



*****New RCTs included in the 2009 update are italicized.***

1.0 Enteral Nutrition vs. Parenteral Nutrition

1. Rapp RP, Young DB, Twyman D. The favorable effect of early parenteral feeding on survival in head-injured patients. J Neurosurgery 1983;58:906-12 [Pubmed Link](#)
2. Adams S, Dellinger EP, Wertz MJ. Enteral versus parenteral nutritional support following laparotomy for trauma: A randomized prospective trial. J Trauma 1986;26(10):882-891. [Pubmed Link](#)
3. Young B, Ott L, Twyman D et al. The effect of nutritional support on outcome from severe head injury. J Neurosurg 1987;67:668-76. [Pubmed Link](#)
4. Young B, Ott L, Haack D. Effect of total parenteral nutrition upon intracranial pressure in severe head injury. J Neurosurg 1987;67:76-80. [Pubmed Link](#)
5. Peterson VM, Moore EE, Jones TN, Rundus C, Emmett M, Moore FA, McCroskey BL, Haddix T, Parsons PE. Total enteral nutrition versus total parenteral nutrition after major torso injury: attenuation of hepatic protein reprioritization. Surgery 1988 Aug;104(2):199-207. [Pubmed Link](#)
6. Cerra FB, McPherson JP, Konstantinides FN, Konstantinides NN, Teasley KM. Enteral nutrition does not prevent multiple organ failure syndrome (MOFS) after sepsis. Surgery 1988;104:727-33. [Pubmed Link](#)
7. Moore FA, Moore EE, Jones TN, McCroskey BL, Peterson VM. TEN versus TPN following major abdominal trauma - Reduced septic morbidity. J Trauma 1989;29:916-923. [Pubmed Link](#)
8. Kudsk KA, Croce MA, Fabian TC et al. Enteral versus parenteral feeding: Effects on septic morbidity after blunt and penetrating abdominal trauma. Ann Surg 1992;215:503-13. [Pubmed Link](#)
9. Dunham CM, Frankenfield D, Belzberg H, Wiles C, Cushing B, Grant Z. Gut failure-predictor of or contributor to mortality in mechanically ventilated blunt trauma patients? J Trauma 1994;37(1):30-34. [Pubmed Link](#)
10. Borzotta AP, Pennings J, Papisadero B et al. Enteral versus parenteral nutrition after severe closed head injury. J Trauma 1994;37(3):459-468. [Pubmed Link](#)
11. Hadfield RJ, Sinclair DG, Houldsworth PE, Evans TW. Effects of enteral and parenteral nutrition on gut mucosal permeability in the critically ill. Am J Respi Crit Care Med 1995;152:1545-8. [Pubmed Link](#)



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12. Kalfarentzos F, Kehagias J, Mead N, Kokkinis K, Gogos CA. Enteral nutrition is superior to parenteral nutrition in severe acute pancreatitis: Results of a randomized prospective trial. *British J Surg* 1997;84:1665-9. [Pubmed Link](#)
13. Woodcock NP, Zeigler D, Palmer MD, Buckley P, Mitchell CJ, Macfie J. Enteral versus parenteral nutrition: A pragmatic study. *Nutrition* 2001;17:1-12. [Pubmed Link](#)

2. Early vs. Delayed Nutrient Intake

1. Moore EE, Jones TN. Benefits of immediate jejunostomy feeding after major abdominal trauma—a prospective, randomized study. *J Trauma*. 1986 Oct;26(10):874-81. [Pubmed Link](#)
2. Chiarelli A, Enzi G, Casadei A, Baggio B, Valerio A, Mazzoleni F. Very early nutrition supplementation in burned patients. *Am J Clin Nutr*. 1990 Jun;51(6):1035-9. [Pubmed Link](#)
3. Eyer SD, Micon LT, Konstantinides FN, Edlund DA, Rooney KA, Luxenberg MG, Cerra FB. Early enteral feeding does not attenuate metabolic response after blunt trauma. *J Trauma*. 1993 May;34(5):639-43. [Pubmed Link](#)
4. Chuntrasakul C, Siltharm S, Chinswangwatanakul V, Pongprasobchai T, Chockvivatanavanit S, Bunnak A. Early nutritional support in severe traumatic patients. *J Med Assoc Thai* 1996 Jan; 79(1):21-6. [Pubmed Link](#)
5. Singh G, Ram RP, Khanna SK. Early post-operative enteral feeding in patients with nontraumatic intestinal perforation and peritonitis. *J Am Coll Surg*. 1998 Aug;187(2):142-6. [Pubmed Link](#)
6. *Kompan L, Kremzar B, Gadzijev E, Prosek M. Effects of early enteral nutrition on intestinal permeability and the development of multiple organ failure after multiple injury. Intensive Care Med*. 1999 Feb;25(2):157-61. [Pubmed Link](#)
7. Minard G, Kudsk KA, Melton S, Patton JH, Tolley EA. Early versus delayed feeding with an immune-enhancing diet in patients with severe head injuries. *JPEN J Parenter Enteral Nutr*. 2000 May-Jun;24(3):145-9. [Pubmed Link](#)
8. Pupelis G, Austrums E, Jansone A, Sprucs R, Wehbi H. Randomised trial of safety and efficacy of postoperative enteral feeding in patients with severe pancreatitis: preliminary report. *Eur J Surg* 2000;166(5):383-7. [Pubmed Link](#)
9. Pupelis G, Selga G, Austrums E, Kaminski A. Jejunal feeding, even when instituted late, improves outcomes in patients with severe pancreatitis and peritonitis. *Nutrition*. 2001 Feb;17(2):91-4. [Pubmed Link](#)



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10. Dvorak MF, Noonan VK, Belanger L, Bruun B, Wing PC, Boyd MC, Fisher C. Early versus late enteral feeding in patients with acute cervical spinal cord injury: a pilot study. *Spine*. 2004 May 1;29(9):E175-80. [Pubmed Link](#)
11. Kompan L, Vidmar G, Spindler-Vesel A, Pecar J. Is early enteral nutrition a risk factor for gastric intolerance and pneumonia? *Clin Nutr*. 2004 Aug;23(4):527-32. [Pubmed Link](#)
12. Malhotra A, Mathur AK, Gupta S. Early enteral nutrition after surgical treatment of gut perforations: a prospective randomised study. *J Postgrad Med*. 2004 Apr-Jun;50(2):102-6. [Pubmed Link](#)
13. Peck MD, Kessler M, Cairns BA, Chang YH, Ivanova A, Schooler W. Early enteral nutrition does not decrease hypermetabolism associated with burn injury. *J Trauma*. 2004 Dec;57(6):1143-9. [Pubmed Link](#)
14. Nguyen NQ, Fraser RJ, Bryant LK et al. The impact of delaying enteral feeding on gastric emptying, plasma cholecystokinin, and peptide YY concentrations in critically ill patients. *Crit Care Med*. 2008 May;36(5):1469-74 [Pubmed Link](#)

3.1 Use of indirect calorimetry vs. predictive equations

1. Saffle JR, Larson CM, Sullivan J. A randomized trial of indirect calorimetry-based feedings in thermal injury. *J Trauma*. 1990 Jul;30(7):776-82. [Pubmed Link](#)

3.2 Achieving target dose of EN

1. Taylor SJ, Fettes SB, Jewkes C, Nelson RJ. Prospective, randomized, controlled trial to determine the effect of early enhanced enteral nutrition on clinical outcome in mechanically ventilated patients suffering head injury. *Crit Care Med*. 1999 Nov;27(11):2525-31. [Pubmed Link](#)
2. Martin CM, Doig GS, Heyland DK, Morrison T, Sibbald WJ; Southwestern Ontario Critical Care Research Network. Multicentre, cluster-randomized clinical trial of algorithms for critical-care enteral and parenteral therapy (ACCEPT). *CMAJ*. 2004 Jan 20;170(2):197-204. [Pubmed Link](#)
3. Desachy A, Clavel M, Vuagnat A, Normand S, Gissot V, François B. Initial efficacy and tolerability of early enteral nutrition with immediate or gradual introduction in intubated patients. *Intensive Care Med*. 2008 Jun;34(6):1054-9 [Pubmed link](#)
4. Doig GS, Simpson F, Finfer S, Delaney A, Davies AR, Mitchell I, Dobb G; Nutrition Guidelines Investigators of the ANZICS Clinical Trials Group. Effect of evidence-based feeding guidelines on mortality of critically ill adults: a cluster randomized controlled trial. *JAMA*. 2008 Dec 17;300(23):2731-41. [Pubmed Link](#)



