Community Preventive Services Task Force

# Diabetes Prevention and Control: Intensive Lifestyle Interventions for Patients with Type 2 Diabetes

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## Finding and Rationale Statement
## Ratified October 2016

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# CPSTF Finding and Rationale Statement

## Intervention Definition

During intensive lifestyle interventions patients with type 2 diabetes receive counseling and support to help them change their diet or level of physical activity. Programs must provide ongoing counseling, coaching, or individualized guidance on dietary modifications, regular exercise, or both. Patients must interact with program staff multiple times over a period of six months or longer. Dietary modification components may include tailored advice on dietary changes or meal substitutions. Physical activity components may include structured and personalized guidance, or supervised exercise training. Programs may have weight loss goals or include additional components related to weight loss or maintenance.

## CPSTF Finding (October 2016)

The Community Preventive Services Task Force (CPSTF) recommends intensive lifestyle interventions for patients with type 2 diabetes based on sufficient evidence of effectiveness in improving glycemic control and reducing risk factors for cardiovascular disease. The largest and longest trial to date provided intensive individual and group counseling and extended interpersonal support for dietary modification, regular physical activity, and weight management.

## Rationale

### Basis of Finding

The Community Preventive Services Task Force (CPSTF) uses recently published systematic reviews to conduct accelerated assessments of interventions that could provide program planners and decision-makers with additional, effective options. The following published review was selected and evaluated by a team of specialists in systematic review methods, and in research, practice, and policy related to diabetes management.

> Huang XL, Pan JH, Chen D, Chen J, Hu TT. Efficacy of lifestyle interventions in patients with type 2 diabetes: A systematic review and meta-analysis. *European Journal of Internal Medicine* 2016;27;37-47.

The CPSTF finding is based on results from the published review and expert input from team members and the CPSTF.

The CPSTF recommendation is based on findings from a published systematic review and meta-analysis of 17 randomized controlled trials (search period through July 15, 2014). Studies were categorized into three subgroups for analysis and qualitative comparison: intensive physical activity programs (5 studies), intensive dietary programs (3 studies), and educational programs (10 studies). Results from the largest and longest study (Look AHEAD trial) were considered in both intensive subgroups.

Studies included in the subset reviews of intensive physical activity or dietary programs (7 studies) evaluated interventions that provided patients specific, tailored instruction on lifestyle changes through multiple interactions over extended periods of time. Evaluated interventions provided a median of 11 sessions [interquartile interval (IQI): 6 to 78 sessions] that were provided as individual sessions (3 studies) or as a combination of individual and group sessions (4 studies). Four of the evaluated programs provided additional, extended telephone contact and two of the programs had frequent, ongoing contact with patients through regular exercise sessions. The median intervention duration was 12 months (IQI: 6.5 months to 24 months). All seven studies established clear goals for patients' dietary changes (3 studies), physical activity levels (5 studies), or weight loss (2 studies).

Findings from intensive subgroup meta-analyses demonstrated the effectiveness of intensive physical activity programs and intensive dietary programs in improving glycemic control and diastolic blood pressure. Intensive dietary programs also were effective in reducing systolic blood pressure and improving HDL-cholesterol. The finding of sufficient evidence was based on the magnitude of effect estimates, number of studies, and consistency of effects shown in the table below.

### Summary Estimates

| Outcomes | Intensive Physical Activity Programs (5 studies) | Intensive Dietary Programs (3 studies) |
|---|---|---|
| Body Mass Index | SMD: -0.77† (95%CI -1.94, 0.39) | SMD: -0.20† (95%CI -0.63, 0.22) |
| HbA1c | SMD: -1.02* (95%CI -1.80, -0.23) | SMD: -0.30* (95%CI -0.35, -0.24) |
| Systolic Blood Pressure | SMD: -0.05† (95% CI -0.46, 0.35) | SMD: -0.19* (95%CI -0.25, -0.14) |
| Diastolic Blood Pressure | SMD: -0.76* (95% CI -1.45, -0.07) | SMD: -0.08* (95%CI -0.13, -0.02) |
| LDL-Cholesterol | SMD: -0.02† (95% CI -0.46, 0.42) | SMD: -0.06† (95% CI -0.41, 0.29) |
| HDL-Cholesterol | SMD: 0.34† (95%CI -0.05, 0.74) | SMD: 0.026* (95%CI 0.21, 0.32) |

