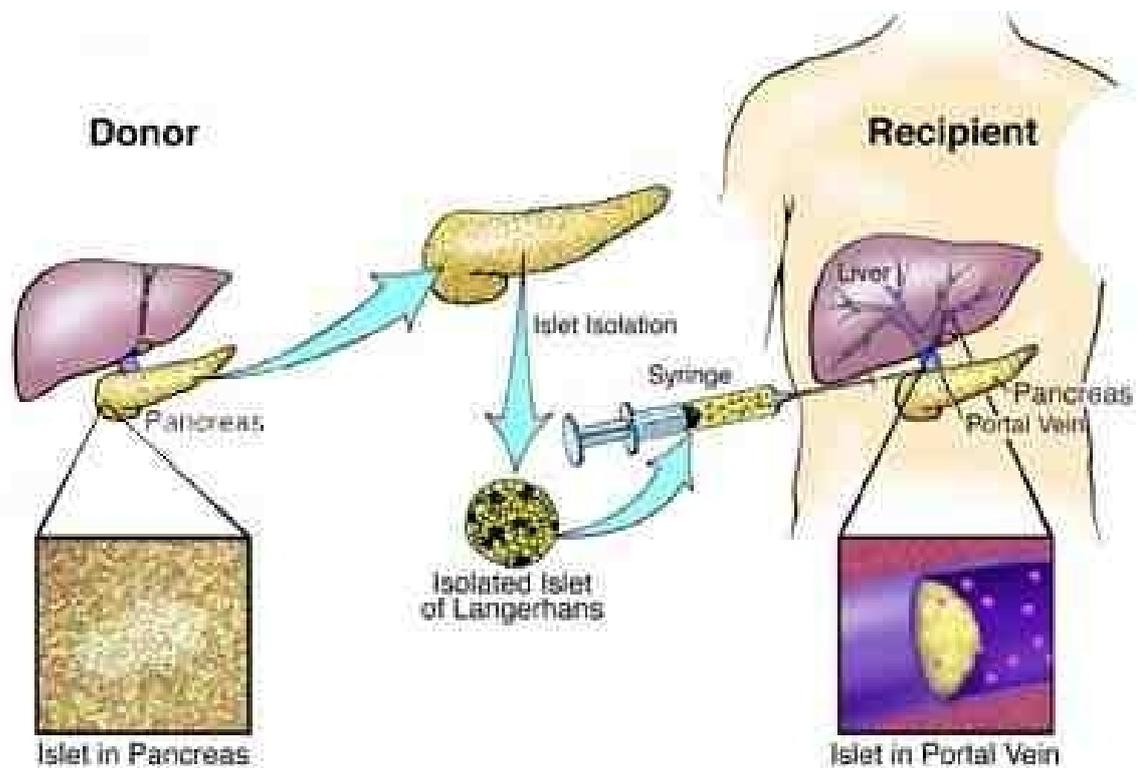


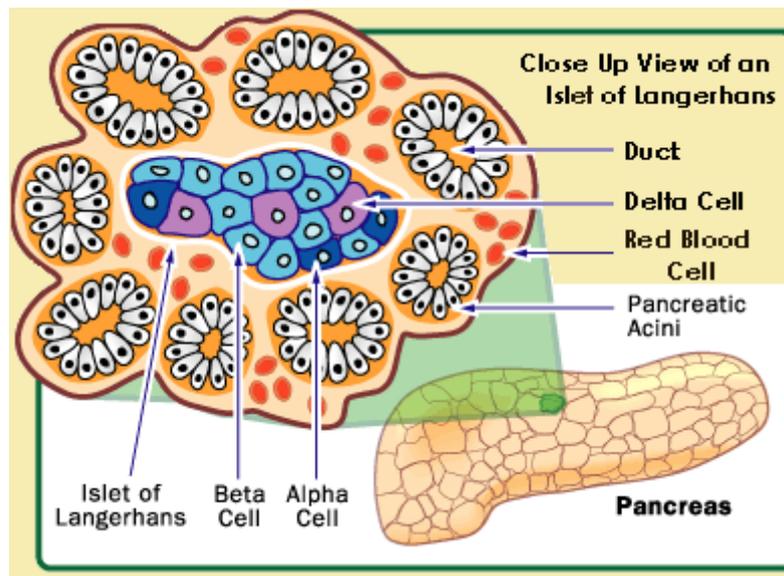
Islet Transplantation

Information for Patients



INTRODUCTION

Insulin is a hormone produced by clusters of cells within the pancreas called Islets of Langerhan (Islets). Insulin controls blood sugar levels within the body and, when not naturally produced need to be given in the form of regular injections. In patients with Type 1 Diabetes the islets no longer produce insulin leading to poor blood glucose control, which can lead to a number of problems which include blood vessel damage in the eyes, kidney failure, stroke, gangrene, heart disease and nerve damage.



