

A.S.P.E.N. Definition of Malnutrition

“an imbalance between nutrient requirement and intake, resulting in cumulative deficits of energy, protein or micronutrients that may negatively affect growth, development and other relevant outcomes.”

Mehta, et al. J Parenter Enteral Nutr 2013;37(4):460-81

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Prevalence of Growth Failure

45%

of children with chronic diseases having nutrition risk



10% of infants in primary care settings¹

4% of hospitalized infants²

1. Daymont C, et al. Acad Pediatr. 2020;20:405-12. 2. Carvalho-Salemi, et al. J Acad Nutr Diet. 2018;118:40-51.e7.

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Etiologies of Growth Failure

Inadequate Intake	Increased Energy Needs	Inadequate Absorption
Reflux	Chronic lung disease	GI conditions
Supply concerns	Congenital heart disease	Cystic Fibrosis
Improper mixing	Renal failure	Milk protein allergy
Feeding difficulties	Hyperthyroidism	Inborn errors of metabolism
Neglect/abuse	Chronic infection	
Acute illness		

*Inadequate energy intake is the **most common** cause of growth failure for children with and without chronic disease*

Carvalho-Salemi J, et al. J Acad Nutr Diet. 2018;118(1):40-51.

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Risk Factors for Growth Failure

Medical

- Low birth weight
- Reflux
- Congenital anomalies
- Chronic illness
- Acute illness

Psychosocial

- Poor feeding techniques
- Post-partum Depression (PPD)
- Poverty
- Abuse

Homan. American Family Physician. 2016;94(4):295-300.

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Diagnostic Criteria for Pediatric Malnutrition

Primary Indicators When Single Data Points Available

	Weight-for-height z score	BMI-for-age z score	Length-/height-for-age z score	Mid-upper arm circumference
Mild Malnutrition	-1 to -1.9 z score	-1 to -1.9 z score	No data	≥ -1 to -1.9 z score
Moderate Malnutrition	-2 to -2.9 z score	-2 to -2.9 z score	No data	≥ -2 to -2.9 z score
Severe Malnutrition	-3 or greater z score	-3 or greater z score	-3 z score	≥ -3 z score

Primary Indicators When Two or More Points Available:

	Weight gain velocity (<2 years of age)	Weight loss (2-20 years of age)	Deceleration in weight-for-length/height z score	Inadequate nutrient intake
Mild Malnutrition	<75% ¹ of the norm ² expected for weight gain	5% usual body weight	Decline of 1 z score	51-75% estimated energy/protein need
Moderate Malnutrition	<50% ¹ of the norm ² expected for weight gain	7.5% usual body weight	Decline of 2 z score	26-50% estimated energy/protein need
Severe Malnutrition	<25% ¹ of the norm ² expected for weight gain	10% usual body weight	Decline of 3 z score	≤25% estimated energy/protein need

1. Guo S, et al. Reference data on gains in weight and length during the first two years of life. Pediatrics. 1991;119(3):355-62. 2. World Health Organization data for patients <2 years old: http://www.who.int/childgrowth/standards/w_velocity/en/index.html. Reproduced from Becker P, et al. Nutr Clin Pract. 2015 Feb;30(1):147-61 © 2015, American Society for Parenteral and Enteral Nutrition.

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Implications of Growth Failure

“The first 1000 days”

Critical period of brain growth and development

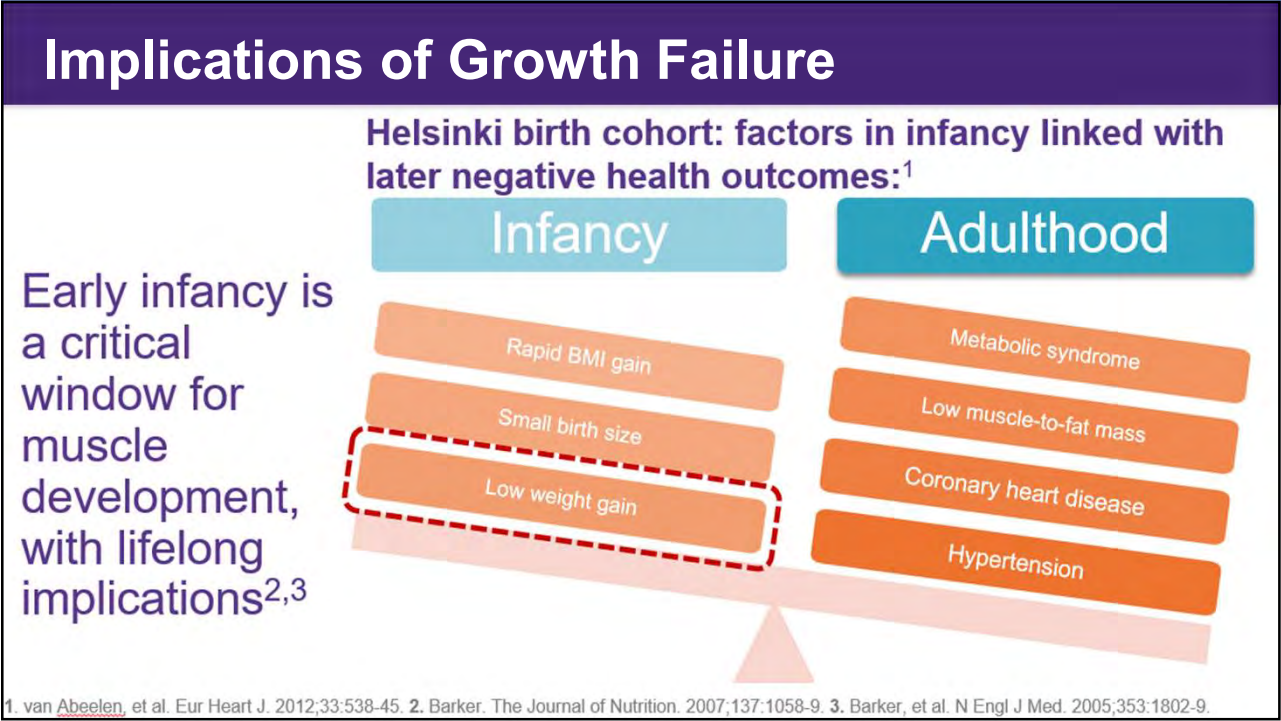
Inadequate nutrition support:

- ❑ Cognitive developmental delays
- ❑ Decreased growth potential
- ❑ Decreased immune function

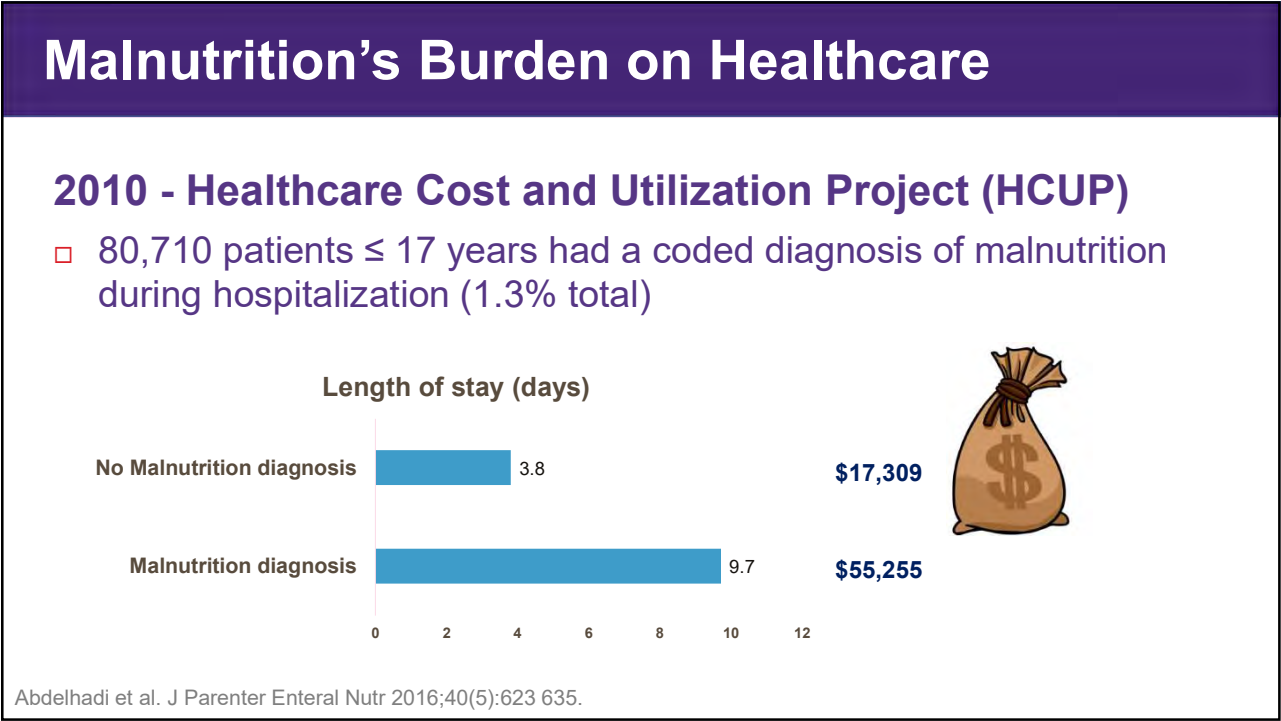


Georgieff MK et al, Acta Paediatr. 2018;107:1310-21

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Case Study – Baby Sophie

History

- Healthy, term, infant
- 3 months old
- Hx of adequate growth
- Breastfed

Diagnosis

- RSV
- Acutely ill
- Decreased appetite
- Difficulty feeding due to fatigue

Anthropometrics

- Weight/length z-score -1.1 (mild malnutrition)

Mom's Request

- Mom wants to continue breastfeeding



Hx = history; RSV = respiratory syncytial virus

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Troubleshooting Growth Failure

Troubling trends
on growth curve

OR

Meets criteria
for malnutrition
diagnosis



- ❑ Does child have an acute or chronic illness?
- ❑ What is infant's feeding regimen?
- ❑ Has volume, frequency, or type of feeds changed?
- ❑ If mother is breastfeeding or pumping, how is her supply and/or feeding quality?
- ❑ Signs of intolerance?
- ❑ How are caregivers preparing formula?
- ❑ Is infant on a non-standard formula recipe?
- ❑ Is socio-economic status a concern?

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Current Practices for Infants with Growth Failure

- Feed more volume, more often.
- Concentrate formula.
- Use a higher-calorie formula at standard concentration.
- Start with a “base” and then supplement or fortify.

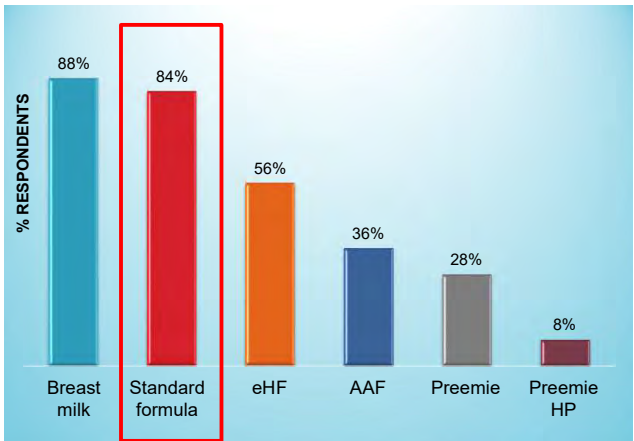


Simental S. J Pediatr Gastroenterol Nutr. 2020;71:S453.

