ndss
national diabetes services scheme

Diabetes
AUSTRALIA

Can I have a healthy baby? Diabetes & Pregnancy

diabetes australiavic

diabetes in pregnancy society
A.D.I.P.S.

TYPE 1 diabetes network

The National Diabetes Services Scheme (NDSS) is an initiative of the Australian Government administered by Diabetes Australia.

Contents

Introduction

You and your partner have the opportunity to prepare for a healthy baby.

To give yourself and your baby the best start you can, it is very important that you have a review of your diabetes and general health at least three months before you start trying to get pregnant. There are a number of risks for both the mother and the child when a woman with diabetes decides to have a baby, but with planning and care, as well as support from a specialised diabetes and pregnancy team, women with diabetes have successful pregnancies and healthy babies every day!

In this booklet we focus on the needs of women who have type 1 or type 2 diabetes and are pregnant or are planning a pregnancy. (This booklet is a consumer version of the **Australasian Diabetes in Pregnancy Consensus Guidelines** for the management of pregnancy with pre-existing diabetes.)

A third type of diabetes, gestational diabetes (GDM), presents during pregnancy and usually 'goes away' after the baby is born. Women who develop GDM are at high risk of developing type 2 diabetes within the next 5-15 years, but the risks can be reduced with healthy lifestyle patterns. A separate booklet is available for women with GDM. A diabetes educator, diabetes specialist or GP can provide more information.

Throughout this booklet, you will also find some real stories and thoughts from women with diabetes who generously shared their thoughts and experiences with us when we were writing this booklet. To read more stories of women's experiences of pregnancy with diabetes, from planning to parenting.

Visit:
www.diabetesvic.org.au or
www.realitycheck.org.au

Encourage your friends and family to read this booklet to help them understand your diabetes and pregnancy. Contact your diabetes specialist or diabetes educator if you have any more questions.

Read on for information about pregnancy with diabetes.

Section 1

Preparing for your Healthy Baby

Can I expect a healthy baby?
Yes. Women with diabetes have an equal chance of having a healthy baby if they become pregnant at a time when their diabetes is controlled and general health is good. It is highly recommended that women with diabetes plan their pregnancies.

If you are already pregnant, NOW is the time to get your body on track. Don't panic! Contact your diabetes and pregnancy team straight away – they will work with you towards the best outcome for you and your baby. Unplanned pregnancies are common and are associated with increased risks for both the baby and mother. The first eight weeks are when a baby's major organs develop so it is important to have blood glucose levels as close to target as possible. Unplanned pregnancies can therefore be extremely stressful for some women as they consider their options.

What can I do to prepare for a healthy baby?
The best preparation for a healthy pregnancy is to understand what your options are. There are various issues you will need to consider depending on the type of diabetes and other medical conditions that you have. Type 1 and type 2 diabetes are associated with similar increased risks during pregnancy such that preparation for pregnancy is equally important for both types.

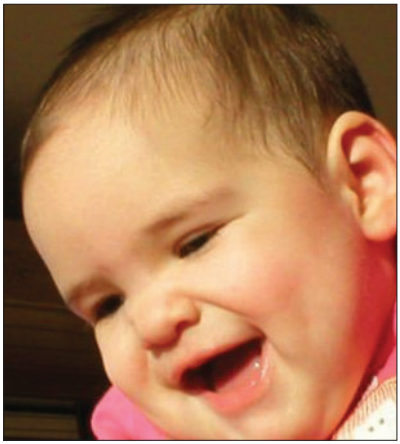
Your diabetes and pregnancy team
There are specialised services to support women with diabetes both during pregnancy, and when planning pregnancy. You may like to attend a pre-pregnancy care session at a diabetes and pregnancy clinic 6-12 months before attempting to conceive.

All major hospitals in Australia and New Zealand have diabetes services, which provide information about diabetes in pregnancy. Similarly, most women's hospitals will have a specialised diabetes and pregnancy clinic. Another option is to directly contact the diabetes educator and/or dietitian at your local hospital or at the women's hospital in your nearest capital city.

If for any reason you are not able to attend a specialised diabetes and pregnancy service, it will be helpful if you speak with both your diabetes team (diabetes educator, endocrinologist) as well as an obstetrician and/or midwife about your diabetes and your family planning – it is best if you do this before you become pregnant – and you should ask all of your team to communicate and work to coordinate your care whilst you are planning your pregnancy.

The health professionals that generally make up a diabetes and pregnancy team who can help you plan your healthy pregnancy include:

- Endocrinologist / Diabetes specialist doctor
- Specialist Obstetrician (pregnancy doctor)
- Midwife
  (nurse specialised in pregnancy)
- Diabetes Educator
  (nurse specialised in diabetes)
- Dietitian (advice on food & healthy eating)
- GP – modified shared-care plan
- Social Worker
- Psychologist



Contraception
Contraception enables you to plan the timing of your pregnancy around your general health, blood glucose control and personal circumstances.

There is no single method of contraception perfect for everyone. There are several new forms of contraception that have become available in recent years. Different methods suit different couples and you should discuss the advantages and disadvantages of each with your doctor. The current forms of oral contraceptive pills have a minimal effect on diabetes control and the same warnings apply as for all women.
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If you decide not to have any more children, your partner could consider a vasectomy or you, a tubal sterilisation. A number of very effective long-term but reversible contraception options now also exist. These procedures do not interfere with control of diabetes, sexual performance or any other aspect of health.

Blood glucose level targets required
Research has shown that optimum blood glucose control (4-7 mmol/L) at the time of conception and during the first 2 months of pregnancy is a major factor in preventing miscarriage and birth defects in your baby generally.

HELPFUL HINTS:
Take your blood glucose monitoring equipment to an appointment with your diabetes educator or diabetes specialist to check that it is working accurately and is up to date.

Folic Acid (Folate)
Folate is a vitamin that is very important to prevent certain birth defects of the brain and spine. Most women can meet their daily requirements from a varied diet including green leafy vegetables, fruit, breads and cereals, nuts and legumes. We also recommend that women of childbearing age take a folate supplement. Women with diabetes are at special risk and should take a **5mg** folate supplement from at least one month prior to pregnancy and throughout the first trimester (3 months of pregnancy). Speak with your diabetes team about taking a folate supplement.
You do not need a prescription to buy folate – just make sure you tell the pharmacist the correct dose you require.

