic review

Meiliana Meiliana MS[1] | Tanith Alexander PhD[1,2] | Frank H. Bloomfield PhD[1] | Barbara E. Cormack PhD[1] | Jane E. Harding DPhil[1] | Orla Walsh[1] | Luling Lin PhD[1]

**Abstract**

**Background:** There is no consensus on optimal nutrition for preterm infants, leading to substantial practice variation. We aimed to assess the quality of nutrition guidelines for preterm infants, the consistency of recommendations, and the gaps in recommendations.

**Methods:** We searched databases and websites for nutrition guidelines for preterm infants before first hospital discharge, which were endorsed, prepared, or authorized by a regional, national, or international body, written in English, and published between 2012 and 2023. Two reviewers independently screened articles and extracted the recommendations. Four reviewers appraised the included guidelines using Appraisal of Guidelines, Research, and Evaluation II.

**Results:** A total of 7051 were identified, with 27 guidelines included, 26% of which were high in quality. Most guidelines lacked stakeholder involvement and rigor of development. We found considerable variation in recommendations, many of which lacked details on certainty of evidence and strength of recommendation. Recommendations for type of feed and breastmilk fortification were consistent among high-quality guidelines, but recommendations varied for intakes of almost all nutrients and monitoring of nutrition adequacy. Different guidelines gave different certainty of evidence for the same recommendations. Most gaps in recommendations were due to very low certainty of evidence.

**Conclusion:** Future development of nutrition guidelines for preterm infants should follow the standard guideline development method and ensure the rigorous process, including stakeholders' involvement, to improve the reporting of strength of recommendation, certainty of evidence, and gaps in recommendation. Evidence is needed to support recommendations about macro and micronutrient intakes, breastmilk fortification, and markers on adequacy of intake of different nutrients.

# Dinh dưỡng giai đoạn NICU

- Sữa mẹ là lý tưởng
- Sữa mẹ + HMF đến 2000g, kéo dài hơn khi CN chưa đạt # 50$^{th}$ percentile theo tuổi or bệnh xương chuyển hóa
- Tăng cân 15 – 20 g/kg/d, VĐ 1 cm/w , CD 1cm/w.
- Mục tiêu 110 – 130 Kcal/kg/d
- Sữa công thức sinh non được khuyến cáo nếu ko có sữa mẹ

Table 3
Dietary intake requirements in infants based on 150 mL/kg/d

| | Energy | Protein | Calcium | Phosphorus |
|---|---|---|---|---|
| Recommended for premature infants after discharge | 120–130 kcal/kg/d | 2.5–3.1 g/kg/d | 70–140 mg/kg/d | 35–90 mg/kg/d |
| Human milk without fortification | 100 kcal/kg | 1.5 g/kg | 44 mg/kg | 14 mg/kg |
| Term infant formula | 100 kcal/kg | 2 g/kg | 80 mg/kg | 42 mg/kg |
| Post-discharge premature formula | 110 kcal/kg | 3.1 g/kg | 117 mg/kg | 69 mg/kg |

*Ricki F. Goldstein(2018),Care of the Neonatal Intensive Care Unit Graduate after Discharge, Pediatr Clin N Am*

*Ariel Salas, Ian J Griffin, Growth and feeding issues in the neonatal intensive care unit graduate, UpToDate 4/2025*

# Các yếu tố nguy cơ cần giám sát dinh dưỡng sau XV

1. Thở máy >10 ngày ở NICU và/hoặc có loạn sản phế quản phổi (BPD)
2. Khó nuốt, trào ngược
3. Thời gian mỗi cử ăn >30 phút
4. Có tiền sử phẫu thuật bụng
5. Dị tật tim bẩm sinh (đặc biệt tím hoặc suy tim)
6. Rối loạn thần kinh cơ
7. Bất thường nhiễm sắc thể
8. Còn hoặc vừa mới cần hỗ trợ dinh dưỡng trong vòng 1 tuần
9. Đường cong tăng trưởng đi xuống trong tuần trước xuất viện
10. Cân nặng hiện tại < −3 SD, hoặc giảm > −2 SD so với lúc sinh

*J Pediatr Gastroenterol Nutr. 2025;81:421–441, A position paper of the ESPGHAN Nutrition Committee*

