NestléHealthScience™

Peptamen® has the proof!

PEPTAMEN® is the only family of peptide-based formulas supported by over **25 years** of clinical experience and more than **60 published studies**.

Evidence in Support of Peptamen® Formulas

This table includes 21 brief study summaries from this body of literature - representing a range of **PEPTAMEN®** formulas across different patient settings, medical conditions and ages.

Authors & Journal	Study Objective	Formulas Studied	Patients & Design	Results
Aguilar-Nascimento JE et al. **Early Enteral Nutrition with Whey Protein or Casein in Elderly Patients with Acute Ischemic Stroke: A Double-blind Randomized Trial** *Nutrition 2011*; 27: 440-444	To investigate the effect of an enteral formula containing whey protein on levels of glutathione, acute phase protein response and inflammatory markers in aged patients with acute ischemic stroke.	Peptamen® 1.5 vs. standard formula and modular protein	Prospective randomized controlled trial of 25 elderly patients (ages 65-90 years) with acute ischemic stroke.	Glutathione peroxidase significantly increased in the whey protein group (p=0.03). IL-6 significantly decreased in the whey protein group (p=0.02). Albumin levels significantly dropped from the first to the fifth feeding days in the casein protein group (p<0.01).
Bandini M et al. **Early enteral nutrition pharmaconutrition improves nutritional status and reduces inflammation in severe subarachnoid hemorrhage (SAH).** *Minerva Anestesiol*. 2011;77, S2 (10): 171	To compare the effects of early enteral nutrition x 7 days (Peptamen AF) versus a standard formula on blood visceral protein, plasmatic markers and clinical expression of Systemic Inflammatory Response Syndrome (SIRS).	Peptamen® AF vs. standard formula and modular protein	Prospective, randomized control trial of 32 critically ill patients suffering from severe SAH.	Compared to the control group, the Peptamen AF group had more SIRS-free days (p<0.01), a decrease in SOFA score (p<0.01), reduced plasma IL-6 levels (p<0.05) and C-Reactive Protein (p<0.05).
Dylewski ML et al. **Whey-based Formulas Improve Tube Feeding Tolerance in Pediatric Burn Patients.** Nutrition Poster 72; *A.S.P.E.N. Clinical Nutrition Week 2006.*	Compare the effects of a whey-based hydrolyzed protein feeding vs. an intact casein-based formula in pediatric burn patients.	Peptamen® vs. standard formula	Retrospective study of 17 pediatric patients with burns exceeding 20% total body surface area	Children receiving Peptamen® reached their goal feeding rate faster and experienced significantly less diarrhea.
Flack S et al. **Experience with a New Hydrolysed Feed in a Paediatric Gastroenterology Clinic.** *J of Human Nutrition and Dietetics* 2003; 16:366.	To determine the usability of a pediatric whey-based diet in children >1 year of age.	Peptamen® Junior	Prospective study of 15 pediatric patients with eosinophilic enteropathy and other food intolerances.	Peptamen® Junior was associated with improvement in diarrhea, vomiting and abdominal pain. It was concluded that Peptamen® Junior is well accepted and tolerated, and provides a better nutritional choice for children than previously offered through infant or adult nutrition products.
Fried MD et al. **Decrease in gastric emptying time and episodes of regurgitation in children with spastic quadriplegia fed a whey-based formula.** *J Peds.* 1992; 120: 569-72.	To determine gastric emptying times and incidence of regurgitation in children with documented delayed gastric emptying.	1 casein predominant vs. 3 whey predominant (including Peptamen®)	Randomized double-blind trial of 9 pediatric patients > 3 years of age with documented evidence of gastro-esophageal reflux (GER) and delayed gastric emptying.	Patients on whey-based formulas had a significant reduction (p<0.05) in vomiting compared with those on the casein based formula. Whey-based formulas like Peptamen reduce the frequency of vomiting by improving the rate of gastric emptying (p<0.001).
Heyland DK et al. **Implementing the PEP uP Protocol in Critical Care Units in Canada: Results of a Multicenter, Quality Improvement Study** *JPEN 2014*; published online 18 April 2014	To describe our experience with implementing this feeding protocol and the observed improvements in nutrition intake in patients admitted to participating ICUs compared with a concurrent control group in the real-world setting.	Peptamen® 1.5 vs. standard feeding protocol	Multicentre Canadian quality improvement initiative (8 ICUs implemented PEP uP protocol, 16 ICUs served as concurrent control sites).	Patients at PEP uP sites received a significantly larger proportion of prescribed protein and calories from EN, compared to control hospitals (61.0% vs. 49.7%, p=0.01 for protein; 60.1% vs. 49.9%, p=0.02 for calories). In the real-life setting, the PEP uP protocol can improve delivery of EN to critically ill patients.

