

Stopping Gestational Diabetes in Daughters and Mothers: A Gestational Diabetes Risk Reduction Program for American Indian/Alaska Native Girls ***Strategic Plan for National Dissemination***

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For the Stopping GDM Study Team

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**Centers for American Indian &
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colorado school of public health



Faculty/Presenter Disclosure

Neither of the speakers has any conflict of interest to disclose



Objectives

At the end of this session, participants will be able to:

1. Identify risks and risk reducing strategies for gestational diabetes mellitus (GDM)
2. Describe the Stopping GDM preconception counseling program
3. Identify key avenues by which they can participate in Stopping GDM program dissemination
4. Generate ideas for key strategies for best practices of Stopping GDM dissemination in their community



Background: Gestational Diabetes Mellitus (GDM)

- Women with diabetes during pregnancy can be divided into
 - Pre gestational / overt diabetes
 - Gestational diabetes
- African American, American Indian and Alaska Native (AI/AN), Asian, and Hispanic women are at higher risk for gestational diabetes compared with other races
- The increasing incidence of gestational diabetes during the past 15 years due to similar statistics for obesity

<https://www.cdc.gov/reproductivehealth/maternalinfanthealth/diabetes-during-pregnancy.htm>



Background: GDM in AI/AN Women

- AI/AN women are disproportionately affected by adolescent obesity, adolescent pregnancy, and gestational diabetes mellitus (GDM); all with nearly twice the United States prevalence.
- GDM can cause pregnancy & newborn complications
- GDM in turn increases the risk of obesity and type 2 diabetes in the mother and offspring
- Great need for early preconception counseling (PC) interventions prior to pregnancy to reduce risk for GDM in AI/AN girls and young women



What's Preconception Counseling (PC) for GDM?

Health Professional advice about:

- Importance of healthy weight before conception
- Facts about GDM and pregnancy / risk of complications
- Facts about healthy lifestyle and decreasing risk
- Importance of planning a pregnancy
- How to prevent an unplanned pregnancy
- Family planning advice



What age do we target?

- Young adolescents, starting at puberty (~13 yrs. old), need developmentally appropriate information with a sensitive/proactive/preventative approach before becoming sexually active to empower them to make informed choices regarding reproductive health.
- Prevent GDM in adolescent girls and young adult women....

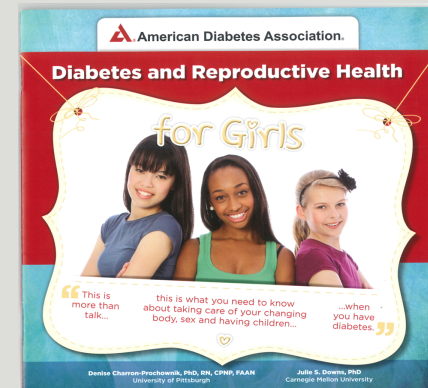
Break the cycle of diabetes in AI/AN communities



Project Background

This project includes adaption of an existing PC program:

- *READY-Girls* (Reproductive-health Education and Awareness of Diabetes in Youth for Girls) is a validated theory and evidence-based PC program for teens with diabetes (starting at puberty) to raise awareness of the effects of diabetes on pregnancy, pregnancy-related complications, prevent unplanned pregnancies, and how to plan pregnancies to decrease their risks.
- Expanded Health Belief Model
- Originally developed for non-AI/AN teens with diabetes
- Collaboration with University of Pittsburgh and American Diabetes Association
- **Principal Investigators (Charron-Prochownik & Moore) partnered to culturally adapt READY-Girls for AI/AN teens at risk for GDM**





What is Stopping GDM?

- Daughter-mother dyadic online intervention
- Stopping GDM program for AI/AN girls at risk for GDM with focus on:
 - Raising awareness of gestational diabetes
 - GDM risk reduction (susceptibility, severity)*
 - Family planning – How to plan pregnancies
 - Enhancing health beliefs (benefits, barriers, self-efficacy)*
 - Targeting behavior changes before pregnancy for a healthy weight:
 - ✓ Healthy eating
 - ✓ Physical activity
 - Mother support
 - Mother-daughter communication
 - Daughter-HCP communication

*Expanded Health Belief Model



Timeline for Stopping GDM Project

Year 1-2
Development
(Phase 1)

