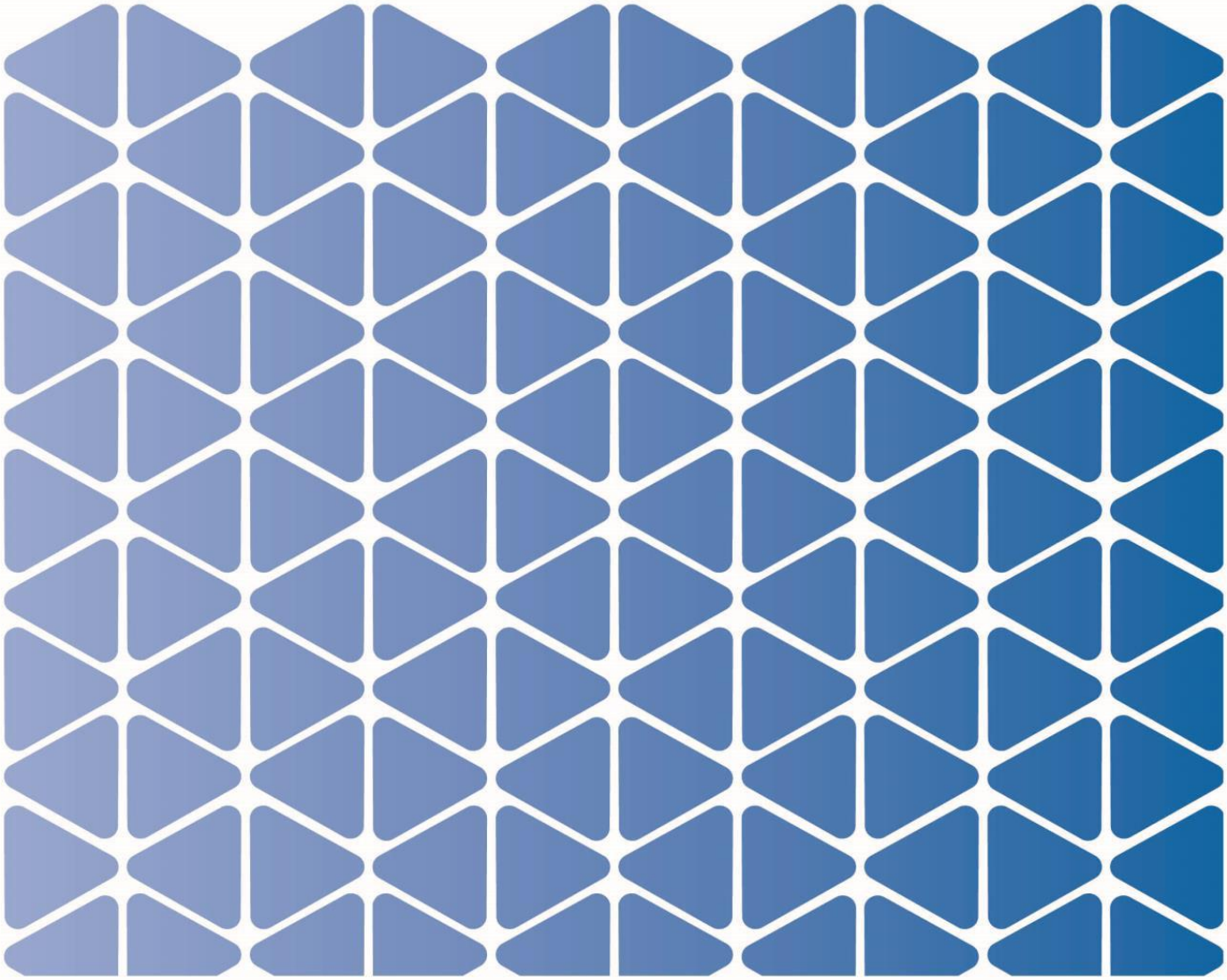
PATIENT INFORMATION

ELECTROPHYSIOLOGICAL STUDY AND SVT ABLATION



It has been recommended that you have an electrophysiology (EP) study with possible ablation of a supraventricular tachycardia (SVT). This leaflet is in two sections. The first section is a summary of the procedure, its risks and benefits The second is more detailed information about the procedure and immediate time before and after the procedure including the risks and benefits.