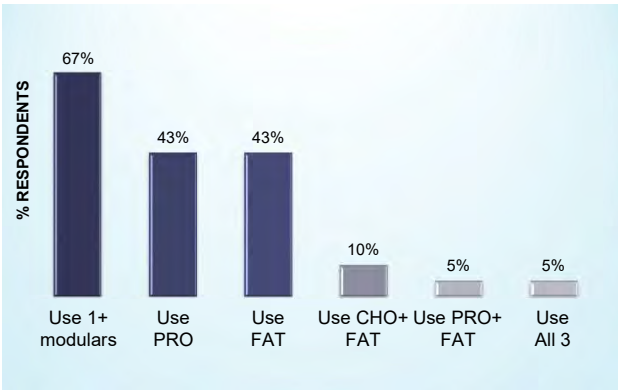
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RDs often use formula and/or modulars to feed hospitalized infants with FTT¹

Common enteral nutrition sources
(n=25: each chose top 3)



Modular(s) sometimes used to help meet 100% of protein +/- energy goals
(n=21: each chose all that apply)



AAF = amino acid-based formula; CHO = carbohydrate; eHF = extensively hydrolyzed formula; Prem-HP = high-protein premature formula; PRO = protein; RD = registered dietitian. Nutricia supports the use of breast milk wherever possible. 1. Simental. Poster at NASPGHAN Annual Meeting. J Pediatr Gastroenterol Nutr. 2020;71:S453(684).

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POLL – respond in the right-hand panel

Which practice do you use most often for feeding infants with growth failure?

- A.** Increase volume and frequency of feeds
- B.** Concentrate powdered formula
- C.** Use a higher-calorie formula at standard concentration
- D.** Start with a “base” and then supplement or fortify

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LIMITATIONS OF CURRENT PRACTICE OF FORMULA FORTIFICATION

-  Tolerability and Hydration
-  Unbalanced Nutrient Ratio
-  Mixing Errors
-  Delays in Advancing
-  Parental Stress
-  Breastfeeding



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**LIMITATIONS OF CURRENT PRACTICE OF FORMULA FORTIFICATION:
TOLERABILITY AND HYDRATION**

**TOLERABILITY AND
HYDRATION**

- Osmolality may exceed >400 mOsm/kg H₂O
- Increased viscosity of feed
 - Difficulty tolerating



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**LIMITATIONS OF CURRENT PRACTICE OF FORMULA FORTIFICATION:
UNBALANCED NUTRIENT RATIO**



**UNBALANCED
NUTRIENT RATIO**


- Increasing calories can skew ratio of other components
- Macronutrients not tailored for target protein needs of 9-12% of calories

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LIMITATIONS OF CURRENT PRACTICE OF FORMULA FORTIFICATION:
MIXING ERRORS


MIXING ERRORS

- Danger of mistakes in mixing powdered formulas to alternative caloric densities
- Inaccuracies in consistent measurements when supplementing with modular nutrition products



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LIMITATIONS OF CURRENT PRACTICE OF FORMULA FORTIFICATION:
DELAYS IN ADVANCING




DELAYS IN ADVANCING

- Slow transition to high caloric density feeds
- Incremental steps to reduce intolerance
- Delayed time to meet nutrition goals

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LIMITATIONS OF CURRENT PRACTICE OF FORMULA FORTIFICATION: BREASTFEEDING



Breastfeeding is considered the gold standard; however, sometimes supplementing is necessary for growth.

BREASTFEEDING


- Fortifying breastmilk displaces the volume of breastmilk provided
- Mixing required

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LIMITATIONS OF CURRENT PRACTICE OF FORMULA FORTIFICATION: PARENTAL STRESS

Parental Stress

- Additional burden on caregivers or staff
- Understanding complex mixing instructions
- Additional time needed to prepare feeds



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POLL – respond in the right-hand panel

Which limitation of fortifying formula most concerns you?

- A.** Poor tolerance
- B.** Inadequate protein
- C.** Inadequate hydration
- D.** Mixing errors
- E.** Delays advancing
- F.** Parental stress
- G.** Displaces breastmilk intake

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**A novel way of
managing infants with
high-calorie needs**

**Energy- and nutrient-dense
infant formulas
(ENDF)**



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What is an ENDF?

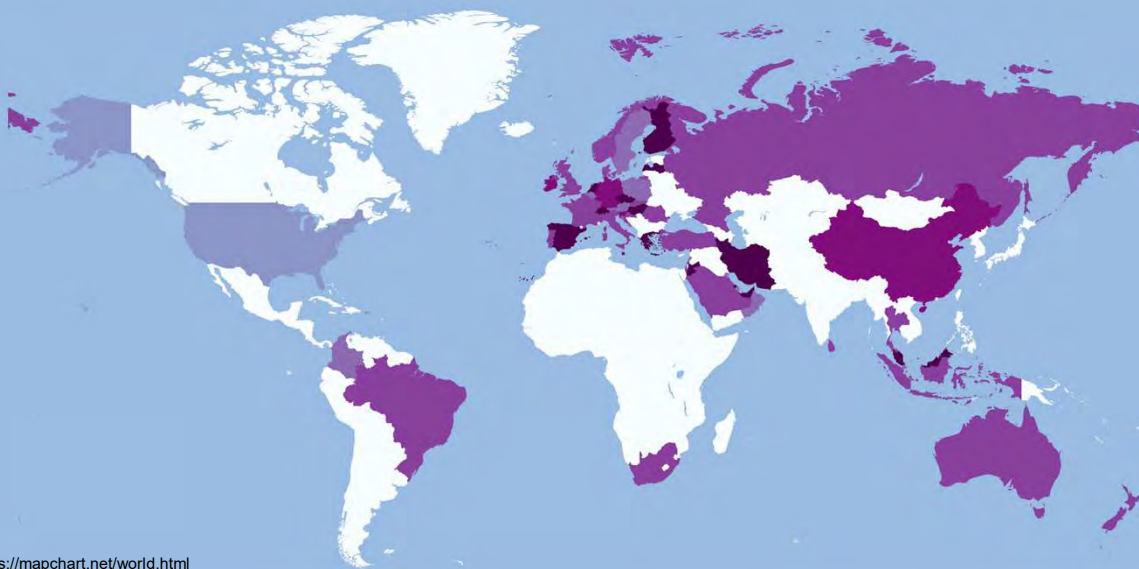
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- 30 KCAL/OZ term infant formula
- High protein/nutrient content
 - 360 mOsm/kg
 - Ready to feed/sterile
 - Nutritionally complete
 - Used in Europe for 20+ years
 - Supported by clinical evidence



