Two Steps to Receive CME/CE Credit

STEP 1:

Scan me to open a text message!

Text in CE Code 83344 to 833-256-8390

by 1:00 PM on November 15th

This activates your online evaluation in the CE portal (new users follow prompts after texting to set up account).

STEP 2:

Complete the required online evaluation

by November 30, 2025

In the Cloud CME portal at **https://beaumont.cloud-cme.com** [Sign In > select **My CME** > select **Evaluations & Certificates**] – or – via the free CloudCME mobile app (organization code *Beaumont)*

Refer to full CE document for additional CE information. For assistance, email **CHEcme@corewellhealth.org**

Disclosure of Financial Relationships:

The following speakers and/or planning committee members have identified the following relevant financial relationship(s) with ineligible companies.

All other individuals involved with this activity have no relevant financial relationships with ineligible companies to disclose.

1. **Lauren Oshman, M.D.** (Course Co-Director): Stocks in publicly traded companies or stock options, excluding diversified mutual funds-Abbott, AbbVie, Johnson & Johnson, Merck & Co., Organon.

MCT2D Learning Community Series 2025
Pregnancy Care, Type 2 Diabetes, and Gestational Diabetes

CME/CE credit is available

In support of improving patient care, this activity has been planned and implemented by Corewell Health Southeast Michigan and Michigan Collaborative for Type 2 Diabetes. Corewell Health Southeast Michigan is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

This activity was planned by and for the healthcare team, and learners will receive 1.0 Interprofessional Continuing Education (IPCE) credit for learning and change.

Medicine CME: Corewell Health Southeast Michigan designates this live activity for a maximum of 1.0 *AMA PRA Category 1 Credit*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Nursing CE: Corewell Health Southeast Michigan designates this activity for a maximum of 1.0 ANCC contact hour. Nurses should claim only the credit commensurate with the extent of their participation in the activity.

Pharmacy CE: Corewell Health Southeast Michigan designates this activity for 1.0 ACPE contact hour. ACPE Universal Activity Number (UAN): JA4008259-9999-25-063-L01-P. Learners should claim only the credit commensurate with the extent of their participation in the activity. Credit will be uploaded to the NABP CPE Monitor within 30 days after activity completion. Per ACPE rules Corewell Health Southeast Michigan does not have access nor the ability to upload credits requested after 60 days. It is the individual learner's responsibility to provide the correct NABP ID and DOB (MMDD) to receive credit.

Dietetic CPEU:

Commission on Dietetic Registration
the credentialing agency for the Academy of Nutrition and Dietetics

Completion of this RD/DTR profession-specific or IPCE activity awards CPEUs (One IPCE credit = One CPEU).

If the activity is dietetics-related but not targeted to RDs or DTRs, CPEUs may be claimed which are commensurate with participation in contact hours (One 60 minute hour = 1 CPEU).

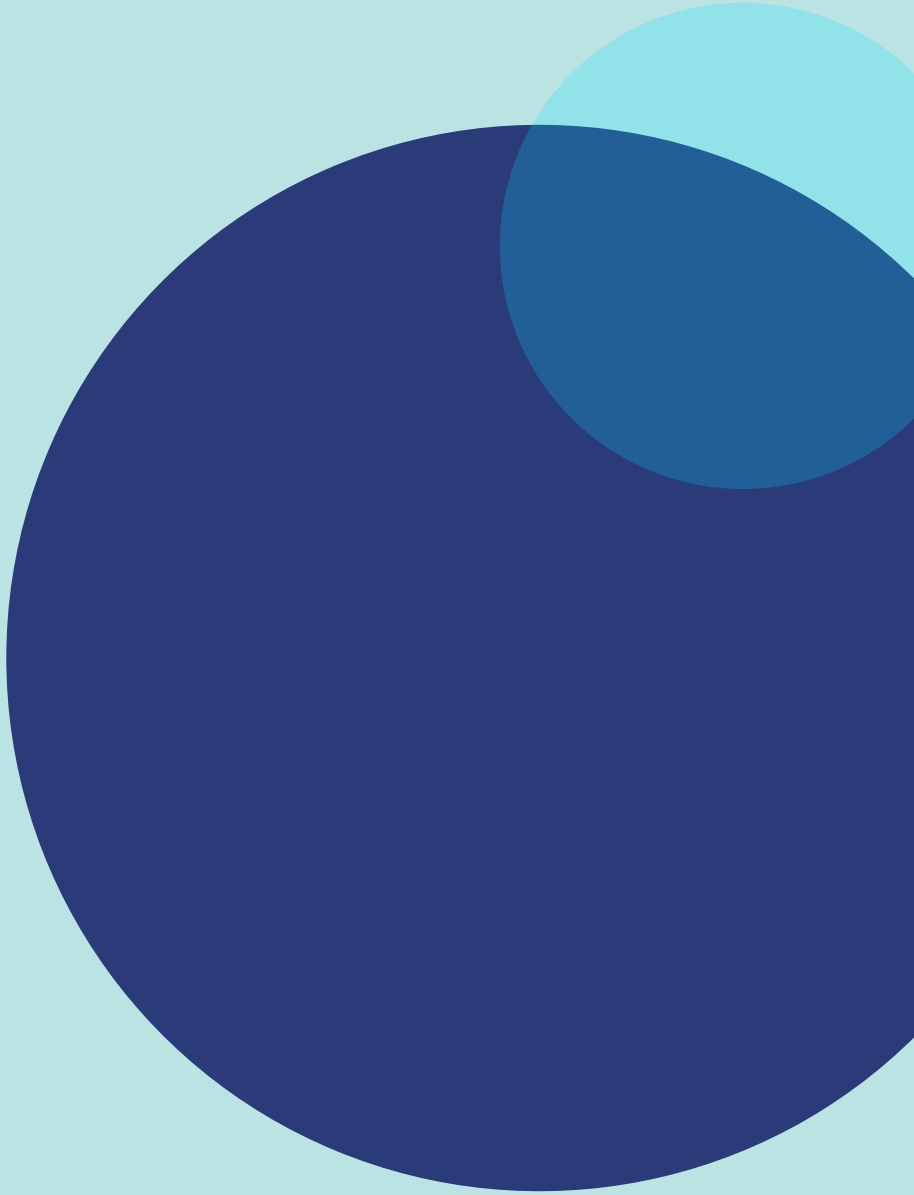
RD's and DTRs are to select activity type 102 in their Activity Log. Sphere and Competency selection is at the learner's discretion.

MCT2D
MICHIGAN COLLABORATIVE FOR TYPE 2 DIABETES

Pre- and Post- Conception Care for Preexisting Diabetes

Jennifer Wyckoff, MD

I have no conflicts of interest.



Initial Survey of Physician Practices related to Pre-Existing Diabetes and Pregnancy

- **Do you screen for pregnancy intent? (Pick one)**
  - No
  - Proactively on an individualized basis (ex. When prescribing high risk meds)
  - Systematically at annual HME
  - Systematically at every Routine Visit (ex. Vital Sign approach)
- **Do you prescribe contraception as part of your regular practice? (Pick more than one)**
  - I prescribe hormonal contraception
  - I place contraceptive implants
  - I place IUDs
  - None of the above
- **Which of the following describes your approach to preconception care for Type 2 diabetes and pregnancy?**
  - Refer to MFM for preconception counselling and provide preconception care myself.
  - Refer to Endocrinology for preconception counselling, care and glycemic management.
  - Perform preconception counselling, care and glycemic management myself.
- **Regarding scheduling of patients with Type 2 diabetes postpartum, do you…?**
  - Proactively perform outreach for postpartum scheduling
  - Depend on patient to schedule postpartum appointment
- **When do you counsel your pregnant patients with Type 2 diabetes to see you post partum?**
  - 2 weeks postpartum
  - 6 weeks postpartum
  - 3 months postpartum
  - 6 months postpartum
  - 1 year

Learning Objectives

Preconception care (PCC)

- Describe the Impact of PCC
- Introduce Screening for Pregnancy Intent
- Review Key Components of PCC
- Discuss how to Counsel on Risks
- Review Contraceptive Choices in Type 2 Diabetes
- Review Glycemic Goals for Preconception

Pregnancy

- Review Medication management in early Pregnancy

Post partum

- Discuss Glycemic Management and Breastfeeding
- Review Inter-partum care

THE JOURNAL OF CLINICAL AND APPLIED RESEARCH AND EDUCATION

Diabetes Care

JANUARY 2025 | VOLUME 48 | SUPPLEMENT 1

DIABETESJOURNALS.ORG/CARE

Standards of Care in Diabetes 2025

American Diabetes Association.

