



Diabetes and Hypertension Project ECHO* Clinic

*ECHO: Extension of Community Healthcare Outcomes

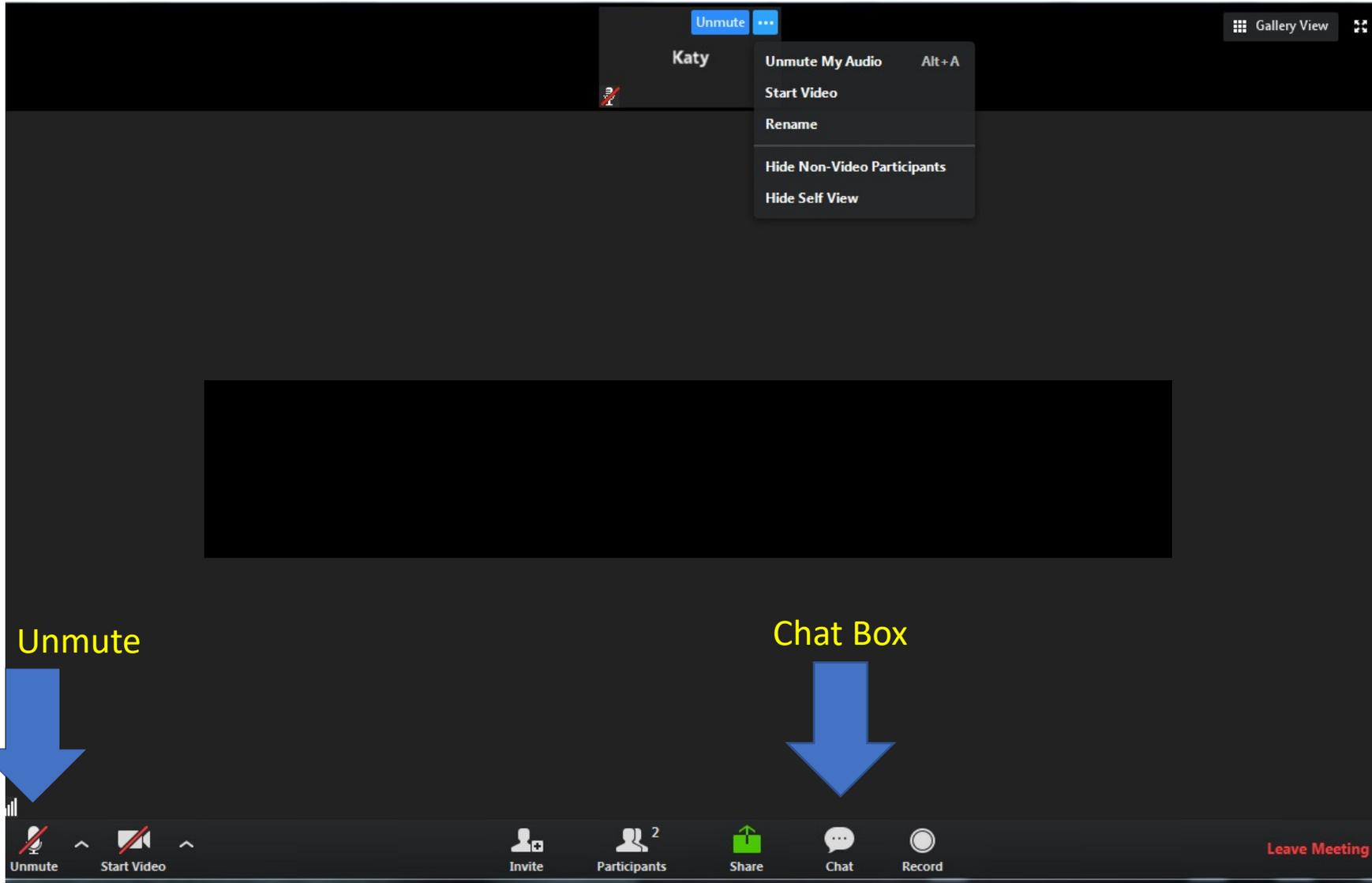
April 22, 2021

Before we begin:

- Rename your Zoom screen with your name and organization
- Claim CE: text 19159-18817 to 804-625-4041
 - Go to vcuhealth.org/echodmhtn for instructions on creating your account

*The Diabetes and Hypertension ECHO is made possible
by funding through CDC Cooperative Agreement
NU58DP006620-InnoVAte.*

Helpful Reminders



- You are all on **mute**. Please **unmute** to talk
- If joining by telephone audio only, press ***6** to mute and unmute
- Use the chat function to speak with our team or ask questions

ECHO is all teach, all learn



Helpful Reminders



Interactive



Co-management
of cases



Peer-to-peer
learning



Collaborative
problem solving

- Please feel free to eat your lunch or step away briefly if needed
- We are recording and can share sessions upon request
 - Each session's slides are available on www.vcuhealth.org/echodmhtn
 - We encourage you to keep your camera on, but if you are uncomfortable being recorded, feel free to turn it off
- Please **do not share any protected health information** in your discussion or the chat
- Project ECHO operates on the “All Teach, All Learn” model
 - Feel free to ask questions in the chat or unmute to ask questions at designated times
 - We're all here to learn from each other and value each person's input and expertise!

VCU Health Diabetes & Hypertension ECHO Clinics

- Bimonthly, 1.5-hour tele-ECHO clinics on 2nd and 4th Thursdays
- Every tele-ECHO clinic includes a 30-minute didactic presentation followed by case discussions
- Didactic presentations are developed and delivered by interprofessional experts
- Website: www.vcuhealth.org/echodmhtn
 - Directions for creating an account and claiming CE can be found here also
 - You have up to six days after our session to claim CE by texting **19159-18817** to **804-625-4041**

Hub and Participant Introductions



VCU Team

Principal Investigator	Dave Dixon, PharmD
Administrative Medical Director ECHO Hub	Vimal Mishra, MD, MMCI
Clinical Experts	Niraj Kothari, MD Trang Le, MD
Project Coordinator/IT Support	Madeleine Wagner, BA

- Use **chat** function for introduction
 - Name
 - Organization

Reminder: **Mute** and **unmute** screen to talk or press ***6** for phone audio

Share your name, organization, and your favorite part about spring!

Disclosures

Trang Le, MD has no financial conflicts of interest to disclose.

Niraj Kothari, MD has no financial conflicts of interest to disclose.

There is no commercial or in-kind support for this activity.

Diabetes in Pregnancy

14. Management of Diabetes in Pregnancy: *Standards of Medical Care in Diabetes—2021*

American Diabetes Association

Diabetes Care 2021;44(Suppl. 1):S200–S210 | <https://doi.org/10.2337/dc21-S014>

The American Diabetes Association (ADA) “Standards of Medical Care in Diabetes” includes the ADA’s current clinical practice recommendations and is intended to provide the components of diabetes care, general treatment goals and guidelines, and tools to evaluate quality of care. Members of the ADA Professional Practice Committee, a multidisciplinary expert committee (<https://doi.org/10.2337/dc21->

Learning Objectives

- Review recommended treatments and glycemic targets in pregnancy
- Describe changes in recommended diabetes health maintenance items prior to and during pregnancy
- Describe changes in insulin needs during and after pregnancy

Poll: goal A1c when planning pregnancy is:

- a. <7%
- b. <6.5%
- c. <6.0%
- d. <5.5%

Poll: goal A1c when planning pregnancy is:

- a. <7%
- b. <6.5%**
- c. <6.0%
- d. <5.5%

Diabetes *before* pregnancy

- All women of childbearing age with diabetes should be informed about the importance of achieving and maintaining as near euglycemia as safely possible prior to conception and throughout pregnancy.
- Observational studies show increased risks of:
 - diabetic embryopathy, especially anencephaly, microcephaly,
 - congenital heart disease,
 - renal anomalies,
 - caudal regression,
- directly proportional to elevations in A1C during the first 10 weeks of pregnancy

Diabetes *before* pregnancy

- Recommendation: optimize glycemia ***prior*** to conception
- Organogenesis occurs primarily at 5–8 weeks of gestation,
- Goal A1c 6.5% or less associated with the lowest risk of
 - congenital anomalies,
 - preeclampsia,
 - preterm birth

