



A Comparison of IMPACT® Peptide 1.5 Cal Formula

Peptide-based Complete Nutrition for Immune Support

vs. Pivot®* 1.5 Cal Formula (per liter)

	IMPACT® Peptide 1.5 Formula	Pivot® 1.5 Cal Formula	IMPACT® Peptide 1.5 KEY ATTRIBUTES
Company	Nestlé Health Science	Abbott Nutrition	
Applications	Peptide-based immunonutrition designed to promote tolerance in surgical and trauma patients.	Peptide-based high protein therapeutic nutrition for metabolic stress.	<ul style="list-style-type: none"> In a retrospective chart review of SICU patients (n=113), a three-fold decrease in diarrhea was associated with feeding IMPACT® Peptide 1.5 formula as compared with Pivot® 1.5 Cal formula.¹
Evidence-based	Contains a proven blend of arginine, fish oil and nucleotides; supported by 40+ peer-reviewed published RCTs and many real world evidence trials.	No peer-reviewed published RCTs	<ul style="list-style-type: none"> Critical care guidelines suggest formulations that include arginine with other agents (including EPA + DHA, glutamine, nucleic acid) for perioperative use in SICU patients.² The unique evidence-based immunonutrient blend of the IMPACT® family of formulas has been studied in more randomized trials, in more patients, with more positive outcomes than any other immune-modulating formula.
Calories (kcal/mL)	1.5	1.5	
Calories (kcal)	1500 kcals (1 L)	1500 kcals (1 L)	
Protein (g)	94 (25% of total kcal)	93.8 (25% of total kcal)	
Protein Source	Enzymatically Hydrolyzed Casein 18.7 g supplemental L-arginine (21.3 g total arginine)	Hydrolyzed Sodium Caseinate, Whey Protein Hydrolysate 11 g supplemental L-arginine (13 g total arginine)	<ul style="list-style-type: none"> Up to 30 g arginine per day may be required to restore arginine levels in trauma and surgery.³ Arginine is essential for normal T-cell function.^{3,4} Nutritional wound management shown to be more successful in humans with intakes of 17-25 g of arginine per day.⁵⁻⁷ IMPACT® Peptide 1.5 formula contains 1.6 times more arginine than Pivot® 1.5 Cal formula.
Intact Protein**	Not Detected	10%	<ul style="list-style-type: none"> IMPACT® Peptide 1.5 formula contains no detectable intact protein, whereas part of the protein in Pivot® 1.5 Cal formula is intact. Intact protein is defined as having a molecular weight > 14,200 daltons, the weight of the smallest intact milk protein, α-lactalbumin.⁸
Peptide Profile [% by weight, daltons (Da)]‡	<1000: 40% 1000-5000: 57% >5000: 3%	Contact manufacturer for peptide profile	<ul style="list-style-type: none"> In the patient with persistent diarrhea, small peptide formulations are suggested.² 97% of the peptides in IMPACT® Peptide 1.5 formula are ≤ 5000 Da. Peptides have been shown to promote better nitrogen absorption and utilization compared to intact protein.⁹⁻¹²

*Pivot® is a registered trademark of Abbott Laboratories.

** Data on file. Multiple batches tested by an external laboratory using the SDS-PAGE (sodium dodecyl sulfate-polyacrylamide gel electrophoresis) method.

‡ Data on file. Peptide profile shown is typical based on determination of average molecular weights of peptides measured within (+/-) 2% absolute variability.