ISSN 0149-5992

European Society of Endocrinology

ENDOCRINE SOCIETY

The Journal of Clinical Endocrinology & Metabolism, 2025, **00**, 1–48
https://doi.org/10.1210/clinem/dgaf288
Advance access publication 13 July 2025
Clinical Practice Guideline

ENDOCRINE SOCIETY

OXFORD

Preexisting Diabetes and Pregnancy: An Endocrine Society and European Society of Endocrinology Joint Clinical Practice Guideline

Jennifer A. Wyckoff,[1,*] Annunziata Lapolla,[2] Bernadette D. Asias-Dinh,[3] Linda A. Barbour,[4] Florence M. Brown,[5,6] Patrick M. Catalano,[7] Rosa Corcoy,[8,9,10] Gian Carlo Di Renzo,[11,12] Nancy Drobycki,[13] Alexandra Kautzky-Willer,[14] M. Hassan Murad,[15] Melanie Stephenson-Gray,[16] Adam G. Tabák,[17,18] Emily Weatherup,[1] Chloe Zera,[19,20] and Naykky Singh-Ospina[21]

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[4]Endocrinology, Diabetes and Metabolism Department, University of Colorado School of Medicine and Anschutz Medical Campus, 1635 N. Aurora Court, Aurora, CO 80045, USA
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With participation and support from ACOG and SMFM, respectively

PATIENT CASE

- It’s a Monday.
- 37 yo G0P0 c Type 2 DM. Diagnosed based on 2+ glucose on UA in ED for uncomplicated UTI 3 weeks ago, successfully treated.
- PMH: PCOS, Infertility, Oligomenorrhea, Depression.
- SH: Divorced. No children.
- Meds: Metformin started in ED 3 weeks ago. Semaglutide from HERS started 2 weeks ago.
- ROS: Feels well.
- PE: BMI 34 BP 145/92
- Labs: A1C 9.6% today

Normal Comprehensive Chemistry and CBC in ED

What is the next best step?

A. Start Dapagliflozin
B. Refer for Comprehensive Type 2 Diabetes Education
C. Start Lisinopril
D. Stop Metformin
E. Screen for Pregnancy Intent/Contraceptive needs
F. Stop Semaglutide

What is the next best step?

A.	Start Dapagliflozin	*Not safe in Pregnancy*
B.	Refer for Diabetes Education	*Good choice/Could delay care*
C.	Start Lisinopril	*Not safe in Pregnancy*
D.	Stop Metformin	*Safe (c caveats)/Increases fertility*
E.	Screen for Pregnancy Intent/Contraceptive needs	
F.	Stop Semaglutide	*Safety Unknown/Increase fertility*

European Society of Endocrinology
ENDOCRINE SOCIETY
The Journal of Clinical Endocrinology & Metabolism, 2025, **00**, 1–48
https://doi.org/10.1210/clinem/dgaf288
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In individuals with diabetes who have the possibility of becoming pregnant, **we suggest asking a screening question about pregnancy intention at every reproductive, diabetes and primary care visit.** Screening for pregnancy intent is also suggested at urgent care/ emergency room visits when clinically appropriate. (2 | ⊕OOO)

Technical remarks

- There are no data supporting a specific timing or frequency of screening.
- A critical component of preconception care (PCC) is optimization of glycemia…
- The GDP suggests that for screening for pregnancy intent to be effective, three actions are required:
  1. Provision of basic counseling about the benefits of PCC
  2. Evaluation of contraception needs and/or family planning referral
  3. Referral for PCC to achieve goals of therapy. (Optimization of glycemia)

The main modifiable risk factor used to reduce complications of diabetes in pregnancy is A1C.

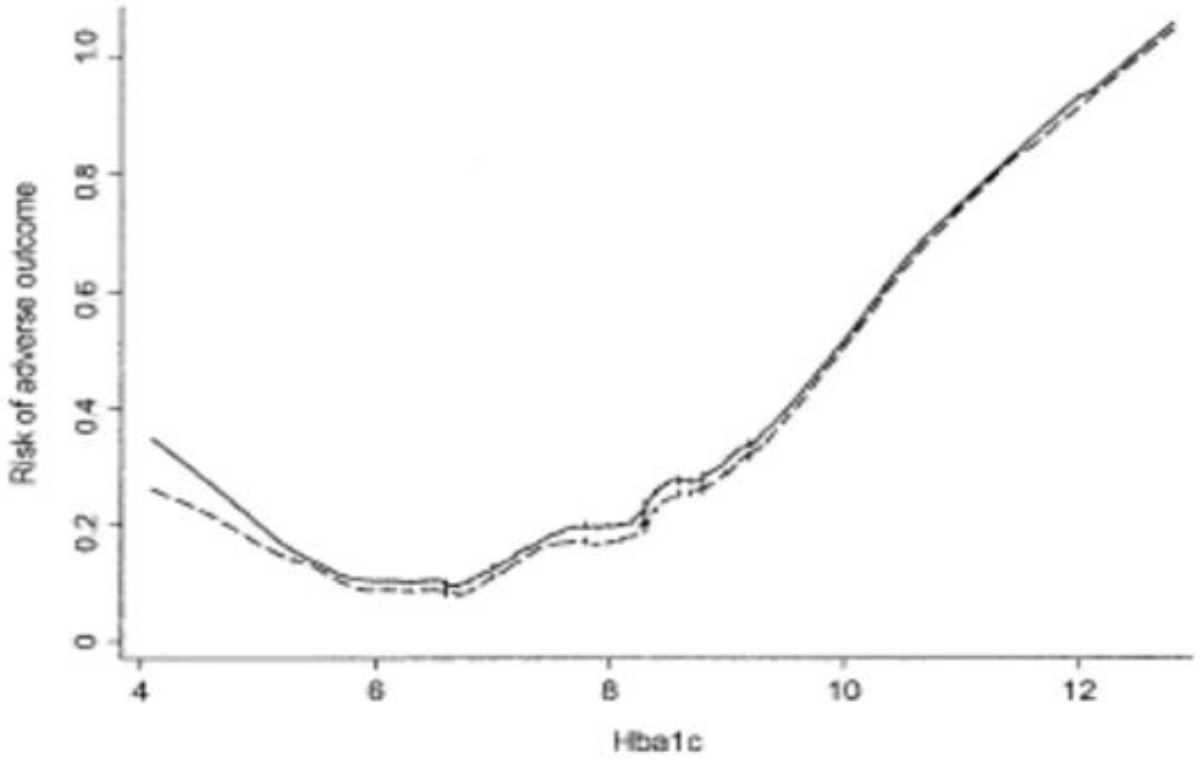

Figure 2—Relation between first-trimester A1C level and pregnancy outcome using the lowess model with bandwidth of 0.5. Full line depicts adverse and broken line early adverse outcome. Based on 376 pregnancies with good outcomes and 98 pregnancies with adverse outcomes.

Nielsen et al Diabetes Care 29:2612-2616,2006

Preconception Care Reduces Risks.

Metanalysis of 40 reports of 36 studies of PCC			
Congenital Malformations (25 studies)	RR 0.29	95% CI (0.21-0.40)*	High
Preterm Delivery (9 studies)	RR 0.85	95% CI (0.73-0.99)*	Moderate
Perinatal Mortality (10 studies)	RR 0.46	95% CI (0.30-0.73)*	Moderate
Small for Gestational Age (6 studies)	RR 0.52	95% CI (0.37-0.75)*	Moderate
NICU admission (4 studies)	RR 0.75	95% CI (0.67-0.84)*	Moderate

Preconception care reduces congenital malformations by 71%.

Adapted from Wahabi PLoS One. 2020 Aug 18;15(8):e0237571. doi: 10.17371/journal.pone.0237571.eCollection 2020.

PATIENT CASE

- It's a Monday.
- 37 yo G0P0 c Type 2 DM. Diagnosed based on 2+ glucose on UA in ED for uncomplicated UTI 3 weeks ago, successfully treated.
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- PE: BMI 34 BP 145/92
- Labs: A1C 9.6% today

