

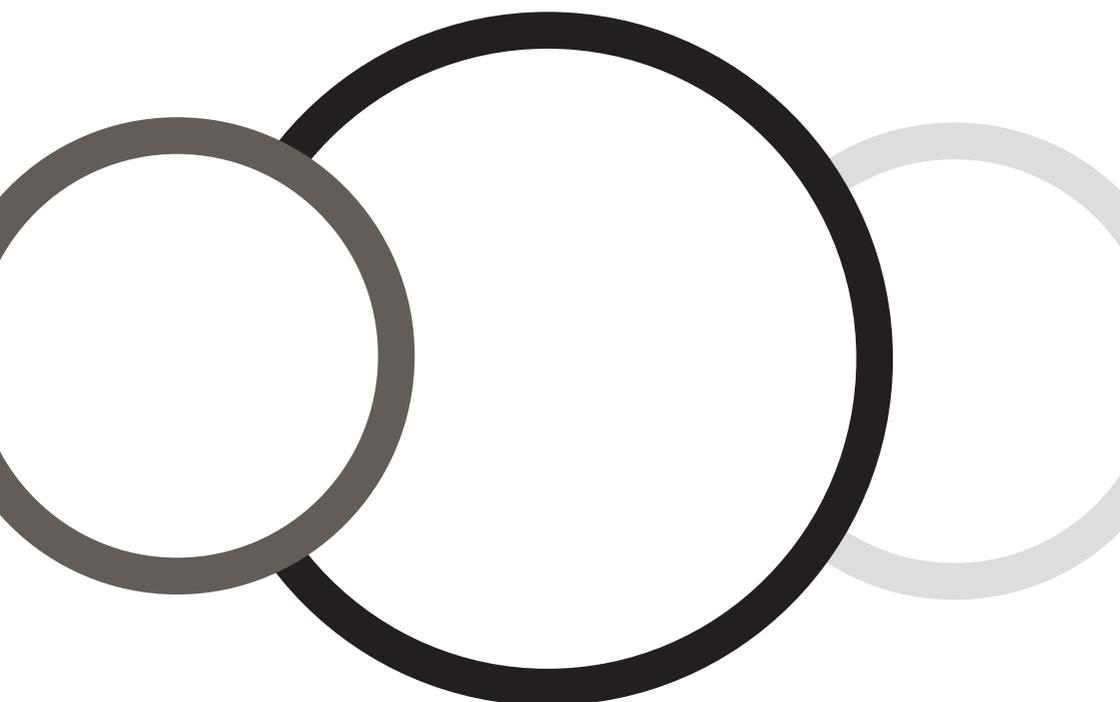


**Basildon and Thurrock  
University Hospitals**  
NHS Foundation Trust

The Essex  
**Cardiothoracic Centre**  
At Basildon University Hospital - a centre for excellence

**Patient information**

# Cardiac resynchronisation therapy



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Produced and designed by the Communications Team  
Issue date May 2017 - Review date May 2020

Version 1  
Ref no. PILCOM2031

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## Having cardiac resynchronisation therapy

You have been referred to have cardiac resynchronisation therapy. This leaflet describes the operation so that you know what to expect.

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## What is cardiac resynchronisation therapy?

Cardiac resynchronisation therapy (CRT) consists of a small metal box-shaped device which contains a battery and electronic circuits.

The box is implanted under the skin, usually under your left collarbone, and is connected to your heart by wires (called leads). CRT monitors your heart and helps support your heart function by producing electrical impulses which pace both the lower chambers of your heart (ventricles) thereby co-ordinating the activity of the ventricles.

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## How the heart works

The heart is a muscular pump which delivers blood containing oxygen to the body. It is divided into two upper chambers (atria) which collect blood returning through the veins; and two lower chambers (ventricles) which pump blood out. The heart has an electrical system which co-ordinates the pumping activity of the heart.

This normally drives the heart to beat in a regular organised way. Each normal heart beat begins with an electrical impulse from a group of specialist cells called the sinus node (SA node). These electrical impulses travel across the atria and down through

the atrio ventricular node (AV node), they then travel across the ventricles, causing the heart to contract and pump. When the heart's electrical system is working normally then conduction across the left ventricle and the right ventricle occurs simultaneously meaning that contraction of the chambers is synchronised.