- Qualitative focus groups: cultural tailoring for AI/ANs
- HCP/Co-I Task Forces: gestational diabetes, diabetes prevention for teens, M-D communication, resource toolbox
- Development of SGDM educational materials by revising and tailoring original READY-Girls materials
- Pilot in one urban Indian health setting

Year 3-4 - RCT
(Phase 2)

- Multi-site randomized controlled trial

Year 5 –
Dissemination
(Phase 3)

- Analysis
- Revision
- Dissemination



Phase 1: Development

- Expert panel focus groups
 - Health Care Professionals (HCPs)
 - Tribal Leaders and Indian health system administrators
- Lay focus groups
 - AI/AN daughters at risk for GDM and their mothers
 - AI/AN women with history of GDM and type 2 diabetes (T2D)
- Task force of HCPs
 - Evidence-based information; national standard guidelines from American Diabetes Association and American College of Obstetricians and Gynecologists
 - GDM, AI/AN adolescent care, AI/AN women's health, M-D reproductive health communication; DPP strategies for adolescents
- Two Feathers Media, LLC
 - Native woman owned media company



Phase 1: Development Recommendations

- Multigenerational female relatives
- Native Plate
- Narrator should be AI/AN
- AI/AN women telling “their stories”, real people, no actors
- AI/AN graphics
- Use action words rather than directives
- Empower girls to make healthy choices
- Strong evidence-base with face and content validity



Publications Phase 1

- Moore K, Stotz S, Nadeau KJ, Terry MA, Garcia-Reyes Y, Gonzales K and Charron-Prochownik D. (2019) Recommendations from American Indian and Alaska Native Adolescent Girls for a Community-Based Gestational Diabetes Risk Reduction and Reproductive Health Education Program. Res J Women's Health; 6:1. <http://dx.doi.org/10.7243/2054-9865-6-1>
- Stotz SA, Charron-Prochownik D, Terry MA, Gonzales K, Moore K. (2019) Reducing Risk for Gestational Diabetes Mellitus (GDM) through a Preconception Counseling Program for American Indian/Alaska Native Girls: Perceptions from Women with Type 2 Diabetes or a History of GDM. The Diabetes Educator, 45(2), 137-145. PMID: 30602351 DOI: 10.1177/0145721718821663
- Moore KR, Stotz SA, Fischl A, Beirne S, McNealy K, Abujaradeh H, Charron-Prochownik D. (2019) Pregnancy and Gestational Diabetes Mellitus (GDM) in North American Indian Adolescents: Implications for Girls and Stopping GDM. Current Diabetes Reports, 19(113). DOI: <https://doi.org/10.1007/s11892-019-1241-3>



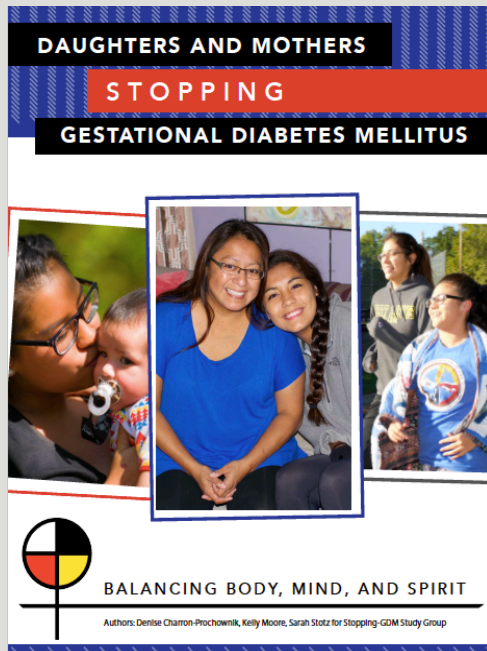
Stopping GDM Program Components



- Electronic book (online eBook)
- Video (online)
- Mother communication booklet
- Tool Box (general and regional resources)



Stopping GDM eBook and Video



eBook Chapters

Part 1 “Gestational Diabetes Mellitus and Prevention”

1. Overview of gestational diabetes mellitus (GDM)
2. Prevention of gestational diabetes mellitus
3. Who can help me decrease my chances of getting GDM?

Part 2 “Taking Care of your Body: Balancing Mind, Body, Spirit”

1. Healthy body, healthy pregnancy
2. Pre-pregnancy advice and planning a pregnancy
3. Glossary



True or False?

American Indian/
Alaska Native women
have a higher risk of
developing GDM.