Begin the discussion *early* and *repeat often*

To minimize the occurrence of complications, beginning at the onset of puberty or at diagnosis, all girls and women with diabetes of childbearing potential should receive education about

- 1) the risks of malformations associated with unplanned pregnancies and even mild hyperglycemia
- 2) the use of effective contraception at all times when preventing a pregnancy.
- Preconception counseling using developmentally appropriate educational tools enables adolescent girls to make well-informed decisions

The most important diabetes-specific component of preconception care is the attainment of glycemic goals
prior to conception

Retinopathy screening

- Women with preexisting type 1 or type 2 diabetes who are planning pregnancy or who have become pregnant should be counseled on the risk of development and/or progression of diabetic retinopathy.
- Dilated eye examinations should occur ideally before pregnancy or in the first trimester
- Then monitor every trimester and for 1 year postpartum as indicated by the degree of retinopathy and as recommended by the eye care provider.

Review for teratogenic medications

- Special attention should be paid to the review of the medication list for potentially harmful drugs:
 - ACE inhibitors
 - Angiotensin receptor blockers
 - Statins

Multidisciplinary care

- Several studies have shown improved diabetes and pregnancy outcomes when care has been delivered from preconception through pregnancy by a multidisciplinary group focused on improved glycemic control
- Care of preexisting diabetes in clinics that included diabetes and obstetric specialists improved care
- However, there is no consensus on the structure of multidisciplinary team care for diabetes and pregnancy, and there is a lack of evidence on the impact on outcomes of various methods of health care delivery

Glycemic targets

- **Fasting and postprandial** self-monitoring of blood glucose are recommended in both gestational diabetes mellitus and preexisting diabetes in pregnancy to achieve optimal glucose levels.
- Glucose targets are
 - fasting plasma glucose 95 mg/dL
 - either 1-h postprandial glucose 140 mg/dL or
 - 2-h postprandial glucose 120 mg/dL

A1c?

- Due to increased red blood cell turnover, A1C is slightly lower in normal pregnancy than in normal nonpregnant women.
- Ideally, the A1C target in pregnancy is 6% *if this can be*
- *achieved without significant hypoglycemia,*
- the target may be relaxed to 7% if necessary to prevent hypoglycemia
- Commonly used estimated A1C and glucose management indicator calculations should not be used in pregnancy as estimates of A1C

Nutrition for diabetes in pregnancy

- Pregnancy in women with normal glucose metabolism is characterized by fasting levels of blood glucose that are lower than in the nonpregnant state
 - due to insulin-independent glucose uptake by the fetus and placenta
 - mild postprandial hyperglycemia and carbohydrate intolerance as a result of diabetogenic placental hormones.
- In patients with preexisting diabetes, glycemic targets are usually achieved through a combination of insulin administration and medical nutrition therapy.

Nutrition for diabetes in pregnancy

- Because glycemic targets in pregnancy are stricter than in nonpregnant individuals, it is important that women with diabetes eat consistent amounts of carbohydrates to match with insulin dosage and to avoid hyperglycemia or hypoglycemia.
- Referral to an RD/RDN is important in order to establish a food plan and insulin-to-carbohydrate ratio and to determine weight gain goals.