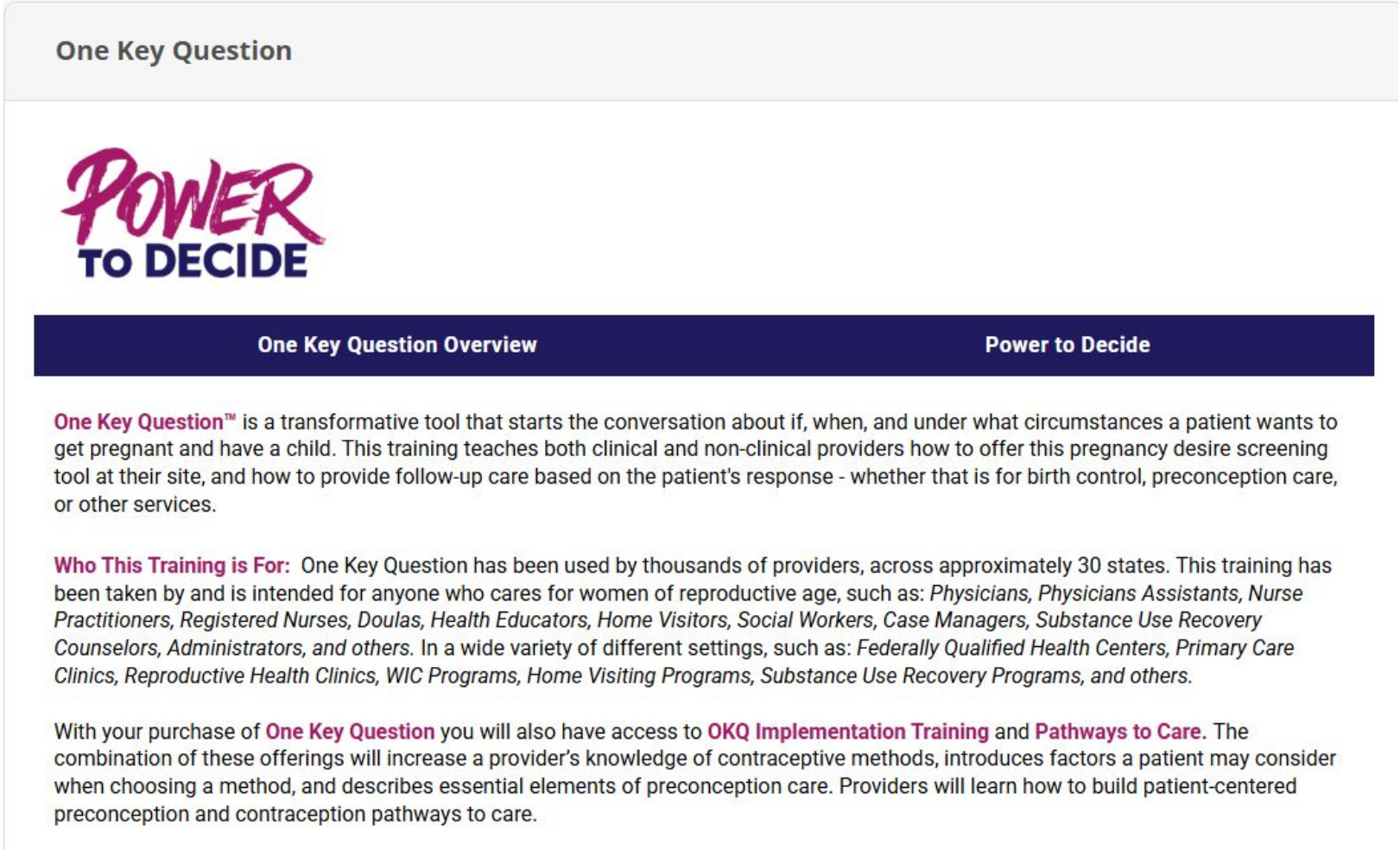
Normal Comprehensive Chemistry and CBC in ED

"Would you like to become pregnant in the next year?"

"I'd love to! I've always wanted children, though I don't know how my boyfriend would feel about it. We've only been dating a few months. But I can't get pregnant anyway. I was married for 10 years and never got pregnant."

Her LMP was 4 months ago. You review previous infertility history and see that Repro Endo had diagnosed PCOS 10 years ago and not found other reasons for infertility. They had recommended Clomiphene citrate as initial therapy, but insurance barriers precluded treatment. There was no follow up and no further interventions were tried.

American Public Health Association


One Key Question

POWER TO DECIDE

One Key Question Overview	Power to Decide

One Key Question™ is a transformative tool that starts the conversation about if, when, and under what circumstances a patient wants to get pregnant and have a child. This training teaches both clinical and non-clinical providers how to offer this pregnancy desire screening tool at their site, and how to provide follow-up care based on the patient's response - whether that is for birth control, preconception care, or other services.

Who This Training is For: One Key Question has been used by thousands of providers, across approximately 30 states. This training has been taken by and is intended for anyone who cares for women of reproductive age, such as: *Physicians, Physicians Assistants, Nurse Practitioners, Registered Nurses, Doulas, Health Educators, Home Visitors, Social Workers, Case Managers, Substance Use Recovery Counselors, Administrators, and others.* In a wide variety of different settings, such as: *Federally Qualified Health Centers, Primary Care Clinics, Reproductive Health Clinics, WIC Programs, Home Visiting Programs, Substance Use Recovery Programs, and others.*

With your purchase of **One Key Question** you will also have access to **OKQ Implementation Training** and **Pathways to Care.** The combination of these offerings will increase a provider's knowledge of contraceptive methods, introduces factors a patient may consider when choosing a method, and describes essential elements of preconception care. Providers will learn how to build patient-centered preconception and contraception pathways to care.

One Key Question®: First Things First in Reproductive Health

Deborah Allen[1], Michele Stranger Hunter[2], Susan Wood[3], Tishra Beeson[4]

2017 Mar;21(3):387-392. doi: 10.1007/s10995-017-2283-2.

Which of the following would you do now?

A. Order Pregnancy test

B. Counsel on diagnosis of PCOS, impact of diabetes medications and weight loss on fertility

C. Counsel on risks in diabetes and pregnancy.

D. Counsel on need for contraception and prescribe or refer as appropriate.

E. Counsel on Glycemic goals in Pregnancy (and outside of pregnancy) and medications in pregnancy.

F. Counsel on the need for Preconception care.

G. All of the Above.

Which of the following would you do now?

A. Order Pregnancy test
B. Counsel on diagnosis of PCOS, impact of diabetes medications and weight loss on fertility
C. Counsel on risks in diabetes and pregnancy.
D. Counsel on need for contraception and prescribe or refer as appropriate.
E. Counsel on Glycemic goals in Pregnancy (and outside of pregnancy) and medications in pregnancy.
F. Counsel on the need for Preconception care.
G. All of the Above.

Comprehensive Preconception Care Checklist

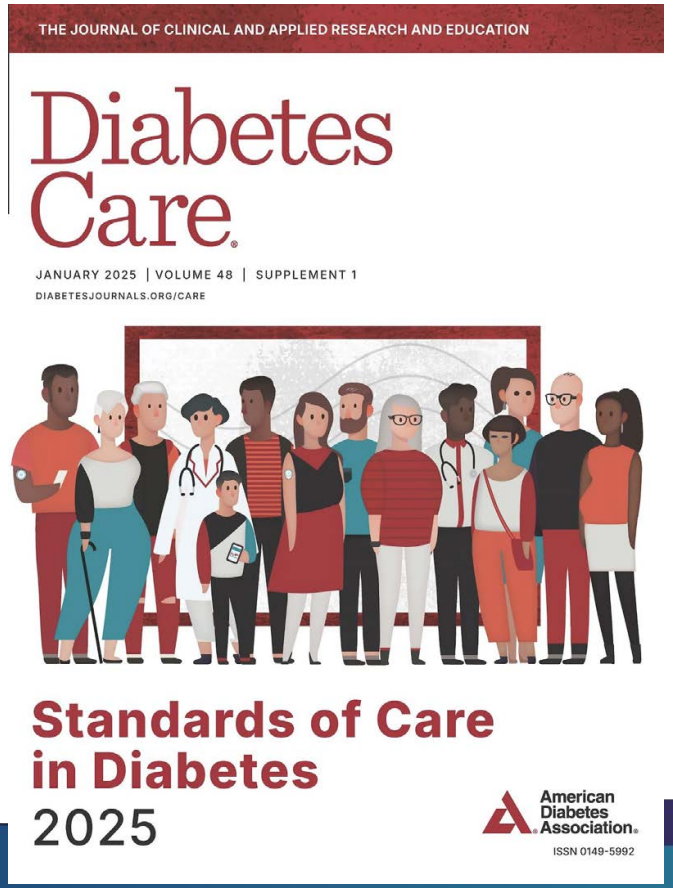


Table 15.1—Checklist for preconception care for people with prediabetes, diabetes, or a history of gestational diabetes mellitus

Preconception education should include:

- ☐ Comprehensive nutrition assessment and recommendations for:
  - Overweight and obesity or underweight
  - Meal planning
  - Correction of dietary nutritional deficiencies
  - Caffeine intake
  - Safe food preparation technique
- ☐ Lifestyle recommendations for:
  - Regular moderate exercise
  - Avoidance of hyperthermia (hot tubs)
  - Adequate sleep
- ☐ Comprehensive diabetes self-management education
- ☐ Counseling on diabetes in pregnancy per current standards, including natural history of insulin resistance in pregnancy and postpartum; preconception glycemic goals; avoidance of DKA and severe hyperglycemia; avoidance of severe hypoglycemia; progression of retinopathy in individuals with preexisting diabetes; PCOS (if applicable); fertility in people with diabetes; genetics of diabetes; risks to pregnancy including miscarriage, stillbirth, congenital malformations, macrosomia, preterm labor and delivery, hypertensive disorders in pregnancy
- ☐ Supplementation
  - Folic acid supplement (400–800 μg/day routine)
  - Appropriate use of over-the-counter medications and supplements

