Quick Start Guide to In-Patient Pediatric Enteral Nutrition

Clinical Improvement Project

Karen Casey
Dietetic Student Intern
Andrews University

February 2025

Suggested next steps for this document are to have it peer reviewed by the Dayton Children's Clinical Nutrition Working Group then branded with appropriate markings. Sections should be evaluated for expansion to a dietetic internship handbook or standards of practice document for RDNs. A comprehensive example handbook with content, formatting and practice expectations can be found here: https://dietmyriam.weebly.com/uploads/2/7/7/2/27723405/pedia_icu.pdf

Introduction

Nutrition is fundamental to sustain life, and enteral nutrition (EN) is a way to deliver precise nutrients directly into the gastrointestinal (GI) system. EN can be used as the sole source of nutrition or in conjunction with oral intake or parenteral nutrition. The ability to rapidly assess a patient and then subsequently develop an enteral nutrition intervention plan, with detailed energy, macronutrient and fluid recommendations is a required skill for an RDN in a clinical setting. However, designing the EN intervention which includes selecting the appropriate formula, performing the calculations and developing feeding transition plans can be a daunting task for a student intern.

This guide is intended to be a practical resource to help jump-start the actions needed to properly design EN interventions. It is meant to provide context, and basic examples of how to apply practices described in the ASPEN guidelines [(1)], Academy of Nutrition and Dietetics (AND) standards of care [(2)] and pediatric nutrition care textbooks. It is also a helpful one stop place for references, organized in a logical manner to help speed up the process of finding information.

This guide is only a summary and does not replace any evidence-based practice standards of care or Dayton Children's Hospital (DCH) Clinical Nutrition and Lactation department policy.

Quick Start: Top Ten Items

Don't Panic. The number and type of online resources that can be used to learn more about pediatric EN is extensive and potentially very confusing. Different specialty practices and each individual RDN applies unique practices, standards and tools to develop a patient's EN intervention. More importantly, EN is tailored for an individual's specific medical condition and needs – which means the number of intervention options are unlimited.

Because it takes time to learn the different types of formulas and specialty needs addressed by EN, a recommended process to navigate the information is listed in this section. The items in the list have been carefully prioritized in order of importance to identify information first, at the same time is, by design, geared to not overwhelm new EN practitioners. Taking the time to orient yourself on where to find information will create efficiencies, speeding up responsiveness to critical needs during in-patient care. At the end of this document is the list of references and attachments.

To streamline learning – it is recommended to use the top ten list, review the References and Attachments. A solid and effective foundation can be gained by investing the 20-40 hours of active, hands-on time to do these training activities either before seeing patients or in parallel to performing in-patient activities.

1. Pediatric Nutrition Support Trifold: Dayton Children's Hospital: The back of the trifold has 4 tables that are used frequently:
    - Energy Needs by Age (DRI – RDA method)
    - Fluid Needs (Holliday-Seger method)
    - Protein by Age (DRI-Increased needs)
    - Guidelines for Initiation and Advancement of EN

Read and think about what those tables mean and how you would use them in the context of the Assessment, Diagnosis, Intervention, Monitoring and Evaluation (ADIME) steps before jumping into individual patients.

2. Read the chapter on Enteral Nutrition in the book, Pediatric Nutrition in Clinical Care 5th Edition. [3]

The book explains the concept of EN as a potential intervention for most medical situations faced in pediatric clinical care. It is a comprehensive overview that is written in a clear manner and is easy to understand. More importantly, it bridges the gap between what is taught in a standard Medical Nutrition Therapy (MNT) course and actual hands-on clinical practice.

3. Nutrition Care Manual. There is an Academy of Nutrition and Dietetics (AND) care manual dedicated to pediatric nutrition. There is an Nutrition Support section listed under conditions, that provides practice guidelines. Find and use the built-in calculators (i.e. Gestational Age, Body Mass Index (BMI), World Health Organization (WHO) equations for Resting energy Expenditure (REE)) to speed up assessment. https://www.nutritioncaremanual.org/

4. Peditools. Find the Z-score and percentile data based on WHO and CDC growth charts; as well as MUAC standards. https://peditools.org/

5. Date Calculator. Use this to calculate the number of days between two dates – helpful for weight velocity calculations, and gestational age https://www.timeanddate.com/date/dateadd.html. Excel also has a built-in date formula (DATE 360) however it is much faster to use the online time and date website.

