Heart Failure

Heart Failure (HF) Guideline (2008)

Welcome to the 2008 Heart Failure Evidence-Based Nutrition Practice Guideline site. The guideline information is divided into several sections:

- Executive Summary - major recommendations and ratings by Nutrition Care Process category.
- Introduction - Guideline Overview; Scope, Statement of Intent and Patient Preference, Guideline Methods, Implementation of the Guideline; Benefits and Harms of Implementing the Recommendations
- Major Recommendations - Guideline recommendations with conditional statements and strength rating
- Algorithms - Diagrams showing a flow of treatment for a disease or condition
- Background Information, Appendices and References - additional information

Use the links on the left to access the guideline material.

Printing Guideline Materials

You can print each page of the guideline by clicking on the print icon in the upper right-hand corner. To print entire sections of a guideline in PDF format, please click below:

- HF: Heart Failure 2008 Guideline Introduction and Executive Summary
- HF: Heart Failure 2008 Major Recommendations
- HF: Heart Failure 2008 Algorithms

The report will be generated in PDF format. We recommend Adobe Reader 7.0 or greater (available as a free download www.adobe.com).

General Information and Disclaimer

This nutrition practice guideline is meant to serve as a general framework for handling clients with particular health problems. The independent skill and judgment of the health care provider must always dictate treatment decisions.

Heart Failure

HF: Major Recommendations (2008)

Heart Failure Evidence-Based Nutrition Practice Guideline

Below, you will find a list of Heart Failure (HF) Recommendations listed by topic. You can print the guideline in PDF format.

Heart Failure (HF) Recommendations

Medical Nutrition Therapy
- HF: Medical Nutrition Therapy and Heart Failure

Nutrition Assessment
- HF: Protein Needs and Heart Failure
- HF: Energy Needs and Heart Failure

Nutrition Intervention
- HF: Sodium and Fluid Restriction and Heart Failure
- HF: Folate, B12 and Heart Failure
- HF: Thiamine Supplementation and Heart Failure
- HF: Magnesium Supplementation and Heart Failure
- HF: Alcohol and Heart Failure
- HF: CoEnzyme Q10, L-Arginine, Carnitine and Hawthorn Berry and Heart Failure

The recommendations listed below were originally developed for other ADA Evidence-Based Nutrition Practice Guidelines and are commonly associated with heart failure.

Diabetes (DM) Type 1 and 2 Evidence-Based Nutrition Practice Guideline for Adults

DM: Medical Nutrition Therapy
- DM: Intervention Options
- DM: Monitor and Evaluate Diabetes

Disorders of Lipid Metabolism (DLM) Evidence-Based Nutrition Practice Guideline

DLM: Referral to a Registered Dietitian for MNT

- Heart Failure
- Heart Failure (HF) Guideline (2008)

Quick Links

Recommendations Summary

Heart Failure (HF) Medical Nutrition Therapy and Heart Failure

Click here to see the explanation of recommendation ratings (Strong, Fair, Weak, Consensus, Insufficient Evidence) and labels (Imperative or Conditional). To see more detail on the evidence from which the following recommendations were drawn, use the hyperlinks in the Supporting Evidence Section below.

• Recommendation(s)
  HF: MNT and Heart Failure

Referral to a registered dietitian for Medical Nutrition Therapy (MNT) is recommended whenever an individual has heart failure. A planned initial visit lasting at least 45 minutes and at least one to three planned follow-up visits (at least 30 minutes each) can lead to improved dietary pattern and quality of life and decreases in edema and fatigue. Along with optimal pharmacological management, MNT may also reduce hospitalizations.

Rating: Strong
Imperative

• Risks/Harms of Implementing This Recommendation
  None

• Conditions of Application
  None

• Potential Costs Associated with Application
  At this time MNT for heart failure is not reimbursed by insurance companies.

• Recommendation Narrative
  • One three-year longitudinal study of RD-delivered MNT for HF patients found that an initial individualized nutrition assessment lasting 45 minutes and two to three follow-up visits lasting 30 minutes each, found significant decreases in sodium and fluid intakes and improved QOL. In addition, MNT reduced hospitalizations.
  • A randomized control trial of RD-delivered MNT for HF patients that received an initial visit (45 minutes) and a follow-up visit (30 minutes) found sodium intake was reduced.
  • A randomized control trial studying the impact of nutrition education by an RD found decreases in sodium and fluid intake.

• Recommendation Strength Rationale
  • Studies found consistent results.
  • Two studies were RCT.
  • Conclusion statement was a grade II.

• Minority Opinions
  None.

• Supporting Evidence

The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).

For optimum management of a patient with heart failure, what is the benefit of individualized medical nutrition therapy provided by a registered dietitian?