For a small number of diabetic patients even the strictest regime of blood sugar monitoring and diet is not enough to ensure diabetic stability and over time if the blood sugar readings are low on a regular basis they no longer recognise the warning signs that occur during hypoglycaemia. As a result of this their blood sugar levels can drop to dangerously low levels without any warning which can be potentially life-threatening..

It is this group of patients that can benefit from an Islet Transplant. The aim of the transplant is to achieve stable blood sugars without the unpredictable drops. In the longer term this can reduce the complications of diabetes and lowers insulin requirements. For a few patients insulin independence is achieved but for all patients a successful transplant improves their quality of life.

An Islet Transplant involves injecting islets which have been extracted from a donor human pancreas. The islets are injected into the liver via the portal vein under X-Ray guidance. The islet cells then become established inside the

liver and begin to develop their own blood supply and release insulin in response to raised glucose levels.

Usually a second “top-up” transplant is given within a few months to ensure maximum results.

To prevent rejection of the transplanted Islet cells all patients have to take immunosuppressant (anti-rejection) drugs

Islet Transplantation is one of the most exciting developments within transplantation and diabetology. The Oxford Transplant Centre and Nuffield Department of Surgery have a long and internationally recognised history of islet transplant research and have performed the largest number of Islet Transplants in the UK to date.

WHO CAN HAVE A TRANSPLANT?

An Islet Transplant is an option for people over 18 years old who have had Type 1 Diabetes for at least 5 years and who, despite optimal insulin therapy, continue to have hypoglycaemic unawareness needing assistance from a second person or paramedic or even hospital admission.

REASONS WHY ISLET TRANSPLANTATION MAY NOT BE SUITABLE FOR YOU.

An Islet Transplant is not currently an option for the following groups of people:

- Patients whose hypoglycaemia can be improved with conventional insulin treatment.
- Those with severe heart disease where the risk of transplantation would outweigh the benefit.
- Those with a recent history of cancer
- Those with high insulin requirements for their body weight
- Any woman who is planning a pregnancy (as the anti-rejection drugs can damage the foetus)

BEFORE YOUR TRANSPLANT-THE ASSESSMENT

STAGE 1

For a patient to be considered for an islet transplant we need a referral from their Diabetic Specialist. This should confirm that all possible options to achieve a stable blood sugar have been attempted.

After referral to the Islet Team we send the patient the information pack and 2 questionnaires. One of these is a diabetic questionnaire which takes a month to complete; the other helps us to assess the patients about Islet Transplantation.

Once these have been sent back to us and have been reviewed an outpatient appointment is made for the patient to meet the Islet Transplant Team at the Churchill Hospital where they will have a full diabetic assessment and have the opportunity to discuss Islet Transplantation.

.The bloods we take at this appointment are to check kidney and liver function, anaemia and clotting, blood group and diabetic function as well as a full viral screen and tissue typing.

The viral screen is important as we have to be sure that patients do not have any infections that would be made worse by the anti-rejection drugs such as HIV and hepatitis. Some of the common viruses that they may have been exposed to lie dormant and can flare up again post transplant e.g. the chicken pox virus can re-occur as shingles.

After this first appointment and if the patient still wants to be considered for an Islet Transplant the Islet Team meet to discuss whether they meet the necessary criteria. If they do then this leads to Stage 2 which involves a number of screening tests to make certain that there are no underlying conditions that would make an Islet Transplant dangerous.

STAGE 2

These investigations are to ensure that you are as fit as possible for transplantation and are arranged, as much as possible in a cluster to minimise the number of hospital visits needed. Occasionally however, because of pressures on the various departments patients may need more than the 3 visits planned.

The following tests will be performed:

Glomerular Filtration Rate (GFR) at the John Radcliffe Hospital.