Section one: summary information

Summary of the procedure itself

The procedure begins with a diagnostic (information-gathering) part. Local anaesthetic is applied to the groin (usually on the right, occasionally both groins) and small tubes are placed in the vein at the top of the leg. Thin wires are then passed up to the heart and the heart is stimulated by pacing in a pre-determined pattern in order to work out where any abnormalities with the electrical connections are. If abnormalities are identified the second part of the procedure involves destroying ("ablation") of the abnormal tissue by applying energy through one of the wires to damage the tissue.

Summary of the benefits

The procedure has two main benefits:

- To diagnose abnormalities of the electrical system of the heart
- Where appropriate and possible, to attempt cure of the problem by destroying the abnormal tissue.

Summary of risks

The risks of the EP study (around 1 in 200) are much lower than the risk if ablation is undertaken (around 2%) and the procedure is considered very safe. The main risks are –

- Damage to a blood vessel at the top of the leg
- Bleeding around the heart requiring insertion of a small drain
- Stroke
- Damage to the normal conduction system requiring pacemaker implantation
- Blood clots in the veins at the top of the leg, or within the heart, that can occasionally pass to the lungs (embolus).
- If you have a pacemaker already, the wires may be dislodged or damaged by the procedure requiring a further procedure to rectify.

Section 2: Detailed information about EP study and SVT ablation

This leaflet explains some of the benefits and risks of the procedure. We want you to have an informed choice so that you can make the decision that is right for you. Please ask the cardiology team about anything you do not fully understand or want explained in more detail.

We recommend you read this leaflet carefully. You and a member of the cardiology team will need to record your agreement to the procedure by signing a consent form, which you will be given.

What is an EP study?

An EP study is a diagnostic study, i.e. it is an information-gathering process to diagnose what the problem is causing particular symptoms. Most patients undergoing the procedure will have had palpitation – a sensation of an abnormally rapid heartbeat – or a recording of an abnormal heart rhythm. The EP study aims to diagnose what is causing the symptoms or abnormal rhythm.

What is an ablation?

If an abnormal connection is identified at the EP study, catheter ablation is usually performed to treat the abnormality. Ablation is the process of applying energy in a focussed way to an area of the heart in order to destroy the abnormality. The outcome is to prevent that part of the heart from conducting electrical impulses and so prevent the abnormal rhythm from occurring.

An EP study and ablation are usually done in the same procedure. The EP study identifies the abnormality and then the ablation is performed immediately afterwards, i.e. in the same sitting, in order to treat the problem.

Why do I need this procedure?

Your heart has its own natural pacemaker. This is called the sinus node; it usually produces between 60 and 100 electrical pulses a minute. These impulses pass from the top chambers (atria) to the pumping chambers (ventricles) where the impulse is distributed around the heart using specialised conduction pathways.

In some circumstances, abnormal heart rhythms occur because the electrical system has abnormal connections. With SVTs, the top of the heart ‘drives’ the abnormal rhythm and is typically caused by one of three abnormalities:

(1) The normal connection from top to bottom has two pathways instead of one (causing an SVT called AV nodal re-entrant tachycardia or AVNRT)
(2) There is an entirely separate connection from the top of the heart to the bottom, known as an accessory pathway; this causes AV re-entrant tachycardia or AVRT. This condition is also known as Wolf-Parkinson-White syndrome.
(3) There is an abnormal area in the atrium capable of initiating heartbeats at an abnormal rate. This causes an SVT known as atrial tachycardia.

Generally speaking, it is not possible to know for certain which of the three mechanisms is responsible for the abnormal rhythm before the procedure which is why the procedure starts with the EP study. Once the abnormality causing the rhythm problem is identified it is then usually possible to perform the ablation to treat it.

How is the procedure performed?

Before the procedure you will have a cannula (thin plastic tube) inserted in a vein in your arm. You will be taken to the procedure room (known as the cardiac catheter lab) and will lie on the bed. Sometimes sedation is given to make you feel more comfortable during the procedure. After pre-procedure final checks, the top of your leg will be cleaned with antiseptic. Local anaesthetic will be injected using a small needle.