SMD: Standardized difference in means

* Statistically significant difference favoring program intervention

† Non-significant difference favoring program intervention

Note: This table summarizes results from the 7 studies categorized into intensive physical activity programs and/or intensive dietary programs. The Look AHEAD trial was included in both categories

## Applicability and Generalizability Issues

Based on evidence from the review, the CPSTF finding is applicable to interventions offered to adults with type 2 diabetes through healthcare settings in the United States. The review by Huang et al. did not examine intervention effectiveness for children and adolescents, so applicability of the CPSTF finding to these groups is unclear.

### Data Quality Issues

Huang et al. conducted a systematic review of evidence from randomized controlled trials. Of the seven trials evaluating intensive interventions, five of did not include blinding for outcome assessment, and only 4 included an intention-to-treat analysis. Their review did not evaluate outcomes related to cardiovascular disease morbidity or mortality, although these were primary outcomes in the largest included study (Look AHEAD).

### Other Benefits and Harms

The review by Huang et al. did not report information on additional benefits or potential harms of these interventions. Postulated benefits for patients include improved engagement in diabetes self-management, including increased adherence to medications and screening recommendations, and improved satisfaction with care. Potential harms include injuries associated with changes in physical activity. Risk of injury can be reduced by emphasizing walking as the primary mode of physical activity and gradually increasing activity levels as tolerated.

### Economic Evidence

Huang et al. did not consider evidence or information on the economic benefits of these interventions. An economic evaluation of the Look AHEAD trial reported lower health-care costs over 10 years.

### Considerations for Implementation

The review by Huang et al. did not report information on intervention implementation.

The U.S. Preventive Services Task Force (USPSTF) issued the following in 2015:

> *The U.S. Preventive Services Task Force recommends screening for abnormal blood glucose as part of cardiovascular risk assessment in adults aged 40 to 70 years who are overweight or obese. Clinicians should offer or refer patients with abnormal blood glucose to intensive behavioral counseling interventions to promote a healthful diet and physical activity. (B recommendation: October 2015)*

This recommendation will likely increase demand for early intervention to support patients in making lifestyle changes and adopting long-term self-management behaviors.

Close coordination between healthcare systems, healthcare providers, and community-based programs is likely to be an essential element of sustainable community-based services for the following reasons:

- Healthcare coverage for preventive services recommended by the USPSTF is likely to be an important source of funding for community-based programs once barriers to billing and reimbursement are addressed.
- Patients with, or at increased risk for, cardiovascular disease may need pre-intervention assessments before initiating changes in physical activity, diet, and weight management.
- Patients will need regular, ongoing diabetes care and medication management which may require adjustment as lifestyle changes are adopted.

### Evidence Gaps

Huang et al. provided little information on remaining evidence gaps. Future research should aim to do the following to increase understanding about intensive lifestyle interventions.

- Evaluate the effectiveness of specific programs in different populations (e.g., by race, SES, educational attainment, age, cognitive or physical disabilities)

- Study the effectiveness of programs delivered via the internet, email, apps, or social networking
- Assess the relative effectiveness of individual and group sessions
- Identify effective structures for the maintenance phase of these programs to help program participants continue their improvements to diet and physical activity following completion of the programs' core phase
- Conduct long-term follow-up of community-based programs to evaluate the durability of the programs' effect on glycemic control, weight loss, cardiovascular disease risk factors, morbidity, and mortality
- Determine attrition rates, understand the reasons program participants drop out, and develop methods to retain them in programs

## References

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## Disclaimer



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