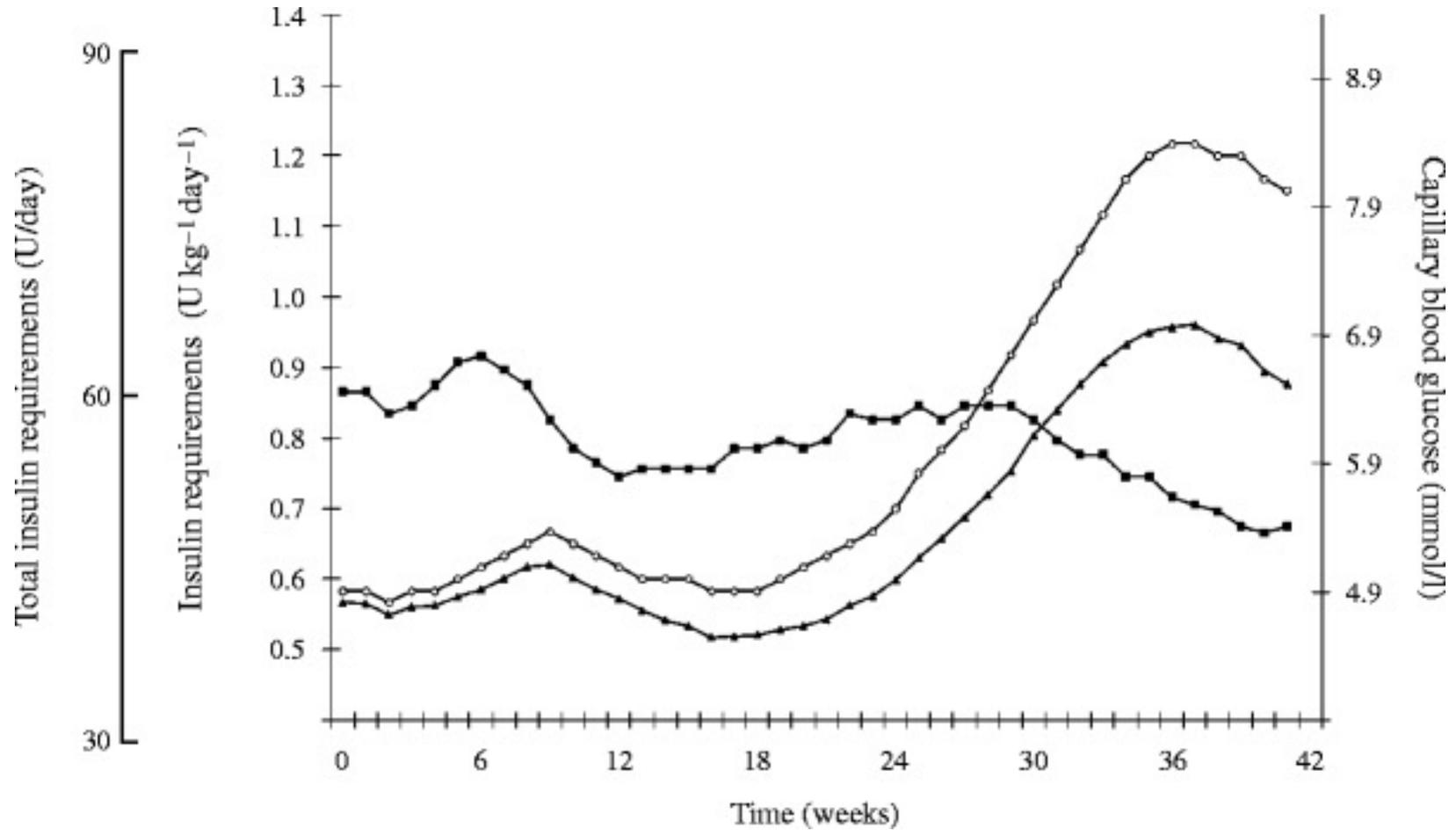
Poll: insulin needs during pregnancy:

- a. Tend to remain steady if the patient was at goal a1c pre-pregnancy
- b. Generally increase and can be doubled by end of pregnancy
- c. Generally increase and can be tripled by end of pregnancy
- d. Decrease through midpregnancy before returning to pre-pregnancy baseline

Changes through pregnancy

- early pregnancy : insulin sensitivity and lower glucose levels,
- many women with type 1 diabetes will have lower insulin requirements and ↑ risk for hypoglycemia
- *Around 16 weeks, insulin resistance begins to ↑, and total daily insulin doses increase linearly → 5% per week through week 36.*
- Doubling of daily insulin dose vs prepregnancy needs
- The insulin requirement levels off toward the end of the third trimester with placental aging.
- A rapid reduction in insulin requirements can indicate the development of placental insufficiency

65 women with type 1 diabetes mellitus and prepregnancy HbA1c $\leq 6.0\%$



García-Patterson, A., et al. Diabetologia 53, 446–451 (2010)