→ True

Even if you don't
get GDM during
your first pregnancy,
American Indian/
Alaska Native women
are still at risk for
getting GDM in their
future pregnancies.

→ True

Who gets GDM?

A woman is more likely to get GDM if she has the following risk factors.

What's my risk of getting GDM?


Check all the risk factors for GDM that are a 'yes' for you:

- ☐ Are overweight before getting pregnant
- ☐ Are not physically active
- ☐ Are American Indian or Alaska Native
- ☐ Have been told you have pre-diabetes
- ☐ Have been told you have high blood sugar
- ☐ Were younger than 12 years old when you started your first period
- ☐ Have a health problem called polycystic ovary syndrome (PCOS)
- ☐ Have a mother, father, brother, or sister with diabetes
- ☐ Had diabetes while pregnant during another pregnancy
- ☐ Have given birth to a baby weighing more than 9 pounds
- ☐ Are over age 25



The good news is that you can lower your chances of getting diabetes while you are pregnant by:

- Being at a healthy weight when you get pregnant
- Eating a healthy diet
- Being physically active
- Not gaining too much weight while you are pregnant

 If you are pregnant and want to be more physically active,
It is Important to check with your nurse or doctor to be
sure it is safe.

Here are some ideas for goals you can make for yourself and intend to do:

- ✓ I will work on having a healthy body weight
- ✓ I will eat healthy foods
- ✓ I will get regular daily physical activity
- ✓ I will get advice about family planning.
- ✓ I'll get advice about how to plan a pregnancy
- ✓ When I decide to plan a pregnancy, I will get help from my doctor or nurse to make sure I am healthy
- ✓ I will talk to my mom (and other trusted adults) about these issues
- ✓ I will take care of my physical, emotional, and spiritual health so that I can have a balanced life

You have the power to choose.

It's your body, your future, and your decision. You are in charge of your body and you have the right to feel safe. You can be the one who decides when to have sex and when you are ready to get pregnant. And you can help to prevent diabetes in your family.



Video



*American Indian and Alaska Natives
are Twice as Likely to Get Gestational Diabetes or GDM*



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Study Sites

1. Indian Health Care Resource Center of Tulsa; Tulsa, OK
2. Northern Navajo Medical Center; Shiprock, NM
3. Portland State University; Portland, OR
4. Saint Regis Band of Mohawk; Akwesasne, NY
5. University of Oklahoma Tulsa Campus Harold Hamm Diabetes Center; Tulsa, OK



Eligibility Criteria for Girls

- AI/AN (self-identified)
- Fluent in English
- 12-24 years old
- Not pregnant
- BMI \geq 85th %'ile (12-19 yo) or BMI \geq 25 (20-24 yo)
 - Asked on telephone screening form
 - Verified with measured weight and height at baseline (visit #1)
 - If BMI is not in this eligible range and girl has family history of type 2 diabetes; the dyad is eligible
- A1C less than 6.5% as tested at the baseline (visit #1)
 - $< 5.7\%$ is normal (eligible)
 - $5.7\% - 6.4\%$ = prediabetes (eligible – but referral made to their Primary Care Provider)
 - $\geq 6.5\%$ (not eligible - referral made to their PCP)



Eligibility Criteria for Adult Female Caregiver

- AI/AN (self identified)
- Fluent in English
- Permanent caregiver for girl participant
- Aunt, grandmother, other older adult female (does not have to live with girl)
- Mother or stepmother who lives with girl



Stopping GDM RCT

Baseline Visit

- Consent, wt, ht, A1C
- Randomization
- Intervention and control groups: Surveys and March of Dimes pamphlet #1; Intervention group: video

3 month F/u

- Wt, ht
- Both groups: Surveys and March of Dimes pamphlet #2; Intervention group: eBook part 1

6 month F/u

- Wt, ht
- Both groups: Surveys and March of Dimes pamphlet #3; Intervention group: eBook part 2

9 month F/u

- Wt, ht, A1C
- Both groups: Surveys; Control group: entire intervention (eBook & video)
- Face-to-face HCP Reproductive Health Plan (Optional)
- Tool box
- **Access to book, video and toolkit for all participants at completion of Phase 2 data collection at all sites**

