

INDIAN HEALTH DIABETES BEST PRACTICE

Diabetes and Pregnancy

Revised April 2011

Indian Health Service
Division of Diabetes Treatment and Prevention
5300 Homestead Road NE
Albuquerque, New Mexico 87110
<http://www.ihs.gov/MedicalPrograms/Diabetes/>



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Instructions for Using This Best Practice

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

Key Recommendations for Diabetes and Pregnancy Best Practice. 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.

Clinical

1. Develop a diabetes and pregnancy team of professionals who can provide education, case management, medical nutrition therapy (MNT), and medical management.
2. Maintain a case management system and active registry for women with pregnancies complicated by diabetes. Conduct clinical outcome and program evaluations for these cases.
3. Screen all women for pre-existing and for gestational diabetes (GDM).
4. Provide comprehensive perinatal care for women with gestational and pre-existing diabetes.
5. Provide postpartum follow-up and education for all women with a pregnancy complicated by diabetes.
6. Identify, assess health status, and provide education to reproductive-age women with diabetes who may become pregnant.
7. Identify women at risk for pregnancies complicated by diabetes, and provide contraception information, preconception counseling, weight management, and medical management.
8. Collaborate with programs who can provide diabetes control and prevention services for reproductive age women before and after pregnancy.

Community

9. Provide and support programs which improve the health of women prior to pregnancy.
10. Provide programs and services which support women during a pregnancy affected by diabetes.
11. Provide programs and services for women following a pregnancy affected by diabetes which address diabetes control and prevention.
12. Monitor progress and outcomes.

Key Measures for Diabetes and Pregnancy Best Practice. 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 the indicated Measures. Programs may report on other measures as well.

Population Identification

1. *Percent of women diagnosed with diabetes in pregnancy whose care and clinical outcomes are actively tracked in the past twelve months.
2. Percent of reproductive age women at increased risk for diabetes in pregnancy (diabetes, prediabetes or obesity) whose targeted risk reduction interventions are tracked in the past twelve months.
3. Percent of women with a history of diabetes in pregnancy who are actively tracked after delivery in the past twelve months.
4. Percent of children born to mothers with diabetes in pregnancy who are actively tracked after delivery in the past twelve months.

Clinical

5. *Percent of reproductive age women with diabetes who have documented preconception care and counseling in the past twelve months.
6. *Percent of women with diabetes in pregnancy who have documented care and education specific to diabetes and pregnancy in the past twelve months.
7. Percent of women with diabetes in pregnancy who have received case management services in the past twelve months.
8. Percent of women with diabetes in pregnancy who have received care from a multidisciplinary team in the past twelve months.
9. Percent of women with history of diabetes in pregnancy who after delivery participated in a diabetes prevention program in the past twelve months.

Community

10. Percent reproductive age women at risk for diabetes in pregnancy with referrals to diabetes prevention programs in the past twelve months.
11. Percent of reproductive age women with diabetes who received diabetes and pregnancy risk reduction program services in the past twelve months.
12. Percent of reproductive age women at risk for diabetes who received diabetes and pregnancy risk reduction program services in the past twelve months.
13. Percent of women with history of diabetes in pregnancy who after delivery participated in a community diabetes prevention program in the past twelve months.

PART 1 Essential Elements of Implementing this Best Practice

Purpose

This Best Practice provides guidelines for communities providing preventive services and clinical programs that seek to improve screening for and care of women at risk for pregnancies complicated by diabetes.

Target Population

The target population is women of reproductive age who are at risk for, or are experiencing, a pregnancy complicated by diabetes.

Action! See [Part 3 – Appendix A](#). Supplemental Information for discussion of the Importance of the Diabetes and Pregnancy Best Practice.

Intended Users of this Best Practice

- Health care workers
- primary health care teams
- community and Tribal programs
- leaders of health care organizations, and
- other stakeholders.

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

Definition of Diabetes and Pregnancy

Diabetes in pregnancy refers to a pregnancy complicated by hyperglycemia (high blood glucose). This includes pregnancies among:

- women at risk for diabetes during pregnancy, including those with prediabetes.
- women with gestational diabetes mellitus (GDM) during pregnancy.
- women with pre-existing (pregestational) diabetes.

Diabetes and pregnancy is of great concern, due to risks that exist before a woman becomes pregnant, and because of potential perinatal and long-term adverse effects to the well-being of mother and infant.

Goals of This Best Practice

The overall goals of this diabetes and pregnancy Best Practice are:

- Identify, monitor, refer, educate, and counsel women at risk for developing diabetes, including women with a history of gestational diabetes.
- Identify, monitor, refer, and educate women of reproductive age with pre-existing type 1 or type 2 diabetes.
- Conduct preconception counseling and promote contraception.
- Provide care for women with pregnancies complicated by diabetes during the perinatal cycle.
- Address actions that organizations and communities can take to raise awareness of diabetes in pregnancy and to address the health burdens involved.
- Provide a framework for programs to provide services for women and families after a pregnancy complicated by diabetes.

Key Recommendations

These are evidence-based actions that can lead to improved outcomes for women of reproductive age who are at risk for, or are experiencing, a pregnancy complicated by diabetes.

Key Recommendations for Diabetes and Pregnancy Best Practice. These are evidence-based actions that will lead to improved outcomes in the community.

Clinical

1. Develop a diabetes and pregnancy team of professionals who can provide education, case management, medical nutrition therapy (MNT), and medical management.
2. Maintain a case management system and active registry for women with pregnancies complicated by diabetes. Conduct clinical outcome and program evaluations for these cases.
3. Screen all women for pre-existing and for gestational diabetes (GDM).
4. Provide comprehensive perinatal care for women with gestational and pre-existing diabetes.
5. Provide postpartum follow-up and education for all women with a pregnancy complicated by diabetes.
6. Identify, assess health status, and provide education to reproductive-age women with diabetes who may become pregnant.
7. Identify women at risk for pregnancies complicated by diabetes, and provide contraception information, preconception counseling, weight management, and medical management.
8. Collaborate with programs who can provide diabetes control and prevention services for reproductive age women before and after pregnancy.

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9. Provide and support programs which improve the health of women prior to pregnancy.
10. Provide programs and services which support women during a pregnancy affected by diabetes.
11. Provide programs and services for women following a pregnancy affected by diabetes which address diabetes control and prevention.
12. Monitor progress and outcomes.

Action! See [Part 2](#) for details on the implementation of each Key Recommendation.

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 women at risk for pregnancies complicated by diabetes who receive preconception counseling.
- Increase the number of women with a pregnancy complicated by diabetes who receive postpartum follow-up and education.

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:

- Increase the number of women with, or at risk for diabetes, who receive preconception counseling from 25% to 45% by the end of the fiscal year.
- Increase the number of women with a pregnancy complicated by diabetes who receive postpartum follow-up and education from 40% to 60% by the end of the fiscal year.

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

Key Measures for Diabetes and Pregnancy Best Practice 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 the indicated Measures. Programs may report on other measures as well.

Population Identification

1. *Percent of women diagnosed with diabetes in pregnancy whose care and clinical outcomes are actively tracked in the past twelve months.
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9. Percent of women with history of diabetes in pregnancy who after delivery participated in a diabetes prevention program in the past twelve months.

Community

10. Percent reproductive age women at risk for diabetes in pregnancy with referrals to diabetes prevention programs in the past twelve months.
11. Percent of reproductive age women with diabetes who received diabetes and pregnancy risk reduction program services in the past twelve months.
12. Percent of reproductive age women at risk for diabetes who received diabetes and pregnancy risk reduction program services in the past twelve months.
13. Percent of women with history of diabetes in pregnancy who after delivery participated in a community diabetes prevention program in the past twelve months.

Action! See [Part 3 – Appendix E](#). for additional measures that can be used to monitor progress and outcomes.

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 and Pregnancy Programs Example* to assist you with applying Key Recommendations and Key Measures to a program

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.

Clinical Recommendations

Key Recommendation 1. Develop a diabetes and pregnancy team of professionals who can provide education, case management, medical nutrition therapy (MNT), and medical management.

Why?

Pregnant women with diabetes or those at risk for a pregnancy complicated by diabetes, are best monitored and managed by highly skilled health care professionals who have received up-to-date training and have access to the latest diabetes technology and information. A health system that develops a multidisciplinary service to meet current standards of care is most likely to obtain positive outcomes. Treatment of diabetes during pregnancy has been associated with a reduction in poor maternal and infant outcomes (Crowther et al., 2005; Mello et al., 2000).

How to Implement the Key Recommendation

A. Develop a Multidisciplinary Diabetes and Pregnancy Team:

1. **A multidisciplinary team might include** a clinical provider; physician, nurse midwife or other nurse practitioner, case manager, obstetrical nurse, dietitian, staff member from medical social work, behavioral health, or public health nursing, wellness center/ exercise specialist. Additional ancillary team members may be contract health, benefits coordinator, patient registration, pharmacy, lab, traditional healer, and a community liaison.
2. **Identify team member roles** and develop position descriptions and defined responsibilities and performance standards.
3. **Establish team meetings** on a regular basis and assist in determining how the Diabetes and Pregnancy Best Practice fits in the facilities organizational structure.
4. **As a team, develop standards of care for management**, clinical and non-clinical policies and procedures, including but not limited to: standing orders, practice guidelines, standardized prenatal flow sheets, specific educational curricula, and clinical pathways.

B. Maintain competency of the entire diabetes and pregnancy team:

1. **Allocate adequate staff time** for clinical and non-clinical program development and maintenance duties.
2. **Provide education and training in motivational interviewing**, and other skill building tools for understanding the social factors surrounding parenting and pregnancy, and individual and social barriers to self-care. (Miller and Rollnick, 1995, 2011).

3. **Maintain current knowledge of guidelines** and practice bulletins on preconception care, gestational diabetes (GDM), pre- diabetes, type 2 diabetes, and perinatal diabetes care.

Action! See **Part 4 – References**.

4. **Attend the IHS/ACOG Obstetric, Neonatal, and Gynecological Care Postgraduate Course, and ALSO Courses.** ACOG stands for the American College of Obstetricians and Gynecologists.

Action! Course information is available at <http://www.acog.org/>

5. **Attend professional conferences or training specific to diabetes and pregnancy** (e.g., Sweet Success Annual Research Conference and Regional Trainings International Association of Diabetes and Pregnancy Study Groups Northern American and International Conferences, Navajo Area Sweet Success Associate Group Training, California Diabetes and Pregnancy Program (CDAPP) SSEP Regional Trainings, and state and regional conferences focusing on diabetes and pregnancy).

Action! Information about Sweet Success is available at <http://www.cdph.ca.gov/programs/cdapp>

6. **Registered dietitians, pharmacists, medical social workers, and behavioral health team members attend conferences and trainings appropriate to their fields,** and specialty diabetes and pregnancy trainings as above.

C. Design a delivery system for diabetes and pregnancy care that collaboratively develops or promotes:

1. **Preconception** (and inter-conception) monitoring of blood glucose levels.
2. **Provide assessment of glycemic status** of all women with the first prenatal laboratory panel.
3. **Prenatal and perinatal care** that meets current standards of care; including Intensive diabetes management for women at risk, including laboratory studies and comprehensive education focused on clinical, behavioral, and self care measures.
4. **Systems that provide referral pathways** within the system for medical nutrition therapy (MNT), physical activity, and outside specialty medical services.
5. **Care coordination for women with anticipated or diagnosed complications** – including use of advanced perinatal services, complete diagnostic and management services, advanced ultrasonic diagnostic imaging, or other obstetrical, perinatology or neonatology services.
6. **Creative services and scheduling:** accept referrals from other sites when providing higher level of care at your facility, provide rural clinics with intermittent provider services and daily health education services, provide family-friendly environments, flexible scheduling and same day appointments.

7. **Assistance with enrollment in Medicaid** or other their party payor programs.
8. **Public health nurse to follow-up** in the clinic or in the home.
9. **Options to enhance patient education and support services.** This could include the involvement of a nurse, dietitian, public health nurse/community health representative, or other community outreach partner to assist with follow-up through individual education/counseling, or group education.

Team Notes:

Key Recommendation 2. Maintain a case management system and active registry for women with pregnancies complicated by diabetes. Conduct clinical outcome and program evaluations for these cases.

Why?

Case management is the strategy of assigning a professional case manager, usually an RN or RD with experience with a perinatal population, to serve as a patient advocate, a facilitator for the process of coordinating patient care, tracking individual and aggregate data, and maintaining patient registries.