# A systematic review and meta-analysis of breastfeeding & neurodevelopmental outcomes in preterm infant

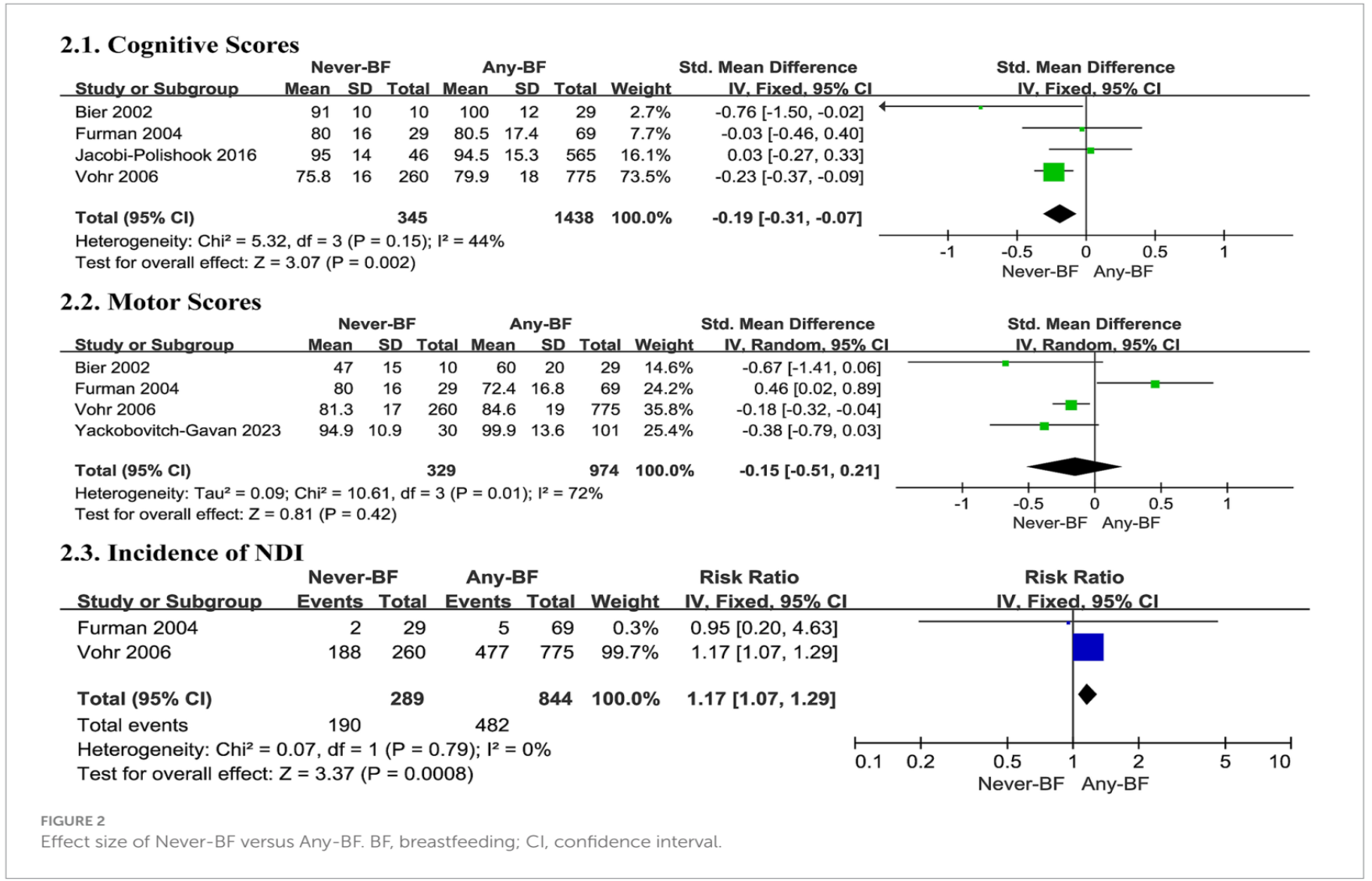
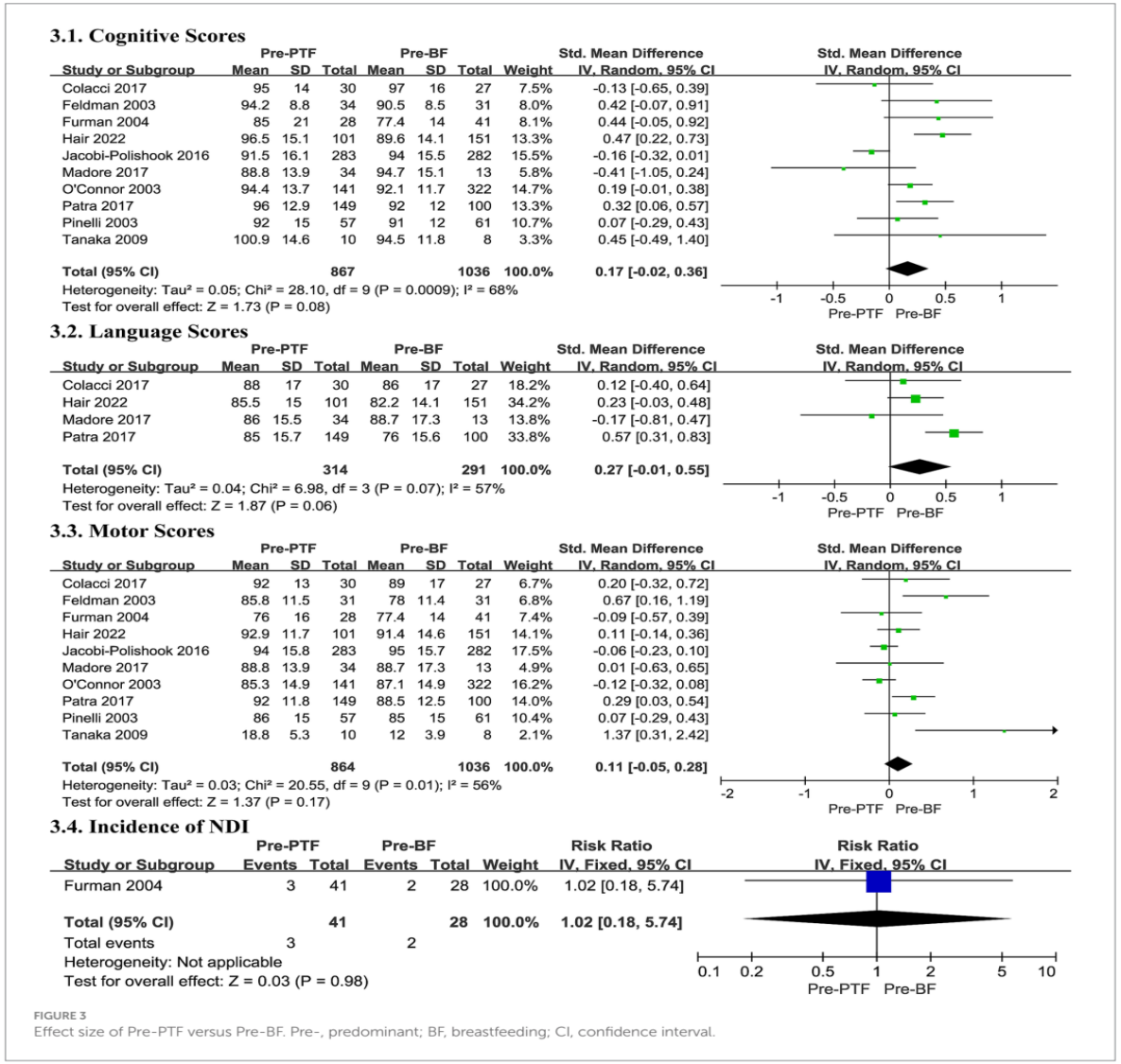



FIGURE 2
Effect size of Never-BF versus Any-BF. BF, breastfeeding; CI, confidence interval.