Outcomes and Measures

Phase 2 Pre-post: before and after watching video and reading eBook

- Knowledge of **GDM, reproductive health (RH), diabetes prevention**
- EHBM: health beliefs/attitudes, self-efficacy, intention
- Healthy lifestyle behaviors (healthy eating, physical activity)
- RH behaviors (family planning, seeking PC, initiating discussion w/ HCP)
- M-D communication, social support
- BMI, A1C, pregnancy outcomes/GDM prevented
- Demographics
- Satisfaction of eBook and video

Phase 3 HCPs' and adolescent girls' **uptake and satisfaction** of online Stopping GDM program



Stopping GDM RCT Recruitment

Total Recruited	Goal	3 month Completed	6 month Completed	9 month Completed
150	300	114	80	64

- Added new site (Portland State University, Portland, OR)
- Expanded age range (12-24yrs) and eliminated BMI inclusion criteria
- Decreased data collection period from 15 months to 9 months by shortening time between study visits to 3 months [baseline (pre-post), 3, 6, 9 month]
- Roll-in recruitment continued until end of data collection period (October 1, 2019)
(Intervention dose)



Baseline Demographic Characteristics

- Mother/daughter dyads (n=113)*
 - Intervention (n=60)
 - Control (n=53)
- Sample characteristics similar between groups ($p \geq 0.05$)

*Data from all sites except Shiprock



Daughter's Baseline Characteristics

Characteristic	Total (n=113) Mean±SD or n(%)	Treatment Group		p-value
		Intervention (n=60) Mean±SD or n(%)	Control (n=53) Mean±SD or n(%)	
Daughter's age (years)	16.9±3.0	16.4±2.5	17.5±3.4	p=.111
Daughter's race				p=.288
AI/AN	84 (74.3)	42 (70.0)	42 (79.2)	
Other	29 (25.7)	18 (30.0)	11 (20.8)	
Daughter's education				p _{FE} =.583
Grade 8 or less	25 (22.1)	14 (23.3)	11 (20.8)	
Grades 9-12	51 (45.1)	29 (48.3)	22 (41.5)	
High school graduate	15 (13.3)	7 (11.7)	8 (15.1)	
Earned GED	2 (1.8)	1 (1.7)	1 (1.9)	
Some college/university	17 (15.0)	9 (15.0)	8 (15.1)	
2-year college	3 (2.7)	0 (0.0)	3 (5.7)	
Daughter's sexual activity status				p=1.000
Yes	34 (30.1)	18 (30.0)	16 (30.2)	
No	79 (69.9)	42 (70.0)	37 (69.8)	

Mother's Baseline Characteristics

Characteristic	Total (n=113) Mean±SD or n(%)	Treatment Group		p-value
		Intervention (n=60) Mean±SD or n(%)	Control (n=53) Mean±SD or n(%)	
Mother's age (years)	44.7±9.4	43.1±7.9	46.6±10.6	p=.044
Mother's race				p=.623
AI/AN	93 (82.3)	48 (80.0)	45 (84.9)	p _{FE} =.082
Other	20 (17.7)	12 (20.0)	8 (15.1)	
Mother's education				
Grades 9-12	4 (3.5)	2 (3.3)	2 (3.8)	
High school graduate	6 (5.3)	3 (5.0)	3 (5.7)	
Earned GED	9 (8.0)	2 (3.3)	7 (13.2)	
Vocational/Technical Certificate	16 (14.2)	14 (23.3)	2 (3.8)	
Some college/university	26 (23.0)	14 (23.3)	12 (22.6)	
2-year college	20 (17.7)	8 (13.3)	12 (22.6)	
4-year college	20 (17.7)	10 (16.7)	10 (18.9)	p=.793
Graduate school (Masters)	9 (8.0)	5 (8.3)	4 (7.5)	
Graduate school (Doctoral)	3 (2.7)	2 (3.3)	1 (1.9)	
Mother's GDM status				p=.208
Yes	17 (15.0)	10 (16.7)	7 (13.2)	
No	96 (85.0)	50 (83.3)	46 (86.8)	
Mother's diabetes status				p _{FE} =.033
Yes	18 (15.9)	7 (11.7)	11 (20.8)	
No	95 (84.1)	53 (88.3)	42 (79.2)	
Relationship to daughter				
Mother	90 (79.6)	54 (90.0)	36 (67.9)	
Grandmother	10 (8.8)	2 (3.3)	8 (15.1)	
Aunt	5 (4.4)	1 (1.7)	4 (7.5)	
Other relative	4 (3.5)	1 (1.7)	3 (5.7)	
Friend	4 (3.5)	2 (3.3)	2 (3.8)	

