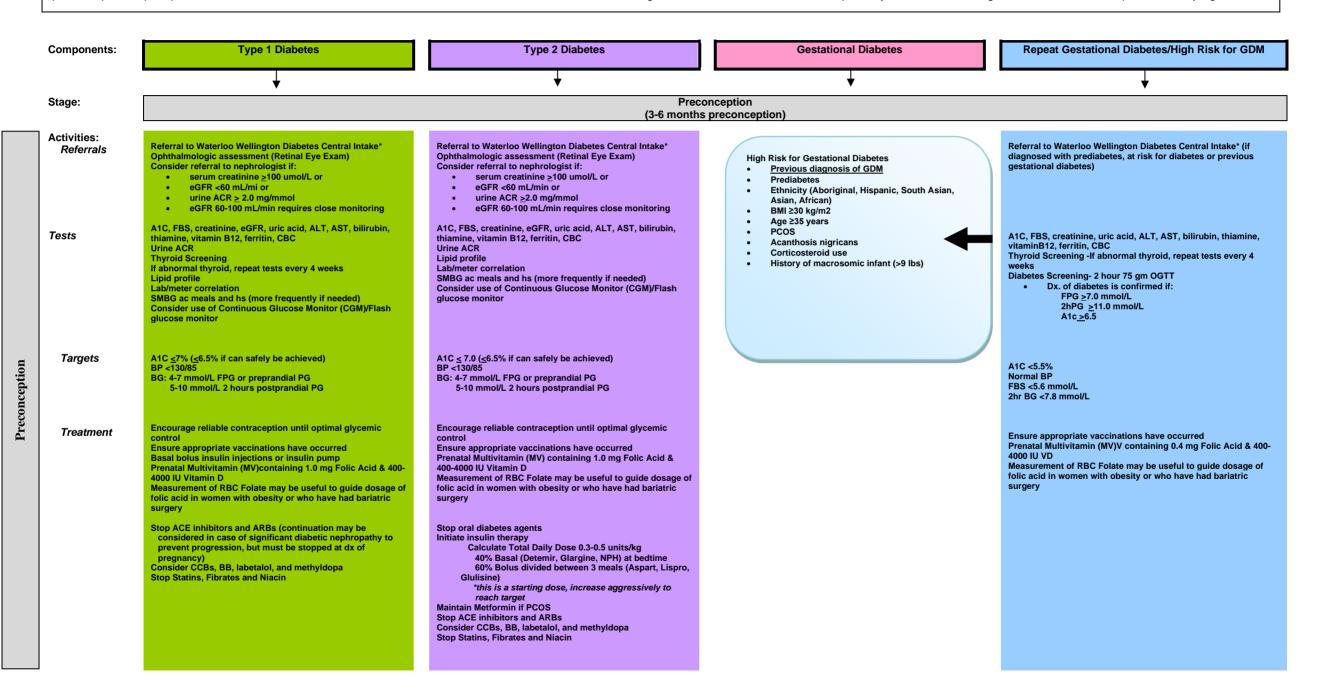


This pathway was created to support a consistent standard of care for all women with diabetes and pregnancy throughout the region. It recognizes a multidisciplinary approach and offers details of care and education from preconception to post-partum, based on the 2018 CDA Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. This pathway is to be used as a guideline and does not replace clinical judgment.





Teach Identify hypoglycemia unawareness and Rx for Glucagon/Bagsimi Encourage optimal control 3 months prior to conception Reinforce healthy lifestyle including nutrition and exercise Review self-care practices Assess carb/insulin ratio knowledge and ability Discuss: Self-monitoring of BG QID (ac meals and hs) Importance of maintaining glycemic targets Preconception Importance of regular visits Avoiding DKA (low level ketosis is normal in pregnancy) Assess the need for social/financial support during pregnancy Frequency of Monthly Visits to DEP team Supporting "A Record of my Journey with Pregnancy and Diabetes" **Documents** Stage:

Encourage optimal control 3 months prior to conception Encourage healthy weight reduction if BMI >29 Reinforce healthy lifestyle including nutrition and importance of exercise in reducing insulin resistance Discuss:

- Importance of maintaining glycemic targets
- Importance of regular visits

Review current therapy and reason for switching to insulin therapy for the duration of their pregnancy

Teach insulin administration

Assess the need for social/financial support during pregnancy

Monthly

"A Record of my Journey with Pregnancy and Diabetes"