ENDF = energy- and nutrient-dense formula

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ENDF available in 30+ countries



<https://mapchart.net/world.html>

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Case Study – Baby Sophie

History

- Healthy, term, infant
- 3 months old
- Hx adequate growth
- Breastfed

Diagnosis

- RSV
- Acutely ill
- Decreased appetite
- Difficulty feeding due to fatigue

Anthropometrics

- Weight/length z-score -1.1 (mild malnutrition)

Current Regimen

- Exclusively breast-fed

Plan

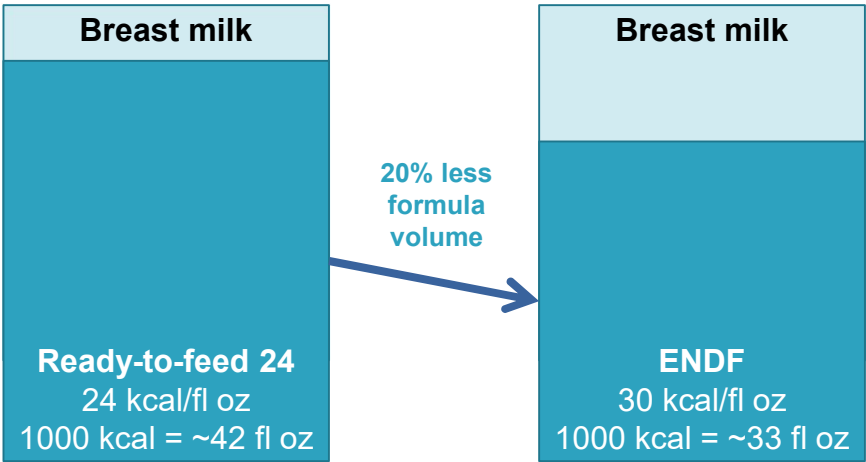
- In order to support breastfeeding, RD recommends use of ENDF 2 feeds per day



Hx = history; RSV= respiratory syncytial virus

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Consider as supplement to breast milk




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Research Review


Evidence-based energy- and nutrient-dense infant formula for the management of growth failure

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ENDF is backed by 7 studies, 8 publications




Evans, *et al.* J Hum Nutr Diet. 2006.




van Waardenburg, *et al.* Clin Nutr. 2009.



de Betue, *et al.* Am J Clin Nutr. 2013.



Eveleens, *et al.* J Hum Nutr Diet. 2019.



GROW-IN STUDY (concluded 2020)

2006

2007

2009

2011

2013


2018

2019


2020

2021


Clarke, *et al.* J Hum Nutr Diet. 2007.




de Betue, *et al.* Arch Dis Child. 2011.



Cui, *et al.* JPEN J Parenter Enteral Nutr. 2018.



Scheeffer, *et al.* JPEN J Parenter Enteral Nutr. 2020.



ENDF = energy- and nutrient-dense formula


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Earliest studies established ENDF as safe, well-tolerated, and supportive of catch-up growth in infants with growth failure


Randomized comparison of a nutrient-dense formula with an energy-supplemented formula for infants with faltering growth

2007 – Clarke et al.



Should high-energy infant formula be given at full strength from its first day of usage?


2006 – Evans et al



ENDF = energy- and nutrient-dense formula

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Clarke et al. aimed to compare energy- and nutrient-dense formula (ENDF) to the current practice of energy supplemented formulas (ESF)

Design

- Randomized, open-label, controlled trial
- 6-week intervention
- At least 80% of kcal from study formula
- Study formulas

Intervention (n = 26)	Control (n = 23)
ENDF <ul style="list-style-type: none">1 kcal/mL2.6g protein/ 100kcal (10.4% PE)	ESF <ul style="list-style-type: none">1 kcal/mL1.4g protein/ 100kcal (5.5% PE)

- Birmingham Children's Hospital, 1997 - 98


Study Population

- Enterally fed infants <12 months old with diagnosis of FTT due to organic or non-organic causes
- Diagnoses in study population:
 - Congenital heart disease: 47% (n=23)
 - GI/surgical patients: 31% (n=15)
 - Cystic Fibrosis: 10% (n = 5)
 - Other: 12% (n=6)
- No significant differences in anthropometry, sex, or biochemistry

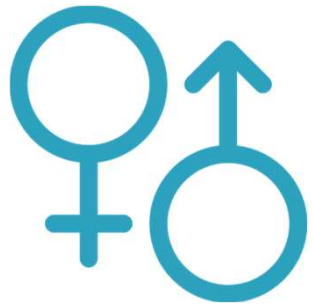
ESF = energy-supplemented standard infant formula; ENDF = energy- and nutrient-dense formula PE = % energy from protein; FTT = failure to thrive; GI = gastrointestinal 1. Clarke, et al. J Hum Nutr Diet. 2007;20:329-39.

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Clarke et al. noted a trend toward better growth for males in the ENDF group



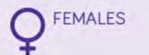


Outcomes & Results: Anthropometry

- Methods: Length, weight, MUAC measurements done by a single trained observer
- Outcomes: Significant improvement in WFA & MUAC z-score overall for both groups
- LFA z-score trended negatively for both groups (>males)
- Only significant for males in ESF group



ESF = energy-supplemented formula; ENDF = energy- and nutrient-dense formula WFA = weight for age; MUAC = mid-upper arm circumference; LFA = length for age; . 1. Clarke et al. J Hum Nutr Diet. 2007;20:329-39

