



# INDIAN HEALTH DIABETES BEST PRACTICE

## Diabetes Prevention

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# Instructions for Using This Best Practice

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The Best Practices are organized into topics on how to plan for and successfully implement a Best Practice in your community.

- **Part 1** provides background information on planning your program and evaluation, Key Recommendations, and Key Measures.
- **Part 2** provides details on implementation of the Key Recommendations.
- **Part 3** includes appendices, tools, and resources.
- **Part 4** provides a list of references.

As you prepare to select, implement, and evaluate a Best Practice, consider these planning guidelines:

- Meet with your diabetes team to discuss which Best Practice(s) is best suited for your situation and resources.
- Use data from your Diabetes Outcomes and Audit, and/or from a community needs assessment to guide your selection of the Best Practice(s).
- Determine your program goal(s) as a team. For example, your team may decide to conduct a community needs assessment of interest in diabetes education and/or providing community education to increase awareness of risks for diabetes.
- Print out at least Part 1 of the Best Practice(s) your team feels is most appropriate to implement.
- Work with your diabetes team to review and discuss the Best Practice(s). You may choose to read it together as a team.
- Choose at least one Best Practice after carefully considering your goals and resources (funding, staff, and time).
- **Review the entire Best Practice(s) you have selected with your diabetes team:**
  - Confirm that you have selected a Best Practice(s) appropriate for your community needs and resources, and that you are confident that your team can successfully implement, evaluate (measure), and document progress and outcomes.
  - Target the population your team wants to improve outcomes for with the Best Practice(s). Remember, you probably do not have resources to do everything for everyone.
  - Carefully consider the Key Recommendations. The recommendations are based on evidence and have been proven to be effective. You may already be doing some of the recommendations and can easily fit these into your plan or you may want to consider some new recommendations to enhance and strengthen your program. Identify those your team can implement.
  - Carefully review the Key Measures. Choose those that best fit with your goals and the Key Recommendations you have chosen to implement.
  - If one Best Practice does not fit, then review another Best Practice until you find one that fits.

Throughout the document you will find links that draw your attention to important items within the Best Practice pdf. Here is a list of the items:

- **Action!** Indicates a **link**. Please use the link to access more detailed descriptions.
- **Note!** Indicates an **important** item. Pay special attention to this **important** item.

# Summary of Key Recommendations and Key Measures

**These are evidence-based actions that will lead to improved outcomes in the community. Action! See [Part 2](#) for details on the implementation of each key recommendation.**

1. Identify adult population at risk for type 2 diabetes and recruit them into the diabetes prevention program.
2. Provide intensive lifestyle intervention, including intensive training in diet, physical activity, and behavior modification to achieve weight loss.
3. Use a lifestyle coach case management approach.
4. Use a medical protocol for medications for diabetes prevention.
5. Monitor and support participant progress.

**These are specific measures that can be used to document changes in outcomes related to implementing the Best Practice.**

**Note! All SDPI grant programs that choose this Best Practice are required to report as required in the terms and conditions attached to the notice of award on indicated Measures. Programs may report on other measures as well.**

The following measures are of primary importance:

1. \*Percentage of all participants who achieve their weight loss goal.
2. \*Percentage of all participants who achieve their nutrition goal(s).
3. \*Percentage of all participants who achieve their physical activity goal(s).
4. Percentage of participants who complete intensive lifestyle intervention.
5. Average number of contacts per participant with their lifestyle coach case manager.

# PART 1 Essential Elements of Implementing this Best Practice

## Purpose and Target Population

A diabetes prevention program includes planned interventions that aim to delay or prevent the onset of type 2 diabetes.

This Best Practice describes recommendations for health care that serves adults who are at risk for type 2 diabetes.

**Action! See** the IHS Diabetes Best Practice for *Youth and Type 2 Diabetes Prevention and Treatment* for recommendations for health care that serves youth who are at risk for type 2 diabetes.

## Intended Users of this Best Practice

- Primary health care teams
- educators
- diabetes prevention outreach teams/health promotion services
- community workers who provide education and/or services, and
- leaders of health care organizations.

**Action! See** [Part 3 – Appendix A](#). Supplemental Information for discussion of the benefits and risks of implementing this Best Practice.

## Importance of Diabetes Prevention

Organizations and communities that successfully implement these recommendations can expect to reduce the number of new cases of type 2 diabetes diagnosed in adults each year. The national Diabetes Prevention Program Study found that for every seven persons who participated in the lifestyle intervention program during a three year period, one case of diabetes was prevented. (The DPP Research Group, 2002)

**Action! See** [Part 3 – Appendix A](#) for more on the importance of a diabetes prevention program.

## Goals of This Best Practice

The overall goals of this diabetes prevention Best Practice are:

- To develop, have in place, and put into practice written guidelines for identification of adults at risk for diabetes.
- To develop, have in place, and put into practice written protocols for diabetes prevention that includes intensive lifestyle intervention and support for maintenance of weight loss and physical activity.

# Key Recommendations

These are evidence-based actions that can lead to improved outcomes for adults at risk for type 2 diabetes.

**These are evidence-based actions that will lead to improved outcomes in the community. Action! See [Part 2](#) for details on the implementation of each Key Recommendation.**

1. Identify adult population at risk for type 2 diabetes and recruit them into the diabetes prevention program.
2. Provide intensive lifestyle intervention, including intensive training in diet, physical activity, and behavior modification to achieve weight.
3. Use a lifestyle coach case management approach.
4. Use a medical protocol for medications for diabetes prevention.
5. Monitor and support participant progress.

# Planning For Your Program and Evaluation

## ***Key action steps in program and evaluation planning include:***

1. **Identify your program's goal(s).** There are many program goals consistent with the Key Recommendations of this practice. Examples of Program Goals include:
  - Increase the number of adults at risk for diabetes who participate in a diabetes prevention program.
  - Decrease the number of adults who develop type 2 diabetes.
2. **Define program objectives** that will be met to reach the program goal(s) in the **SMART format** (specific, measurable, action-oriented, realistic, and time-bound).

Examples of SMART objectives for this Best Practice:

During the first year of diabetes prevention program implementation:

- 50% of adults in the community who are identified as having pre-diabetes will enroll in the diabetes prevention program.
  - 25% of diabetes prevention program participants will achieve a 7% or greater loss of body weight by six months after completion of intensive lifestyle intervention.
3. **Use Key Measures.** The following Key Measures can be used to monitor progress and the effectiveness of implementing this Best Practice. Results of measures will indicate the degree of success in implementing the **Key Recommendations** and meeting program goals.