Insulin for type 1 diabetes
Women with type 1 diabetes will of course need to continue taking insulin throughout pregnancy. While planning your pregnancy, discuss with your diabetes specialist the different options which are now available and which might best suit your needs. There are a number of different rapid, intermediate and long acting insulins that are being increasingly used in pregnancy. The role and safety of the new intermediate and long acting insulins such as insulin determir (Levemir) and insulin glargine (Lantus) in pregnancy are still being investigated. However, they appear to be safe and may result in improved blood glucose control with reduced number of hypoglycaemic reactions.

Insulin Pumps
An increasing number of people with diabetes are using insulin pumps rather than multiple daily injections – at the end of 2007, almost 5,000 Australians with type 1 diabetes were using insulin pumps. Pumps continuously deliver a small amount of quick-acting insulin, and allow the wearer to 'dial up' the dose they need when they eat. Pumps are small pager-sized devices that are worn constantly, with a small plastic cannula, inserted with a needle under the skin, delivering insulin. The cannula is changed twice a week. Insulin pumps have proved beneficial for many women wanting to tighten their diabetes control prior to pregnancy. Pumps can also be used safely during pregnancy.

For more information, ask your diabetes team, call Diabetes Australia (**1300 136 588**) or visit **www.realitycheck.org.au**.

The Diabetes Australia - Vic website has an insulin pump information booklet available for download. Visit: **www.diabetesvic.org.au**.

Diabetes tablets: type 2 diabetes only
If you are taking tablets to control your diabetes before pregnancy, it is important that you discuss your plans to become pregnant with your GP or diabetes specialist. Your doctor may advise that you convert to insulin prior to pregnancy and use insulin during your pregnancy in order to manage blood glucose levels.

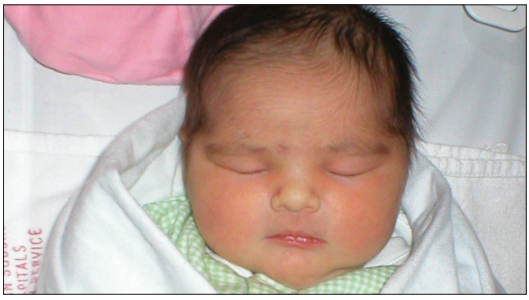
Other Medications
Every medication that you are taking, including those for lowering cholesterol and blood pressure, must be reviewed before you become pregnant or as soon as possible after you find out you are pregnant. Many medications will need to be stopped or changed for the duration of your pregnancy.

REAL STORIES:

"It is important to share the experience of pregnancy with your partner. He will be feeling the same elation and anxieties as you. By sharing them, your lives and your pregnancy will be much happier and easier."

Nutrient Supplements

Multivitamin Supplement for Pregnancy
If your eating plan is lacking in essential nutrients then you may require a multivitamin supplement. It is also recommended that you consider changing to a healthy eating plan to improve your nutritional status. Sometimes it is suggested that iodine or omega 3 fatty acid supplements may be beneficial in pregnancy, although both are present in various fish. Discuss healthy diet choices and the role of multivitamin and other micronutrient supplementation with your doctor and/or dietitian



Iron
Your doctor will check the amount of iron in your blood. Iron is often recommended during pregnancy.

Calcium
If you are not having 3 serves of dairy or calcium enriched food daily you will require a calcium supplement.

Rubella (German measles) & Chicken Pox
Your doctor will arrange blood tests to check your immunity to Rubella and also to Chicken Pox. Contracting Rubella when you are pregnant may lead to blindness, deafness and abnormalities in your baby. If you are not immune, you should be vaccinated before becoming pregnant.

Smoking and Alcohol
Smoking increases the risk of damage to blood vessels in the heart, brain, feet and kidneys, especially in people with diabetes. Also, smoking harms the development of your unborn baby. Ask your diabetes and pregnancy team about strategies to quit, or call the QUITLINE on 13 78 48 or visit **www.quit.org.au** Alcohol should be totally avoided. There is no safe limit of alcohol for pregnancy. Recreational drugs and alcohol increase the risk of miscarriage and damage to your baby.

Weight management
Aim for a healthy weight before becoming pregnant. A healthy eating plan and regular activity can help with weight management. Speak with a dietitian if healthy lifestyle advice is required. Some weight gain is associated with a healthy pregnancy and it is not advisable to aim to lose weight during pregnancy.

Blood Pressure
If you have high blood pressure, you should consult with your doctor before pregnancy, especially if you are taking medication. High blood pressure increases the chance of certain problems in pregnancy for you and your baby, and needs special attention. Sometimes it is necessary to change your medication before becoming pregnant.

Diabetes Complications Screening
Before conceiving or as soon as possible afterwards, it is important to be tested for all complications of diabetes: kidneys, eyes and nerves.

Kidneys:
Your doctor will ask you to supply a urine sample to check the amount of protein passing through your kidneys as well as to exclude urinary tract infection (UTI).

Nerves:
Your diabetes specialist can test for nerve damage, particularly in your feet (peripheral neuropathy), using simple physical examinations such as a tuning fork, a "monofilament" that measures pressure sensation, or a sharp object to test your pain sensation. Some women with longstanding diabetes may develop another type of nerve damage called autonomic neuropathy. This can lead to problems with stomach emptying (feeling full or bloated), bowel transit (diarrhoea/constipation) and unstable blood pressure (postural hypotension). In pregnancy, these problems can worsen and be very difficult to manage. If you have any of these problems, you should discuss them with your doctor prior to pregnancy.

Eyes:
Make an appointment to see an ophthalmologist who will give you eye drops and look at the back of your eyes to check for growth of irregular blood vessels which is common in people with diabetes, and treatable.
If you have diabetic retinopathy (damage to the back of the eye), it needs to be treated and stabilised before you become pregnant. Your eye problems may worsen during pregnancy and for a period of a few weeks after birth, but most commonly, after that they return to the stage they were at pre-pregnancy.

ACTION:

Thinking about having a baby?