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ENDF supports growth				
	Within ENDF group (n=26) (n=14 male) (n=12 female)*	Within ESF group (n=23) (n=12 male) (n=11 female)*	Between groups†	ESF = energy-supplemented formula; ENDF = energy- and nutrient-dense formula WFA = weight for age. *Within-group differences: Wilcoxon signed rank test. †Between-group differences: Mann-Whitney test. Female length-for-age z-scores not significantly different, not shown. 1. Clarke, et al. J Hum Nutr Diet. 2007;20:329-39.
WFA z-scores				
	0.29 P = 0.007	0.49 P = 0.006	P = 0.26	
 MALES	0.21 P = 0.02	0.40 P = 0.24	P = 0.98	
 FEMALES	0.32 P = 0.16	0.86 P = 0.01	P = 0.12	
Length-for-age z-scores				
	-0.18 P = 0.24	-0.28 P = 0.01	P = 0.30	
 MALES	-0.16 P = 0.42	-0.80 P = 0.002	P = 0.02	

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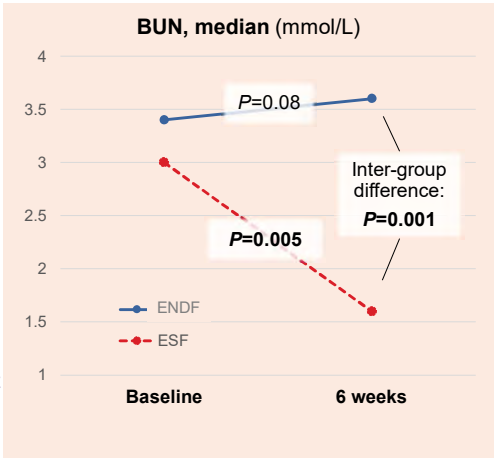
ENDF group had higher nutrient intake & better protein status despite consuming similar volume and energy



Outcomes & Results: Nutritional Status

Results	ENDF	ESF	P-Value
Volume intake mL/kg/d, median, range	140 (103-175)	143 (97-199)	NS
Protein intake g/kg/d, median	3.7	2.0	P<0.0001
Sodium, potassium, calcium, zinc, iron, vitamins D, C, and A intake	ENDF group 14-42% higher than ESF		P≤0.0001

- Methods: Intake/tolerance records and hematological assessment
- 42% higher protein intake in ENDF group
- No infants in the ENDF group had BUN outside of normal limits



BUN = blood urea nitrogen; ESF = energy-supplemented formula; ENDF = energy- and nutrient-dense formula 1. Clarke, et al. J Hum Nutr Diet. 2007;20:329-39.

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ENDF was as safe and well-tolerated as ESF



Results: Tolerance & Safety

- No difference in number of daily emesis or stools
- No safety concerns noted for either formula

Results	ENDF	ESF	P-Value
Stools/d median, range	2.5 (0.7-4.5)	2.5 (1.0-4.8)	NS
Emesis/d median, range	0.33 (0-1.8)	0.30 (0-5)	NS
Volume intake mL/kg/d, median, range	140 (103-175)	143 (97-199)	NS


ESF = energy-supplemented formula; ENDF = energy- and nutrient-dense formula 1. Clarke, et al. J Hum Nutr Diet. 2007;20:329-39.

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Evans et al. compared tolerance of ENDF introduced at full strength versus by graded introduction


Randomized comparison of a nutrient-dense formula with an energy-supplemented formula for infants with faltering growth

2007 – Clarke et al.



Should high-energy infant formula be given at full strength from its first day of usage?


2006 – Evans et al




ENDF = energy- and nutrient-dense formula

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Some infants may benefit from transitioning onto ENDF

Design

- Randomized, controlled trial (non-blinded)
- 2-week intervention with ENDF
- Birmingham Children's Hospital

Study Population

- Infants with diagnosis of failure to thrive
- 73% (n=22) of the infants had CHD
- 93% (n=28) standard formula (20 kcal/fl oz) previously

Outcomes & Results

Full Strength (FS) Start
(n = 18)

Full strength at day 1

Graded Start
(n = 12)

ENDF diluted with water

Day 1: 80% (24 kcal/ fl. oz)
Day 2: 90% (27 kcal/ fl. oz)
Day 3:100% (30 kcal/ fl. oz)

1 – Tolerance: Emesis & Stool Frequency

- ↑ stool frequency in first 2 days for FS group (p=0.02), inversely correlated with age
- No differences in emesis

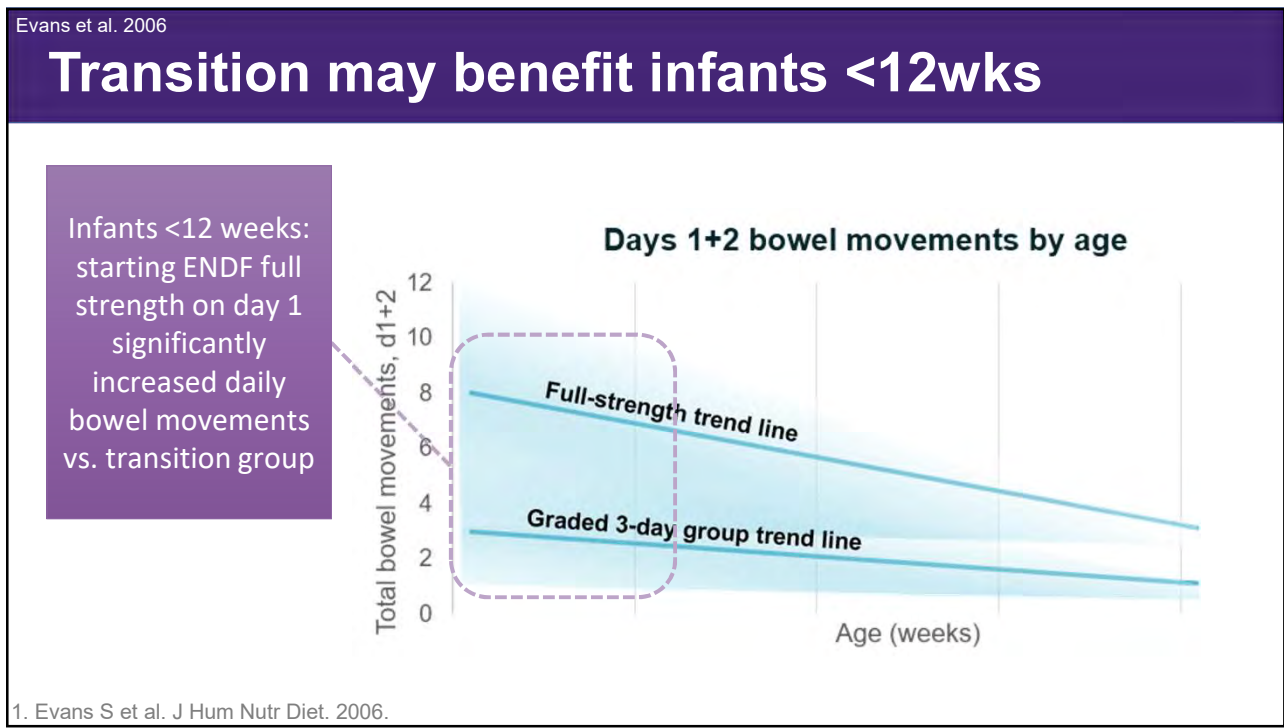
2 – Anthropometry: Weight, Length, HC, MUAC