Reinforce healthy lifestyle including nutrition and importance of exercise in reducing insulin resistance Encourage healthy weight reduction if BMI >29 Risks for Type 2 diabetes

As needed

"A Record of my Journey with Pregnancy and Diabetes"

1st Trimester (1-12 weeks)

Activities: Referrals

If not already done:

Referral to Waterloo Wellington Diabetes Central Intake* Ophthalmologic assessment (Retinal Eve Exam)

Consider referral to nephrologist if:

- serum creatinine >100 umol/L or
- urine ACR >2.0 mg/mmol
- Pre-conception eGFR <60 mL/min

Tests

Trimester

Confirm viability of pregnancy and gestational age A1C (more often if there is concern), FBS, creatinine, uric acid, ALT, AST, bilirubin, triglycerides, thiamine, vitamin B12, ferritin, CBC

Urine ACR

Thyroid Screening - If abnormal, repeat tests every 4 weeks Repeat retinal eye exam

Self-monitoring of blood glucose: 4-7x/day, ac and 1 hr pc meals, hs and occasionally during night

CGM should be offered

2 hr postprandial BG: <6.7 mmol/L

Targets

A1C <6.5% (ideally <6.1% if can safely be achieved) Time in Range (TIR) >70%, Time Below Range (TBR) <4%, Time Above Range (TAR) <25% BP <130/85 FBS and Preprandial BG: <5.3 mmol/L 1 hr postprandial BG: <7.8 mmol/L

(Be prepared to raise these targets if needed because of the increased risk of severe hypoglycemia)

Manage gestational weight gain as per Institute of Medicine (IOM) quidelines

Prenatal MV containing: 1mg Folic acid & 400-4000 IU VD

Treatment

If not already done:

Referral to Waterloo Wellington Diabetes Central Intake* Ophthalmologic assessment (Retinal Eve Exam) Obstetrician

Consider referral to nephrologist if:

- serum creatinine >100 umol/L
- urine ACR >2.0 mg/mmol
- Pre-conception eGFR <60 mL/min

Confirm viability of pregnancy and gestational age A1C(more often if there is concern), FBS, creatinine, uric acid, ALT, AST, bilirubin, triglycerides, thiamine, vitamin B12, ferritin, CBC Urine ACR

Thyroid Screening - If abnormal, repeat tests every 4 weeks Repeat retinal eye exam

Self-monitoring of blood glucose 4-7x/day, ac and 1 hr pc meals, hs and occasionally during night (if on insulin) CGM should be offered

A1C <6.5% (ideally <6.1% if can safely be achieved) BP <130/85

FBS and Preprandial BG: <5.3 mmol/L 1 hr postprandial BG: <7.8 mmol/L

2 hr postprandial BG: <6.7 mmol/L Manage gestational weight gain as per Institute of Medicine

(IOM) guidelines

Prenatal MV containing 1 mg Folic & 400-4000 IU VD Basal Bolus Insulin injections or Insulin Pump

Referral to Waterloo Wellington Diabetes Central Intake* at 10 to 12 weeks' gestation for women with previous gestational diabetes

2-hour 75g OGTT if high risk and not previously done

Dx. of GDM with one elevated value

FPG >5.1 mmol/L 1hPG >10.0 mmol/L 2hPG >8.5 mmol/L

A1C, FBS, creatinine, uric acid, ALT, AST, bilirubin, triglycerides, thiamine, vitamin B12, ferritin, CBC

Thyroid Screening- If abnormal, repeat tests every 4 weeks Start self-monitoring of blood glucose fasting and 1 hr pc meals 2 to 3 days/week

A1C <5.5% Normal BP

FBS and Preprandial BG: <5.3 mmol/L 1 hr postprandial BG: <7.8 mmol/L 2 hr postprandial BG: <6.7 mmol/L

Manage gestational weight gain as per Institute of Medicine (IOM)

auidelines

Prenatal MV containing 0.4mg folic acid & 400-4000 IU VD



Basal Bolus Insulin injections or Insulin Pump (Aspart, lispro, glulisine, detemir/glargine) Teach 1st Trimester Explain changing insulin requirements during pregnancy and high risk of hypoglycemia during 1st trimester Identify possible hypoglycemia unawareness Teach partner glucagon/Bagsimi Ketone testing Assess the need for social/financial support during pregnancy Frequency of Visits Monthly Supportina "A Record of My Journey with Pregnancy and Diabetes" **Documents**