Measures of progress need to occur before the intervention (baseline) and at designated times thereafter. Measurement needs to be frequent enough to provide meaningful information for planning and evaluation.

## Key Measures

These are specific measures that can be used to document changes in outcomes related to implementing the Best Practice.

**Note!** All SDPI grant programs that choose this Best Practice are **required** to report as required in the terms and conditions attached to the notice of award on indicated Measures. Programs may report on other measures as well.

The following measures are of primary importance:

1. \*Percentage of all participants who achieve their weight loss goal.
2. \*Percentage of all participants who achieve their nutrition goal(s).
3. \*Percentage of all participants who achieve their physical activity goal(s).
4. Percentage of participants who complete intensive lifestyle intervention.
5. Average number of contacts per participant with their lifestyle coach case manager.

4. **Collect, record, and analyze data** on an ongoing basis; share with the team and the organization leadership.
5. Use creative ways to display data and measure outcomes, such as graphs or charts. This helps the team understand the data and know whether there are improvements.
6. **Think about what the data are telling you.** What changes are you seeing? Are they improvements? Use data for planning next steps.

**Action! See** the following resources to help your program improve.

**See Part 3 – Appendix B. Key Measures Example** to assist you with identifying ways to choose Key Measures that incorporate your community data.

**See Part 3 – Appendix C. Improving Diabetes Prevention Programs Example** to assist you with applying Key Recommendations and Key Measures to a program plan.

**Action! See** an online training and a workbook to get more ideas about setting goals and objectives, and developing a program plan. Available from: (see pages 23-28.)  
<http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Training/WebBased/Basics/Creating/Workbook.pdf>

**Team Notes:**

# Part 2 Key Recommendations

**Note!** Part 2 provides **important** detail on the “why?” and “how?” of implementation of each Key Recommendation.

## Key Recommendation 1. Identify adult population at risk for type 2 diabetes and recruit them into the diabetes prevention program.

### Why?

Type 2 diabetes can be prevented or delayed in adults with prediabetes who receive intensive lifestyle management (weight loss and increased physical activity) and/or take medication (metformin or pioglitazone). Studies in the U.S., Finland, India, and China have shown that the risk-reduction can be sustained and adults with pre-diabetes who received intensive lifestyle management can delay diabetes for up to ten years. The prevention and/or delay of type 2 diabetes in people with prediabetes should decrease the rate of complications of diabetes. (IHS SDPI Diabetes Prevention Data Projects, 2010; Diabetes Prevention Program (DPP) 10-Year Results, 2009; Follow-up of Finnish Diabetes Prevention Study, 2006; The Indian Diabetes Prevention Programme, 2006; 20-Year China Da Qung Follow-up Study, 2008; DeFronzo, RA et al, 2011.)

### How to Implement the Key Recommendation

- A. **Identify target population** as people age 18 or older in the community. The goal is to identify all adults at risk for type 2 diabetes in the community.
- B. **A person is at risk for type 2 diabetes** if they have prediabetes or a positive diabetes risk assessment.
- C. **Adults at risk for type 2 diabetes can be identified with testing for prediabetes or completion of a diabetes risk assessment.**
- D. **Because AI/AN people are at high risk for type 2 diabetes**, when feasible, test all adults for prediabetes. (IHS, DPP Funding Proposal, 2010)
- E. **Use a venous blood sample** for prediabetes testing.
- F. **A person has prediabetes if** (*ADA Clinical Practice Recommendations, 2011*):

**Table 1. Laboratory Values for Diagnosis of Prediabetes**

	<b>Prediabetes</b>
<b>FPG</b>	100-125 mg/dL (IFG)
<b>2-hour plasma glucose (using a 75-g OGTT)</b>	140-199 mg/dL (IGT)
<b>A1C</b>	5.7%-6.4% (high risk for diabetes)

- G. **Recruit/enroll all adults with prediabetes into the diabetes prevention program.** Intensive lifestyle intervention for adults with prediabetes has been proven to prevent or delay type 2 diabetes. (See references under [Why?](#) above.)
- H. **If test results are normal** (less than the range of prediabetes in table above), repeat testing at least every three years; consider more frequent testing depending on initial results and risk status (*ADA Clinical Practice Recommendations, 2011*).

- I. **If test results indicate diabetes**, refer to appropriate health care provider.  
A person has diabetes if (*ADA Clinical Practice Recommendations, 2011*):

**Table 2. Laboratory Values for Diagnosis of Diabetes**

	<b>Diabetes</b>
<b>FPG</b>	126 mg/dL or greater
<b>2-hour plasma glucose (using a 75-g OGTT)</b>	200 mg/dL or greater
<b>A1C</b>	6.5% or greater

A random plasma glucose 200 mg/dL or greater with classic symptoms of hyperglycemia, or hyperglycemia crisis, is also diagnostic of diabetes.

- J. **Complete a diabetes risk assessment when it is not feasible to test for prediabetes and/or a person refuses a blood test for prediabetes.** The diabetes risk assessment may be used as a tool to educate and recruit people for prediabetes testing.

**Note!** Studies to date have not proven that intensive lifestyle intervention prevents or delays type 2 diabetes for people who have risk factors for type 2 diabetes but do not have prediabetes.

- K. **The diabetes risk assessment can be completed at a variety of community settings,** such as:

- Area businesses
- Community centers
- Community health fairs
- Community physical activity events
- Fitness centers
- Powwows
- Staff wellness program sites
- Worksites

- L. **Use routine health visits as opportunities to complete a diabetes risk assessment and/test for prediabetes.**

- M. **A diabetes risk assessment includes** screening for the following risk factors for type 2 diabetes (*ADA Clinical Practice Recommendations, 2011*):

- body mass index (BMI) 25 kg/m<sup>2</sup> or greater
- high-risk race/ethnic group (Native American, African American, Latino, Asian American, Pacific Islander)
- family member with type 2 diabetes (parent or sibling)
- physical inactivity
- previous diagnosis of prediabetes or A1C 5.7% or greater
- history of gestational diabetes or delivery of baby > 9lb
- history of polycystic ovarian syndrome (PCOS)
- hypertension (HTN) or on medication for HTN
- HDL cholesterol < 35 and/or a triglyceride level (TG) > 250)