ADA-recommended targets for women with type 1 or type 2 diabetes

- Fasting glucose 70–95 mg/dL and either
- One-hour postprandial glucose 110-140mg/dL, or
- Two-hour postprandial glucose 100-120mg/dL
- Lower limits do not apply to diet-controlled type 2 diabetes

Poll: goal *A1c during* pregnancy is:

- a. <7%
- b. <6.5%
- c. <6.0%
- d. <5.5%

Poll: goal *A1c during* pregnancy is:

- a. <7%
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- In the second and third trimesters, A1C < 6% has the lowest risk of large-for-gestational-age infants
- Preterm delivery
- Preeclampsia
- Taking all of this into account, a target of 6% is optimal during pregnancy if it can be achieved without significant hypoglycemia.

Low, but not *too* low...

- The A1C target in a given patient should be achieved without hypoglycemia, which, in addition to the usual adverse sequelae, may increase the risk of low birth weight.
- Given the alteration in red blood cell kinetics during pregnancy and physiological changes in glycemic parameters, A1C levels may need to be monitored more frequently than usual (e.g., monthly).

Treatment

- None of the currently available human insulin preparations have been demonstrated to cross the placenta
- No specific insulin regimens are preferred over another for the treatment of diabetes in pregnancy
- While many providers prefer insulin pumps in pregnancy, it is not clear that they are superior to multiple daily injections
- Hybrid closed-loop insulin pumps that allow for the achievement of pregnancy fasting and postprandial glycemic targets may reduce hypoglycemia and allow for more aggressive prandial dosing to achieve targets.
- **Not all hybrid closed-loop pumps are able to achieve the pregnancy targets.**

T1DM considerations

- Women with type 1 diabetes have an increased risk of hypoglycemia in the first trimester and, like all women, have altered counterregulatory response in pregnancy that may decrease hypoglycemia awareness.
- Pregnancy is a ketogenic state, and lesser extent those with type 2 diabetes, are at risk for diabetic ketoacidosis (DKA) at lower blood glucose levels than in the nonpregnant state.
- Women with type 1 diabetes should be prescribed ketone strips and receive education on DKA prevention and detection.

T2DM Considerations

- Type 2 diabetes is often associated with obesity.
- Recommended weight gain during pregnancy for
 - women with overweight is 15–25 lb and for
 - Women with obesity is 10–20 lb
- There are no adequate data on optimal weight gain versus weight maintenance in women with BMI >35 kg/m².
- Glycemic control is often easier to achieve in women with type 2 diabetes than in those with type 1 diabetes but can require much higher doses of insulin, sometimes necessitating concentrated insulin formulations.
- As in type 1 diabetes, insulin requirements drop dramatically after delivery.

T2DM Considerations

- Risk for associated hypertension and other comorbidities may be as high or higher with type 2 diabetes as with type 1 diabetes, even if diabetes is better controlled and of shorter apparent duration,
- Pregnancy loss appears to be more prevalent in the third trimester in women with type 2 diabetes compared with the first trimester in women with type 1 diabetes
- Insulin is the preferred agent for the management of type 2 diabetes in pregnancy.

Aspirin

- Women with type 1 or type 2 diabetes should be prescribed low-dose aspirin 100–150 mg/ day starting at 12 to 16 weeks of gestation to lower the risk of preeclampsia. E
- A dosage of 162mg/day may be acceptable; currently in the U.S., low-dose aspirin is available in 81-mg tablets. E

Aspirin

- The U.S. Preventive Services Task Force recommends the use of low-dose aspirin (81 mg/day) as a preventive medication at 12 weeks of gestation in women who are at high risk for preeclampsia (96).
- However, a meta-analysis and an additional trial demonstrate that low-dose aspirin ,100 mg is not effective in reducing preeclampsia.
- Low-dose aspirin >100 mg is required (97–99).
- A costbenefit analysis has concluded that this approach would reduce morbidity, save lives, and lower health care costs (100).
- However, there is insufficient data regarding the benefits of aspirin in women with preexisting diabetes (98).