Daughter's Knowledge Outcomes

Outcome	Total (n=113) Mean±SE	Treatment Group		Test statistic, p-value
		Intervention (n=60) Mean±SE	Control (n=53) Mean±SE	
Diabetes Prevention Comprehensive Knowledge (Daughter) (n=112)				F(Group)=1.556, p=.215 F(Time)=3.991, p=.048* F(G×T)=0.020, p=.887
Pre	58.7±1.8	56.5±2.5	60.9±2.6	
Post	61.4±1.8	59.4±2.5	63.4±2.6	
Total	60.1±1.7	58.0±2.3	62.1±2.4	
Reproductive Health & GDM Knowledge (Daughter) (n=112)				F(Group)=0.085, p=.771 F(Time)=29.635, p<.001* F(G×T)=6.867, p=.010*
Pre	39.2±2.1	37.4±2.8	41.0±3.0	
Post	48.7±2.1	51.5±2.8	46.0±3.0	
Total	43.9±1.9	44.5±2.5	43.4±2.7	
Family Planning Knowledge (Daughter) (n=112)				F(Group)=0.076, p=.783 F(Time)=22.622, p<.001* F(G×T)=9.081, p=.003*
Pre	59.3±2.6	57.1±3.5	61.6±3.7	
Post	68.7±2.6	72.2±3.6	65.0±3.8	
Total	64.0±2.4	64.7±3.3	63.3±3.5	
GDM Knowledge (Daughter) (n=112)				F(Group)=0.044, p=.834 F(Time)=20.902, p<.001* F(G×T)=2.625, p=0.108
Pre	21.9±2.3	20.581±3.1	23.2±3.3	
Post	31.6±2.3	33.743±3.2	29.5±3.3	
Total	26.7±2.0	27.162±2.8	26.3±2.9	

Daughter's Knowledge Outcomes - Summary

- Although daughters in both treatment groups showed improvements in their mean overall reproductive health and GDM knowledge scores and family planning knowledge scores from pre- to post-assessment at the baseline visit, greater mean improvements in these knowledge scores were found in the intervention group compared to the control group.



Mother's Knowledge Outcomes

Outcome	Total (n=113) Mean±SE	Treatment Group		Test statistic, p-value
		Intervention (n=60) Mean±SE	Control (n=53) Mean±SE	
Diabetes Prevention Comprehensive Knowledge (Mother)				F(Group)=0.041, p=.840 F(Time)=5.086, p=.026* F(G×T)=3.321, p=.071
Pre	75.5±1.6	74.1±2.1	76.9±2.3	
Post	78.1±1.6	78.9±2.1	77.4±2.3	
Total	76.8±1.5	76.5±2.0	77.1±2.1	
Reproductive Health & GDM Knowledge (Mother)				F(Group)=1.513, p=.221 F(Time)=28.333, p<.001* F(G×T)=2.063, p=.154
Pre	72.8±1.3	67.1±1.8	65.9±1.9	
Post	69.6±1.2	75.1±1.8	70.5±1.9	
Total		71.1±1.6	68.2±1.7	
Reproductive Health & GDM Knowledge—Family Planning Knowledge (Mother)				F(Group)=0.189, p=.665 F(Time)=4.876, p=.029* F(G×T)=2.657, p=.109
Pre	86.8±1.5	85.0±2.1	88.7±2.2	
Post	90.4±1.5	91.1±2.1	89.6±2.2	
Total	88.6±1.3	88.1±1.7	89.2±1.8	
Reproductive Health & GDM Knowledge—GDM Knowledge (Mother)				F(Group)=3.791, p=.054 F(Time)=29.175, p<.001* F(G×T)=0.357, p=.551
Pre	49.1±1.8	51.7±2.5	46.4±2.6	
Post	57.83±1.8	61.4±2.5	54.2±2.6	
Total	53.4±1.6	56.5±2.2	50.3±2.3	

Mother's Knowledge Outcomes - Summary

- Significant time effects were found for all knowledge scores for mothers at the baseline visit, with mothers showing increases in all mean knowledge scores from pre- to post-assessment at the baseline visit.
- Marginally significant difference between groups were found for GDM knowledge with mothers in the intervention group having higher scores.