(continued)

Authors & Journal	Study Objective	Formulas Studied	Patients & Design	Results
Heyland DK et al. **Enhanced Protein-Energy Provision via the Enteral Route Feeding Protocol in Critically Ill Patients: Results of a Cluster Randomized Trial** *Critical Care Medicine* 2013; 41(12): 2743-53	To determine the effect of the enhanced protein-energy provision via the enteral route feeding protocol (PEP uP) combined with a nursing educational intervention, compared to a standard feeding protocol (usual care) on amount of protein and calories received.	Peptamen® 1.5 vs. standard feeding protocol	Cluster randomized trial of mechanically ventilated adult patients in 18 ICUs in North America.	Patients in the intervention group received a significantly larger proportion of prescribed protein and calories from EN, compared to baseline (47 vs. 34%, p= 0.005 for protein; 44 vs. 32%, p= 0.001 for calories) but there were no significant changes in the control group. There was no significant difference in complication rates between the two groups.
Heyland DK et al. **Enhanced Protein-energy Provision via the Enteral Route in Critically Ill Patients: a Single Center Feasibility Trial of the PEP uP Protocol.** *Critical Care* 2010. ccforum.com/content/14/2/R78	To assess the feasibility, acceptability, and safety of a new feeding protocol (PEP uP) designed to enhance the delivery of early EN.	Peptamen® 1.5 vs. standard feeding protocol	Prospective before and after pilot study of 50 mechanically ventilated adult ICU patients.	A new, "second generation" feeding protocol was studied which includes: starting EN at a 24-hour volume based target rate using Peptamen 1.5, Beneprotein, motility agents and more liberal GRV thresholds. The new PEP uP feeding protocol was safe, feasible, and found acceptable by ICU nurses. The adoption of this protocol may be associated with enhanced delivery of early and adequate EN.
Hopkins B & Alberda C. **Achieving Protein Targets in the ICU with a Specialized Enteral Formula** DC Conference 2016, Winnipeg, MN(Abstract)	To demonstrate that a specialized EN formula with 37% calories from protein will deliver at least 80% of prescribed protein needs to CI patients within the first 5 days of feeding and to describe clinicians' experience with this formula.	Peptamen® Intense High Protein	Quality improvement project of 49 adult ICU patients requiring exclusive EN x up to 5 days.	The average protein prescribed was 134 g/day or 1.9 g/kg, with an average protein intake of 112 g/day or 1.6 g/kg. Between 75-83% patients received ≥ 80% prescribed protein on days 2 through 5. The formula was well-tolerated with no GI symptoms reported in 38 (86%) patients.
Hussey TA et al. **Nutrition Therapy in Pediatric Crohn's Disease Patients Improves Nutritional Status and Decreases Inflammation.** *J of Pediatric Gastroenterology and Nutrition* 2003; 37:341.	To observe tolerance and efficacy of a six-week tube feeding regimen of Peptamen® with Prebio1™.	Peptamen® with Prebio1™	Prospective, open label pilot study of 10 pediatric patients with Crohn's disease.	Peptamen® with Prebio1™ was well tolerated and associated with clinically meaningful gains in weight, height, nutritional status and quality of life scores. Inflammation and disease activity were decreased. A six-week tube-feeding regimen of Peptamen® with Prebio1™ is effective in treating pediatric Crohn's disease.