*Zhang et al. doi: 10.3389/fpubh.2024.1401250*

# A systematic review and meta-analysis of breastfeeding & neurodevelopmental outcomes in preterm infant



**3.1. Cognitive Scores**

| Study or Subgroup | Pre-PTF Mean | SD | Total | Pre-BF Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Colacci 2017 | 95 | 14 | 30 | 97 | 16 | 27 | 7.5% | -0.13 [-0.65, 0.39] |
| Feldman 2003 | 94.2 | 8.8 | 34 | 90.5 | 8.5 | 31 | 8.0% | 0.42 [-0.07, 0.91] |
| Furman 2004 | 85 | 21 | 28 | 77.4 | 14 | 41 | 8.1% | 0.44 [-0.05, 0.92] |
| Hair 2022 | 96.5 | 15.1 | 101 | 89.6 | 14.1 | 151 | 13.3% | 0.47 [0.22, 0.73] |
| Jacobi-Polishook 2016 | 91.5 | 16.1 | 283 | 94 | 15.5 | 282 | 15.5% | -0.16 [-0.32, 0.01] |
| Madore 2017 | 88.8 | 13.9 | 34 | 94.7 | 15.1 | 13 | 5.8% | -0.41 [-1.05, 0.24] |
| O'Connor 2003 | 94.4 | 13.7 | 141 | 92.1 | 11.7 | 322 | 14.7% | 0.19 [-0.01, 0.38] |
| Patra 2017 | 96 | 12.9 | 149 | 92 | 12 | 100 | 13.3% | 0.32 [0.06, 0.57] |
| Pinelli 2003 | 92 | 15 | 57 | 91 | 12 | 61 | 10.7% | 0.07 [-0.29, 0.43] |
| Tanaka 2009 | 100.9 | 14.6 | 10 | 94.5 | 11.8 | 8 | 3.3% | 0.45 [-0.49, 1.40] |
| **Total (95% CI)** | | | **867** | | | **1036** | **100.0%** | **0.17 [-0.02, 0.36]** |

Heterogeneity: Tau² = 0.05; Chi² = 28.10, df = 9 (P = 0.0009); I² = 68%
Test for overall effect: Z = 1.73 (P = 0.08)

**3.2. Language Scores**

| Study or Subgroup | Pre-PTF Mean | SD | Total | Pre-BF Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Colacci 2017 | 88 | 17 | 30 | 86 | 17 | 27 | 18.2% | 0.12 [-0.40, 0.64] |
| Hair 2022 | 85.5 | 15 | 101 | 82.2 | 14.1 | 151 | 34.2% | 0.23 [-0.03, 0.48] |
| Madore 2017 | 86 | 15.5 | 34 | 88.7 | 17.3 | 13 | 13.8% | -0.17 [-0.81, 0.47] |
| Patra 2017 | 85 | 15.7 | 149 | 76 | 15.6 | 100 | 33.8% | 0.57 [0.31, 0.83] |
| **Total (95% CI)** | | | **314** | | | **291** | **100.0%** | **0.27 [-0.01, 0.55]** |

Heterogeneity: Tau² = 0.04; Chi² = 6.98, df = 3 (P = 0.07); I² = 57%
Test for overall effect: Z = 1.87 (P = 0.06)

**3.3. Motor Scores**

| Study or Subgroup | Pre-PTF Mean | SD | Total | Pre-BF Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Colacci 2017 | 92 | 13 | 30 | 89 | 17 | 27 | 6.7% | 0.20 [-0.32, 0.72] |
| Feldman 2003 | 85.8 | 11.5 | 31 | 78 | 11.4 | 31 | 6.8% | 0.67 [0.16, 1.19] |
| Furman 2004 | 76 | 16 | 28 | 77.4 | 14 | 41 | 7.4% | -0.09 [-0.57, 0.39] |
| Hair 2022 | 92.9 | 11.7 | 101 | 91.4 | 14.6 | 151 | 14.1% | 0.11 [-0.14, 0.36] |
| Jacobi-Polishook 2016 | 94 | 15.8 | 283 | 95 | 15.7 | 282 | 17.5% | -0.06 [-0.23, 0.10] |
| Madore 2017 | 88.8 | 13.9 | 34 | 88.7 | 17.3 | 13 | 4.9% | 0.01 [-0.63, 0.65] |
| O'Connor 2003 | 85.3 | 14.9 | 141 | 87.1 | 14.9 | 322 | 16.2% | -0.12 [-0.32, 0.08] |
| Patra 2017 | 92 | 11.8 | 149 | 88.5 | 12.5 | 100 | 14.0% | 0.29 [0.03, 0.54] |
| Pinelli 2003 | 86 | 15 | 57 | 85 | 15 | 61 | 10.4% | 0.07 [-0.29, 0.43] |
| Tanaka 2009 | 18.8 | 5.3 | 10 | 12 | 3.9 | 8 | 2.1% | 1.37 [0.31, 2.42] |
| **Total (95% CI)** | | | **864** | | | **1036** | **100.0%** | **0.11 [-0.05, 0.28]** |