- Non-significant trend to higher weight for FS group

ENDF = energy- and nutrient-dense formula; CHD = congenital heart defect; FS = full strength. 1. Evans S et al. J Hum Nutr Diet. 2006.

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First two studies established ENDF as a safe, well tolerated alternative to standard care

Conclusions

1 – Growth

✓ Supports catch-up growth

- Trend toward improved growth in males
- Longer term evidence forthcoming

2 – Tolerance

✓ ENDF is well tolerated by most infants when fed at full-strength from day 1

- A gradual introduction may benefit infants <12 weeks old

✓ Equivalent tolerance to current practice of ESF

3 – Nutritional Status

✓ Improved nutrient intake and better protein status


4 – Safety

✓ Safe in infants with growth failure due to CHD and other causes of growth failure

ESF = energy-supplemented formula; ENDF = energy- and nutrient-dense formula; CHD = congenital heart defect. 1. Clarke, et al. J Hum Nutr Diet. 2007;20:329-39. 2. Evans S et al. J Hum Nutr Diet. 2006.


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Grow-In Study: Long-term US Clinical trial in infants with growth failure




Design

- Prospective, open-label, multi-center study
- Up to 16-week intervention
- Assessments at 0, 2, 4, 8, 12, and 16 weeks



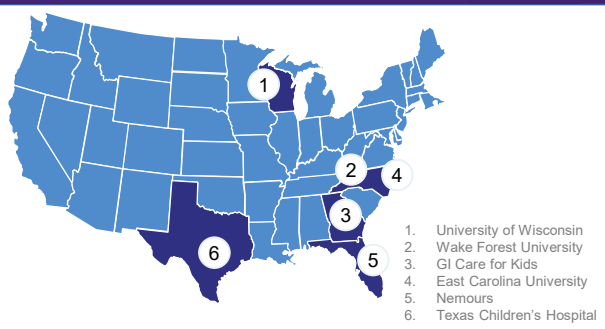
Study Population

- Infants 1- 8 months old with growth failure due to cardiac and non-cardiac diagnoses



Outcomes

1 – Growth 2 –Tolerance 3 – Safety



1. University of Wisconsin
2. Wake Forest University
3. GI Care for Kids
4. East Carolina University
5. Nemours
6. Texas Children's Hospital

1. Nutricia North America. <https://clinicaltrials.gov/ct2/show/NCT03563391>.

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Grow-In Study: Population Characteristics

Variable	Result
Gender: n (%)	
male	16 (61.5%)
female	10 (38.5%)
Gestational age*	37.4 ± 3.2
Age at Visit 1**	22.2 ± 10.5
WAZ at birth (mean)	-0.19
WAZ at baseline (mean)	-2.92

N=26 Per Protocol subjects. WAZ = weight-for-age z-score *Median weeks **Mean Weeks.
1. Goday, et al. JPEN J Parenteral Enter Nutr. 2021;45:S224-5(P143). 2. Goday, et al. Children's Hospital of Philadelphia. 2021.

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Grow-In Study: Formula Composition

Study Formula Composition	
Concentration	30 kcal/fl oz
Protein/100 kcal	2.6 g
% En as Protein	10.3%
Osmolalit, mOsm/kg	360
Nutritionally complete for term infants with FTT	✓

WHO expert guidance:

~9-12%
to promote accelerated weight gain of 5-10 g/kg/d¹

En = Energy. 1. World Health Organization; Food and Agriculture Organization of the United Nations. Protein and amino acid requirements in human nutrition. 2007.

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Grow-In Study Results: Anthropometrics

Weight-for-age:

+0.86
±0.74
mean WAZ
from baseline
(p=0.0001)

Length-for-age:

+0.25
±0.61
mean HAZ
from baseline
(p=0.003)

Weight-for-length:

+0.77
±0.81
mean WHZ
from baseline
(p=0.0001)

Head circumference:

+0.54
±0.68
mean HCZ
from baseline
(p=0.0001)

1. Goday, et al. JPEN J Parenteral Enter Nutr. 2021;45:S224-5(P143). 2. Goday, et al. Children's Hospital of Philadelphia. 2021.

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Grow-In Study: Rate of catch-up growth

Percentage of infants who achieved weight gain velocity >WHO median:

83%


At ≥1 time point

67%

For overall study period

13%

Met criteria for “early success”*



No difference in time to meeting weight gain velocity target by presence of CHD

*Early success = WHZ ≥0 or weight velocity > +2 z-score for age at two consecutive visits; transitioned to lower energy-density formula. Two infants in the PP group withdrew early and are not included. 1. Goday, et al. JPEN J Parenteral Enter Nutr. 2021;45:S224-5(P143). 2. Goday, et al. Children's Hospital of Philadelphia. 2021.