Here is a quick checklist that summarises the advice in this section for you:

- Visit your GP for: Referrals to diabetes and pregnancy specialists (equally important for women with type 1 and type 2 diabetes).
- Contraception and other general pregnancy advice – Ask your GP or other doctor for help to choose the best contraceptive for you and your partner to help with planning your pregnancy.
- Meet or put together your Diabetes & Pregnancy Team.
- Folate supplements : Take 5mg per day for at least one month before becoming pregnant and during the first 3 months of pregnancy.
- Review insulin therapy: consider insulin pump (at least three months before becoming pregnant) and new types of insulin.
- Review all medications you are taking with your doctor.
- Vaccinations: make sure your Rubella and Chicken Pox vaccinations are up to date.
- Blood pressure – check and stabilise before becoming pregnant.
- Diabetes Complications – full check up and screening.
  Treat and stabilise if necessary before becoming pregnant.
- Stop smoking if applicable – ask your team for help.
  Alcohol and other drugs should also be avoided.
- Diet and other supplements – check with your doctor and/or dietitian if you need to take iron, multivitamins or other supplements.
- Weight management – Aim for a healthy weight.

Hard work but worth it!
Achieving very tight blood glucose control before conceiving, then maintaining it through the early stages of pregnancy as your body undergoes tremendous changes, can be extremely stressful and demanding for many women. For others, everything seems to fall into place when they become pregnant and it is smooth sailing.

Depression and anxiety are common in people with diabetes. Your diabetes team are aware of this and are prepared to discuss your concerns and to access appropriate supports to manage this if required.

Planning a pregnancy when you have diabetes is likely to be a very challenging period of your life. Be sure to seek the support and understanding that you need from people close to you and health professionals.

Section 2

Pregnancy with Pre-existing Diabetes

Prepare		
Prepare Before Pregnancy (at least 3 months)	Contraception Meet your diabetes and pregnancy team Optimise blood glucose control Dietitian: review dietary needs re DM and pregnancy HbA1c 6-7% (discuss your individual target) Discuss hypoglycaemia prevention and treatment GlucaGen script and training for partner Review sick day management	General health assessment Diabetes complications assessment (eyes, kidneys, nerves) Review of medications including diabetes tablets/insulin for type 2, BP and lipid medication Folate (>1 month before conception) Rubella and Varicella test Discuss overall management plan
Conceive		
Conceive Confirm Pregnancy	Visit GP- confirm pregnancy, book birth hospital and specialist team appointments Early pregnancy bloods including HbA1c Ultrasound to confirm dates Review blood glucose control and hypoglycaemia prevention and treatment Review sick day plan	Maintain adequate diet for pregnancy Continue folate supplements for first 3 months Review medications Complications assessment Discuss need for 12 -14 week ultrasound and blood test to screen for genetic abnormalities
12 - 14 weeks	Ultrasound/blood test genetic abnormality screen Book 18-20 week anatomy scan	Review blood glucose control
18 - 20 weeks	Anatomy ultrasound (check for normal development of baby)	Discuss results of ultrasound and review blood glucose control
24 - 40 weeks	Review blood glucose control Anticipate changing insulin requirements Monitor blood pressure Monitor diabetes complications Serial ultrasounds for assessment of baby's growth	Blood and urine tests including HbA1c (according to doctor's assessments) Monitor baby's heartbeat by CTG (according to obstetrician assessment - late pregnancy only) Discuss breast feeding
36 weeks	Discuss mode and timing of birth Monitor diabetes complications	Discuss management during labour/ delivery
Birth		
Breast feeding / Going home	Support breast feeding Review blood glucose control (insulin and tablets) Review prevention and treatment of hypoglycaemia Provide post-discharge contact details for diabetes re-stabilisation	Arrange follow-up appointments Discuss family planning including contraception and pre-conception care for next pregnancy

Section 3

Nutrition and Exercise for Pregnancy

Pregnancy is a good time to update your knowledge of food, and nutrition. Speak with the dietitian at your hospital to discuss eating during pregnancy. Your diet is an integral part of your diabetes management and general health.
The food you eat must provide suitable nourishment for both you and your baby, whilst assisting to stabilise blood glucose levels.

There are several aspects of your eating plan that require special attention in the lead up to and during your pregnancy: energy, protein, iron, calcium and folate. It is also important to minimise your risk of exposure to infections such as listeria and toxoplasmosis as these infections can harm your developing baby. Alcohol should be avoided during pregnancy. Be sure to see a dietitian to discuss the most appropriate foods for you during your pregnancy and obtain a list of foods to avoid that may put you at risk of getting listeria infection.

What exercise can I do?
Women with diabetes benefit from regular exercise in pregnancy, too. Physical activity is a way to relax and spend time with friends, as well as an essential tool for diabetes control. Pregnancy is not the time to begin a vigorous new exercise routine but swimming, for example, is a great activity to support your abdominal muscles during pregnancy. If you are already active continue your activities as long as it is comfortable to do so. Discuss your current activities with your GP or other healthcare professionals for reassurance.

Enjoy walking or swimming by incorporating activity into your daily routine.

Start with 10 minutes, 2 or 3 times a day for example:

- Walk your dog (or a friend's)
- Meet friends for lunch after a swim
- Walk along the beach
- Walk your children to school
- Take the family to the park for a ball game

Section 4

Your Baby

Pregnancy for women with diabetes is considered high risk. In this section, we will explain the risks for your baby and how to minimise them.

The effects of high blood glucose levels on your baby

Glucose can freely cross the placenta to the baby during pregnancy but insulin does not. Your baby stores the extra glucose and may grow more rapidly than babies of women without diabetes. Your baby will produce its own insulin from about 15 weeks gestation.

High blood glucose levels in you, the mother, will result in high blood glucose levels in your baby. This stimulates your baby's pancreas to make extra insulin, which can make your baby grow bigger and faster than necessary. A large baby, born at term or prematurely, may have low blood glucose levels at birth as it continues to make extra insulin for a day or two. Your baby could also have trouble with feeding, breathing and other medical problems.

Maintaining your blood glucose levels during pregnancy and delivery will dramatically reduce the risk of all these problems. However, some babies still have problems, just like babies of women without diabetes.

The effects of low blood glucose levels on your baby
Your low blood glucose levels don't affect your baby like they do you. When your blood glucose level drops low it only affects your brain cells, not your baby's. Your baby is able to maintain his/her own blood glucose, by releasing glucose from his/her own liver if the amount of glucose you have is too low.

The risk of congenital abnormalities and miscarriage
Rarely, congenital (structural) abnormalities in babies do occur, and some types are more common if the mother has diabetes. Damage to the heart, spine and kidneys may occur during early developmental stages of pregnancy, often before you realise you are pregnant. Miscarriage can also occur as it can for women without diabetes.