Some patients who are suffering from heart failure (where the muscle of the heart is damaged or diseased and not working efficiently) have a delay in the electrical conduction through their heart which results in un-coordinated contraction of the

ventricles. This can lead to a weaker heart and worsen heart failure symptoms. These patients may benefit from CRT.

CRT typically uses three leads, one lead in the atria on the right side of the heart, a second in the right ventricle and an additional third lead on the back wall of the left ventricle. Not all patients need the atrial lead, for example if they have atrial fibrillation, in this case only the ventricular leads will be placed. These leads co-ordinate electrical conduction in the heart and the ventricles are paced simultaneously which results in synchronised contraction of the ventricles. This may result in

an improvement in heart failure symptoms and a delay in further deterioration of heart function.

There are two types of CRT device, a CRT pacemaker (CRT-P) and a CRT defibrillator (CRT-D). Both types of CRT provide paced resynchronisation of the ventricles however a CRT-D also has the additional capability of providing an electrical shock if required which can treat dangerous heart rhythms. The reason you are having your specific type of CRT will be discussed during your pre-assessment clinic appointment.

You may need to stay in hospital overnight.

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## Points to note

A date will be arranged for you to have a pre-admission assessment. This will take place at either the Essex Cardiothoracic Centre or the Cardiac Department at Basildon Hospital.

A nurse will take some details to make sure you are well enough to have a CRT implanted. Your blood pressure, ECG, weight and pulse will be checked.

● **If you have any special needs or requirements**, please tell the

nurse during your pre-admission assessment appointment.

- **You will need to arrange for somebody to bring you** to the hospital and collect you by car or taxi on the day of your operation. You will not be able to drive yourself. You will not be able to travel by public transport for 24 hours following discharge.
- **Unless you require someone to stay with you** to interpret or to assist with special needs, we ask that relatives or friends

return to collect you when you are ready to go home.

- **If you already have an implanted device** please bring your current identification card

with you to your pre-assessment appointment and on the day of your procedure as it may contain essential information.

**If you need ambulance transport** because of your medical condition and are being admitted to:

**Basildon Hospital:**

Please contact the Waiting List Co-ordinator's office on 01268 524900 ext 4536/4065 for advice

**The Essex Cardiothoracic**

**Centre:** Please contact the Patient Activity Office on 01268 524900 ext 4191/4192 for advice.

For patients attending the Cardiothoracic Centre for their procedure who do not live in the local area, there is a possibility of subsidised hotel accommodation.

Please contact the CTC Patient Activity Office on 01268 524900 ext 4191/4192 for advice.

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## On the day

On the day of your operation please remember to bring with you:

- All your medication (in its original container).
- Something to read or a personal stereo.
- An overnight bag with your preferred nightwear, dressing gown, slippers and toiletries.
- Your current identification card (if applicable)
- For security reasons, please do not bring anything that is valuable to you into hospital. The hospital regrets that it

cannot accept responsibility for loss or damage to property belonging to patients.

**Please do not wear jewellery, make-up or nail varnish.** Your wedding ring may be left on if you wish and we will cover it with tape.

Unless you are informed otherwise you will be able to have an early light breakfast on the day of your procedure, such as a small bowl of cereal, usually no later than 6am. Once you have eaten your breakfast, you must not eat or drink thereafter.

## **Should I take my normal medication?**

Unless advised by the nurse at your pre-admission assessment appointment, you should take all your usual medication with a small sip of water.

You may be taking medications that need to be withheld prior

to your procedure, if so this will be discussed and explained to you by the pharmacy technician and the nurses during your preadmission assessment.

If you are diabetic the management of your diabetes and your diabetic medication will be discussed with you during your pre-admission assessment.

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## **What happens when I arrive at hospital?**

You will be admitted to the ward by a nurse. Please tell the nurse if you have had any allergic reactions in the past or if you think you might be pregnant.

The consultant or doctor will come to see you. They will explain the

procedure and any side-effects or possible complications for you. They will then ask you to sign a consent form.

If there is anything you don't understand or if you have any questions, please ask.

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## **What happens during the procedure?**

You will be taken to either the cardiac catheter procedure room or theatre for your operation.

There will be a team of people present, including your consultant, a doctor, a physiologist (for technical support), nurses and a radiologist who will assist with the x-ray equipment.