• References
  Kuehneman T, Saulsbury D, Splett P, Chapman DB, Demonstrating the impact of nutrition intervention in a heart
Heart Failure (HF) Protein Needs in Heart Failure Patients

In assessing protein needs for patients with heart failure, clinically stable depleted patients should have a daily intake of at least 1.37 g protein/kg and normally nourished patients should have a daily intake of 1.12 g protein/kg in order to preserve their actual body composition or limit the effects of hypercatabolism. Research indicates that HF patients have significantly higher protein needs than those without HF, as measured by negative nitrogen balance.

Rating: Fair

Risks/Harms of Implementing This Recommendation

In the decompensated (fluid overload, shortness of breath) patient be cautious of fluid levels, interpretation of albumin and renal insufficiency. If you are basing calories on weight only, excess fluid may overestimate calorie needs. Excess fluid could cause albumin levels to appear lower than actual resulting in an overestimation of protein needs. Diuretic use and fluid restriction may contribute to acute renal insufficiency, therefore limiting protein may not be warranted.

Conditions of Application

None.

Potential Costs Associated with Application

None.

Recommendation Narrative

Two papers were identified that address the protein needs in clinically stable HF patients at all ranges of BMI. Studies were of varying ages and NYHA classifications.

- One positive quality study (Aquilani, et. al., 2003) found while protein intake was equal for HF patients and controls, nitrogen excretion was higher and nitrogen balance was lower in HF patients.
- One neutral quality study (Pasini, et. al., 2004) found a significant negative nitrogen balance in HF patients versus controls.

Recommendation Strength Rationale

- Limited number of studies addressed protein levels in HF patients.
- Conclusion statement is a Grade III.

Minority Opinions

None.

Supporting Evidence

The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).

For the clinically stable HF patient, what is the protein level needed to maintain lean body mass in underweight (BMI<19), appropriate body weight (BMI 19-24.9) and overweight (BMI>24.9) individuals?

References

Heart Failure Energy Needs in Heart Failure Patients

In assessing energy needs for patients with heart failure, the majority of studies indicate that use of indirect calorimetry best determines energy needs. When indirect calorimetry is not possible consider starting with usual predictive equations and adjusting for increased catabolic state.

Rating: Fair

Imperative

Risks/Harms of Implementing This Recommendation

In the decompensated (fluid overload, shortness of breath) patient be cautious of fluid levels, interpretation of albumin and renal insufficiency. If you are basing calories on weight only, excess fluid may overestimate calorie needs. Excess fluid could cause albumin levels to appear lower than actual resulting in an overestimation of protein needs. Diuretic use and fluid restriction may contribute to acute renal insufficiency, therefore limiting protein may not be warranted.

Two studies (Aquilani et al, 2003 and Pasini et al, 2004) suggests that great caution should be paid in prescribing a hypocaloric diet in overweight/obese heart failure patients.

Conditions of Application

None

Potential Costs Associated with Application

None

Recommendation Narrative

Five papers were identified that address the calorie and/or protein needs in clinically stable HF patients at all ranges of BMI. Studies were of varying ages and NYHA classifications.

- One high-quality study found HF patients had a higher REE and TEE vs controls. In addition, the malnourished HF patients had a higher REE and TEE vs malnourished controls.
- One neutral-quality study found HF patients had a higher REE vs controls.
- One high-quality study found that REE and DEE were lower in cachetic vs noncachetic HF patients and controls.
- One high-quality study found HF patients had a lower DEE vs controls. Predictive equations developed from healthy controls inaccurately measured energy needs (measured DEE) in the HF patients by -10 to 30%.
- One neutral-quality study found predictive equations underestimated energy needs (measured REE) in the HF patients by 2-11%.

Recommendation Strength Rationale

- Studies of varying quality found inconsistent results
- Conclusion statement is a Grade III

Minority Opinions

None.

Supporting Evidence

The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).
For the clinically stable HF patient, what is the calorie level needed to maintain lean body mass in underweight (BMI<19), appropriate body weight (BMI 19-24.9) and overweight (BMI>24.9) individuals?

References


Quick Links

Recommendations Summary

Heart Failure (HF) Sodium and Fluid Restriction and Heart Failure

Click here to see the explanation of recommendation ratings (Strong, Fair, Weak, Consensus, Insufficient Evidence) and labels (Imperative or Conditional). To see more detail on the evidence from which the following recommendations were drawn, use the hyperlinks in the Supporting Evidence Section below.

- Recommendation(s)
  - HF: Fluid Intake
    - For patients with heart failure, fluid intake should be between 1.4 and 1.9 L (48-64 oz.) per day, depending on clinical symptoms (i.e. edema, fatigue, shortness of breath). Fluid restriction will improve clinical symptoms and quality of life.
    - Rating: Fair
    - Imperative
  - HF: Sodium Intake
    - For patients with heart failure, sodium intake should be less than 2000 mg (2 g) per day. Sodium restriction will improve clinical symptoms (i.e. edema, fatigue) and quality of life.
    - Rating: Fair
    - Imperative

- Risks/Harms of Implementing This Recommendation

One potential risk of a fluid and sodium restricted diet is elevated BUN and creatinine. If these parameters are elevated, the patient may be hypovolemic and alterations in diuretics, fluid and sodium intake should be considered.