To reduce your chance of miscarriage, and of your baby developing abnormalities, health professionals stress the importance of checking your blood glucose levels frequently and keeping blood glucose as close to the normal healthy range of 4-7 mmol/l as possible without causing too high a risk of serious hypoglycaemic attacks. The aim is to have your HbA1c between 6-7% for three months prior to becoming pregnant and throughout your pregnancy. Have your blood glucose meter checked and upgraded if needed to ensure the accuracy of your blood glucose levels.

Will my baby be born with diabetes?
No. Your baby will not be born with diabetes. If you have type 1 diabetes, the chance of your child developing type 1 diabetesbefore the age of 20 is only 2% and is actually greater (5%) if his/her father has type 1 diabetes.

Section 5

How will Pregnancy affect me?

As well as the potential effects on your baby, there are a number of ways that pregnancy will affect your own body and your diabetes.

In this section we explain a number of issues that you should also discuss in more detail with your diabetes team:

- Changes to hypoglycaemia (low blood glucose)
- Treating serious hypos
- Sick days
- Ketoacidosis and high blood glucose in type 1 diabetes
- Diabetes complications
- Morning sickness
- Pre-eclampsia and high blood pressure
- Your partner's involvement

In the next section we will look specifically at insulin changes during pregnancy.

Changes to hypoglycaemia (Low blood glucose)
Your insulin requirements often reduce by about 5-10% in early pregnancy (between 6 and 16 weeks) and this can lead to severe hypos. Also, many women notice that their early warning signs for hypos such as feeling shaky or sweating change or disappear completely in pregnancy. This means that hypos often happen fast and without enough warning for you to treat the early symptoms.

Treating serious hypos
A recent Australian audit found that one in six women with type 1 diabetes had experienced severe hypoglycaemia (losing consciousness or passing out) during their pregnancy. Your partner and family may like to meet with your diabetes educator for an information session on when and how to use GlucaGen® in an emergency.

GlucaGen® is an intramuscular injection that can be used to reverse hypoglycaemia in someone who has lost consciousness. It assists your body to release glucose stored in your liver and raise your blood glucose levels quickly.

ACTION:

- Get into the habit of carrying a supply of hypo food such as glucose tablets or jelly beans with you at all times.
- Check your GlucaGen® is in date and ask your doctor for a script if required.

REAL STORIES:

"No matter what your diabetes control, once you know you have a life growing inside you, your focus changes.
Be prepared to actually WANT to do lots of blood tests, eat properly and exercise.
Also, to be fussed over by your partner, told to sit down and relax. It sounds great, but sometimes, occasionally, you may resent it. Don't worry, it's normal."

Sick days

Just as prior to pregnancy, illnesses such as the 'flu' and infections can cause your blood glucose levels to rise. During pregnancy, you will need to be particularly careful if this occurs. Have a sick day management plan – this takes the guess work out of maintaining optimal blood glucose levels during times of illness.

HELPFUL HINTS:

Infection or Flu Sickness

Check your blood glucose levels more frequently when you are unwell.

Take your insulin.

(You may need to increase your dose when unwell too)

Commence your sick day management.

Control blood glucose levels and prevent ketones in type 1 diabetes.

Check your urine or blood for ketones if you have type 1 diabetes.

Call your doctor or diabetes team if:

- your urine has more than one plus (+) of ketones for type 1 diabetes.
- your blood ketone reading is more than 0.6 mmol/L for type 1 diabetes.
- you are vomiting or unable to eat or drink.
- you are worried about high blood glucose levels.

See your doctor to establish the cause of the illness.

If you are vomiting so much that you cannot keep food or fluids down, always call your doctor or diabetes team immediately.

Ketoacidosis and high blood glucose levels in type 1 diabetes

Body cells that cannot use glucose for energy, breakdown fats instead to form ketones which you can detect in your blood or urine. For people with type 1 diabetes, high blood glucose and ketones can lead to a serious condition called ketoacidosis, requiring hospitalisation.

Ketoacidosis may occur when you are unwell, forget your insulin or don't take enough insulin. Frequent testing of blood glucose and increasing insulin doses when you are sick, can prevent ketoacidosis from developing. Ketones should be monitored by testing your urine (urine testing strips are available where you buy blood testing strips) or by testing your blood (using a new type of monitor which can test for both glucose and ketones in your blood).

For more information about ketones, ketoacidosis and sick day management, contact Diabetes Australia or ask your diabetes team for a copy of the booklet called 'Guidelines for Sick Day Management for People with Diabetes' or visit: **www.adea.com.au** to download a free copy.

Diabetes Complications
Some of the complications of long-term diabetes can be made worse by pregnancy, for example, renal damage (kidneys) and retinopathy (eyes).

Your doctor will request a baseline screening for all diabetes complications prior to pregnancy to establish if any complications are present. If present, complications will need to be stabilised and closely monitored throughout your pregnancy. In most cases, any deterioration of eyes or kidneys during pregnancy resolves after your baby is born.

If complications are advanced, it is important to have an individual assessment of your capacity to carry a child, as pregnancy does put additional stress on your body.

Morning Sickness
During the first 12 weeks of pregnancy, some women feel sick first thing in the morning, some in the evenings and others in the afternoon; some women feel sick all day long and may vomit.

HELPFUL HINTS:

Morning Sickness

- Keep your fluids up - sip on drinks such as flat, diet (sugar-free) lemonade, diluted diet cordial, fruit juice or diet icy poles.
- If you have been vomiting or unable to eat, you may need to include ordinary soft drinks and cordial instead of diet drinks. (Sick day management plan)
- Eat small, frequent meals -talk to your diabetes team about changing insulin doses to cater for this.
- Avoid strong food odours and rich, fatty foods.
- Snack on something like dry toast or dry biscuits before getting out of bed, if mornings are a problem.
- Eat and drink slowly. Cold foods may be more tolerable.
- Some women find ginger (tea, biscuits, tablets) to be useful.
- Always take your insulin, but you may need to alter the dose.

Pre-eclampsia and High Blood Pressure
Pre-eclampsia is an important and potentially very dangerous complication of pregnancy. It is diagnosed if you develop high blood pressure, swelling or puffiness of legs, fingers and face and protein in the urine. It occurs more frequently in women with diabetes and is a major cause of premature birth. The risk of pre-eclampsia is reduced by good blood glucose control throughout pregnancy.