Health assessment and plan should include:

- ☐ General evaluation of overall health
- ☐ Evaluation of diabetes and its comorbidities and complications, including DKA and severe hyperglycemia; severe hypoglycemia/hypoglycemia unawareness; barriers to care; comorbidities such as hyperlipidemia, hypertension, MASLD, PCOS, and thyroid dysfunction; complications such as macrovascular disease in individuals with preexisting diabetes, nephropathy, neuropathy (including autonomic bowel and bladder dysfunction), and retinopathy
- ☐ Evaluation of obstetric or gynecologic history, including a history of cesarean section, congenital malformations or fetal loss, current methods of contraception, hypertensive disorders of pregnancy, postpartum hemorrhage, preterm delivery, previous macrosomia, Rh incompatibility, and thrombotic events (DVT/PE)
- ☐ Review of current medications and appropriateness during pregnancy

Screening should include:

- ☐ Diabetes complications and comorbidities in individuals with preexisting diabetes, including comprehensive foot exam; comprehensive ophthalmologic exam; ECG in individuals starting at age 35 years who have cardiac signs or symptoms or risk factors and, if abnormal, further evaluation; lipid panel; serum creatinine; TSH; and urine albumin-to-creatinine ratio
- ☐ Anemia
- ☐ Genetic carrier status (based on history):
  - Cystic fibrosis
  - Sickle cell anemia
  - Tay-Sachs disease
  - Thalassemia
  - Others if indicated
- ☐ Infectious disease (per ACOG guidelines)

Preconception plan should include:

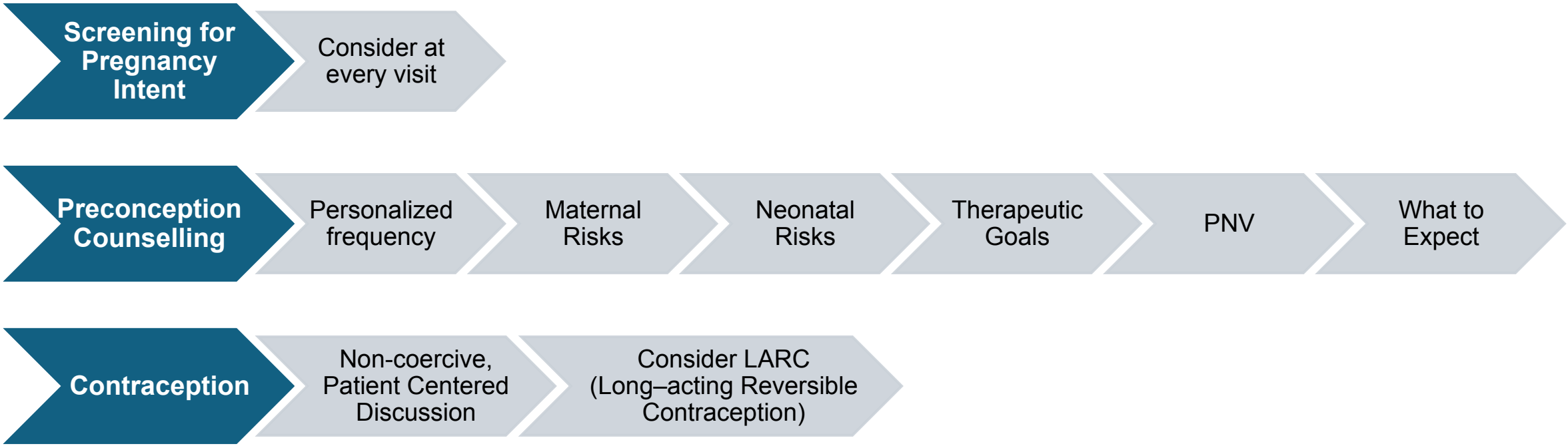
- ☐ Immunizations (per ACOG guidelines) (165–167)
- ☐ Nutrition and medication plan to achieve glycemic goals prior to conception, including appropriate implementation of blood glucose monitoring, continuous glucose monitoring (if indicated and appropriate), and pump technology (if indicated and appropriate)
- ☐ Contraceptive plan to prevent pregnancy until glycemic goals are achieved
- ☐ Management plan for general health, gynecologic concerns, comorbid conditions, or complications, if present, including hypertension, nephropathy, retinopathy; Rh incompatibility; and thyroid dysfunction

Created using information from American College of Obstetricians and Gynecologists (ACOG) (5) and others (20,22). DKA, diabetic ketoacidosis; DVT/PE, deep vein thrombosis/pulmonary embolism; ECG, electrocardiogram; MASLD, metabolic dysfunction-associated steatotic liver disease; PCOS, polycystic ovary syndrome; TSH, thyroid-stimulating hormone.

MCT2D

MCT2D.org

Key Components of Preconception Care (1/2)



Key Components of Preconception Care (2/2)

Preconception Screening and Evaluation

- Thorough History and Physical, confirm diagnosis, Hz of Bariatric surgery, and include screening mental health, social determinants of health, etc.
- Referrals:
  - MFM assessment (with Genetic Carrier screening)
  - Ophthalmology
- Immunizations
- Screening on PE:
  - BMI
  - BP, P
  - Cardiac exam
  - Foot exam
  - EKG >35 yo
- Lab Screenings:
  - A1C
  - CBC,
  - GFR and UMA,
  - LFTs,
  - Lipids,
  - TSH

Diabetes Education

- Comprehensive Diabetes Education (Insulin use expected)
- Monitoring
- Nutrition

Preconception Care

- Every 4-8 weeks
- Optimize Glycemia to Achieve A1C < 6.5%
  - Fasting < 95 mg/dl
  - 2hr pp < 120 mg/dl
  - TIR (63-140 mg/dl) >70%
- Glycemic Medications
- BMI
- Blood Pressure
- Lipids – Stop statins

European Society of Endocrinology
ENDOCRINE SOCIETY
The Journal of Clinical Endocrinology & Metabolism, 2025, 00, 1–48
https://doi.org/10.1210/clinem/dgaf288
Advance access publication 13 July 2025
Clinical Practice Guideline

Preexisting Diabetes increases Maternal/Neonatal Risks

Table 1. Rates of pregnancy complications in preexisting diabetes in a United States cohort, 2004-2011

Adverse event	No diabetes N = 773 751	Type 1 diabetes N = 1125	Type 2 diabetes N = 10 136
Miscarriage, % RR [95% CI]	19.7%	17.9% 0.91 [0.80-1.67]	25.2%[a] 1.28 [1.24-1.32]
Any congenital malformation, % RR [95% CI]	13.4%	18.5%[a] 1.38 [1.15, 1.67]	19.0%[a] 1.42 [1.33, 1.51]
Any congenital heart defect, % RR [95% CI]	3.2%	8.9%[a] 2.80 [2.10, 3.73]	6.9%[a] 2.16 [1.92, 2.41
Intrauterine fetal demise, % RR [95% CI]	0.3%	0.4% 1.47 [0.55, 3.92]	0.8%[a] 2.5 [1.94, 3.26]
Hypertensive disorders of pregnancy, % RR [95% CI]	28.2%	47.4%[a] 1.68 [1.56, 1.81]	55.4% 1.97 [1.92, 2.01]
Macrosomia, % RR [95% CI]	4.6%	11.0%[a] 2.38 [1.85, 3.07]	6.6%[a] 1.43 [1.27, 1.61]
Cesarean delivery, % RR [95% CI]	27.4%	52.5%[a] 1.92 [1.79, 1.82]	48.5% 1.37 [1.35, 1.38]

Abbreviation: RR, risk ratio.
[a]Indicates statistical significance compared to no diabetes. (Modified from Jovanovič L et al. *Diabetes Metab Res Rev.* 2015;31(7):707-716. ©The Authors, published by John Wiley & Sons, Ltd. (2)).

Patient Education on Maternal Risk

- Retinopathy
  - Vision loss
- Kidney disease
  - Renal Failure
- Preeclampsia
  - Strokes, Seizures
- L+D complications
  - Tears, Hemorrhage

Patient Education- Risk to Offspring

- Congenital Malformations
  - Heart Defects
  - Caudal Regression
- Macrosomia
  - Shoulder Dystocia
- Neonatal hypoglycemia
- Miscarriage/Stillbirth
- Epigenetic changes and risk of Obesity and Type 2 diabetes
- Preterm Delivery

JAMA. 2015;313(14):1425-1434. doi:10.1001/jama.2015.2707
Diabetalogia 1995;38:975-82
J Pediatr. 2012 Nov;161(5):787-91. doi: 10.1016/j.jpeds.2012.05.022. Epub 2012 Jun 23

Risk to Offspring- Common Questions

- Neonatal hypoglycemia
  - 48% hypoglycemic (Glucose < 47mg/dl)
  - 19% severe hypoglycemia (Glucose < 36 mg/dl)
    - Seizures
  - 83% of episodes occurred in 24 hours
- Genetics and Risk of T1DM (5-7%) vs T2DM (15%->50%)
- C section
- Preterm Delivery
  - 24% of pregnancies in women with T1DM resulted in preterm delivery.
  - 15% indicated (mostly for preeclampsia)
  - 9% spontaneous
  - Poor control was a factor in both.