- Conditions of Application

  - Use caution when a patient has an elevated BUN or creatinine
  - Consider a lower range of fluid restriction in NYHA stage IV patients

- Potential Costs Associated with Application

  None

- Recommendation Narrative

Four studies found that sodium restriction with or without fluid restriction improved at least one of the following: quality of life, NYHA functional class, sleep disturbance, physical activity, edema, BNP and blood pressure.

- Recommendation Strength Rationale

  - Three RCT and one prospective study found consistent results
  - Conclusion statement is a Grade II

Supporting Evidence

The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).

For the patient with heart failure, is there an optimal level of fluid and/or sodium restriction which will reduce heart failure symptomatology and morbidity/mortality in heart failure?

References


Recommendations Summary

Heart Failure (HF) Folate, B12, and Heart Failure

Click here to see the explanation of recommendation ratings (Strong, Fair, Weak, Consensus, Insufficient Evidence) and labels (Imperative or Conditional). To see more detail on the evidence from which the following recommendations were drawn, use the hyperlinks in the Supporting Evidence Section below.

Recommendation(s)

HF: Folate and heart failure

The practitioner should encourage patients with HF to consume at least the DRI for folate through food and/or a combination of B6, B12, and folate supplementation. Folate supplementation given with other vitamins/minerals has been shown to have beneficial clinical HF outcomes.

Rating: Fair

HF: B12 and heart failure

A multi-vitamin/mineral containing B12 or a combination of B6, B12 and folate could be recommended in HF patients. This level of B12 supplementation (200-500 mcg daily), given with other vitamins/minerals, has been shown to have beneficial clinical heart failure outcomes.

Rating: Fair

Risks/Harms of Implementing This Recommendation

CAD patients, not necessarily with heart failure, that have had a recent MI or coronary stenting may have increased risk of restenosis with doses of:

- Folic acid: 0.8-1.2 mg per day when given with other vitamins. More research is warranted.
- Vitamin B12: 0.06-0.4 mg per day when given with other vitamins. More research is warranted.
Conditions of Application
None

Potential Costs Associated with Application
None

Recommendation Narrative
Two positive-quality studies (Andresson et. al. 2005 and Witte et. al. 2005) found beneficial effects of folic acid given as part of a multivitamin/mineral or with B12 and B6 on heart failure outcomes.

Recommendation Strength Rationale
Small sample sizes and short duration
Two positive quality studies
Conclusion statement Grade II

Minority Opinions
None.

Supporting Evidence
The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).

For the patient with heart failure, does supplementing with folate and/or B12 provide beneficial outcomes?

References


Quick Links
Recommendations Summary
Heart Failure (HF) Thiamine Supplementation and Heart Failure

Heart Failure (HF) Guideline (2008)

Recommendation(s)

HF: Thiamine Supplementation

Since diuretic use can lead to thiamine deficiency in patients with heart failure (HF), then the practitioner should evaluate thiamine status. The practitioner should encourage the patient to consume at least the DRI through food and/or supplements. The practitioner should stay alert to future research involving thiamine.

Rating: Fair
Conditional

Risks/Harms of Implementing This Recommendation
The two studies reviewed reported none to mild adverse events (nausea and insomnia) in the subjects taking thiamine supplements. Details regarding side-effects can be found in the worksheets and evidence summaries.
Practitioners should use additional resources in conjunction with the evidence analysis documents for information regarding further potential side-effects of thiamine supplementation.

- **Conditions of Application**
- **Potential Costs Associated with Application**
- **Recommendation Narrative**
  - Two randomized controlled trials of subjects with heart failure found taking 200 mg thiamine (IV, IM and/or oral) increased plasma thiamine levels. One study found benefit in clinical symptoms.

- **Recommendation Strength Rationale**
  - Both studies were randomized controlled trials
  - Studies were of small sample sizes
  - Although both studies were of heart failure patients, one study was of elderly subjects (76-95 yr old)
  - Conclusion statement was a grade III

- **Minority Opinions**
  None.

- **Supporting Evidence**

  The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).

  **For the patient with heart failure, does supplementing with thiamine provide beneficial outcomes?**

- **References**
  References not graded in Academy of Nutrition and Dietetics Evidence Analysis Process
  Natural Medicines Comprehensive Database.

- **Heart Failure**
- **Heart Failure (HF) Guideline (2008)**

### Quick Links

#### Recommendations Summary

**Heart Failure (HF) Magnesium Supplementation and Heart Failure**

*Click here* to see the explanation of recommendation ratings (Strong, Fair, Weak, Consensus, Insufficient Evidence) and labels (Imperative or Conditional). To see more detail on the evidence from which the following recommendations were drawn, use the hyperlinks in the **Supporting Evidence Section** below.