Heterogeneity: Tau² = 0.03; Chi² = 20.55, df = 9 (P = 0.01); I² = 56%
Test for overall effect: Z = 1.37 (P = 0.17)

**3.4. Incidence of NDI**

| Study or Subgroup | Pre-PTF Events | Total | Pre-BF Events | Total | Weight | Risk Ratio IV, Fixed, 95% CI |
|---|---|---|---|---|---|---|
| Furman 2004 | 3 | 41 | 2 | 28 | 100.0% | 1.02 [0.18, 5.74] |
| **Total (95% CI)** | | **41** | | **28** | **100.0%** | **1.02 [0.18, 5.74]** |
| Total events | 3 | | 2 | | | |

Heterogeneity: Not applicable
Test for overall effect: Z = 0.03 (P = 0.98)

FIGURE 3
Effect size of Pre-PTF versus Pre-BF. Pre-, predominant; BF, breastfeeding; CI, confidence interval.

*Zhang et al. doi: 10.3389/fpubh.2024.1401250*

**Table 3.** Main nutrient content in 5 selected powdered bovine-based fortifiers (per gram of powder) and nutrient intakes (per kg/day) in infants fed 160 mL/kg/day of fortified mature human milk

| | HM | Fortifiers[a], /g | Fortified HM, /kg/day | Recommended intakes[b] |
|---|---|---|---|---|
| Energy, kcal | 66 | 3.5–4.9 | 128–134 | 110–130 |
| Protein, g | 1.2 | 0.18–0.36 | 3.1–3.7 | 500–1,500 g: 3.5–4.5<br>1,500–2,000 g: 3.0–4.0<br>2,000–2,500 g: 2.5–3.5 |
| Sodium, mg | 21 | 4.2–9.2 | 58–92 | 69–115 |
| Calcium, mg | 27 | 10.0–33.0 | 107–233 | 120–220 |
| Phosphorus, mg | 16 | 6.8–19 | 69–135 | 70–120 |
| Iron, mg | 0.04 | 0–0.5 | 0.1–3.3 | 1–3 |

*a Fortifiers from Nestle, Nutricia, Mead-Johnson, and Ross*
*b See chapter "Recommended nutrient intakes," ESPGHAN [13], 2010, and Koletzko et al. [15], 2014.*

# Khi nào dinh dưỡng tăng cường sau xuất viện

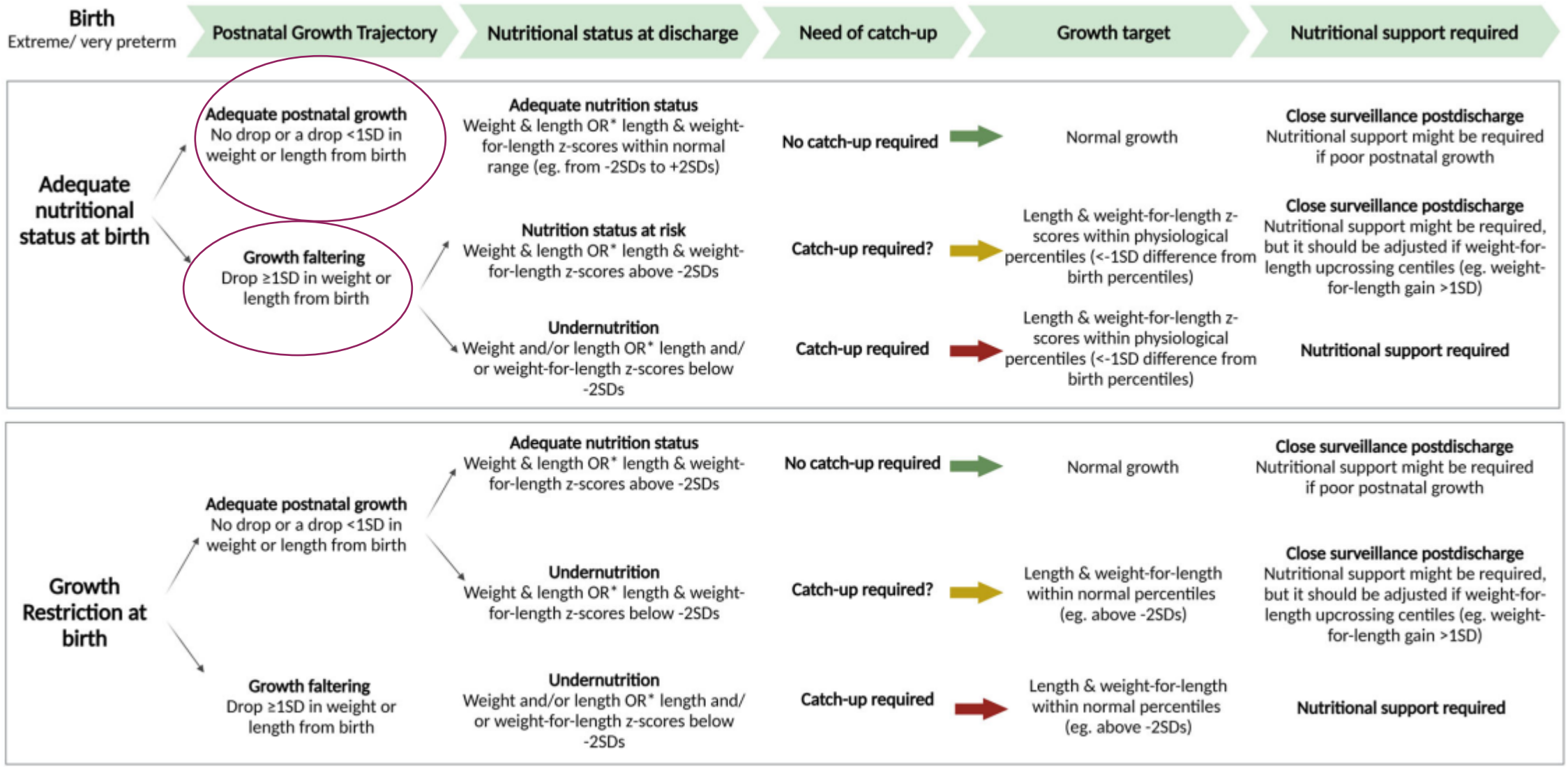
- Cá thể hóa: tùy biểu đồ tăng trưởng, tùy mục tiêu và kinh tế gia đình
- gđ NICU không có dinh dưỡng tăng cường, có thể bổ sung sau xuất viện, nếu biểu đồ tăng trưởng không bắt kịp
- Dinh dưỡng tăng cường có thể kéo dài đến 48 – 52 tuần tuổi sau sinh
- Trẻ bú mẹ trực tiếp và tăng trưởng đủ, có thể ngưng dinh dưỡng tăng cường sớm hơn