JAMA. 2015;313(14):1425-1434. doi:10.1001/jama.2015.2707
Diabetalogia 1995;38:975-82
J Pediatr. 2012 Nov;161(5):787-91. doi: 10.1016/j.jpeds.2012.05.022. Epub 2012 Jun 23
***Diabetes Care* 27:2824–2828, 2004**

PATIENT CASE

- 37 yo G0P0 c Type 2 DM, diagnosed 3 weeks ago.

You briefly counsel her on PCOS and infertility, the impact of diabetes medication and weight loss on PCOS related infertility, and the risks associated with an elevated A1C periconception.

It is a lot for her to take in!

She wants to know what her contraceptive choices are.

Contraception Efficacy

LARC
Long-Acting Reversible Contraception

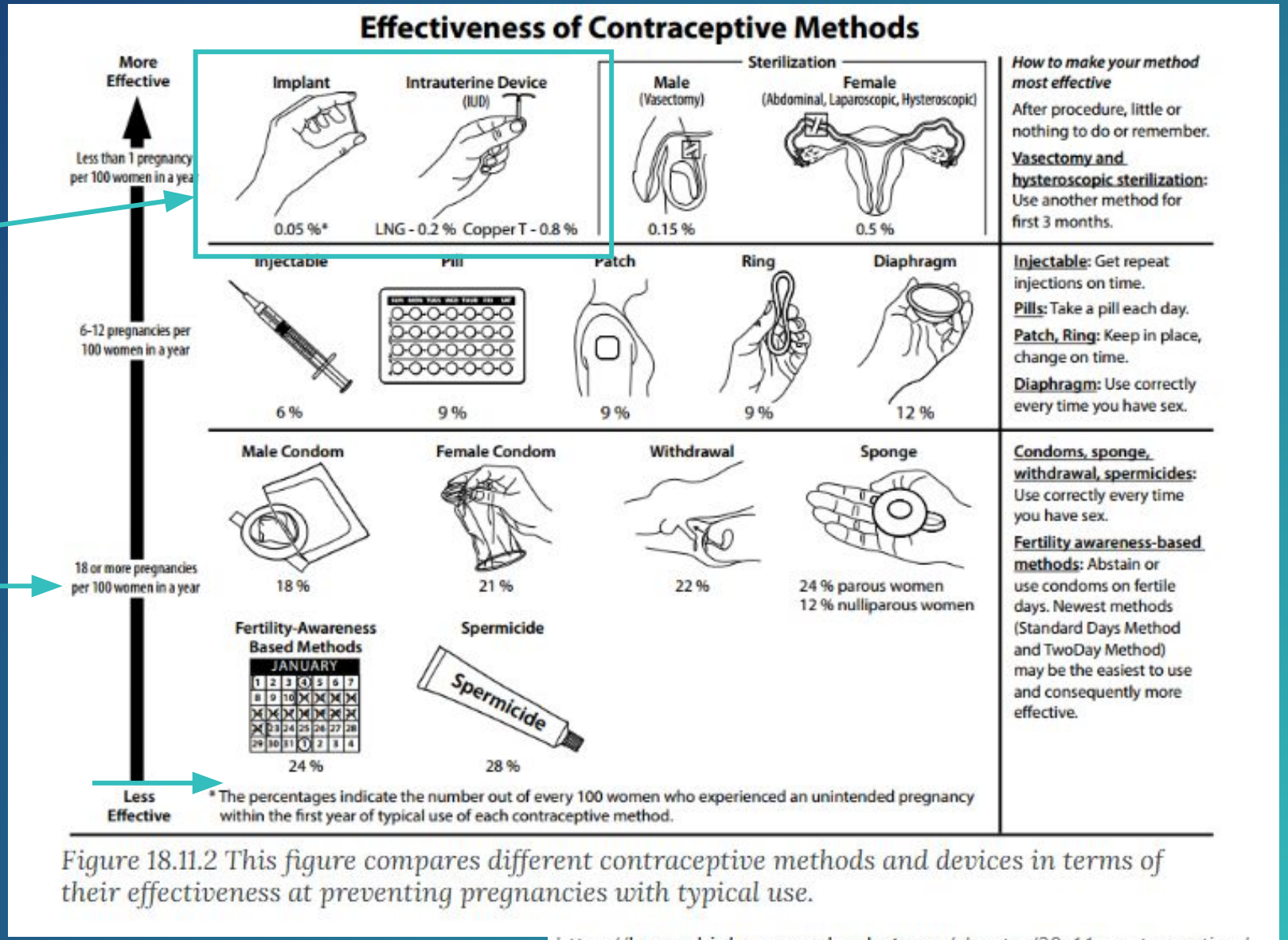


Figure 18.11.2 This figure compares different contraceptive methods and devices in terms of their effectiveness at preventing pregnancies with typical use.

https://humanbiology.pressbooks.tru.ca/chapter/20-11-contraception/

Contraception Safety

For accessible version, please see the summary of classifications at https://www.cdc.gov/contraception/hcp/usmec/

Summary Chart of U.S. Medical Eligibility Criteria for Contraceptive Use (U.S. MEC)

Updated in 2024. This summary sheet only contains a subset of the recommendations from the U.S. MEC. For complete guidance, see: https://www.cdc.gov/contraception/hcp/usmec/. Most contraceptive methods do not protect against STIs. Consistent and correct use of the external (male) latex condom reduces the risk of STIs and HIV.
Please see NIH guidelines for up to date recommendations on hormonal contraception and ARVs: https://clinicalinfo.hiv.gov/en/guidelines/perinatal/prepregnancy-counseling-childbearing-age-overview?view=full#table-3 and https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-arv/drug-interactions-overview?view=full.

Condition	Sub-Condition	Cu-IUD		LNG-IUD		Implant		DMPA		POP		CHC	
		I	C	I	C	I	C	I	C	I	C	I	C
Diabetes	a) History of gestational disease	1		1		1		1		1		1	
	b) Nonvascular disease												
	i) Non-insulin dependent	1		2		2		2		2		2	
	ii) Insulin dependent	1		2		2		2		2		2	
	c) Nephropathy/retinopathy/neuropathy‡	1		2		2		3		2		3/4*	
	d) Other vascular disease or diabetes of >20 years' duration‡	1		2		2		3		2		3/4*	

KEY: 1 = No restriction (method can be used) | 2 = Advantages generally outweigh theoretical or proven risks | 3 = Theoretical or proven risks usually outweigh the advantages | 4 = Unacceptable health risk (method not to be used)

Abbreviations: ARV = antiretroviral; C = continuation of contraceptive method; CHC = combined hormonal contraceptive (pill, patch, and ring); COC = combined oral contraceptive; Cu-IUD = copper intrauterine device; DMPA = depot medroxyprogesterone acetate; I = initiation of contraceptive method; LNG-IUD = levonorgestrel intrauterine device; NA = not applicable; POP = progestin-only pill; P/R = patch/ring; SSRI = selective serotonin reuptake inhibitor; STI = sexually transmitted infection; VTE = venous thromboembolism. ‡Condition associated with increased risk as a result of pregnancy. *Please see the complete guidance for a clarification to this classification: https://www.cdc.gov/contraception/hcp/usmec/.

PATIENT CASE

- 37 yo G0P0 c Type 2 DM, diagnosed 3 weeks ago.

You discuss contraception and pregnancy, and she agrees to use condoms. She knows she should have been for disease prevention. She really doesn't believe she can get pregnant, and though she'd like a pregnancy, she doesn't think she is at the right point in her life to pursue.

You order labs,refer to Comprehensive Diabetes Education Type 2 Classes, start metformin (and a PNV!), prescribe a glucose meter and she agrees to test fasting and bedtime.

Her labs come back on Tuesday.

BHCG:12,000

UMA: <30

Lipids: Triglycerides 180 (not fasting), LDL 124

TSH: normal

You arrange an urgent follow up in person the next day.

PATIENT CASE

- 37 yo G0P0 c Type 2 DM, diagnosed 3 weeks ago.

Unclear gestational age (6-15 weeks based on BHCG)

She's very excited. "Glowing". Her boyfriend has come with her and seems very supportive.

She wants this pregnancy.

PE: BMI 34, BP 150/90

Labs: BHCG- 12,000

Her glucoses are

Monday pm: 245 mg/dL

Tuesday am: 142 mg/dL

Tuesday pm: 220 mg/dL

Wed am: 137 mg/dL

You review the importance of glycemic targets again.