4.1a Diets supplemented with arginine and select other nutrients

1. Cerra FB, Lehman S, Konstantinides N, Konstantinides F, Shronts EP, Holman R. Effect of enteral nutrient on in vitro tests of immune function in ICU patients: a preliminary report. *Nutrition*. 1990 Jan-Feb;6(1):84-7 [Pubmed Link](#)
2. Gottschlich MM, Jenkins M, Warden GD, Baumer T, Havens P, Snook JT, Alexander JW. Differential effects of three enteral dietary regimens on selected outcome variables in burn patients. *J Parenter Enteral Nutr*. 1990 May-Jun;14(3):225-36. [Pubmed Link](#)
3. Brown RO, Hunt H, Mowatt-Larssen CA, Wojtysiak SL, Henningfield MF, Kudsk KA. Comparison of specialized and standard enteral formulas in trauma patients. *Pharmacotherapy*. 1994 May-Jun;14(3):314-20. [Pubmed Link](#)
4. Moore FA, Moore EE, Kudsk KA, Brown RO, Bower RH, Koruda MJ, Baker CC, Barbul A. Clinical benefits of an immune-enhancing diet for early postinjury enteral feeding. *J Trauma*. 1994 Oct;37(4):607-15. [Pubmed Link](#)
5. Bower RH, Cerra FB, Bershadsky B, Licari JJ, Hoyt DB, Jensen GL, Van Buren CT, Rothkopf MM, Daly JM, Adelsberg BR. Early enteral administration of a formula (Impact) supplemented with arginine, nucleotides, and fish oil in intensive care unit patients: results of a multicenter, prospective, randomized, clinical trial. *Crit Care Med*. 1995 Mar;23(3):436-49 [Pubmed Link](#)
6. Kudsk KA, Minard G, Croce MA, Brown RO, Lowrey TS, Pritchard FE, Dickerson RN, Fabian TC. A randomized trial of isonitrogenous enteral diets after severe trauma. An immune-enhancing diet reduces septic complications. *Ann Surg*. 1996 Oct;224(4):531-40. [Pubmed Link](#)
7. Engel JM, Menges T, Neuhauser C, Schaefer B, Hempelmann G. [Effects of various feeding regimens in multiple trauma patients on septic complications and immune parameters] *Anesthesiol Intensivmed Notfallmed Schmerzther*. 1997 Apr;32(4):234-9. German. [Pubmed Link](#)
8. Mendez C, Jurkovich GJ, Garcia I, Davis D, Parker A, Maier RV. Effects of an immune-enhancing diet in critically injured patients. *J Trauma*. 1997 May;42(5):933-40. [Pubmed Link](#)
9. Rodrigo Casanova MP, Garcia Pena JM. [The effect of the composition of the enteral nutrition on infection in the critical patient] *Nutr Hosp*. 1997 Mar-Apr;12(2):80-4. Spanish. [Pubmed Link](#)
10. Saffle JR, Wiebke G, Jennings K et al. Randomized trial of immune-enhancing enteral nutrition in burn patients. *Journal of Trauma*. 1997;42:793-802. [Pubmed Link](#)
11. Weimann A, Bastian L, Bischoff WE, Grotz M, Hansel M, Lotz J, Trautwein C, Tusch G, Schlitt HJ, Regel G. Influence of arginine, omega-3 fatty acids and nucleotide-supplemented enteral support on systemic inflammatory response syndrome and



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- multiple organ failure in patients after severe trauma. *Nutrition*. 1998 Feb;14(2):165-72. [Pubmed Link](#)
12. Atkinson S, Sieffert E, Bihari D. A prospective, randomized, double-blind, controlled clinical trial of enteral immunonutrition in the critically ill. Guy's Hospital Intensive Care Group. *Crit Care Med*. 1998 Jul;26(7):1164-72. [Pubmed Link](#)
 13. Galban C, Montejó JC, Mesejo A, Marco P, Celaya S, Sanchez-Segura JM, Farre M, Bryg DJ. An immune-enhancing enteral diet reduces mortality rate and episodes of bacteremia in septic intensive care unit patients. *Crit Care Med*. 2000 Mar;28(3):643-8. [Pubmed Link](#)
 14. Caparros T, Lopez J, Grau T. Early enteral nutrition in critically ill patients with a high-protein diet enriched with arginine, fiber, and antioxidants compared with a standard high-protein diet. The effect on nosocomial infections and outcome. *J Parenter Enteral Nutr*. 2001 Nov-Dec;25(6):299-308 [Pubmed Link](#)
 15. Conejero R, Bonet A, Grau T, Esteban A, Mesejo A, Montejó JC, Lopez J, Acosta JA. Effect of a glutamine-enriched enteral diet on intestinal permeability and infectious morbidity at 28 days in critically ill patients with systemic inflammatory response syndrome: a randomized, single-blind, prospective, multicenter study. *Nutrition*. 2002 Sep;18(9):716-21. [Pubmed Link](#)
 16. Dent D, Heyland DK, et al. Increased mortality in patients with pneumonia receiving an immune-enhancing diet. *Crit Care Med* 2003 (in press).
 17. Bertolini G, Iapichino G, Radrizzani D, Facchini R, Simini B, Bruzzone P, Zanforlin G, Tognoni G. Early enteral immunonutrition in patients with severe sepsis: results of an interim analysis of a randomized multicentre clinical trial. *Intensive Care Med*. 2003 May;29(5):834-40. [Pubmed Link](#)
 18. Chuntrasakul C, Siltham S, Sarasombath S, Sittapirochana C, Leowattana W, Chockvivanavanit S, Bunnak A. Comparison of a immunonutrition formula enriched arginine, glutamine and omega-3 fatty acid, with a currently high-enriched enteral nutrition for trauma patients. *J Med Assoc Thai*. 2003 Jun;86(6):552-61. [Pubmed Link](#)
 19. Kieft H, Roos A, Bindels A et al. Clinical Outcome of an Immune Enhancing Diet in a Heterogenous Intensive Care population. *Intensive Care Medicine* 2005, 31:524. [Pubmed Link](#)
 20. Tsuei BJ, Bernard AC, Barksdale AR, Rockich AK, Meier CF, Kearney PA. Supplemental enteral arginine is metabolized to ornithine in injured patients. *J Surg Res*. 2005 Jan;123(1):17-24. [Pubmed Link](#)
 21. Wibbenmeyer LA, Mitchell MA, Newel IM, Faucher LD, Amelon MJ, Ruffin TO, Lewis RD. Effect of a fish oil and arginine-fortified diet in thermally injured patients. *J Burn Care Res*. 2006 Sep-Oct;27(5):694-702. [Pubmed Link](#)



22. *Beale RJ, Sherry T, Lei K, Campbell-Stephen L, McCook J, Smith J, Venetz W, Alteheld B, Stehle P, Schneider H. Early enteral supplementation with key pharmac nutrients improves Sequential Organ Failure Assessment score in critically ill patients with sepsis: outcome of a randomized, controlled, double-blind trial. Crit Care Med 2008;36(1):131-44. [Pubmed link](#)*

4.1b Composition of EN: Fish Oils

1. Gadek JE, DeMichele SJ, Karlstad MD et al. Effect of enteral feeding with eicosapentaenoic acid, gamma-linolenic acid, and antioxidants in patients with acute respiratory distress syndrome. *Critical Care Medicine* 1999;27:1409-20. [Pubmed Link](#)
2. Singer P, Theilla M, Fisher H, Gibstein L, Grozovski E, Cohen J. Benefit of an enteral diet enriched with eicosapentaenoic acid and gamma-linolenic acid in ventilated patients with acute lung injury. *Crit Care Med*. 2006 Apr;34(4):1033-8. [Pubmed Link](#)
3. Pontes-Arruda A, Aragao AM, Albuquerque JD. Effects of enteral feeding with eicosapentaenoic acid, gamma-linolenic acid, and antioxidants in mechanically ventilated patients with severe sepsis and septic shock. *Crit Care Med*. 2006 Sep;34(9):2325-33. [Pubmed Link](#)
4. *Moran V, Grau T et al. Effect of an enteral feeding with Eicosapentanoic and Gamma-Linoleic acids on the outcomes of mechanically ventilated critically ill septic patients. Crit Care Med 2006 A 70 (abstract)*
5. *Elamin M, Hughes et al. Effect of enteral nutrition with Eicosapentaenoic Acid (EPA), Gamma-Linolenic Acid (GLA), and antioxidants reduces alveolar inflammatory mediators and protein influx in patients with Acute Respiratory Distress Syndrome (ARDS). Chest, 2005;128(suppl):225 S (abstract).*

4.1c Composition of EN: Glutamine

1. Houdijk AP, Rijnsburger ER, Jansen J, Wesdorp RI, Weiss JK, McCamish MA, Teerlink T, Meuwissen SG, Haarman HJ, Thijs LG, van Leeuwen PA. Randomised trial of glutamine-enriched enteral nutrition on infectious morbidity in patients with multiple trauma. *Lancet*. 1998 Sep 5;352(9130):772-6. [Pubmed Link](#)
2. Jones C, Palmer TE, Griffiths RD. Randomized clinical outcome study of critically ill patients given glutamine-supplemented enteral nutrition. *Nutrition*. 1999 Feb;15(2):108-15. [Pubmed Link](#)
3. Brantley S, Pierce J: Effects of enteral glutamine on trauma patients. *Nutrition in Clinical Practice* 2000; 15, S13.