Pre-eclampsia may be dangerous for you and your baby. Your doctor or team will check your blood pressure and urine, and look for swelling in your face, hands and feet at each visit. In women at high risk, medication to reduce the risk of pre-eclampsia may be prescribed. This may include low dose aspirin.

ACTION:

Visit or phone your diabetes & pregnancy team regularly and understand the signs of pre-eclampsia and high blood pressure.

Support from your partner, family and friends
Your partner and/or other family and friends supporting you through your pregnancy are welcome to attend appointments with your diabetes and pregnancy team during the planning stage as well as during your pregnancy. They should be encouraged to ask as many questions as they need so that they also understand your diabetes and the pregnancy.

Some particularly challenging times where the support and involvement of your partner and/or family and friends may include:

- First trimester of pregnancy – Frequent and sometimes severe hypoglycaemia is quite common, and it will be important that your partner or family member is trained in how to administer GlucaGen® and support you.
- Maintaining very tight blood glucose control whilst trying to get pregnant – If it takes some time for you to fall pregnant, it can be challenging and sometimes frustrating for many reasons, but keeping blood glucose levels very tight can add to the pressures. Some women have described these feelings as ‘diabetes burnout’. Support of your partner and others will be important at this time.

There are many different ways by which partners and others can be involved in supporting you through your pregnancy, the birth and beyond.

Support from other women with diabetes
Many women find that it is very helpful to hear stories of how other women have experienced pregnancy with diabetes. Ask your diabetes team if there is a group you can attend or a way to meet other women with diabetes. (Some women have formed informal support groups in the waiting rooms of diabetes and pregnancy clinics!).

The Reality Check website contains many stories that women with diabetes have written about their pregnancies – the most popular is a blog by Vanessa called 'The Sweetest Thing'. There is also an online community where many women who are pregnant or have had babies log in to ask questions and share their experiences.

Visit: **www.realitycheck.org.au.**

Diabetes Australia offers information sessions, phone support and support groups for women about diabetes and pregnancy.

Contact your state office on **1300 136 588** for details.

Section 6

Insulin Changes during Pregnancy

The recommended targets for blood glucose levels during pregnancy are:

Target Blood Glucose Levels	
Fasting:	4.0 - 5.5 mmol/L
2 hours after each meal:	5.0 - 7.0 mmol/l

Insulin requirements change constantly throughout pregnancy as your baby grows and different hormones take effect. You need to be prepared to adjust your insulin doses on a daily or at least weekly basis. It is important that you understand the action of each of your insulins so you can adjust your doses effectively. If you are unsure of how to alter your insulin doses, ask your diabetes team.

Early Pregnancy Changes
Many women find it extremely challenging to maintain optimal blood glucose levels in this early stage of pregnancy as your body is undergoing so many hormonal and physical changes.

Women with type 2 diabetes who are taking tablets for diabetes are advised to discuss their medication with their diabetes team. Some women will need to change their diabetes tablets to insulin injections during pregnancy.

Insulin needs for women with type 1 diabetes often decrease in the early stages of pregnancy: between 6 and 16 weeks gestation. This may cause severe 'hypos' (low blood glucose) to occur, sometimes without warning. Preventing a hypo is better than treating one. An important tip is to not miss any meals and snacks.

It is essential that you make a habit of carrying hypo food such as glucose tablets or jelly beans and a carbohydrate snack with you at all times to treat a hypo quickly.

Mid-pregnancy Changes
From 20 weeks gestation, your insulin needs begin to rise you may need two or three times your pre-pregnancy dose from about 30 weeks. The placental hormones interfere with the way your insulin normally works, directing food to your baby. It is normal to need more insulin to allow food to pass into your own body cells.

Changes after the Birth
Once your baby is born, your insulin requirements will reduce dramatically on delivery of the placenta. Insulin requirements then gradually increase to close to your pre-pregnancy dose by about the third day after birth of your baby. Breastfeeding may cause your insulin needs to decrease again. Your endocrinologist will need to assist you and the delivery team to adjust your insulin dose immediately after delivery to prevent hypoglycaemia.

ACTION:

- Review your sick day management plan.
- Check you have a GlucaGen® script and current supply, and your partner knows how to use it!
- Carry jelly beans or sweets in your handbag, glove box and sports bag at all times.
- Keep a jar of lollies and dry biscuits by your bed.
- Make a plan with your diabetes and pregnancy team - times and number of blood glucose tests you do each day or week.

Section 7

Clinical Tests during Pregnancy

What tests will I have during pregnancy?
Throughout your pregnancy, your health team will order tests to check your general health and the wellbeing of your baby.

Blood tests will include:

- Rubella & Chicken Pox - Your doctor may request a blood test to assess your immunity to Rubella (German Measles) and Chicken Pox before you become pregnant and at your first pregnancy visit.
- Haemoglobin level to make sure you are not anaemic.
- Liver, kidney and thyroid function tests.
- HbA1c - measure of long-term blood glucose level (over the last 3 months). It is critical to aim for less than 7% to ensure the risk of your baby being born with abnormalities is just the same as women without diabetes.

ACTION:

Ask your doctor for the results of all your blood tests when you are planning pregnancy and during your pregnancy so that you can track your own progress.

Ultrasound scans
Ultrasound scans are used to identify fetal abnormalities and assess risk calculations for genetic disorders in your baby. You may be offered an ultrasound at 6-8 weeks: Dating scan, 11-13 weeks: 1st Trimester screen (to check for genetic abnormalities), 17-19 weeks: Anatomy scan (to check for physical abnormalities). You may be asked to have serial ultrasound scans through the second half of pregnancy to monitor your baby's growth and general condition.

