5. Tisdale MJ, Brennan RA, Fearon KC. Reduction of weight loss and tumour size in a cachexia model by high fat diet. *Br J Cancer* 1987, **56**, 39–43.
6. Barbul A. Arginine and immune function. *Nutrition* 1990, **6**, 53–58.
7. Holm E. Ernährungstherapie bei Tumorkrankheiten: Wird der Tumor "gefüttert"? In Schauder P, ed. *Ernährung und Tumorerkrankungen*. Basel, Karger, 1991, 454–476.
8. Klimberg VS, McClellan JL. Glutamine, cancer, and its therapy. *Am J Surg* 1996, **172**(5), 418–424.
9. Cynober L, Vasson MP, Aussel C. Arginine-enriched diets: rationale for use and experimental data. *Nutr Clin Metab* 1996, **10**(2), 89–95.
10. Heys SD, Gough DB, Khan L, Eremin O. Nutritional pharmacology and malignant disease: a therapeutic modality in patients with cancer. *Br J Surg* 1996, **83**(5), 608–619.
11. Wigmore SJ, Ross JA, Falconer JS, *et al.* The effect of polyunsaturated fatty adds on the progress of cachexia in patients with pancreatic cancer. *Nutrition* 1996, **12**(1), Suppl., S27–S30.
12. Laviano A, Renvyle T, Yang ZJ. From laboratory to bedside: new strategies in the treatment of malnutrition in cancer patients. *Nutrition* 1996, **12**(2), 112–122.
13. Brennan MF. Total parenteral nutrition in the cancer patient. *N Engl J Med* 1981, **217**, 375–382.
14. Issell B. Protection against chemotherapy toxicity in IV hyperalimentation. *Cancer Treatment Reports* 1978, **62**, 1139–1143.
15. Bounous G, Le Bel E, Shuster J, *et al.* Dietary protection during radiation therapy. *Strahlenther* 1975, **149**, 476–483.
16. Brennan MF. Total parenteral nutrition in cancer patients. *N Engl J Med* 1981, **305**, 375–382.
17. Copeland EM, MacFadyen BV, MacComb WS, *et al.* Intravenous hyperalimentation in patients with head and neck cancer. *Cancer* 1975, **35**, 606–610.
18. DeVries EGE, Mulder NH, Houwen B, *et al.* Enteral nutrition by nasogastric tube in adult patients treated with intensive chemotherapy for acute leukemia. *Am J Clin Nutr* 1982, **35**, 1490–1496.
19. Donaldson SS, Lenon RA. Alteration of nutritional status: impact of chemotherapy and radiation therapy. *Cancer* 1979, **43** (Suppl.), 2036–2052.
20. Koretz R. Parenteral nutrition: is it oncologically logical? *J Clin Oncol* 1984, **2**, 534–538.
21. Evans W, Nixon D, Daly J. A randomized study of standard or augmented oral nutritional support versus ad lib nutrition intake in patients with advanced cancer. *Clin Invest Med* 1986, **9**, A-127.
22. Klein S, Koretz RL. Nutrition support in patients with cancer: what do the data really show? *Nutr Clin Pract* 1994, **9**, 91–100.
23. Bozzetti F. Is enteral nutrition a primary therapy in cancer patients? *Gut* 1994, **35**(Suppl.), S65–S68.
24. Nitenberg G, Nicolas C, Garban F. Nutritional support in cancer. *Med Nutr* 1995, **31**, 139–147.
25. Shike M. Nutrition therapy for the cancer patient. *Haematol Oncol Clin North Am* 1996, **10**, 221–234.
26. Ripamonti C, Gemlo BT, Bozzetti F, *et al.* Role of enteral nutrition in advanced cancer patients: indications and contraindications of the different techniques employed. *Tumori* 1996, **82**, 302–308.
27. Müller JM, Brenner U, Dienst C, *et al.* Preoperative parenteral feeding in patients with gastrointestinal carcinoma. *Lancet* 1982, **1**, 68–71.
28. Detsky AS, Baker JP, O'Rourke K, *et al.* Perioperative parenteral nutrition: a meta-analysis. *Ann Intern Med* 1987, **107**, 195–200.
29. Brennan MF, Pisters PW, Posner M, *et al.* A prospective randomized trial of total parenteral nutrition after major pancreatic surgery for malignancy. *Ann Surg* 1994, **20**, 436–441.
30. McArdle AH, Wittnich C, Freeman CR, *et al.* Elemental diet as prophylaxis against radiation injury. *Arch Surg* 1985, **120**, 1026–1030.
31. Lowry SF, Brennan MF. Intravenous feeding of cancer patient. In Rombeau JL, Caldwell MC, eds. *Parenteral Nutrition*. Philadelphia, Saunders, 1986, 445–470.
32. Donaldson SS, Wesley MN, Ghavimi F. A prospective randomized clinical trial of total parenteral nutrition in children with cancer. *Med Pediatr Oncol* 1982, **10**, 129–139.
33. Solassol C, Joyeux H, Dubois JB. Total parenteral nutrition (TPN) with complete nutrition mixtures. An artificial gut in cancer patients. *Nutr Cancer* 1979, **1**, 13–18.
34. Valerio D, Overett L, Malcolm A. Nutritive support for cancer patients receiving abdominal and pelvic radiotherapy: a randomized prospective clinical experiment of intravenous versus oral feeding. *Surg Forum* 1978, **29**, 145–148.
35. McGeer AJ, Detsky AS, O'Rourke K. Parenteral nutrition in cancer patients undergoing chemotherapy: a meta-analysis. *Nutrition* 1990, **6**, 233–240.
36. Nixon DW. The value of parenteral nutrition support. Chemotherapy and radiation treatment. *Cancer* 1986, **58**, 1902–1903.
37. Hill A, Daly JM. Current indications for intravenous nutritional support in oncology patients. *Surg Oncol Clin North Am* 1995, **4**, 549–563.
38. McGeer AJ, Detsky AS, O'Rourke K. Parenteral nutrition in patients receiving chemotherapy: American College of Physicians Position Paper. *Ann Intern Med* 1989, **110**, 734–735.
39. Moley JF, August D, Norton JA, *et al.* Home parenteral nutrition for patients with advanced intraperitoneal cancers and gastrointestinal dysfunction. *J Surg Oncol* 1986, **33**, 186–189.
40. Sailer D, Kolb S, Neff H, eds. *Künstliche Ernährung zu Hause*. Basel, Karger, 1986.
41. Mercadante S. Parenteral nutrition at home in advanced cancer patients. *J Pain Symptom Man* 1995, **10**, 476–480.
42. Tchekmedian NS, Zahyna D, Halpert C, *et al.* Assessment and maintenance of nutrition in older cancer patients. *Oncology* 1992, **49**(Suppl. 2), 105–111.
43. Howard L, Ament M, Fleming CR, *et al.* Current use and clinical outcome of home parenteral and enteral nutrition therapies in the United States. *Gastroenterology* 1995, **109**, 355–365.
44. Bozzetti F, Amadori D, Bruera E, *et al.* Guidelines on artificial nutrition versus hydration in terminal cancer patients. *Nutrition* 1996, **12**, 163–167.