Initiate insulin therapy if not previously done:
Calculate Total Daily Dose 0.3-0.5 units/kg
40% Basal (Detemir, Glargine, NPH)
60% Bolus divided between 3 meals (Aspart, Lispro, glulisine)
*this is a starting dose, increase aggressively to reach target

Explain increasing insulin resistance during pregnancy requiring frequent adjustments
Reinforce healthy lifestyle including nutrition and exercise Importance of maintaining glycemic targets Importance of regular visits
Review current therapy and initiate insulin therapy if not already done
Assess the need for social/financial support during pregnancy

Monthly

"A Record of My Journey with Pregnancy and Diabetes"

Explain risk of developing GDM if previously diagnosed Review increasing insulin resistance during pregnancy and importance of occasional monitoring early in pregnancy Reinforce healthy lifestyle including nutrition and exercise Assess the need for social/financial support during pregnancy

As required

"A Record of My Journey with Pregnancy and Diabetes"

Stage 2nd Trimester (13-27 weeks)

Activities: Referrals

Consider referral to nephrologist if:

- serum creatinine > 100 umol/L or
- urine ACR >2.0 mg/mmol

Tests

Repeat retinal eye exam if required A1C, creatinine

Urine ACR

Thyroid Screening - If abnormal, repeat tests every 4 weeks Self-monitoring of blood glucose ac and 1 hr pc meals, hs and occasionally during night

Continuous glucose monitoring should be offered

Targets

Trimester

A1C <6.5% (ideally <6.1% if can safely be achieved)

TIR >70%, TBR <4%, TAR <25%

BP <130/85

FBS and Preprandial BG: <5.3 mmol/L

2 hr postprandial BG: <6.7 mmol/L

(Be prepared to raise these targets if needed because of the

increased risk of severe hypoglycemia)

Manage gestational weight gain as per IOM guidelines

Treatment

Prenatal MV with 0.4 to 1.0 mg Folic Acid & 400-4000 IU VD Basal Bolus Insulin injections or Insulin Pump Aspirin 81 mg for the prevention of preeclampsia

Obstetrician if not already done

Consider referral to nephrologist if:

- serum creatinine ≥ 100 umol/L or
- urine ACR >2.0 mg/mmol

Repeat retinal eye exam if required A1C, creatinine

Urine ACR

Thyroid Screening - If abnormal, repeat tests every 4 weeks Self-monitoring of blood glucose ac and 1 hr pc meals and hs and occasionally during night (if on insulin)

Continuous glucose monitoring should be offered

A1C <6.5% (ideally <6.1% if can safely be achieved)

FBS and Preprandial BG: <5.3 mmol/L 1 hr postprandial BG: <7.8 mmol/L 2 hr postprandial BG: <6.7 mmol/L

Manage gestational weight gain as per IOM guidelines

Prenatal MV with 0.4 to 1.0 mg Folic Acid & 400-4000 IU VD Basal Bolus Insulin injections or Insulin Pump Aspirin 81 mg for the prevention of preeclampsia

If diagnosed with GDM: Referral to Waterloo Wellington Diabetes Central Intake*

75 gm OGTT test at 24-28 week Dx. of GDM with one elevated value

FPG >5.1 mmol/L 1hPG >10.0 mmol/L 2hPG >8.5 mmol/L

Self-monitoring of blood glucose fasting and 1 hr pc meals If on insulin, self-monitoring of blood glucose ac and 1 hr pc meals

Thyroid Screening - If abnormal, repeat tests every 4 weeks

BP <130/80

FBS and Preprandial BG: <5.3 mmol/L 1 hr postprandial BG: <7.8 mmol/L 2 hr postprandial BG: <6.7 mmol/L

Manage gestational weight gain as per IOM guidelines

Prenatal MV with 0.4mg Folic Acid & 400-4000 IU VD Ensure appropriate vaccinations have occurred Initiate Insulin therapy if:

- Fasting Blood glucose above target Initiate 4-5 units basal insulin at bedtime (NPH, Detemir, Glargine)
- Postprandial blood glucose above target Initiate 2-4 units bolus insulin (Lispro, Aspart, glulisine) before the meal