	IMPACT® Peptide 1.5 Formula	Pivot® 1.5 Cal Formula	IMPACT® Peptide 1.5 KEY ATTRIBUTES
Company	Nestlé Health Science	Abbott Nutrition	
Fat (g)	63.6 (37% of total kcal)	50.8 (30% of total kcal)	
Fat Source	MCT Oil Fish Oil Soybean Oil	Structured lipid as Interesterified Marine Oil/MCT Soy Oil Canola Oil	<ul style="list-style-type: none"> • MCT is a readily available fuel source absorbed directly into the portal circulation.¹³ • No human studies are published showing a metabolic advantage of structured lipids over physical mixtures of MCT and LCT having the same fatty acid profiles supplied enterally.
MCT:LCT	50:50 31.8 grams MCT/L 31.8 grams LCT/L	20:80 10.16 grams MCT/L 40.64 grams LCT/L	<ul style="list-style-type: none"> • 50% of fat as MCT helps facilitate fat absorption, which supports formula tolerance.^{13,14} • IMPACT® Peptide 1.5 formula contains 3 times more MCT than Pivot® 1.5 Cal formula. • The immunosuppressive effects of linoleic acid and corresponding n-6 derivatives can be minimized by displacing some LCT with MCT.¹⁵
EPA + DHA (g) n6:n3	4.9 1.5:1	3.7 1.7:1	<ul style="list-style-type: none"> • n-3 fatty acids (EPA + DHA) are a source of inflammation resolving mediators: resolvins, protectins and maresins. They help modulate cytokines to produce less inflammatory and less immunosuppressive metabolites.¹⁶ • Increased amount of EPA + DHA in IMPACT® Peptide 1.5 formula may help to decrease the production of inflammatory cytokines.¹⁶
Supplemental Nucleotides (g)	1.8	None	<ul style="list-style-type: none"> • The body under stress preferentially utilizes the more efficient salvage vs. de novo pathway for synthesis of nucleotides. Availability of nucleotide bases is the rate limiting factor for the salvage pathway.^{17,18} • Nucleotide supplementation assists the immune response by supporting rapidly dividing T-lymphocytes and enterocytes.^{17,18} • In a meta-analysis of 28 studies of immunonutrition formulas, only IMPACT® formulas containing a unique blend of supplemental arginine, n-3 fatty acids and nucleotides showed significantly reduced infection rates vs. standard nutrition after major elective surgery. 'Other' arginine-supplemented formulas lacked supplemental nucleotides and did not make a significant difference in outcomes vs. standard nutrition.¹⁹

	IMPACT® Peptide 1.5 Formula	Pivot® 1.5 Cal Formula	IMPACT® Peptide 1.5 KEY ATTRIBUTES
Company	Nestlé Health Science	Abbott Nutrition	
Carbohydrate (g)	140 (38% of total kcal)	172.4 (45% of total kcal) 7.5 g FOS	<ul style="list-style-type: none"> • Postoperative hyperglycemia greatly increases the risk of infection for people with and without diabetes.¹⁹ • VBF of IMPACT® Peptide 1.5 formula in STICU patients was associated with a 38% reduction in days with hyperglycemia vs. RBF of standard formula, primarily containing 47% carbohydrate.²⁰
Carbohydrate Source	Maltodextrin, Corn Starch	Corn Syrup Solids	
Dietary Fiber (g)	0	7.5	<ul style="list-style-type: none"> • Provides option to avoid fiber when concerned about patients at high risk for bowel ischemia or severe dysmotility.²
Fiber Source	N/A	Fructooligosaccharides (FOS)	<ul style="list-style-type: none"> • Provides option to supplement fiber (i.e. NUTRISOURCE® Fiber) when indicated.
Vitamin C (mg)	1000	304	<ul style="list-style-type: none"> • Guidelines advise malnourished or at risk patients with Stage 2 or greater pressure injury receive a formula that provides increased amounts of calories, protein, L-arginine, zinc and other antioxidants to help improve pressure injury closure.^{21,22} • Enteral formula studied to meet above criteria contained increased amounts of antioxidants: Vitamins C & E, Selenium, Copper and Manganese, vs. standard formula.²² • Higher levels of zinc may be important in patients with wound drainage or any condition causing GI zinc losses.²³ • Zinc excretion is increased in patients on Propofol sedation, due to EDTA. A higher zinc content may help minimize zinc depletion.²⁴ • Retinoic acid, a major oxidative metabolite of Vitamin A has a key role in T-cell related immunity.²⁵ • IMPACT® Peptide 1.5 formula meets the IOM recommendations for increased Vitamin D in 1000 mL.^{26†}
Vitamin E (mg)	68	27	
Selenium (mcg)	100	70	
Copper (mg)	3	2.2	
Manganese (mg)	4	5.1	
Zinc (mg)	36	30.8	
Vitamin A (RAE mcg) Retinol (mcg) β-Carotene (mcg)	2615 2240 4500	1800 605 3000	
Vitamin D (mcg)	20	24	
Volume to meet 100% RDI for key micronutrients	1000 mL (1500 kcal)	1000 mL (1500 kcal)	
Osmolality (mOsm/kg H ₂ O)	510	660	
Packaging	250 mL Tetra Prisma® 1000 mL UltraPak® Closed System with SpikeRight® PLUS Port	237 mL cartons 1000 mL Ready-To-Hang™	<ul style="list-style-type: none"> • Case of 24–250 mL cartons provides 5% more volume (312 mL) vs. case of 24–237 mL cartons. • All Tetra Prisma® and UltraPak® packaging is made without the use BPA.
Minimum Tube Sizes (FR)	Pump Assisted ≥5 Gravity ≥8	Pump Assisted ≥8 Gravity – Not recommended	<ul style="list-style-type: none"> • IMPACT® Peptide 1.5 formula accommodates use of smaller enteral feeding tubes, and also allows measured bolus gravity feeding.