6. Standards of Care. Some specialty nutrition areas at Dayton Children's have developed standards of care that implement evidence-based practices. Ask for those documents before starting to write assessments on patients. Use those documents to extract key decisions that need to be made during the intervention process.

7. Academy of Nutrition and Dietetics Practice Group (DPG) documents.

The Pediatric Nutrition Practice (PNP) group maintains a peer reviewed, updated list of formulas, their nutrient content, and key conversions such as number of grams per scoop, and formula recipes for discharge. https://www.pnpg.org/home. Find the documents on the Clinical Nutrition share drive or ask your preceptor for an electronic copy. Using these references will save time in comparison to manually looking up individual formula products by supplier catalog or in books – which often use outdated formula product names. The Nutrition Support Practice (NSP) group has a video on Enteral Nutrition that is a helpful overview. https://www.dnsdpg.org/home. Gaining access to these websites requires joining the associated DPG and paying annual fees through the Academy.

8. As part of the Dayton Children's onboarding process, there are five important training modules that can be found in the training section of Workday, that provide complementary information.

- Pediatric Nutrition Assessment
- Pediatric Growth
- Enteral Nutrition
- Introduction to Parenteral Nutrition
- Infant and Pediatric Formulas

The training is interactive, and if you do not provide the correct answer, the online module will skip ahead, providing a false sense of completion. These are comprehensive and thoughtfully designed modules; however, it will take a significant amount of time complete them accurately. If time is limited, consider asking your Preceptor for the answer key, and use it to move through the examples quicker, or to use the examples as a basis for in-person clinical interventions so time can be spent learning the process for how to design EN solutions.

The Resources documents attached to the online modules are important. Review them, and either download them, or find where they are on the Clinical Nutrition drive because it is much faster to access data electronically if you have it centralized and in a common place.

9. Standards and Conversion – some standards are listed in the Pediatric Nutrition Support trifold, however there is not a single list of Dayton Children's Hospital EN standards & conversions. There is a very small variability in EN calculations between different RDNs and chart notes (for example, does a 237 mL container of Pediasure 1.0 Grow and Gain contain 237 kcal or 240 kcal?). Below are conversions that are commonly used in clinical practice.
    - 1 oz = 30 mL or 30 ml [Standard documentation is to capitalize the L]
    - 3 tsp = 1 T
    - 47 inches = 1 Meter
    - EBM = 20 kcal/oz
    - EBM = 1.5 – 0.8 g protein/oz [variable – see trifold, ask preceptor]

10. Find an existing patient that is currently on EN and look at the diet order and history. In clinical practice, the diet order is only a single point in time for care. The order can be used to provide temporary emergency nutrition, it can be a step in a transition plan, it may exactly match a home EN regimen, or bedside nutrition can be delivered differently than what is documented. Sometimes multiple of these things happen effect the diet order, depending ton timing. Compare the patient's estimated energy needs (trifold) to the actual diet order. Think about why those things might be different in the context of the reason the patient was admitted to the hospital.

11. The process for documenting an EN intervention in an EPIC chart note can seem overwhelming at first. Smart phrases simplify and standardize documentation. It is recommended that DCH adopt a standard format for documenting interventions that uses a table format, using built-in automated calculations in the format below (adult example). Standardizing chart notes in this manner will speed up the process of writing documentation by eliminating time required for manual calculations. It will help RDN's quickly review chart notes to evaluate specific differences in EN prescription changes between visits.