- **Recommendation(s)**
  - **HF: Magnesium Supplementation**

  The practitioner should encourage patients with heart failure (HF) to consume at least the DRI for magnesium through food and/or supplements. Low levels of magnesium may be present in patients with heart failure and irregular heart rhythms may occur. The practitioner should stay alert to future research involving magnesium.

  **Rating: Fair**
  Conditional

  - **Risks/Harms of Implementing This Recommendation**

    The two studies reviewed reported none to mild adverse events (transient flushing, burning at the intravenous site, transient paresthesia) during the magnesium supplementation. Details regarding side-effects can be found in the worksheets and evidence summaries.

    Practitioners should use additional resources in conjunction with the evidence analysis documents for information regarding further potential side-effects of magnesium supplementation.
Two high-quality studies of heart failure patients found beneficial affects of IV magnesium supplementation on heart failure outcomes.

**Recommendation Strength Rationale**
- Studies were high-quality
- Studies had consistent findings
- Studies were of small sample sizes
- Conclusion statement was a grade II

**Minority Opinions**
None.

**Supporting Evidence**
The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).

For the patient with heart failure, does correcting magnesium deficiencies provide beneficial outcomes?

**References**

**References not graded in Academy of Nutrition and Dietetics Evidence Analysis Process**

**Quick Links**

**Recommendations Summary**

**Heart Failure (HF) Alcohol and Heart Failure**

*Click here* to see the explanation of recommendation ratings (Strong, Fair, Weak, Consensus, Insufficient Evidence) and labels (Imperative or Conditional). To see more detail on the evidence from which the following recommendations were drawn, use the hyperlinks in the Supporting Evidence Section below.

**Recommendation(s)**

**HF: Alcohol and Heart Failure**

Current limited evidence does not justify encouraging those who do not drink alcohol to start doing so. If a patient currently drinks alcohol, and if not contraindicated, then a maximum of one drink per day for women and up to two drinks per day for men may be tolerated. This level of alcohol consumption has been demonstrated to not be harmful in heart failure patients.

**Rating: Fair Conditional**

**Risks/Harms of Implementing This Recommendation**
- Possible adverse effects of alcohol use:
  - Fetal alcohol syndrome
  - Hypertension
  - Cardiac arrhythmia
  - Sudden death
  - Long-term consumption of 60g alcohol per day (approximately 4-5 drinks) is associated with risk for strokes of all types
  - Increases in serum triglyceride and VLDL cholesterol, resulting in increased risk for pancreatitis in some individuals
- Increased risk of automobile accident, trauma, and suicide.

**Conditions of Application**

Recommendation applies only to those who drink alcohol.

One drink is equal to 12 oz beer, 4-5 oz. wine or 1.5 oz. distilled spirits.

Contraindications include:

- Suspicion or history of alcohol abuse
- Liver failure
- Pregnancy

**Potential Costs Associated with Application**

None

**Recommendation Narrative**

A retrospective analysis of high-quality found light-to-moderate drinkers with left ventricular (LV) dysfunction had decreased risk of all-cause mortality, fatal myocardial infarction and noncardiovascular death (p<0.01) in patients with ischemic LV dysfunction versus abstainers.

A longitudinal study of high-quality found no difference in survival and hospitalization rates, symptoms, physical and social function, and quality of life in HF patients who were abstainers and low-moderate drinkers.

Other studies in the analysis were not applicable to the question either because they were of alcohol abusers or comparing men and women.

**Recommendation Strength Rationale**

Rationale:

- A large well designed study was included in the analysis
- Studies were of similar patients (primarily NYHA stage I, II and III)
- Consistent findings of no harm from alcohol consumption in patients with heart failure
- Conclusion statement is a grade II

**Areas of uncertainty:**

- Although studies included a small group of NYHA stage IV patients, practitioners should be cautious with this population.

**Minority Opinions**

None.

**Supporting Evidence**

The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).

For the patient with heart failure, does alcohol intake affect heart function?

**References**


**Dietary Guidelines for Americans, 2005**


**American Heart Association Guidelines**

http://americanheart.org/presenter.jhtml?

**Quick Links**

Recommendations Summary

Heart Failure (HF) L-Arginine, Carnitine, Coenzyme Q10 and Hawthorn and Heart Failure

Click here to see the explanation of recommendation ratings (Strong, Fair, Weak, Consensus, Insufficient Evidence) and labels (Imperative or Conditional). To see more detail on the evidence from which the following recommendations were drawn, use the hyperlinks in the Supporting Evidence Section below.

- **Recommendation(s)**
  
  HF: L-Arginine, Carnitine, Coenzyme Q10 and Hawthorn

  If a patient inquires about or is currently taking L-arginine, carnitine, coenzyme Q10 or hawthorn supplements, then the practitioner may discuss the limited evidence available regarding clinical heart failure outcomes. Research is inconclusive. The practitioner should stay alert to future research involving these supplements.