Approximate growth rates for girls and boys at the 50th percentile of the WHO growth standards are:

| | Weight | Length |
|---|---|---|
| Birth to 3 months | 31 g/d | 0.85 cm/wk |
| 3 to 6 months | 17 g/d | 0.47 cm/wk |
| 6 to 9 months | 11 g/d | 0.34 cm/wk |
| 9 to 12 months | 8 g/d | 0.29 cm/wk |

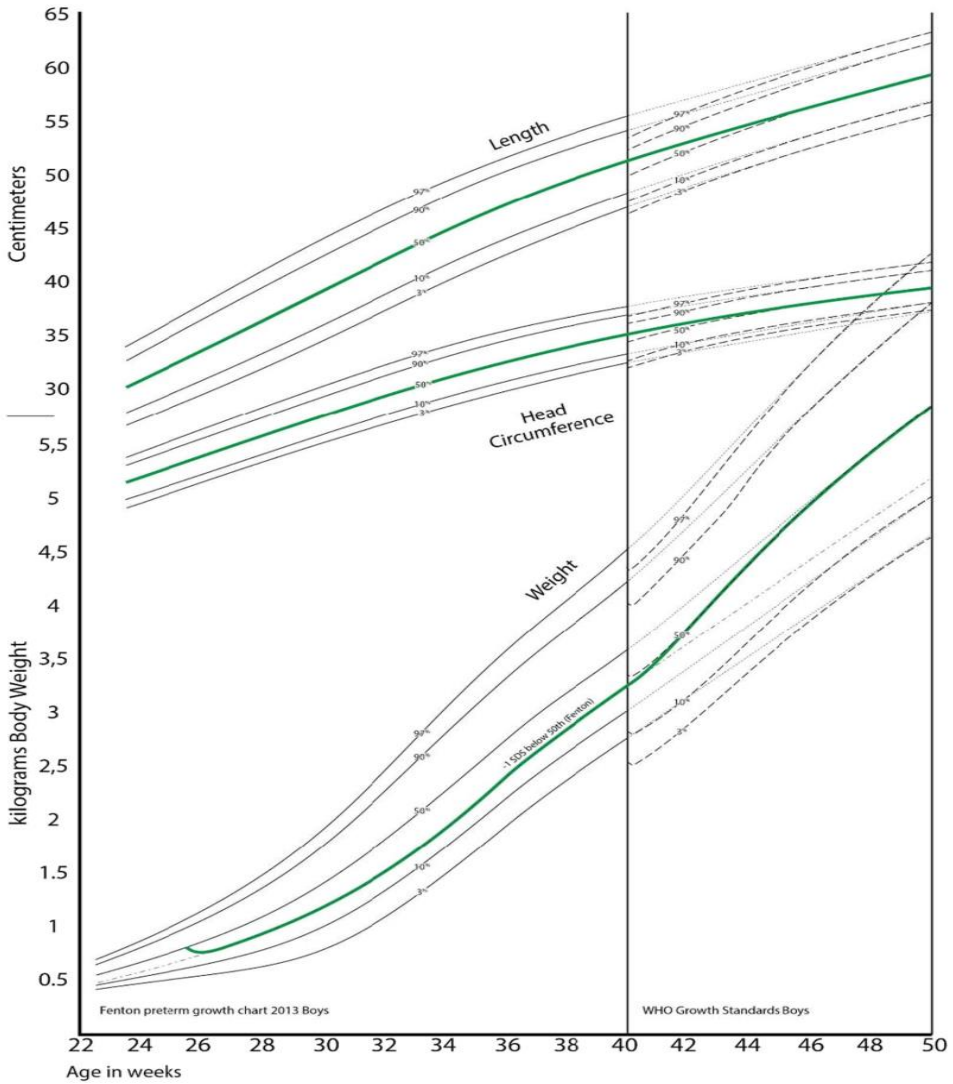
*Goldstein & Malcolm (2018), Care of the NICU Graduate after Discharge, Pediatr Clin N Am*

*Ariel Salas, Ian J Griffin, Growth and feeding issues in the neonatal intensive care unit graduate, UpToDate 4/2025*




*J Pediatr Gastroenterol Nutr. 2025;81:421–441, A position paper of the ESPGHAN Nutrition Committee*

# Sử dụng phần mềm Peditools tính Z-score




PediTools *Clinical tools for pediatric providers*

**Today is Friday, April 12th, 2019**

## Growth Parameters

**Growth metrics on analysis date**

| | |
|---|---|
| Gender | Male / Female |
| Gestational age | 34 3/7 |
| Weight (grams) | 2405 |
| Head circumference (cm) | 31.75 |
| Length (cm) | 45 |
| Last menstrual period | |
| Due date | |
| Date of birth | |
| Gestation at birth | |
| **Analysis date** | |
| Age in days on date | |
| Day of life on date | |