- other conditions associated with insulin resistance (waist circumference > 40 in males and > 35 in females, severe obesity, *acanthosis nigricans*)
  - history of cardiovascular disease (CVD)
- N. **Action!** For a **sample diabetes risk assessment** see the ADA Diabetes Risk Test at: <http://www.diabetes.org/diabetes-basics/prevention/diabetes-risk-test>
- O. **If a person has a positive diabetes risk assessment, i.e., two or more risk factors present, and testing for prediabetes is not feasible or is refused, enroll in the diabetes prevention program. Note!** Enrollment priority is for people with prediabetes. Studies to date have not proven that intensive lifestyle intervention prevents or delays type 2 diabetes for people who have risk factors for type 2 diabetes but do not have diabetes. However, if resources allow, enroll people with a positive risk assessment because they would likely benefit.
- P. **Whenever it is not feasible to recruit/enroll a person in the diabetes prevention program, or the person refuses enrollment, refer** to a registered dietitian and/or fitness specialist as well as nutrition and physical activity community events and activities.
- Q. **Do not recruit/enroll people into the diabetes prevention program who are** pregnant, actively abusing alcohol or other substances to the extent that it would affect their participation, have end-stage renal disease (ESRD), have a previous diagnosis of diabetes, have cancer under treatment to the extent that it affects participation, or who have any other illness that limits their ability to participate in an intensive lifestyle program.
- R. **Settings for recruitment may include community or clinical settings**, such as:
- Clinics
  - Community events such as health fairs, cultural gatherings, and sporting events
  - Community settings such as grocery stores, post offices, and other businesses
  - Family events
  - Fitness centers
  - Primary care offices
  - Schools
  - Staff wellness program sites
  - Tribal government centers and offices
  - Worksites
- S. **Methods for recruitment include:**
- advertisements in local media and on billboards
  - clinic/health/wellness facility information
  - community activities and events
  - identification and referral by clinical staff
  - targeted home visits by community health representatives
  - targeted mailings or phone calls from existing records
  - use of graduates from the diabetes prevention program
  - word of mouth
  - written materials such as brochures, posters, and flyers

**Team Notes:**

## **Key Recommendation 2. Provide intensive lifestyle intervention, including intensive training in diet, physical activity, and behavior modification to achieve weight loss.**

### ***Why?***

Participants in the national Diabetes Prevention Program study (DPP) who lost a modest amount of weight through dietary changes and increased physical activity sharply reduced their chances of developing diabetes. Taking metformin also reduced risk, although less dramatically.

In the DPP, participants in the lifestyle intervention group – those receiving intensive individual counseling and motivational support on effective diet, exercise, and behavior modification – reduced their risk of developing diabetes by 58%.

The intensive lifestyle intervention was beneficial regardless of ethnicity, age (adults), BMI, or sex, and resulted in weight loss and increased activity level for the duration of the study. About 5% of the lifestyle intervention group developed diabetes each year during the study period, compared with 11% of those in the placebo group. Lifestyle changes worked particularly well for participants aged 60 and older, reducing their risk by 71%.

(The DPP Research Group, 2002)

**Action! See** DPP Summary at <http://diabetes.niddk.nih.gov/dm/pubs/preventionprogram>  
(The DPP Research Group, 2002)

### **How to Implement the Key Recommendation**

#### **A. Set clearly defined, time-specific, and achievable goals with participant:**

- **Weight loss is the key to diabetes prevention.** The national Diabetes Prevention Program's Lifestyle Balance (See <http://www.hncp.org/>) weight loss program was specifically designed toward preventing and delaying the onset of diabetes. Since weight loss is the key to diabetes prevention, other evidence-based weight loss programs that help people achieve and maintain weight loss similarly to those in the national Diabetes Prevention Program should also prevent and/or delay the onset of type 2 diabetes. Examples of such programs include:
  - Weight Watchers
  - TOPS (Take Off Pounds Sensibly)
  - Working with a Registered Dietitian
- **Weight goal:** 7% or greater loss of body weight and maintenance of weight loss
  - Dietary fat goal: < 25% of calories from fat
  - Calorie intake goal: 1200-1800 kcal/day

**Table 3. Daily Fat and Calorie Goal Chart (DPP)**

<b>Weight (lbs) (Participant)</b>	<b>Fat Goal (grams)</b>	<b>Calorie Goal</b>
120-174	33	1,200
175-219	42	1,500
220-249	50	1,800

250 or greater	55	2,000
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- **Physical activity goal:** 150 minutes or more of aerobic physical activity per week

**B. Provide education and training on nutrition and physical activity methods and behavior modification skills:**

- Use an intensive education curriculum, such as:
  - **Native American Lifestyle Balance Curriculum** available at: <https://www.hncp.org/wst/hpdp/NLB/default.aspx>. **Note!** The lessons in this curriculum are nearly identical to the DPP Curriculum but have been simplified to meet low literacy guidelines and adapted for cultural considerations.
  - **DPP curriculum** available at: <http://www.bsc.gwu.edu/dpp/manuals.html#doc>
  - Other curricula modeled after the DPP
  - Identify curriculum facilitators
- Focus on group interaction and discussion through use of a model script
- Use a variety of tools, such as those in the national DPP curriculum toolbox, or other similar tools, to achieve goals

**Action! See DPP Toolbox:** <http://www.bsc.gwu.edu/dpp/lifestyle/apndxg.pdf>

- Develop a system to make up missed sessions

**C. Individualize intervention:**

- Recognize the participant as the most important team member
- Individualize goals using baseline weight. **Action!** See [Table 3](#), above
- Individualize methods toward participant success; implement toolbox methods when goals are not met.
  - Toolbox ideas **Action! See** DPP Toolbox: <http://www.bsc.gwu.edu/dpp/lifestyle/apndxg.pdf>),
    - structured meal plans
    - alternative methods for monitoring progress/keeping track
    - participant contracts
- Tailor curriculum to participant lifestyle, learning style, and culture
  - Address personal needs such as jobs, family responsibilities, literacy, and language
  - Use local examples to reinforce session concepts, such as local recipes, foods, physical activity events, and support groups

**D. Focus on participant self-management:**

- Use self-monitoring and tracking tools such as the Keeping Track booklet  
**Action! See:** [http://www.bsc.gwu.edu/dpp/lifestyle/dpp\\_part.html](http://www.bsc.gwu.edu/dpp/lifestyle/dpp_part.html)

**Note!** In the national DPP study, dietary self-monitoring was positively related to meeting both weight loss and physical activity goals. (The DPP Research Group, September 2004)