Change testing to fasting, pre and 2 hours after each meal.

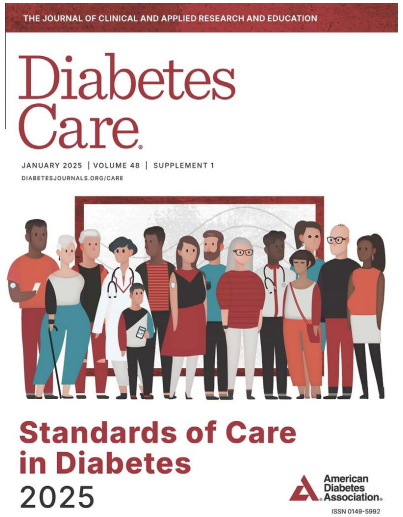
Discuss CGM

Schedule once to twice weekly glycemic follow up.

Glycemic goals

- A1C < 6.5% (<6.0% in pregnancy)
- Fasting glucose < 95 mg/dl
- 1hr postprandial glucose <140 mg/dL
- 2hr postprandial glucose < 120 mg/dL

- Pregnancy specific TIR (63-140 mg/dL)
  - >70% in T1DM
  - >90% In T2DM



Recommendation:

In individuals with PDM using a CGM, <u>we suggest against the use of single CGM target</u> <140 mg/dl (7.8 mmol/L) in place of standard of care pregnancy glucose targets of fasting <95 mg/dl (5.3 mmol/L), 1h pp <140 mg/dl (7.8 mmol/L), 2h pp <120 mg/dl (6.7 mmol/L)

(2 | ⊕◯◯◯), very low due to lack of direct evidence

The Journal of Clinical Endocrinology & Metabolism, 2025, 00, 1–48
https://doi.org/10.1210/clinem/dgaf288
Advance access publication 13 July 2025
Clinical Practice Guideline

Which of the following would you do now?

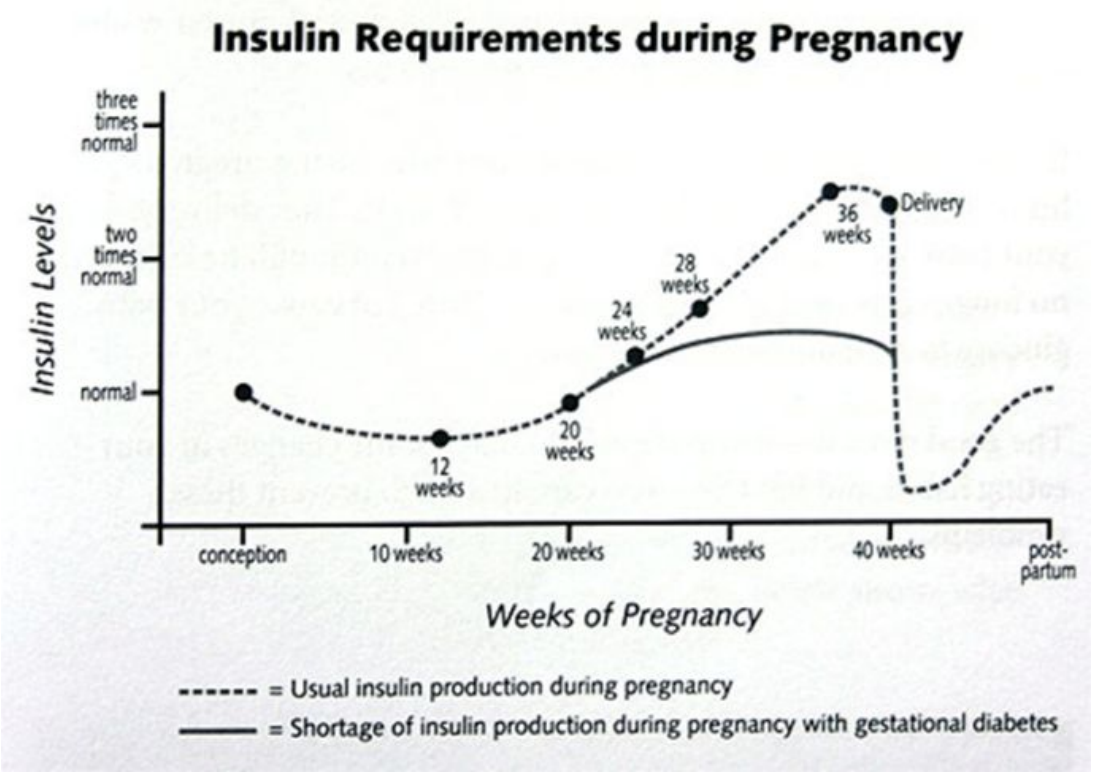
A. Start Once daily long acting insulin
B. Start Basal/Bolus Insulin
C. Stop Metformin.
D. Continue Metformin until end of 1st trimester
E. Continue Metformin through pregnancy.
F. Stop Semaglutide.
G. Continue Semaglutide until end of 1st trimester
H. Continue Semaglutide through pregnancy.

Which of the following would you do now?

A. Start Once daily long acting insulin
B. Start Basal/Bolus Insulin
C. Stop Metformin.
D. Continue Metformin until end of 1st trimester
E. Continue Metformin through pregnancy.
F. Stop Semaglutide.
G. Continue Semaglutide until end of 1st trimester
H. Continue Semaglutide through pregnancy.

Treatment of Preexisting Diabetes in Pregnancy

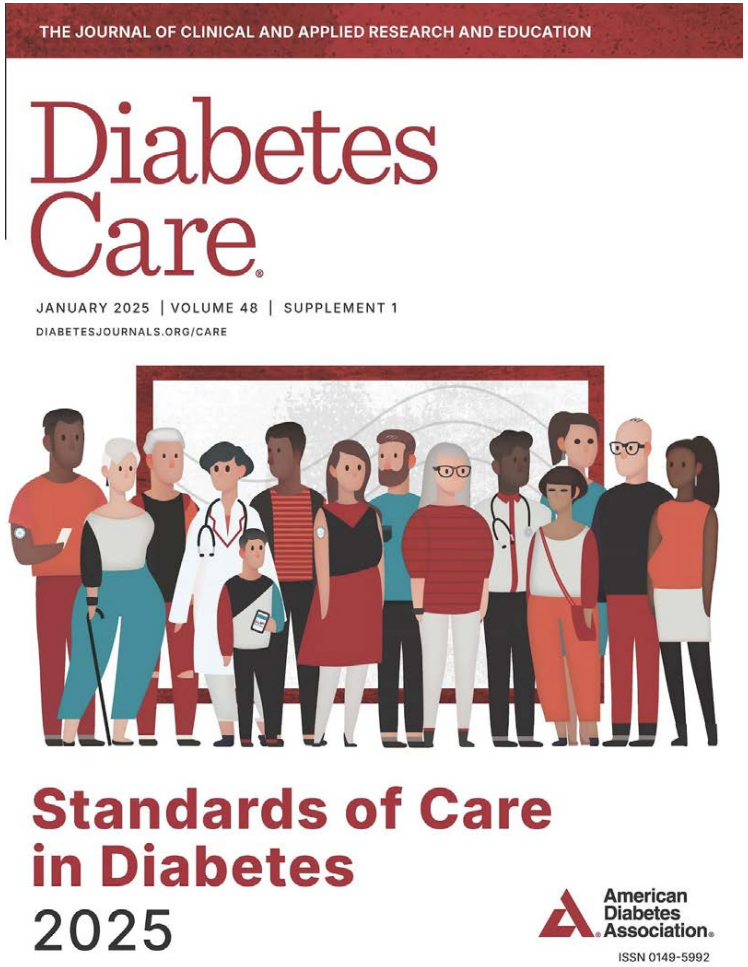
- Insulin
  - 2-4 fold increase in insulin requirements
- Basal Bolus or Insulin pump



Davidson J Fish LH, Reader D. Gestational Diabetes: Caring for yourself and your baby. 5thed. Minneapolis: MN International Diabetes Center; 2008.