A goal of case management is to achieve specific outcomes such as improvement in patient satisfaction, resource utilization, efficiency and coordination of services. Case management has been well researched, carefully analyzed, applied in many settings, and can be a practical and effective strategy for IHS, Tribal, and Urban Indian health organizations (IHS Diabetes Case Management Best Practice 2009; Rosenthal, 2010).

How to Implement the Key Recommendation

A. Develop an RN or RD case management position:

1. In larger facilities, there may be an existing **pregnancy case manager**.
2. Experienced prenatal staff member or a new hire may be qualified as diabetes in **pregnancy case manager**.
3. **RNs or RDs require adequate time** apart from patient care duties to be allocated for program and data related tasks.
4. Employ evidence-based case management concepts to monitor, evaluate, and improve outcomes.

B. Basic case management direct patient care elements:

1. **Identify, conduct outreach, and recruit women at risk.**
2. **Provide multi-disciplinary education**, counseling, and self-management support.
3. **Coordinate basic prenatal care services.**
4. **Facilitate referrals to specialty care**, confirm patient scheduling, facilitate communication between referring provider, consultants and outside facilities. Assure documentation of referred services as required.
5. **Refer women to best practice educators/dietitians** for nutrition and diabetes self-care counseling and support.
6. **Offer assistance** in arranging transportation, timely scheduling of clinic, lab services, and out of facility appointments.

7. **Refer women for oral health** exam to evaluate for periodontal disease.
8. **Provide glucose monitor, supplies, and self-care glucose** and food choices workbook using these tools as education and discussion opportunities.
9. **Assist women with blood glucose monitor accuracy skills.**
10. **Provide glycemic medication** and insulin injection education, if qualified.
11. **Provide care in family friendly environment.**
12. **Inform women about evidence-based guidelines** for care.
13. **Provide women with emergency medical contact information.**
14. **Offer Medicaid or other third-party enrollment assistance services.**
15. **Link women** to Healthy Start, WIC, and other community programs.
16. **Identify fitness resources** and community activity programs that fit women's needs.
17. **Assess women's health behaviors**, knowledge, and self-care practices, and individualize medical and self-care education and counseling.
18. **Utilize interventions** including education, support, home visits, referral to public health nursing, CHRs, telephone outreach, telemedicine, and use RPMS and/or electronic health record (EHR) health maintenance reminders.

C. Program Development and Maintenance

1. **Promote the development of a culturally appropriate and comprehensive diabetes and pregnancy program.**
2. **Participate in the development of standing orders**, practice guidelines, clinical pathways, and referral processes to facilitate care coordination.
3. **Work collaboratively to solve problems** and identify a range of solutions in the development of an individual care plan.
4. Throughout the health care system promote care coordination and care continuity prior to, during and beyond the pregnancy.
5. **Promote use of RPMS-based programs** to improve patient care, including I-Care, EHR reminders, and patient letters.
6. **Collaborate with community/ Tribal programs** to assist in meeting unmet population needs and promote patient referral by providers to community programs.
7. Perform a comprehensive needs assessment of program on a regular basis.

8. Assist in the design of interventions which are more acceptable to women at risk and result in improved outcomes.
9. Follow the offspring of women with pre-gestational and gestational diabetes during the first year of life, and implement a plan to track them for long-term follow-up.
10. Conduct chart reviews and continuous quality improvement (CQI) with members of the multi-disciplinary care team.

D. Patient Population Tracking

Note! Correct use of ICD 9 codes and White's Classification is important. See [Part 3 – Appendix D. Table 10](#) for White's Classification.

1. **Develop and maintain an active registry** for women and infants of pregnancies complicated by diabetes to:
 - a. **Target patients more effectively through use of registries**, RPMS Q-Man, V-Gen, EHR, Diabetes Management System, Perinatal and Diabetes Health Summaries, diabetes, audit information, Excel worksheets, and other available data to obtain clinical and demographic data on current and historical patients.
 - b. **Consider developing and maintaining registries** that include:
 - women of childbearing age at risk for diabetes in pregnancy
 - women of reproductive age with pre-gestational diabetes or prediabetes
 - women current with gestational diabetes
 - offspring of mothers who have had diabetes during their pregnancy
 - sub-registries of high-risk women
 - women with one abnormal value on an oral glucose tolerance test (OGTT), carbohydrate intolerance in pregnancy
 - history of pregnancy complicated by diabetes
 - c. **Consider measuring the following data points.**
 - hospital admissions
 - maternal comorbidities
 - mode of delivery
 - birth weight
 - postpartum contraception
 - postpartum A1C
 - postpartum glucose
 - offspring comorbidities
 - breastfeeding initiation and duration
 - d. **Track interventions and measure their effectiveness.**
 - patient education
 - medical nutrition therapy (MNT),
 - physical activity counseling or activities, and other lifestyle interventions
2. Some desired measures are not tracked by the RPMS System. An **Excel Workbook may be necessary to track some of these measures:**

- physical activity levels
- patient satisfaction
- patient care costs
- program costs

3. Data use to develop process and outcome evaluation measures

- a. Establish incidence and prevalence of pregestational and gestational diabetes.
- b. Identify the population of women at risk for complications of diabetes and pregnancy, and target specific patient subsets including:
 - women with prediabetes, poorly controlled type 1 or 2 diabetes, a history of GDM, obesity, polycystic ovary syndrome (PCOS), or who have other diabetes risk factors.
 - women with a high utilization of services as determined by number of visits or health care costs—for example, admissions with elevated blood glucose/A1C, history of macrosomic infants, use of neonatal care unit (NICU) after a pregnancy complicated by diabetes, etc.
 - women in the subsets listed above who do not use contraception, increasing the risk of a pregnancy complicated by diabetes.
- b. Evaluate individual and population outcomes.
- c. Enhance surveillance through linkages with Tribal epidemiology centers.
- d. Track comorbidities using key ICD-9 data from maternal records such as high blood pressure, preeclampsia, and delivery complications.
- e. Include the history of gestational diabetes and insulin management for all women with diabetes during pregnancy on the health summary/EHR problem list.
- f. Document and track infant clinical measures and outcomes, such as miscarriages and stillbirths, birth weights, anomalies, and gestational ages at birth.
- g. Utilize tracked data to analyze and evaluate clinical outcomes and program progress; report and publish the outcomes.
- h. Conduct clinical outcome and program evaluations. **Note!** See [Key Recommendation 2](#).
- i. Use evaluation findings to provide feedback to the individual, health care system providers, and community, to inform each of identified gaps and unmet needs.

4. Promote the development of a diabetes and pregnancy audit.

Team Notes:

Key Recommendation 3. Screen all women for pre-existing diabetes and for gestational diabetes (GDM).

Why?

During recent generations, diabetes during pregnancy has increased significantly in AI/AN women. Hyperglycemia during pregnancy can be associated with morbidity and mortality for both the mother and her infant. Therefore, management of diabetes in pregnancy offers a unique opportunity to affect both patients' health positively. Currently, women with diabetes and good glycemic control can look forward to pregnancy outcomes that are comparable to that of the general population (IHS Diabetes Standard of Care 2011.)

How to Implement the Key Recommendation

All pregnant patients should be screened for gestational diabetes (GDM) whether by history, clinical risk factors, or a laboratory screening test to determine blood glucose levels (ACOG 2010).

American Indian and Alaska Native women are at known increased risk for developing GDM as are women with certain other risk factors, including but not limited to the following: previous GDM, obesity, previous fetal macrosomia, insulin resistance syndrome, unexplained stillbirth, polycystic ovarian syndrome, congenital anomaly, and family history of diabetes (IHS Diabetes Standards of Care 2011).

For several decades, the IHS has followed the two-step screening and diagnosis recommendations of the American Diabetes Association (ADA) and the American College of Obstetrics and Gynecology (ACOG).

Results of the Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) study (2008) provided clear evidence of association between maternal hyperglycemia and adverse perinatal and neonatal outcomes, even at ranges previously defined as normal for pregnancy. Other studies have demonstrated that treatment even of mild gestational diabetes results in improved outcomes for mothers and infants (Crowther, 2005; Landon, 2005).

Based on these recent studies the International Association of Diabetes Pregnancy Study Group (IADPSG) has issued revised recommendations for the diagnosis of GDM and overt diabetes during pregnancy. (IADPSG, Diabetes Care 2010) The ADA has endorsed these revised recommendations (ADA, 2011).

ACOG has not yet released updated recommendations, and for this reason, both the new IADPSG/ADA guidelines, and the original two-step procedure using Carpenter-Coustan criteria strategies, are detailed in the following section.

Both approaches are acceptable at this time. The new recommendations for diagnosis of both GDM and overt diabetes during pregnancy are currently being evaluated for use by individual IHS clinical sites.

In some settings the new criteria will likely result in a larger percentage of women classified with gestational diabetes, as the set-points are lower and only one abnormal value is required for diagnosis.

The limitations in early diagnosis of GDM using the new criteria vs. the Coustan criteria are of concern in settings with high incidence of early GDM diagnosis below overt diabetes values. These high-risk population settings are currently evaluating ways to implement the new recommendations.

A. Phase 1: Early screening for pre-existing diabetes and gestational diabetes

Patients with a pre-existing diagnosis of type 1 or 2 diabetes do not require diabetes testing. All other patients should be screened at their initial prenatal visit to assess for overt diabetes. Within the high-risk population of the IHS, many centers have been initiating the traditional two-step process at the initial prenatal visit. This is still an acceptable approach, although the emphasis should be placed on identifying and diagnosing women with pre-existing diabetes. Alternatively, the newer IADPGS and ADA guidelines can be applied at the initial prenatal visit, and are particularly useful as they provide clear guidance for diagnosing type 2 diabetes.

1. IADPSG Guidelines: Initial Prenatal Visit

Screen all patients at the initial prenatal visit for overt diabetes as defined by the criteria listed in Table 1.

- a. If the patient is fasting, obtain:
 - i. Fasting plasma glucose, A1C
- b. If the patient is not fasting, then obtain:
 - i. A1C, random plasma glucose

Table 1. Diagnosis of overt diabetes in pregnancy (IADPSG 2010)

Measure of glycemia	Consensus threshold	Action
FPG	≥ 126 mg/dl ≥ 92 mg/dl but < 126 mg/dl < 92 mg/dl	Diagnose type 2 diabetes Diagnose GDM Test for GDM 24-28 weeks
A1C	$\geq 6.5\%$ 5.7%-6.4%	Diagnose type 2 diabetes Perform FPG for type 2 or GDM diagnosis
Random plasma glucose	≥ 200 mg/dl + confirmation	Confirm with FPG or A1C above threshold* to diagnose type 2 diabetes

*using a DCCT/UKPDS standardized/aligned method

- Of note, under these guidelines, a patient with an impaired fasting glucose (≥ 92 mg/dl but < 126 mg/dl) is diagnosed with gestational diabetes.
- If the initial testing reveals Hgb A1C 5.7%-6.4%, or the initial random plasma glucose is 140-199 mg/dl, then one may consider a FPG at a subsequent visit before 24 weeks. A FPG value > 92 mg/dl but < 126 mg/dl is classified as GDM.
- If patient enrollment is at 24 weeks gestation or later and overt diabetes is not found by the methods above, then the initial tests above should be followed by a 75-g OGTT and evaluated by the criteria in Table 2.

2. Two-Step Carpenter-Coustan Criteria: Initial Prenatal Visit

Perform screening and diagnostic tests just as in the third trimester (see below). The drawback to this approach is that there is no clear consensus regarding criteria for diagnosing overt diabetes rather than gestational diabetes.

B. Phase 2: Identify gestational diabetes

The second phase of testing is intended to diagnose gestational diabetes at 24-28 weeks gestation. This can be done according to either the new IADPSG/ADA guidelines, or the original two-step procedure using Carpenter-Coustan criteria.

1. One-Step IADPSG/ADA Criteria

Perform a 75-g OGTT at 24–28 weeks gestation in all women not previously found to have overt diabetes or GDM (Table 1). If the patient does not tolerate the standard glucose solution, there are several alternative modalities.

Action! See [Part 3 – Appendix D](#).

The patients should be given 75 g of anhydrous glucose dissolved in water following an 8-12 hour fast after three days of unrestricted carbohydrate diet as follows:

1. Draw a fasting venous blood sample.
2. Administer a 75 g oral glucose load.
3. Draw venous blood samples at one and two hours.
 - Only one of these values from a 75-g OGTT must be equaled or exceeded for the diagnosis of GDM.
 - Refer to appropriate health care providers promptly, when there is a positive diagnosis of gestational diabetes.