Reset form — Submit

| 34 3/7 wks male | Value | Imperial | %ile | Z-score | 50%ile | Weekly* |
|---|---|---|---|---|---|---|
| Weight (g) | 2405 | 5 lb 4.8 oz | 55% | 0.12 | 2,357 | 238 |
| Head (cm) | 31.75 | 12.50 in | 57% | 0.18 | 31.5 | 0.77 |
| Length (cm) | 45 | 17.72 in | 46% | -0.11 | 45.3 | 1.24 |

*Expected weekly increase to maintain current percentile

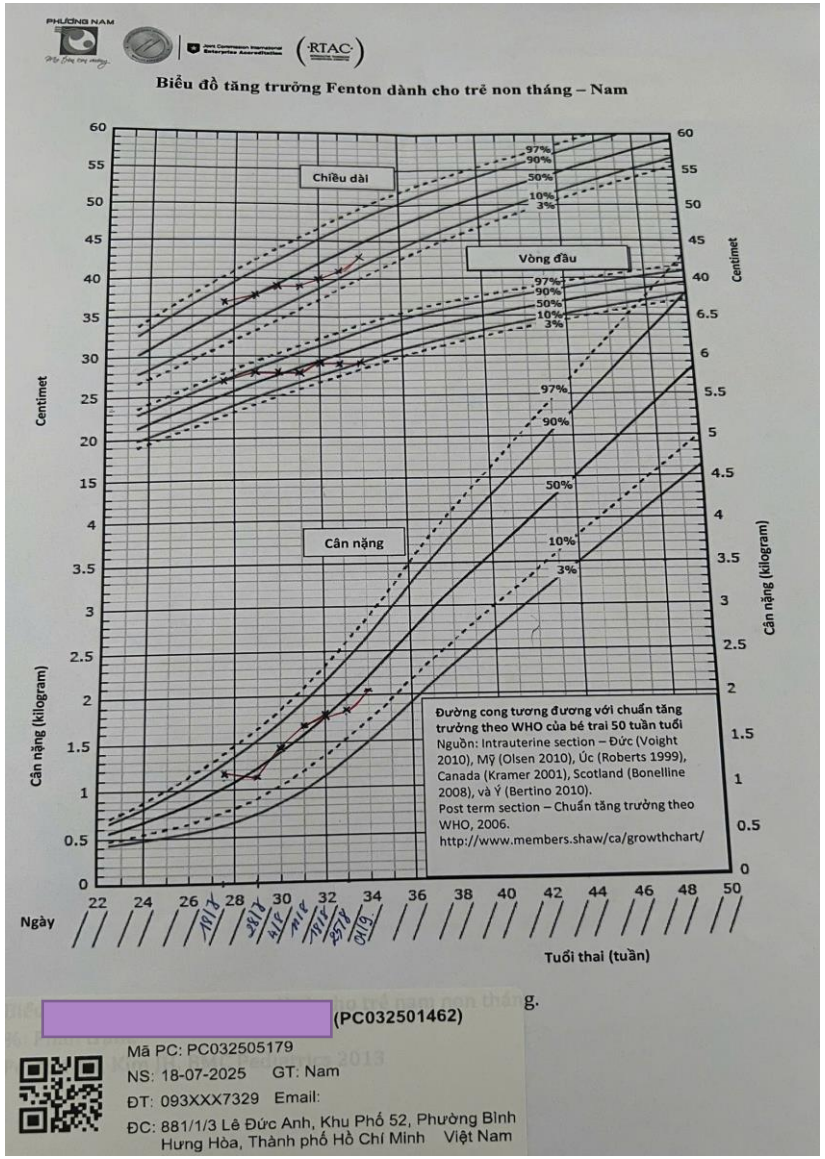
*J Pediatr Gastroenterol Nutr. 2025;81:421–441, A position paper of the ESPGHAN Nutrition Committee*

Sinh non 27w 4/7, trai, CNLS 1080g, VĐ 26, CD 36, BMT, hPDA, VP sớm, mẹ NT tiểu, sau sinh thở nHFO, surfactant, para đóng OĐM, NATM, bú mẹ hoàn toàn

Thời điểm 34w hiệu chỉnh: bú mẹ hoàn toàn đủ + HMF 50%, CN 2020, VĐ 29 cm, CD 41 cm

https://peditools.org/fenton2025/

| 34w | Chỉ số | %per | Z- Score | 50%per | Weekly |
|---|---|---|---|---|---|
| **CN** | 2020g | 25% | -0.67 | 2.200 | 210 |
| **VĐ** | 29 | 5% | -1.67 | 31.5 | 0.89 |
| **CD** | 41 | 6% | -1.58 | 44.9 | 1.24 |



