Tacrolimus - has been used in Britain since the mid 1990s and all transplant units have put patients on this drug. It works in the same way as cyclosporin, although it is also toxic to the kidney, other side effects may be different.

Mycophenolate - has been used in Britain since the late 1990s. It is an alternative to azathioprine. Not all centres use the drug, again partly because of the expense. Like tacrolimus, it can be very effective if rejection occurs despite treatment with other drugs. There are two different preparations of mycophenolate on the market, one of which has a preparation designed to reduce the rate of diarrhoea, which can be a troublesome complication of the drug.

Azathioprine - The main problem with azathioprine is that it can suppress activity in the bone marrow (where blood cells are made). By affecting blood cell production, azathioprine can cause a number of serious problems. If too few red blood cells are produced, the patient will suffer from anaemia, causing tiredness. If there are too few white blood cells, the patient will develop a condition called neutropaenia. This lack of white blood cells will affect the patient’s ability to fight infection. If too few of the blood cells called platelets are produced, the resulting problem is thrombocytopaenia, which can cause bleeding problems. Patients taking azathioprine may suffer from any or all of the above problems. However, stopping the drug or reducing the dose will normally put matters right. Azathioprine can also damage the liver. If the side effects of azathioprine are severe, mycophenolate may be used in its place.

Sirolimus works slightly differently from cyclosporin and tacrolimus, so might be used as an alternative drug in some cases. Unlike, cyclosporin and tacrolimus, it is not toxic to the function of the kidney, which is an advantage. It can cause rashes or mouth ulcers when first started, and can also cause rises in the blood cholesterol level.

Prednisolone - This drug is a steroid and, like other steroid drugs, it can cause thinning of the skin (leading to easy bruising), and facial swelling (giving a red and rounded appearance. These problems may lessen if the dose of the drug is reduced. Taking prednisolone can also cause diabetes mellitus (sugar diabetes). At worst, this might mean that the patient will have to take tablets or give themselves insulin injections. A further possible problem with prednisolone is that it can cause bone weakness (osteoporosis), which may in the long term lead to a risk of breaking an arm or a hip in a fall. Rarely, there may be crumbling of the joints, especially the hip joints. Replacement of one or both hips may become necessary.

Drugs can come in different preparation where dose and number of times taken in the day can vary. If you receive a drug with a different name, please discuss this with your renal transplant team (eg. Tacrolimus, ‘Prograf’, ‘Adoport’, ‘Advagraf’)

Other Drugs used after Transplant
Many drugs are prescribed in the first few months after transplant. Some of these are the immunosuppressant drugs discussed above, many of which are stopped at 6 months or a year after the transplant. Other drugs are given because of side effects such as high blood pressure or high cholesterol levels. So, although EPO, phosphate binders and anti-itching drugs needed on dialysis can usually be stopped soon after a transplant, the total number of tablets you need to take will often be increased.

Make sure that you know what your drugs are for, and carry a list of medication at all times, including the names of any drugs you are allergic to.

The National Kidney Federation cannot accept responsibility for information provided. The above is for guidance only. Patients are advised to seek further information from their own doctor.

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The NKF - the largest Kidney Patient charity in the UK
A federation of more than fifty patient charities, supporting kidney patients & carers
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Charity No 1106735 Company No 5272349 Reg. in England & Wales. Give as you earn contributions No CAF/GYS11
**Drugs you can take yourself or buy from the chemist**

Minor aches, pains and headaches are a normal part of life and sometimes it is necessary to take medication for these problems. Most of the drugs you can buy from the chemist or supermarket are safe to take, but some are not. Try to read the ingredients label before you buy, as many medications contain a mixture of different ingredients. Even better, ask a pharmacist for advice on the best treatment to suit you. Say you have a kidney transplant and show the pharmacist an up to date list of all the drugs you are taking.

**Paracetamol** is safe to take at the recommended dose, and is the best painkiller for anyone with kidney trouble. It will help headaches, pains in the joints and elsewhere.

