



What I tell my patients about contraception and pregnancy in renal disease

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Kidney diseases affect both fertility (how easy it is to become pregnant) and pregnancy itself. The chance of becoming pregnant decreases with worsening kidney function. Nevertheless, even women on dialysis can become pregnant. Renal transplantation restores fertility, with the first successful pregnancy in a kidney transplant recipient occurring in 1958 in a woman from Oklahoma after receiving a kidney from her twin sister. As our management of kidney disease improves, so the numbers of women who become pregnant with kidney disease, a kidney transplant or even when on dialysis are increasing.

How do you detect pregnancy in renal disease?

Kidney disease interferes with the hormones that normally regulate periods, so many women with kidney disease find their periods become irregular or stop completely. It can become difficult to detect pregnancy and some women only suspect they are pregnant when they develop other unexplained symptoms, such as nausea and fatigue. Standard pregnancy tests, including home testing kits, are still reliable in kidney disease, unless your urine output is very low, in which case a blood test can be performed.

Does having kidney disease affect the course of pregnancy?

Having kidney disease can make pregnancy more complicated. The more severe your kidney



The coil is a good choice of contraceptive for women with renal disease, but should be avoided if you are on immunosuppressants

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disease, the greater the risk of having a difficult pregnancy. There are risks to both mother and baby. Three things are important for working out the risks of having a complication during pregnancy:

- Level of kidney function
- High blood pressure
- Protein in your urine (proteinuria).

The risks include further damage to your kidneys during pregnancy and an illness called pre-eclampsia. Kidney disease can be categorised as mild, moderate or severe, according to a blood level of a substance called creatinine (see Table 1). For most people with mild kidney disease, the risks of pregnancy complications are quite low, but for some people, usually those with

Table 1. Category of kidney function according to creatinine levels in the blood

Reduction in kidney function	Creatinine level ($\mu\text{mol/l}$)	eGFR (ml/min/1.73 m^2)	Approx CKD stage	Risk
Mild	Less than 125	Over 50	1 and 2	Risk usually only slightly increased
Moderate	125–250	25–50	3	Risk rises with worsening function. Blood pressure and proteinuria also important
Severe	Over 250	Less than 25	4 and 5	Risks to mother and baby may be high

Note that these guidelines were written before the chronic kidney disease (CKD) stages (fourth column) were introduced and, therefore, the levels do not precisely match the stages; eGFR is estimated glomerular filtration rate, which is calculated from your creatinine blood test. Note that eGFR calculations are not accurate in pregnancy



quite significant kidney disease or other health problems, the risks may occasionally be very high.

What is pre-eclampsia?

Pre-eclampsia is a complication of the second half of pregnancy. It most commonly causes high blood pressure, but there can also be a leak of protein from the kidneys into the urine, and sometimes other problems such as seizures or liver failure. Most cases are mild, but some are serious and require early delivery of the baby. Babies may be small, as well as premature (born at less than 37 weeks).

High blood pressure is more common in people with kidney disease, and this makes pre-eclampsia more likely. The risk is increased the worse your kidney function, the higher your blood pressure, and the more protein in your urine. Taking aspirin during pregnancy may help to prevent pre-eclampsia in some women with kidney disease.

Blood pressure in pregnancy

A lot of attention is paid to blood pressure in pregnancy. The higher your blood pressure and more difficult it is to control, the more likely it is that pregnancy will be complicated. Your doctors will aim to keep it between 110/80 and 140/90 mmHg.

Does having kidney disease harm the baby?

Having kidney disease does not, in itself, harm the unborn baby; however, some kidney diseases are inherited and may be passed onto a child. Table 2 lists some common examples.

Having more serious kidney disease may result in earlier delivery than the usual 40 weeks. Babies may have to be born prematurely because of medical concerns such as pre-eclampsia and inadequate growth of the baby. Women with kidney disease can, therefore, expect to have babies of a lower birthweight.

The earlier a baby is born, the more likely it is to have problems with breathing, feeding and growth. Babies who are born early often need special or intensive care in hospital initially. If a baby is born before 24 weeks, the outlook for survival is poor. From 24 weeks to 28 weeks, the chances for survival improve with each extra week in the womb, but this prematurity still carries a risk of serious complications. From 30 weeks onward, the overall outlook for the baby is better, but until 34–36 weeks, the baby is likely to still need to spend some time in a special care baby unit.

If you are at increased risk, your doctor may want to perform regular ultrasound scans to measure your baby’s growth and the amount of fluid around the baby, to ensure that any problems can be detected as soon as possible.

Medicines in pregnancy

It is known that many drugs cross the placenta and could harm a baby. If you are on any medications, especially those used to control blood pressure, you may find they are stopped and changed to different types of drugs. As mentioned earlier, you may be prescribed a small dose of aspirin. You should remember that smoking, drinking alcohol and the use of non-prescription drugs could all harm a baby.

Some drugs that are definitely harmful to babies are shown in Table 3. Drugs known as angiotensin-converting enzyme (ACE) inhibitors and angiotensin-receptor blockers are dangerous in mid- and late pregnancy, but are relatively safe in early pregnancy. If these medicines are particularly important for your kidney disease, taking them until you become pregnant and

Table 2. Risk of inheritance in some kidney diseases

Kidney disease	Risk of inheritance
Polycystic kidney disease (usual adult type)	1 in 2 risk
Alport’s syndrome	Variable
Reflux nephropathy	Unknown

Table 3. Examples of medications that are harmful to babies

Medication	Examples	Reason for use	Period of most risk
ACE inhibitors	Enalapril, ramipril	High blood pressure, kidney disease	Mostly mid-pregnancy
Angiotensin-receptor blockers	Candesartan, irbesartan	High blood pressure, kidney disease	Mid-pregnancy
Immunosuppressants	Mycophenolate mofetil, sirolimus, methotrexate, cyclophosphamide	Renal transplants, lupus, vasculitis	You should not become pregnant while taking these drugs

ACE = angiotensin-converting enzyme



Pregnancy in women with renal disease is more complicated, but not impossible

stopping them as soon as you are pregnant may be an option. Some transplant drugs, such as prednisolone and tacrolimus, are known to be safe in pregnancy and you should be changed to these before conceiving.