†† 2011 DRI for Vitamin D is 600 IU/day (15 mcg) (ages 1-70 years) and 800 IU/day (20 mcg) (ages >70 years)

IMPACT® Peptide 1.5 Formula Offers:

- The most evidence-based blend of immunonutrients to support improved outcomes in major surgery and trauma patients.
- A more hydrolyzed protein source and more MCT to facilitate absorption, which supports tolerance.
- Real World Evidence^{20,27,28}
 - Volume-based feeding (VBF) in surgical trauma (STICU) patients is associated with decreased hyperglycemia and pneumonia vs. rate-based feeding (RBF) of standard formula.²⁰
 - Feasibility of VBF in traumatic brain injury (TBI) patients.²⁷
 - Head/neck cancer surgery patients provided with a perioperative protocol had reduced complications and LOS.²⁸
- Wound management^{21,22}
 - IMPACT Peptide formula contains more L-arginine, zinc and other antioxidants.



**The above statement does not constitute an endorsement of IMPACT® formulas or any other Nestlé HealthCare Nutrition products by SCCM or A.S.P.E.N.

References:

1. Rumberger L et al. Code Brown: Incidence of diarrhea in critically ill patients on defined enteral formulas. *JPEN*. Clinical Nutrition Week 2014, A 1835637.
2. McClave SA, Martindale RG et al. Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: Society of Critical Care Medicine (SCCM) and American Society of Parenteral and Enteral Nutrition (A.S.P.E.N.) *JPEN* 2016;40(2):159-211.
3. Ochoa JB et al. A rational use of immune enhancing-diets: When should we use dietary arginine supplementation? *NutrClinPract* 2004;19:216-225.
4. Zhu X et al. The central role of arginine catabolism in T-cell dysfunction and increased susceptibility to infection after physical injury. *Ann Surg* 2014; 259(1): 171-178.
5. Ochoa Gautier JB 2014. Arginine in Crit Care: Preclinical Aspects. In: *Diet and Nutrition in Crit Care*. NY: Springer. 1-17.
6. Barbul A, Lazarou SA, Efron DT et al. Arginine enhances wound healing and lymphocyte immune responses in humans. *Surgery* 1990;108:331-337.
7. Chow O and Barbul A. Immunonutrition: Role in wound healing and tissue regeneration. *Adv Wound Care* 2014;3(1):46-53.
8. Phillips GO and Williams PA Eds. *Handbook of Food Proteins*. Woodhead Publishing. 2011; 30-55.
9. Meredith JW et al. Visceral protein levels in trauma patients are greater with peptide diet than with intact protein diet. *J of Trauma* 1990;30(7):S25-S29.
10. Ziegler F et al. Efficiency of enteral nutrition support in surgical patients: Small peptides v non-degraded proteins. *Gut* 1990;31 (11): 1277-1283.
11. Zaloga GP. Physiologic effects of peptide-based enteral formulas. *NCP* 1990;5(6):231-237.
12. Calbet JA et al. Gastric emptying, gastric secretion and enterogastrone response after administration of milk proteins or their peptide hydrolysates in humans. *Eur J Nutr* 2004;43(3):127-139.
13. Sucher KP. Medium chain triglycerides: a review of their enteral use in clinical nutrition. *NCP* 1986;1(3):146-150.