Table 2. Threshold values for diagnosis of gestational diabetes mellitus (IADPSG)

Glucose measure	Consensus Threshold
FPG	≥ 92*
1-Hour plasma glucose	≥ 180
2-Hour plasma glucose	≥ 153

Interpretation of 2H OGTT:	
GDM	If <u>one</u> or more of the three values equals or exceeds thresholds
Normal	If all values are less than thresholds

*Consider diagnosing overt diabetes if FPG ≥ 126 mg/dl.

2. Two-step Carpenter-Coustan Criteria

- A. Step 1: Screen women for gestational diabetes at 24-28 weeks gestation using a 50-gram, one-hour oral glucose challenge test as outlined in the IHS Standards of Care for Adults with Type 2 Diabetes. Fasting preparation is not required, but it may be recommended that the woman not consume food or drink (other than water) in the hour before the test. Follow this procedure:
1. Give the 50-g glucose challenge beverage
 2. Draw a venous blood sample in one hour
 - a. If plasma glucose exceeds the chosen threshold (≥ 130 or 140), perform three hour glucose tolerance test.
[Either threshold is acceptable – see discussion ACOG Bulletin No. 30, 2003]
 - b. If plasma glucose ≥ 200 mg/dl, treat as GDM and do not perform three hour OGTT.
- B. Step 2: Perform a diagnostic test for women with an abnormal one-hour OGTT screen, using a 100-g, three-hour oral glucose tolerance test. If possible, the three-hour OGTT should be performed within one week of an abnormal screening one-hour OGTT. The patient should be tested after following an 8-12 hour fast after three days of unrestricted carbohydrate diet. Follow this procedure:
1. Draw a fasting venous blood sample.
 2. Give glucose tolerance beverage (100 g of anhydrous glucose dissolved in water).
 3. Draw venous blood samples at one, two, and three hours.

Table 3. Threshold values for diagnosis of gestational diabetes mellitus (Carpenter-Coustan)

Glucose measure	Carpenter-Coustan Threshold
FPG	≥ 95
1-Hour plasma glucose	≥ 180
2-Hour plasma glucose	≥ 155
3-Hour plasma glucose	≥ 140

Table 4. Interpretation of three hours oral glucose tolerance test.

Interpretation of 3H OGTT:	
GDM	If <u>two</u> or more of the four values exceed thresholds
Impaired Glucose Tolerance	If only one of the four values exceed thresholds
Normal	If all values are less than thresholds

- Two of these values from a 100-g OGTT must be equaled or exceeded for the diagnosis of GDM.
- Refer to appropriate health care providers with little delay, when there is a positive diagnosis of gestational diabetes.

- There is evidence that one abnormal value (OAV) on the oral glucose tolerance test (also referred to as CHO Intolerance of pregnancy or IGT of pregnancy), when not treated, is associated with adverse maternal and fetal outcomes (Jovanovich et al., 1989; DiCanni Diabetes Care, 2007). Some have identified these women as CHO intolerance of pregnancy or IGT. An advantage of using the IADPSG one step diagnostic protocol is that only one threshold value is required for the diagnosis and treatment of GDM.
- Medical Nutrition Therapy (MNT) and home glucose monitoring is recommended for treatment of impaired glucose tolerance (IGT).

Action! See [Part 3](#) – [Appendix D](#). for more details on implementation of this Key Recommendation.

Team Notes:

Key Recommendation 4. Provide comprehensive perinatal care for women with gestational diabetes and pre-existing diabetes.

Why?

Critical evidence reveals that identifying and treating gestational diabetes can substantially reduce the risk of adverse perinatal outcomes. (Crowther et al., NEJM 2005; Landon et al. NEJM 2005)

Diabetes treatment has been associated with a reduction in poor maternal and infant outcomes (Crowther et al., 2005; ACOG, 2001; Mello et al., 2000).

How to Implement the Key Recommendation

- A. **Obtain a detailed medical and obstetrical history if not obtained preconception.**
- B. **Conduct a comprehensive physical exam.**
- C. **Provide initial and ongoing consultation for Medical Nutritional Therapy (MNT) and exercise.**
- D. **Support home glucose monitoring.**
- E. **Classify pre-existing diabetes according to White's classification and gestational diabetes according to glycemic control.**

Action! See [Part 3](#) – [Appendix D](#). Class A1 – diet controlled, Class A2- medication required.

- F. **Achieve glycemic control as soon as possible. Insulin therapy should remain the recommended and preferred treatment of pre-existing diabetes in pregnancy.**
- G. **Initiate therapy for A-2 GDM with insulin or oral hypoglycemics.**

Action! See [Part 3](#) – [Appendix D](#). for detailed discussion regarding the use of the latter.

- H. **Provide fetal assessment.**
- I. **Plan routine delivery.**

- A. Women should be counseled in preparation for labor and delivery, including:
 - a. delivery method
 - b. discussion of potential intrapartum maternal and fetal complications, and
 - c. discussion of family planning methods and initiation.
- B. Timing of delivery should be planned according to diabetic class and overall glycemic control (ACOG, 2005).

- J. **Maintain intrapartum euglycemia.**
- K. **Promote and support women’s plans and efforts to breastfeed.**
- L. **Provide postpartum follow-up.**

Action! See [Part 3 – Appendix D](#). for detailed description of how to provide perinatal care for women with gestational diabetes and pre-existing diabetes.

Team Notes:

Key Recommendation 5. Provide postpartum follow-up and education for all women with a pregnancy complicated by diabetes.

Why?

All women benefit from postpartum follow-up to continue learning lifestyle modifications, to prevent the development of overt diabetes, or to maintain the glycemic control they achieved during pregnancy. A retrospective study of Navajo women demonstrated the rapid development of type 2 diabetes in women with preceding gestational diabetes (Steinhart, 1997; Nicholson, Johns Hopkins, 2008). Postpartum screening of women in this population for diabetes and prediabetes is particularly important. (Steinhart, 1997; Nicholson, Johns Hopkins, 2008)

How to Implement the Key Recommendation

- A. Provide postpartum follow-up for all women with a pregnancy complicated by diabetes to continue lifestyle modification learned during pregnancy in order to prevent diabetes or to maintain control achieved during pregnancy.**
- B. Referral of women to establish care with a primary provider for ongoing health care, maintenance, and diabetes management or screening for related DM risks.**
- C. Referral to educators/medical nutrition therapy/exercise and other programs that can work with women after delivery to reduce diabetes risk – through lactation support, lifestyle management, and weight loss.**
- D. For GDM and carbohydrate intolerant women perform postpartum OGTT.** The ACOG recognizes the value of both the fasting plasma glucose and the OGTT in identifying women with abnormal glucose tolerance after a GDM pregnancy (ACOG, 2001).
 - 1. Schedule a medical six-weeks postpartum morning appointment. Follow-up by educator or case manager is most productive when done on the day of the postpartum medical visit.
 - 2. Instruct the woman to present, fasting, for a two-hour OGTT. A fasting plasma glucose is drawn, followed by a 75-g glucose tolerance beverage and a two hour venous blood glucose level. This can identify type 2 diabetes and prediabetes.
 - 3. For women who miss their OGTT appointments or do not present fasting, an A1C can also be performed at \geq twelve weeks postpartum for screening for overt diabetes or prediabetes. This is less sensitive than a fasting plasma glucose or OGTT, but may serve to identify high-risk women with limited follow-up.
- E. Refer for MNT and physical activity program, if appropriate.**
- F. Offer follow-up counseling with an educator, a dietitian, or a primary provider.**

- G. If the woman had pre-gestational diabetes or has been identified as type 2 diabetes postpartum, refer the patient to her primary provider, diabetes clinic, or diabetes program in order to:**
1. Establish/reestablish glycemic management regimen.
 2. Set non-pregnant goals for self-monitored blood glucose.
 3. Provide ongoing primary health care, weight management, screening, and treatment of complications, including cardiovascular (CV) risk reduction.
- H. Women with a GDM pregnancy who have normal initial postpartum diabetes screening should continue to have lifelong screening for diabetes or prediabetes at least every three years (ADA 2011).**
- I. Provide or refer to diabetes prevention programs.**
- J. Inform women of local, Tribal, and national efforts to prevent diabetes.**

Action! See **Part 3 – [Appendix D](#)** for resource list.

Action! See **Part 3 – [Appendix D](#)** for detailed description of how to provide post partum care for women with pregnancies complicated by diabetes.

Team Notes:

Key Recommendation 6. Identify, assess health status, and provide education to reproductive-age women with diabetes who may become pregnant.

Why?

Pregnancy in women with pre-gestational diabetes is associated with an increase in risk to both the fetus and the mother. Management of diabetes before and during pregnancy offers a unique opportunity to positively affect the health of both (IHS *Standards of Care for Adults with Type 2 Diabetes*, 2009). Preconception care has been demonstrated to be effective in reducing congenital malformations, preterm delivery, and perinatal mortality associated with diabetic pregnancy (Wahabi et al, 2010).

How to Implement the Key Recommendation

A. Create and maintain a registry of women of childbearing age with type 1 or type 2 diabetes.

Action! See [Part 2 – Key Recommendation 2](#).

B. Assess preconception health status:

1. Obtain medical and obstetrical history before planning for pregnancy.
2. Conduct a comprehensive physical exam.
3. Review the patient's current management plan and adjust as appropriate for pregnancy to include:
 - medical nutrition therapy (MNT)
 - physical activity consultation with exercise physiologist or physical therapist
 - education and counseling on home blood glucose monitoring
 - review and adjustment of other medications according guidelines for safety in pregnancy (e.g., those used to control hypertension or hyperlipidemia)
 - insulin therapy (some settings will consider oral glycemetic medication if current diabetes control is good)
 - monitoring of A1C levels at one- to two-month intervals until stable
 - aggressive monitoring and control of hypertension during preconception period, and
 - initiation of folic acid supplementation at least one month prior to conception.
4. Conduct an individual education evaluation session with a diabetes educator and a registered dietitian.

5. Refer patients to appropriate health care providers and resources based on assessment of health status

Action! See American Diabetes Association information at <http://www.diabetes.org/gestational-diabetes.jsp>

Action! See [Part 3 – Appendix D](#). for a detailed description of identification, health status assessment, and referral.

Team Notes:

Key Recommendation 7. Identify women at risk for pregnancies complicated by diabetes, and provide contraception information, preconception counseling, weight, and medical management.

Why?

Pregnancies in women with pre-existing diabetes have increased risk of complications including miscarriage, birth defects, and other maternal and fetal health problems. American Indian and Alaska Native women of childbearing age are at increased risk for developing diabetes during pregnancy. Education about pregnancy, the importance of family planning, and the risks of diabetes is essential to prevent miscarriages and birth defects (IHS Standards of Care for Adults with Type 2 Diabetes, 2009).

Overweight and obesity are major contributing factors to adverse outcomes. The risk of gestational diabetes is increased twofold in overweight compared with normal-weight women, and it is increased eightfold in the severely obese (BMI > 40) (American Dietetic Association, 2009). Infants born to obese mothers have a higher prevalence of congenital anomalies than do offspring of normal-weight women, suggesting that maternal adiposity alters development in the sensitive embryonic period (American Dietetic Association, 2009).

Given the detrimental influence of maternal obesity on reproductive and pregnancy outcomes, overweight and obese women of reproductive age should receive counseling on the preventive roles of diet and physical activity prior to pregnancy, during pregnancy, and in the inter-conceptual period. (American Dietetic Association, 2009)

How to Implement the Key Recommendation

A. Routine screening of women at increased risk for diabetes and prediabetes could be considered in any health care setting including annual women's health care visits.

B. Identify women at risk for developing diabetes during pregnancy, including those who:

- have prediabetes or an A1C from 5.7-6.4
- are over the age of 25
- have a previous history of gestational diabetes
- have delivered an infant weighing greater than 4,000 grams at birth
- have a first-degree family relative with a history of diabetes
- have a body mass index (BMI) greater than 25 kg/m²
- have a history of previous stillbirth, habitual abortion, or congenital anomaly
- have polycystic ovary syndrome (PCOS), or irregular menses
- American Indian/Alaska Native
- have *acanthosis nigricans*
- have delivered a Small for Gestational Age infant.

