Leave Behind for Congress

Effectiveness of Medical Nutrition Therapy

Medical Nutrition Therapy is an evidence-based application of the Nutrition Care Process that can include nutrition assessment/reassessment, nutrition diagnosis, nutrition intervention and nutrition monitoring and evaluation. MNT is provided by a Registered Dietitian Nutritionist with the goal of preventing, delaying or managing diseases or conditions.

The Medical Nutrition Therapy Act would provide coverage under Medicare Part B for MNT for a variety of chronic conditions beyond diabetes and renal disease, which are already covered. Below is a compilation of evidence that shows MNT to be clinically effective in treating or managing the new conditions included in the bill. Clinical guidelines that include MNT as a recommended component of care are listed as well.

Cancer

Evidence: MNT as part of a comprehensive treatment strategy can improve outcomes in adult oncology patients for many types of cancer including breast, ovarian, lung, leukemia, colorectal, gastrointestinal and head and neck.[1]

Clinical Guidelines: European Society for Clinical Nutrition and Metabolism; American Cancer Society; Academy of Nutrition and Dietetics Standards of Practice in Oncology Nutrition; Academy of Nutrition and Dietetics Oncology Practice Guideline

Cardiovascular Disease including Hypertension and Dyslipidemia

Evidence: In a 2022 systematic review with eight randomized clinical trials, usual care or no intervention compared to MNT provided by RDNs significantly improved total cholesterol (total-C), low-density lipoprotein cholesterol (LDL-C) [-11.56 mg/dL, triglycerides (TG), and systolic blood pressure (SBP).[56] Additionally, cost savings of $638 to $1450 per patient per year were reported due to decreases in medications and a reported increase in quality adjusted life years (QALY) by 0.75 years.[57] Individual or group sessions utilizing MNT resulted in a reduction in blood pressure for those with hypertension and pre-hypertension with improvements reported as quickly as after one month of working with an RDN according to a systematic review of 70 research studies.[2] A systematic review of 34 studies determined that patients who participated in multiple MNT sessions were able to substantially lower their total cholesterol, low-density lipoprotein cholesterol and triglyceride levels.[3,4,5,6,7,8] MNT interventions led to improved blood sugar levels, weight, blood pressure and quality-adjusted life years and reduced the need for lipid-lowering medications which resulted in cost-effectiveness and even cost savings in some cases.[9,10,11,12,13,14,15]

In a 2023 systematic review with thirty-one randomized clinical trials in adults with prehypertension or hypertension, usual care or no intervention compared to MNT provided by RDNs significantly lowered blood pressure, lowered CVD events (stroke and myocardial infraction), CVD risk score, and anthropometric measures.

Clinical Guidelines:; VA/DoD Clinical Practice Guideline; American Heart Association; Academy of Nutrition and Dietetics Hypertension Practice Guideline

Celiac Disease

Evidence: MNT administered by a RDN can improve gluten-free diet adherence, self-reported general health and wellbeing, anemia, and gastrointestinal symptoms such as indigestion, diarrhea, constipation, abdominal pain, and reflux.[16,17,18,19,20,21,22] Evidence indicates that RDN should collaborate with individual with celiac disease, their families and healthcare teams to design individualized MNT interventions focused on comprehensive nutrition assessment and individualized modification of diet to maintain or improve nutritional status, and monitor overtime.

Clinical Guidelines: Canadian Association of Gastroenterology **Academy of Nutrition and Dietetics Celiac Disease Practice Guideline**

Eating Disorders

Evidence: MNT provided by RDNs as part of an interdisciplinary care team helps patients with restoring body weight, achieving adequate nutrient intake to meet daily requirements through regular meal patterns and portions and reducing negative beliefs and fears surrounding food.[23,24,25,26]

Clinical Guidelines: American Psychiatric Association (Draft Guideline); American Psychiatric Association; Academy of Nutrition and Dietetics Standards of Practice in Eating Disorders

HIV/AIDS

Evidence: Early MNT intervention can improve oral intake, symptoms, cardiovascular risk, and prevent progressive weight loss. Nutrition counseling can support weight gain, CD4 white blood cell levels that help to measure the immune system and quality of life.[27,28,29,30,31,32,33,34]

Clinical Guidelines: HIV/AIDS: A Guide for Nutrition Care and Support

Malnutrition

Evidence: Malnourished older adults have longer periods of illness, longer hospital stays and increased readmission rates.[35] MNT provided in the outpatient setting to patients with malnutrition increases overall nutrition status, cognitive function, functional status and overall food intake and significantly decreases primary care physician costs.[36,37,38]

