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II Congresso Catarinense de Perinatologia

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Declaração de conflito de interesse

Nestlé, Mead Jonhson e Danone nos anos 2014-2015

NUTRIÇÃO PARENTERAL

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Conflito de interesses

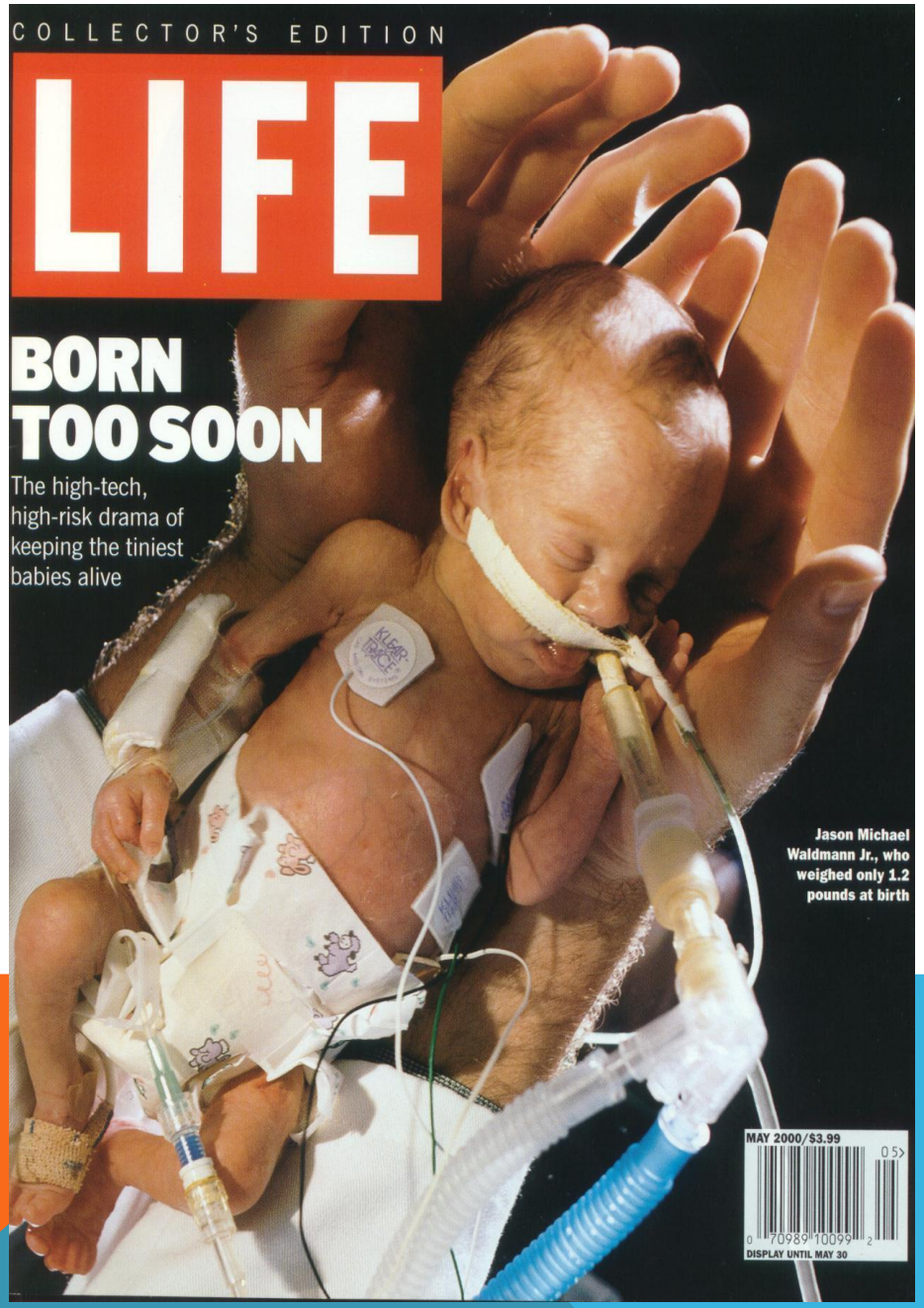
Declaro:

-Não recebo financiamentos para pesquisa ou salários de nenhuma empresa alimentícia

Nos últimos anos recebi financiamento da Mead Jonhson, Nestlé, Abbott e Pfizzer para congressos