Khoshoo V, Brown S. **Gastric Emptying of Two Whey-based Formulas of Different Energy Density and its Clinical Implication in Children with Volume Intolerance.** *European J of Clinical Nutrition* 2002; 56:656-658.	To study the emptying rates of equal volumes of two similar whey-based formulas of different energy density and clinical implications in children with volume intolerance.	Peptamen® 1.5 vs. Peptamen®	Prospective study of 10 pediatric gastrostomy fed patients with spastic quadriplegia and evidence of GER, frequent vomiting and failure to gain weight.	The higher density whey-based formula can safely substitute an equal volume of a lower energy density formula to produce weight gain without affecting tolerance. This provides an important intervention for increasing energy intake in children with volume intolerance or fluid restriction.
Kowalski L et al. **Nutrition Autonomy after Pediatric Intestinal Transplantation.** Nutrition Poster NP01; *A.S.P.E.N. Clinical Nutrition Week* 2006.	To evaluate the effect of various feeding modalities on nutritional outcomes in intestinal transplant patients managed with or without a lymphocyte depleting agent (rATG).	Peptamen® Junior vs. Amino acid based formula	Retrospective study of 85 pediatric patients with short bowel syndrome undergoing intestinal transplantation.	Enteral feedings were initiated sooner and nutritional autonomy achieved more rapidly in patients receiving rATG therapy. Patients who received rATG and a peptide-based feeding reached full feedings more quickly and had reduced ostomy output at 6 months, compared to those who received an amino acid based formula. The authors concluded peptide-based EN was successfully used post intestinal transplant and may have nutritional outcome benefits over amino acid-based products.
McClave SA et al. **Appropriateness of a Very High Protein, Low Carbohydrate Formula in Critically Ill Patients with Obesity: A Pilot Study of Design, Safety and Tolerance** *JPEN* 2015; 39(2): 240.	To evaluate tolerance, safety and design of a unique enteral formula in ICU patients with obesity.	Peptamen® Intense High Protein (formerly Peptamen® Bariatric in the USA)	Prospective observational study of 16 medical/surgical ICU patients with BMI >30.	Received 80% calorie goal and 86% protein goals by day 3. Peptamen® Intense High Protein is safe and well tolerated in critically ill patients with obesity. The design of the formula may facilitate glucose control and allows for achievement of nitrogen balance without overfeeding calories.
McClave SA et al. **Comparison of the Safety of Early Enteral vs. Parenteral Nutrition in Mild Acute Pancreatitis.** *JPEN* 1997;21:14–20.	To assess safety and efficacy of a whey-based peptide diet in acute pancreatitis.	Peptamen® vs. total parenteral nutrition (TPN)	Prospective randomized study of 30 adults with acute pancreatitis or chronic pancreatitis with flare-ups.	Peptamen® fed jejunally was as effective as TPN in resolving the stress response to pancreatitis. Peptamen® patients had significantly greater improvement in severity of illness scores (Ranson criteria) and trend toward improvement in LOS, ICU stay and days to PO diet. Peptamen may promote more rapid resolution of the toxicity and stress response and is significantly less costly than TPN.