C. Given the detrimental influence of maternal overweight and obesity on reproductive and pregnancy outcomes for the mother and child

1. Counseling about possible complications associated with obesity and how to prevent those problems should be available to all women of reproductive age.
2. Overweight and obese women of reproductive age should receive counseling on the roles of diet and physical activity in reproductive health prior to pregnancy, during pregnancy, and in the inter-conceptual period, to prevent adverse outcomes (American Dietetic Association, 2009; ADA Diabetes Care, Preconception 2004 and ADA Standards 2011)

D. Provide contraception information and preconception counseling to women at risk.

Set goals and focus content of preconception education to reduce the risk of adverse outcomes for both the mother and the offspring. Cover the following topics:

1. Family planning methods and preparing for conception
2. Healthy lifestyle choices, including:
 - making healthy food choices – controlling total calories and refined carbohydrate intake while providing adequate nutrients
 - increasing physical activity
 - maintaining a healthy weight
 - value of folic acid supplements, and
 - avoiding tobacco, alcohol, recreational drugs, and excessive caffeine.
3. Consequences of diabetes and pregnancy

Action! See **Part 3** – [Appendix D](#). for resources (e.g., brochures and videos) for women at risk.

E. Provide nutrition counseling to women at risk that is consistent with American Diabetes Association and American Dietetic Association recommendations.

Counseling should be provided by a registered dietitian, when possible. Counseling content should include:

1. preconception nutrition management (American Dietetic Association, 2002)
2. individualized medical nutrition therapy (MNT) to reach and maintain a healthy weight including:
 - successful weight loss practices

Action! See Indian Health Diabetes **Best Practice Adult Weight Management and Diabetes**

- healthful eating—both in the types of food and quantities (portion sizes)
- folic acid supplement use, and
- moderate to vigorous physical activity on most days of the week.

F. Referral to Tribal/community lifestyle balance and/or exercise programs

Team Notes:

Key Recommendation 8. Collaborate with programs who can provide diabetes control and prevention services for reproductive age women before and after pregnancy.

Why?

Effective collaborations between clinical, community, and Tribal programs can improve the health of women in our communities. Efforts which are directed at helping women control pre-existing diabetes or reduce their diabetes risk through diet and lifestyle management prior to pregnancy have the potential to improve the health and outcomes for both mothers and babies. Women who have had gestational diabetes are at very high risk for developing type 2 diabetes. Community-based diabetes prevention services can help these women reduce this risk. This is of particular benefit to women who are planning future pregnancies.

How to Implement the Key Recommendation

- A. Designate a person/group responsible for a community inventory** of nutrition and physical activity resources, services, and programs that would be appropriate for women at risk for diabetes or experiencing diabetes in pregnancy.
- B. Develop collaborative partnerships to develop programs to reduce diabetes risk and to promote improved maternal and infant outcomes.** Consider forming an advisory body or task force to assist in coordination of programs and services.
- C. Acquire increased knowledge of health behaviors, practices, and beliefs in the community** about diabetes and pregnancy, maternal obesity, and long term infant risks of diabetes in pregnancy, and breastfeeding.
- D. Offer community training for field health and program personnel on reproductive age obesity risks, pre-pregnancy diabetes risks and gestational diabetes mellitus (GDM).** Provide education skills required to work with this population of women.
- E. Develop programs for women and families following a pregnancy affected by diabetes that provide diabetes prevention education, healthy lifestyle, weight management, and breastfeeding support.** Incorporate community resources – including Tribal, local, state, and federal agencies, coalitions, foundations and other stakeholders in coordinating follow-up care and services.
- F. Collaborate with programs to support breastfeeding,** and to educate the community about breastfeeding's role in diabetes and obesity prevention.
- G. Provide education on obesity and diabetes prevention,** diabetes and pregnancy, and breastfeeding at local health fairs and schools.

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 Recommendations

Note! Community Recommendations are Key Recommendations.

Key Recommendation 9. Provide and support programs which improve the health of women prior to pregnancy.

Why?

Community-based initiatives to educate women and provide outreach, diabetes prevention and healthy lifestyle promotion prior or pregnancy have the potential to decrease the burden of diabetes in pregnancy for women and their babies, and to improve health outcomes.

How to Implement the Key Recommendation

- A. **Develop a diabetes and pregnancy team** which can provide education, outreach, education and services to women in their child-bearing years who have experienced diabetes in pregnancy, or who would be at risk for diabetes in pregnancy in the future.
- B. **Identify women at risk for pregnancies complicated by diabetes.** This would include:
 - women with pre-existing diabetes
 - have prediabetes or an A1C 5.7-6.4
 - are over the age of 25
 - have a previous history of gestational diabetes
 - have delivered an infant weighing greater than 4,000 grams at birth
 - have a first-degree family relative with a history of diabetes
 - have a body mass index (BMI) greater than 25 kg/m²
 - have a history of previous stillbirth, habitual abortion, or congenital anomaly
 - have polycystic ovary syndrome (PCOS), or irregular menses
 - American Indian/Alaska Native
 - have acanthosis nigricans
 - have delivered a Small for Gestational Age infant.
- C. **Provide education, programs, and support for these women to improve health status prior to pregnancy.** Examples of programs include:
 - Lifestyle Balance
 - Weight Management
 - Diabetes Prevention Programs

- D. **Develop and provide culturally sensitive materials and programs** in order to support and assist women with diabetes in controlling their blood sugar prior to pregnancy.
- E. **Develop and provide culturally sensitive materials and programs for women without diabetes to improve their health prior to pregnancy.** Programs could have a special focus on women with a history of gestational diabetes, prediabetes, and obesity.

Team Notes:

Key Recommendation 10. Provide programs and services which support women during a pregnancy affected by diabetes.

Why?

Women who are experiencing diabetes in pregnancy may benefit from additional support services and coordination of care with programs within the community.

How to Implement the Key Recommendation

- A. **Work with local health care providers and teams** who provide clinical care to pregnant women and children to support services during pregnancy and after delivery.
- B. **Work with WIC programs to adapt education and materials for women with diabetes in pregnancy-** addressing individualized nutritional needs and weight gain recommendations.
- C. **Promote the benefits of breastfeeding for diabetes and obesity prevention.**

Action! See *Indian Health Diabetes* **Best Practice Breastfeeding Support**

Team Notes:

Key Recommendation 11. Provide programs and services for women following a pregnancy affected by diabetes which address diabetes control and prevention.

Why?

Women who have had gestational diabetes are at very high risk for developing type 2 diabetes. Community-based diabetes prevention services can help these women reduce this risk. This is of particular benefit to women who are planning future pregnancies.

How to Implement the Key Recommendation

- A. **Provide postpartum follow-up**, along with diet, lifestyle, and weight management support for women and families following a pregnancy complicated by diabetes.
- B. **Provide support for breastfeeding following delivery** – as a means to promote diabetes and obesity prevention. Collaborate with existing programs in the community.
- C. **Provide diabetes prevention programs for women with GDM** which are adapted and appropriate to the need of mothers with young children.
- D. **Provide education and support for family planning.**
- E. **Provide programs, education, and support for weight management**, healthy lifestyle, and controlling blood sugar in preparation for future pregnancies.
- F. **Maintain an active registry for women who are referred and who participate in community programs.** Use the registry to conduct outcome and program evaluations.

Team Notes:

Key Recommendation 12. Monitor progress and outcomes.

Why?

The identification of program success and challenges is required for program evaluation and planning. Documentation of program progress and outcomes can help a program identify the best use of limited program resources and can increase the number of women accessing services.

How to Implement the Recommendation

- A. **Track attendance at community and Tribal programs.** Collect information about sources of referrals, if applicable.
- B. **Track the increase in number of programs in your community that serve reproductive age women with resources for diabetes prevention education, healthy lifestyle, weight management, and breast-feeding support.**
- C. **Collaborate with the health care system to combine community data with health care outcome data to track:**
 - 1. Number of women participating community programs prior to pregnancy.
 - 2. Number of women with diabetes in pregnancy who will have been referred for and/or participated in participated in a healthy lifestyle program following delivery after a pregnancy affected by pre-existing diabetes or gestational diabetes.
 - 3. Percent of women who participated in breastfeeding programs who are breastfeeding at six months and one year after delivery.

Team Notes:

Organization Recommendations

Organization Recommendation 1. Establish organizational policies that support and provide for coordinated maternal and child health services.

Why?

The health and well-being of women, infants, children, and families is an important indicator of a community and nation's health status, and is a predictor of the health of future generations. This is reflected in the US Health and Human Services Healthy People 2020 Objectives. Programs coordinating and providing the care for women who have a pregnancy affected by diabetes can improve perinatal health and long term outcomes for those women and their children.

How to Implement the Recommendation

A. The health care organizations have the authority to:

- A. Promote the adoption of detailed, evidence-based diabetes and pregnancy care guidelines. **Note!** See **Part 4 – References**.
- B. Include prevention and treatment of diabetes and pregnancy in the organization's annual goals and objectives.
 - Include specific diabetes and pregnancy outcome measures in the organization's annual performance-based objectives.
 - Support the development of policies, mechanisms, and resources for screening and referral for out-of-facility services when required.
 - Adopt protocols and standards of care for the management and referral of pregnant women with diabetes and women of childbearing age with diabetes.
 - Include breastfeeding education and support in the organization's annual goals and objectives.
 - Include specific protocols and outcome measures in the organization's annual performance-based objectives to track post partum and ongoing diabetes prevention, education, and referral of women after a pregnancies complicated by diabetes.

B. Clinical programs caring for pregnant women with diabetes need organizational support to provide access to comprehensive, multi-disciplinary education, and prenatal services. A diabetes and pregnancy team may include a nurse educator, diabetes in pregnancy case manager, a medical nutrition therapy counselor, and providers with up-to-date specialty knowledge, and public health nursing.

The organization should:

- C. Promote the adoption of detailed, evidence-based diabetes and pregnancy care guidelines. **Note!** See **Part 4 – References**.
- D. Include prevention and treatment of diabetes and pregnancy in the organization's annual goals and objectives.
 - Include specific diabetes and pregnancy outcome measures in the organization's annual performance-based objectives.
 - Support the development of policies, mechanisms, and resources for screening and referral for out-of-facility services when they are required.

- Adopt protocols and standards of care for the management and referral of pregnant women with diabetes and women of childbearing age with diabetes.
- Include specific protocols and outcome measures in the organization's annual performance-based objectives. These measures will be used to track the post partum and ongoing diabetes prevention education, and referral of women after a pregnancy complicated by diabetes.

C. Partnerships between organizations, Tribal, local, and community stakeholders are essential to promote culturally respectful care and community stake in improved outcomes for women with diabetes and pregnancy.

- Establish organizational based relationships with community based programs to promote development of a scope of services for women and families – which might include education, outreach, formal classes, and structured programs.
- Collaborations between clinical programs, Tribal and community programs should include specific goals and objectives.
- Community resources and stakeholders should be identified – programs and organizations which address breastfeeding, nutrition, lifestyle balance, diabetes prevention should be included.
- Procedures for referral and communication should be developed.
- Programs should regularly enlist Tribal and health board consultation, but they may also consider developing a program advisory body or task force to plan objectives and review outcomes.

Team Notes:

Organization Recommendation 2. Institute system and programmatic changes.

Why?

Health care organizations that are ready to implement systematic change can: (1) target women more effectively; (2) design interventions that are more acceptable to women; and (3) design interventions that help improve blood glucose control monitoring by physicians. Changes in health care organizations also have been associated with increased delivery of appropriate diabetes care (Norris et al., 2002).

How to Implement the Recommendation

- A. **The organization's annual goals and objectives should include:**
 - E. prevention of diabetes and pregnancy
 - F. breastfeeding education and support
 - G. diabetes prevention
 - support for the development of policies, mechanisms, and resources for referral to and from facilities and programs involved in women's health care, and
 - specific protocols and outcome measures in the organization's annual performance-based objectives.
- B. **Recognize the need for and promote changes in the health care system that will promote improved patient care and satisfaction.**
- C. **Recognize and support the role of medical records in providing continuity of care for women with pregnancies complicated by diabetes** by obtaining records on previous pregnancies and pregnancy-related services provided in other health care settings.
- D. **Support case management strategies** to complement existing services.
- E. **Provide evidence of organizational support** through policies and procedures, structures, and accountability processes.
- F. **Establish Medicaid or other state insurance eligibility** as a high priority for the prenatal patient.
- G. **Provide the diabetes and pregnancy team with time and funding** to participate in regional and national perinatal collaborative activities focused on diabetes in pregnancy.
- H. **Promote innovative opportunities to initiate improvements prenatal care services**, i.e., First Prenatal Nurse Visits, evening clinics, Centering Pregnancy Program.
- I. **Provide facility access to antenatal surveillance** (e.g., ultrasound, serum markers, fetal echo, etc.) **and other specialty services** such as (e.g., oral health, optometry, perinatology, genetics counseling, etc.) or implement specific policies supporting access to outside referrals for such services.