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4. Hall JC, Dobb G, Hall J, De Sousa R, Brennan L, McCauley R. A prospective randomized trial of enteral glutamine in critical illness. *Intensive Care Med.* 2003 Oct;29(10):1710-6. [Pubmed Link](#)
5. Garrel D, Patenaude J, Nedelec B, Samson L, Dorais J, Champoux J, D'Elia M, Bernier J. Decreased mortality and infectious morbidity in adult burn patients given enteral glutamine supplements: a prospective, controlled, randomized clinical trial. *Crit Care Med.* 2003 Oct;31(10):2444-9. [Pubmed Link](#)
6. Zhou YP, Jiang ZM, Sun YH, Wang XR, Ma EL, Wilmore D. The effect of supplemental enteral glutamine on plasma levels, gut function, and outcome in severe burns: a randomized, double-blind, controlled clinical trial. *JPEN J Parenter Enteral Nutr.* 2003 Jul-Aug;27(4):241-5. [Pubmed Link](#)
7. Peng X, Yan H, You Z, Wang P, Wang S. Effects of enteral supplementation with glutamine granules on intestinal mucosal barrier function in severe burned patients. *Burns.* 2004 Mar;30(2):135-9. [Pubmed Link](#)
8. Luo M, Bazargan N, Griffith DP, Estivariz CF et al. Metabolic effects of enteral versus parenteral alanyl-glutamine dipeptide administration in critically ill patients receiving enteral feeding: a pilot study. *Clin Nutr* 2008;27(2):297-306. [Pubmed Link](#)
9. McQuiggan M, Kozar R et al. Enteral glutamine during active shock resuscitation is safe and enhances tolerance of enteral feeding. *JPEN.* 2008 ;32(1):28-35 [Pubmed Link](#)

4.1d Ornithine Ketoglutarate (OKG)

1. De Bandt JP, Coudray-Lucas C, Lioret N, Lim SK, Saizy R, Giboudeau J, Cynober L. A randomized controlled trial of the influence of the mode of enteral ornithine alpha-ketoglutarate administration in burn patients. *J Nutr.* 1998 Mar; 128(3): 563-9. [Pubmed Link](#)
2. Donati L, Ziegler F, Pongelli G, Signorini MS. Nutritional and clinical efficacy of ornithine alpha-ketoglutarate in severe burn patients. *Clin Nutr.* 1999 Oct; 18(5): 307-11 [Pubmed Link](#)
3. Coudray-Lucas C, Le Bever H, Cynober L, De Bandt JP, Carsin H. Ornithine alpha-ketoglutarate improves wound healing in severe burn patients: a prospective randomized double-blind trial versus isonitrogenous controls. *Crit Care Med.* 2000 Jun; 28(6): 1772-6. [Pubmed Link](#)



4.2a High fat/low CHO

1. Van den Berg B, Bogaard JM, Hop WC. High fat, low carbohydrate, enteral feeding in patients weaning from the ventilator. *Intensive Care Med.* 1994 Aug; 20(7): 470-5. [Pubmed Link](#)
2. al Saady NM, Blackmore CM, Bennett ED. High fat, low carbohydrate, enteral feeding lowers PaCO₂ and reduces the period of ventilation in artificially ventilated patients. *Intensive Care Med* 1989;15:290-5.B [Pubmed Link](#)
3. Mesejo A, Acosta JA, Ortega C, Vila J, Fernandez M, Ferreres J, Sanchis JC, Lopez F. Comparison of a high-protein disease-specific enteral formula with a high-protein enteral formula in hyperglycemic critically ill patients. *Clin Nutr.* 2003 Jun; 22(3): 295-305. [Pubmed Link](#)

4.2b Low fat/high CHO

1. Garrel DR, Razi M, Lariviere F, Jobin N, Naman N, Emptoz-Bonneton A, Pugeat MM. Improved clinical status and length of care with low-fat nutrition support in burn patients. *JPEN.* 1995;19(6):482-91. [Pubmed Link](#)

4.2c High Protein vs. Low Protein

1. Clifton GL, Robertson CS, Contant CF. Enteral hyperalimentation in head injury. *J Neurosurgery* 1985;62:186-193. [Pubmed Link](#)

4.3 Protein/Peptides

1. Brinson RR, Kolts BE. Diarrhea associated with severe hypoalbuminemia: a comparison of a peptide-based chemically defined diet and standard enteral alimentation. *Crit Care Med.* 1988 Feb;16(2):130-6. [Pubmed Link](#)
2. Meredith JW, Ditesheim JA, Zaloga GP. Visceral protein levels in trauma patients are greater with peptide diet than with intact protein diet. *J Trauma.* 1990 Jul;30(7):825-8; discussion 828-9. [Pubmed Link](#)
3. Mowatt-Larssen CA, Brown RO, Wojtysiak SL, Kudsk KA. Comparison of tolerance and nutritional outcome between a peptide and a standard enteral formula in critically ill, hypoalbuminemic patients. *JPEN.* 1992 ;16(1):20-4. [Pubmed Link](#)
4. Heimburger DC, Geels VJ, Bilbrey J, Redden DT, Keeney C. Effects of small-peptide and whole-protein enteral feedings on serum proteins and diarrhea in critically ill patients: a randomized trial. *JPEN* 1997;21(3):162-7. [Pubmed Link](#)



4.4 pH

1. Heyland DK, Cook DJ, Schoenfeld PS, Frietag A, Varon J, Wood G. The effect of acidified enteral feeds on gastric colonization in critically ill patients: results of a multicenter randomized trial. Canadian Critical Care Trials Group. Crit Care Med. 1999 Nov;27(11):2399-406. [Pubmed Link](#)
2. Kruger J-M, Demetre L, Cate F, Barclay D. The effect of acidified enteral formulae on microbial gastric and tracheal colonization and contamination of the enteral feeding delivery system in the intensive care unit. Poster presentation at ESPEN Congress 2006, Turkey.
3. Tulaimat A, Laghi F, Mikrut K, Carey RB, Budinger GR. Potassium sorbate reduces gastric colonization in patients receiving mechanical ventilation. J Crit Care. 2005 Sep;20(3):281-7. [Pubmed Link](#)

4.5 Fibre

1. Hart GK, Dobb GJ. Effect of a fecal bulking agent on diarrhea during enteral feeding in the critically ill. JPEN 1988;12(5):465-8. [Pubmed Link](#)
2. Dobb GJ, Towler SC. Diarrhoea during enteral feeding in the critically ill: a comparison of feeds with and without fibre. Intensive Care Med 1990;16(4):252-5. [Pubmed Link](#)
3. Heather DJ, Howell L, Montana M, Howell M, Hill R. Effect of a bulk-forming cathartic on diarrhea in tube-fed patients. Heart Lung. 1991;20(4):409-13. [Pubmed Link](#)
4. Schultz AA, Ashby-Hughes B, Taylor R, Gillis DE, Wilkins M. Effects of pectin on diarrhea in critically ill tube-fed patients receiving antibiotics. Am J Crit Care. 2000;9(6):403-11. [Pubmed Link](#)
5. Spapen H, Diltoer M, Van Malderen C, Opdenacker G, Suys E, Huyghens L. Soluble fiber reduces the incidence of diarrhea in septic patients receiving total enteral nutrition: a prospective, double-blind, randomized, and controlled trial. Clin Nutr. 2001;20(4):301-5. [Pubmed Link](#)
6. Rushdi TA, Pichard C, Khater YH. Control of diarrhea by fiber-enriched diet in ICU patients on enteral nutrition: a prospective randomized controlled trial. Clin Nutr. 2004;23(6):1344-52. [Pubmed Link](#)

5.1 Feeding Protocols

1. Pinilla JC, Samphire J, Arnold C, Liu L, Thiessen B. Comparison of gastrointestinal tolerance to two enteral feeding protocols in critically ill patients: a prospective, randomized controlled trial JPEN 2001 Mar-Apr;25(2):81-6. [Pubmed Link](#)



2. Martin CM, Doig GS, Heyland DK, Morrison T, Sibbald WJ; Southwestern Ontario Critical Care Research Network. Multicentre, cluster-randomized clinical trial of algorithms for critical-care enteral and parenteral therapy (ACCEPT). *CMAJ*. 2004 Jan 20;170(2):197-204. [Pubmed link](#)
3. Doig GS, Simpson F, Finfer S, Delaney A, Davies AR, Mitchell I, Dobb G; Nutrition Guidelines Investigators of the ANZICS Clinical Trials Group. Effect of evidence-based feeding guidelines on mortality of critically ill adults: a cluster randomized controlled trial. *JAMA*. 2008 Dec 17;300(23):2731-41. [Pubmed Link](#)