You will be given a local anaesthetic and a mild sedative to make you relax or a general anaesthetic. You will be advised which type of anaesthetic you will

be having during pre-assessment clinic.

If you are having a local anaesthetic and mild sedative, you will need to lay flat during the procedure and you will be asked to lie as still and relaxed as possible. If you have difficulty lying flat please discuss this with the nurse during your pre-assessment.

The nurse will clean your chest with antiseptic solution and cover you with sterile drapes. You will

also have a drape around your head and you may have a light drape covering one side of your face. You will be attached to a heart monitor.

### **Having a CRT implanted**

CRT devices are implanted by making a small cut (5cm / 2 inches), in the upper chest, just below the collar bone, usually on the left side.

An x-ray machine will be positioned above you and may be moved around when the CRT device is being implanted.

Three leads (typically) are then inserted into a vein. The tips of

the first two leads are advanced until they reach inside the heart chambers, the third lead is advanced through a vein in the heart to reach the back wall of the lower left heart chamber.

The leads are then connected to the device, which is placed under the skin. You may feel some pushing at the top of your chest and a fluttering sensation in the chest. This is normal so please do not worry. If you do feel uncomfortable, please tell the nurse. The wound will be stitched with either dissolvable or non-dissolvable stitches. You will be told which you have, and whether these will be removed.

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## **Are there any side-effects or possible complications?**

CRT device implantation is considered a safe procedure. Complications may include:

- infection
- bleeding
- bruising

Due to the position of the leads, patients with CRT implants can sometimes experience diaphragmatic pacing. This is when the diaphragm is stimulated

when the CRT delivers electrical energy to pace the heart and can lead to a twitching sensation. This is not dangerous in any way but can feel strange and disconcerting. Please contact the Pacing and ICD clinic if you believe you are experiencing diaphragmatic pacing.

Specific complication risks will be discussed during your pre-admission appointment.

## What happens after the operation?

You may need to stay at least one night after the operation this will be discussed during your pre-assessment appointment. You may need to rest in bed, in a sitting position for a few hours after the operation. Once you are fully awake you will be allowed to eat and drink normally.

You will need to have a chest x-ray before you go home.

You will be told about any changes to your medication and how to care for your wound. You will be advised when to restart any medication that was withheld, before you go home.

Before you leave the hospital your new device will be checked, and an identification card will be sent to you in the post.

Once you have received your identification card you should carry it with you at all times.

You will be given an appointment for an outpatient device check in the Pacing & ICD clinic; this will typically be 4-8 weeks after your implant date.

## What is my CRT device identity card for?

<b>Cardiac Device I.D Card</b>		
<b>Permanent pacemaker</b>		
<b>Model: Pacesetter St Jude - Allure Quadra RF</b>		
<b>PM3242</b>		
Date of Implant: 01/01/2017 Device Serial Number: 123456		
<b>Lead Details:</b>		
Right ventricle	Medtronic - 5078-58cm	CapSureRx Novus MRI SureScan
Left ventricle	Medtronic - 4390-58cm	Performa straight
<b>WARNING: PLEASE PHONE PACEMAKER IMPLANT CENTRE PRIOR TO USING ELECTROSURGERY, NMR OR IONISING RADIATION!</b>		

<b>NHS No:</b> 123456789
<b>Surname:</b> Bond <b>Forename:</b> James
<b>Date of Birth:</b> 01/01/1950
<b>Device Implant Centre:</b> Essex CTC, Basildon Hospital, Nethermayne, Basildon, Essex <b>SS16 5NL, UK</b>
<b>Tel</b> 0044 1268 524 900
<b>Email:</b> btu-tr.essexccrm@nhs.net


Your device identity card will be sent to you in the post after you leave the hospital. Please remember to carry it with you at all times. Please inform your GP, dentist, or other healthcare professionals who may use electrical appliances to treat you that you have had a CRT device implanted. The card tells the doctors about the type of CRT device you have and the manufacturer. Your identification card is also provides very useful information if you are ever admitted to hospital in an emergency.

## **How long will my CRT device last?**

The life of CRT batteries varies depending on how much they are used. Regular attendance at the Pacing and ICD clinic is essential and will allow us to predict when the battery will need replacing. Battery replacement is a simple procedure involving a short stay in hospital. The operation is performed under a local or general anaesthetic; the old device is removed and replaced with a new CRT.