This is a test which provides very specific information about kidney function. A dye is injected into a vein in the arm and blood samples are taken at regular intervals to measure how well the kidney's drainage tubes are filtering out the dye. This test takes 4 hrs and you can leave the department between having blood taken.

Liver Ultrasound to make sure that there is no existing liver damage

Chest X-Ray (John Radcliffe Hospital)

Electrocardiogram (ECG) (John Radcliffe Hospital)

This is an tracing your heart and only takes a few minutes.

Myocardial Perfusion Scintigraphy (MPS) at the John Radcliffe Hospital

This test measures the amount of blood in your heart muscle at rest and during exercise to make sure that all areas of the heart have a good blood supply.

This test can take from 3 to 5 hrs and patients are able to have lunch during the time before the resting images are taken.

Psychological Assessment at the Churchill Hospital

We try and arrange this on the afternoon following the MPS and it is the patient's opportunity to talk to a nurse who is a transplant psychologist about the impact diabetes has had on their life, their hopes post transplant and any of the concerns they may have about having the transplant. This helps us to plan any support may be needed.

24hr Urine Testing for creatinine clearance at the Churchill Hospital

This is another test to check renal function and we do this because, if kidneys are already damaged and not working properly this damage could be made worse by the anti-rejection therapy.

Before this visit patients are sent a large container and asked to collect all the urine passed over a 24hr period ending with the morning of the appointment and to take the container to the phlebotomy room in Transplant and Renal Outpatients where the nurse will take a blood sample to go with the urine collection.

MSU (Clean urine sample)

At the same time as the above patients are we asked to provide a clean urine sample which is tested in the outpatient department..

Retinal Screening (site varies)

Diabetes causes damage to the retina of the eyes. We need to ensure that any eye disease is stable prior to a transplant. By taking a series of photographs of both retinas we can detect any changes.

To take the photographs the pupils are dilated with drops so it isn't safe to drive for a short period after this test.

7 Day Blood Glucose Monitoring (Churchill Hospital)

The monitor is attached via a very fine needle which is inserted just under the skin on the abdomen and takes a glucose reading every 5 minutes allowing us to get a good understanding of the variations in blood sugars..

All these investigations are to protect the patient and although they may make daunting reading none are painful or any more invasive than giving a blood sample.

INVESTIGATIONS THAT CAN BE CARRIED OUT LOCALLY

Cervical Smear tests and/or mammograms if you are in the appropriate age group

Dental assessment—regular check ups are important as any infection can be made worse by giving anti-rejection drugs.

Once all these investigations have been completed and the results reviewed if the patient and the Islet Team still feel that an Islet Transplant is the best option then the patients name is placed on the National Islet Transplant Waiting List.

BEING ON THE WAITING LIST

Unfortunately it is impossible to predict how long patients will have to wait before being called in for a transplant and it is important that we are told of any changes in their general health.

Patients are also asked to contact us with any changes in contact phone numbers and if they change their address and to give us any dates when they would not be available for transplantation i.e. holidays abroad or hospital admissions.

During this period Tissue Typing need monthly blood samples and will send patients the blood bottles and packaging. These blood samples can be taken at routine diabetic clinic appointments or at the patients GP surgery.

BEING CALLED IN FOR A TRANSPLANT

Patients for Islet Transplantation are only called in when the Islet Team are happy that sufficient islets of good quality have been isolated from a donor pancreas. The islets are placed in a culture medium once isolated and then checked again.

If the islets are suitable then a patient for whom they are the best match is contacted by a member of the Transplant Team and asked about your general health and if on dialysis when last dialysed. If patients have an active infection then, unfortunately, we are unable to transplant because of the effect of anti-rejection drugs on the immune system.

If there are no problems patients are asked to have nothing more to eat or drink and omit bolus insulin injections but continue to monitor glucose levels as the exception to the nil by mouth request is any treatment needed r blood sugar levels drop ie: glucose tablets or lucozade.

Although the inpatient stay will be quite short—about 48hrs patients are asked to bring an overnight bag and all your medication with them and to make their way to the TRANSPLANT WARD- WYTHAM WARD at the CHURCHILL HOSPITAL in OXFORD where the ward staff will be expecting them.

ON ADMISSION

When patients are admitted they have blood samples taken and are given a thorough physical examination by one of the transplant doctors.

A small cannula (plastic tube) is inserted into a vein in the arm and an insulin infusion and intravenous fluid infusion is started to make sure that blood sugar levels are well controlled. When we know that the transplant is going ahead the first dose of anti-rejection drugs is given.