Malnutrition in the Community: A randomized clinical trial on 83 older adults living in the community and evaluated the effect of nutrition counseling and oral nutrition supplement by a dietitian compared to standard care; calorie intake significantly improved in the intervention group.[54] In a study with 276 older adults with low protein intake (<1.0g/kg adjusted by weight), dietary advice by an RDN to increase protein intake to ≥ 1.2 g/kg ABW/d and similar advice plus advice to consume protein enriched foods within half an hour after usual physical activity resulted in significantly greater calorie intake.[55]

Clinical Guidelines: American Society for Parenteral and Enteral Nutrition; Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition

Obesity

Evidence: A systematic review of 62 randomized clinical trials, found that when compared with control conditions, MNT interventions by a dietitian resulted in a reduction in body mass index, significantly greater weight loss and

increased likelihood of achieving 5% weight loss, reduced waist circumference, reduction in fasting blood sugar levels and systolic blood pressure, and likely increase in quality of life.[39] One to three contacts with a dietitian per month results in the largest improvement in parameters. Weight management interventions can be cost effective programs that have been shown to increase quality of life.[40,41,42,43]

Clinical Guidelines: **Obesity Canada and the Canadian Association of Bariatric Physicians and Surgeons**; **Academy of Nutrition and Dietetics Standards of Practice in Adult Weight Management**

Prediabetes

Evidence: A recent systematic review with 13 randomized clinical trials demonstrates that MNT interventions delivered by dietitians compared with standard care results in improved hemoglobin A1c and fasting blood glucose. Additionally significant improvements were seen in weight, body mass index and waist circumference, total, high and low-density lipoproteins and blood pressure (systolic and diastolic).[56] In other studies, MNT was show to be an effective treatment for prediabetes that can result in a significant reduction in fasting blood sugar, blood sugar two hours after meals and waist circumference.[44,45,46,47,48,49,50,51] MNT is a cost effective and potential cost-saving intervention for the prevention of diabetes in gained cost per quality-adjusted life years.[52,53]

Clinical Guidelines: **American Diabetes Association**; **Joslin Diabetes Center**; **Academy of Nutrition and Dietetics Standards of Practice in Diabetes Care**

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References - Effectiveness of Medical Nutrition Therapy

[1] Thompson KL, Elliott L, Fuchs-Tarlovsky V, Levin RM, Voss AC, Piemonte T. Oncology Evidence-Based Nutrition Practice Guideline for Adults. *J Acad Nutr Diet.* 2017;117(2):297-310.e47.

[2] Lennon SL, DellaValle DM, Rodder SG, et al. 2015 Evidence Analysis Library Evidence-Based Nutrition Practice Guideline for the Management of Hypertension in Adults. *J Acad Nutr Diet.* 2017;117(9):1445-1458.e17.

[3] Sikand G, Cole RE, Handu D, deWaal D, Christaldi J, Johnson EQ, Arpino LM, Ekvall SM. Clinical and cost benefits of medical nutrition therapy by registered dietitian nutritionists for management of dyslipidemia: A systematic review and meta-analysis. *J Clin Lipidol.* 2018 Sep-Oct;12(5):1113-1122.

[4] Dalgard C, Thuroe A, Haastrup B, Haghfelt T, Stender. Saturated fat intake is reduced in patients with ischemic heart disease 1 year after comprehensive counseling but not after brief counseling. *J Am Diet Assoc*. 2001;101:1420-1424, 1429.

[5]Geil PB, Anderson JW, Gustafson NJ. Women and men with hypercholesterolemia respond similarly to an American Heart Association step 1 diet. *J Am Diet Assoc*. 1995;95(4):436-441.

[6] Hebert JR, Ebbeling CB, Ockene IS, Ma Y, Rider L, Merriam PA, Ockene JK, Saperia G. A dietitian-delivered group nutrition program leads to reductions in dietary fat, serum cholesterol and body weight: The Worcester area trial for counseling in hyperlipidemia (WATCH*). J Am Diet Assoc*. 1999; 99: 544-552.

[7] Henkin Y, Shai I, Zuk R, Brickner D, Zuilli I, Neumann L, Shany S. Dietary treatment of hypercholesterolemia: Do dietitians do it better? *Am J Med.* 2000: 109: 549-555.

[8] Lim HJ, Choi YM, Choue R. Dietary intervention with emphasis on folate intake reduces serum lipids but not plasma homocysteine levels in hyperlipidemic patients. *Nutr Res*. 2008 Nov; 28(11): 767-774.