## **Taking care of your wound**

A clear dressing will be sprayed on your wound before you leave hospital – this will gradually dissolve over the next week or two.

You must keep the wound site clean and dry for seven days (if you are not diabetic) or 10 days (if you are diabetic) or until your stitches have been removed. You can have a bath or shower but you must ensure that the wound stays completely dry.

After this time you may bath or shower as normal, taking care around your wound until it is healed. It is common to have some discomfort around the site of the wound. Pain relief such as paracetamol may be taken to relieve this.

You should avoid wearing tight clothing over the wound.

Women may find that a soft pad placed over the wound will help to reduce any skin irritation. Some bruising is quite normal.

## **Wound infection/swelling**

If you notice any reddening or swelling near your CRT or have any concerns please contact the department where you had your CRT implanted:

### **Essex Cardiothoracic Centre:**

Arrhythmia nurses:  
01268 394021

### **Basildon Hospital:**

Cardiac department:  
01268 394536

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## **Returning to normal activity**

Until new tissue has had the chance to form around the leads, there is a small possibility of them moving. You should avoid lifting the arm on the same side as the

CRT implant above shoulder level or using the affected arm for lifting or carrying heavy items until you have attended your first outpatient device check in the Pacing and

ICD clinic. Do not restrict all movement but try to avoid any sudden or jerky movements that could cause problems. It is very important to keep some mobility so gentle arm exercises are important to prevent your shoulder becoming stiff.

Once you have had your first device check in the Pacing & ICD clinic you should be able to return to normal activity. Once the wound is healed a normal lifestyle can be resumed. You may resume sexual activity as soon as you feel fit. You should avoid any position that will put pressure on the affected arm/ shoulder for the first four weeks.

### **Returning to work**

You should notify medical staff at your workplace that you have had a CRT implanted.

Requirements for time off work can vary depending upon the individual and occupation. If necessary you can self-certificate or obtain a medical certificate from your GP; please ask the nurses during your pre-assessment if you have any concerns.

### **Driving**

You must notify the DVLA that you have had a CRT implanted. It is a DVLA requirement that you attend

the Pacing & ICD clinic regularly in order to retain your licence.

Typical DVLA guidelines for CRT implants confer the following driving restrictions. If you experience symptoms because of heart failure, there may be further restrictions which apply. This will be clarified during your pre-assessment appointment.

### **CRT-P guidance**

Group 1 (car): DVLA guidance varies depending upon the reason you are having your CRT-P implanted. Driving restrictions range from 1-4 weeks.

If you hold a Group 2 licence (LGV/PCV), this procedure typically disqualifies you from driving for six weeks with possible re-licensing required thereafter.

### **CRT-D guidance**

Group 1 (car): DVLA guidance varies depending upon the reason you are having your CRT-D implanted. Driving restrictions range from 4 weeks – 6 months.

If you hold a Group 2 licence (LGV/PCV), this procedure permanently disqualifies you from driving using a group 2 licence.

All driving restrictions will be discussed and explained during your pre-assessment appointment. If you have access

to the internet, current DVLA regulations are available at [www.dvla.gov.uk](http://www.dvla.gov.uk)

### **Device alerts**

Your device may beep or vibrate an alert. Please call the Pacing and ICD clinic if you hear any alerts coming from your device. During your first attendance to the Pacing and ICD clinic, the physiologist will demonstrate the alert tones specific to your device so that you will know what they sound like.

### **Remote monitoring**

If you have had a CRT-D implanted you will be offered the opportunity for remote monitoring which enables information to be obtained from your device without the need for you to attend the Pacing and ICD clinic. Remote monitoring does not negate the need for clinic visits but can reduce the frequency of attendances. Remote monitoring will be discussed with you before your discharge.

### **Can I travel by air?**

You can safely travel abroad with your CRT device. However, it is necessary to carry your device identification card with you when you travel by plane as you may need to show this to the security staff.

### **Can electrical equipment affect my CRT?**

Most electrical items that you encounter will not affect your CRT. Modern devices have built-in safety features which protect them from electrical interference from all common electrical appliances encountered in daily life.

If you are working with high voltage industrial equipment and powerful magnets, please call the pacing and ICD clinic for advice.