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Grow-In Study: Energy intake reached target range

Total energy intake:
123±32 kcal/kg/d

ENDF intake:
116±32 kcal/kg/d


94.3%

average energy intake from ENDF

WHO expert guidance

→

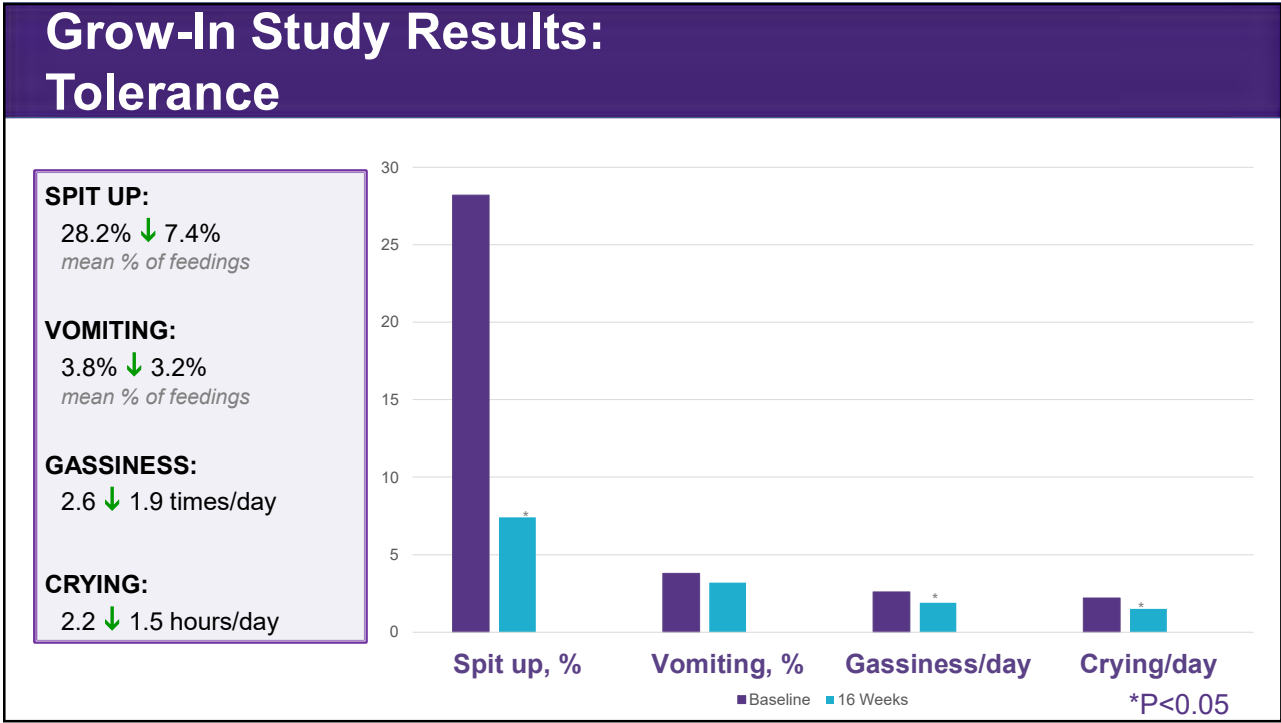
105-126 kcal/kg/d to promote accelerated weight gain of 5-10 g/kg/d¹



CHD = congenital heart disease; HCZ = head circumference z-score. WHO = World Health Organization. 1. World Health Organization; Food and Agriculture Organization of the United Nations. Protein and amino acid requirements in human nutrition. 2007. 2. Goday, et al. JPEN J Parenteral Enter Nutr. 2021;45:S224-5(P143). 3. Goday, et al. Children's Hospital of Philadelphia. 2021.


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Grow-In Study: Conclusions



- Positively impacts growth
- Well-tolerated
- Safe

1. Goday P, et al. ASPEN Conference. 20-23 March; Virtual. JPEN J Parenteral Enter Nutr. 2021;45:S224-5(P143). 2. Goday P, et al. Presented at Annual Update on Pediatric and Congenital Cardiovascular Disease. 11-14 February; Virtual. Children's Hospital of Philadelphia. 2021. 3. Manuscript under review by JPEN J Parent Enter Nutr.

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ENDF is well tolerated and supports nutrient intake, growth and anabolism									
Year 1 st author	2006 Evans	2007 Clarke	2009 van Waardenburg	2011 de Betue	2013 de Betue	2018 Cui	2019 Eveleens	2020 Scheffer	2021 Goday
Format:	Clinical trial	Clinical trial	Clinical trial 3 publications from 1 trial			Clinical trial	Retrospective review	Clinical trial	Clinical trial
Findings:									
Well tolerated in infants with FTT	✓	✓	✓			✓	✓	✓	✓
Higher nutrient intake*	Not studied	✓	✓			✓	Not studied	Not studied	Not studied
Helps meet nutrient goals sooner*	Not studied	Not measured	✓			✓	Not studied	Not studied	Not studied
Supports weight gain / catch-up growth...	Not designed to study growth	✓	Too brief to study growth			Too brief to study growth	✓	✓	✓
Supports positive nitrogen balance / anabolism	Not studied	Not studied	✓			✓	Not studied	Not studied	Not studied
Studied in infants with CHD		✓				✓	✓	✓	✓

*Than current practices using standard infant formula. CHD = congenital heart disease; FTT = failure to thrive; ENDF = energy- and nutrient-dense formula. 1. Evans, et al. J Hum Nutr Diet. 2006;19:191-7. 2. Clarke, et al. J Hum Nutr Diet. 2007;20:329-39. 3. van Waardenburg, et al. Clin Nutr. 2009;28:249-55. 4. Cui, et al. JPEN J Parenter Enteral Nutr. 2018;42:186-204. 5. de Betue, et al. Arch Dis Child. 2011;96:817-22. 6. de Betue, et al. Am J Clin Nutr. 2013;98:907-16. 7. Eveleens, et al. J Hum Nutr Diet. 2019;32:3-10. 8. Scheffer, et al. JPEN J Parenter Enteral Nutr. 2020;44:348-54. 9. Goday P, et al. JPEN J Parenter Enteral Nutr. 2021;45:S224-5.

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POLL – respond in the right-hand panel

Which finding related to energy- and nutrient-dense formula is most relevant to your practice?