Metformin

- 15.22 Metformin, when used to treat polycystic ovary syndrome and induce ovulation, should be discontinued by the end of the first trimester. A



R4- Metformin: Direct Evidence

Metformin in women with type 2 diabetes in pregnancy (MiTy): a multicentre, international, randomised, placebo-controlled trial

*Denice S Feig, Lois E Donovan, Bernard Zinman, J J Sanchez, Elizabeth Asztalos, Edmond A Ryan, I G Fantus, Eileen Hutton, Anthony B Armson, Lorraine L Lipscombe, David Simmons, Jon F R Barrett, Paul J Karanicolas, Siobhan Tobin, H David McIntyre, Simon Yu Tian, George Tomlinson, and Kellie E Murphy, on behalf of the MiTy Collaborative Group**

- Multicenter RCT (26 centers)
- N=502: Insulin + Metformin vs Insulin + placebo
- Mean BMI 35; HgA1C 6.4 at 16.5 wks

- **No difference in Composite Primary Outcome: Pregnancy Loss, Pre-Term Birth, Birth Injury, Neonatal Hypoglycemia, NICU admission >24 hrs**

- Secondary Outcomes
- Less LGA/ More SGA
  - **LGA >97% (9 vs 15%);** BW lower (3156 vs 3375g) both a ~37.5 wks
  - **SGA <10% (13% vs 7%)** nearly twice as high with Metformin

Metformin was found to cause renal dysmorphology in Rhesus monkeys exposed in utero.

Clinical implications of our findings. We demonstrate fetal bioaccumulation of metformin with associated fetal growth restriction in the viscera and skeletal muscle, and significant renal dysmorphology, following maternal initiation of the drug within 30 days of conception. Given these results and the prevalence of metformin therapy, additional investigation of any potential immediate and enduring effects of prenatal metformin use is warranted.

Please cite this article as: BOLTE E, DEAN T, GARCIA B, SEFEROVIC MD, SAUTER K, HUMMEL G, BUCHER M, Li F, HICKS J, QIN X, SUTER MA, BARROZO ER, JOCHUM M, SHOPE C, FRIEDMAN JE, GANNON M, WESOLOWSKI SR, MCCURDY CE, KIEVIT P, AAGAARD KM, Initiation of Metformin in Early Pregnancy Results in Fetal Bioaccumulation, Growth Restriction & Renal Dysmorphology in a Primate Model, *American Journal of Obstetrics and Gynecology* (2024), doi: https://doi.org/10.1016/j.ajog.2024.06.002.

GLP-1RA

- Unlikely to cross placenta; but there are GLP-1 Receptors present in placenta

- Concern with rapid weight gain prior to conception and during early pregnancy
- Concern with stopping it abruptly with rebound hyperglycemia during organogenesis

- Cohort/Retrospective studies: Heterogeneous populations, with limited prescription and exposure data <5 wks
- Glycemia in 1st trimester unknown;

Dao et al BMJ Open 2024

- Animal studies; marked decrease in oral intake

Manufacturers of GLP-1 RAs recommend stopping drugs 2 mos before conception due long half-life.

JAMA Internal Medicine | Original Investigation

Safety of GLP-1 Receptor Agonists and Other Second-Line Antidiabetics in Early Pregnancy

Carolyn E. Cesta, PhD; Ran Rotem, ScD; Brian T. Bateman, MD, MSc; Gabriel Chodick, PhD; Jacqueline M. Cohen, PhD; Kari Furu, PhD; Mika Gissler, PhD; Krista F. Huybrechts, PhD; Lars J. Kjerpeseth, PhD; Maarit K. Leinonen, PhD; Laura Pazzagli, PhD; Helga Zoega, PhD; Ellen W. Seely, MD; Elisabetta Patorno, MD, DrPH; Sonia Hernández-Díaz, MD, DrPH

Clinical Science (2023) **137** 663–678
https://doi.org/10.1042/CS20220890

PORTLAND PRESS

Research Article

Maternal glucagon-like peptide-1 is positively associated with fetal growth in pregnancies complicated with obesity

Jerad H. Dumolt[1], Fredrick J. Rosario[1], Avery C. Kramer[1], Stacee Horwitz[1], Theresa L. Powell[1,2] and Thomas Jansson[1]

[1]Department of Obstetrics & Gynecology, Division of Reproductive Sciences, University of Colorado Anschutz Medical Campus, Aurora, CO, U.S.A.; [2]Section of Neonatology, Department of Pediatrics, University of Colorado Anschutz Medical Campus, Aurora, CO, U.S.A.

Correspondence: Jerad H. Dumolt (jerad.dumolt@cuanschutz.edu)

Unique tirzepatide effect:

- Oral contraceptives: Reduction in Cmax & AUC
  - *Add barrier method for <u>4 weeks</u> after start and <u>4 weeks</u> after each dose adjustment*
  - *Consider switch to non-oral contraceptive method*

You refer to MFM, and Ophthalmology. You perform an EKG which is normal. What else would you do now?

A. Start Lisinopril.

B. Start Labetalol.

C. Start HCTZ

D. Start Atenolol.

You refer to MFM, and Ophthalmology. You perform an EKG which is normal. What else would you do now?

A. Start Lisinopril.

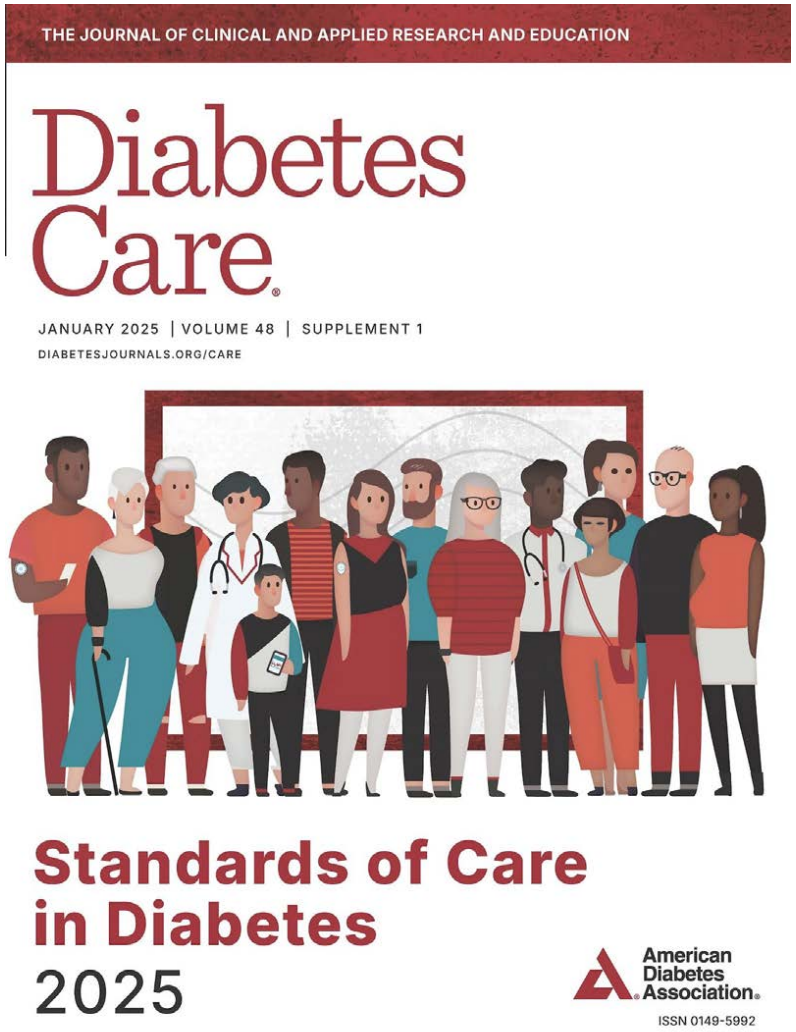
B. Start Labetalol.

C. Start HCTZ

D. Start Atenolol.

Preconception Blood Pressure Management

- 15.25a Potentially harmful medications in pregnancy (e.g., ACE inhibitors, angiotensin receptor blockers, mineralocorticoid receptor antagonists) should be stopped prior to conception and avoided in sexually active individuals of childbearing potential who are not using reliable contraception. B



PATIENT CASE

- 37 yo G0P0 c Type 2 DM

She returns 1 week later. She has lost 3 lbs since last week and 8 lbs since she was in the ED 4 weeks ago.

She has stopped Semaglutide.

She is still taking Metformin.

She has started Basal/Bolus insulin with significant improvement in glucose.

She has an upcoming appt with MFM for a US for dates tomorrow.

She saw the RD/CDCES and was given a standard pregnancy diet for diabetes which is targeting about 180 grams of carbs a day. She reports she has started a “keto” diet. She is keeping total daily carbs < 60 gms.

What is your advice?

A. Dietary intake < 100 gm of carbs/day is associated with neural tube defects/ poor neurologic outcomes.

B. Dietary intake > 190 gm of carbs/day is associated with worse A1C.

C. Her weight gain goal is between 11 and 20 lbs during this pregnancy.

D. All of the above.

What is your advice?