PII: S0959-8049(97)10058-2

Arbiter:

C.L. Loprinzi

Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905, U.S.A.

HAVING ACCEPTED my requested assignment to write this bridging editorial, I read the preceding pro and contra position articles. Reflecting on these two articles it became apparent that these debators are actually singing very similar tunes. So much so, that I am not sure I would have been able to pick out the 'pro' piece from the 'contra' piece if they had not been so labelled.

Both articles clearly agree that there are no data to support the routine use of parenteral or enteral nutrition in patients with advanced incurable malignancies. Both agree

that more studies need to be carried out to find appropriate roles for nutritional therapy in patients with advanced cancer. Both also agree that the important endpoints in these studies should consist of quality of life and quantity of life.

Interestingly, it was the contra article that spent more time discussing possible situations where parenteral nutrition might actually have a role in patients with incurable cancer, e.g. those with gastrointestinal insufficiency due to surgery, radiation therapy or high-dose chemotherapy (and I might add abdominal carcinomatosis without other impending organ failure). It is clear, however, that such patients represent a small minority of those seen in clinical practice.

It is also noteworthy that the contra article attempted to weaken papers which supported its contra position (that is that parenteral or enteral nutrition is not helpful), by noting that these publications had 'methodologic flaws' and 'serious shortcomings'. Is this really true? It is true that retrospectively a clinical scientist, or another critical reviewer, can always look back at the performed experiment and think of potential ways to improve the experimental method. Nonetheless, when there are a series of related experiments with similarly negative conclusions, the truth is probably that the hypothesis undergoing testing is the problem, not the scientific methodology. To give an alternative example, when a variety of independent clinical investigators individually examined the hypothesis that either progestational agents [1–4] or corticosteroids [5–8] could stimulate appetites, the results of these experiments, where the hypothesis turned out to be true, were similarly positive. Thus, it is likely that it is the hypothesis (that enteral/parenteral nutrition is helpful) that is flawed, not the methodology of the various experiments.

As detailed in the two preceding articles, at this time there are substantial data available to suggest that neither quality nor quantity of life is improved in patients with advanced cancer by increasing caloric intake by parenteral nutrition, enteral nutrition or dietary counselling. In concert with this, our group was unable to demonstrate any benefit with pharmacological appetite stimulation for improving response rates, quality of life or survival in a group of patients with newly diagnosed, extensive-stage small cell lung cancer [9].