J. **Support development of processes for referral to community organizations** such as Healthy Start, Women, Infants, and Children (WIC), and Head Start programs.

Team Notes:

PART 3 Appendices, Tools, and Resources

Appendix A. Supplemental Information

1. Importance of Diabetes and Pregnancy Best Practice

During recent generations, the prevalence of diabetes during pregnancy has increased significantly in American Indian and Alaska Native (AI/AN) women. The burden of diabetes in women is unique in that diabetes affects both mothers and their unborn children during pregnancy, at delivery, and throughout the life span of both individuals. (IHS *Standards of Care for Adults with Type 2 Diabetes*, 2009)

Managing blood glucose to target levels—before a woman becomes pregnant and throughout her pregnancy—is essential to reduce the risk of birth defects and to ensure a healthy pregnancy. Women with diabetes and good glycemic control can look forward to pregnancy outcomes that are comparable to the general population (IHS *Standards of Care for Adults with Type 2 Diabetes*, 2009).

Facts and Statistics

- According to recent data from CDC, 11.3% of adults 20 years of age and older in the U.S. have diabetes. In this age group, an estimated 35% have prediabetes – based on elevated fasting blood sugar or A1C. (CDC, National diabetes fact sheet, 2011) Prediabetes is associated with metabolic syndrome and polycystic ovarian syndrome (PCOS).
- Data from the IHS indicates that 16.1% of the total adult population served by the care system has diagnosed diabetes, with rates which vary from 5.5% in Alaska Natives to 33.5% in American Indian adults in southern Arizona.
- According to recent data, 81% of NA adults 20-81 years of age are overweight or obese of which 51% are obese. (Healthy Weight for Life: A Vision for Healthy Weight Across the Lifespan of American Indians and Alaska Natives, IHS, 2011) More than 60% of women receiving IHS services 1996-2005 were overweight or obese, increasing their risk for diabetes and diabetes during pregnancy. (IHS Program Statistics 2005)
- Increasingly higher preconception A1C levels are associated with an increased risk of adverse pregnancy outcomes, spontaneous abortion, stillbirth, neonatal death, and congenital anomaly, with an almost linear association from an A1C slightly below 7%. (Kitzmilller, Diabetes Care 2008.)
- Approximately 7% of all pregnancies are complicated by gestational diabetes (GDM). The prevalence of gestational diabetes is as high as 15% in some groups (ADA, 2004). American Indian and Alaska Native women had approximately 49,449 births in 2007 (CDC, 2010). Conservative estimates indicate that between approximately 3,416-6,428 of these births will be affected by gestational diabetes (based on a 7-13% incidence of gestational diabetes).
- The incidence of diabetes in pregnancy in Navajo Area has increased from 7.2% in 2003 to 13.4% in 2008. (Navajo Area Sweet Success Associate Group, Data 2008).
- Hyperglycemia during pregnancy is associated with increased mortality and morbidity, including but not limited to: spontaneous abortion, fetal anomaly, fetal demise,

macrosomia, birth injury, cesarean delivery, worsening retinal and renal damage, and cardiovascular disease for the mother. (ACOG, 2001; HAPO Study Cooperative Research Group, N Engl J Med 2008; ADA, 2011)

- Women who have had gestational diabetes have a 35% to 60% risk of developing diabetes over the next 10-20 years (CDC, National diabetes fact sheet, 2011).
- Diabetes confers long-term risk in the infant of the diabetic pregnancy for elevated body mass index (BMI) and early onset of type 2 diabetes or impaired glucose tolerance, as well as the risk associated with complications of these conditions (Pettit, 1998; Pettit, 1997; Hillier, Pettit D. Diabetes Care, 2007).
- Exposure to diabetes in the intrauterine environment accounts for approximately 40% of type 2 diabetes in children between the ages of five and nineteen; more than 70% of people with prenatal exposure to type 2 diabetes develop it by the time they reach early adulthood (between the ages of 25 and 34 years). (Dabelea, 2000)
- Breastfeeding for six months or more can reduce the risks of obesity in children born to mothers who had diabetes in pregnancy (Crume et al, 2011).

2. Benefits and Risks of this Best Practice

Potential health benefits or health impacts of this Best Practice include:

- Prevention and early intervention, more active use of pregnancy planning and contraception, and earlier initiation of perinatal and prenatal care can decrease:
 - risk during pregnancy
 - perinatal mortality and morbidity associated with hyperglycemia, and
 - the number of caesarean deliveries.
- Improved health status for women prior to pregnancy.
- Appropriate screening, diagnosis, and active management of blood glucose before and during pregnancy can decrease adverse perinatal outcomes associated with hyperglycemia and excessive weight gain during pregnancy.
- Improved blood glucose control, as measured by the A1C test at initiation of pregnancy, can lead to a decrease in pregnancy loss and fetal anomalies.
- Gestational diabetes in subsequent pregnancies can be prevented in some women who implement lifestyle improvement and achieve weight loss postpartum.
- Women with a history of gestational diabetes have a high risk of developing type 2 diabetes in their lifetime. Estimates range from 35-60% over 10-20 years. There is evidence that Native American women have an even higher risk; 53%-70% in 11 years. (Steinhart, 1997) Postpartum diet, lifestyle improvement, and weight loss may delay or prevent the onset of type 2 diabetes.

There are no potential health harms associated with implementing this Best Practice.

3. Health Questions Addressed by This Best Practice

This Best Practice addresses the following questions:

- How can communities and health care systems work together to improve the health and outcomes for women and their children before, during, and after pregnancies affected by diabetes?
- How can health care systems with varying levels of services develop a multi-disciplinary diabetes in pregnancy program?
- How can women at risk for a pregnancy complicated by diabetes be identified?
- What pre-pregnancy services can decrease the incidence and risk of complications for these women and their infants?
- How are women screened for and diagnosed with gestational diabetes?
- How are health status assessments and medical management community interventions developed and implemented for women with pre-gestational diabetes?
- When pregnancies are complicated by diabetes, what services can health care organizations and their programs implement to provide active, multi-disciplinary perinatal management for these women and their infants?
- How can health care systems provide postpartum assessment and follow-up to identify prediabetes and type 2 diabetes in women with GDM? How can they best promote continuity of care for these women?
- How can communities and health care systems best provide medical and lifestyle management services for women with pregnancies complicated by diabetes?
- What are the benefits, challenges, and processes required for maintaining an active registry and conducting clinical outcome and program evaluations for the women and infants of diabetic pregnancies?
- What can health care systems, communities, and leadership partners do to raise awareness of diabetes and pregnancy? How can they raise awareness of the need for integrated preconception, perinatal, and postpartum medical services?

4. Sustaining a Diabetes and Pregnancy Program

In order to reach improved quantitative clinical outcomes and achieve program stability goals, planning for sustainability is a major organizational challenge. Building the capacity for financial support is essential for many programs' futures.

- Support is needed from all stakeholders, including health care workers, administration, Tribal health boards, and the community. Stakeholders need to be aware of program structure, the role and responsibilities of each the multi-disciplinary team members, and be committed to the continuation of the program.

- Policies need to be established to promote staff retention, integrate care, and maintain collaboration with women's-health care providers, internal medicine personnel, diabetes educators, professionals from other disciplines, Tribal leaders, community organizations and programs.
- Standardization of clinical programs promotes successful implementation of best practices, provides well-defined outcome measures for evaluation, promotes culturally appropriate clinical and educational programs.
- Training ensures that the diabetes and pregnancy team has access to continued education opportunities; remain up-to-date on current practices, and ensures that other clinical staff members have updates related to their practices.
- Updates on diabetes and pregnancy clinical and community program activities, progress and outcomes must be provided to all stakeholders on a regular basis.
- For financial sustainability, involve Contract Health Services and Benefits Coordinator to assure verified eligibility for alternative resources for women with diabetes in pregnancy; seek program resources through grants and other funding sources; maximize billing capabilities for prenatal care and other services.

Appendix B. Key Measures Example

Remember—this is an example! Apply this process to your community using your data.

Women with diabetes in pregnancy are increasing in our community.

Our health care center and community are concerned about the potential problems for mothers and babies associated with diabetes in pregnancy.

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

Identified sources of data. Local data included:

- Audit data
- RPMS data
- Medical Record review
- Contract Health data
 - Data indicated:
 - 30% of reproductive age women with diabetes were receiving annual pre-conception counseling.
 - Women with diabetes in pregnancy were being referred to contract health care providers for prenatal care, delivery and postpartum visit.
 - 90% of women were bringing their newborn to clinic for well baby checks.

Selected suitable Best Practice. After thinking carefully about our goals and resources, and reviewing data, we decided the Diabetes and Pregnancy Best Practice was a good fit for us. We chose to work on two of the Key Recommendations: develop a diabetes and pregnancy team, and provide programs and services which support women with diabetes in pregnancy.

Identified Target Population. We decided to start implementation of this Best Practice with all reproductive age women with diabetes, or at risk for diabetes, in the community.

Identified Program goals:

- To improve health outcomes for mothers with diabetes in pregnancy and their baby
- To increase the number of reproductive age women with diabetes, or at risk for diabetes, who receive annual preconception counseling
- To increase the number of women with diabetes in pregnancy who receive diabetes and pregnancy education

Identified SMART objectives based on our resources and data:

- Percent of women with diabetes in pregnancy whose care and clinical outcomes are actively tracked in the past twelve months will increase from 0% to 50% by the end of the fiscal year.
- Percent of reproductive age women with diabetes who received documented preconception care and counseling in the past twelve months will increase from 30% to 50% by the end of the fiscal year.

- Percent of reproductive age women at risk for diabetes who received documented pre-conception care counseling in the past twelve months will increase from 0% to 20% by the end of the fiscal year.
- Percent of women with diabetes in pregnancy who received education specific to diabetes and pregnancy in the past twelve months will increase from 0% to 50% by the end of the fiscal year.

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 5. Selected Key Measures

	A. Measure	B. <u>Baseline</u> or beginning value and date (collected prior to starting activities)	D. Most recent value and date (if applicable)	E. Data source (where did these numbers come from)
1	* Percent of women with diabetes in pregnancy whose care and clinical outcomes are actively tracked.	0% as of 1/20/2011	15% as of 4/30/2011	RPMS, Prenatal registry
2	* Percent of reproductive age women with diabetes who received documented preconception care and counseling.	30% as of 1/20/2011	32% as of 4/30/2011	RPMS, medical record
3	Percent of reproductive age women at risk for diabetes who received documented preconception care and counseling.	0% as of 1/20/2011	5% as of 4/30/2011	RPMS, medical record
4	* Percent of women with diabetes in pregnancy who received education specific to diabetes and pregnancy.	0% as of 1/20/2011	10% as of 4/30/2011	RPMS, medical record, referrals

* Required Key Measure

Appendix C. Improving Diabetes and Pregnancy Programs

Remember—this is an example! Ask these questions in your community, thinking about your local needs, resources, and tracking systems.

There are four fundamental questions to ask as you plan and implement your Best Practice. These questions (and sample answers) are:

1. Who is your target population?

- The target population is women of reproductive age who are at risk for or are experiencing a pregnancy complicated by diabetes.

2. What are you trying to do?

- Reduce the burden of diabetes in pregnancy complications for both mothers and their unborn children during pregnancy, at delivery, and throughout their lifespan.

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 your next steps.
- Improved data results will suggest that things are getting better. For example:
 - Over one year, at least 50% more women with diabetes in pregnancy will have been identified, and evaluated by a multi-disciplinary team.
 - Over one year, an increase of at least 25% of women with diabetes in pregnancy will have participated in a healthy lifestyle program following delivery.

4. What can you do to make things better?

- Obtain leadership support to initiate and improve effective diabetes and pregnancy services.
- Establish a multi-disciplinary team to manage women with diabetes in pregnancy, to identify gaps in providing service, and to apply realistic solutions in order to improve the standard of care.
- Work together in a multi-disciplinary team to increase the number of educational and medical management interactions occurring for women with diabetes in pregnancy, including postpartum interactions.
- Expand clinical and community follow-up services to women and families after pregnancies are affected by pre-existing diabetes and gestational diabetes by developing programs for diabetes prevention education, healthy lifestyle, weight management, and breast-feeding support.