INTERVENTION		
Enteral Recommendations:		
Formula Name	Pivot 1.5 Cal	
Feeding Type	Continous	
Tube Type	J-Tube	
Goal Rate	65 mL/hr	22 hrs/d
Flush	155 mL q 4 hr	
Total Calories	2145 kcal	33 kcal/kg
Total Protein	134 gm	2.0 gm/kg
Free Water from Formula	1086 mL/d	
Total Free Water	2016 mL	
Current Enteral rate:	Pivot 1.5 at 30 mL per hour with 30 mL flush every 2	
Estimated Fluid Needs	1900 - 2100 mL/d	mL/d
Estimated Calorie Needs	2050 - 2100 kcal/d	30 - 35 kcal/kg/d
Estimated Protein Needs	91 - 134 gm/kg/d	1.4 - 2.0 gm/kg/d
Formula Recipe	If Needed	
DISCHARGE INSTRUCTIONS		
Formula Name	Jevity 1.0	
Feeding Type	Continous	
Tube Type	J-Tube	
Goal Rate	65 mL/hr for 22 hours or 90 mL/hr for 16 hours	
Flush	900 q 1 day	
Total Calories	2145 kcal	33 kcal/kg
Total Protein	91 gm	1.4 gm/kg
Free Water from Formula	1086 mL/d	
Total Free Water	1986 mL/d	
Formula Recipe	Six - 237 mL cartons per day	

EN Overview

The appropriate use of EN requires accurate assessment of a patient's nutritional status. This process requires an evaluation and review of the patient's gender, age, medical diagnosis, current state, medications, food and medicine allergies, anthropometrics, diet history, intake, intake methods, tolerance and output. This assessment process is beyond the scope of this document however the diagnosis should communicate the most critical nutritional concerns, paired with an etiology the EN will directly affect.

A complete list of nutrition diagnostic terminology is listed in Attachment #1: Nutrition Diagnostic Codes. Complete assessment requires an evaluation of malnutrition status. The use of clinical judgement – to include subjective assessment of the patient, a nutrition focused physical exam and evaluation of patient status against formal malnutrition criteria, as described by the AND standards of practice may be needed. The standards and guidelines used to diagnose malnutrition are listed in Attachment #2: Malnutrition Clinical Characteristics. It is important to recognize that RDN in-person evaluation of the patient and clinical judgment take precedent when making any diagnosis. Accurate assessment and diagnosis form the basis of which specific recommendations to make during the intervention step.

Ordering EN

In most cases, the diet order for the EN is initiated by the physician. Experienced dietitians at Dayton Children's Hospital have nutrition support order writing privileges. When assessing existing EN orders, it is important to understand the provider role and timeframe/context when the EN was ordered. For example, during an emergency room visit, EN orders can be made without the benefit of a full nutritional assessment. Rapid decisions occur during intensive care rounds, adapting to changing patient needs. Human communication and multiple providers are involved in translating the diet order into actionable nutrition delivered to the patient. There are times when the EN delivered at the point of care is different from the diet order. Similarly, patient tolerance: emesis, bowel movements and urinary output can be a challenge to accurately document in a clinical setting. All these factors need to be considered when reviewing the status of a patient prior to making any intervention decisions.

EN Intervention

The most common reasons for initiating EN during an in-patient hospital stay are:

- Pre-term birth – Neonatal Intensive Care Unit (NICU) patients
- Respiratory insufficiency or Trauma – Pediatric Intensive Care Unit (PICU) patients
- Malnutrition – Acute or Chronic
- Oral intake insufficiency – to include congenital or metabolic conditions

If gut function is present, and the patient is hemodynamically stable, EN is a viable method for nutrient delivery. If the GI tract is not functioning normally, then EN may not be recommended. The GI tract must be anatomically intact. Aspiration risk is a possible contraindication if using the nasal-gastric (NG) route.

The process of designing an EN intervention requires that the following decisions be made:

1. Determine the patient's nutrition needs: energy (kcal/day), fluid (mL/day), protein, other electrolytes, supplements or vitamins; based on a comprehensive nutrition assessment – including a Nutrition Focused Physical Exam (NFPE).
2. Pick an appropriate source of EN: in infants, Expressed Breast Milk (EBM) is preferred, formula and/or modular supplements or some combination of all three are used depending on patient age, medical condition and needs.
3. Determine the appropriate calorie concentration by balancing energy needs, fluid needs or restrictions, initiation rate and method of delivery
    a. Identify a route of delivery – NG is nearly always the default starting point
    b. Determine the method of delivery – bolus or continuous (pump)
    c. Determine a goal rate of delivery – total fluid/energy needs for 24-hour period
    d. Determine an initiation rate
    e. Determine frequency
    f. Add free water flushes if necessary to meet patient total fluid needs
4. Calculate total amount of energy, protein, and fluid delivered via the EN.
5. Determine what information is needed for ongoing monitoring of growth and tolerance.