If insulin therapy refused, consider 2nd line- Metformin, 3rd Line- Glyburide

If not already done, referral to Waterloo Wellington Diabetes Central Intake*

If 1st trimester OGTT is normal, repeat 75 gm OGTT @ 24-28 weeks

Dx. of GDM with one elevated value

FPG ≥5.1 mmol/L 1hPG ≥10.0 mmol/L 2hPG ≥8.5 mmol/L

Self-monitoring of blood glucose fasting and 1 hr pc meals if on insulin, self-monitoring of blood glucose ac and 1 hr pc

Thyroid Screening - If abnormal, repeat tests every 4 weeks

BP <130/80

FBS and Preprandial BG: <5.3 mmol/L 1 hr postprandial BG: <7.8 mmol/L 2 hr postprandial BG: <6.7 mmol/L

Manage gestational weight gain as per IOM guidelines

Prenatal MV with 0.4mg Folic Acid & 400-4000 IU VD Ensure appropriate vaccinations have occurred Initiate Insulin therapy if:

- Fasting Blood glucose above target Initiate 4-5 units basal insulin at bedtime (NPH, Detemir, Glargine)
- Postprandial blood glucose above target Initiate 2-4 units bolus insulin (Lispro, Aspart, glulisine) before the meal

If insulin therapy refused, consider 2nd line- Metformin, 3rd Line-Glyburide



Teach

Review changing insulin requirements Review hypoglycemia treatment

Advice on where to have birth e.g. Level 2 or 3 nursery

Frequency of Visits

Supporting **Documents** Every 2 weeks

Consider more frequent visits for those with poor alvoemic control and/or hypertension

"A Record of My Journey with Pregnancy and Diabetes"

Review and explain increasing insulin requirements Review hypoglycemia treatment

Advice on where to have birth e.g. Level 2 or 3 nursery

Every 2 weeks

Consider more frequent visits for those with poor glycemic control, and/or hypertension

"A Record of My Journey with Pregnancy and Diabetes"

Pathophysiology of GDM Importance of nutrition, exercise, monitoring

Review changing insulin requirements Review hypoglycemia treatment if on insulin

Every 2 weeks

Consider more frequent in those with poor alvcemic control. and/or hypertension

"A Record of My Journey with Pregnancy and Diabetes"

Pathophysiology of GDM

Review nutrition and exercise guidelines Review changing insulin requirements Review hypoglycemia treatment if on insulin

Every 2 weeks

Consider more frequent in those with poor alvoemic control. and/or hypertension

"A Record of My Journey with Pregnancy and Diabetes"

Stage

3rd Trimester (28-42 weeks)

Activities:

Referrals

Consider referral to nephrologist if:

- serum creatinine >100 umol/L or
- urine ACR >2.0 mg/mmol

Tests

Self-monitoring of blood glucose ac and 1 hr pc meals, hs

and occasionally during night or CGM Repeat retinal eve exam if required

A1C, creatinine Urine ACR **Thyroid Screening**

If abnormal thyroid test repeat every 4 weeks

Start fetal surveillance at 30-32 weeks, and weekly from 34-36

weeks through delivery for fetal growth

Targets

Trimester

3rd

A1C <6.1% (increased risk of still birth with A1c >6.1)

TIR >70%, TBR <4%, TAR <25%

BP <130/80

FBS and Preprandial BG: <5.3 mmol/L 1 hr postprandial BG: <7.8 mmol/L

2 hr postprandial BG: <6.7 mmol/L

(Be prepared to raise these targets if needed because of the increased risk of severe hypoglycemia)

Manage gestational weight gain as per IOM guidelines

Treatment

Prenatal Vitamins with 0.4 to 1.0 mg Folic Acid. & 400-4000 IU

Basal Bolus Insulin or Insulin Pump

Ongoing insulin adjustments

Aspirin 81 ma

Consider induction @ 38-39 weeks with uncomplicated

If fetal macrosomia, consider early induction at 37-38 weeks

Obstetrician (if not already done) Consider referral to nephrologist if:

- serum creatinine >100 umol/L or urine ACR >2.0 mg/mmol

Self-monitoring of blood glucose ac and 1 hr pc meals and hs

and occasionally during night (if on insulin) or CGM

Repeat retinal eve exam if required A1C. creatinine

Urine ACR

Thyroid Screening

If abnormal thyroid test repeat every 4 weeks

Consider ultrasound at 36-38 weeks for fetal growth Start fetal surveillance at 30-32 weeks, and weekly from 34-36

weeks through delivery for fetal growth

A1C <6.1% (increased risk of stillbirth if A1c >6.1) BP <130/80

FBS and Preprandial BG: <5.3 mmol/L

1 hr postprandial BG: <7.8 mmol/L

2 hr postprandial BG: <6.7 mmol/L Manage gestational weight gain as per IOM guidelines

Prenatal Vitamins with 0.4 to 1.0 mg Folic Acid & 400-4000 IU

Basal Bolus Insulin or Insulin Pump

Ongoing insulin adjustments

Aspirin 81 ma

Consider induction @ 38-39 weeks with uncomplicated diabetes

If fetal macrosomia, consider early induction at 37-38 weeks

If not already done: referral to Waterloo Wellington Diabetes

Self-monitoring of blood glucose fasting and 1 hr pc meals or

If on insulin, self-monitoring of blood glucose ac and 1 hr pc

Provide requisition for 3-month post-partum OGTT Thyroid Screening

Consider ultrasound at 36-38 weeks for fetal growth

BP <130/80

FBS and Preprandial BG: <5.3 mmol/L 1 hr postprandial BG: <7.8 mmol/L

2 hr postprandial BG: <6.7 mmol/L Manage gestational weight gain as per IOM guidelines

Prenatal Vitamins with 0.4 mg Folic Acid & 400-4000 IU VD Initiate Insulin therapy if:

- Fasting Blood glucose above target Initiate 4-5 units basal insulin at bedtime (NPH, Detemir, Glargine)
- Postprandial blood glucose above target Initiate 2-4 units rapid (Lispro, Aspart, glulisine) before the meal

If insulin therapy refused, consider 2nd line- Metformin, 3rd Line- Glyburide

Consider elective delivery @ 38-40 weeks

If fetal macrosomia, consider early induction at 37-38 weeks If diet controlled, no special intervention unless other obstetrical concerns

If not already done: referral to Waterloo Wellington Diabetes Central Intake

Self-monitoring of blood glucose fasting and 1 hr pc meals or

If on insulin, self-monitoring of blood glucose ac and 1 hr pc meals

Provide requisition for 3-month post-partum OGTT

Thyroid Screening

Consider ultrasound at 36-38 weeks for fetal growth

BP <130/80

FBS and Preprandial BG: <5.3 mmol/L 1 hr postprandial BG: <7.8 mmol/L

2 hr postprandial BG: <6.7 mmol/L

Manage gestational weight gain as per IOM guidelines

Prenatal Vitamins with 0.4 Folic Acid & 400-4000 IU VD Initiate Insulin therapy if:

- Fasting Blood glucose above target Initiate 4-5 units basal insulin at bedtime (NPH, Detemir,
- Postprandial blood glucose above target Initiate 2-4 units rapid (Lispro, Aspart, glulisine) before

If insulin therapy refused, consider 2nd line- Metformin, 3rd Line-Glyburide

Consider elective delivery @ 38-40 weeks

If fetal macrosomia, consider early induction @ 37-38 weeks If diet controlled, no special intervention unless other obstetrical concerns



Teach Trimester Visits Stage

Monitor fetal movement

Unexplained hypoglycemia due to maturing placenta, may alert possible need for an early delivery or increased fetal

Offer information and advice about:

- When to go to hospital
- What diabetes supplies to take to hospital
- What to do with insulin

Changes to insulin therapy during and after birth Importance of breastfeeding

Continue maternal vitamins if breastfeeding

Frequency of

Weekly after 36 weeks Book postpartum follow-up for diabetes education and diabetes specialist

Supportina **Documents**

At 34 weeks, give insulin orders for delivery Nutrition and breastfeeding guidelines

Monitor fetal movement

Unexplained hypoglycemia due to maturing placenta, may alert possible need for an early delivery or increased fetal

Offer information and advice about:

- When to go to hospital
- What diabetes supplies to take to hospital
- What to do with insulin

Changes to insulin therapy during and after birth Importance of breastfeeding

Continue maternal vitamins if breastfeeding

Weekly after 36 weeks

Book postpartum follow-up for diabetes education and diabetes specialist

At 34 weeks, give insulin orders for delivery Nutrition and breastfeeding guidelines