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Authors & Journal	Study Objective	Formulas Studied	Patients & Design	Results
Minor G & Storm H. **Formula Switch Leads to Enteral Feeding Tolerance Improvements in Children with Developmental Delays. Clinical Abst. 294**; *NASPGHAN*, 2015.	To evaluate the effects of switching children with developmental delays who were experiencing feeding intolerance from intact protein containing formulas to a 100% whey peptide-based formula.	Peptamen® Junior vs. standard formulas	Retrospective study of 13 children with developmental delays.	Of the subjects assessed, 92% had improved feeding tolerance. Parameters improved were vomiting, gagging and retching, high residual volumes, diarrhea and poor weight gain. In addition, 71% of the patients tolerated increased feeding volumes.
Oz HS et al. **Nutrition Intervention: A Strategy Against Systemic Inflammatory Syndrome.** *JPEN* 2009; 33:380–9.	To determine if an enteral nutrition formula high in cysteine, EPA-DHA and FOS would protect against systemic inflammatory syndrome in a well established rat model.	Peptamen® AF vs. Peptamen® vs. chow	Experimental design in an animal model of lipopolysaccharide (LPS)-induced systemic inflammatory response.	Rats were allocated to receive Peptamen® AF, Promote® or rat chow for 6 days, after which they received an injection with LPS or saline. Rats were euthanized 18 hours after injection with LPS or control. Peptamen® AF rats showed significantly less weight loss, significantly less increase in ALT (liver function enzyme), less hepatic damage, less decrease in hematocrit, limited muscle atrophy, increased ileal and hepatic blood flow, and greater hepatic glutathione content. Data suggests that Peptamen® AF protects against systemic inflammatory response.
Parekh N. **A Semi-Elemental Enteral Formula with Prebiotics is Associated with Weight Gain in Intestinal Failure Patients Undergoing Intestinal Failure Rehabilitation.** *Am College of Gastroenterology Annual Meeting* 2006, S313–14, Abstract No 776.	To describe the outcome from switching from a polymeric or semi-elemental formula to an isocaloric, isotonic semi-elemental formula with prebiotics.	Peptamen® with Prebio1™	Prospective, descriptive study of 8 adult patients with intestinal failure undergoing intestinal rehabilitation.	Three months of oral or enteral intake of Peptamen® with Prebio1™ may induce weight gain in patients with intestinal failure undergoing intestinal rehabilitation.
Shea JC et al. **An Enteral Therapy Containing Medium- Chain Triglycerides and Hydrolyzed Peptides Reduces Postprandial Pain Associated with Chronic Pancreatitis.** *Pancreatology* 2003; 3:36–40.	To determine if an enteral formula containing MCT and hydrolyzed peptides would minimally stimulate the pancreas and decrease pain associated with chronic pancreatitis.	Peptamen® vs. Ensure® vs. high fat meal	Prospective study of 8 adults with chronic pancreatitis and 6 healthy adults.	Peptamen® minimally stimulated the pancreas and cholecystokinin release, as compared to a high fat meal and/or Ensure®. There was also a significant improvement in pain scores which corresponded to clinical improvement in 6 of 8 patients.
Tiengou LE et al. **Semi-Elemental Formula or Polymeric Formula: Is There a Better Choice for Enteral Nutrition in Acute Pancreatitis? Randomized Comparative Study.** *JPEN* 2006; 30(2):1–5.	To compare tolerance and outcomes in patients with acute pancreatitis receiving a semi-elemental formula versus a polymeric formula.	Peptamen® vs. standard formula	Randomized prospective study of 30 adults with acute pancreatitis stratified for disease severity.	Peptamen® usage resulted in a significant decrease in weight loss and hospital length of stay. A clinical trend was seen for decreased infection, improved CRP, amylase and serum albumin in the Peptamen® group. Use of Peptamen® in acute pancreatitis supports the hypothesis of a more favorable clinical course compared to use of a polymeric formula.
Tsutsumi R et al. **Whey Peptide-Based Formulas with Omega-3 Fatty Acids are Protective in Lipopolysaccharide-Mediated Sepsis.** *JPEN* 2015; 39(5): 552-561.	To examine the effects of a whey-based enteral formula high in cysteine (antioxidant precursor) and the addition of ω-3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) on inflammation and anti-oxidation markers in sepsis.	Peptamen®, Peptamen® AF vs. standard formula	Experimental design in an animal model of lipopolysaccharide (LPS) – induced sepsis.	Mice fed whey-based formulas were protected against LPS-induced weight loss. Whey-based diets suppressed inflammatory cytokine release and oxidative stress damage. These data suggest a clinical role for whey peptide–based diets in promoting healing and recovery in critically ill patients.
Wakefield SC & Green J. **Chyle Leaks and Upper Gastrointestinal Surgery.** *Clin Nutr Suppl* 2012; 7(1): 88	To examine the effect of change in surgical technique on incidence of chyle leaks and to see if specialized enteral nutrition will resolve leaks.	Peptamen® vs. standard formula	Prospective randomized trial of 106 adult patients undergoing radical surgery for upper GI cancer.	Rates of chyle leaks increased following radical lymphadenectomy (7.8% to 22%, $p<0.06$). Specialized enteral feeding resolved chyle leaks in 73% of patients.