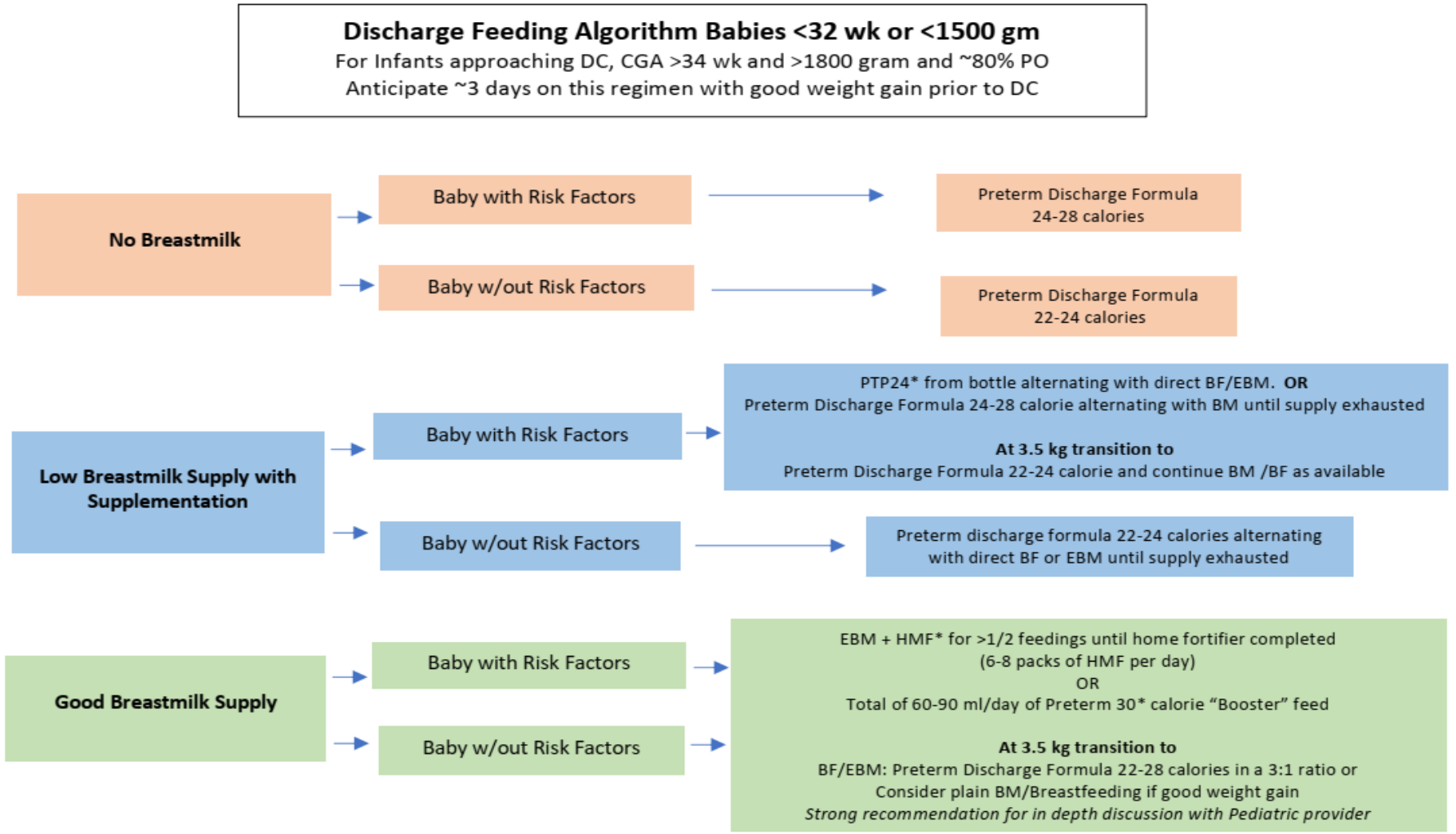
# Dinh dưỡng bổ sung tăng cường sau xuất viện

| | |
|---|---|
| Indications | *Very preterm infants with*<br>Growth restriction at discharge<br>– body weight <10th percentile or –1 SD<br>– and/or loss of more than 0.5 SD between birth and discharge<br>Continuing medical problems such as bronchopulmonary dysplasia<br>BUN levels less than 3.2 mmol/L (9 mg/dL)<br>Serum alkaline phosphatase higher than 600 IU/L or phosphorus less than 1.6 mmol/L (5 mg/dL) |
| Modalities | *Addition of an MCF to expressed HM*<br>Mix a predetermined volume (150 mL × infant weight [kg]/2) of HM with a full-strength powdered MCF and feed in combination with unfortified HM feedings.<br>About half of feeds as supplemented expressed breast milk<br>*Alternatives*<br>Addition of postdischarge formula powder to HM<br>Addition of a concentrated liquid preterm formula |
| Monitoring | *Growth using appropriate growth chart*<br>Fenton growth chart until 50 weeks PCA<br>Then World Health Organization growth chart |
| Duration | Up to 40–52 weeks PCA, depending on growth |

SD, standard deviation; BUN, blood urea nitrogen; MCF, multicomponent fortifier; PCA, postconceptional age.

*Koletzko, B., Nutritional care of preterm infants : scientific basis and practical guidelines, Karger 2021*

# Consensus Statement and Clinical Recommendations




**Risk Factors Include**
**Anthropometric**: ≤1500 g BW GA and/or ≤32 weeks at birth; history of suboptimal weight gain with declining weight percentile or Z-score 1-2 weeks prior to discharge. At ≤37 weeks and/or ≤2 kg at dc
**Biochemical**: alkaline phosphatase ≥600 U/L, serum phosphorus ≤5.5 mg/dL
**Nutritional**: Total parenteral nutrition ≥4 weeks; total volume intake <130 mL/kg per day; history of intolerance or use of low nutrient density nutrition (e.g., soy, protein hydrolysate, amino acid-based formulas, or unfortified human milk).
**Miscellaneous**: Osteopenia of prematurity, radiological evidence of bone demineralization and/or fracture(s); chronic use of mineral-wasting medications (e.g. furosemide)

# Lựa chọn cách dinh dưỡng tăng cường

**Intakes of key nutrients from typical enriched post-discharge feedings for preterm infants, assuming milk intake of 160 mL/kg per day**

| Feeding strategy | Breast milk plus formula supplements (give BOTH of the below daily) | | | Formula |
|---|---|---|---|---|
| Breast milk | 6 feeds | 5 feeds | 6 feeds | |
| Premature discharge formula | 2 feeds at 22 kcal/oz (75 kcal/100 mL)[1,2] | 3 feeds at 22 kcal/oz (75 kcal/100 mL)[1,2] | 2 feeds at 30 kcal/oz (100 kcal/100 mL)[3] | 8 feeds at 22 kcal/oz (75 kcal/100 mL)[1,2] |
| Energy (kcal/kg/day) | 112 | 113 | 120 | 117 |
| Protein (g/kg/day) | 1.9 | 2.2 | 2.3 | 3.4 |
| Calcium (mg/kg/day) | 59 to 64 | 70 to 76 | 94 to 100 | 125 to 144 |
| Phosphorus (mg/kg/day) | 34 to 35 | 41 to 42 | 49 to 56 | 74 to 80 |

This table uses the following assumptions:

- Feeding intake is 160 mL/kg/day
- Breast milk provides 20 kcal/oz with 0.9 g/dL of protein[4]

For infants who are less than 44 weeks gestational age, a liquid formulation of premature discharge formula[1,2] or premature formula[3] should be used rather than a powdered formulation. Nutrient compositions of these formulas are based on commonly used commercial brands, as cited.