A number (typically 3) of small tubes will be placed in the femoral vein at the top of the leg and thin wires will be passed through these into specific areas of the heart. You should not feel much when the wires are passed; the local anaesthetic stings but typically you will not feel much after that.

Once the wires are positioned, basic measurements are made and then the heart is paced using the wires. Pacing means that a heartbeat is initiated in the chamber where the wire is placed by passing a small electrical impulse down the wire. The response of the heart's electrical system is measured using the other wires. This allows the operator to determine if any abnormal connections are present.

It is almost always useful to try to initiate the abnormal heart rhythm in order to determine the best treatment. This is done with pacing in specific patterns, and by giving medication into the vein to try to stimulate the heart to beat faster.

Ablation is also carried out in a similar way, i.e. by passing a wire through the vein at the top of the leg up to the abnormal area identified, and when the exact location is found, energy (usually radio-frequency energy) is applied to the area through the wire. The tissue is damaged to the extent that it can no longer cause the abnormal conduction and rhythm problems.

Intended benefits of the procedure

The aim of the procedure is to diagnose the cause of any rhythm problems, and treat it to prevent further rhythm disturbances.

Limitations of an EP study and SVT ablation

The EP study is effective at showing what the problem is in the majority of cases, but sometimes it is not possible to trigger the heart rhythm disturbance and no clue as to the diagnosis is found. In those circumstances (a 'negative EP study'), it is not possible

to perform an ablation as the target for ablation has not been identified. This occurs in around 5% of cases.

If the abnormal rhythm is identified, it is occasionally a more complex rhythm than expected, such that either the risk of ablation is much higher than anticipated, or it is not possible to ablate it with the resources allocated (for example, an overnight bed might be required, or it might be preferable to perform ablation in a hospital with cardiothoracic surgeons on site). In those circumstances, ablation would not be performed at the same time but it may be offered as a separate procedure following further discussions.

Sometimes the abnormal area is identified and ablation is attempted but is unsuccessful; this can occur for a number of reasons, but on average 95% (19 out of 20) cases in which ablation is attempted result in a complete success.

Serious or frequent risks

As with any procedure that involves implanting something in the body, the procedure does carry some risks, although these are quite small. Complications can generally be treated and are very rarely life-threatening.

At the time of the procedure, there may be –

- Accidental damage to blood vessels (most commonly at the top of the leg) (approximately 0.5-1%)
- Discomfort or pain during the procedure. It is done under local anaesthetic and sedation can be given so you should tell the nurse if you are finding the procedure uncomfortable so more pain relief or sedation can be given.
- Bleeding around the heart requiring emergency insertion of a small plastic tube (drain) through the upper abdomen to remove the blood that accumulates and allow the leak to heal (approximately 0.5-1%)
- Reaction to the drugs used to sedate you.
- Changes in heart rhythm requiring emergency treatment (there will always be adequate equipment and staff available to deal with this during the procedure).
- Damage to your normal electrical system requiring insertion of a pacemaker (0.5-1%)
- Rarely (less than ½ %), a stroke can occur due to a small blood clot forming in the left side of the heart and passing up to the brain.
- Blood clots in the legs that can then ebolise (move to the lungs) is a rare but serious complication.
- If you already have an electronic pacemaker, the procedure may cause dislodgement or damage to one or more of the pacemaker wires, which would require a further procedure to rectify.

After the procedure there may be –

- Bleeding from the groin; it is common to have minor oozing but if a blood vessel has been damaged then there may be significant bruising and / or swelling around the site of the punctures.
- Chest pain. Discomfort is common after ablation procedures but is not usually severe and responds well to standard painkillers.
- Palpitation. The ablation procedure will often cure the rhythm disturbance being targeted; it does not however do anything other than treat that particular rhythm problem. It is very common to have a sensation of extra or missed beats for a period of time after the ablation procedure. This does not necessarily mean the procedure has been unsuccessful.

These risks are all rare but it is our duty to make you aware of them before you sign the consent form. Please do not hesitate to ask the doctor any questions you may have to help allay any concerns prior to signing the consent form.