[9]Sikand G, Kashyap ML, Yang I. Medical nutrition therapy lowers serum cholesterol and saves medication costs in men with hypercholesterolemia. *J Am Diet Assoc*. 1998;98(8):889-896.

[10] Delahanty LM, Sonnenberg LM, Hayden D, Nathan DM. Clinical and cost outcomes of medical nutrition therapy for hypercholesterolemia: A controlled trial. *J Am Diet Assoc*. 2001 Sep; 101(9): 1,012-1,023.

[11] McGehee MM, Johnson EQ, Rasmussen HM, Sahyoun N, Lynch MM, Carey M. Benefits and costs of medical nutrition therapy by registered dietitians for patients with hypercholesterolemia. Massachusetts Dietetic Association. *J Am Diet Assoc*. 1995;95(9):1041-1043.

[12] Sikand G, Kashyap ML, Wong ND, Hsu JC. Dietitian intervention improves lipid values and saves medication costs in men with combined hyperlipidemia and a history of niacin noncompliance. *J Am Diet Assoc*. 2000;100(2):218-224.

[13] Milani RV, Lavie CJ. Impact of worksite wellness intervention on cardiac risk factors and one-year health care costs. *Am J Cardiol*. 2009;104(10):1389-1392.

[14] Troyer JL, McAuley WJ, McCutcheon ME. Cost-effectiveness of medical nutrition therapy and therapeutically designed meals for older adults with cardiovascular disease. *J Am Diet Assoc.* 2010;110(12):1840-1851.

[15] Eriksson MK, Hagberg L, Lindholm L, Malmgren-Olsson EB, Österlind J, Eliasson M. Quality of life and cost-effectiveness of a 3-year trial of lifestyle intervention of primary health care. *Archives of Internal Medicine.* 2010;170(16):1470-1479.

[16] Cheng J, Brar PS, Lee AR, Green PH. Body mass index in celiac disease: beneficial effect of a gluten-free diet. *J Clin Gastroenterol*. 2010;44(4):267-271

[17] Mahadev S, Simpson S, Lebwohl B, Lewis SK, Tennyson CA, Green PH. Is dietitian use associated with celiac disease outcomes?. *Nutrients*. 2013;5(5):1585-1594. Published 2013 May 15

[18] Rajpoot P, Sharma A, Harikrishnan S, Baruah BJ, Ahuja V, Makharia GK. Adherence to gluten-free diet and barriers to adherence in patients with celiac disease. *Indian J Gastroenterol*. 2015;34(5):380-386.

[19] Jacobsson LR, Friedrichsen M, Göransson A, Hallert C. Impact of an active patient education program on gastrointestinal symptoms in women with celiac disease following a gluten-free diet: a randomized controlled trial. *Gastroenterol Nurs*. 2012;35(3):200-206.

[20] Haas K, Martin A, Park KT. Text Message Intervention (TEACH) Improves Quality of Life and Patient Activation in Celiac Disease: A Randomized Clinical Trial. *J Pediatr*. 2017;185:62-67.e2.

[21] Muhammad H, Reeves S, Ishaq S, Mayberry J, Jeanes YM. Adherence to a Gluten Free Diet Is Associated with Receiving Gluten Free Foods on Prescription and Understanding Food Labelling. *Nutrients*. 2017;9(7):705. Published 2017 Jul 6.

[22] Sainsbury K, Mullan B, Sharpe L. A randomized controlled trial of an online intervention to improve gluten-free diet adherence in celiac disease. *Am J Gastroenterol*. 2013;108(5):811-817.

[23] Mitchell SL, Klein J, Maduramente A. Assessing the impact of an eating disorders treatment team approach with college students. *Eat Disord*. 2015;23(1):45-59.

[24] Cockfield A, Philpot U. Feeding size 0: the challenges of anorexia nervosa. Managing anorexia from a dietitian's perspective. *Proc Nutr Soc.* 2009;69(3):281-288.