Having contended with resultant data from a series of studies over the past decade regarding pharmacological appetite simulation [1, 9–17], our focus has migrated from concentrating on body composition measurements, including non-fluid weight status, to concentrating on changes in patient appetites and perceived drug toxicities. If nutritional interventions cannot improve patient survival or response to antitumor therapy, can we effectively improve an untoward symptom (anorexia) with minimal other toxicity? This can be analogous to providing therapies for other untoward symptoms (e.g. cough, nausea, hiccups, pain, etc.) where we hope to alleviate such symptoms but do not expect to impact upon tumour status or survival.

In conclusion, the contra position to the proposed question wins. That is that, with few exceptions in very selected cases, cancer patients with advanced incurable disease should not receive parenteral or enteral nutritional support as a part of routine clinical care. There was relatively equivalent support for this argument in both articles. What then can we realistically offer the masses of patients suffering from cancer anorexia/cachexia? We can provide psychosocial and empathetic support including simple nutritional counselling, for what that is worth. We can also provide appetite stimulants, such as progestational agents or corticiosteroids, understanding that these can improve patient appetites, albeit for limited times, but without any demonstrable effect on quality or quantity of life. More work surely needs to be done.

1. Loprinzi CL, Ellison NM, Schaid DJ, *et al.* Controlled trial of megestrol acetate for the treatment of cancer anorexia and cachexia. *J Natl Cancer Inst* 1990, **82**, 1127–1132.
2. Bruera E, Macmillan K, Kuehn N, *et al.* A controlled trial of megestrol acetate on appetite, caloric intake, nutritional status, and other symptoms in patients with advanced cancer. *Cancer* 1990, **66**, 1279–1282.
3. Feliu J, Gonzalez-Baron M, Berrocal A, *et al.* Usefulness of megestrol acetate in cancer cachexia and anorexia. *Am J Clin Oncol CCT* 1992, **15** (5), 436–440.
4. Tchekmedyian NS, Hickman M, Siau J, *et al.* Megestrol acetate in cancer anorexia and weight loss. *Cancer* 1992, **69**, 1268–1274.
5. Moertel CG, Schutt AJ, Reitemeier RJ, Hahn RG. Corticosteroid therapy of preterminal gastrointestinal cancer. *Cancer* 1974, **33**, 1607–1609.
6. Bruera E, Roca E, Cedaro L, *et al.* Action of oral methylprednisolone in terminal cancer patients: a prospective randomized double-blind study. *Cancer Treat Rep* 19XX, **69**, 751–754.
7. Popiela T, Lucchi R, Giongo F. Methylprednisolone as an appetite stimulant in patients with cancer. *Br Med J* 1984, **288**, 27.
8. Wilcox J, Corr J, Shaw J, *et al.* Prednisolone as an appetite stimulant in patients with cancer. *Br Med J* 1984, **288**, 27.
9. Rowland KM Jr, Loprinzi CL, Shaw EG, *et al.* Randomized double blind placebo controlled trial of cisplatin and etoposide plus megestrol acetate/placebo in extensive stage small cell lung cancer. A North Central Cancer Treatment Group Study. *J Clin Oncol* 1996, **14**(1), 135–141.
10. Kardinal CG, Loprinzi CL, Schaid DJ, *et al.* A controlled trial of cyproheptadine in cancer patients with anorexia and/or cachexia. *Cancer* 1990, **65**, 2657–2662.
11. Loprinzi CL, Michalak JC, Schaid DJ, *et al.* Phase III evaluation of four doses of megestrol acetate as therapy for patients with cancer anorexia and/or cachexia. *J Clin Oncol* 1993, **11**, 762–767.
12. Goldberg R, Loprinzi CL, Mailliard JA, *et al.* Pentoxifylline for treatment of cancer anorexia/cachexia? A randomized double-blinded, placebo-controlled trial. *J Clin Oncol* 1995.
13. Loprinzi CL, Schaid DJ, Dose AM, Burnham NL, Jensen MD. Body-composition changes in patients who gain weight while receiving megestrol acetate. *J Clin Oncol* 1993, **11**(1), 152–154.
14. Loprinzi CL, Jensen MD, Jiang NS, Schaid DJ. Effect of megestrol acetate on the human pituitary–adrenal axis. *Mayo Clin Proc* 1992, **67**, 1160–1162.
15. Leinung MC, Liporace R, Miller CH. Induction of adrenal suppression by megestrol acetate in patients with AIDS. *Ann Intern Med* 1995, **122**, 843–845.
16. Loprinzi CL, Goldberg RG, Su JOI, *et al.* Placebo-controlled trial of hydrazine sulfate in patients with newly diagnosed non-small cell lung cancer. *J Clin Oncol* 1994, **12**, 1126–1129.
17. Loprinzi CL, Kuross SA, O'Fallon JR, *et al.* Randomized placebo-controlled evaluation of hydrazine sulfate in patients with advanced colorectal cancer. *J Clin Oncol* 1994, **12**, 1121–1125.