You will be cared for by a skilled team of doctors, nurses and other professionals. If problems arise, we will be able to assess them and deal with them appropriately.

Other procedures that are available

There are no alternative procedures available to treat the heart rhythm disturbance. It is however important to say that these heart rhythms are generally not dangerous, and so the procedure proposed is an option to improve quality of life but generally does not protect against anything life-threatening. (Some accessory pathways can be dangerous in which case the procedure does have some advantages in terms of protecting against dangerous heart rhythms.)

Medications can be effective at treating these rhythm disturbances. There are advantages and disadvantages to taking medications versus the approach of an EP study and SVT ablation and you should ensure you understand the relative risks and benefits of each approach before you decide how to proceed. Your cardiologist will be able to discuss this if you have any questions.

Before you come into hospital

You will receive a letter from the hospital explaining your admission date and where to go.

Instructions for eating and drinking

It is important that you follow the instructions we give you about eating and drinking.

If your planned procedure is early in the morning (admission time before 9am), you should have nothing to eat that morning before the procedure. If your planned procedure is later (morning admission after 9am), please have a normal breakfast no later than 7am on the day of the procedure. If your admission is 12pm or later, please have a normal breakfast and nothing to eat or drink after 10am.

Your usual medicines
We will usually ask you to continue with your normal medication (except as instructed below), so please bring it with you. You may have sips of water with any medications you have to take on the morning of the procedure.

Clopidogrel / Prasugrel / Ticagrelor / Dipyridamole (antiplatelet drugs)
If you are taking these types of blood thinners, you should continue them including on the day of the procedure. **Please do not stop taking any of these medications unless specifically instructed to.**

Warfarin / Dabigatran / Rivaroxiban / Apixaban / Edoxaban (anticoagulants)
If you are taking these types of blood thinners, you should continue them including on the day of the procedure. **Please do not stop taking any of these medications unless specifically instructed to.**

If you take warfarin, please ensure you have a blood test for your INR done 24-48 hours prior to the date of your procedure. If you are able to find out the result and bring that with you it is helpful.

Medications to control your heart rhythms
You should receive clear instructions on what to do. Generally speaking, we will advise you stop any anti-arrhythmic drugs for 4 days prior to the EP study / ablation procedure. **Please ensure you ask what to do if you are not sure.**

Diabetes
If you are **diabetic,** you should follow the appropriate instructions below.

Diabetes treated with a special diet:
You do not need to follow any specific instructions other than the above.

Diabetes treated with tablets:
Take all your diabetic tablets as normal (with a sip of water).

Diabetes treated with insulin:
If you take insulin you should not take your usual dose on the morning of your procedure. The nurses will do regular checks on your blood sugar levels. You will be able to have some food and drink after your procedure. Please bring your insulin with you so that you can have your usual dose at this time.

If you have any questions or concerns about your diabetic treatment please contact whoever normally advises you about your diabetes.

What to do if you feel unwell before attending for your procedure
If you don't feel well and have a cough, a cold or any other illness when you are due to come into hospital for your procedure, we need to know. Depending on your illness and how urgent your procedure is, we will advise you whether or not your procedure should be delayed.

On the day of the procedure
You will usually be admitted to the cardiac catheter lab unit on the day of your procedure so that we can prepare for your procedure. We will welcome you to the ward and check your details. We will fasten an armband containing your name and hospital information to your wrist. We will ask you to change into a gown ready for your procedure. You will have an ECG (heart trace) performed.

Before your procedure you will be seen by a member of the cardiology team who will check that everything has been arranged correctly for you to have your treatment. A cannula (fine plastic tube) will be inserted into a vein in your arm so that we can give you any treatments required during the procedure. Please let us know in advance if you are allergic to any medications.

Very occasionally it may be necessary to cancel your procedure at the last minute (i.e. after you have arrived in the hospital); this may occur due to equipment failure or unexpected complications from an earlier procedure. We will do our best to minimise the risk of this happening and if it does we will rebook you at the earliest opportunity.