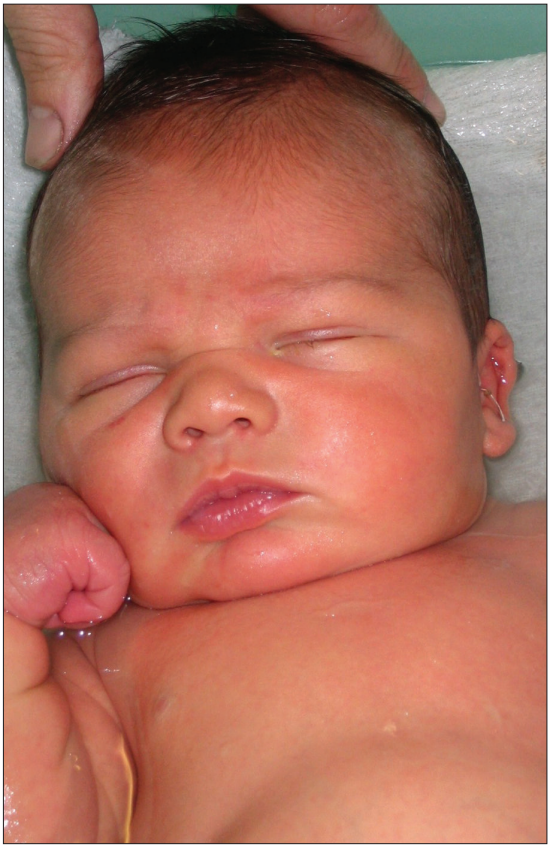
Urine tests
You will be asked to give a urine sample at each visit during your pregnancy. This is tested for ketones and protein. Protein may indicate that the pregnancy has affected your kidneys, or that you are developing a pregnancy complication called 'pre-eclampsia'.

Cardiotocography (CTG)
After 32 weeks, fetal heart rate monitoring may be offered to women with diabetes. Two sensors sit on your abdomen to record an electronic trace of your baby's heart rate and to detect any contractions. The frequency of CTGs will vary according to how your blood glucose is controlled, how well your baby is growing and your overall health. It takes approximately 30 minutes to have your baby's heart rate recorded on the graph. Your obstetrician will usually determine if and when you need to have CTGs.

Blood glucose after meals
Together with your regular monitoring of blood glucose levels throughout the day, you will be asked to do tests two hours after each meal. You may not have had to do this before. These extra tests will help you and your doctor gain a more thorough understanding of your blood glucose levels and adjust your insulin to attain optimum control of your diabetes.

REAL STORIES:

"Overall, being pregnant is a wonderful, magical experience. Even though there are many 'downs', enjoy this time. It's a gift that women living with diabetes in the past feared, and were advised against. Thank goodness times have changed."



Section 8

Labour and Birth

Your diabetes and pregnancy team will work with you towards the ultimate goal of carrying your baby to full term (40 weeks) and having a healthy baby. Some women are advised to have their baby early for various reasons including diabetes control becoming difficult or the baby being particularly large and some will be advised to have a caesarean section delivery instead of a vaginal birth.

The experience for Australian women with diabetes of labour and birth varies considerably. A recent audit of the experience of 90 women with pre-existing diabetes across nine different hospitals found that the rates of caesarean deliveries ranged from 28.5% to 66.6%[1]. The same study found that average gestation at delivery was 38 weeks.

If your doctor is concerned about you not being able to have a vaginal birth (i.e. suspects your baby is large or due to other obstetric problems), he/she will discuss this with you when you are making a plan for your baby's birth towards the end of your pregnancy.

Induction of Labour

You may be offered an induction of labour, which means helping your body to start labour. An induction can be performed several ways; sometimes a combination of two or more ways:

- **Gel induction** - a pessary type gel is inserted into your vagina, to assist the cervix to soften and open. This in turn tells your uterus to start contracting. Some women need two or three gels before labour begins.
- **Oxytocin** - an intravenous (IV) line ('drip') is inserted into a vein in your arm and this hormone is slowly delivered into your blood to assist your uterus to start contracting. The IV may be used alone or with a gel induction.
- **Balloon induction** - a catheter-like device is inserted into your vagina and air is pumped into the device, which gently puts pressure on your cervix. This pressure assists dilation and may encourage your uterus to begin contracting.
- **Break waters** - the bag of fluid around your baby is gently broken using an "amnihook", which looks like a long crochet hook. The gush of fluid may encourage your uterus to start contractions.

1 Simmons, D., Cheung, W., McIntyre, D., et al, 2007, The ADIPS pilot national diabetes in pregnancy audit project, Aust NZ J Obstet Gynaecol, 47 (3): 198-206.

Caesarean Sections
A caesarean section may be necessary for both you and your child.
Birth by caesarean section is not a decision taken lightly as there are risks involved in any major surgery. The medical decision to perform a caesarean section should be discussed with you in detail. Your doctor will explain the risks involved.

You will usually be required to fast for this surgery, and you should discuss with your diabetes and pregnancy team the options for managing your blood glucose levels during this time. You may wish to have made a plan with your diabetes and pregnancy team for how you will manage this well before the birth.

Diabetes management during labour
The mother's blood glucose levels immediately prior to the birth have an important effect on the baby's health. The higher the mother's glucose, the higher the glucose supply to the baby before birth which stimulates the baby's pancreas to make lots of insulin. At birth, the mother's glucose supply suddenly stops, but excess production of insulin can continue for several hours to 1 or 2 days causing neonatal hypoglycaemia. (The chance of this occurring was shown in a recent audit of 90 women to range between 11% and 46%[2].)

Control of blood glucose levels during labour helps your baby to have better blood glucose levels at birth. 'Normal' blood glucose (4-7 mmol/L) in the mother during labour decreases the risk of your baby having low blood glucose at birth. When an induction or caesarean section is planned, discuss with your doctor a plan (insulin / tablet dose) for the night before.

ACTION:

Speak with your diabetes team prior to labour about pain relief options, diabetes management and any other questions or concerns you may have. Have a written plan of your insulin requirements during birth.

Women who have type 1 or type 2 diabetes are often managed with an insulin and dextrose (sugar) intravenous (IV) drip throughout labour, which allows small amounts of insulin to run into your blood continuously.

This way, your blood glucose levels can be adjusted and maintained within the normal range much more simply. When you are in labour, your blood glucose will be tested frequently and the amount of insulin you are being given will be adjusted to keep your blood glucose in the normal range.

2 Simmons, D., Cheung, W., McIntyre, D., et al, 2007, The ADIPS pilot national diabetes in pregnancy audit project, Aust NZ J Obstet Gynaecol, 47 (3): 198-206.