- Problem solving
- Goal setting
- Individualization

**E. Provide intensive intervention:**

- Frequent contacts
- Consistent, supportive, and honest relationships with participant and family
- Demonstrate belief in participant

**F. Refer participants to community-based supplemental/supportive/motivational activities to help them achieve their goals, such as:**

- Walks, runs, health fairs, competitions, community physical activity programs, community nutrition programs, and fitness centers
- Honoring the Gift of Heart Health Curriculum. **Action! See** [http://www.nhlbi.nih.gov/health/prof/heart/other/aian\\_manual/ak\\_manual.pdf](http://www.nhlbi.nih.gov/health/prof/heart/other/aian_manual/ak_manual.pdf)
- Encourage family participation in these activities and incorporate diabetes prevention awareness activities

**G. Refer to IHS Diabetes Best Practice on *Adult Weight Management* for other evidence-based approaches to weight loss. **Action!****

**H. Refer to IHS Diabetes Best Practice on *Physical Activity* for evidence-based approaches to increasing physical activity. **Action!****

**Team Notes:**

## **Key Recommendation 3. Use a lifestyle coach case management approach.**

### ***Why?***

To sustain behavior at a level needed to prevent and/or delay diabetes, most people will need ongoing self-management support. Numerous studies have demonstrated the effectiveness of self-management support, including case management, in improving health outcomes. (Battersby et al., 2010)

Case management has been well-researched, carefully analyzed, and applied in many settings, including American Indian and Alaska Native communities. Potential benefits or health impact include:

- Case management by a lifestyle coach was a key strategy used in the Diabetes Prevention Program (DPP) lifestyle intervention, where a 5-7% weight reduction resulted in a 58% decrease in diabetes incidence over a three year period (Knowler et al., 2002).
- In the IHS, case management improves blood glucose control as measured by improvements in A1C. It also improves self-monitoring, patient education, and laboratory testing, as well as eye, foot, and pre-diabetes or diabetes exams. (Wilson et al., 2005)
- Case management can improve self-management and patient outcomes if it is goal directed and guideline based. (Battersby et al. 2010)

### **How to Implement the Key Recommendation**

#### **A. Implement the diabetes prevention program through case management by a lifestyle coach.**

- In the national Diabetes Prevention Program study, the intensive lifestyle intervention was implemented individually and the recommended ratio of lifestyle coach to participant was 20 to 1. (The DPP Research Group, 2002)
- The ratio of lifestyle coach case managers to participants depends on program design, resources, and expectations. If the program design includes more individual (one-on-one) contacts than group contacts, the program will need more managers.
  - The Montana program (Montana, 2010) had 1.75 FTE for 84 participants. This program used only group contacts and their results were similar to the national DPP study.
  - The Telehealth program (Telehealth, 2010) had a ratio of one case manager for 20 participants. This program used only one-on-one contacts.
- IHS SDPI diabetes prevention programs have a ratio of one case manager for every 15 to 20 participants.

**B. Identify lifestyle coach case manager roles and responsibilities in the diabetes prevention program.**

- **Assure coaches have protected time to perform responsibilities.**
- **Roles and responsibilities may include:**
  - Conduct lifestyle intervention with assigned participants (caseload), including monitoring, coaching, and counseling. This is the primary responsibility of the lifestyle coach case manager.
  - Collaborate with the diabetes prevention team and community partners to help participants meet specific weight loss and physical activity goals, and sustain these goals.
  - Use motivational interviewing or stages of change techniques to help participants achieve goals.
  - Identify participant strengths and use these strengths to promote success.
  - Problem solve identified barriers to participation in the diabetes prevention program.
  - Individualize interventions based on participant life circumstances.
  - Participate in presentation of curriculum sessions.
  - Collect weight and activity data, and use data for program evaluation.
  - Provide ongoing reinforcement and support.
  - Keep participant records.
  - Participate in recruitment and retention activities.

**C. Identify and train lifestyle coach case managers:**

**Note!** Successful programs (IHS, Montana, University of Pittsburgh, YMCA) held coach trainings prior to implementation of the intensive lifestyle program.

- Recruit lifestyle coach case managers who are:
  - enthusiastic, empathetic, positive, and flexible
  - confident that people can make changes and lose weight
  - able to take initiative independently
  - familiar with the local community and culture
  - able to work with a variety of adults
  - able to work with a multidisciplinary team
- Program participants can become coaches; they understand the curriculum and barriers to change.
- Provide training for all lifestyle coach case managers, including:
  - Curriculum
    - Educate lifestyle coach case managers to teach the evidence-based weight loss program selected by your diabetes prevention team.
    - Training methods include:
      - Reading written curriculum materials
      - Attending a certification or training program for the weight loss program

- Using internet-based curriculum materials
  - Participating in curriculum webinars
  - Practice teaching curriculum sessions
  - Observation of curriculum videotapes
- Use experienced lifestyle coach case managers to mentor new ones
- Lifestyle Coaching
  - Skills include motivating people to change lifestyle habits to create a healthier life balance
  - Enhance skills through training programs using experienced coaches, trainers, and experts in lifestyle change
  - Some programs may offer coach certification
  - **Action!** See **Part 3** – [Tools and Resources](#) for training programs
- Case Management
  - Experts can be invited for on-site training
- Motivational Interviewing
  - Experts can be invited for on-site training
  - Use local role playing to enhance skills
- Program Requirements
  - On-site training with local, regional or national program staff

**D. Establish regular communication among lifestyle coach case managers and with other local diabetes prevention program staff and/or diabetes teams:**

**Note!** The national Diabetes Prevention Program (DPP) held regular staff trainings on the curriculum and regular follow-up.

- Communication may include:
  - Conference calls
  - List serves
  - Regional meetings
  - Team meetings
  - WebEx meetings
- Provide ongoing updates and training to keep knowledge and skills current.

**Action! See** the IHS Diabetes Best Practice for *Case Management* for more information on Best Practices for case management.

**Team Notes:**

## **Key Recommendation 4. Use a medical protocol for medications for diabetes prevention.**

### **Why?**

Participants in the national Diabetes Prevention Program study (DPP) who lost a modest amount of weight through dietary changes and increased physical activity sharply reduced their chances of developing diabetes. Taking metformin also reduced risk, although less dramatically.