5.2 Motility Agents

1. Chapman MJ, Fraser RJ, Kluger MT, Buist MD, De Nichilo DJ. Erythromycin improves gastric emptying in critically ill patients intolerant of nasogastric feeding. *Crit Care Med*. 2000 Jul;28(7):2334-7. [Pubmed Link](#)
2. Yavagal DR, Karnad DR, Oak JL: Metoclopramide for preventing pneumonia in critically ill patients receiving enteral tube feeding: A randomized controlled trial. *Crit Care Med* 2000;May;28(5):1408-11. [Pubmed Link](#)
3. Boivin MA, Levy H. Gastric feeding with erythromycin is equivalent to transpyloric feeding in the critically ill. *Crit Care Med*. 2001 Oct;29(10):1916-9. [Pubmed Link](#)
4. Berne JD, Norwood SH, McAuley CE, Vallina VL, Villareal D, Weston J, McClarty J. Erythromycin reduces delayed gastric emptying in critically ill trauma patients: a randomized, controlled trial. *J Trauma*. 2002 Sep; 53(3): 422-5. [Pubmed Link](#)
5. Reignier J, Bensaid S, Perrin-Gachadoat D, Burdin M, Boiteau R, Tenailon A. Erythromycin and early enteral nutrition in mechanically ventilated patients. *Crit Care Med* 2002;Jun; 30(6): 1237-41. [Pubmed Link](#)
6. Meissner W, Dohrn B, Reinhart K. Enteral naloxone reduces gastric tube reflux and frequency of pneumonia in critical care patients during opioid analgesia. *Crit Care Med* 2003 Mar; 31(3):776-80. [Pubmed Link](#)
7. Nguyen NQ, Chapman M, Fraser RJ, Bryant LK, Burgstad C, Holloway RH. Prokinetic therapy for feed intolerance in critical illness: One drug or two? *Crit Care Med* 2007;35(11):2561-2567. [Pubmed link](#)
8. Nursal TZ, Erdogan B, Noyan T, Cekinmez M, Atalay B, Bilgin. The effect of metoclopramide on gastric emptying in traumatic brain injury. *J Clin Neurosurg* 2007;14:344-348. [Pubmed link](#)
9. MacLaren R, Kiser TH, Fish DN, Wischmeyer PE. Erythromycin vs metoclopramide for facilitating gastric emptying and tolerance to intragastric nutrition in critically ill patients. *JPEN*. 2008;32(4):412-419. [Pubmed Link](#)



5.3 Small bowel vs. Gastric feedings

1. Montecalvo MA, Steger KA, Farber HW et al. Nutritional outcome and pneumonia in critical care patients randomized to gastric versus jejunal tube feedings. The Critical Care Research Team. Crit Care Med. 1992;20:1377-87. [Pubmed Link](#)
2. Kortbeek JB, Haigh PI, Doig C. Duodenal versus gastric feeding in ventilated blunt trauma patients: a randomized controlled trial. J Trauma 1999;46:992-6. [Pubmed Link](#)
3. Taylor SJ, Fettes SB, Jewkes C, Nelson RJ. Prospective, randomized, controlled trial to determine the effect of early enhanced enteral nutrition on clinical outcome in mechanically ventilated patients suffering head injury. Crit Care Med 1999;27:2525-31. [Pubmed Link](#)
4. Kearns LJ, Chin D, Mueller L, Wallace K, Jensen WA, Kirsch CM. The incidence of ventilator-associated pneumonia and success in nutrient delivery with gastric versus small intestinal feeding: A randomized clinical trial. Crit Care Med 2000;28:1742-6. [Pubmed Link](#)
5. Minard G, Kudsk KA, Melton S, Patton JH, Tolley EA. Early versus delayed feeding with an immune-enhancing diet in patients with severe head injuries. JPEN 2000;24:145-9. [Pubmed Link](#)
6. Boivin MA, Levy H. Gastric feeding with erythromycin is equivalent to transpyloric feeding in the critically ill. Crit Care Med 2001;29(10):1916-9 [Pubmed Link](#)
7. Day L, Stotts NA, Frankfurt A, Stralovich-Romani A, Volz M, Muwaswes M, Fukuoka Y, O'Leary-Kelley C. Gastric versus duodenal feeding in patients with neurological disease: a pilot study. J Neurosci Nurs. 2001 Jun;33(3):148-9, 155-9 [Pubmed Link](#)
8. Esparza J, Boivin MA, Hartshorne MF, Levy H. Equal aspiration rates in gastrically and transpylorically fed critically ill patients. Intensive Care Med 2001;27:660-4. [Pubmed Link](#)
9. Davies AR, Froomes PR, French CJ, Bellomo R, Gutteridge GA, Nyulasi L, Walker R, Sewell RB. Randomized comparison of nasojejunal and nasogastric feeding in critically ill patients. Crit Care Med 2002;30(3):586-90. [Pubmed Link](#)
10. Montejo JC, Grau T, Acosta J et al. Multicenter, prospective, randomized, single-blind study comparing the efficacy and gastrointestinal complications of early jejunal feeding with early gastric feeding in critically ill patients. Crit Care Med 2002;30:796-800. [Pubmed Link](#)



11. Neumann DA, DeLegge MH. Gastric versus small-bowel tube feeding in the intensive care unit: a prospective comparison of efficacy. Crit Care Med. 2002 Jul;30(7):1436-8. [Pubmed Link](#)

5.4 Body Position

1. Drakulovic MB, Torres A, Bauer TT, Nicolas JM, Nogue S, Ferrer M Lancet. Supine body position as a risk factor for nosocomial pneumonia in mechanically ventilated patients: a randomised trial. Lancet. 1999 ;27;354(9193):1851-8. [Pubmed Link](#)
2. van Nieuwenhoven CA, Vandenbroucke-Grauls C, van Tiel FH, Joore HC, van Schijndel RJ, van der Tweel I, Ramsay G, Bonten MJ. Feasibility and effects of the semirecumbent position to prevent ventilator-associated pneumonia: a randomized study. Crit Care Med. 2006;34(2):396-402. [Pubmed Link](#)

6.1 Closed vs. Open system

1. Mickschl DB, Davidson LJ, Flournoy DJ, Parker DE. Contamination of enteral feedings and diarrhea in patients in intensive care units. Heart Lung. 1990 Jul;19(4):362-70. [Pubmed Link](#)

6.2 Prebiotics/Probiotics/Synbiotics

1. Tempe JD, Steidel AL, Blehaut H, Hasselmann M, Lutun P, Maurier F. [Prevention of diarrhea administering Saccharomyces boulardii during continuous enteral feeding] Sem Hop. 1983 May 5; 59(18): 1409-12. [Pubmed Link](#)
2. Bleichner G, Blehaut H, Mentec H, Moyses D. Saccharomyces boulardii prevents diarrhea in critically ill tube-fed patients. A multicenter, randomized, double-blind placebo-controlled trial. Intensive Care Med. 1997 May; 23(5): 517-23. [Pubmed Link](#)
3. Jain PK, McNaught CE, Anderson AD, MacFie J, Mitchell CJ. Influence of synbiotic containing Lactobacillus acidophilus La5, Bifidobacterium lactis Bb 12, Streptococcus thermophilus, Lactobacillus bulgaricus and oligofructose on gut barrier function and sepsis in critically ill patients: a randomised controlled trial. Clin Nutr. 2004 Aug;23(4):467-75. [Pubmed Link](#)
4. McNaught CE, Woodcock NP, Anderson AD, MacFie J. A prospective randomised trial of probiotics in critically ill patients. Clin Nutr. 2005 Apr;24(2):211-9. [Pubmed Link](#)
5. Klarin B, Johansson ML, Molin G, Larsson A, Jeppsson B. Adhesion of the probiotic bacterium Lactobacillus plantarum 299v onto the gut mucosa in critically ill patients: a randomised open trial. Crit Care. 2005 Jun;9(3):R285-93. [Pubmed Link](#)