Daughter's Self-Efficacy Outcomes

Outcome	Total (n=113) Mean±SE	Treatment Group		Test statistic, p-value
		Intervention (n=60) Mean±SE	Control (n=53) Mean±SE	
Self-efficacy for Healthy Living (Daughter) (n=112)				F(Group)=0.562, p=.445
Pre	47.3±1.4	47.9±1.9	46.7±2.0	F(Time)=15.789,
Post	51.2±1.4	52.6±1.9	50.0±2.0	p<.001*
Total	49.4±1.3	50.2±1.8	48.2±1.9	F(G×T)=0.538, p=.465
Self-efficacy for Planning a Pregnancy (Daughter) (n=110)				F(Group)=1.065, p=.304
Pre	86.4±2.2	87.7±3.0	85.2±3.1	F(Time)=7.523,
Post	90.4±2.2	93.4±3.0	87.5±3.1	p=.007*
Total	88.4±2.1	90.5±2.9	86.3±3.0	F(G×T)=1.394, p=.241

Daughter's Self-Efficacy Outcomes Summary

- Only significant time effects were found for self-efficacy for healthy living and self-efficacy for planning a pregnancy scores for daughters at the baseline visit, with daughters showing increases in mean self-efficacy scores from pre- to post-assessment at the baseline visit.

Daughter's and Mothers Intention Outcomes

Outcome	Total (n=113) Mean±SE	Treatment Group		Test statistic, p-value
		Intervention (n=60) Mean±SE	Control (n=53) Mean±SE	
Intention to Initiate Discussion with HCP and use Family Planning (Daughter) (n=110)	15.0±0.6	14.9±0.8	15.0±0.9	F(<u>G</u> roup)=0.000, p=.986 F(<u>T</u> ime)=7.241, p=.008* F(G×T)=0.045, p=.833
Pre	16.7±0.6	16.8±0.8	16.7±0.9	
Post	15.8±0.5	15.8±0.7	15.9±0.7	
Total				
Intention to Communicate with Daughter about Gestational Diabetes and Reproductive Health (Mother)	27.3±1.1	27.5±1.4	27.1±1.5	F(<u>G</u> roup)=1.805, p=.182 F(<u>T</u> ime)=27.737, p<.001* F(G×T)=5.105, p=.026*
Pre	31.7±1.0	34.0±1.4	30.0±1.5	
Post	29.5±1.0	31.0±1.2	28.2±1.4	
Total				

Daughter's and Mother's Intention Outcomes Summary

- Only significant time effects were found for daughter's intention to initiate discussion with health care provider and use family planning at the baseline visit, with daughters showing an increase in mean intention scores from pre- to post-assessment at the baseline visit.
- Significant group-by time interaction and time effects were found for mother's intention to communicate with daughters on GDM and reproductive health at the baseline visit. While mothers from both treatment groups show increases in mean intention to communicate with daughters on GDM and reproductive health scores from pre- to post-assessment at the baseline visit, greater mean improvements in these intention scores were found in the intervention group compared to the control group.



Daughter's and Mother's Health Belief and Attitudes Summary

- Only significant time effects were found for perceived susceptibility and barriers scores for daughters and mothers at the baseline visit, with daughters and mothers showing increases in mean perceived susceptibility scores and decreases in mean perceived barriers scores from pre- to post-assessment at the baseline visit.



Challenges with RCT

- Obtaining all IRBs (University, Tribal, National and Regional Indian Health Service)
- Recruitment at all sites
 - Mothers/daughters attend study visits together
- Solutions:
 - Expanded inclusion criteria
 - Remote access
 - Home-based
 - Paper surveys



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Dissemination Plan

- “Participants” are Health Care Professionals
- Recruiting Health Care Professionals
 - To learn about Stopping GDM and preconception counseling
 - To recommend Stopping GDM program to their patients (free)
- Website portal online for Stopping GDM program and background information on Stopping GDM & downloadable copies of eBook, video, mother communication book, and general toolkit
- <https://www.stoppinggdm.com>



Dissemination Plan

- Patients and Health Care Professionals will have satisfaction survey (optional) post viewing only
- National - Health Care Professional conferences and webinars
- Regional - offer to all Health Care Professionals at our RCT study sites



Dissemination Goal

Provide **FREE** access to **Stopping GDM** program to all AI/AN adolescent females at risk for GDM

You can help break the cycle of diabetes in AI/AN communities!



Stopping GDM Website

www.stoppinggdm.com



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The Stopping GDM Team

Stopping GDM Website

www.stoppinggdm.com