THE ISLET TRANSPLANT

The Islet Transplant takes place in the X-Ray department as a sterile procedure and under ultrasound guidance. The machine you can see in the picture below is the Ultrasound Scanner.

All patients having an Islet Transplant are given pain relieving drugs and a drug to help them relax.

During the transplant, a [radiologist](#) uses [ultrasound](#) and [radiography](#) to guide placement of a catheter through the upper abdomen and into the [portal vein](#) of the liver. The islets are then infused through the catheter into the liver. The patient will receive a [local anesthetic](#). If a patient cannot tolerate local anesthesia, the surgeon may use general anesthesia and do the transplant through a small incision.



These pictures show the various stages in Islet Transplant. The first shows the pancreas being injected with the solution which breaks it down so that the islets can be isolated. The second shows how the individual islets, stained in red, appear and the third and fourth the actual transplant and the islet solution.

POSSIBLE RISKS AND SIDE EFFECTS OF THE PROCEDURE

There is a very slight risk with this procedure of bleeding as a result of cannulation of the portal vein, infection and damage to your liver, gall bladder, or intra-abdominal blood vessels that may require surgical intervention.

A less serious complication is bleeding from the puncture site in the skin. This can be controlled but on a few occasions the recipient may need an operation.

POST TRANSPLANT

After the transplant blood sugar levels are carefully controlled and patients continue on an insulin infusion. This is because the islets need to have a chance to settle in their new environment and it is important not to stress them.

As this procedure involves injecting into a large blood vessel the patients pulse and blood pressure will be checked at frequent intervals and the puncture site checked for any signs of bleeding or inflammation.

In the 24hrs post transplant all patients have a special blood test to check clotting and a liver ultrasound as well as routine post transplant blood tests to check kidney function, haemoglobin levels, white cell count, liver function, anti-rejection drug levels and diabetic screening.

Normal inpatient stay is about 48hrs although this may be longer. During this time patients will meet members of the Islet Transplant Team and by the pharmacist who will explain the anti-rejection drugs.

GOING HOME ON INSULIN

On discharge patients continue with their insulin as before but at a reduced level, and will be asked to monitor their blood sugar levels very carefully as, not only will their insulin requirements have changed but it's important at this stage not to overwork the islets. Initially we ask patients to check and record blood sugar levels 7 times a day but this level of testing decreases as their blood sugar stabilises and they are asked to bring their records to each appointment.

DRUGS ON DISCHARGE

Patients go home with a month's supply of anti-rejection drugs and then, at about a fortnight post transplant you see the Transplant Outpatients Pharmacist who arranges for the next month's supply to be sent to their home. It's very important that you don't run out as missing doses can cause the islets to reject and as follow up appointments become more widely spaced it's easy to forget that you need to see the pharmacist to order the next month's supply.

All the anti-rejection drugs protect the Islet Transplant Cells from rejection by your immune system. However this does mean that patients will be more susceptible to infection, particularly in the early stages post transplant when the drug doses are at their highest. During this period antibiotics, and if indicated anti-viral drugs are given.

The anti-rejection drugs that patients go home with are **Tacrolimus** and **Mycophenolate**

Tacrolimus this is given as a tablet

Possible side effects of Tacrolimus are:

- Affecting kidney function if drug levels are too high which is why the levels are carefully monitored
- Shakiness of hands and head-aches
- Disturbed sleep
- Increased blood sugars
- Increased blood pressure
- Upset stomach

Mycophenolate this is given as a tablet

Possible side effects of Mycophenolate are:

- The most common side effect is a drop in white cell blood count which puts you at risk of infection. Your blood count is monitored and medication adjusted accordingly
- Upset stomach including diarrhoea, nausea and vomiting

Another possible long term side effect of drugs which affect the immune system is an increased risk of cancer, particularly skin cancer so we advise all patients to use the highest factor sun block possible and to cover up in the sun.

OUTPATIENT APPOINTMENTS

Post transplant follow up is in Oxford and initially we see patients twice a week to check all the routine bloods and to help with any questions they might have and with any reductions in insulin needed. This will change to once a fortnight and then once a month until the end of the first year when patients are seen every three months. When patients are admitted for a transplant they are given a follow up schedule.

At every appointment blood will be taken to check the anti-rejection drug blood levels, liver function tests, renal function tests and to check how well the islets are performing.