Participants taking metformin reduced their risk of developing diabetes by 31%. Metformin was effective for both men and women, but it was least effective in people aged 45 and older. Metformin was most effective in people 25 to 44 years old and in those with a body mass index of 35 or higher, meaning they were at least 60 pounds overweight. About 7.8% of the metformin group developed diabetes each year during the study, compared with 11% of the group receiving the placebo. (The DPP Research Group, 2002)

**Action! See** DPP Summary at <http://diabetes.niddk.nih.gov/dm/pubs/preventionprogram>

In the national DPP, in women with a history of gestational diabetes (GDM), the use of metformin reduced the incidence of diabetes by 50% compared to placebo. (The DPP Research Group, 2008)

As compared with a placebo, pioglitazone reduced the risk of conversion of impaired glucose tolerance to type 2 diabetes by 72%. (DeFronzo, RA et al, 2011)

### **How to Implement the Key Recommendation**

**A. Develop a medical protocol for use of medication for diabetes prevention with the diabetes prevention team that includes:**

- Criteria for prescribing
- medical conditions excluding use
- type and frequency of monitoring
- recommended dosage, and
- support measures to maximize adherence.

**B. Consider metformin therapy for prevention of type 2 diabetes in people with prediabetes. (ADA, 2011)**

**Note!** In the national DPP study, the dose of metformin was 850 mg twice a day.

**C. Review and monitor new research and recommendations on the effectiveness of other diabetes medicines in prevention of type 2 diabetes in people with prediabetes.**

**Note!** There is a study showing the effectiveness of pioglitazone (DeFronzo, RA et al, 2011) and there may be recommendations in the future to consider its use for prevention of type 2 diabetes in people with prediabetes.

### **Team Notes:**

## **Key Recommendation 5. Monitor and support participant progress.**

### ***Why?***

Frequent contact between the lifestyle coach case manager and the participant is critical to encourage program retention and maintain participant lifestyle changes. Initial success at achieving weight and physical activity goals predicts long-term success.  
(The DPP Research Group, September 2004)

### **How to Implement the Key Recommendation**

#### **Monitor**

- A. Document activities and outcomes according to program requirements.**
- B. Monitor weight loss and physical activity goal achievement. Intensive lifestyle intervention is goal-based and weight loss is the key component for prevention and/or delay of type 2 diabetes:**
  - At a minimum, assess participants for weight and physical activity change comparing baseline with the completion of intensive lifestyle intervention
  - If a program is interested in monitoring maintenance of weight loss in participants who complete intensive lifestyle intervention, weight and physical activity should be monitored at least annually.
- C. Measure height at least once in order to calculate BMI.**
- D. Programs may choose to collect additional data such as waist circumference, blood pressure, lipid profile, glycemic measurement, and urine albumin:creatinine ratio, but this is not needed to demonstrate the diabetes prevention program's efficacy.**

#### **Support**

- A. Develop a weight loss and physical activity maintenance program that continues to stress self-management techniques, a lifestyle coach case management approach, and face-to-face contact.**
  - Individualize methods toward participant success
    - Reinforce self-monitoring and behavior strategies
    - Implement toolbox methods for motivation and maintenance of goal achievement

**Action! See Native American Lifestyle Balance Curriculum** at <https://www.hncp.org/wst/hpdp/NLB/default.aspx> and the **DPP Toolbox** at <http://www.bsc.qwu.edu/dpp/lifestyle/apndxg.pdf>

- Frequency of contact and support needs to be individualized and determined collaboratively between the lifestyle coach case manager and the participant.
  - Frequency is the amount needed to help the participant meet his/her goals.
  - Contact may occur in person, by mail, by phone, or by email.
  - Examples:

- In the IHS SDPI Diabetes Prevention Program, contact occurs weekly during the sixteen session curriculum; monthly for a period after curriculum completion, and then quarterly based on agreement between coach and participant to review progress and encourage retention.
  - In the national DPP study, participants met with their lifestyle coach case manager sixteen times over the first six months of the program to complete the core curriculum. Following core curriculum completion, participants were seen individually in person once every two months with a phone contact between individual visits. In addition, weight loss maintenance group classes were offered three times a year
- Include group activities and refresher classes in maintenance program, such as:
    - Cooking classes
    - Community physical activity events
    - Motivational campaigns
- B. Include support people identified by the participant, such as family or friends, in plans to achieve and maintain goals.**
- C. Identify self-management support resources outside of the diabetes prevention program team for use in plans to achieve and maintain goals:**
- Compile a list/directory of resources
  - Develop referral mechanisms

**Team Notes:**

## Additional Recommendations

### Working Together with your Community and Organization

In addition to implementing the **Key Recommendations**, programs need to work on broader community and organizational support of the goals they are trying to achieve.

### Community Recommendation

#### Create a community environment that supports healthy food choices and daily physical activity.

##### *Why?*

Community support of healthy food choices and daily physical activity can help individuals maintain a healthy weight and prevent or delay diabetes.

##### **How to Implement the Key Recommendation**

- A. Gather community input to develop a community and Tribal focus on the specific lifestyle behaviors to prevent and/or delay diabetes, such as, better dietary choices and daily physical activity. **Community members should be the voice for healthy eating and physical activity choices, programs, and support in the community.**
- B. Develop and implement culturally appropriate diabetes prevention messages:
  - Use culturally appropriate approaches such as talking circles and forums to increase knowledge of the link between overweight and obesity and risk of diabetes.
  - Conduct community campaigns to increase awareness that weight management is a lifelong process.
- C. Work with Tribal government and local business leaders to provide adequate and affordable healthy foods and healthy food public policy in the community.
- D. Encourage environmental changes for increasing access to healthful foods, including neighborhood gardens, healthy food and beverage choices in grocery stores, and farmers' markets where possible.
- E. Make community facilities available and accessible for physical activity for all ages, including the elderly (e.g., open schools and/or wellness centers on weekends and evenings).
- F. Create opportunities for physical activity by giving employees 30 minutes to exercise, posting nutrition content of meals, and providing non-sugary beverages and low-calorie foods in vending machines.

- G. Conduct community campaigns that increase knowledge about effective approaches to attain and manage a healthy weight in adults at risk for diabetes by:
- featuring successful participants in a lifestyle change program telling his or her story on a local radio show or interview for a Tribal newsletter article, and
  - featuring local people or family members being physically active and participating in traditional activities such as harvesting traditional food, running races, etc.

**Team Notes:**

## Organization Recommendations

### Organization Recommendation 1. Create and support a diabetes prevention team.

#### *Why?*

A team-based approach to diabetes prevention has been shown to be effective in improving outcomes for the patient in the both the national DPP study and the IHS SDPI diabetes prevention grant program.