Nonetheless, the best thing for a healthy baby is a healthy mother – it is important not to stop taking essential medicines that are keeping you well! Before stopping or starting any medicines, discuss it with your doctors.

Does being pregnant harm the kidneys?

A kidney that is already diseased might suffer further damage during pregnancy. The risk of losing kidney function during pregnancy rises with increasing severity of kidney disease before pregnancy. The risk is low in mild kidney disease, but is increased if you have protein in your urine and blood pressure that is difficult to control. People with kidney failure who expect to need dialysis in the future may find that pregnancy hastens their progression to dialysis. Rarely, it is necessary to start dialysis during pregnancy. Women with severe and deteriorating kidney disease who want to start a family may, therefore, be advised that their best chance is to wait until they have had a successful kidney transplant.

What if I become pregnant when I'm on dialysis?

Women on dialysis rarely become pregnant; those who do usually develop complications. Dialysis needs to be done more frequently, sometimes every day, and your dry weight will

need to be reviewed regularly. Your baby is very likely to be born early (sometimes extremely early) and, unfortunately, miscarriages are common. Overall, this is not a good time to become pregnant.

What if I become pregnant with a kidney transplant?

A transplant that is functioning very well gives the best chance of a perfectly normal pregnancy for people with severe kidney disease. However, if the transplant is not functioning as well as it could, then all the possible complications noted above will apply, in addition to the risk of deterioration in the function of the transplant itself.

It is essential to take antirejection therapy throughout pregnancy and careful attention to drug doses will be needed. If you want to become pregnant, you should discuss this with your medical team and make sure you are taking safe medicines.

You should wait at least one to two years after the transplant before becoming pregnant to allow your kidney function to be as good as possible and your medication doses to be as low as possible.

Who will look after me when I'm pregnant?

The team who normally look after your kidney disease will continue to monitor you. If you are at increased risk you may need to see specialist obstetricians and midwives who



have a detailed knowledge of pregnancy and kidney disease.

You may find that your clinic visits are not at your local hospital, but in a specialist centre further away. Clinic visits can sometimes become very frequent and it may be that admission to hospital is necessary during the pregnancy to monitor your, and your baby's, well-being.

How will my baby be born?

If at all possible, delivery will be by the normal vaginal route. If pregnancy is complicated, especially if an early delivery is needed, then a caesarean section may be needed. These options will be discussed with you. A kidney transplant is not injured by vaginal delivery and rarely causes a problem during caesarean section.

Should I breastfeed?

Breastfeeding is the best option for you and your baby, especially if your baby is born early; however, some medication is transferred into breastmilk. If it is safe for you, your doctors will try to alter your medication to allow you to breastfeed.

Key points

- Women with kidney disease can become pregnant, but fertility decreases with worsening kidney function.
- Risks to mother and baby rise with increasing severity of kidney disease. They include pre-eclampsia, poor growth of the baby and further damage to the mother's kidneys.
- Some medications are harmful to the baby during pregnancy and breastfeeding, and therefore they may need to be stopped or altered before becoming pregnant.
- A kidney transplant can restore fertility.
- It is important you plan your pregnancy with the help of your doctors. Use contraception until pregnancy is advised.

Further Information

- The Edinburgh Renal Unit website www.edren.org is a useful source of information on many aspects of kidney disease
- SafeFetus.com provides information on the safety of specific medications in pregnancy
- Patient-friendly information on pre-eclampsia – the Royal College of Obstetricians and Gynaecologists' advice at www.rcog.org.uk/womens-health/clinical-guidance/pre-eclampsia-what-you-need-know
- The National Institute for Health and Clinical Excellence (NICE) has issued a helpful guideline on the management of hypertension in pregnancy, which can be found at www.nice.org.uk/guidance/CG107
- For professionals, Dr Catherine Nelson-Piercy's book *Handbook of Obstetric Medicine* (Informa, 2010) has a concise and informative chapter on renal disease.

What advice is there on planning pregnancy?

If you have kidney disease and you wish to become pregnant, you should discuss this with your doctors. They will be able to say when, or whether, pregnancy is advisable and they will be able to adjust your medicines appropriately.

Folic acid supplements, to reduce the risk of spina bifida, should be started pre-conception if pregnancy is planned.

What about contraception in renal disease?

Contraception is advised while you plan your pregnancy. Many women with kidney disease have irregular periods, and therefore think they are infertile. Even if your periods have disappeared completely, you can still be fertile. There are no problems in using barrier methods of contraception such as condoms.

Progesterone-type methods such as the 'mini-Pill', injection (Depo-Provera®, Pfizer, UK), implant (Implanon®, Organon, UK) and coil (Mirena®, Bayer, UK) are often the best choice of contraception as they do not have an effect on blood pressure. Coils are not usually advised for women who are on immunosuppressive drugs as this medication can render the coil less effective and make infection of the womb more likely. Your GP or kidney specialist will advise you on what is best for you ■



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