<u>Delivery Methods - Tube Placement</u>

EN can be delivered through a nasogastric (NG), nasoduodenal (ND), or nasojejunal (NJ) tube inserted through the nose, into the stomach, duodenal or jejunum respectively, see Figure 1. NG tubes can be inserted manually, at the bedside. Alternatively, a gastric tube (GT) or jejunum (JT) is surgically placed directly into the stomach or jejunum. Intolerance, high aspiration risk, gastric paresis, severe GERD, are all factors in the decision of where to place the tube. Transpyloric placement (ND, NJ) is used only after NG intolerance occurs. The process of bolus feedings cannot be used with ND or NJ tubes.

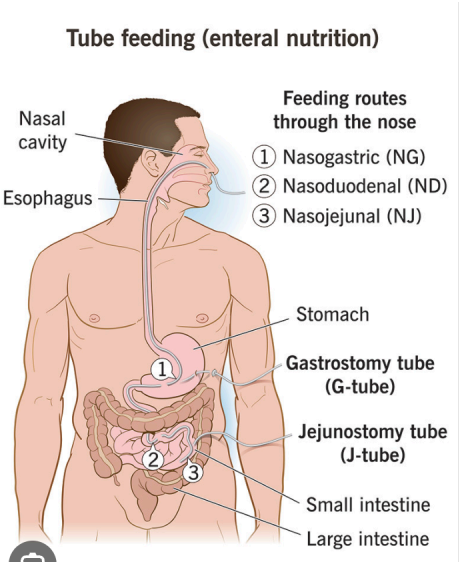

Figure 1: Oral and surgical routes of Enteral Nutrition [4]

Rate of Feeding

EN can be delivered via a bolus feed or a continuous feed. The advantage of bolus feed is that is more consistent with the daily routine of mealtimes because nutrition is delivered over a short amount of time, multiple times per day. Typically, bolus feeds do not require a pump, providing an advantage of patient mobility.

Continuous feeds are delivered via a pump and can improve tolerance and absorption in comparison to bolus feeds. They can be administered overnight to limit impacts to daytime activities like school, and to complement oral feeding.

Provisioning of EN

During an in-patient hospital stay, all EN nutrition is provided via unopened containers of ready to feed or powdered medical food or from EBM. The Nutrition Lab staff mixes all liquid and powdered formulas, fiber and protein supplements, as well as any specialized EN recipe that fortifies expressed breast milk.

It is important to know that the hospital carries a large variety of pre-stocked formulas, however very specialized formulas may not be available such as those needed for cardiac care, rare metabolic conditions, or ready to eat feed whole food EN products. The Nutrition Lab staff mixes formulas based on the diet order. The dietary technicians that mix formulas do not see the EPIC chart note, background assessment, intervention description or recipe details.

Nutrition supplements, which can also be used interchangeably as sole source EN, such as cans or cartons of Pediasure or Boost, are available on the floor of the hospital units. During patient interventions, the RDN may deliver these products to the patient room for tasting, or to initiate care. Similar to the Nutrition Lab, inventory of these products is carefully monitored, so any products used must be accounted for using proper methods when removed from inventory.

Formula Classification and Product Lines

One of the most important considerations in designing EN interventions is picking a formula. While medical necessity and tolerance take precedent in the decision process, it is also important to understand formula access (cost & availability) considerations.

A description of the types of formulas available at DCH for infant, child and adult EN can be found in Attachment #3: Dayton Children's Formula Classification. This document is a reference document attached to the *Infant Formula* module available in Workday. It is important to know the way formulas are classified to determine how to use them for specific medical conditions.