#### **How to Implement the Key Recommendation**

- A. Support a multidisciplinary team approach and dedicate resources to the team.
- B. Build communication among team members.
- C. Use existing diabetes prevention programs as team models.
- D. Prepare multidisciplinary staff through training and education.
- E. The diabetes team and diabetes prevention team can be the same if funding and/or staff resources are limited.
- F. Make diabetes prevention available on-site as part of routine care or through a referral mechanism that is easy for the patient to use and ensures communication back to the primary care provider.
- G. If diabetes prevention services are not available in the facility, establish referral mechanisms and have this information available on the patient's record.

#### **Team Notes:**

## **Organization Recommendation 2. Develop clear mechanisms for referring participants to the Diabetes Prevention Program.**

### ***Why?***

Referral mechanisms will enhance program recruitment.

### **How to Implement the Key Recommendation**

- A. Establish written or electronic referral mechanisms to optimize communication among clinic and community programs, using systems such as electronic health record, word of mouth, recruitment events, informal screenings, health fairs, self-referrals, and program presentations
- B. Designate a person/group responsible for ascertaining what is available in the community and engaging community stakeholders who have an interest or ability to interact with patients on education and intervention.
- C. Develop and use brochures, flyers, posters, and other written materials to share diabetes prevention program information.
- D. Reinforce specific clinic-community linkages, such as clinic-community health:
  - Develop referral mechanism and coordinated services for public health nurses, community health representatives (CHRs), and home care personnel. Screening, education, and self-management support can be provided and/or reinforced in the field. Training may be required.
- E. Evaluate outcomes regularly and modify referral mechanisms as needed.

### **Team Notes:**

## **Organization 3. Provide resources and support for diabetes prevention.**

### ***Why?***

Health care systems that provide medical support and resources to make and sustain healthy choices can result in effective prevention and treatment of overweight and obesity. (IHS, 2010; Neisner et al., 2003; American Diabetes Association, 2011)

### **How to Implement the Key Recommendation**

- A. Create an environment that promotes healthy lifestyles by supporting environmental and policy changes. For example:
- Create opportunities for physical activity by giving employees 30 minutes to exercise, posting nutrition content of meals, and providing non-sugary beverages and low-calorie foods in vending machines.
  - Expand coalitions and partnerships within IHS and with other Federal agencies to build a dynamic Indian Health Network for healthy weight management.
  - Develop tools for local programs to assess existing resources and assets, and to identify the gaps and needs for local healthful eating and physical activity services.
  - Disseminate information about successful weight loss programs to American Indian and Alaska Native communities through the IHS network (e.g., email, list serves and online messages).
  - Encourage partnerships between health care providers/facilities and schools, faith-based groups, traditional healers, cultural divisions, and other organizations regarding prevention efforts.
- B. Support evidence-based guidelines to facilitate clinical decision-making and improve outcomes.
- C. Provide staff training to increase sensitivity and foster respect for overweight and obese clients. It is important that health care providers be aware of their own biases regarding individuals who are overweight or obese (American Dietetic Association, 2009).
- D. Provide community education to improve understanding of weight management.

### **Team Notes:**

# PART 3 Appendices, Tools, and Resources

## **Appendix A. Supplemental Information**

### **1. Importance of a diabetes prevention program.**

The human and financial costs associated with type 2 diabetes, the challenges associated with effective diabetes treatment once it has developed, the modifiable risk factors associated with type 2 diabetes such as overweight and obesity, the ability to identify individuals with prediabetes, and the availability of scientifically proven interventions to delay or prevent progression to type 2 diabetes, make diabetes prevention an increasingly important and achievable goal for American Indian and Alaska Native communities.

Diabetes affects 25.8 million people—8.3%—of the U.S. population (All ages, 2010).

About 1.9 million people aged 20 years or older were newly diagnosed with diabetes in 2010 in the United States.

It is estimated that 79 million adults have pre-diabetes in the U.S. in 2010. Prediabetes is a condition in which individuals have blood glucose or A1C levels higher than normal but not high enough to be classified as diabetes. People with prediabetes have an increased risk of developing type 2 diabetes, heart disease, and stroke.

16.1% of the total adult population served by IHS in 2009 had diagnosed diabetes, with rates varying by region from 5.5% among Alaska Native adults to 33.5% among American Indian adults in southern Arizona. 30% of American Indians and Alaska Natives are estimated to have prediabetes.

Diabetes is the leading cause of kidney failure, nontraumatic lower-limb amputations, and new cases of blindness among adults in the U.S. It is a major cause of heart disease and stroke. Adults with diabetes have heart disease death rates about two to four times higher than adults without diabetes. Diabetes is the seventh leading cause of death in the U.S.

Medical expenses for people with diabetes are more than two times higher than for people without diabetes. The estimated diabetes costs in the United States in 2007 were 174 billion dollars.

(CDC, National diabetes fact sheet, 2011 and IHS, *Facts at a Glance, 2008*)

### **2. Benefits and Risks of Implementing This Best Practice**

The national Diabetes Prevention Program (DPP) showed that both an Intensive Lifestyle Intervention and/or the use of metformin for diabetes prevention were well accepted and safe. (The DPP Research Group, 2002)

Recent studies of pioglitazone use for diabetes prevention indicated it is very effective in reducing the risk of conversion from prediabetes to type 2 diabetes, but it was associated with significant weight gain and edema. (DeFronzo, RA et al, 2011)

### **3. Health Questions Address by Best Practice**

This Best Practice addresses the following questions:

- What are the best ways to identify adults at risk for type 2 diabetes and what are the criteria?
- What are the most effective approaches for delaying or preventing the onset of type 2 diabetes in adults?

### **4. Sustaining a Diabetes Prevention Program**

It is common for new initiatives to require a certain level of maturity before care goals can be achieved. This maturational process may require more than a few years to produce the desired outcomes in a stable and self-sustaining fashion. Sustainability is a critical issue for programmatic success, and can be an elusive target.

The following are some helpful tips for sustaining your program:

- Explore opportunities to bill for education and diabetes prevention services.
- Focus on recruitment of participants.
- Advertise the program, including PSAs.
- Incorporate program information and activities into community activities, such as health fairs.
- Include program responsibilities in position descriptions of key staff.
- Track and report outcomes and share your successes with the clinic and other providers.
- Report your program successes to the community, such as through newsletters.
- Make your program services user-friendly, such as offering walk-in services.
- Encourage diabetes prevention programs to become model programs and share their expertise through regional workshops. Invite other programs to make site visits to observe the model program at work.