Alternatively, your doctor may suggest using fast acting insulin injections, also adjusted regularly throughout labour according to your blood glucose levels.
If you use an insulin pump, you should discuss with your obstetrician and endocrinologist whether you are able to remain connected to your pump or whether he/she suggests a different form of management during delivery. Some women with type 2 diabetes may not need insulin during labour. Your doctor will assess your need for insulin in labour on an individual basis.

It is advisable to take to hospital your own equipment (blood glucose meter, insulin pens, etc) and you are encouraged to continue your own testing and insulin injections whenever possible. You may like to "train-up" your partner or support person so they know how to do check your blood glucose levels and to switch off your insulin pump if necessary.

The arrival
A paediatrician or midwife may want to examine your baby in the room with you after the birth. If your blood glucose levels have been stable during your pregnancy and the birth, and your baby has no problems, your baby may be able to go with you to your hospital room.

If your baby is born large or premature, or is having breathing problems, he/she may need to be observed in a Special Care Nursery for a day or two. Not all maternity hospitals are equipped with high level SCNs, such that in some circumstances your baby may need hospital transfer.

If your baby needs special care
Kangaroo care is a phrase developed in Australia and is used to assist with the care of babies who are born early or have other problems. 'Skin to skin' contact between you and your baby will be encouraged at birth. This has been found to assist in developing bonds between mother and baby, whilst giving your baby the opportunity to suckle and assists your baby with temperature control. Ask your midwife about 'Kangaroo care', if you and your baby need to be separated due to premature delivery.

The Special Care Nursery
- Open 24 hours a day. You are welcome to visit at any time.
- Breastfeeding can still be successful. Ask your midwife about expressing within the first 4 hours. Your breasts make milk on a supply and demand basis. If you express, your breasts will keep producing milk to give to your baby, whether by spoon, tube or breast.
- Nursery staff often have instant cameras, so ask for a photo of your baby if you are separated from your baby.
- Visitors are limited to the nursery to assist in noise and infection control.
- Other visitors may need to be accompanied by a parent for security reasons.

ACTION:

- Ask your midwife or diabetes team for a tour of your hospital's special care nursery before your due date
- Find out what rules they have regarding visitors
- Ask about "Kangaroo care"

Will I be able to breastfeed my baby?
Breastfeeding within 30 to 60 minutes of birth can reduce the risk of your baby experiencing low blood glucose levels. Regular feeds, three to four hourly, on the first few days, will also assist your baby to maintain blood glucose levels. Too low blood glucose levels for an extended period may cause seizures. Your diabetes and pregnancy team will work with you to ensure your baby's blood glucose levels are closely monitored and managed.

If you don't have your baby with you, ask your midwife about expressing within the first 4 hours of your baby's birth. Your breasts make milk on a supply and demand basis. If you express, your breasts will keep producing milk to give to your baby, whether by spoon, tube or breast.

Blood tests on your baby
Your baby will be tested for LOW blood glucose within the first 24 hours after birth. Your baby may have needed to make extra insulin if extra glucose from you was crossing over the placenta to the baby in the period before delivery. Your baby's pancreas may need 24 to 48 hours to adapt and return to normal insulin production.

Your baby will have blood glucose tests by heel prick about every 4 hours. This is to check for LOW blood glucose. It is NOT a check to see if the baby has diabetes. If your baby's blood glucose level is low (less than 2.0-2.5 mmol/l), your baby may need to have supplementary feeds or some glucose. Talk to your midwife about using your own milk.

This does not mean your baby will develop diabetes in the future.

ACTION:

Talk with your midwife or lactation consultant about breastfeeding and preventing low blood glucose levels in your baby at birth.

Section 9

Breastfeeding

Will I be able to breast feed my baby?
Yes. Your baby's blood glucose will benefit from an early breastfeed (within 30 minutes of birth) if possible to prevent hypoglycaemia. There are also many other proven benefits to your child's health to be gained through breastfeeding. Talk to your midwife or doctor about strategies to enhance successful breastfeeding.

Breastfeeding takes a lot of energy from you; some say as much as walking 25km every day!

Your insulin doses will be quite small in the first few days or so after delivery so you will need to do more regular blood tests to assist careful adjustment of your insulin doses. It is usually safer to keep them in the 5-10 mmol/l range at this stage so that you avoid having hypoglycaemia. Also be prepared for hypoglycaemia when you are breastfeeding!

If you have type 2 diabetes and were on tablets before the pregnancy, your doctor will need to advise you on whether you still need insulin treatment while you are breastfeeding if your blood glucose levels are elevated after delivery, or whether you may return to treatment with tablets.

If you plan not to breastfeed for long, remember that just 6 – 8 weeks of breastfeeding may still give many benefits to your baby including immunity from infections. Breast feeding may also reduce the chance of your baby developing diabetes later in life.

The initiation of breast milk or 'milk coming in' (usually on day three) may be delayed for 24 to 48 hours in some women with diabetes, especially if there is any hypoglycaemia after delivery.

Managing the risk of hypoglycaemia with a new baby
Your blood glucose levels may fall rapidly during and following breastfeeding, just like any other physical activity, you may need to:

- Discuss with your health professionals strategies to prevent hypoglycaemia.
- Snack prior to or whilst breastfeeding eg. fruit, crackers, sandwich or speak with your health professional about adjusting your insulin dose.
- Treat yourself immediately should a 'hypo' occur.
- Drink at least 2 litres of fluid each day.
- Develop a routine for feeding your baby, so you are able to have your meals on time and reduce your risk of hypos.
- Controlling blood glucose levels will help ensure a good milk supply.
- Rub expressed milk into your nipples after each feed to help prevent nipple soreness and heal cracked nipples.
- Test your blood glucose after a feed, especially during the night, to avoid nocturnal hypos.
- If you are having trouble with breastfeeding phone your hospital's lactation midwife for advice anytime.
- If your baby is losing weight, is continuously unsettled or has few wet nappies contact your baby's paediatrician or maternal and child health centre.

ACTION:

- Talk to your team about setting new blood glucose goals and insulin adjustments during breastfeeding.
- Talk to your midwife about successful breastfeeding strategies.
- Ask about storing breast milk to supplement feeds if necessary.

Section 10

Going Home and the Future

Pregnancy is a time to update yourself about your diabetes and how you can manage it well. It is vital to achieve optimal blood glucose control to prevent long-term complications of diabetes. High blood glucose levels over a period of time will affect the eyes, kidneys, nerves and blood vessels, and may lead to blindness, kidney failure, foot problems and heart disease.