6. Kotzampassi K, Giamarellos-Bourboulis EJ, Voudouris A, Kazamias P, Eleftheriadis E. Benefits of a synbiotic formula (Synbiotic 2000Forte) in critically ill trauma patients: early results of a randomized controlled trial. *World J Surg.* 2006 Oct;30(10):1848-55. [Pubmed link](#)
7. Alberda C, Gramlich L et al. Effects of probiotic therapy in critically ill patients: a randomized, double-blind, placebo-controlled trial. *Am J Clin Nutr.* 2007 Mar;85(3):816-23. [Pubmed Link](#)
8. Karakan T et al. Comparison of early enteral nutrition in severe acute pancreatitis with prebiotic fiber supplementation versus standard enteral solution: a prospective randomized double-blind study. *World J Gastro* 2007 May 21;13(19):2733-7. [Pubmed link](#)
9. Olah A, Belagyi T, Poto L, Romics L Jr, Bengmark S. Synbiotic control of inflammation and infection in severe acute pancreatitis: a prospective, randomized, double blind study. *Hepatogastroenterology* 2007;54(74):590-4. [Pubmed Link](#)
10. Forestier C, Guelon D, Cluytens V et al. Oral probiotic and prevention of *Pseudomonas aeruginosa* infections: A randomized, double-blind, placebo-controlled pilot study in intensive care unit patients. *Critical Care.* 12(3),2008: R69. [Pubmed Link](#)
11. Besselink MG, van Santvoort HC et al Dutch Acute Pancreatitis Study Group. Probiotic prophylaxis in predicted severe acute pancreatitis: a randomised, double-blind, placebo-controlled trial. *Lancet.* 2008 Feb 23;371(9613):651-9 [Pubmed Link](#)
12. Knight DJ, Gardiner D, Banks A, Snape SE, Weston VC, Bengmark S, Girling KJ. Effect of synbiotic therapy on the incidence of ventilator associated pneumonia in critically ill patients: a randomised, double-blind, placebo-controlled trial. *Intensive Care Medicine* 2008 [Pubmed Link](#)

6.3 Continuous vs. other methods

1. Bonten MJ, Gaillard CA, van der Hulst R, de Leeuw PW, van der Geest S, Stobberingh EE, Soeters PB. Intermittent enteral feeding: the influence on respiratory and digestive tract colonization in mechanically ventilated intensive-care-unit patients. *Am J Respir Crit Care Med.* 1996 Aug;154(2 Pt 1):394-9. [Pubmed Link](#)
2. Steevens EC, Lipscomb AF, Poole GV, Sacks GS. Comparison of continuous vs intermittent nasogastric enteral feeding in trauma patients: perceptions and practice. *Nutr Clin Pract.* 2002 Apr;17(2):118-22. [Pubmed Link](#)
3. MacLeod JB, Lefton J, Houghton D, Roland C, Doherty J, Cohn SM, Barquist ES. Prospective randomized control trial of intermittent versus continuous gastric feeds for critically ill trauma patients. *J Trauma* 2007;63(1):57.61. [Pubmed link](#)



6.4 Gastrostomy vs nasogastric feeding

1. Kostadima E, Kaditis AG, Alexopoulos EI, Zakynthinos E, Sfyras D. Early gastrostomy reduces the rate of ventilator-associated pneumonia in stroke or head injury patients. *Eur Respir J.* 2005 Jul;26(1):106-11. [Pubmed Link](#)

7.0 Enteral nutrition in combination with PN

1. Herndon DN, Stein MD, Rutan TC, Abston S, Linares H. Failure of TPN Supplementation to improve liver function, immunity, and mortality in thermally injured patients. *J Trauma* 1987;27:195-204 [Pubmed Link](#)
2. Herndon DN, Barrow RE, Stein M, Linares H, Rutan TC, Rutan R, Abston S. Increased mortality with intravenous supplemental feeding in severely burned patients. *J Burn Care Rehabil* 1989;10:309-13 [Pubmed Link](#)
3. Dunham CM, Frankenfield D, Belzberg H, Wiles C, Cushing B, Grant Z. Gut failure-predictor of or contributor to mortality in mechanically ventilated blunt trauma patients? *J Trauma* 1994;37:30-4 [Pubmed Link](#)
4. Chiarelli AG, Ferrarello S, Piccioli A, Abate A, Chini G, Berioli MB, Peris A, Lippi R. Total enteral nutrition versus mixed enteral and parenteral nutrition in patients in an intensive care unit. *Minerva Anestesiol* 1996;62:1-7 [Pubmed Link](#)
5. Bauer P, Charpentier C, Bouchet C, Nace L, Raffy F, Gaconnet N. Parenteral with enteral nutrition in the critically ill. *Intensive Care Med* 2000;26:893-900 [Pubmed Link](#)

8.0 Use of PN vs. standard care alone in patients with an intact GI tract

1. Abel RM, Fischer JE, Buckley MJ, Barnett GO, Austen WG. Malnutrition in cardiac surgical patients. Results of a prospective, randomized evaluation of early postoperative parenteral nutrition. *Arch Surg.* 1976 Jan;111(1):45-50. [Pubmed Link](#)
2. Sax HC, Warner BW, Talamini MA, Hamilton FN, Bell RH Jr, Fischer JE, Bower RH. Early total parenteral nutrition in acute pancreatitis: lack of beneficial effects. *Am J Surg.* 1987 Jan;153(1):117-24. [Pubmed Link](#)
3. Reilly J, Mehta R, Teperman L, Cemaj S, Tzakis A, Yanaga K, Ritter P, Rezak A, Makowka L. Nutritional support after liver transplantation: a randomized prospective study. *JPEN.* 1990 Jul-Aug;14(4):386-91. [Pubmed Link](#)
4. Sandström R, Drott C, Hyltander A, Arfvidsson B, Scherstén T, Wickström I, Lundholm K. The effect of postoperative intravenous feeding (TPN) on outcome following major surgery evaluated in a randomized study. *Ann Surg.* 1993 Feb;217(2):185-95. [Pubmed Link](#)



5. Heyland DK. Parenteral nutrition in the critically-ill patient: more harm than good? Proc Nutr Soc. 2000 Aug;59(3):457-66. [Pubmed Link](#)
6. Xian-Li He et al. Effect of total parenteral nutrition (TPN) with and without glutamine dipeptide supplementation on outcome in severe acute pancreatitis (SAP). Clinical Nutrition Supplements 2004(1):43.

9.1 Branched Chain Amino Acids

1. Van Way CW 3rd, Moore EE, Allo M, Solomons C, Gordon S, Jones T. Comparison of total parenteral nutrition with 25 per cent and 45 per cent branched chain amino acids in stressed patients. Am Surg. 1985 Nov; 51(11): 609-16. [Pubmed Link](#)
2. Ott LG, Schmidt JJ, Young AB, Twyman DL, Rapp RP, Tibbs PA, Dempsey RJ, McClain CJ. Comparison of administration of two standard intravenous amino acid formulas to severely brain-injured patients. Drug Intell Clin Pharm. 1988 Oct; 22(10): 763-8. [Pubmed Link](#)
3. Kuhl DA, Brown RO, Vehe KL, Boucher BA, Luther RW, Kudsk KA. Use of selected visceral protein measurements in the comparison of branched-chain amino acids with standard amino acids in parenteral nutrition support of injured patients. Surgery. 1990 May; 107(5): 503-10. [Pubmed Link](#)
4. von Meyenfeldt MF, Soeters PB, Vente JP, van Berlo CL, Rouflart MM, de Jong KP, van der Linden CJ, Gouma DJ. Effect of branched chain amino acid enrichment of total parenteral nutrition on nitrogen sparing and clinical outcome of sepsis and trauma: a prospective randomized double blind trial. Br J Surg. 1990 Aug; 77(8): 924-9. [Pubmed Link](#)
5. Vente JP, Soeters PB, von Meyenfeldt MF, Rouflart MM, van der Linden CJ, Gouma DJ. Prospective randomized double-blind trial of branched chain amino acid enriched versus standard parenteral nutrition solutions in traumatized and septic patients. World J Surg. 1991 Jan-Feb;15(1):128-32; discussion 133. [Pubmed Link](#)
6. Garcia-de-Lorenzo A, Ortiz-Leyba C, Planas M, Montejo JC, Nunez R, OrdonezFJ, Aragon C, Jimenez FJ. Parenteral administration of different amounts of branch-chain amino acids in septic patients: clinical and metabolic aspects. Crit Care Med. 1997 Mar; 25(3): 418-24. [Pubmed Link](#)

9.2 Type of Lipids (PN)

LCT + MCT vs. LCT

1. Lindgren BF, Ruokonen E, Magnusson-Borg K, Takala J. Nitrogen sparing effect of structured triglycerides containing both medium-and long-chain fatty acids in critically ill patients; a double blind randomized controlled trial. Clin Nutr. 2001 Feb;20(1):43-8. [Pubmed Link](#)



2. Nijveldt RJ, Tan AM, Prins HA, de Jong D, van Rij GL, Wesdorp RI, van Leeuwen PA. Use of a mixture of medium-chain triglycerides and longchain triglycerides versus long-chain triglycerides in critically ill surgical patients: a randomized prospective double-blind study. *Clin Nutr.* 1998 Feb;17(1):23-9. [Pubmed Link](#)
3. Garnacho-Montero J, Ortiz-Leyba C, Jiménez-Jiménez FJ, Garcia-Garmendia JL, Jiménez-Jiménez LM, Garnacho-Montero MC, Barrero-Almodóvar A.. Clinical and metabolic effects of two lipid emulsions on the parenteral nutrition of septic patients. *Nutrition.* 2002 Feb;18(2):134-8 [Pubmed Link](#)
4. Iovinelli G, Marinangeli F, Ciccone A, Ciccozzi A, Leonardis M, Paladini A, Varrassi G. Parenteral nutrition in ventilated patients with chronic obstructive pulmonary disease: long chain vs medium chain triglycerides. *Minerva Anesthesiol.* 2007 Jan-Feb;73(1-2):65-76. [Pubmed Link](#)