*Ariel Salas, Ian J Griffin, Growth and feeding issues in the neonatal intensive care unit graduate, UpToDate 4/2025*

# Bổ sung vitamin và sắt sau xuất viện

Sữa mẹ có 0,3 – 1 mg Fe/L
Sữa CT sinh non có 13 - 16 mg Fe/L
Sữa CT đủ tháng có 6 – 7 mg Fe/L

**Trẻ < 35w cần bổ sung Fe trước 1 m tuổi.**

**Trẻ VLBW, bú mẹ: Fe 2 – 4 mg/kg/ngày từ 2W đến 12 tháng.**

**Trẻ VLBW -bú sữa công thức, Fe bổ sung 1 – 3 mg/kg/ngày**

**Table 45.1. Hemoglobin Nadir**

| Characteristic | Hemoglobin Level | | |
|---|---|---|---|
| | Healthy Term Infants | Very Low Birth Weight Infants (1,000–1,500 g) | Extremely Low Birth Weight Infants (<1,000 g) |
| Hemoglobin nadir | 10 g/dL | 8 g/dL | 7 g/dL |
| Postnatal age | 10–12 weeks | 4–6 weeks | 4–6 weeks |

*Source*: Reprinted from Strauss RG. Anemia of prematurity: pathophysiology and treatment. *Blood Rev* 2010;24(6):221–225. Copyright © 2010 Elsevier. With permission.

**TABLE 2** Recommendations for iron intake in preterm infants.[3,80,95]

| Birth weight | Iron supplementation | Increase | Stop |
|---|---|---|---|
| <1500 g | 2–3 mg/kg/day | If ferritin is <35–70 µg/L up to 3–4(6) mg/kg/day especially in breastfed infants | If ferritin is >300 µg/L |
| 1500–2000g | 2 mg/kg/day | | |
| 2000– 2500 g | 1–2 mg/kg/day | | |

*Ravi M. Patel and (2023), Anemia, Cloherty and Stark's Manual of Neonatal Care 9th*

*Josehp A Garcia- Prats, Anemia of preterm infants, UpToDate 2025*

*J Pediatr Gastroenterol Nutr. 2025;81:421–441*

# Bệnh xương chuyển hóa ở trẻ sinh rất non

- 23% VLBW & 55% ELBW
- Sàng lọc lúc 4 - 6 w, và mỗi 2 w đến khi ALP ổn định (< 500 UI/L) & yếu tố nguy cơ không còn
- TPN, đt Lasix, vàng da ứ mật: cần sàng lọc bệnh xương chuyển hóa

| | Vitamin D | Fe | Calcium | Phospho |
|---|---|---|---|---|
| **Trong 1000 mL sữa mẹ** | 20 UI | 0,9 | 350 | 200 |
| **Nhu cầu trẻ sinh non** | 400 – 800 UI/day | 2 – 4 mg/kg/d | 100 – 220 mg/kg/d | 60 – 140 mg/kg/d |

*Sarah(2023), Metabolic Bone Disease of Prematurity, Cloherty & Stark's Manual of Neonatal Care 9th ed*

# Thiếu Vitamin D

- Định nghĩa thiếu Vit D: 25OH < 20 ng/mL ( 50nmol/L)
- Mặc dù bổ sung Vit D 400 UI/d. Có 30% & 27% sinh non ≤ 33w, thiếu VitD thời điểm 6m và 12 m

**Table 3.** Recommendations for vitamin D supplementation in preterm infants.

| Recommendations for Vitamin D Supplementation in Preterm Infants by Medical Societies | Vitamin D IU/Day |
|---|---|
| IOM + WHO [4] | 400–1000 |
| AAP [9] | 200–400 IU up to max 1000 * (200 IU/day from PN/feeds) |
| ESPGHAN (2023) [61] | 800–1000 |
| ESPGHAN (2023) [61] | 400–700 IU/kg/day up to maximum 1000 UI/day |

*Children **2025**, 12, 392. https://doi.org/10.3390/ children12030392*
*Koletzko B, ed. Nutritional Care of Preterm Infants. 2nd ed. Karger; 2021*
*Nutrients,2021;13(6):2019,doi:10.3390/nu13062019*

# Thông điệp

1. Tất cả trẻ sinh non cần được theo dõi dinh dưỡng và tăng trưởng sau xuất viện
2. Theo dõi liên tục biểu đồ tăng trưởng và điều chỉnh dinh dưỡng phù hợp
3. Sữa mẹ là nền tảng, cần dinh dưỡng tăng cường ở trẻ nguy cơ
4. Giám sát tăng trưởng cân đối, tránh cả SDD lẫn tăng cân quá nhanh
5. Hỗ trợ sau XV cần mang tính đa ngành: phối hợp giữa bs nhi, chuyên gia dinh dưỡng, và gia đình


BỆNH VIỆN PHƯƠNG NAM
Mẹ tròn con vuông
Thành Viên Tập Đoàn Y Tế Phương Châu

# Cám ơn!