### **Airport security systems**

You should show airport security staff your CRT identity card. It is advisable to avoid walking through airport detector archway/security machines or to be checked with a handheld detector. The metal detector should not be placed directly over your CRT because this can temporarily interfere with your CRT. Where some patients have walked through the security machines there have been no reported problems. If you cannot avoid going through the security machines, walk through briskly.

### **Shop security systems**

It is advised you should walk straight through the shop doorway without loitering; your CRT should not trigger the alarm system.

## **Household/domestic appliances**

Practically everything in the household environment is safe for CRT devices. These include:

- Microwave ovens
- Televisions
- Radios and stereos
- All kitchen equipment
- Hairdryers and shavers
- Vacuum cleaners
- Garden equipment

**TENS machines in particular should be avoided** (sometimes used for pain control).

## **Mobile phones**

Mobile phones are safe, but it is recommended that you use the phone on the opposite side to your device implant (six inches away from the CRT). It is safe for other people to use a mobile phone close to you.

## **Hospital environment**

Most equipment used in hospitals will not cause any interference with the CRT. If you need hospital or dental treatment it is important that you let medical and dental staff know you have a CRT so that they can assess if their equipment is safe to use. Please make sure you carry your device identity card with you at all times and take it with you to any hospital appointments.

## **X-rays**

X-rays do not interfere with CRT devices.

## **MRI scans/CT scans**

CT scans are usually safe however, MRI scans are not appropriate for all types of device. An MRI scan is a diagnostic test that uses a strong electromagnetic field. Some devices and leads have been engineered to be compatible with MRI scans to avoid damage to the implanted device.

If your device is not MRI compatible then you should not have MRI scans as the risk of damage to your device is high. If you are advised that you would benefit from an MRI scan after your device has been implanted, please contact the Pacing and ICD clinic to confirm if your device and leads are MRI compatible. If you regularly undergo MRI scans or if you think there is a high probability that you will require MRI scans in the future, please discuss this with the nurses during your pre-assessment appointment.

## **Radiotherapy**

If you are advised at any time that you would benefit from radiotherapy then it is important that your consultant contact the

Essex Cardiothoracic Centre to discuss treatment.

### **Radio Frequency (RF)**

It is unlikely that most patients will come across sources of RF that will cause problems. If you are concerned about anything at all, please contact the Pacing and ICD clinic for advice.

### **Can I stop taking my medication now that I have a CRT?**

A CRT- P or CRT-D is more effective in helping heart failure symptoms when used in conjunction with your heart failure medications, equally a CRT-D will not stop you getting dangerous heart rhythms; it only treats them when they occur. You should continue all of your medication unless specifically advised otherwise

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## **CRT-D specific advice**

### **Shock treatment**

In addition to providing paced resynchronisation therapy, CRT-D devices can also deliver therapy to provide life-saving treatment if needed using either pacing mechanisms or electrical shocks. Shocks delivered by the CRT-D can be because of a dangerous heart rhythm (appropriate shocks) but sometimes treatment can be delivered because of other reasons (inappropriate shocks). This does not mean your CRT-D device is malfunctioning; inappropriate shocks are a known risk of CRT-D implantation. The nurses will fully discuss shock treatment during pre-assessment clinic and will answer any questions you have.

### **What will happen to me when the CRT-D delivers treatment?**

At the start of a fast heart rhythm, you may feel palpitations and start to feel dizzy as your blood pressure drops.

Some patients may lose consciousness, so if there is time then it is best to sit down. You should wait for your palpitations to stop or for treatment to be delivered.

Your response will vary depending on what treatment is being delivered. Many patients are unaware of pacing therapies and some are unaware of shock treatment.

Shock therapy is felt in different ways by different people. It can

cause your body to twitch or jump, sometimes quite violently. This can be unpleasant.

### **What should I do after receiving shock therapy?**

You may be very upset the first time you receive shock therapy, and need help and support. Please contact the Pacing and ICD clinic as soon as possible, on 01268 524900 ext 4019 and arrangements will be made to see you. If you have remote monitoring at home we may be able to give you more information regarding your symptoms and advise if you need to attend the Pacing and ICD clinic. For advice out of hours please contact Roding Ward on 01268 524 900 Ex 4209.