Fish Oil containing emulsions

5. Grecu I, Mirea L, Grintescu I. Parenteral fish oil supplementation in patients with abdominal sepsis. *Clinical Nutrition 2003 (abstract)*
6. Wang X, Li W, Li N, Li J. Omega-3 fatty acids-supplemented parenteral nutrition decreases hyperinflammatory response and attenuates systemic disease sequelae in severe acute pancreatitis: a randomized and controlled study. *JPEN J Parenter Enteral Nutr.* 2008 May-Jun;32(3):236-41. [Pubmed Link](#)
7. Friesecke S, Lotze C, Köhler J, Heinrich A, Felix SB, Abel P. Fish oil supplementation in the parenteral nutrition of critically ill medical patients: a randomised controlled trial. *Intensive Care Med.* 2008 Aug;34(8):1411-20. [Pubmed Link](#)

Olive Oil containing emulsions

8. García-de-Lorenzo A, Denia R, Atlan P, Martínez-Ratero S, Le Brun A, Evard D, Bereziat G. Parenteral nutrition providing a restricted amount of linoleic acid in severely burned patients: a randomised double-blind study of an olive oil-based lipid emulsion v. medium/long-chain triacylglycerols. *Br J Nutr.* 2005 Aug;94(2):221-30. [Pubmed Link](#)
9. Huschak G, Zur Nieden K, Hoell T, Riemann D, Mast H, Stuttmann R. Olive oil based nutrition in multiple trauma patients: a pilot study. *Intensive Care Med.* 2005 Sep;31(9):1202-8. [Pubmed Link](#)

LCT vs. LCT

10. Kari A, Hersio K, Takala J, Penttila I. Comparison of two long-chain triglyceride fat emulsions in parenteral nutrition of critically ill patients. *Current Therapeutic Research.* 1989 June;45(6):1077-87.



9.3 Zinc

1. Young B, Ott L, Kasarskis E, Rapp R, Moles K, Dempsey RJ, Tibbs PA, Kryscio R, CcClain C. Zinc supplementation is associated with improved neurologic recovery rate and visceral protein levels of patients with severe closed head injury. *J Neurotrauma* 1996;13:25-34 [Pubmed Link](#)
2. Berger MM, Spertini F, Shenkin A, Wardle C, Wiesner L, Schindler C, Chioléro RL. Trace element supplementation modulates pulmonary infection rates after major burns: a double-blind, placebo-controlled trial. *Am J Clin Nutr*. 1998;68:365-371 [Pubmed Link](#)
3. Berger MM, Reymond MJ, Shenkin A, Rey F, Wardle C, Cayeux C, Schindler C, Chiolero RL. Influence of selenium supplements on the post-traumatic alterations of the thyroid axis: a placebo-controlled trial. *Intensive Care Med*. 2001 Jan;27(1):91-100. [Pubmed Link](#)
4. Berger MM, Baines M, Chiolero R, Wardle C, Cayeux, Shenkin A. Influence of early trace element and vitamin E supplements on antioxidant status after major trauma: a controlled trial. *N. Research*. 2001;21:41-54
5. *Berger MM, Binnert C, Chiolero RL, Taylor W, Raffoul W, Cayeux MC, Benathan M, Shenkin A, Tappy L. Trace element supplementation after major burns increases burned skin trace element concentrations and modulates local protein metabolism but not whole-body substrate metabolism. Am J Clin Nutr. 2007 May;85(5):1301-6. [Pubmed Link](#)*
6. *Berger MM, Soguel L, Shenkin A, Revelly JP, Pinget C, Baines M, Chioléro RL. Influence of early antioxidant supplements on clinical evolution and organ function in critically ill cardiac surgery, major trauma, and subarachnoid hemorrhage patients. Crit Care. 2008;12(4):R101 [Pubmed Link](#)*

9.4 Composition of PN: Glutamine

1. Griffiths RD, Jones C, Palmer TE. Six-month outcome of critically ill patients given glutamine-supplemented parenteral nutrition. *Nutrition*. 1997 Apr;13(4):295-302. [Pubmed Link](#)
2. Powell-Tuck J, Jamieson CP, Bettany GE, Obeid O, Fawcett HV, Archer C, Murphy DL. A double blind, randomised, controlled trial of glutamine supplementation in parenteral nutrition. *Gut*. 1999 Jul;45(1):82-8. [Pubmed Link](#)
3. Wischmeyer PE, Lynch J, Liedel J, Wolfson R, Riehm J, Gottlieb L, Kahana M. Glutamine administration reduces Gram-negative bacteremia in severely burned patients: a prospective, randomized, double-blind trial versus isonitrogenous control. *Crit Care Med*. 2001 Nov;29(11):2075-80. [Pubmed Link](#)



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4. Goeters C, Wenn A, Mertes N, Wempe C, Van Aken H, Stehle P, Bone HG. Parenteral L-alanyl-L-glutamine improves 6-month outcome in critically ill patients. *Crit Care Med*. 2002 Sep;30(9):2032-7. [Pubmed Link](#)
5. Griffiths RD, Allen KD, Andrews FJ, Jones C. Infection, multiple organ failure, and survival in the intensive care unit: influence of glutamine-supplemented parenteral nutrition on acquired infection. *Nutrition*. 2002 Jul-Aug;18(7-8):546-52. [Pubmed Link](#)
6. Fuentes-Orozco C, Anaya-Prado R, González-Ojeda A, Arenas-Márquez H, Cabrera-Pivaral C, Cervantes-Guevara G, Barrera-Zepeda LM. L-alanyl-L-glutamine-supplemented parenteral nutrition improves infectious morbidity in secondary peritonitis. *Clin Nutr*. 2004 Feb;23(1):13-21. [Pubmed Link](#)
7. Xian-Li He et al. Effect of total parenteral nutrition (TPN) with and without glutamine dipeptide supplementation on outcome in severe acute pancreatitis (SAP). *Clinical Nutrition Supplements* 2004(1):43.
8. Zhou Ye-Ping et al. The effects of supplemental glutamine dipeptide on gut integrity and clinical outcomes after major escharectomy in severe burns: a randomized, double blind, controlled clinical trial. *Clinical Nutrition Supplements* 2004(1):55.
9. Déchelotte P, Hasselmann M, Cynober L, Allaouchiche B, Coëffier M, Hecketsweiler B, Merle V, Mazerolles M, Samba D, Guillou YM, Petit J, Mansoor O, Colas G, Cohendy R, Barnoud D, Czernichow P, Bleichner G. L-alanyl-L-glutamine dipeptide-supplemented total parenteral nutrition reduces infectious complications and glucose intolerance in critically ill patients: the French controlled, randomized, double-blind, multicenter study. *Crit Care Med*. 2006 Mar;34(3):598-604. [Pubmed Link](#)
10. *Palmese S, Odierna I, Scarano D et al. Early enteral nutrition enriched with FOS and intravenous glutamine supplementation in intensive care unit patients. Nutritional Therapy and Metabolism* 2006;24:140-6
11. *Sahin H, Mercanligil S M, Inanc N, Ok E. Effects of glutamine-enriched total parenteral nutrition on acute pancreatitis. European Journal of Clinical Nutrition*. 2007; 61: 1429-1434. [Pubmed Link](#)
12. *Yang DL, Xu JF. Effect of dipeptide of glutamine and alanine on severe traumatic brain injury. Chin J Traumatol*. 2007;10(3):145-9. [Pubmed Link](#)
13. *Cai G, Yan J, Zhang Z, Yu Y. Immunomodulatory effects of glutamine enriched nutritional support in elderly patients with severe sepsis: a prospective, randomized, controlled study. Journal of Organ Dysfunction*. 2008;4:31-37.
14. *Duska F, Fric M, Waldauf P, Pazout J et al. Frequent intravenous pulses of growth hormone together with glutamine supplementation in prolonged critical illness after multiple trauma: effects on nitrogen balance, insulin resistance, and substrate oxidation. Crit Care Med*. 2008 Jun;36(6):1707-13. [Pubmed link](#)