A. Dietary intake < 100 gm of carbs/day is associated with neural tube defects/ poor neurologic outcomes.

B. Dietary intake > 190 gm of carbs/day is associated with worse A1C.

C. Her weight gain goal is between 11 and 20 lbs during this pregnancy.

D. All of the above.

Table 1. Institute of Medicine Weight Gain Recommendations for Pregnancy ⇦

Prepregnancy Weight Category	Body Mass Index*	Recommended Range of Total Weight (lb)	Recommended Rates of Weight Gain† in the Second and Third Trimesters (lb) (Mean Range [lb/wk])
Underweight	Less than 18.5	28–40	1 (1–1.3)
Normal Weight	18.5–24.9	25–35	1 (0.8–1)
Overweight	25–29.9	15–25	0.6 (0.5–0.7)
Obese (includes all classes)	30 and greater	11–20	0.5 (0.4–0.6)

*Body mass index is calculated as weight in kilograms divided by height in meters squared or as weight in pounds multiplied by 703 divided by height in inches.

†Calculations assume a 1.1–4.4 lb weight gain in the first trimester.

Modified from Institute of Medicine (US). Weight gain during pregnancy: reexamining the guidelines. Washington, DC. National Academies Press; 2009. ©2009 National Academy of Sciences.

ACOG Guideline 548 1/2013- reaffirmed 2023. based on IOM recommendations.

Nutrition

- **DAPIT RCT in T1DM**
- **Carbs > 191 g/day doubled risk of poor glycemic control**

Hill 2022

- **Severe restriction (<100 g/day) associated with Neural Tube Defects, etc.**

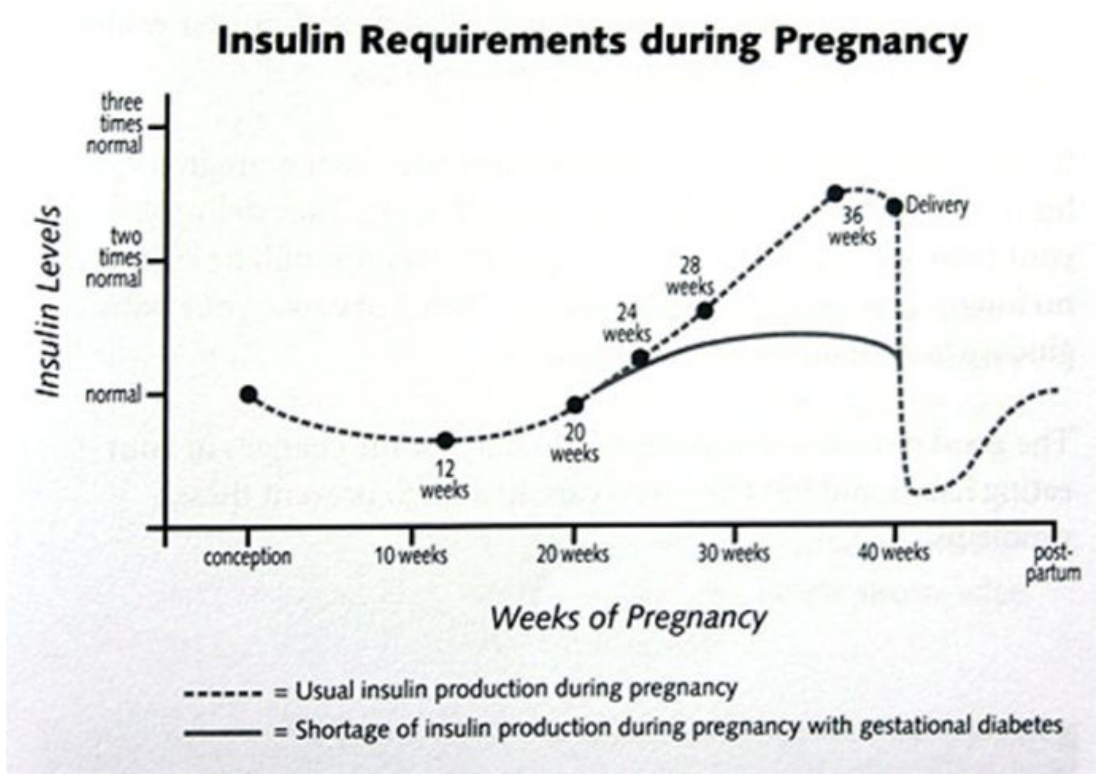
Desrosiers 2018; Shaw and Yang 2019; Shaw 2024; Sweeting 2021

PATIENT CASE

- 37 yo G0P0 c Type 2 DM returns 2 weeks postpartum…

Postpartum Glycemia

- **Glycemic Management**
  - Basal insulin needs drop SUDDENLY!
  - Reduce insulin to 1/3 to ½ of preconception dose.
  - Titrate dose upward over the next few days as postpartum insulin sensitivity resolves.
  - Breast feeding may increase insulin sensitivity. Hypoglycemia overnight.



PLoS One. 2020 Aug 18;15(8):e0237571. 2020.
J Clin Endocrinol Mateb 101: 1598-1605, 2016
Am J Obstet Gynecol 2023;229:160.e1-8. And AmJ Obstet Gynecol MFM 2021;3:100363
Diabetes Care 2023;46(12):2258-2266.
Diabet Med 33,17-24 (2016) And BMC Pregnancy and Childbrith (2023) 23:309. And BMC Women's Health 2011, 11:10.
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Maternal Child Health J (2019) 20:S22-S27.
Circulation 2015; 132(18) 1726-1733.

Postpartum Medical Care

- **Postpartum Hypertension**
  - PDM is a risk factor for de novo postpartum hypertension (13.0 vs 3.9%) and persistent hypertension (21.5% vs 5.6%).
- **Postpartum care is Preconception Care!**
  - Termination and loss
  - Screen for pregnancy intent
  - Contraception
- **Transition and Postpartum Care needs to be intentional.**
  - Only about ½ of women will re-establish care with primary care in the first year postpartum.
  - More frequent postpartum care (which included glucose management) in high-risk patients showed decreased hospitalizations within 30 day.

PLoS One. 2020 Aug 18;15(8):e0237571. 2020.
J Clin Endocrinol Mateb 101: 1598-1605, 2016
Am J Obstet Gynecol 2023;229:160.e1-8. And AmJ Obstet Gynecol MFM 2021;3:100363
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Am J Obstet Gynecol MFM 2021;3:100363
Maternal Child Health J (2019) 20:S22-S27.
Circulation 2015; 132(18) 1726-1733.

Breastfeeding and Diabetes Medications

- Insulin
  - Safe in breastfeeding.
  - Not present in milk.
- Metformin
  - Present in breast milk
  - Has been detected in infant blood.
  - Often used in breastfeeding.
  - Could cause GI upset in infants.
- GLP-1s
  - Large molecules.
  - Semaglutide (oral and injectable) not detected in Breast Milk.
  - SNAC (salcaprozate sodium), a component in the oral Semaglutide formulation is present in breast milk.
- SGLT-2s
  - Unknown

Summary

- **Preconception care (PCC) in patient with Type 2 diabetes is essential to prevent congenital malformations and other adverse outcomes.**
- **Screening for Pregnancy Intent is suggested to implement PCC.**
- **PCC includes comprehensive review of health and medications, but three essential components are:**
  - Patient education on risks.
  - Contraception until glycemic goals are achieved.
  - Achieving glycemic goals
- **The goal A1C for Preconception is < 6.5%**
- **Glycemic control in the 1st trimester is imperative.**
- **Insulin is the first line treatment for all forms of diabetes in pregnancy.**
- **Metformin should be stopped in most patients by the end of the 1st trimester.**
- **Postpartum care is often neglected, contributing to**
  - Maternal anxiety
  - Failure to Breastfeed successfully
  - 1st trimester hyperglycemia in the next pregnancy

Survey of Physician Practice Needs related to Pre-Existing Diabetes and Pregnancy

- **As a result of this presentation what changes would you like to see in your practice?**
  - Implementation of screening for pregnancy intent
  - Expansion of contraceptive choices provided within my practice
  - Expansion of referral choices for contraception used by my practice
  - Improvement in Preconception counselling/care provided by my practice
  - Expansion of referral choices for Preconception counselling/care used by my practice
  - Changes to how the transition from MFM/OB care to Primary care occur

- **What services/ support would you like to help with Diabetes and Pregnancy care?**
  - **Trainings/ Materials on**
    - Best practices for screening for pregnancy intent
    - Management of hormonal contraception
    - How to provide preconception care in Type 2 diabetes
    - How to manage Type 2 diabetes during pregnancy
    - Postpartum care and Breastfeeding
  - **Updates to the Electronic Health Record**
    - to track reproductive status and possibility of pregnancy (automated information display)
    - passive reminders to screen for pregnancy intent (exs. adding pregnancy intent to vital signs or health maintenance topics)
    - active reminders to screen for pregnancy intent (automated alerts)
    - active reminders to provide outreach postpartum
  - **Resources for referring for**
    - Hormonal contraception
    - Contraceptive implants
    - IUDs
    - MFM services for pre-existing diabetes and pregnancy
    - Endocrinology services for pre-existing diabetes and pregnancy
    - Diabetes Education and Nutrition services for pre-existing diabetes and pregnancy
  - **Other:**