Appendix D. Detailed Information for Implementing Key Recommendations 3 through 7.

Key Recommendation 3. Screen all women for pre-existing diabetes and for gestational diabetes (GDM).

B. Phase 2: Identify gestational diabetes

Alternative Options for Screening

Polycose screening

Give 75 g of Polycose solution. Polycose is the best tolerated, e.g., no nausea, bloating, or lightheadedness and most reproducible among the alternative methods tested.

Polycose can be prepared ahead of time in the pharmacy in the following manner:

75 g of Polycose, 75 ml of unsweetened club soda, and 1.5 gm of unsweetened lemon-lime Kool-Aid mix.

75 Gram Carbohydrate Test Breakfast

Breakfast must follow a specific carbohydrate controlled-breakfast menu exactly. The right amount of carbohydrate is needed for accurate test results. Take no more than half an hour to eat breakfast. Eat nothing more until the test is over, and do not take a nap. For instructions and sample menus (ANMC, Appendix A, 2010)

Key Recommendation 4. Provide comprehensive perinatal care for women with gestational diabetes and preexisting diabetes.

A. Obtain a detailed medical and obstetrical history if not obtained preconception. For women with pre-existing diabetes this should include:

Table 6. Medical and Obstetrical History for Women with Pre-existing Diabetes

Diabetes history	Duration since diagnosis Diabetes type History of ketoacidosis Glycemic control
Presence of microvascular disease	Retinopathy Nephropathy Autonomic or peripheral neuropathy
Presence of macrovascular disease	Cardiovascular disease Thrombotic disease
Diabetes management	Medication regimens Self-monitoring of blood glucose Nutrition plan and physical activity
Concomitant medical conditions and medications	Obesity HTN ... etc
Pregnancy history	Prior diabetic pregnancy Previous stillbirth Prior baby with birth defects Prior large baby

B. Conduct a comprehensive physical exam, including:

Table 7. Perinatal Physical Exam

Blood pressure	Include testing for orthostatic changes to suggest autonomic neuropathy
Cardiovascular exam*	Cardiac exam Peripheral vascular exam Baseline EKG
Baseline labs	A1C CBC, TSH Serum creatinine, 24-hour protein (protein and creatinine clearance)
Dilated retinal exam	Refer for diabetic eye exam upon diagnosis of pregnancy
Neurologic exam	Evaluate for neuropathy
Oral health exam	Evaluate for periodontal disease

C. Provide initial and ongoing consultation for Medical Nutritional Therapy (MNT) and exercise

- a. Medical Nutritional Therapy (MNT)
 - i. In general, recommendations should be individualized to each specific patient's home environment. A basic guideline is shown in Table 8.

Action! See Sweet Success Guidelines at <http://www.cdph.ca/gov/programs/cdapp> and **ANMC Diabetes Mellitus in Pregnancy Screening and Management Guidelines**, as an MSWord document, located at: <http://www.ihs.gov/medicalprograms/mch/w/documents/DMPreg.doc>

Table 8. Basic Guidelines for Medical Nutrition Therapy

Total calories	BMI < 30: 30 kcal/kg, or ~2200 kcal BMI ≥ 30: 25 kcal/kg
Calorie source	40% carbohydrate 20% protein 40% fat (< 10% saturated fat)
Calorie distribution (eat every 2-3 hours)	Breakfast 10-15% Morning snack 5-10% Lunch 20-30% Afternoon snack 5-10% Dinner 30-40% Bedtime snack 5-10%
Avoidance of certain foods	Simple refined carbohydrates (fruit juice, soda, Kool-Aid, ice cream, syrup, candy, cake, cookies, etc)
Healthy food choices	Snacks incorporating protein sources High-fiber foods Sugar substitutes (generally safe in pregnancy)
Prevention of hypoglycemia	Eating meals and snacks on time Routine bedtime snack with at least 7 grams protein Testing blood glucose frequently

- o Nutrition counseling should be consistent with American Diabetes Association recommendations and provided by a registered dietitian, when possible. Content should include:

- weight management counseling- using Institute of Medicine guidelines for weight gain in pregnancy

Action! <http://www.iom.edu/Reports/2009/Weight-Gain-During-Pregnancy-Reexamining-the-Guidelines.aspx>

- adequate calories and nutrients to meet the needs of pregnancy, and consistent with the maternal blood glucose goals that have been established
- consumption of adequate water, protein, calcium, and fruits and vegetables, especially those high in folic acid
- avoidance of alcohol, tobacco, recreational drugs, and excessive caffeine.

b. Exercise

- i. There is good evidence to show that moderate exercise improves glycemic control in gestational diabetes. (De Barros et al, 2010; Brankston et al, 2004)
- ii. The pregnant woman should receive an exercise consult and an individualized exercise prescription from an exercise physiologist or physical therapist.
- iii. The patient should be encouraged to exercise for at least three to four times weekly for 20-30 minutes per session.

D. Support home glucose monitoring

- a. Glucose monitoring should be taught to all women with GDM and taught/ reviewed with all women who have pre-existing diabetes. Equipment (glucometer and strips) should be supplied.
- b. Pregnant women should perform and record glucose levels at least four times daily, including fasting and one-hour or two-hour post-prandial levels.
- c. Women should be instructed to keep logs documenting glucose monitoring and food choices.
- d. Women should be instructed about the symptoms of hypoglycemia and appropriate treatment measures.
- e. Glucose monitoring logs and glucose monitor values should be assessed at each prenatal visit in conjunction with ongoing MNT counseling.

Table 9. Glucose Goals for Pregnancy

Fasting	65 - 95 mg/dL
1 Hour post-prandial	110-135 mg/dL
2 Hour post-prandial	≤ 120 mg/dL

E. Classify diabetes in pregnancy according to White's Classification

Table 10. Modified White Classification

Class			
A1	GDM – diet controlled		
A2	GDM – not controlled by diet		
	Age of Onset	Duration (year)	Vascular disease
B	> 20	< 10 years	0
C	10-19	10-19 years	0
D	< 10	> 20 years	Benign retinopathy
F	Any	Any	Nephropathy
R	Any	Any	Proliferative retinopathy
H	Any	Any	Heart disease

- White's Class D and above have increased risks of perinatal complications due to underlying vascular disease, including hypertensive disease, fetal growth restriction, and stillbirth. For this reason, prenatal visits and monitoring of fetal growth and well-being may need to be more frequent.

Note that gestational diabetes is classified according to glycemic control.

- a. Class A-1 pregnant women are those who can achieve glycemic control (> 80% of glucose levels within goals) with diet and exercise alone. Women in this class may progress to Class A-2.
- b. Class A-2 pregnant women are those who require insulin or hypoglycemic therapy to achieve glycemic control. These are women who have been treated with at least two weeks of Medical Nutrition Therapy (MNT) after consultation with a skilled nutrition counselor, and have > 20% of glucose levels above goals.

F. Initiate therapy for A-2 GDM

For pregnant women who are unable to achieve glycemic control with MNT and exercise alone, pharmacologic therapy should be instituted. Treatment should also be considered for women in whom a third trimester ultrasound reveals a fetal abdominal circumference greater than the 75th percentile (Buchanan et al, 1994).

- Insulin
 - The gold standard for treatment of diabetes in pregnancy remains insulin therapy, given extensive safety and efficacy data in pregnancy (ADA, 2011).
 - There are several different approaches to dosing insulin in pregnancy. Table 11 outlines the two most common dosing protocols.
 - Insulin doses should be assessed and adjusted as needed at each prenatal visit in order to maintain glucose levels within goals.

- Oral Hypoglycemics
 - Glyburide and metformin are being used increasingly in pregnancy, although data remains limited and they are not FDA approved for this indication. Limited observational and randomized data appear to demonstrate efficacy for glycemic control in pregnancy without increase in adverse perinatal outcomes (Nicholson et al, 2009; Rowan et al, 2008) However, current expert opinion cautions against their widespread use in pregnancy given data confirming transplacental passage and concerns regarding uncertain long-term effects in offspring (Paglia and Coustan, 2009; Kramer et al, 2006; Hebert et al, 2009). ACOG states that further study is recommended before their use can be supported in pregnancy.
 - When initiating one of these medications for GDM, the medical record should clearly document that the patient was offered insulin therapy and counseled on the current limited knowledge regarding outcomes, lack of FDA approval and risks.
 - Oral hypoglycemic therapy may be a reasonable alternative for the patient with A2 GDM who declines insulin therapy.

Table 11. Medical Therapy for A-2 GDM

	Starting Dose	Dosing Calculation
Insulin – Split Dosing	•Weight-based starting dose NPH + short acting insulin BID <u>Total Daily Insulin Dose:</u> 1-18 weeks 0.7 units/kg/day 18-26 weeks 0.8 units/kg/day 26-36 weeks 0.9 units/kg/day 36-40 weeks 1.0 units/kg/day*	Pre-breakfast: 2/3 daily insulin (2/3 NPH, 1/3 short-acting) Pre-dinner: 1/3 daily insulin (1/2 NPH, 1/2 short-acting)
Insulin - alternative	•Fixed starting dose NPH BID Short-acting insulin before meals (regular, lispro, aspart)	Before breakfast: NPH 20 units Before dinner: NPH 7 units Before meals: 5-10 units short-acting
Glyburide	2.5 mg po daily	Increase by 2.5 mg BID to maximum of 10 mg BID
Metformin	250-500 mg daily	Increase slowly to maximum of 1000 mg BID

*Based on actual body weight

- Because of increasing insulin resistance with progressive gestation, insulin requirements will increase over time. Aggressive insulin adjustments may be needed for optimal control.

G. Assure glycemic control as soon as possible in women with pre-existing or uncontrolled diabetes in pregnancy

Insulin is required for pregnant women with type 1 diabetes. Women with type 2 diabetes may be on oral hypoglycemics that might pose fetal risks at the time of conception. These women should be evaluated for conversion to insulin upon diagnosis of pregnancy. Most women with type 2 diabetes will not achieve adequate glycemic control with exercise and MNT alone, and will need insulin therapy.

a. Insulin

- i. The gold standard for treatment of diabetes in pregnancy remains insulin therapy, given extensive safety and efficacy data in pregnancy (ADA, 2011).
- ii. There are several different approaches to dosing insulin in pregnancy. Table 12 outlines the two most common dosing protocols.
- iii. Insulin doses should be assessed and adjusted as needed at each prenatal visit in order to maintain glucose levels within goals.

Oral Hypoglycemics

- iv. Glyburide and metformin are being used increasingly in pregnancy, although data remains limited and they are not FDA approved for this indication. In addition, some clinicians may combine metformin with insulin in the setting of pre-existing diabetes to treat increased insulin resistance. Limited observational and randomized data appear to demonstrate efficacy for glycemic control in gestational diabetes (but not type 2 diabetes) without increase in adverse perinatal outcomes (Nicholson et al, 2009; Rowan et al, 2008). However, current expert opinion cautions against their widespread use in pregnancy given data confirming transplacental passage and concerns regarding uncertain long-term effects in offspring (Paglia and Coustan, 2009; Kraemer et al, 2006; Hebert et al, 2009). ACOG states that further study is recommended before their use can be supported in pregnancy.
- v. Insulin therapy should remain the recommended and preferred treatment for pre-existing diabetes in pregnancy.

Table 12. Insulin Therapy for Pre-existing Diabetes

	Starting Dose	Dosing Calculation
Insulin – Split Dosing	<ul style="list-style-type: none"> •Weight-based starting dose NPH + short acting insulin BID <u>Total Daily Insulin Dose:</u> 1-18 weeks 0.7 units/kg/day 18-26 weeks 0.8 units/kg/day 26-36 weeks 0.9 units/kg/day 36-40 weeks 1.0 units/kg/day* 	<ul style="list-style-type: none"> Pre-breakfast: 2/3 daily insulin (2/3 NPH, 1/3 short-acting) Pre-dinner: 1/3 daily insulin (1/2 NPH, 1/2 short-acting)
Insulin - alternative	<ul style="list-style-type: none"> •Fixed starting dose NPH BID Short-acting insulin before meals (regular, lispro, aspart) 	<ul style="list-style-type: none"> Before breakfast: NPH 20 units Before dinner: NPH 7 units Before meals: 5-10 units short-acting

*Based on actual body weight

- o Because of increasing insulin resistance with progressive gestation, insulin requirements will increase over time. Aggressive insulin adjustments may be needed for optimal control.