**Ibuprofen** (sold under a number of trade names, including ‘Advil’ and ‘Nurofen’) is best avoided. It can upset the stomach and may cause water retention in someone with a kidney transplant. It should only be taken if recommended by a kidney specialist.

**Aspirin** is best avoided as a painkiller. Most people with transplants take a small dose to reduce the risk of heart attacks and strokes. In higher doses, aspirin is an effective painkiller but can cause stomach irritation or ulcers. Paracetamol is a good alternative.

**Indigestion and ‘flu and cold remedies.** Many of these contain a mixture of ingredients, so check the label and if in any doubt ask a pharmacist for advice.

**Missing out prescribed drugs - a dangerous experiment!**

Taking drugs is a big problem after transplantation. There are many tablets to take each day and the doctors will often change the prescription. It can be frustrating to have to take so many tablets if you feel very well and dialysis is no longer needed. You may feel normal in every way, but appear ill to your friends and work mates by taking tablets several times a day.

But keep on taking the tablets! Doctors looking after transplant patients know how hard it is to take the tablets, but they are all prescribed for a reason. If you have side effects, tell your doctors or the clinic nurse. It may not seem important to skip a few blood pressure tablets, but the long term effects can be very serious.

One of the commonest causes of failure of transplants is when the patient stops taking all their medication properly. This may surprise people who are on dialysis and are desperate for a transplant, or those people who just take tablets regularly and have no worries and few side effects associated with drugs; but it is not easy for everyone to take all the tablets.

The reason transplant kidneys can fail when drugs are stopped is because, without the drugs, the immune system ‘fights back’. If someone is unable to take their immuno-suppressant drugs, they should go to the hospital at once. The immune system does not forget that there is a ‘foreign’ kidney in the body. It is always waiting for a chance to attack and reject it.

**So think about these important rules for taking the transplant drugs:**

- understand why each drug is given
- tell the doctors if you have any possible side effects, do not just stop the drug
- carry a list of the drugs around with you at all times
- make sure you do not run out of the drugs
- contact the hospital or your GP immediately if you do run out by mistake
- do not forget that however well you feel, your body can reject a transplant

**Immuno-suppressants in common use**

All patients who have a kidney transplant need to take immuno-suppressant drugs. As the name immuno-suppressant suggests, the function of these drugs is to suppress the immune system. The aim is to dampen down the immune system sufficiently to stop it rejecting the transplant kidney, while still keeping it active enough to fight infection. Finding the balance can be quite difficult.

The most commonly used immuno-suppressants are currently tacrolimus, cyclosporin, azathioprine, mycophenolate and prednisolone (a steroid). Every transplant unit uses these drugs slightly differently. This may seem odd, but research has shown that slightly different combinations of these drugs do not affect overall transplant survival. It is important that each unit has a system which it uses in all patients to avoid making mistakes.

No-one will take all 5 of the drugs listed above; they will mostly take tacrolimus or sometimes cyclosporin, mycophenolate or sometimes azathioprine and prednisolone. Some people don’t need three types of drug, and may be treated with drugs in one or two of these categories. The permutations of drugs are almost endless. There is no proof that one mixture of drugs is really better than the other, and different people will respond best to particular combinations and doses of the drugs.

All the most commonly used immuno-suppressant drugs have their problems:

**Cyclosporin** - Unfortunately, if patients are given too much of it, cyclosporin is itself toxic to the kidney and can prevent the transplant from working. This condition is called cyclosporin toxicity. To reduce the risk of problems, patients who take cyclosporin will have the amount of the drug in their blood monitored regularly. If problems do occur, these can usually be reversed either by stopping the drug or reducing the dose.

Some patients who take cyclosporin for a long time develop a condition called gum hypertrophy. This is an excessive growth of the gums, which can be unsightly. It is less likely to develop if patients practise good dental hygiene, including regular flossing between the teeth. Another possible side effect of cyclosporin is excessive growth of hair on the face and body.

If the side effects of cyclosporin are severe, tacrolimus may be used in its place.