[25] Reiter CS, Graves L. Nutrition therapy for eating disorders. *Nutr Clin Pract.* 2010;25(2):122-136.
[26] Ozier AD, Henry BW. Position of the American dietetic association: nutrition intervention in the treatment of eating disorders. *J Am Diet Assoc.* 2011;111(8):1236-1241.
[27] Allen SJ, Okoko B, Martinez E, Gregorio G, Dans LF. Probiotics for treating infectious diarrhoea. *Cochrane Database Syst Rev*. 2004;(2):CD003048.
[28] Amadi B, Mwiya M, Chomba E, et al. Improved nutritional recovery on an elemental diet in Zambian children with persistent diarrhoea and malnutrition. *J Trop Pediatr*. 2005;51(1):5-10.
[29] Carroccio A, Guarino A, Zuin G, et al. Efficacy of oral pancreatic enzyme therapy for the treatment of fat malabsorption in HIV-infected patients. *Aliment Pharmacol Ther*. 2001;15(10):1619-1625
[30] Craig GB, Darnell BE, Weinsier RL, et al. Decreased fat and nitrogen losses in patients with AIDS receiving medium-chain-triglyceride-enriched formula vs those receiving long-chain-triglyceride-containing formula. *J Am Diet Assoc*. 1997;97(6):605-611.
[31] Fawzi WW, Mbise R, Spiegelman D, Fataki M, Hertzmark E, Ndossi G. Vitamin A supplements and diarrheal and respiratory tract infections among children in Dar es Salaam, Tanzania. *J Pediatr*. 2000;137(5):660-667.
[32] Filteau SM, Rollins NC, Coutsoudis A, Sullivan KR, Willumsen JF, Tomkins AM. The effect of antenatal vitamin A and beta-carotene supplementation on gut integrity of infants of HIV-infected South African women. *J Pediatr Gastroenterol Nutr*. 2001;32(4):464-470.
[33] Turner MJ, Angel JB, Woodend K, Giguère P. The efficacy of calcium carbonate in the treatment of protease inhibitor-induced persistent diarrhea in HIV-infected patients. *HIV Clin Trials*. 2004;5(1):19-24.
[34] Wanke CA, Pleskow D, Degirolami PC, Lambl BB, Merkel K, Akrabawi S. A medium chain triglyceride-based diet in patients with HIV and chronic diarrhea reduces diarrhea and malabsorption: a prospective, controlled trial. *Nutrition*. 1996;12(11-12):766-771.
[35] Kassin MT, Owen RM, Perez SD, et al. Risk factors for 30-day hospital readmission among general surgery patients. *J Am Coll Surg*. 2012;215(3):322-330.
[36] Beck AM, Kjær S, Hansen BS, Storm RL, Thal-Jantzen K, Bitz C. Follow-up home visits with registered dietitians have a positive effect on the functional and nutritional status of geriatric medical patients after discharge: a randomized controlled trial. *Clin Rehabil*. 2013;27(6):483-493.
[37] Endevelt R, Lemberger J, Bregman J, et al. Intensive dietary intervention by a dietitian as a case manager among community dwelling older adults: the EDIT study. *J Nutr Health Aging*. 2011;15(8):624-630.
[38] Munk T, Tolstrup U, Beck AM, et al. Individualised dietary counselling for nutritionally at-risk older patients following discharge from acute hospital to home: a systematic review and meta-analysis. *J Hum Nutr Diet*. 2016;29(2):196-208
[39] Morgan-Bathke M, Domel Baxter S, Halliday TM, et al. Weight Management Interventions Provided by a Dietitian for Adults with Overweight or Obesity: An Evidence Analysis Center Systematic Review and Meta-Analysis. *J Acad Nutr Diet*. Nutrition and Dietetics. 2021.
[40] Hagberg L, Winkvist A, Brekke HK, Bertz F, Hellebö Johansson E, Huseinovic E. Cost-effectiveness and quality of life of a diet intervention postpartum: 2-year results from a randomized controlled trial. *BMC Public Health.* 2019;19(1):38.
[41] Rothberg AE, McEwen LN, Fraser T, Burant CF, Herman WH. The impact of a managed care obesity intervention on clinical outcomes and costs: A prospective observational study. *Obesity*. 2013; 21(11):2157-2162.
[42] Wolf AM, Siadaty M, Yeager B, Conaway MR, Crowther JQ, Nadler JL, Bovbjerg VE. Effects of lifestyle intervention on health care costs: Improving Control with Activity and Nutrition (ICAN). *J Am Diet Assoc.* 2007 Aug; 107(8):1,365-1,373.
[43] Bradley DW, Murphy G, Snetselaar LG, Myers EF, Qualls LG. The incremental value of medical nutrition therapy in weight management. Manag Care. 2013;22(1):40-45.
[44] Corpeleijn E, Feskens EJ, Jansen EH, et al. Improvements in glucose tolerance and insulin sensitivity after lifestyle intervention are related to changes in serum fatty acid profile and desaturase activities: The SLIM study. *Diabetologia*. 2006; 49 (10): 2,392-2,401.
[45] Dyson PA, Hammers MS, Morris RJ, Holman RR, Turner RC. The Fasting Hyperglycaemia Study: II. Randomized controlled trial of reinforced healthy-living advice in subjects with increased but not diabetic fasting plasma glucose. *Metabolism*. 1997; 46 (12) Suppl 1: 50-55.
[46] Eriksson J, Lindström J, Valle T, et al. Prevention of type II diabetes in subjects with impaired glucose tolerance: the Diabetes Prevention Study (DPS) in Finland: Study design and 1-year interim report on the feasibility of the lifestyle intervention programme. *Diabetologia.* 1999;42:793-801.
[47] Gagnon C, Brown C, Couture C, et al. A cost-effective moderate-intensity interdisciplinary weight-management programme for individuals with prediabetes. *Diabetes Metab.* 2011; 37(5): 410-418.
[48] Katula JA, Vitolins MZ, Rosenberger EL, et al. One-year results of a community-based translation of the Diabetes Prevention Program: Healthy-Living Partnerships to Prevent Diabetes (HELP PD) Project. *Diabetes Care.* 2011; 34(7): 1,451-1,457.
[49] Lindstrom J, Eriksson JG, Valle TT, et al. Prevention of Diabetes Mellitus in Subjects with Impaired Glucose Tolerance in the Finnish Diabetes Prevention Study: Results From a Randomized Clinical Trial. *J Am Soc Nephrol* 2003;14: S108-S113.