14. McLaughlin J et al. Fatty acid chain length determines cholecystokinin secretion and effect on human gastric motility. *Gastroenterol* 1999;116:46-53.
15. Hoshimoto A et al. Caprylic acid and medium-chain triglycerides inhibit IL-8 gene transcription in Caco-2 cells: Comparison with the potent histone deacetylase inhibitor trichostatin. *Brit J Pharm* 2002;136:280-286.
16. Calder PC. Marine omega-3 fatty acids and inflammatory processes: Effects, mechanisms and clinical relevance. *Biochem Biophys Acta* 2015;1851:469-484.
17. Santora R and Kozar RA. Molecular mechanisms of pharmaconutrients. *J Surg Res* 2010;161:288-294.
18. Gil A. Modulation of the immune response mediated by dietary nucleotides. *Eur J Clin Nutr* 2002;56(Suppl 3):S1.
19. Kwon S et al. Importance of perioperative glycemic control in general surgery. A report from the Surgical Care and Outcomes Assessment Program. *Ann Surg* 2013;257:8-14.
20. Prest PJ, Comparison of a Volume Based Tube Feeding Protocol to Traditional Rate Directed Tube Feeding in the Surgical Trauma ICU. *JPEN* 2020; 44(5):880-888. Comparison of a Volume Based Tube Feeding Protocol to Traditional Rate Directed Tube Feeding in the Surgical Trauma ICU. ASPEN 2019 Abstract 3074727.
21. EPUAP, NPIAP & PPPIA. Prevention and Treatment of Pressure Ulcers/Injuries: Quick Reference Guide. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2019.
22. Cereda E et al. *J Nutr Health Aging*. 2017;21(6):655-661.
23. McKeever L. Vitamins and Trace Elements. In: *The ASPEN Nutrition Support Core Curriculum*. 3rd Edition. 2017;18-56.
24. Mason J. Vitamins and trace elements in the critically ill patient. *Nutritional Considerations in the Intensive Care Unit: Science, Rationale*. Dubuque: Kendall/Hunt, 2002;73
25. Ross AC. Vitamin A and retinoic acid in T cell-related immunity. *AJCN* 2012;96(Suppl):1166S-72S.
26. Institute of Medicine of the National Academies. *Dietary Reference Intakes for Calcium and Vitamin D*. 2011.
27. Justice J et al. Early and adequate feeding in the critically ill brain injured patient. Clinical Nutrition Week 2017, S82.
28. Rowan NR et al. Utility of a perioperative nutrition intervention on postoperative outcomes in high-risk head and neck cancer patients. *Oral Onc* 2016;54:42-46.

Data is based on information available as of the date of publication and is subject to change. Please contact the manufacturer for the most current information. This information is provided for comparison purposes only; not all clinical considerations are listed. This is not intended as a substitute for clinical judgment.

For assistance in product selection and clinical application call 1-800-422-ASK2 (2752) or visit www.NestleMedicalHub.com.

Pivot® is a registered trademark of Abbott Laboratories.
Unless otherwise noted, all trademarks are owned by Société des Produits. Nestlé S.A., Vevey, Switzerland.
©2021 Nestlé. All rights reserved.
IPCT-14657-0721