H. Provide fetal assessment for gestational diabetes.

Table 13. Fetal Assessment for Gestational Diabetes

Test	Gestational Age
Ultrasound -Dating ultrasound -Anatomy screening -Growth ultrasound	-Preferably first trimester -18-20 weeks -At term for estimated fetal weight (36-39 weeks) and in third trimester as indicated clinically (generally at 28-30 weeks and monthly thereafter)
Serum analyte screening AFP Quad Screen Integrated Screen with or without NT	15-21 weeks 11-13 weeks
Fetal movement count (kick count)	Start at 30-32 weeks until delivery
Non-stress test (NST)	two times per week testing at - 32 weeks if A-2 GDM - 40 weeks if A-1 GDM - 28-32 weeks if HTN, renal disease, or suspected fetal growth restriction
Amniotic fluid index	Weekly for: - A-2 GDM - > 40 weeks - If HTN or suspected fetal growth restriction
Fetal biophysical profile (BPP)	As indicated for nonreactive NST

I. Provide fetal assessment for preexisting diabetes (Class B and above)

Table 14. Fetal Assessment for Pre-existing Diabetes

Test	Gestational Age
Ultrasound -Dating ultrasound -Detailed anatomic survey (Level 2) -Growth ultrasound	-Preferably first trimester -18-20 weeks -28-30 weeks and monthly thereafter, and at term for estimated fetal weight (36-39 weeks)
Fetal echocardiogram	20-24 weeks particularly if pre-conception A1C \geq 8%
Serum analyte screening Integrated Screen with or without NT AFP Quad Screen	11-13 weeks 15-21 weeks
Fetal movement count (kick count)	Start at 30-32 weeks until delivery
Non-stress test (NST)	two times per week testing at - 26-28 weeks if Class D or above - 28-30 weeks if uncontrolled, with hypertension or suspected fetal growth restriction - 32 weeks if Type 1 - 32-34 weeks if well-controlled without complications
Amniotic fluid index	At least weekly when initiating antenatal NST testing.
Fetal biophysical profile (BPP)	As indicated for nonreactive NST
Amniocentesis	As needed for delivery < 38 weeks or with poor dating, to document fetal lung maturity (unnecessary if complicating maternal or fetal indication for delivery) present)

J. Plan routine delivery

C. Pregnant women should be counseled in preparation for labor and delivery

a. Delivery method

- i. For women with diabetes in pregnancy and a sonographic estimated fetal weight of 4,500 grams or more, cesarean delivery may be considered. This should be offered to the patient in the context of a discussion of the maternal and fetal risks of vaginal delivery of a macrosomic fetus, particularly of the risk of shoulder dystocia and traumatic birth injury (ACOG, 2000).
- ii. Suspected fetal macrosomia is not an indication for induction of labor because induction does not improve maternal or fetal outcomes.

b. Discussion of potential intrapartum maternal and fetal complications

- i. Clinicians and women should be aware that women with diabetes in pregnancy (both preexisting diabetes and GDM) are more likely to develop hypertensive disorders during pregnancy. Women should be counseled to recognize the signs and symptoms of pre-eclampsia.
- ii. Women should be aware that diabetes in pregnancy is associated with a higher risk of fetal macrosomia and neonatal hypoglycemia and hyperbilirubinemia. Infants of women with diabetes in pregnancy are also at increased risk of shoulder dystocia and birth trauma.

c. Discussion of family planning methods and initiation

- i. Women should be counseled prior to the onset of labor regarding the full range of contraceptive options.
- ii. A postpartum contraceptive plan should be developed.
- iii. Women with pre-existing diabetes should be counseled to consider the most effective contraceptive methods available, given increased risks of pregnancy complications with unplanned pregnancy in diabetes. This includes long-acting reversible contraceptive methods or sterilization if desired.

D. Timing of delivery should be planned according to diabetic class and overall glycemic control (ACOG, 2005).

a. A-1 GDM

- i. In the absence of obstetrical complication or fetal indication, allowing for the spontaneous onset of labor is preferable.
- ii. Induction of labor at 40 weeks is recommended if no spontaneous labor.

b. A-2 GDM

- i. In general, delivery by 39 weeks is recommended. When GDM is well-controlled and dates are well-documented, routine amniocentesis for fetal lung maturity is not necessary.
 - ii. Earlier induction of labor (37-38 weeks) may be considered on a case-by-case basis in the context of poor glycemic control. Amniocentesis for fetal lung maturity should be considered prior to induction at < 38 weeks or if poor dating criteria.
- c. Pre-existing diabetes (Class B and above)
- i. In general, delivery by 39 weeks is recommended. When diabetes is well-controlled and dates are well-documented, routine amniocentesis for fetal lung maturity is not necessary.
 - ii. Earlier induction of labor (37-38 weeks) may be considered on a case-by-case basis in the context of poor glycemic control. Amniocentesis for fetal lung maturity should be considered prior to induction at < 38 weeks or if poor dating criteria.

K. Maintain intrapartum euglycemia

The goal of intrapartum glucose monitoring and treatment is to maintain a maternal glucose level of 70-110 mg/dl in order to decrease the risk of subsequent neonatal hypoglycemia. Hypoglycemia is a serious and significant risk to the neonate. Because the neonatal brain is glucose-dependent, a lack of circulating glucose can result in neuronal damage.

- o A-1 GDM
 - Obtain a maternal glucose level on admission, following the patient's usual testing regimen or more often while in latent labor, and Q1-3 hours in active labor.
 - Insulin infusion is rarely needed, but should be initiated if maternal glucose is consistently ≥ 110 mg/dl.
- o A-2 GDM and pre-existing diabetes (Class B and above)
 - Obtain a maternal glucose level on admission, following the patient's usual testing regimen or more frequently while in latent labor, and Q1-3 hours in active labor.
 - Long-acting insulin dose should be held on the morning of a planned Cesarean delivery or induction.
 - Insulin infusion should be initiated if maternal glucose is consistently ≥ 110 mg/dl. Maternal glucose levels should then be assessed hourly and the insulin dose adjusted accordingly to keep levels between 70-110 mg/dl.
 - When an insulin infusion is started, IV fluid containing dextrose should be maintained to avoid sudden hypoglycemia. Continuous fetal monitoring should also be considered.

- If a pregnant woman is in poor glucose control and is scheduled for a morning cesarean delivery or induction, consider admission the evening prior to delivery to facilitate establishment of euglycemia prior to delivery.

L. Provide postpartum follow-up for gestational diabetes

- Discontinue intravenous insulin therapy with delivery of the placenta.
- Encourage early initiation of breastfeeding (within 30-60 minutes of birth) and provide support and instruction as needed.
- Encourage maintenance of the exercise and dietary habits learned during pregnancy.
- Establish ideal body weight goal and provide weight loss support.
- Initiate effective postpartum contraceptive method, if not already in place.
- Perform a two-hour 75 gm OGTT at six to eight weeks postpartum (ACOG, 2009)
 - Any one abnormal value may be used for diagnosis of prediabetes (“at-risk” for diabetes) or type 2 diabetes.
 - If normal, lifelong diabetes screening should be repeated at least every three years thereafter.

Table 15. Postpartum Overt Diabetes Screening

	Normal	Prediabetes	Type 2 Diabetes Mellitus
Fasting	< 100 mg/dl	100-125 mg/dl (IFG)	≥ 126 mg/dl
2 Hour	< 140 mg/dl	140-199 mg/dl (IGT)	≥ 200 mg/dl

- A fasting plasma glucose level or A1C can also be used for screening using the ADA nonpregnant criteria, however the more sensitive test is the two-hour OGTT.
 - The A1C should not be used until at least twelve weeks postpartum.

M. Provide postpartum follow-up for women with pre-existing diabetes

- a. Adjust glycemic therapy postpartum
 - i. Discontinue insulin and restart oral hypoglycemic medication per nonpregnant protocols
- OR
- ii. Reduce insulin by at least half of recent pregnancy doses
- b. Encourage early initiation of breastfeeding (within 30-60 minutes of birth) and provide support and instruction as needed.
- c. Encourage maintenance of the exercise and dietary habits learned during pregnancy.
- d. Establish ideal body weight goal and provide weight loss support.

- e. Re-evaluate glycemic control at the six-week postpartum visit and adjust medications accordingly
- f. Initiate effective postpartum contraceptive method, if not already in place.
- g. Referral of women to establish/reestablish care with a primary provider for diabetes management, management of comorbidities and cardiovascular risk.

Key Clinical Recommendation 5. Provide postpartum follow-up and education for all women with a pregnancy complicated by diabetes.

Resources for Diabetes Treatment and Prevention Education

- 1) The National Diabetes Education Program’s (NDEP) *Small Steps. Big Rewards. Prevent Type 2 Diabetes* campaign offers materials that can help women with a history of gestational diabetes take steps to prevent or delay type 2 diabetes and help their children lower their risk for the disease.

Action! The following educational materials can be ordered from the NDEP website at <http://www.ndep.nih.gov/> or by calling 1-800-438-5383:

- *“It’s Never Too Early to Prevent Diabetes. A Lifetime of Small Steps for a Healthy Family”*: A tip sheet for women who have had gestational diabetes.
- *“Lower Your Risk for Type 2 Diabetes”*: A tip sheet for children at risk for type 2 diabetes.
- *“Your GAME PLAN to Prevent Type 2 Diabetes”*: A booklet for adults to help women and their families make healthy food choices and be more physically active to prevent or delay type 2 diabetes.

Key Recommendation 6. Identify, assess health status, and provide education to reproductive age women with diabetes who may become pregnant.

A. Assess preconception health status:

- 1) Obtain medical and obstetrical history before planning for pregnancy, including:

Table 16. Preconception Medical and Obstetrical History

Diabetes history	Duration since diagnosis Diabetes type History of ketoacidosis Glycemic control
Presence of microvascular disease	Retinopathy Nephropathy Autonomic or peripheral neuropathy
Presence of macrovascular disease	Cardiovascular disease Thrombotic disease
Diabetes management	Medication regimens Self-monitoring of blood glucose Nutrition plan and physical activity

Concomitant medical conditions and medications	Obesity HTN, hyperlipidemia, retinopathy, etc
Pregnancy history	Prior diabetic pregnancy Previous stillbirth Prior baby with birth defects Prior large baby
Contraceptive use*	*Diabetic women not planning pregnancy or with poor glycemic control should have active and effective contraceptive method

2) Conduct a comprehensive physical exam, including:

Table 17. Preconception Physical Exam

Blood pressure	Include testing for orthostatic changes to suggest autonomic neuropathy
Cardiovascular exam*	Cardiac exam Peripheral vascular exam Baseline EKG
Baseline labs	A1C CBC, TSH Serum creatinine, 24-hour protein (protein and creatinine clearance)
Dilated retinal exam	Refer for diabetic eye exam upon diagnosis of pregnancy
Neurologic exam	Evaluate for neuropathy
Oral health exam	Evaluate for periodontal disease

*If evidence of cardiac or peripheral vascular disease is found, women should have screening tests for coronary artery disease before attempting pregnancy to ensure they can tolerate the increased cardiac demands.

3) Review the patient's current management plan and adjust as appropriate for pregnancy to include:

- medical nutrition therapy (MNT)
- physical activity consultation with exercise physiologist or physical therapist
- education and counseling on home blood glucose monitoring:
 - monitoring fasting and one-hour postprandial blood glucose (Jovanovic, Diabetes Care, 1989)
 - documentation of blood glucose and food choices in workbook

Table 18. Preconception Glycemic Goals

Pre-prandial	70-100 mg/dL
2 Hours post-prandial	< 140 mg/dL
A1C	< 6.0%

- Insulin therapy (some settings will consider oral glycemic medication if current diabetes control is good)

- monitoring of A1C levels at one- to two-month intervals until stable
 - aggressive monitoring and control of hypertension during preconception period
 - initiation of folic acid supplementation at least one month prior to conception
 - 1-4 mg daily through the first trimester, to reduce the risk of neural tube defects.
- 4) Conduct an individual education evaluation session with a diabetes educator and a registered dietitian.