15. Estívariz CF, Griffith DP, Luo M, Szeszycki EE et al. Efficacy of parenteral nutrition supplemented with glutamine dipeptide to decrease hospital infections in critically ill surgical patients. *JPEN J Parenter Enteral Nutr.* 2008;32(4):389-402. [Pubmed link](#)
16. Fuentes-Orozco C, Cervantes-Guevara G, Muciño-Hernández I et al. L-alanyl-L-glutamine-supplemented parenteral nutrition decreases infectious morbidity rate in patients with severe acute pancreatitis. *JPEN J Parenter Enteral Nutr.* 2008;32(4):403-11. [Pubmed link](#)
17. Luo M, Bazargan N, Griffith DP, Estívariz CF, Leader LM, Easley KA, Daignault NM, Hao L, Meddings JB, Galloway JR, Blumberg JB, Jones DP, Ziegler TR. Metabolic effects of enteral versus parenteral alanyl-glutamine dipeptide administration in critically ill patients receiving enteral feeding: a pilot study. *Clin Nutr.* 2008 Apr;27(2):297-306. Epub 2008 Feb 7. [Pubmed link](#)
18. Pérez-Bárcena J, Regueiro V, Marsé P et al. Glutamine as a modulator of the immune system of critical care patients: Effect on Toll-like receptor expression. A preliminary study. *Nutrition.* 2008 Jun;24(6):522-7. [Pubmed link](#)

10.1 Dose of Parenteral Nutrition

1. Bastistella FD, Widergren JT, Anderson JT, et al. A prospective, randomized trial of intravenous fat emulsion administration in trauma victims requiring total parenteral nutrition. *J Trauma* 1997 Jul;43(1):52-8; discussion 58-60 [Pubmed Link](#)
2. Choban PS, Burge JC, Scales D et al. Hypoenergetic nutrition support in hospitalized obese patients: a simplified method for clinical application. *Am J Clin Nutr.* 1997 Sep;66(3):546-50 [Pubmed Link](#)
3. McCowen KC, Friel C, Sternberg J, et al. Hypocaloric total parenteral nutrition: Effectiveness in prevention of hyperglycemia and infectious complications. A randomized clinical trial. *Crit Care Med.* 2000 Nov;28(11):3606-11 [Pubmed Link](#)
4. Ahrens CL, Barletta JF, Kanji S, Tyburski JG, Wilson RF, Janisse JJ, Devlin JW. Effect of low-calorie parenteral nutrition on the incidence and severity of hyperglycemia in surgical patients: a randomized, controlled trial. *Crit Care Med.* 2005 Nov;33(11):2507-12. [Pubmed Link](#)

10.2 Use of Lipids

- 1 Bastistella FD, Widergren JT, Anderson JT, et al. A prospective, randomized trial of intravenous fat emulsion administration in trauma victims requiring total parenteral nutrition. *J Trauma* 1997 Jul;43(1):52-8; discussion 58-60, [Pubmed Link](#)



2. McCowen KC, Friel C, Sternberg J, et al. Hypocaloric total parenteral nutrition: Effectiveness in prevention of hyperglycemia and infectious complications. A randomized clinical trial. *Crit Care Med*. 2000 Nov;28(11):3606-11. [Pubmed Link](#)

10.3 Mode of Lipid Delivery

1. D'Angio RG, Riechers KC, Gilsdorf RB, Constantino JM. Effect of the mode of lipid administration on parenteral nutrition-related infections. *Ann Pharmacother*. 1992 Jan;26(1):14-7. [Pubmed Link](#)

10.4 Insulin Therapy

1. Van den Berghe G, Wouters P, Weekers F, Verwaest C, Bruyninckx F, Schetz M, Vlasselaers D, Ferdinande P, Lauwers P, Bouillon R. Intensive insulin therapy in the critically ill patients. *N Engl J Med*. 2001 Nov 8;345(19):1359-67 [Pubmed Link](#)
2. Grey NJ, Perdrizet GA. Reduction of nosocomial infections in the surgical intensive-care unit by strict glycemic control. *Endocr Pract*. 2004 Mar-Apr;10 Suppl 2:46-52 [Pubmed Link](#)
3. *Bland DK, Fankhanel Y et al. Intensive versus modified conventional control of blood glucose level in medical intensive care patients: a pilot study. Am J Crit Care 2005;14(5):370-376. [Pubmed Link](#)*
4. *Henderson WR, Dhingra VK, Chittock DR, et al., in association with the Canadian Critical Care Trials Group. Survival using glucose algorithm regulation (SUGAR) trial — pilot data [abstract]. New York (NY): American Thoracic Society; 2005. A37.*
5. *Yu W, Li W, et al. Influence and mechanism of a tight control of blood glucose by intensive insulin therapy on human sepsis. Chin J Surg 2005;43(1):29-32. [Pubmed Link](#)*
6. Van den Berghe G, Wilmer A, Hermans G, Meersseman W, Wouters PJ, Milants I, VanWijngaerden E, Bobbaers H, Bouillon R. Intensive insulin therapy in the medical ICU. *N Engl J Med*. 2006 Feb 2;354(5):449-61. [Pubmed Link](#)
7. *Mitchell I, Knight E, Gissane J et al. A phase II randomised controlled trial of intensive insulin therapy in general intensive care patients. Crit Car Resus 2006;8(4):289-293 [Pubmed Link](#)*
8. *Walters MR, Weir CJ, Lees KR. A randomised, controlled pilot study to investigate the potential benefit of intervention with insulin in hyperglycaemic acute ischaemic stroke patients. Cerebrovasc Dis. 2006;22(2-3):116-22 [Pubmed Link](#)*
9. *Wang LC, Lei S, Wu YC, Wu JN, Wang LF, Guan TR, Jiang HF, Ni HX, Ye XH. [Intensive insulin therapy in critically ill patients] [Article in Chinese]. Zhongguo Wei Zhong Bing Ji Jiu Yi Xue. 2006 Dec;18(12):748-50. [Pubmed Link](#)*



10. de Azevedo JRA, Lima ERM, Cossetti RJD, de Azevedo RP. Intensive insulin therapy versus conventional glycaemic control in patients with acute neurological injury. *Arq Neuropsiquiatr* 2007 ;65(3-B) :733-738 [Pubmed Link](#)
11. Farah R, Samokhvalov A et al. Insulin therapy of hyperglycemia in intensive care. *IMAJ* 2007;9:140-142. [Pubmed link](#)
12. He W, Zhang TY, Zhou H, Li T, Zhao JY, Zhao D, Liu XH, Hou J, Wang C, Xu Y. [Impact of intensive insulin therapy on surgical critically ill patients] [Article in Chinese] *Chinese Journal of Surgery [Zhonghua Wai Ke Za Zhi]*. 2007 Aug 1;45(15):1052-4. [Pubmed Link](#)
13. McMullin J, Brozek J, McDonald E et al. Lowering of glucose in critical care: a randomized pilot trial. *J Crit Care* 2007;22:112-119. [Pubmed Link](#)
14. Oksanen T, Skrifvars MB, Varpula T, Kuitunen A, Pettilä V, Nurmi J, Castrén M. Strict versus moderate glucose control after resuscitation from ventricular fibrillation. *Intensive Care Med*. 2007 Dec;33(12):2093-100. [Pubmed Link](#)
15. Arabi YM, Dabbagh OC et al. Intensive versus conventional insulin therapy: a randomized controlled trial in medical and surgical critically ill patients. *Crit Care Med* 2008;36(12):3190-7 [Pubmed Link](#)
16. Brunkhorst FM, Engel C, Bloos F et al. Intensive insulin therapy and pentastarch resuscitation in severe sepsis. *N Engl J Med* 2008;358(2):125-139. [Pubmed link](#)
17. Bruno A, Kent TA, Coull BM, Shankar RR, Saha C, Becker KJ, Kissela BM, Williams LS. Treatment of hyperglycemia in ischemic stroke (THIS): a randomized pilot trial. *Stroke*. 2008 Feb;39(2):384-9 [Pubmed Link](#)
18. De La Rosa G, Donado J et al. Strict glycaemic control in patients hospitalised in a mixed medical and surgical intensive care unit: a randomised clinical trial. *Crit Care* 2008;12(5):R120 (online article). [Pubmed link](#)
19. He Z.-Y, Lin A, Xing J, Xie X-H, Wu Y. Effect of intensive insulin therapy on short-term. *Chinese Journal of Clinical Nutrition [Zhongguo linchuang yingyang zazhi]*. 2008;16(4):220-222
20. Iapichino G, Albicini M, Umbrello M et al. Tight glycaemic control does not affect asymmetric-dimethylarginine in septic patients. *Intensive Care Med* 2008;34:1843-1850. [Pubmed Link](#)
21. Mackenzie IM, Ercole A, Blunt M, Ingle S. Glycaemic control and outcome in general intensive care: The East Anglian GLYCOGENIC study. *British Journal of Intensive Care*. 2008;Winter:121-126
22. Preiser JC, Devos P. Multi-centre assessment of tight glucose control by intensive insulin therapy in intensive care units: the Glucontrol study; unpublished.