Abbott Nutrition Formula Product Line

Dayton Children's uses Abbott Nutrition as a preferred formula provider in order to standardize care and minimize costs. Similar to food insecurity in adults, infant and pediatric formula affordability and access is a significant challenge. The Women, Infant and Child (WIC) nutrition program provides formula subsidies to qualified participants – however only for certain categories and formula product lines, and only up to age 5 years old. Formula manufacturers are constantly improving and modifying their ingredients, recipes and packaging. Product names, ingredients and nutritional content can frequently change.

The best way to navigate these challenges is to become familiar with a core set of formulas brand names and to understand formula classification categories. Instead of memorizing product names and nutritional info, consider why to use a particular formula and post discharge implications: whether it qualifies for WIC benefits and ease of transition to home care. It is important to know where to find accurate information about formula nutritional content.

The Abbott Nutrition formula product line includes the following brand names:

- Similac
- Pediasure
- Elecare
- Afamino
- Ensure
- Glucerna
- Jevity
- Juven
- Phenex
- Nepro
- Osmolite
- Pedialyte
- Vital

Classification of Formulas

Formulas are classified by the age group they are designed for, and by the type of ingredients and extent of hydrolyzation. There are about 20 different categories, and in addition to Abbott Nutrition, there are other formula manufacturers that make products in each category. A listing of the core set of formulas, and key nutrient content that are available at Dayton Children's can be found in Attachment #4: Nutrient Composition of Commonly Used Formulas at Dayton Children's. Specific case studies on how to use different types of formulas can be found the *Infant and Pediatric Formula* training module in Workday.

The Abbott product line for infants (age 0-12 months) is as follows:

- Premature/Low Birth Weight: Similac
    - Special Care 24
    - 24 High Protein
    - 30 High Protein
- Transitional Premature: Similac Expert Care Neosure
- Reduced Lactose: Similac
    - Sensitive/Pro Sensitive
    - Total Comfort
    - Pro Total Comfort
- Soy Formula [use for Galactosemia]: Similac Soy Isomil
- Reduce spit up: Similac for Spit Up
- Reduced Mineral: Similac PM 60/40
- Extensively Hydrolyzed (Semi-Elemental & Hypoallergenic): Similac Alimentum

- Free Amino Acid
    - Elecare Infant
    - Afamino Infant

The Abbott Nutrition product line for pediatric patients – age 1 – 18-year-old is as follows:

- Standard Formulas: Pediasure
    - Enteral 1.0
    - Enteral with Fiber
- Increased Calorie Standard: Pediasure
    - Enteral 1.5
    - 1.5 with Fiber
- Reduced Calorie Standard: Pediasure Reduced Calorie
- Extensively Hydrolyzed (Semi-Elemental & Hypoallergenic) Pediasure
    - Peptide 1.0
    - Peptide 1.5

The list of adult products (sometimes used for adolescents) is as follows:

- Standard Formulas
    - Jevity 1.0
    - Osmolite 1.0
    - Promote
- Standard Increased Calorie
    - Jevity 1.2
    - Osmolite 1.2
    - Jevity 1.5
    - Osmolite 1.5
    - Pulmocare
- Extensively Hydrolyzed (Semi-elemental): Vital
    - Vital 1.0
    - High Protein
- Renal
    - Suplena
    - Nepro
- Impaired Glucose: Glucerna
- Immunonutrition: Oxepa
- Oral Supplements
    - Ensure
    - Ensure Enlive
    - Ensure Plus

Case Study Examples

The intent of the case study section is to begin developing a list of "Gold" examples that are accurate and complete. There are several source examples available in the online training modules in Workday. The examples below are a starting point, however further work should determine categories of "scenarios" and provide corresponding examples.

The first scenario is simple – both in terms of patient complexity and calculation. The second scenario involve more complexity due to the need to calculate the impact of different sources of EN in order to meet nutrient needs. The example only shows one process to figure out the solution – there are many different ways to come up with the same (or similar) answers. In general, a discussion process should be used to learn how to do this for the first few times, vs attempting to memorize exact steps. The examples in this guide are all based generalized case studies. Any identifying patient characteristics have been removed or changed.