  **Rating: Weak**
  
  **Conditional**

  - **Risks/Harms of Implementing This Recommendation**

    A nonsignificant number of subjects in the studies reported mild adverse reactions taking these supplements:

    | Supplements   | Adverse Reactions                                           |
    |---------------|------------------------------------------------------------|
    | L-Arginine    | none specified                                             |
    | Carnitine     | nausea, minor GI problems                                  |
    | Coenzyme Q10  | transient nausea, maculopapular rash, epigastric pain, dizziness, photophobia, irritability |
    | Hawthorn      | dizziness, vertigo                                         |

  As with any supplement, caution is required regarding the risks and harms of taking supplements in different disease states and with various medications.

  - **Contraindications**

    Practitioners should use additional resources in conjunction with the evidence analysis documents for information regarding further potential side effects of these supplements. See the Food and Drug Administration more information on the drugs listed below.

    - **Coenzyme Q10**
      
      Use caution in patients taking warfarin (Coumadin), as CoQ10 is chemically similar to vitamin K and can decrease the effectiveness of warfarin.

    - **Hawthorn**
      
      Use caution in patients taking beta-blockers and calcium channel blockers, as hawthorn may decrease blood pressure. Hawthorn in combination with digoxin or may increase the serum digoxin levels and increase the risk of side effects. Taking hawthorn with nitrates which increase blood flow may cause dizziness and lightheadedness.

  - **Conditions of Application**

    None.

  - **Potential Costs Associated with Application**

    None.

  - **Recommendation Narrative**

    **L-Arginine**

    - Four trials found improvement in heart failure outcomes with L-arginine. Study results are preliminary because the range in doses and delivery methods varied between studies. In addition, all studies were of small sample sizes. Three studies were high and one was neutral quality.

    **Carnitine**

    - Two neutral quality randomized controlled studies found beneficial outcomes with oral supplementation of carnitine.

    **CoEnzyme Q10**

    - A high-quality systematic review, which included five randomized placebo-controlled studies plus a meta-analysis reported that heart failure patients may benefit from using CoEnzyme Q10. One other high-quality RCT found no benefit.
    
    - Six studies found positive results but these were primarily neutral quality studies and contained small sample sizes.

    **Hawthorn**

    - A high quality meta-analysis that included eight randomized double-blind placebo controlled trials found a beneficial effect in favor of hawthorn for maximal workload, pressure-heart rate products and improved symptoms (fatigue and dyspnea).
**Recommendation Strength Rationale**

- Studies of varying quality have not confirmed benefit with these supplements.
- Conclusion statements were Grade III with the exception of Coenzyme Q10, which was a Grade II.
- The American Heart Association and American College of Cardiology 2005 Practice Guidelines for Heart Failure found similar findings and stated, "use of nutritional supplements to treat structural heart disease or to prevent the development of heart failure is not recommended."

**Minority Opinions**

None.

**Supporting Evidence**

The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).

- For the patient with heart failure, does L-arginine provide beneficial outcomes?
- For the patient with heart failure, does carnitine provide beneficial outcomes?
- For the patient with heart failure, does the hawthorn provide beneficial outcomes?
- For the patient with heart failure, does CoEnzyme Q10 provides beneficial outcomes?

**References**


References not graded in Academy of Nutrition and Dietetics Evidence Analysis Process


Natural Medicines Comprehensive Database.
Heart Failure
Heart Failure (HF) Guideline (2008)

Quick Links

Recommendations

Recommendations Summary

DM: Medical Nutrition Therapy 2008

Click here to see the explanation of recommendation ratings (Strong, Fair, Weak, Consensus, Insufficient Evidence) and labels (Imperative or Conditional). To see more detail on the evidence from which the following recommendations were drawn, use the hyperlinks in the Supporting Evidence Section below.

- Recommendation(s)
  DM: MNT and Number/Length of Initial Series of Encounters

Medical nutrition therapy (MNT) provided by a registered dietitian (RD) is recommended for individuals with type 1 and type 2 diabetes. An initial series of three to four encounters each lasting from 45 to 90 minutes is recommended. This series, beginning at diagnosis of diabetes or at first referral to an RD for MNT for diabetes, should be completed within three to six months. The RD should determine if additional MNT encounters are needed after the initial series based on the nutrition assessment of learning needs and progress towards desired outcomes. Studies based on a range in the number (1-5 individual sessions or a series of 6-12 group sessions) and length (45-90 minutes) report sustained positive outcomes at one year and longer. Studies implementing a variety of nutrition interventions report a reduction in A1C levels, and some studies also report improved lipid profiles, improved weight management, adjustments in medications, and reduction in the risk for onset and progression of comorbidities.