Realizo palestras em eventos patrocinados pela indústria

Recebo Financiamentos para pesquisa do CNPq e Faperj



Vulnerabilidade dos pré-termos

- Orgãos e Sistemas Imaturos
- Ambiente desfavorável
- Limitações com volumes
- Gasto metabólico alto
- Doenças associadas a prematuridade
- Dificuldades operacionais de manter o aleitamento
- Repercussões a longo prazo da restrição de crescimento
- Metas "quase" inalcançáveis

INDICAÇÕES

- Menores de 1500g
- Doenças gastrointestinais
- Situações onde a nutrição enteral não pode ser iniciada

CONTEÚDO

- Proteína
- Lipídeos
- Água e Glicose
- Minerais
- Vitaminas
- Oligoelementos

COMPOSIÇÃO DA NPT

TABLE 1 Nutritional composition of a binary RTU premixed PS and a commercially premixed 3-CB for preterm infants compared with the European Society of Pediatric Gastroenterology, Hepatology, and Nutrition recommendations for VLBW infants at the end of the first week of life[1]

Nutritional component/ (kg body weight · d)	Recent recommendations for VLBW infants at the end of the first week of life[2]	Binary RTU premixed PS[3]	Commercially premixed 3-CB[4]
Fluids, *mL*	—	165	128
Energy, *kcal*	90–120	118	117
Protein[5], *g*	3.5–4.0	4.1	4.0
Glucose, *g*	13–18	18.8	17.1
Fat[6], *g*	2–4	3.0[7]	3.2
Sodium, *mmol*	2–7	2.4	2.8
Potassium, *mmol*	2–5	2.3	2.6
Chloride, *mmol*	2–7	3.0	4.0
Calcium, *mmol*	1.3–4.0	2.7	1.6
Phosphorus, *mmol*	1.0–2.5	2.7	1.6
Magnesium, *mmol*	0.2–0.4	0.25	0.55

[1] PS, parenteral solution; RTU, ready-to-use; VLBW, very-low-birth-weight; 3-CB, 3-chamber bag; —, not applicable.
[2] Source: references 4 and 5.
[3] Source: references 3 and 9.
[4] Numeta G13%E; Baxter Healthcare.
[5] Primene 10%; Baxter Healthcare.
[6] ClinOleic; Baxter Healthcare.
[7] Lipid provided separately.

Rigo & Senterre. Intrauterine-Like Growth Rates Can Be Achieved with Premixed Parenteral Nutrition Solution in Preterm Infants1–3. The Journal of Nutrition . 2014

PROTEÍNA

- Iniciar logo após o nascimento
- Quantidade : 2,5 a 3,5 g/Kg/dia
- Soluções que contenham taurina
- 20 a 25 Kcal de calorias não proteicas são requeridas para cada grama de proteína para promover crescimento – evidência moderada

Uthaya S, Modi N. Practical preterm parenteral nutrition: Systematic literature review and recommendations for practice. 2014. Early Human Development.

Braake Te et al. Parenteral amino acid and energy administration to premature infants em early life. Semin Fetal Neonatal Med 2007

LIPÍDEOS

- Alto valor calórico – soluções a 20 % 1g – 10 calorias
- Baixa Osmolaridade - veia periférica
- Lipoproteína lipase
- Soluções a 20% contem uma menor razão fosfolipide/troglicerideos – melhor clearence de triglicerideos
- **Tipos:**
- Óleo de soja
- Óleo de soja com triglicerideos de cadeia media
- Óleo de soja + triglicerídeo de cadeia média + óleo de oliva + óleo de peixe

LIPÍDEOS

Table 1. Comparison and Characteristics of Different Parenteral Lipid Emulsions

Product	Intralipid	SMOFlipid	ClinOleic	Omegaven	ClinOleic: Omegaven 1:1
Oil source, %					
Soybean	100	30	20	0	10
MCT	0	30	0	0	0
Olive oil	0	25	80	0	40
Fish oil	0	15	0	100	50
Saturated FA, g/10 g ILE					
Caprylic (8:0)		1.6			
Capric (10:0)		1.1			
Palmitic (16:0)	1.0	0.92	1.3	0.63	0.96
Stearic (18:0)	0.40	0.27	0.20	0.13	0.16
Monounsaturated FA, g/10 g ILE					
Oleic (18:1)	2.6	2.8	6.5	0.95	3.7
Polyunsaturated FA, g/10 g ILE					
Linoleic (18:2)	5.0	1.9	1.8	0.40	1.1
α-Linolenic (18:3)	0.90	0.24	0.20	<0.20	0.20
EPA (20:5)	0	0.24	0	2.0	1.0
Arachidonic (20:4)	0	0.05	0.03	0.25	0.14
DHA (22:5)	0	0.22	0	2.3	1.15
Phytosterols, mg/L	348 ± 33	47.6	237 ± 8	0	119
α-Tocopherol, mg/L	38	200	32	150–296	75–148