Case Study #1: Complex Care Child - Simple Bolus Feed

Introduction and Assessment:

PH is a 3 y.o. 6 m.o. female complex care patient with a history of poor weight gain, admitted for seizure activity. She is NG dependent. Current weight is **10 kg**. She has continued to lose weight since admission.

Diagnosis:

Oral or Nutrition Support Intake – Inadequate oral intake, related to acute medical condition/complex medical status, as evidenced by need for enteral nutrition support.

Malnutrition:

Chronic severe malnutrition related to inadequate energy intake vs unknown etiology as evidenced by weight loss: -10% usual body weight.

Intervention:

Enteral Feeds: Bolus NG feeds of Pediasure 1.0 kcal

Provide 240 mL (1 container) of Pediasure 1.0 via NG q 4 hours x 4 feeds per day

- Feed at 0730, 1130, 1530 and 1930 to mirror home schedule
- Provides (per 10 kg): 960 mL total volume, 960 kcal (96 kcal/kg/d) 28 grams protein (2.8 gm/kg/d)

Supplements: Consider Iron supplementation to address baseline anemia

Monitoring and Evaluation: Obtain baseline Vitamin D level to assess status and 2x weekly daily weights

Case Study Explanation

This is a very straightforward EN order. The protein content of Pediasure can be found by looking up the nutrition information on the Abbott website or in the product reference catalog. One bottle contains 237 mL and 240 kcal (1:1 fluid to kcal). There are 7 grams of protein per bottle, so 4 a day is 28 grams of protein. This patient weighs 10 kg, so the other calculations determined by dividing total volume, kcal and protein by 10.

Case Study #2: Premature Infant with Fortified Human Milk

Introduction and Assessment:

IA is a 4 m.o. male born at 35 + 5 weeks with multiple congenital abnormalities and is NG dependent. He was admitted for respiratory failure. Current weight is **6.27 kg**. MOP reports IA is not tolerating overnight feeds. Plan is to return to 95 mL q 3 hours during admission.

Diet Prior to Admission and Nutrition History:
Receives NG bolus feed of 11 oz EBM + 1 scoop Similac Neosure 22 + 1 scoop Beneprotein

- Daytime: Receives 80 mL bolus feed, 4 times per day at 800am, 12:00pm, 4:00 pm and 8:00 pm.
- Nighttime: Receives 35 mL/hr x 10 hours from 10:00pm – 8:00 am.

Estimated Requirements: per 6.27 kg
Energy: 2-3 months: 102 – 108 kcal/kg/d vs 4-6 months: 82 – 108 kcal/kg/d
Protein: 3-4 g/kg/d per increased needs (Nephrology) method of estimation
Total Fluid: 627 mL/d per Holliday Segar method

Diagnosis:
Oral or Nutrition Support Intake – Inadequate oral intake, related to: feeding difficulties in context of prematurity and congenital nephrotic syndrome, as evidenced by: NG tube dependent.

Nutrient – Increased nutrient needs (energy, protein) related to congenital nephrotic syndrome, as evidenced by need for fortified feeds with protein modular to meet nutrition needs.

Intervention:
Enteral Feeds

- Transition to home bolus feeding regime, run feeds over 1 hour as tolerated.
- Recipe: Fortified EBM: 11 oz (330 mL) expressed breast milk + 1 scoop (10 g) Neosure Infant 22 powder + 1 scoop (7 g) Beneprotein (~26 kcal/oz, makes 3.5 feeds)
- Bolus Feed: 95 mL q 3 hours run over 60 minutes x 7 feeds per day
- Provides (per 6.27 kg) 665 mL total volume, 592 kcal (94 kcal/kg/d), 27 gm protein (4.3 gm/kg/d).
- Supplements: Continue Vitamin D per home supplementation

Monitoring and Evaluation: Monitor daily weight, tolerance, clinical course and re-evaluate in 2x week.

Case Study Explanation:
In this patient, the EBM is being fortified with both formula and a modular protein supplement, Beneprotein. Together these raise the energy density of the EN to approximately 26 kcal/oz.

To determine the mixing recipe, energy and protein needs, refer to the Attachment #5: Infant Formula and Feeding Recipe Tables for Discharge (Pediatric Nutrition Practice Group Document).