B. Refer women to appropriate health care providers and resources based on assessment of health status

Action! See American Diabetes Association information at <http://www.diabetes.org/gestational-diabetes.jsp>

Key Recommendation 7 – Identify women at risk for pregnancies complicated by diabetes and provide contraception information, preconception counseling, weight, and medical management

4. Action! Resources for women at risk:

- “Support a Healthy Weight for Life” at <http://www.ihs.gov>
- The National Institute of Child Health and Development offers a free brochure titled *Am I at Risk for Gestational Diabetes?* as well as other educational brochures. <http://www.nichd.nih.gov/publications/pubs/upload/GestationalDiabetesBrochure.pdf>.
- The American Diabetes Association (ADA) provides numerous resource materials <http://www.diabetes.org/gestational-diabetes.jsp>.
- The National Diabetes Education Program’s (NDEP’s) publication titled *It’s Never Too Early to Prevent Diabetes. A Lifetime of Small Steps for a Healthy Family* can help American Indian and Alaska Native women with a history of gestational diabetes take steps to prevent or delay type 2 diabetes, as well as help their children lower their risk for the disease. The following educational materials can be ordered from the NDEP website at <http://www.ndep.nih.gov/> or by calling 1-800-438-5383.
 - ◆ *It’s Never Too Early to Prevent Diabetes. A Lifetime of Small Steps for a Healthy Family* – A tip sheet for women who have had gestational diabetes
 - ◆ *Lower Your Risk for Type 2 Diabetes* -- A tip sheet for children who are at risk for type 2 diabetes
 - ◆ *Your GAME PLAN to Prevent Type 2 Diabetes* – A booklet for adults to help women and their families make healthy food choices and be more physically active to prevent or delay type 2 diabetes.

- March of Dimes. A booklet for planning for a healthy pregnancy called *The Coming of the Blessing - A Pathway to a Healthy Pregnancy*. 2009. Call 1-800-367-6630.

Appendix E. Measures for Monitoring Progress and Outcomes

The following measures can be used to monitor the effects of implementing the Best Practice:

Clinical Progress and Outcomes

- registries of women and their infants are important tools used track to the care and outcomes when pregnancies are complicated by diabetes
- percent of target population that has been identified, documented, and reached with the Best Practices you have implemented, using available data systems such as Q-man queries, registries, audits, etc.
- percent of staff caring for pregnant women with diabetes and prediabetes who have received up-to-date training and have access to the latest diabetes technology and clinical information
- number of multi-disciplinary use of standards of care management policies for women of reproductive age with diabetes and for women with pregnancies complicated by diabetes
- number of preconception and contraceptive counseling visits that have occurred in the target population
- percent of women with diabetes whose pregnancies were identified early and who achieved and sustained lower A1C levels (less than 6.0%) throughout pregnancy
- percent of women of reproductive age with diabetes who achieved lower A1C levels less than 6.0% before becoming pregnant
- percent of women with controlled diabetes in pregnancy with an A1C less than 6%
- percent of women who received prenatal care and screening for pre-existing and gestational diabetes (GDM) soon after positive pregnancy test
- percent of women who received follow-up gestational diabetes (GDM) care was initiated soon after being diagnosed
- percent of large for gestational age (LGA) babies born to women with a pregnancy complicated by diabetes
- percent of women with gestational diabetes and carbohydrate intolerance who received postpartum screening for prediabetes and diabetes
- percent of women with a history of gestational diabetes and carbohydrate intolerance and their infants who are accurately identified on their Resource and Patient Management System (RPMS)/electronic health record (EHR) problem list
- percent of women with diabetes in pregnancy who received case management services post partum

- percent of women who developed prediabetes or diabetes subsequent to a GDM or carbohydrate intolerant pregnancy

Community Monitoring of Progress and Outcomes

- percent of women with gestational diabetes who received diabetes prevention education and who were referred to diabetes prevention programs. Number or percentage of women participating in community obesity or diabetes prevention programs. Number or percentage of pregnancies in these women.
- number or percent of women with diabetes in pregnancy who will have been referred for and/or participated in a healthy lifestyle program following delivery after a pregnancy affected by pre-existing diabetes or gestational diabetes.
- number or percent of women with diabetes in pregnancy who are breastfeeding at six weeks after delivery.
- number or percent of women who participated in breastfeeding program who are breastfeeding at six weeks, six months, and one year after delivery.

Tools and Resources

IHS Websites

Beautiful Beginnings. The IHS Division of Diabetes Treatment and Prevention's Beautiful Beginnings: Pregnancy and Diabetes (BB) Supplemental Teaching Sessions provide information specific to pregnancy and type 2 diabetes, including pre-gestational diabetes and gestational diabetes mellitus (GDM). These Supplemental Teaching Sessions are intended for use in conjunction with the IHS Balancing Your Life and Diabetes (BYLD) curriculum.

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

IHS Division of Diabetes Treatment and Prevention [Internet]. [Updated 2009 April 27; cited 2009 June] Creating Strong Diabetes Programs: Plan a Trip to Success [38 pages with one page sample in appendix]. A workbook (with on-line training course) on effective program planning and evaluation.

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

IHS Division of Diabetes Treatment and Prevention [Internet]. [Updated 2009 July; cited 2009 June] Creating Strong Diabetes Programs: Plan a Trip to Success. An on-line training course on effective program planning and evaluation. Division of Diabetes Treatment and Prevention [Internet].

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

IHS Maternal and Child Health Website. Excellent source for perinatal, breastfeeding and child health notes, abstracts, hot topics, features, upcoming trainings, and articles.

Subscribe online: <http://www.ihs.gov/MedicalPrograms/MCH/sitemap.cfm>

Diabetes in Pregnancy Guidelines. ANMC Women's Health Service, Diabetes Mellitus in Pregnancy Screening and Management Guidelines. Neil Murphy, 2010.

http://www.ihs.gov/NonMedicalPrograms/nc4/index.cfm?module=clinguid&CFID=13085729&CF_TOKEN=97964494 Titled "Diabetes in Pregnancy [ANMC][WORD-260KB]"

IHS Diabetes Audit Information. Source of support for conducting and using the Diabetes Audit. <http://www.dmaudit.com/>

IHS Area Diabetes Consultants website. The Navajo Area Diabetes Consultant has experience in how an SDPI program can support diabetes in pregnancy programs.

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

Women's Health Newsletter. Focus on health of American Indian and Alaskan Native Women and Children. (Future and back issues on diabetes and pregnancy.)

http://www.ihs.gov/MedicalPrograms/MCH/index.cfm?module=whn_home

Other Web-Based Resources

California Diabetes and Pregnancy Program (CDAPP). CDAPP developed “Sweet Success,” a clinical model of care based on the use of trained multi-disciplinary teams composed of physicians, nurses, dietitians, social workers, and other health care professionals to provide comprehensive services to the target population. The CDAPP Guidelines for Care outline how to provide comprehensive health services and promote improved pregnancy outcomes for high-risk pregnant women with pre-existing diabetes and women who develop diabetes while pregnant. <http://www.cdph.ca.gov/programs/CDAPP/>

California Diabetes and Pregnancy Program Resource Center. Produces and distributes high quality, easy-to-read educational materials. <http://www.regionalperinatalsystem.org/programs/mrc>

Cochrane Library, systematic reviews of the effects of health care interventions. <http://www.cochrane.org/>. In the Indian Health system this is most easily reached through the NIH website at <http://nihlibrary.ors.nih.gov/ezproxy/ihs.htm>

Institute of Medicine. Guidelines for weight gain in pregnancy <http://www.iom.edu/Reports/2009/Weight-Gain-During-Pregnancy-Reexamining-the-Guidelines.aspx>

National Diabetes Education Program (NDEP). Offers materials on gestational diabetes, diabetes management, and diabetes prevention, including information specifically for American Indians and Alaska Natives. <http://www.ndep.nih.gov/>

Small Steps. Big Rewards. Prevent Type 2 Diabetes. “It’s Never Too Early to Prevent Diabetes” is a NDEP campaign for women with a history of GDM. The “Power to Prevent Diabetes” materials for American Indians and Alaska Natives contain seven powerful tips to prevent diabetes. <http://www.ndep.nih.gov/>

SSEP (Sweet Success Express). This nonprofit program serves facilities outside the State of California. SSEP was developed, with encouragement from CDAPP, to increase awareness of the Sweet Success model of care nationwide. SSEP offers services and activities that support improved pregnancy outcomes for diabetes in pregnancy, including educational materials, conferences, and membership programs. <http://www.sweetsuccessexpress.com/>

UpToDate is an evidence-based, peer-reviewed information resource. <http://www.uptodateonline.com>

Utah Department of Health – guidelines and graphs for weight gain in pregnancy according to maternal BMI <http://www.babyourbaby.org/pregnancy/during-pregnancy/weight-gain.php>

Women’s Health Information Center. This Office of Women’s Health, U.S. Department of Health and Human Services website has resources and information on breastfeeding, diabetes in pregnancy, and obesity. <http://womenshealth.gov/>

Examples of Current Best Practice Programs

Alaska Native Medical Center

Neil Murphy, MD
4320 Diplomacy Drive, PCC-WH
Anchorage, AK 99508
(907) 729-3154
njmurphy@southcentralfoundation.com

The Alaska Native Medical Center has developed diabetes in pregnancy management guidelines that can be accessed at:

http://www.ihs.gov/NonMedicalPrograms/nc4/index.cfm?module=clinguid&CFID=13085729&CF_TOKEN=97964494

Titled "Diabetes in Pregnancy [ANMC] word file

Navajo Area Sweet Success Associate Group Group facilities- Crownpoint, Chinle, Fort Defiance, GIMC, Kayenta/Inscription, NNMC, Tuba, Utah, Winslow

CAPT Karen Bachman-Carter, MPH, RD,
Navajo Area Diabetes Consultant
Navajo Area IHS Diabetes Program
Northern Navajo Medical Center
P.O. Box 160 (Hwy 491 North)
Shiprock, NM 87420
(505) 368-7430
karen.bachman-carter@ihs.gov

Winslow Indian Health Care Center-NASS Member

Mona Patterson BSN, RN, CBC
Perinatal Educator, SDPI Diabetes Program
500 N. Indiana Ave.
Winslow, AZ 86047
Office: (928) 289-6265; Cell: (928) 386-0288
mona.patterson@wihcc.org
mona_patterson@msn.com

Navajo Area has a well-established diabetes in pregnancy program. Nine facilities (Chinle, Crownpoint, Fort Defiance, Gallup, Kayenta/Inscription House, Shiprock, Tuba, SE Utah, and Winslow) make up the Sweet Success Associate Group. Women with pregnancies complicated by pre-gestational diabetes, gestational diabetes, and carbohydrate intolerance in pregnancy are cared for in these multi-disciplinary programs.

Phoenix Indian Medical Center Diabetes Center of Excellence (PIMC)

Marie Russell, MD
Director, Diabetes Center of Excellence
4212 North 16th Street
Phoenix, AZ 85016
(602) 263-1587

Rob Collison, MS, RD, CDE
Commander, U.S. Public Health Service
Diabetes Program Coordinator

Phoenix Indian Medical Center
4212 N. 16th Street
Phoenix, AZ 85016
Phone: (602) 263-1200 x2003
Fax: (602) 263-1649
Email: robert.collison@ihs.gov

The Diabetes and Pregnancy Program at PIMC has many years of experience in case management. It is also a large program that has been peer evaluated and published. PIMC predominantly uses midwives, but they are complemented by OB-GYN doctors. Diabetes screening and treatment are routine care as well as options such as underwater tubs for the birthing process.

Four Directions Clinic

Terry Friend CNM
Community Based Services
Pine Ridge Service Unit
1208 East Highway 18
Pine Ridge, SD 57770
605-441-1722
terry.friend@ihs.gov

This program, located in community clinics in Pine Ridge, South Dakota, serves pregnant women with pre-existing diabetes or gestational diabetes.

Additional Contacts

Contacting other people involved in diabetes and pregnancy is important because they can help you get started. Peers at other health care organizations can share their expertise, materials, ideas, and challenges. They can also tell you what has worked for them and what has not worked. This can help to avoid reinventing the wheel. Following are ideas for connecting with others:

- Ask your Area Diabetes Consultant for the names of people who may be able to help you.
<http://www.ihs.gov/MedicalPrograms/diabetes/index.cfm?module=peopleADCDirectory>
- Contact the IHS Division of Diabetes Treatment and Prevention for ideas. Staff members may be able to point you in the right direction.
- Ask the IHS Integrated Diabetes Education Recognition Program and your Area IHS Diabetes Consultant for suggested contacts. They have names and contact information for people who work with IHS-accredited diabetes education programs (see Web-based Resources).
- *Health for Native Life* magazine articles may give you ideas for activities to try and people to contact. This magazine profiles many diabetes programs throughout Indian Country.
- Contact web-based resources and current Best Practice Programs for critical resources such as algorithms, fact sheets, patient education materials, and handouts.

Part 4 References

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