[50] Mensink M, Feskens EJ, Saris WH, De Bruin TW, Blaak EE. Study on Lifestyle Intervention and Impaired Glucose Tolerance Maastricht (SLIM): preliminary results after one year. *Int J Obes Relat Metab Disord*. 2003;27(3):377-384.

[51] Oldroyd JC, Unwin NC, White M, Imrie K, Mathers JC, Alberti KGMM. Randomized controlled trial evaluating the effectiveness of behavioral interventions to modify cardiovascular risk factors in men and women with impaired glucose tolerance: Outcomes at six months. *Diabetes Res Clin Pract*. 2001; 52 (1): 29-43.

[52] Sikand G, Wolf A, Gradwell E, et al. Cost effectiveness and economic savings of inpatient medical nutrition therapy services: a call for further research. *J Am Diet Ass.* 2009;109(9):A9.

[53] Bertram MY, Lim SS, Barendregt JJ, Vos T. Assessing the cost-effectiveness of drug and lifestyle intervention following opportunistic screening for pre-diabetes in primary care. *DIabetologia.* 2010;53(5):875-881.

[54] Payette H, Boutier V, Coulombe C, Gray-Donald K. Benefits of nutritional supplementation in free-living, frail, undernourished elderly people: a prospective randomized community trial. J Am Diet Assoc. 2002;102(8):1088-1095.

[55] Reinders I, Visser M, Jyväkorpi SK, et al. The cost effectiveness of personalized dietary advice to increase protein intake in older adults with lower habitual protein intake: a randomized controlled trial. Eur J Nutr. 2022;61(1):505-520.

[56] Mohr AE, Hatem C, Sikand G, Rozga M, Moloney L, Sullivan J, De Waal D, Handu D. Effectiveness of medical nutrition therapy in the management of adult dyslipidemia: A systematic review and meta-analysis. J Clin Lipidol. 2022 Sep-Oct;16(5):547-561. doi: 10.1016/j.jacl.2022.06.008. Epub 2022 Jun 25. PMID: 35821005.

[57] Sikand G, Handu D, Rozga M, de Waal D, Wong ND. Medical Nutrition Therapy Provided by Dietitians is Effective and Saves Healthcare Costs in the Management of Adults with Dyslipidemia. Curr Atheroscler Rep. 2023 Jun;25(6):331-342. doi: 10.1007/s11883-023-01096-0. Epub 2023 May 11. PMID: 37165278; PMCID: PMC10171906.

[58] Josephine M. Dudzik, Katelyn E. Senkus, Alison B. Evert, Hollie A. Raynor, Mary Rozga, Deepa Handu, Lisa M. Moloney. The effectiveness of medical nutrition therapy provided by a dietitian in adults with prediabetes: a systematic review and meta-analysis. The American Journal of Clinical Nutrition, Volume 118, Issue 5, 2023, Pages 892-910, ISSN 0002-9165, https://doi.org/10.1016/j.ajcnut.2023.08.022.