Comparing this recipe/intake to the actual needs:

- 94 kcal/d is within range for a 4-month-old, a bit high for 3-month-old (adjust based on prematurity)
- 4.3 g of protein a day is slightly higher than recommended but reasonable.

In addition to monitoring tolerance, it will also be important to monitor labs to ensure increased protein remains appropriate.

Calculations for this patient. In this example, the calculations are for the recipe first, then total volume, but in clinical practice, may be more efficient to calculate total needs based on the end volume of 665 mL. Either way ends with approximately the same answers, showing this EN is appropriately designed to meet this patients' needs.

EBM Total Nutrient Content
330 mL of 20 kcal/oz EBM
= 220 kcal (330/30 * 20 kcal/oz)
= 14 gm protein (330/30 * 1.3 gm/oz) [Reference trifold for EBM protein, assume Term]

Neosure Total Nutrient Content
1 scoop = 10 grams of powder (weight of 1 scoop)
= 51.3 kcal (10 x 5.13) (1 gram = 5.13 kcal [Reference Attachment #5])
= 1.4 g protein (2.8 x .513) (2.8 g protein per 100 calories) [Reference Nutrition Label can of Neosure 22 kcal)

Beneprotein Total Nutrient Content
1 scoop [Reference Nutrition label can of Beneprotein]
= 25 kcal
= 6 g protein

1 Recipe (~330 mL, not counting for displacement)
= 296 kcal (220 + 51.3 + 25)
=21 g protein (14 + 1.4 + 6)

Scaling that for 665 mL to determine total 24-hour intake [Easy way is to just double every number, since 330 x 2 = 660]
= 592 kcal
= 42 g protein

These calculations are not accounting for displacement. See the *Enteral Nutrition and Infant Formula* training modules in Workday for additional examples.

Summary
Designing pediatric EN interventions is complex and is a rapidly evolving area of practice in the dietetics community. Knowing the nutrient content of an EN intervention and how it aligns with estimated needs based on patient assessment is paramount, however that can be lost due to information overload. It is important to understand many different factors such as the current state of evidence-based clinical practices, the anatomy of EN delivery sites, and formula classification, before starting the process of calculating interventions. Hands-on calculations are more accurate when using common standards and key reference documents. Knowing where and how to find the references is critical, as is having accurate sources of information. It is important to pull data from trusted sources and continue to check back for regular updates as formula ingredients, branding and naming conventions change frequently.

References

1. Malone, A., Carney, L. N., Carrera, A. L., & Mays, A. (2019). *ASPEN Enteral Nutrition Handbook* (Second). American Society for Parenteral and Enteral Nutrition.
2. Fell, D. M., Bitetto, E. A., & Skillman, H. E. (2023). Timing of enteral nutrition and parenteral nutrition in the PICU. *Nutrition in Clinical Practice*, *38*(S2). https://doi.org/10.1002/ncp.11050
3. Konek, S., Becker, P., & Ruffin, A. (2020). *Pediatric Nutrition in Clinical Care* (5th ed.). Samour & King's.
4. *What Is Tube Feeding (Enteral Nutrition)?* (n.d.). Cleveland Clinic. Retrieved January 6, 2025, from https://my.clevelandclinic.org/health/treatments/21098-tube-feeding--enteral-nutrition

Attachments

Number	Document Name	Content Owner	Source Location
1	Nutrition Diagnostic Codes	Academy of Nutrition and Dietetics	Nutrition Care Manual
2	Malnutrition Clinical Characteristics	Academy of Nutrition and Dietetics/ American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.)	Journal of Academy of Nutrition and Dietetics
3	Pediatric and Adult Formula Classifications	Dayton Children's Hospital Clinical Nutrition Department	Pediatric Nutrition training module - References
4	Nutrient Composition of Commonly Used Formulas	Dayton Children's Hospital Clinical Nutrition Department	Appendix A: Pediatric Nutrition training module
5	Infant Formula Tables for Discharge Instructions	Pediatric Nutrition Practice Group (PNPG) of Academy of Nutrition and Dietetics	Pediatric Nutrition Practice Website