## Appendix B. Key Measures Example

**Diabetes increasing among community.** Our health care center and community are concerned about the increasing number of people with diabetes.

**Diabetes team takes action.** Our diabetes team talked about addressing this problem and how the diabetes team could be more involved. We read the Diabetes Prevention Best Practice and talked about the Key Recommendations.

**Identified sources of data.** Local data included:

- Prediabetes registry
  - A prediabetes registry had been started in the last year and clinic staff had added 30 adults.
- Chart review of random sample of adult clinic patients
  - 30% of adults were overweight or obese as identified by a random sample of clinic charts.

**Selected suitable Best Practice.** After thinking carefully about our goals and resources, and reviewing data, we decided the Diabetes Prevention Best Practice was a good fit for us. We chose to start working on two of the Key Recommendations: Identify and recruit the adult population at risk for type 2 diabetes and provide intensive lifestyle intervention.

**Identified Target Population.** We decided to start implementing this Best Practice with patients identified in the prediabetes registry.

**Identified Program goals:**

- To develop, have in place, and put into practice written guidelines for identification and recruitment of adults at risk for diabetes.
- To develop, have in place, and put into practice written protocols for diabetes prevention that includes intensive lifestyle intervention and support for maintenance of weight loss and physical activity.

**Identified SMART objectives based on our resources and data:**

Following the formation of a diabetes prevention team, selection of an intensive lifestyle intervention curriculum, and identification and training of two lifestyle coach case managers, our objectives are:

- 50% of adults with prediabetes who enroll in the diabetes prevention program will complete the intensive lifestyle intervention within six months.
- 25% of diabetes prevention program participants will achieve their weight loss goal within the next twelve months.
- 25% of diabetes prevention program participants will achieve their nutrition goal(s) within the next twelve months.
- 25% of diabetes prevention program participants will achieve their physical activity goal(s) within the next twelve months.

**Selected Key Measures.** We chose the corresponding Key Measures for these Objectives and Key Recommendations. Data will be collected and reviewed at baseline and mid-year.

**Table 4. Selected Key Measures**

	<b>A. Measure</b>	<b>B. Baseline or beginning value and date (collected prior to starting activities)</b>	<b>C. Most recent value and date (if applicable)</b>	<b>D. Data source (where did these numbers come from)</b>
1	Percentage of participants who complete intensive lifestyle intervention Note: Minimum time to complete is 4 months	0% as of 2/2/2011	0% as of 4/2/2011	Tracking logs
2	* Percentage of all participants who achieve their weight loss goal	0% as of 2/2/2011	3% as of 4/2/2011	Tracking logs
3	* Percentage of all participants who achieve their nutrition goal(s)	0% as of 2/2/2011	2% as of 4/2/2011	Tracking logs
4	* Percentage of all participants who achieve their physical activity goal(s)	0% as of 2/2/2011	5% as of 4/2/2011	Tracking logs

\* Required Key Measure

## **Appendix C: Improving Diabetes Prevention Programs in the Indian Health System**

This document provides guidance for programs that seek to improve an individual's health status and enhance delivery of effective diabetes prevention interventions. There are four fundamental questions to address as you plan and implement your Best Practice. The example guides you in answering these questions:

### **1. Who is your target population?**

- Adults (Age 18 and older) with prediabetes

### **2. What are you trying to accomplish by implementing this Best Practice?**

- Improve services for people at risk of diabetes in order to prevent or delay diabetes.

### **3. How will you know if what you do makes things better?**

- Collect and display data on an ongoing basis; analyze the data and use it to plan next steps.
- Improved data results suggest that things are getting better. Examples:
  - Over six months, the percent of adults with prediabetes recruited into the diabetes prevention program increased by 10%.
  - Within one year, the percent of adults with prediabetes recruited into the diabetes prevention program increased by 20%.

### **4. What can you do to make things better?**

- Enlist leadership support to improve diabetes prevention services.
- Develop clear mechanisms for referring patients.

## Tools and Resources

### Web-based Resources

#### **Diabetes Prevention Program (DPP) Study Repository**

<http://www.bsc.gwu.edu/dpp/index.htmlvdoc>

#### **Diabetes Prevention Support Center**

University of Pittsburgh Diabetes Institute

<http://diabetesinstitute.upmc.com/DPSC.htm>

#### **Diabetes Training and Technical Assistance Center**

Emory University/Centers for Disease Control

<http://hip.emory.edu/education/programs/dttac.html>

The recognition program sets recognition standards for diabetes prevention programs, monitors recognized diabetes prevention programs, and maintains a national registry of recognized diabetes prevention programs and a master trainer directory. The recognition process assures the quality and fidelity of the National Diabetes Prevention Program and provides a registry to track and report data, performance, and outcomes of the National Diabetes Prevention Program for quality assurance, monitoring, and reporting purposes.

#### **Healthy Native Communities Partnership**

Healthy Native Communities Partnership Inc. (HNCP) is a non-profit organization that supports capacity building, leadership development, partnership, and networking so that Native communities realize their own vision of wellness.

<http://www.hncp.org>

#### **IHS Division of Diabetes Treatment and Prevention. *Creating Strong Diabetes Programs: Plan a Trip to Success.***

This 38-page workbook and one-page Appendix (with online training course) provides guidance on effective program planning and evaluation. [Updated 2009 April 27; cited 2009 June]. Available from:

<http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Training/WebBased/Basics/Creating/Workbook.pdf>

#### **IHS Division of Diabetes Treatment and Prevention. *Creating Strong Diabetes Programs: Plan a Trip to Success.***

This online training course provides guidance on effective program planning and evaluation. [Internet]. [Updated 2009 July; cited 2009 June] Available from:

<http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=trainingBasicsCreating>

#### **Small Steps. Big Rewards. Your Game Plan to Prevent Type 2 Diabetes Health Care Provider Toolkit.**

This toolkit contains a decision pathway to diagnose and treat pre-diabetes, proven strategies to counsel and motivate patients, an office poster, and copier-ready patient education materials.

These materials help people to take steps to prevent or delay diabetes.