Rating: Strong
Imperative

DM: MNT Long-Term Follow-up Encounters

At least one follow-up encounter is recommended annually to reinforce lifestyle changes and to evaluate and monitor outcomes that impact the need for changes in MNT or medication. The RD should determine if additional MNT encounters are needed. Studies involving regular lifestyle intervention sessions (up to 1 per month) report sustained positive outcomes at one year and longer.

Rating: Strong
Imperative

- Risks/Harms of Implementing This Recommendation
  None.

- Conditions of Application
  None.

- Potential Costs Associated with Application
  Although costs of MNT sessions and reimbursement vary, medical nutrition therapy sessions are essential for improved outcomes.

- Recommendation Narrative
  
  MNT has its greatest impact at diagnosis of diabetes (Monk et al, 1995; Delahanty et al, 1998).
  Eight studies (Franz et al, 1995; DAFNE Study Group, 2002; Graber et al, 2002; Miller et al, 2002; Goldhaber-Fiebert et al, 2003; Wilson et al, 2003; Lemon et al, 2004; Gaetke et al, 2006), evaluating the effectiveness of diabetes MNT at three to six months, reported reductions in A1C, ranging from 0.25% to 2.9%, depending on the type and duration of diabetes. Individual sessions ranging from one to five or a series of 10 to 12 group sessions were employed.
  A variety of nutrition therapy interventions, such as a reduced energy and fat intake, carbohydrate counting, simplified meal plans, healthy food choices, individualized meal planning strategies, exchange lists, insulin-to-carbohydrate ratios and behavioral strategies were implemented.
  The number of initial and follow-up sessions varies in all the studies.
  Studies reporting on effectiveness of MNT from six to twelve months (Lemon et al, 2004; DAFNE Study Group, 2002; Franz et al, 1995; Wolf et al, 2004; Banister et al, 2004; Chima et al, 2005; Bray et al, 2005) report a variety in the number and type of MNT sessions that lead to improved outcomes. Therefore, the RD needs to determine what is appropriate for individual clients.
  Seven studies (DCCT, 1993; Latihnen et al, 1993; Maislos et al, 2002; Banister et al, 2004; Wolf et al, 2004; Bray et al, 2005; Chima et al, 2005) report sustained improvements in A1C at 12 months and longer. All involved regular sessions with an RD, ranging from monthly to three sessions per year.
et al, 2004; Wolf et al, 2004; Gaetke et al, 2006) report improvements in other outcomes, such as improved lipid profiles, weight management, decreased need for medications and reduced risk for onset and progression of comorbidities.

**Recommendation Strength Rationale**

- Conclusion statement was Grade I

**Minority Opinions**

Consensus reached.

**Supporting Evidence**

The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).

**How effective is MNT provided by Registered Dietitians in the management of persons with type 1 and type 2 diabetes?**

**References**

Recommendation(s)

DM: Intervention Options

The RD should implement MNT selecting from a variety of interventions (reduced energy and fat intake, carbohydrate counting, simplified meal plans, healthy food choices, individualized meal planning strategies, exchange lists, insulin-to-carbohydrate ratios, physical activity and behavioral strategies). Nutrition education and counseling should be sensitive to the personal needs, willingness to change, and ability to make changes of the individual with diabetes. Studies reporting on effectiveness of MNT report a variety in the number and type of MNT sessions that lead to improved outcomes.

Rating: Strong

Imperative

- Risks/Harms of Implementing This Recommendation

  None.

- Conditions of Application

  None.

- Potential Costs Associated with Application

  Although costs of MNT sessions and reimbursement vary, medical nutrition therapy sessions are essential for improved outcomes.

- Recommendation Narrative

  - MNT has its greatest impact at diagnosis of diabetes (Monk et al, 1995; Delahanty et al, 1998).
  - Eight studies (Franz et al, 1995; DAFNE Study Group, 2002; Graber et al, 2002; Miller et al, 2002; Goldhaber-Fiebert et al, 2003; Wilson et al, 2003; Lemon et al, 2004; Gaetke et al, 2006), evaluating the effectiveness of diabetes MNT at three to six months, reported reductions in A1C, ranging from 0.25% to 2.9%, depending on the type and duration of diabetes. Individual sessions ranging from one to five or a series of 10 to 12 group sessions were employed.
  - A variety of nutrition therapy interventions, such as a reduced energy and fat intake, carbohydrate counting, simplified meal plans, healthy food choices, individualized meal planning strategies, exchange lists, insulin-to-carbohydrate ratios and behavioral strategies were implemented.
  - The number of initial and follow-up sessions varies in all the studies.
  - Studies reporting on effectiveness of MNT from six to twelve months (Lemon et al, 2004; DAFNE Study Group, 2002; Franz et al, 1995; Wolf et al, 2004; Banister et al, 2004; Chima et al, 2005; Bray et al, 2005) report a variety in the number and type of MNT sessions that lead to improved outcomes. Therefore, the RD needs to determine what is appropriate for individual clients.
  - Seven studies (DCCT, 1993; Laitinen et al, 1993; Maislos et al, 2002; Banister et al, 2004; Wolf et al, 2004; Bray et al, 2005; Chima et al, 2005) report sustained improvements in A1C at 12 months and longer. All involved regular sessions with an RD, ranging from monthly to three sessions per year.
  - Seven studies (DCCT, 1993; Franz et al, 1995; Goldhaber-Fiebert et al, 2003; Banister et al, 2004; Lemon et al, 2004; Wolf et al, 2004; Gaetke et al, 2006) report improvements in other outcomes, such as improved lipid profiles, weight management, decreased need for medications and reduced risk for onset and progression of comorbidities.
  - American Diabetes Association Recommendation: Nutrition counseling should be sensitive to the personal needs, willingness to change, and ability to make changes of the individual with pre-diabetes or diabetes (Grade E).