- A. WELL TOLERATED:** 30 kcal/fl oz ENDF is tolerated as well as 20 kcal/fl oz formula and energy-supplemented formula
- B. SUPPORTS ANABOLISM:** ENDF supports positive nitrogen balance and anabolism
- C. FOR CHD INFANTS:** 30 kcal/fl oz formula has been studied in infants with congenital heart defects
- D. HIGHER NUTRIENT INTAKE:** 30 kcal/fl oz ENDF supports higher protein and nutrient intake than standard formula

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USE OF ENERGY NUTRIENT DENSE FORMULAS

WHEN ENERGY NUTRIENT DENSE FORMULAS ARE BENEFICIAL

- Increased energy and protein requirements
- Catch-up growth for undernourished or at risk of growth failure
- Demonstrating poor growth on current regimen
- Achieve protein-calorie goals earlier during period of fluid restriction
- Higher Protein:Energy ratio to promote positive nitrogen balance during illness

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ENDF PATIENT POPULATION

Congenital
Heart Disease

Chronic Lung
Disease

Cystic Fibrosis

Neurological
Syndromes

Respiratory
Syncytial Virus

Non-Disease-
Related Failure
to Thrive

Term infants with:

- Growth Failure
- At-Risk of Growth Failure
- Increased Energy Requirements
- Fluid Restriction

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INTRODUCING ENERGY NUTRIENT DENSE FORMULAS (ENDF)

GUIDELINES TO SUCCESSFULLY INTRODUCE ENERGY NUTRIENT DENSE FORMULAS (ENDF)
Infants <12 weeks of age:
Administer full strength formula and alternate with current feed or dilute to 24 kcal/oz and grade to full strength over 3 days to avoid frequent stools
Infants >12 weeks to 18 months:
Full strength and full transition from day 1
Alternate breast milk/breast feeding and ENDF feeding

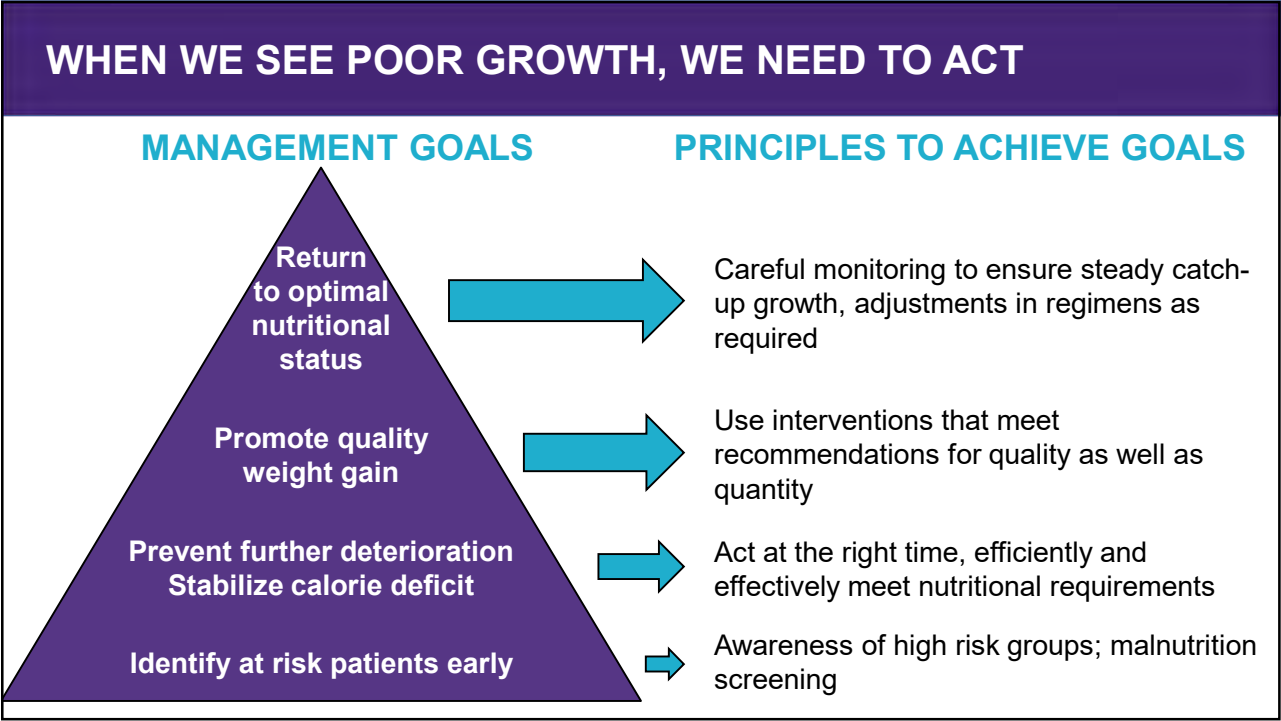
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Case Study – Baby Sophie

History
<ul style="list-style-type: none">• Healthy, term, infant• Adequate growth• Breastfed
Diagnosis
<ul style="list-style-type: none">• RSV• Acutely ill• Decreased appetite• Difficulty feeding due to fatigue
Anthropometrics
<ul style="list-style-type: none">• Weight/length z-score -1.1 (mild malnutrition)
Mom’s Request
<ul style="list-style-type: none">• Mom wants to continue breastfeeding
Plan
<ul style="list-style-type: none">• In order to support breastfeeding, RD recommends use of ENDF 2 feeds per day
Results
<ul style="list-style-type: none">• 3 weeks later – weight/length z-score is 0.3• ENDF supported growth and well tolerated• Infant able to resume exclusive breastfeeding




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SUMMARY

- Malnutrition has serious implications for infants. It's critical to prevent, identify and resolve malnutrition in a timely and safe manner.
- ENDF provide optimal energy, protein, and micronutrients to support lean tissue gain for catch-up growth and support increased protein needs during critical illness.
- ENDF have equivalent tolerability to 20 kcal/oz infant formulas.
- Clinical research has shown ENDF promote catch-up growth in disease and non-disease related growth failure.



ENDF = energy- and nutrient-dense formula

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