[http://www.ndep.nih.gov/media/GP\\_Toolkit.pdf](http://www.ndep.nih.gov/media/GP_Toolkit.pdf)

## **Y Diabetes Prevention Program**

The YMCA's Diabetes Prevention Program is based on the national Diabetes Prevention Program. Researchers at Indiana University School of Medicine were able to replicate the successful results of the Diabetes Prevention Program in conjunction with the YMCA of Greater Indianapolis. The YMCA's program is conducted in a group setting. The research conducted by the Indiana University researchers also proved that the YMCA could effectively deliver a group program for about 75 percent less than the cost of the original Diabetes Prevention Program. This research also highlighted the YMCA's ability to deliver the program nationally. The YMCA's Diabetes Prevention Program is being offered as part of UnitedHealth Group's Diabetes Prevention and Control Alliance.

## **Lifestyle Coach Case Manager Training Resources**

- Cooper Institute Lifestyle Coaching <http://www.cooperinstitute.org/>
- Emory University Lifestyle Coach Training and Diabetes Prevention Program Master Trainer Curriculum <http://www.dttac.org/>
- University of Pittsburgh Lifestyle Balance (<http://diabetesinstitute.upmc.com/DPSC.htm> )
- YMCA Program (contact local YMCA )

## **Examples of Current Best Practice Programs**

### **Southwest American Indian Diabetes Prevention Program Outcomes Study Clinics**

The following are the American Indian clinics in the national Diabetes Prevention Study. Staff at these clinics will provide tips on conducting lifestyle balance in American Indian communities.

#### **Arizona**

Diabetes Prevention Program Outcomes Study  
1616 Indian School Road  
Suite 470  
Phoenix, AZ 85016  
602-640-2184x102

#### **Shiprock**

Northern Navajo Medical Center  
P.O. Box 160  
N Yucca St  
Shiprock, NM 87420  
505-368-6345

#### **Zuni**

Zuni Hospital  
18B Avenue P.O. Box 974  
Zuni, NM 87327  
505-782-4566

**Special Diabetes Programs for Indians (SDPI)  
Diabetes Prevention Program Initiative**

Contact Information

IHS Division of Diabetes

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505-248-4182

**SDPI Initiatives Coordinating Center**

Meghan Berrier, Program Specialist

[meghan.berrier@ucdenver.edu](mailto:meghan.berrier@ucdenver.edu)

303-724-0426

## **Additional Contacts**

Contacting other people involved in diabetes prevention is important because they can help you get started. Your peers at other health care organizations can share their expertise, materials, and ideas, and can also tell you what has worked for them and what has not. This can help you avoid reinventing the wheel.

**Area Diabetes Consultants** website:

<http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=peopleADC>

# Part 4 References

## References

- 20-Year China Da Qung Follow-up Study. *Lancet*. 371: 1783-1789, 2008.
- Ackermann R et al. Translating the Diabetes Prevention Study into the Community: The DEPLOY Study. *American Journal of Preventive Medicine* 35(4): 357-63, 2008
- Ackerman R and Marrero D. Adapting the DPP Lifestyle Intervention for Delivery in the Community: The YMCA Model. *Diabetes Educator*. Vol 33. Number 1:1-6Jan/Feb 2007.
- American Diabetes Association Clinical Practice Recommendations 2011. *Diabetes Care*, January 2011; 34 ( Supplement 1).
- Battersby M et al. Twelve Evidence-Based Principles for Implementing Self-Management Support in Primary Care. *The Joint Commission Journal on Quality and Patient Safety*. Vol 36, No 12, 561-570, December 2010.
- Centers for Disease Control and Prevention. *National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011.
- DeFronzo, RA et al. Pioglitazone for diabetes prevention in impaired glucose tolerance. *New England Journal of Medicine*. Vol 364, No. 12, March 24, 2011, p 1104-1115.
- Diabetes Prevention Program (DPP) 10-Year Results, *Lancet* 374:1677, 2009.
- DPP Fact Sheet  
[http://www.ndep.nih.gov/media/DPP\\_FactSheet.pdf](http://www.ndep.nih.gov/media/DPP_FactSheet.pdf)
- Edwards K and Patchell B. State of the Science: A Cultural View of Native Americans and Diabetes Prevention. *Journal of Cultural Diversity*. 2009; 16 (1): 32-35.
- Follow-up of Finnish Diabetes Prevention Study. *Lancet* 368: 1673-1679, 2006.
- IHS. *Diabetes in American Indians and Alaska Natives: Facts at a Glance 2008*.  
<http://www.ihs.gov/medicalprograms/diabetes/homedocs/resources/factsheets/aian08.pdf>
- IHS SDPI Diabetes Prevention Data Projects. [IHS Press Release 11/15/2010](#)
- IHS, DPP Funding Proposal, 2010
- Knowler et al. Reduction in incidence of type 2 diabetes with lifestyle intervention or metformin. *New England Journal of Medicine*, 2002, 346:393-403.
- The Montana Program described in the *Journal of Rural Health* (2010), 1-7c2010, National Rural Health Association .
- Pan et al. Effects of diet and exercise in preventing NIDDM in people with impaired glucose tolerance. *Diabetes Care* 20: No 4, 537-544, 1997.

Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance \*. New England Journal of Medicine. 2001 May 3;344(18):1343-50.

Sustained reduction in the incidence of type 2 diabetes by lifestyle intervention: follow-up of the Finnish Diabetes Prevention Study. Lancet. 2006 Nov 11;368(9548):1673-9.

Telehealth program described in the The Diabetes Educator Online First, published on June 9, 2010 as doi: 10.1177/0145721710372811.

The DPP Research Group, Journal of Clinical Endocrinology and Metabolism. Vol 93, No 12, 4774-4779, 2008.

The DPP Research Group. Achieving Weight and Activity Goals Among Diabetes Prevention Program Lifestyle Participants. Obesity Research. Vol.12, No. 9, Sept 2004, p1426-1434.

The DPP Research Group. Costs associated with the primary prevention of type 2 diabetes mellitus in the Diabetes Prevention Program. Diabetes Care. 2003 Jan;26(1):36-47.

The DPP Research Group. The Diabetes Prevention Program (DPP): Description of lifestyle intervention. Diabetes Care. 2002 Dec;25(12):2165-2171.

The DPP Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med 2002 Feb 7;346(6):393-403

The Indian Diabetes Prevention Programme. Diabetologia. 49: 289-297, 2006.

Wilson et al. Nurse case manager effectiveness and case load in a large clinical practice: Implications for workforce development. Diabetic Medicine. 2005, 22:1116-1120.