Monitor fetal movement

Unexplained hypoglycemia due to maturing placenta, may alert possible need for an early delivery or increased fetal

Offer information and advice about:

- When to go to hospital
- What diabetes supplies to take to hospital
- What to do with insulin

Changes to insulin therapy during and after birth

Importance of returning to pre-pregnancy weight to reduce risk of Type 2 diabetes

Importance of post-partum OGTT Importance of breastfeeding

Continue maternal vitamins if breastfeeding

Weekly after 36 weeks

Book postpartum follow-up for diabetes education and diabetes specialist

At 34 weeks, give insulin orders for delivery Nutrition and breastfeeding guidelines

Monitor fetal movement

Unexplained hypoglycemia due to maturing placenta, may alert possible need for an early delivery or increased fetal

Offer information and advice about:

- When to go to hospital
- What diabetes supplies to take to hospital
- What to do with insulin

Changes to insulin therapy during and after birth

Importance of returning to pre-pregnancy weight to reduce risk of Type 2 diabetes

Importance of post-partum OGTT Importance of breastfeeding

Continue maternal vitamins if breastfeeding

Weekly after 36 weeks

Book postpartum follow-up for diabetes education and diabetes specialist

At 34 weeks, give insulin orders for delivery Nutrition and breastfeeding guidelines

Activities:

Referrals

Tests

BG 4-7mmol/L **Targets**

BP <130/80

Treatment

care orders

safely manage

Documents

Consider elective delivery @ 38-39 weeks. If fetal macrosomia, consider early induction at 37-38 weeks

Monitor blood glucose every 2 hours during early labour and every 1 hour during active labour

Biophysical monitoring of baby

Mainline: D5W @ 75mL/hr

and Pregnancy

Piggy-back: Insulin infusion 50u/500 mL D5W-see patient Insulin Pumps may be continued if patient or partner can

Supporting

Patient Care Orders—Intrapartum Management of Diabetes Patient Care Orders—Post-partum Management of Diabetes Consider elective delivery @ 38-39 weeks. If fetal macrosomia, consider early induction at 37-38 weeks If diet controlled, no special intervention unless other obstetrical concerns

Monitor blood glucose every 2 hours during early labour and every 1 hour during active labour Biophysical monitoring of baby

RG 4-7mmol/l BP <130/80

Mainline: D5W @ 75mL/hr

Piggy-back: Insulin infusion 50u/500 mL D5W-see patient care orders

Insulin Pumps may be continued if patient or partner can safely manage

Patient Care Orders—Intrapartum Management of Diabetes and Pregnancy Patient Care Orders—Post-partum Management of Diabetes Consider elective delivery at 38-40 weeks

If fetal macrosomia, consider early induction at 37-38 weeks If diet controlled, no special intervention unless other obstetrical concerns

Monitor blood glucose every 2 hours during early labour and every 1 hour during active labour Biophysical monitoring of baby

RG 4-7mmol/l BP <130/80

Post-Partum

(0 to 6 months)

Labour and Delivery

Mainline: D5W @ 75mL/hr—see patient care orders For insulin infusion requirements--see patient care orders

Patient Care Orders—Intrapartum Management of Diabetes and Pregnancy

Patient Care Orders—Post-partum Management of Diabetes

Consider elective delivery at 38-40 weeks

If fetal macrosomia, consider early induction at 37-38 weeks If diet controlled, no special intervention unless other obstetrical concerns

Monitor blood glucose every 2 hours during early labour and every 1 hour during active labour Biophysical monitoring of baby

BG 4-7mmol/L BP <130/80

Mainline: D5W @ 75mL/hr—see patient care orders For insulin infusion requirements--see patient care orders