Intralipid, Omegaven, and SMOFlipid (Fresenius Kabi, Bad Homburg, Germany) and ClinOleic (Baxter, Maurepas, France). Data in the table are the mean value when an interval is given from the manufacturer. DHA, docosahexaenoic acid; EPA, eicosapentaenoic acid; FA, fatty acid; ILE, intravenous lipid emulsions; MCT, medium-chain triglycerides.

ENERGIA

- Lipideos
- Glicose
- AIG : iniciar 5 a 6 mg/kg/minuto
- PIG : iniciar 6 a 8 mg/Kg/minuto
- Cuidado com veia periferica nas altas concentrações de glicose

CÁLCIO/FÓSFORO

TABLE I
Recommended intravenous intakes of calcium, phosphorus, and magnesium

Nutrient	Preterm infants*	Term infants	Children > 1 y†
		mg/L	
Ca	500–600	500–600	200–400
P	400–450	400–450	150–300
Mg	50–70	50–70	20–40

* To prevent Ca-P precipitation, intakes are described per liter, to prevent administration of high concentrations of Ca and P, which may result if intakes are expressed per kilogram body weight and there is fluid restriction. These recommendations also assume an average fluid intake of ~120–150 $mL \cdot kg^{-1} \cdot d^{-1}$ with 25 g amino acid/L of a pediatric amino acid solution. These dosage levels for preterm infants should only be given in central venous infusions.

† Requirements are less with advancing age; few data available.

VITAMINAS

TABLE 2
Suggested intakes of parenteral vitamins in infants and children

Vitamin	Term infants and children Dose per day*	Preterm infants Dose/kg body wt (maximum not to exceed term infant dose) Current suggestions†	Preterm infants Dose/kg body wt (maximum not to exceed term infant dose) Best estimate for new formulation‡
Lipid soluble			
A (μg)§	700	280	500
E (mg)§	7	2.8	2.8
K (μg)	200	80	80
D (μg)§	10	4	4
(IU)	400	160	160
Water soluble			
Ascorbic acid (mg)	80	32.0	25
Thiamin (mg)	1.2	0.48	0.35
Riboflavin (mg)	1.4	0.56	0.15
Pyridoxine (mg)	1.0	0.4	0.18
Niacin (mg)	17	6.8	6.8
Pantothenate (mg)	5	2.0	2.0
Biotin (μg)	20	8.0	6.0
Folate (μg)	140	56	56.0
Vitamin B-12 (μg)	1.0	0.4	0.3

* These guidelines for term infants and children are identical to those of the AMA (NAG). MVI-Pediatric® (Armour) meets these guidelines. Recent data indicate that 40 IU·kg^{-1}·d^{-1} of vitamin D (maximum of 400 IU/d) is adequate for term and preterm infants (Koo et al, JPEN 1987;11:172–7) (23). The higher dose of 160 IU·kg^{-1}·d^{-1} has not been associated with complications and maintains blood levels

OLIGOELEMENTOS

Table 2. Enteral and parenteral recommendations (per kg/day) for ELBW and VLBW infants

Nutrient	Enteral recommendation	Parenteral recommendation	Content in 2 ml Peditrace®
Iron, mg	2–3	0–0.25	–
Zinc, mg	1.4–2.5	0.4*	0.5
Copper, µg	100–230	40*	40
Selenium, µg	5–10	5–7*	4
Manganese, µg	1–15	1*	2
Iodine, µg	10–55	10*	2
Chromium, µg	0.03–2.25	0.05–0.3*	–
Molybdenum, µg	0.35	0.25*	–

* Approximate values. Iodine recommendation assumes no use of iodine containing antiseptics.

Koletzko B . Nutritional care of Premature Infants: Microminerals, 2014

CUIDADOS GERAIS

- Soluções comercialmente prontas – diminui erros
- Preparo em capela de fluxo laminar
- Cálcio e fosforo nas soluções
- Cálculos computadorizados diminuem erros
- Filtros de linha –protege pacientes contra precipitados – custo alto
- Proteção contra luz-proteção contra peroxidação
- Evitar uso de outras medicações na linha de parenteral
- Soluções 3:1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