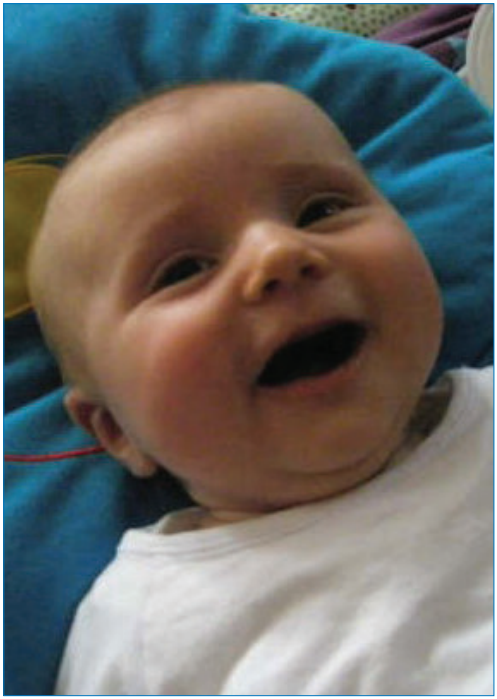
Keep yourself healthy with the lifestyle and diabetes management techniques you have now developed and enjoy your new child!

Taking home a new baby is an incredibly exciting, but sometimes also stressful time. Some women with diabetes find it very hard to give their own health and their diabetes the attention it demands during this busy time.

Do what you can to take care of yourself and your health and don't be afraid to ask for help from your diabetes and pregnancy team even after your baby is born.

ACTION:

- Talk to your GP or diabetes specialist about regular screening for diabetes complications (kidneys, eyes, nerves every year).
- Make a date with the diabetes & pregnancy team or doctor when planning your next baby!
- Review your Family Planning and contraceptive techniques, whether you intend to have another child or not.



Further resources recommended by women with diabetes

Diabetes and Pregnancy DVDs
Diabetes Australia-Vic has produced DVDs about type 1 diabetes and pregnancy and type 2 diabetes and pregnancy

For your free copy, please contact Diabetes Australia on **1300 136 588**.

Diabetes and pregnancy information.
Visit:
Diabetes Australia-Vic website: **www.diabetesvic.org.au**
Diabetes Australia website: **www.diabetesaustralia.com.au**
Diabetes Australia website for 15 to 25 year olds: **www.myd.net.au**
Australasian Diabetes in Pregnancy website: **www.adips.org**

Alison Nankervis, MD and Josephine Costa, **Diabetes and Pregnancy**, Miranova, Melbourne, 2001.

Anna Knopfler, **Diabetes and Pregnancy**, Macdonald & Co, Cambridge, 1989.

The Sweetest Thing - Vanessa's Blog of Pregnancy and Motherhood with Diabetes.
Visit: **www.realitycheck.org.au**

Simmons, D., Cheung, W., McIntyre D., Flack, J., et al (2007) **The ADIPS Pilot National Diabetes in Pregnancy Audit Project**, Aust NZ J Obstet Gynaecol 47 (3) 198–206.
Visit: **www.ranzcog.edu.au/publications/anzjog.shtml**

For a copy of the **Australasian Diabetes in Pregnancy Society consensus guidelines** for the management of type 1 and type 2 diabetes in relation to pregnancy,
Visit: **www.adips.org/content/ADIPS_PreGDM_Guidelines.pdf**

Diabetes and Mental Health
Diabetes Australia and SANE Australia have developed a guide to help people diagnosed with diabetes maintain good mental health. The SANE Guide to Good Mental Health is available from the Diabetes Australia website.
Visit: **www.diabetesaustralia.com.au/Resources/Information-Resources/Request-A-Resource/**
or call Diabetes Australia on **1300 136 588** for your free copy.

Reality Check
Visit: **www.realitycheck.org.au**

Diabetes and Pregnancy Services around Australia

There are approximately 60 diabetes and pregnancy clinics at hospitals around Australia. If you are having trouble finding a diabetes and pregnancy service near you, contact the major hospitals closest to where you live and seek their advice.

Phone numbers can be found in the White Pages or via directory assistance and once you reach the main enquiry line, ask to speak with the diabetes and pregnancy service or to the diabetes nurse educator.

Acknowledgement

We would like to thank the many women with diabetes who shared their time and pregnancy stories, many of which are quoted in the booklet. These women have shared their stories and photos of their children to show that having a healthy baby is a reality for women with diabetes. All babies and toddlers appearing in this booklet were born to women with diabetes.

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This booklet has been jointly produced by:

Diabetes Australia–Vic

Diabetes Australia–Vic is the leading charity and peak consumer body representing people with diabetes in Victoria and providing vital support and information to the community about diabetes.

Diabetes Australia-Vic has a Diabetes and Pregnancy Program. Services include the coordination of diabetes and pregnancy information sessions throughout Victoria each year and phone support for women about diabetes and pregnancy.

Visit: **www.diabetesvic.org.au**

Australasian Diabetes in Pregnancy Society

The Australasian Diabetes in Pregnancy Society is a professional body established to advance clinical and scientific knowledge of diabetes in pregnancy, to encourage dissemination of this knowledge and to foster collaboration with other regional societies interested in diabetes in pregnancy. It is also involved in the development of health policy regarding diabetes in pregnancy at the National and State levels.

32 St. Georges Road, Toorak VIC 3142, Phone: 03 9827 8263

Visit: **www.adips.org**

The Type 1 Diabetes Network

The Type 1 Diabetes Network is an Australian organisation run for and by people with type 1 diabetes.Services include:

- Online community for discussing any issue you may have with other people who have type 1 diabetes
- Stories of living with type 1 diabetes, including the Sweetest Thing, blog of pregnancy with diabetes
- Free email newsletter with type 1 diabetes news and views

Visit: **www.d1.org.au**

The review and reprint of this booklet was funded by a Strategic Development Grant under the National Diabetes Services Scheme (NDSS).

The NDSS is an initiative of the Australian Government administered by Diabetes Australia. The NDSS delivers diabetes-related products at subsidised prices and provides information and support services to people with diabetes.

Registration is free and open to all Australians diagnosed with diabetes.
Visit **www.ndss.com.au** or call **1300 136 588**.

The development of this edition was coordinated by Diabetes Australia - Vic.
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Third edition - December 2008