During the EP procedure
The procedure is undertaken in a Cardiac Catheter Laboratory equipped with an X-ray camera facility, monitoring equipment and a table on which you will be asked to lie for the duration of the procedure. The procedure (or parts of it) may be carried out by a suitably qualified trainee doctor but all parts will always be directly supervised by a consultant.

You will be taken from the ward by a nurse or healthcare assistant and will be handed over to the care of a nurse or support worker who will stay with you throughout your procedure.

The procedure usually takes between one and two hours, during which time you will often be given a sedative injection into the tube in your arm to make you feel pleasantly drowsy. You will also be attached to a heart monitor throughout the procedure. After this, the top of your right leg (or in some cases both legs) may be shaved if necessary, cleaned with a skin disinfectant preparation and injected with a local anaesthetic.

A number (usually 3) of tubes will be inserted into the vein at the top of the leg. Thin wires are passed through the tubes up to the heart – it is unusual to feel anything as the wires pass up through the body. They are positioned in the relevant areas of the heart.

Electrical impulses are then delivered through those wires to pace the heart in a pattern designed to identify the electrical connections in the heart, and then to try to induce any heart rhythm problems that can then be treated. You will probably feel ‘bumps’ in the chest whilst the pacing is happening. If the heart rhythm abnormality is produced, then you will typically feel your heart racing rapidly; if you have previously had a heart rhythm disturbance then this will often reproduce those symptoms.

Once all the relevant pacing tests have been performed to identify exactly what the rhythm is, the abnormal rhythm will be terminated by pacing, and the procedure can move on to the ablation phase if relevant / appropriate.

If no rhythm problem can be produced, typically the operator will inject medications to try to stimulate the heart and make the abnormal heart rhythm easier to induce. Possible side effects of these medications include a feeling of anxiety / agitation, dry mouth, chest tightness and palpitation.

If a target for ablation is identified, a wire for that purpose is inserted (often one of the other wires is removed to allow this). The wire is moved within the heart to try to identify the abnormality. Once the area of interest is found, energy is applied to that to try to cure the problem. During this, you will often feel some discomfort in your chest (sometimes in other areas such as your shoulder, jaw, arm, or upper abdomen). It is important to try to avoid taking large breaths during this time, and to avoid excessive movements.
If it is causing significant pain, you should notify the nurse or doctor – usually ablation can be stopped, more pain relief given, and then ablation re-commenced. Often a number of burns will need to be applied so it is very important you let the team know if you are experiencing significant pain so that further pain relief can be given.

After your procedure

You will return to the catheter lab day unit. The nurse will check your pulse and blood pressure and monitor groin site(s) for any signs of bleeding or swelling. If you have had sedation you will need to rest in bed for a couple of hours, depending on how sleepy you are. You will be required to stay in bed for 2 hours to allow the vein punctures to heal up. A nurse will perform an ECG on the ward.

You will then be able to get up and dressed and walk around. You can eat and drink as soon as you feel like it so long as the nurses are confident you are sufficiently awake.

Leaving hospital

Most patients having this procedure will be in hospital most of the day, but will not need to stay overnight. You may find that you feel slightly drowsy for a couple of days, while you are recovering from your procedure and particularly from the effects of the sedation. It is, therefore, wise not to make any important life changing decisions until these feelings have worn off.

We advise that there is a responsible adult present with you for 24 hours following the procedure. If this will not be possible, please ensure you discuss it with the team prior to the day of admission.

You will have some bruising around the wound area and this is quite normal, but the wound itself should not be actively bleeding or swollen. If you have any concerns, please contact us – contact details are on the advice sheet given immediately after the procedure. It is generally much better to contact us rather than your GP or practise nurse as we deal with these procedures all the time.

You are advised not to do any heavy lifting, such as carrying shopping bags or moving heavy furniture for 48 hours after the procedure. Don't be afraid to ask for help from your family and friends and take it when it is offered.

You cannot, by law, drive for **at least** two days after the procedure and so you cannot drive yourself home; after that time, it is ok to resume driving so long as you are confident that your leg has healed to the extent that you would have no difficulty performing an emergency stop if required.

Medication when you leave hospital

If you take any blood thinners, we will usually ask you to continue them.