Patient Care Orders—Intrapartum Management of Diabetes and Pregnancy

Patient Care Orders—Post-partum Management of Diabetes and

Stage

Activities: Referrals

Reminder for diabetes education and diabetes specialist

Reminder for diabetes education and diabetes specialist appointment

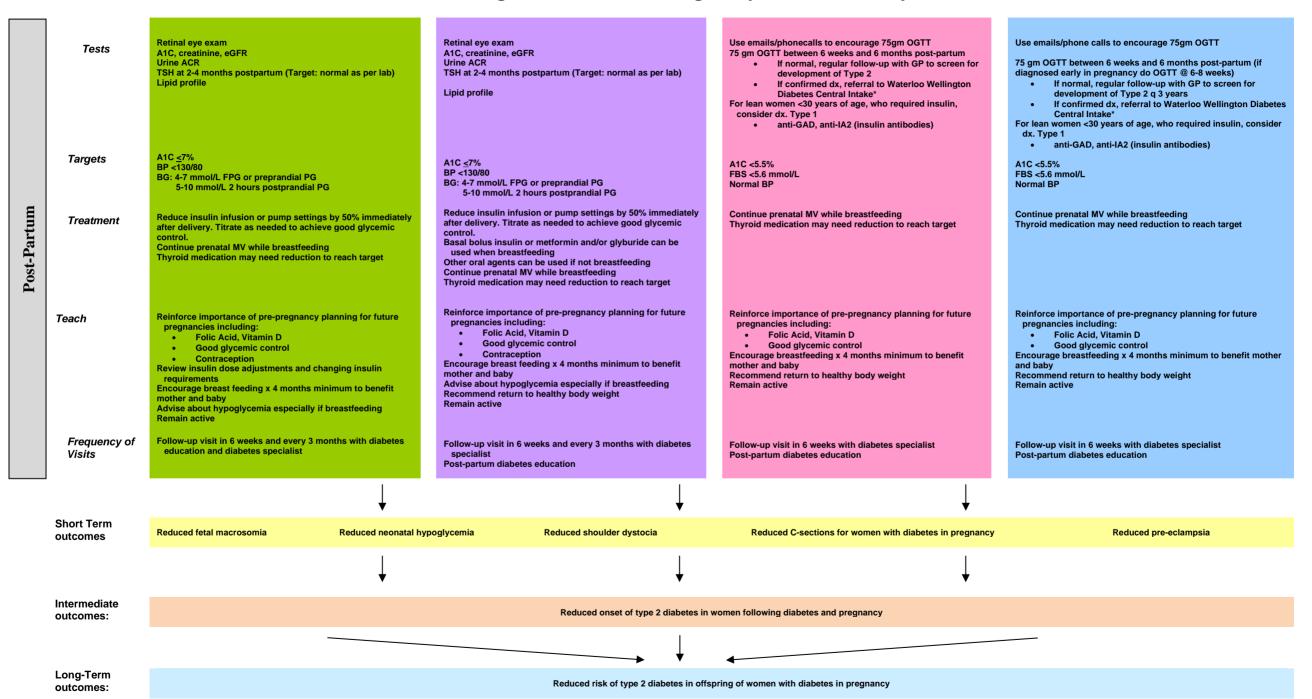
Reminder for diabetes education and diabetes specialist appointment

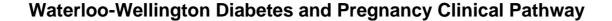
Reminder for diabetes education and diabetes specialist appointment

Post-Partum

Labour and Delivery









*Referral to Diabetes Central Intake automatically generates a referral to a diabetes specialist. Physicians' billing number needs to be included on the referral.

Abbassi-Ghanavati M, Greer LG, Cunningham FG. Pregnancy and laboratory studies: a reference table for clinicians. Obstet Gynecol. 2009 Dec;114(6):1326-31.

Blumer I, Hadar E, Hadden DR, Jovanovic L, Mestman JH, Murad MH et al. Diabetes and Pregnancy: An Endocrine Society Clinical Practice Guideline. The Journal of Clinical Endocrinology and Metabolism. 2013;98:4227-4249

Diabetes Canada Clinical Practice Guidelines Expert Committee. Diabetes Canada 2018 Clinical Practice Guidelines. Can J Diabetes 2018;42:S255-274

Hollis BW, Johnson D, Husley TC, Ebeling M, Wagner CL. Vitamin D supplementation during pregnancy: double-blind, randomized clinical trial of safety and effectiveness. Journal of Bone and Mineral Research. 2010: 26(10):2341-2357.

IOM (Institute of Medicine) and NRC (National Research Council). 2009. Weight Gain During Pregnancy: Reexamining the Guidelines. Washington, DC: The National Academies Press.

Liston R, Sawchuck D, Young D. Society of Obstetrics and Gynecologists of Canada, British Columbia Perinatal Health Program. Fetal health surveillance: antepartum and intrapartum consensus guideline. Journal Obstetrics and Gynaecology Canada. 2007; Sep:29 (9 suppl 4): S3-S56.