The anti-rejection drug levels are measured on the lowest level of the drug in the blood stream and patients are asked not to take these anti-rejection drugs until after their blood test.

At 3, 6 and 12 months post transplant islet function is checked with a Meal Tolerance Test which takes 3hrs and involves being nil by mouth before admission, drinking a glucose and protein supplement then having blood samples taken at regular intervals via a cannula inserted into a vein in the arm.

This test is always linked in with a clinic appointment

REPEAT TRANSPLANTATION

A second transplant may be needed to “top up” the number of transplanted islets and if the Islet Team feels that a patient would benefit from this they are placed onto a priority waiting list.

POSSIBLE COMPLICATIONS AFTER DISCHARGE

REJECTION

Over time Islet cells may slowly stop working and this will be reflected by rising blood sugars and increased insulin requirement. We would check this with a Meal Tolerance Test and then consider the options. During this period it is very important that patients continue to take their anti-rejection drugs until asked to stop by the Islet Team.

INFECTION

Although all post transplant patients are at an increased risk of infection this risk can be minimised by taking simple precautions such as good hand washing, avoiding people with infections, and avoiding eating out in places where the kitchen hygiene is suspect and practising safe sex.

We ask everyone to try and remain as fit and healthy as possible, gentle exercise; healthy eating and good dental care all help. If still smoking this is a good time to try to stop. We also recommend having an annual “flu jab”

Sometimes however, even with the best efforts infections occur. Because of the anti-rejection drugs any infection needs to be treated early and patients need to see their GP if they have any of the following symptoms:

Raised temperature, chills and shivering

Pain, swelling, redness and heat in any area of your body

Excessive tiredness combined with aching muscles or joints.

Vomiting or diarrhoea

Pain on passing urine, having to pass urine more frequently

Possible chest infection, coughing up green phlegm

Cold sores

If the infection prevents patients being able to take, or absorb, their anti-rejection drugs they must call the transplant unit. Phone numbers are at the end of this booklet.

THE OXFORD TRANSPLANT CENTRE IS OPEN 24 HOURS A DAY SO PLEASE RING US IF YOU ARE AT ALL WORRIED. AFTER 4PM THE BEST PLACE TO RING IS THE **TRANSPLANT WARD (01865 235011)**

OTHER USEFUL CONTACT NUMBERS AND ADDRESSES

The Oxford Transplant Centre

Churchill Hospital
Old Road
Headington
Oxford
OX3 7LE
Tel: 01865 225355/56

Churchill Hospital Switchboard

01865 741841

Transplant Recipient Co-ordinator

01865 228656 e-mail: robert.crookston@ouh.nhs.uk

THE ISLET TRANSPLANT TEAM

Professor Paul Johnson	Director of the Islet Transplant Programme
Professor Stephen Gough	Professor of Diabetology
Dr Stephen Hughes	Manager of the Islet Isolation Laboratory
Rob Crookston	Transplant Advanced Nurse Practitioner

USEFUL WEBSITES TO EXPLORE

Google "Islet Transplantation" and the web is full of information. In addition Oxford has its own Islet Website just type in "Islet Transplantation Oxford"

www.oxfordradcliffe.nhs.uk

Oxford Radcliffe Trust website

www.diabetes.org.uk

useful website on many aspects of diabetes

www.communitylegaladvice.org

This UK website offers free advice on legal matters relating to chronic health problems. Their phone number is 0845 3454345