When you come to see us we will be able to identify exactly what has happened, and provide you with the reassurance and support you need. Patients who have had treatments from their CRT-D regularly will often be aware of their heart rhythm changing and will be able to prepare themselves for whatever treatment is to be delivered.

### **Should I call 999?**

If you receive a shock from the CRT-D try and stay as calm as possible. Many patients feel

perfectly well after a shock and can carry on with whatever they were doing beforehand. If this is the case then there is no need to treat the situation as an emergency. Remember, potentially needing shock therapy is why you were originally offered a CRT-D, please follow guidance as below;

Stay at home if you have experienced a single shock only and feel otherwise well. There is no need to attend hospital but we recommend that you stay at home and rest. You should not drive and you should contact the Pacing and ICD clinic either immediately or during the next available working hours.

Call 999 if you have experienced multiple shocks, (these may occur in quick succession or may be isolated single shocks some time apart) or if you feel unwell in any way and have received any shocks at all. You should not drive and we recommend your CRT-D is checked as soon as possible.

Driving restrictions following treatment from your CRT-D vary depending upon whether treatment was appropriate or inappropriate. You will be advised by the physiologist, nurse or doctor caring for you which driving restrictions apply to you.

In all cases the DVLA need to be informed.

If you are in any doubt about what to do if you receive shocks, call 999.

**What should I do if I feel unwell but have not received any shocks?**

This depends on how unwell you feel. If you feel generally unwell but have had no palpitations or shocks from the ICD then you should contact your GP. They will assess you and decide whether you need additional help.

If you are feeling very unwell then you should call an ambulance. It is important that you tell them that you have a CRT-D and show them your CRT-D identification card.

**What happens if anyone is touching me when I get a shock from my CRT-D?**

This is not a problem. No harm can come to anyone touching a

patient with a CRT-D during shock therapy. Many patients who have small children or grandchildren worry about this. There is no need to worry – it will not harm anyone. At worst they may feel a slight tingle.

**Planned defibrillator deactivation**

The defibrillator function of your CRT-D is designed to provide life-saving treatment. Some people, as they near the end of life, may not feel that they want or need shock treatment any more.

In such circumstances it is possible to request a planned defibrillator deactivation.

Deactivation of the defibrillator eliminates the risk of shocks while retaining the benefits of cardiac resynchronisation therapy pacing.

If you have any questions please contact the arrhythmia nurses or the Pacing and ICD clinic.

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## Where can I find further information?

If you need to contact us regarding your procedure, please telephone:

### **Arrhythmia nurses**

Essex Cardiothoracic Centre  
01268 394021  
[arrhythmia.nurses@btuh.nhs.uk](mailto:arrhythmia.nurses@btuh.nhs.uk)

### **Pacing and ICD clinic**

Essex Cardiothoracic Centre  
For appointment queries and  
transport requests:  
01268 394516

### **For all other queries**

01268 524900 ext 4019 or email  
[btu-tr.essexcrm@nhs.net](mailto:btu-tr.essexcrm@nhs.net)

### **Cardiac department**

Basildon Hospital  
01268 394536

### **Roding Ward**

Essex Cardiothoracic Centre  
01268 524900 ext 4209  
(For out of office hours queries)

### **Hospital contact details**

Basildon University Hospital  
Nethermayne, Basildon  
Essex SS16 5NL  
01268 524900  
[www.basildonandthurrock.nh.uk](http://www.basildonandthurrock.nh.uk)

### **Patient advice and liaison service (PALS)**

01268 394440  
Email: [pals@btuh.nhs.uk](mailto:pals@btuh.nhs.uk)  
[www.basildonandthurrock.nhs.uk](http://www.basildonandthurrock.nhs.uk)

Basildon University Hospital  
Nethermayne  
Basildon, Essex SS16 5NL

01268 524900

Minicom 01268 593190

[www.basildonandthurrock.nhs.uk](http://www.basildonandthurrock.nhs.uk)

Patient Advice and  
Liaison Service (PALS)

01268 394440

[pals@btuh.nhs.uk](mailto:pals@btuh.nhs.uk)

The Trust will not tolerate  
aggression, intimidation or  
violence.

This is a smokefree Trust.  
Smoking is not allowed in any of  
our hospital buildings or grounds.

This information can be provided  
in a different language or format  
(e.g. large print, Braille or audio  
version) on request