- Recommendation Strength Rationale

  - Conclusion Statement was given Grade I

- Minority Opinions

  Consensus reached.

- Supporting Evidence

The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).

How effective is MNT provided by Registered Dietitians in the management of persons with type 1 and type 2 diabetes?

- References


References not graded in Academy of Nutrition and Dietetics Evidence Analysis Process


Quick Links

- Heart Failure
- Heart Failure (HF) Guideline (2008)
**Recommendations Summary**

**DM: Monitor & Evaluate and Diabetes 2008**

Click here to see the explanation of recommendation ratings (Strong, Fair, Weak, Consensus, Insufficient Evidence) and labels (Imperative or Conditional). To see more detail on the evidence from which the following recommendations were drawn, use the hyperlinks in the Supporting Evidence Section below.

- **Recommendation(s)**
  
  **DM: Monitoring and Evaluation**

  The RD should monitor and evaluate food intake, medication, metabolic control (glycemia, lipids, and blood pressure), anthropometric measurements and physical activity. Research reports sustained improvements in A1C at 12 months and longer with long-term follow-up encounters with an RD.

  **Rating: Strong**
  
  Imperative

  **DM: Evaluation of Glycemic Control**

  The RD should primarily use blood glucose monitoring results in evaluating the achievement of goals and effectiveness of MNT. Glucose monitoring results can be used to determine whether adjustments in foods and meals will be sufficient to achieve blood glucose goals or if medication additions or adjustments need to be combined with MNT.

  **Rating: Consensus**
  
  Imperative

- **Risks/Harms of Implementing This Recommendation**

  None.

- **Conditions of Application**

  None.

- **Potential Costs Associated with Application**

  Although costs of MNT sessions and reimbursement vary, medical nutrition therapy sessions are essential for improved outcomes.

- **Recommendation Narrative**

  - MNT has its greatest impact at diagnosis of diabetes (Monk et al, 1995; Delahanty et al, 1998).
  - Eight studies (Franz et al, 1995; DAFNE Study Group, 2002; Graber et al, 2002; Miller et al, 2002; Goldhaber-Fiebert et al, 2003; Wilson et al, 2003; Lemon et al, 2004; Gaetke et al, 2006), evaluating the effectiveness of diabetes MNT at three to six months, reported reductions in A1C, ranging from 0.25% to 2.9%, depending on the type and duration of diabetes. Individual sessions ranging from one to five or a series of 10 to 12 group sessions were employed.
  - A variety of nutrition therapy interventions, such as a reduced energy and fat intake, carbohydrate counting, simplified meal plans, healthy food choices, individualized meal planning strategies, exchange lists, insulin-to-carbohydrate ratios and behavioral strategies were implemented.
  - The number of initial and follow-up sessions varies in all the studies.
  - Studies reporting on effectiveness of MNT from six to twelve months (Lemon et al, 2004; DAFNE Study Group, 2002; Franz et al, 1995; Wolf et al, 2004; Banister et al, 2004; Chima et al, 2005; Bray et al, 2005) report a variety in the number and type of MNT sessions that lead to improved outcomes. Therefore, the RD needs to determine what is appropriate for individual clients.
  - Seven studies (DCCT, 1993; Laitinen et al, 1993; Maislos et al, 2002; Banister et al, 2004; Wolf et al, 2004; Bray et al, 2005; Chima et al, 2005) report sustained improvements in A1C at 12 months and longer. All involved regular sessions with an RD, ranging from monthly to three sessions per year.
  - Seven studies (DCCT, 1993; Franz et al, 1995; Goldhaber-Fiebert et al, 2003; Banister et al, 2004; Lemon et al, 2004; Wolf et al, 2004; Gaetke et al, 2006) report improvements in other outcomes, such as improved lipid profiles, weight management, decreased need for medications and reduced risk for onset and progression of comorbidities.
  - American Diabetes Association Recommendation: Plasma glucose monitoring can be used to determine whether adjustments in foods and meals will be sufficient to achieve blood glucose goals or if medication(s) needs to be combined with MNT (Grade E).

- **Conclusion Statement for MNT given Grade I**

  - Recommendation Strength Rationale

  - Minority Opinions

  Consensus reached.