www.uktransplant.org.uk

Facts and figures on transplantation in the UK

www.nhs.uk/England/Dentists

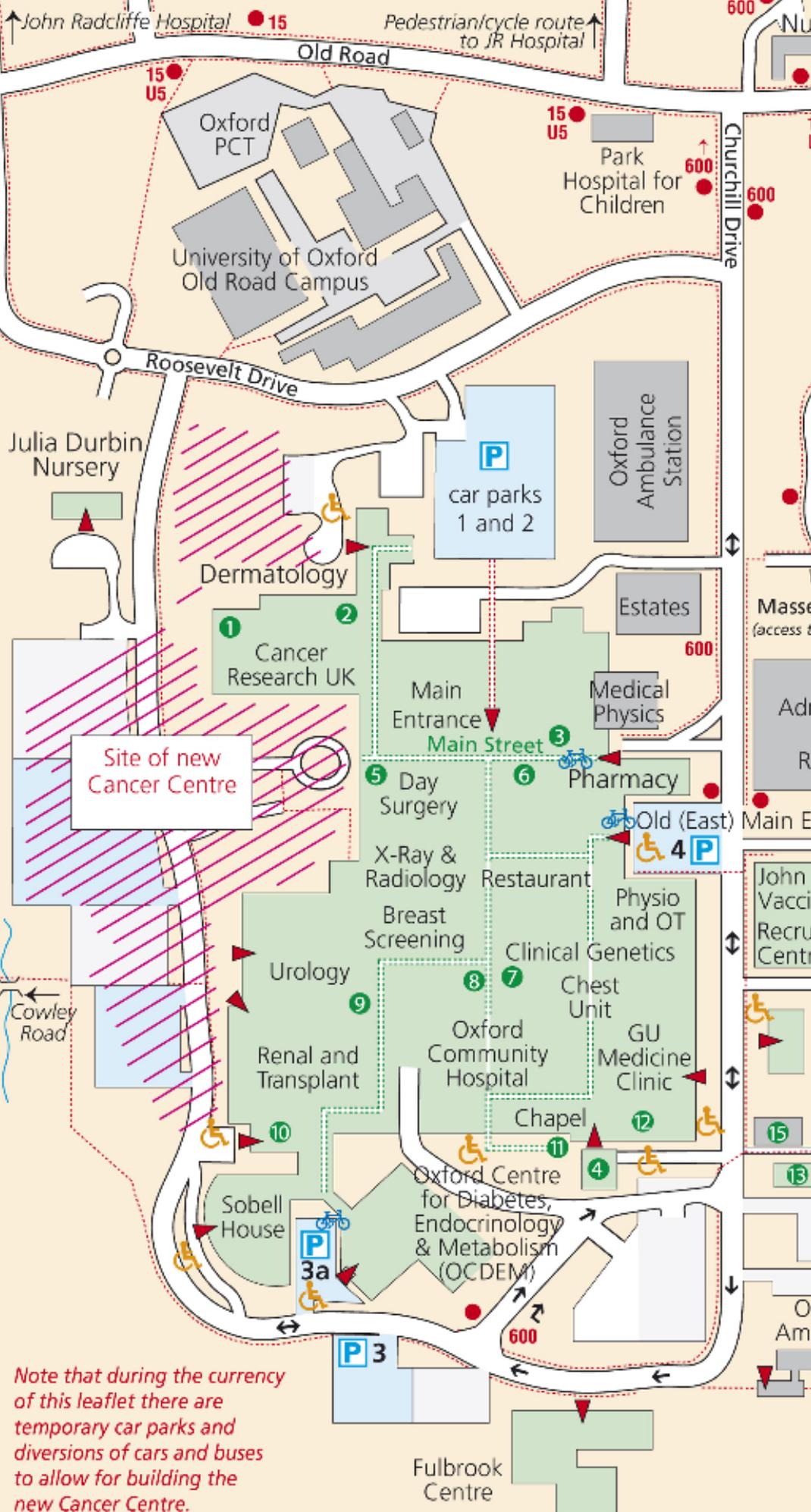
Information on finding a local NHS dentist or you can contact NHS Direct on 0845 4647

The Churchill Hospital

Not to Scale

- 15 Bus stop and service number
- ▶ Hospital entrances
- One way section
- ↔ Two way section
- P Visitor pay & display parking (car parks 1 to 4)
- Permit holder parking only
- ♿ Disabled parking and drop off facilities
- 🚲 Cycle Parking
- ⋯ Footpath

- 1 Pain Relief Unit
- 2 Blenheim Ward and Oncology Outpatients (green area)
- 3 Radiotherapy
- 4 Maggie's Cancer Information Centre & Oncology Outpatients (blue area)
- 5 Reception (Ground Floor)
League of Friends Café (1st Floor)
- 6 Admissions
- 7 Frank Ellis Unit
- 8 Jane Ashley Unit
- 9 Dialysis
- 10 Oxford Kidney Unit
- 11 Resuscitation Training
- 12 Red Cross Transport
- 13 Elliot Smith Clinic
- 14 UTL HIFU unit
- 15 Cancer Network and Relocation Offices



Note that during the currency of this leaflet there are temporary car parks and diversions of cars and buses to allow for building the new Cancer Centre.