Postpartum

- Insulin resistance decreases dramatically immediately postpartum,
- Insulin requirements need to be evaluated and adjusted as they are often roughly half the prepregnancy requirements for the initial few days postpartum
- Insulin sensitivity then returns to prepregnancy levels over the following 1–2 weeks.
- In women taking insulin, particular attention should be directed to hypoglycemia prevention in the setting of breastfeeding and erratic sleep and eating schedules

Summary

- Optimal management of diabetes in pregnancy is tightly linked to optimized management before pregnancy
- Recommendations should include
 - More frequent eye exams for retinopathy
 - Review of medications with potential teratogenic effects
 - Anticipatory guidance re: changes in insulin needs that may occur throughout pregnancy
 - Aspirin

Case Study #1:

- 33 year old lady with T2DM diagnosed at age 15 years, presenting to establish care for diabetes – referred by OBGYN for preconception planning.
- PMH: Class III Obesity BMI 55, HTN, Hyperlipidemia, sleep apnea, PCOS
- Diabetes regimen: Levemir 50 units BID, Novolog 10 units ac meals (1-2x daily), Metformin, Victoza.
- Other meds: atenolol, simvastatin, Mirena IUD
- PE: BMI as above, Wt 156kg, BP 142/75. Significant acanthosis
- Labs: A1c >14%, Tchol 229, TG 421, HDL 31, LDL unable to be calculated

Case presentation #1

Any clarifying questions?

Any recommendations?

- How would you present these recommendations to the patient?

Summary

Case Study #2

- 21 yo patient with T1DM diagnosed at age 7 years old, on Tslim insulin pump with Dexcom CGM, presenting due to pregnancy – estimated at 16WGA. Attends clinic appointments every 1-2 years previously. No anomalies on fetal US.
- Referred by high risk OB, reports both hyper- and hypoglycemia
- PMH: T1DM, hyperlipidemia previously prescribed statin but not taking for > 1 year, depression
- Meds: Novolog via insulin pump, acetaminophen PRN
- Labs: A1c 10.3%, Cr 0.43, LDL 135

Case presentation #2

Any clarifying questions?

Any recommendations?

- How would you present these recommendations to the patient?

Summary

Case Studies

- Anyone can submit cases: www.vcuhealth.org/echodmhtn
- Receive feedback from participants and content experts
- Earn **\$150** for submitting and presenting

Provide Feedback

www.vcuhealth.org/echodmhtn

- Feedback
 - Overall feedback related to session content and flow?
 - Ideas for guest speakers?



Access Your Evaluation

vcuhealth.org/services/telehealth/for-providers/education/diabetes-and-hypertension-project-echo



For Providers

Education	-
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VCU Nursing Home ECHO	+
VCU Health Palliative Care ECHO	+
Virginia Opioid Addiction ECHO	+
Virginia Sickle Cell Disease ECHO	+

Diabetes and Hypertension Project ECHO

Welcome to the Diabetes and Hypertension Extension for Community Health Outcomes or ECHO, a virtual network of multidisciplinary diabetes and hypertension experts. An ECHO model connects professionals with each other in real-time collaborative virtual sessions on Zoom. Participants present de-identified cases to one another, share resources, connect to each other, and grow in their expertise. This ECHO will address practice level issues and solutions related to managing complex patients with difficult to control diabetes and hypertension. [Register now for an ECHO Session!](#)

Network, Participate and Present

- Engage in a collaborative community with your peers.
- Listen, learn and discuss informational and case presentations in real-time.
- Take the opportunity to [submit your de-identified case study](#) for feedback from a team of specialists for diabetes and hypertension.
- [Provide valuable feedback.](#)
- Claim CE credit by [texting in attendance.](#)

Benefits



VCU Diabetes & Hypertension Project ECHO Clinics

2nd and 4th Thursdays — 12-1:30 p.m.

Mark Your Calendars — Upcoming Sessions

May 13: Practical approaches to injectable agents

May 27: Team-based approaches to diabetes and hypertension care

June 10: Remote home blood pressure monitoring

Please register at www.vcuhealth.org/echodmhtn

Thank you, and see you in two weeks!



Text **19159-18817** to **804-625-4041** for CE credit

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