- **Supporting Evidence**

  The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence
How effective is MNT provided by Registered Dietitians in the management of persons with type 1 and type 2 diabetes?

References


Heart Failure

Heart Failure (HF) Guideline (2008)

Quick Links

Recommendations Summary
**DLM: Referral to a Registered Dietitian for Medical Nutrition Therapy (MNT) 2005**

Click here to see the explanation of recommendation ratings (Strong, Fair, Weak, Consensus, Insufficient Evidence) and labels (Imperative or Conditional). To see more detail on the evidence from which the following recommendations were drawn, use the hyperlinks in the Supporting Evidence Section below.

- **Recommendation(s)**
  
  **DLM: MNT and Referral to a Registered Dietitian**

  Referral to a registered dietitian for Medical Nutrition Therapy (MNT) is recommended whenever an individual has an abnormal lipid profile, based on ATPIII Risk category and LDL-C goals, or has CHD. A planned initial visit lasting from 45-90 minutes and at least two to six planned follow-up visits (30-60 minutes each, with an RD) can lead to improved dietary pattern; improved lipid profile; reduced plasma total cholesterol, LDL-C, and triglycerides; and improved weight status.

  **Rating:** Strong
  Conditional

  **DLM: MNT Number and Duration of Visits**

  The number and duration of visits in the course of Medical Nutrition Therapy will need to be greater if the client is in a higher risk category, if there is a large number of Therapeutic Lifestyle Changes (TLC) that need to be made, and if the individual is not motivated to make TLC changes. Increasing the number of visits and length of time spent with a dietitian can improve serum lipid levels and CVD risk.

  **Rating:** Fair
  Conditional

  **DLM: Lipid-Lowering Medication Re-evaluation**

  Re-evaluate the dosage and necessity of lipid-lowering medications throughout the course of Medical Nutrition Therapy. Medical Nutrition Therapy may successfully improve the lipid levels to the point where medication doses can be lowered or discontinued.

  **Rating:** Fair
  Imperative

  - **Risks/Harms of Implementing This Recommendation**

    None.

  - **Conditions of Application**

    None specified.

  - **Potential Costs Associated with Application**

    None specified.

  - **Recommendation Narrative**

    - Seven studies (four RCT, two retrospective chart reviews, and one nonrandomized trial with use of historic controls) describe individualized Medical Nutrition Therapy that results in improved cardioprotective dietary pattern changes and/or subsequent plasma lipid changes, thereby decreasing cardiac heart disease risks. Reductions in total fat and saturated fat intake were seen in three studies (two high- and one neutral-quality). Decreases in TC and LDL-C were reported in five studies (three high- and two neutral-quality). Three of these studies found reductions in body weight. Four studies looked at the impact on TG and HDL-C and found varying results.

    - Two studies (one neutral-quality retrospective chart review and one neutral-quality RCT) found that decreases in total cholesterol correlated with time spent with a dietitian. A third high-quality RCT found that individuals who went to three or four MNT sessions had lower LDL-C compared to those that attended fewer than three sessions.

    - Two retrospective chart reviews (one high- and one neutral-quality) found that MNT obviated the need for lipid-lowering medications in some patients.

    - One study identified a trend that the dietitian group had lower attrition compared to the control group (MD counseling), possibly indicating preferences for services provided by a dietitian.

  - **Recommendation Strength Rationale**

    - Studies were of a variety of populations. Studies represented individuals (21-75 years of age) who had ischemic heart disease, hypercholesterolemia, hyperlipidemia (high LDL-C), combined hyperlipidemia (high LDL-C and TG), or hypertriglyceridemia; but excluded familial hypertriglyceridemia (FH).

    - Sufficient time was provided to see outcomes (six weeks was the shortest intervention, with the longest intervention lasting more than six months).

    - Consistent findings across a variety of study designs.

    - Conclusion statements were Grade I, III and V.
Supporting Evidence

The recommendations were created from the evidence analysis on the following questions. To see detail of the evidence analysis, click the blue hyperlinks below (recommendations rated consensus will not have supporting evidence linked).

1. In patients with disorders of lipid metabolism, does medical nutrition therapy (MNT) given by a registered dietitian result in changes in levels of dietary fat, saturated fat, serum cholesterol, and cardiac risk factors?
2. Do additional medical nutrition therapy (MNT) visits with a registered dietitian (RD) result in further reductions in total and LDL cholesterol in adults?
3. (2005) What is the optimal duration and frequency of follow-up visits for an adult patient by a registered dietitian using medical nutrition therapy (MNT)?
4. In patients with disorders of lipid metabolism, does MNT result in reduced need for lipid lowering medications?

References

- Plous S, Chesne RB, McDowell AV. Nutrition knowledge and attitudes of cardiac clients. JADA. 1995; 95: 442-446.
- 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. JADA. 2000; 100: 218-224.