Authors & Journal	Outcome	Tolerance	Weight Gain/ Maintain	Feeding Goals	Inflammation	Pancreatitis	Obesity/ICU	Pediatrics	Chyle Leaks
Aguilar-Nascimento JE. Nutrition 2011; 27: 440-444	Enteral formulas containing whey protein may decrease inflammation and increase antioxidant defenses.				✓				
Bandini M et al. Minerva Anestesiol. 2011;77, S2 (10): 171	More SIRS free days, decreased SOFA score, reduced IL-6 levels and CRP levels. Enhanced tolerance improved calorie delivery.	✓			✓				
Dylewski ML et al. A.S.P.E.N. CNW 2006.	More rapid progression to goal feeding and reduced diarrhea.	✓		✓				✓	
Flack S et al. J Hum Nutr & Diet 2003; 16:366.	Marked improvement in GI symptoms (diarrhea, vomiting, abdominal pain).	✓						✓	
Fried MD et al. J Peds. 1992; 120: 569-72.	Reduction in vomiting; improvement in gastric emptying on whey-based formulas compared to casein.	✓						✓	
Heyland DK et al. JPEN 2015; 39 (6): 698-706	In the real-life setting, the PEP uP protocol can improve delivery of EN to critically ill patients.			✓					
Heyland DK et al. Crit Care Med 2013;41(12)	The PEP uP protocol results in modest but statistically significant increases in protein and calorie intake in critically ill patients.			✓					
Heyland DK et al. Crit Care 2010; 14:R78	The PEP uP feeding protocol was safe, increased protein and calorie delivery, and was acceptable to critical care nurses.			✓					
Hopkins B, Alberda C. DC Conference 2016 (Abstract)	A specialized EN formula with 37% calories from protein will help achieve higher protein targets in CI patients and is well tolerated.	✓		✓			✓		
Hussey TA et al. J of Pediatric Gastro & Nutr 2003; 37:341.	Increase in QOL and catch-up growth.		✓					✓	
Khoshoo V, Brown S. Eur J of Clin Nutr 2002;56:656-8	The higher density whey-based formula can safely substitute an equal volume of a lower energy density formula to produce weight gain without affecting tolerance.	✓	✓					✓	
Kowalski L et al. Poster, A.S.P.E.N. CNW 2006.	Peptide-based formulas may have nutrition outcome benefits (feeding volume delivered, reduce ostomy output).	✓		✓					
McClave SA et al. JPEN 2015; 39(2): 240.	This new, unique formula is safe and well-tolerated in critically ill patients with obesity. The formula may facilitate glucose control and allows for achievement of N balance.	✓	✓				✓		
McClave SA et al. JPEN 1997; 21:14–20.	EN is as safe and effective, and significantly less costly than TPN.					✓			
Minor G, Storm H. Clinical Abst. 294; NASPGHAN, 2015.	Improved symptoms of feeding intolerance.	✓						✓	
Parekh N. Am Coll of Gastro An Mtg 2006, S313–14, Abst. 776.	Weight gain.		✓						
Oz HS et al. JPEN 2009; 33:380–9.	Protection against systemic inflammatory response in an animal model.				✓				
Shea JC et al. Pancreatology 2003; 3:36–40.	Minimal increase in plasma cholecystokinin levels, reduction in postprandial pain.		✓		✓				
Tiengou LE et al. JPEN 2006; 30(2):1-5.	Semi-elemental formula supports a more favorable clinical course (shorter LOS, less weight loss).		✓			✓			
Tsutsumi R et al. JPEN 2015; 39(5): 552-561.	Data suggest a clinical role for whey peptide–based diets in promoting healing and recovery in critically ill patients (antioxidant and anti-inflammatory effects in animal model).				✓				
Wakefield SC, Green J. Clin Nutr Suppl 2012; 7(1): 88	Use of a specialized whey peptide, high MCT formula helped resolve the majority of patients' chyle leaks.								✓

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