If you are not taking any blood thinners, you will need to take a mediation to reduce the risk of clots if an ablation was performed. Aspirin 150mg once daily or (if intolerant to Aspirin) Clopidogrel 75mg once daily is required for six weeks after the procedure.
We can issue a prescription for this medication but (in the case of Aspirin) you may find it easier and cheaper to buy it 'over the counter' from a pharmacy. You should ensure you know what you should be taking before you leave hospital.

If a successful ablation was performed, often your heart rhythm medication will be reduced or stopped altogether, unless there is also another reason why you take it. This will be explained after the procedure.

Convalescence
How long it takes for you to recover fully from your procedure varies from person to person. Once home, it is important to rest quietly for the remainder of the day.

Most people feel some discomfort at the top of the leg for the first few days. You can take a simple pain killer such as paracetamol. We recommend that you are not alone at home the night after your procedure.

Groin wound
If you experience any obvious bleeding from the groin or any swelling or troublesome pain around where the tubes were inserted, you should seek further help and advice (see below). It is usually better to contact the hospital team rather than your GP as we are more familiar with problems that may arise from these procedures.

Exercise
For the first 48 hours after the procedure you should avoid any strenuous exercise – limit yourself to gentle walking.

For the following 7 days, you can gradually increase your exercise levels up to normal.

Work
When you return to work will depend on your job. If your job involves heavy manual work you may be advised to take some time off. If your job does not include manual work or lifting you may be able to return to work within a few days of your procedure.

Communication
A report of your procedure will be sent to your doctor (GP) within a few days.

Follow-up arrangements
You will receive a follow-up appointment in the arrhythmia clinic, typically 3 months after the procedure unless stated otherwise. If you have not received an appointment within 5 months of the procedure, please telephone Dr Foster's secretary on 01905 760217 to explain the situation.

Contact details
If you have any specific concerns that you feel have not been answered and need explaining, please contact the following:

Arrhythmia team secretary (Lauren Neathway), telephone 01905 760217
Coronary care unit (Worcester) – for out of hours emergencies, telephone 01905 760561

Additional Information
The following Internet websites contain additional information that you may find useful:

www.patient.co.uk
Information fact sheets on health and disease.

www.nhsdirect.nhs.uk
On-line Health Encyclopaedia and Best Treatments website.

www.bhf.org.uk
British Heart Foundation website.

www.heartrhythmcharity.org.uk
Arrhythmia alliance website

If your symptoms or condition worsens, or if you are concerned about anything, please call your GP, 111, or 999.

Patient Experience

We know that being admitted to hospital can be a difficult and unsettling time for you and your loved ones. If you have any questions or concerns, please do speak with a member of staff on the ward or in the relevant department who will do their best to answer your questions and reassure you.

Feedback

Feedback is really important and useful to us – it can tell us where we are working well and where improvements can be made. There are lots of ways you can share your experience with us including completing our Friends and Family Test – cards are available and can be posted on all wards, departments and clinics at our hospitals. We value your comments and feedback and thank you for taking the time to share this with us.

Patient Advice and Liaison Service (PALS)

If you have any concerns or questions about your care, we advise you to talk with the nurse in charge or the department manager in the first instance as they are best placed to answer any questions or resolve concerns quickly. If the relevant member of staff is unable to help resolve your concern, you can contact the PALS Team. We offer informal help, advice or support about any aspect of hospital services & experiences.

Our PALS team will liaise with the various departments in our hospitals on your behalf, if you feel unable to do so, to resolve your problems and where appropriate refer to outside help.

If you are still unhappy you can contact the Complaints Department, who can investigate your concerns. You can make a complaint orally, electronically or in writing and we can advise and guide you through the complaints procedure.

How to contact PALS:

Telephone Patient Services: 0300 123 1732 or via email at: wah-tr.PALS@nhs.net

Opening times:

The PALS telephone lines are open Monday to Thursday from 8.30am to 4.30pm and Friday: 8.30am to 4.00pm. Please be aware that a voicemail service is in use at busy times, but messages will be returned as quickly as possible.

If you are unable to understand this leaflet, please communicate with a member of staff.