23. Zhang R-L, He W, Li T, Zhou H, Wang C, Gao S, Xu Y. Evaluation of optimal goal of glucose control in critically ill patients [Article in Chinese]. *Chinese Journal of Clinical Nutrition [Zhongguo linchuang yingyang zazhi]* 2008;16:204–8
24. Bilotta F, Caramia R, Paoloni FP, Delfini R, Rosa G. Safety and efficacy of intensive insulin therapy in critical neurosurgical patients. *Anesthesiology*. 2009 Mar;110(3):611-9
[Pubmed Link](#)
25. Finfer S, Chittock DR, Su SY, Blair D, Foster D, Dhingra V, Bellomo R, Cook D, Dodek P, Henderson WR, Hébert PC, Heritier S, Heyland DK, McArthur C, McDonald E, Mitchell I, Myburgh JA, Norton R, Potter J, Robinson BG, Ronco JJ for the NICE-SUGAR Study Investigators,. Intensive versus conventional glucose control in critically ill patients. *N Engl J Med*. 2009 Mar 26;360(13):1283-97 [Pubmed Link](#)

11.1 Combined vitamins and trace elements

1. Kuklinski B, Buchner M, Schweder R, Nagel R. [Acute pancreatitis--a free radical disease. Decrease in fatality with sodium selenite (Na₂SeO₃) therapy]. *Z Gesamte Inn Med*. 1991 Apr;46(5):145-9. [Pubmed Link](#)
2. Maderazo EG, Woronick CL, Hickingbotham N, Jacobs L, Bhagavan HN. A randomized trial of replacement antioxidant vitamin therapy for neutrophil locomotory dysfunction in blunt trauma. *J Trauma*. 1991;31:1142-1150 [Pubmed Link](#)
3. Young B, Ott L, Kasarskis E, Rapp R, Moles K, Dempsey RJ, Tibbs PA, Kryscio R, CcClain C Zinc supplementation is associated with improved neurologic recovery rate and visceral protein levels of patients with severe closed head injury. *J Neurotrauma*. 1996 13:25-34
[Pubmed Link](#)
4. Zimmerman T, Albrecht S, Kuhne H, Vogelsang U, Grutzmann R, Kopprasch S. Selensubstitution bei sepsispatienten. *Medizinische Klinik*. 1997 92;Suppl.3:3-4
5. Berger MM, Spertini F, Shenkin A, Wardle C, Wiesner L, Schindler C, Chioléro RL Trace element supplementation modulates pulmonary infection rates after major burns: a double-blind, placebo-controlled trial. *Am J Clin Nutr*. 1998;68:365-371 [Pubmed Link](#)
6. Angstwurm MW, Schottdorf J, Schopohl J, Gaertner R Selenium replacement in patients with severe systemic inflammatory response syndrome improves clinical outcome. *Crit Care Med*. 1999;27:1807-1813 [Pubmed Link](#)
7. Porter JM, Ivatury RR, Azimuddin K, Swami R. Antioxidant therapy in the prevention of organ dysfunction syndrome and infectious complications after trauma: early results of a prospective randomized study. *Am Surg*. 1999;65:478-483 [Pubmed Link](#)



Critical Care Nutrition

8. Preiser JC, Van Gossum A, Berré J, Vincent JL, Carpentier Y Enteral feeding with a solution enriched with antioxidant vitamins A, C, E enhances the resistance to oxidative stress. *Crit Care Med.* 2000;28:3828-3832 [Pubmed Link](#)
7. Berger MM, Reymond MJ, Shenkin A, Rey F, Wardle C, Cayeux C, Schindler C, Chioloro RL. Influence of selenium supplements on the post-traumatic alterations of the thyroid axis: a placebo-controlled trial. *Intensive Care Med.* 2001 Jan;27(1):91-100. [Pubmed Link](#)
8. Nathens AB, Neff MJ, Jurkovich GJ, Klotz P, Farver K, Ruzinski JT, Radella F, Garcia I, Maier RV Randomized, prospective trial of antioxidant supplementation in critically ill surgical patients. *Ann Surg.* 2002;236:814-822 [Pubmed Link](#)
9. Crimi E, Liguori A, Condorelli M, Cioffi M, Astuto M, Bontempo P, Pignalosa O, Vietri MT, Molinari AM, Sica V, Della Corte F, Napoli C. The beneficial effects of antioxidant supplementation in enteral feeding in critically ill patients: a prospective, randomized, double-blind, placebo-controlled trial. *Anesth Analg.* 2004 Sep;99(3):857-63, table of contents. [Pubmed Link](#)
10. Angstwurm M W, Engelmann L et al. Selenium in Intensive Care (SIC) study: Results of a prospective randomized, placebo-controlled, multiple-center study in patients with severe systemic inflammatory response syndrome, sepsis, and septic shock. *Crit Care Med.* 2007; 35(1): 1-9. [Pubmed link](#)
11. *Berger MM, Baines M, et al. Trace element supplementation after major burns modulates antioxidant status and clinical course by way of increased tissue trace element concentrations. Am J Clin Nutr. 2007;85(5):1293-1300. [Pubmed link](#)*
12. *Mishra V, Baines M et al. Effect of selenium supplementation on biochemical markers and outcome in critically ill patients. Clin Nutr. 2007;26(1):41-50. [Pubmed link](#)*
13. *Forceville X, Laviolle B et al. Effects of high doses of selenium, as sodium selenite, in septic shock: a placebo-controlled, randomized, double-blind, phase II study. Crit Care. 2007;11(4):R73. [Pubmed link](#)*
14. *Berger MM, Soguel L, Shenkin A, Revelly JP, Pinget C, Baines M, Chioloro RL. Influence of early antioxidant supplements on clinical evolution and organ function in critically ill cardiac surgery, major trauma, and subarachnoid hemorrhage patients. Crit Care. 2008;12(4):R101. [Pubmed Link](#)*

11.2 Parenteral Selenium

1. Kuklinski B, Buchner M, Schweder R, Nagel R (1991) Akute Pancreatitis-eine "Free Radical Disease": Letalitätssenkung durch Natriumselenit (Na₂SeO₃)-Therapie. *Z. gestame Inn Med* 46:S145-149 [Pubmed Link](#)
2. Zimmerman T, Albrecht S, Kuhne H, Vogelsang U, Grutzmann R, Kopprasch S. Selensubstitution bei sepsispatienten. *Medizinische Klinik.* 1997 92;Suppl.3:3-4



3. Berger MM, Spertini F, Shenkin A, Wardle C, Wiesner L, Schindler C, Chioléro RL Trace element supplementation modulates pulmonary infection rates after major burns: a double-blind, placebo-controlled trial. *Am J Clin Nutr.* 1998;68:365-371 [Pubmed Link](#)
4. Angstwurm MW, Schottdorf J, Schopohl J, Gaertner R Selenium replacement in patients with severe systemic inflammatory response syndrome improves clinical outcome. *Crit Care Med.* 1999;27:1807-1813 [Pubmed Link](#)
5. Porter JM, Ivatury RR, Azimuddin K, Swami R. Antioxidant therapy in the prevention of organ dysfunction syndrome and infectious complications after trauma: early results of a prospective randomized study. *Am Surg* 1999 65:478-483 [Pubmed Link](#)
6. Berger MM, Recond MJ, Shenkin A, Rey F, Wardle C, Cayeux C, Schindler C, Chiolo Influence of selenium supplements on the post-traumatic alterations of the thyroid axis: a placebo-controlled trial. *Intensive Care Med* 2001;27:91-100 [Pubmed Link](#)
7. Angstwurm M W, Engelmann L et al. Selenium in Intensive Care (SIC) study: Results of a prospective randomized, placebo-controlled, multiple-center study in patients with severe systemic inflammatory response syndrome, sepsis, and septic shock. *Crit Care Med.* 2007; 35(1): 1-9. [Pubmed link](#)
8. *Berger MM, Baines M, et al. Trace element supplementation after major burns modulates antioxidant status and clinical course by way of increased tissue trace element concentrations. Am J Clin Nutr. 2007;85(5):1293-1300. [Pubmed link](#)*
9. *Forceville X, Laviolle B et al. Effects of high doses of selenium, as sodium selenite, in septic shock: a placebo-controlled, randomized, double-blind, phase II study. Crit Care. 2007;11(4):R73. [Pubmed link](#)*
10. *Mishra V, Baines M et al. Effect of selenium supplementation on biochemical markers and outcome in critically ill patients. Clin Nutr. 2007;26(1):41-50. [Pubmed link](#)*
11. *Berger MM, Soguel L, Shenkin A, Revely JP, Pinget C, Baines M, Chioléro RL. Influence of early antioxidant supplements on clinical evolution and organ function in critically ill cardiac surgery, major trauma, and subarachnoid hemorrhage patients. Crit Care. 2008;12(4):R101. [Pubmed link](#)*