



**Society for
Cardiothoracic Surgery**
in Great Britain and Ireland

NATIONAL TRAINEE COMMITTEE FOR CARDIOTHORACIC SURGERY

ST1 INTRODUCTION GUIDE

LAST UPDATED: AUGUST 2023

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INTRODUCTION

Welcome to run-through cardiothoracic surgical training and congratulations on being awarded a coveted National Training Number! You have joined a small but great society, and there is a lot to look forward to in the upcoming years. Having done the hard work to get a training number, it is important to keep a strong work ethic throughout your training to make sure you are a well-rounded, competent and competitive surgeon by the end of it. Always remember, your time as a registrar is essentially a very long job interview!

In this guide you will find some basic information to help get you started in your training, but as you settle in it will all get much easier to handle and become second nature to you. Different deaneries across the country run their ST1 programmes in varying ways. Some have their trainees fully inducted into core surgical training (CST), some have shared ownership and others as complete standalone ST1 and ST2 cardiothoracic trainees. Find out early-on who will be running your ARCP (the core surgical or cardiothoracic programmes). For the purposes of this guide, we'll use CST as the common model as the majority of ST1-2 programmes have some shared rotations/assessment with CST.

ISCP

The Intercollegiate Surgical Curriculum Program (ISCP) is the portfolio you will keep with you for the duration of your training and is used to evidence progression. It can be difficult to navigate at first but you will soon get the hang of it.

It is a good idea to start things off strong with the portfolio: it is easy to convince yourself that you will just settle in the department or placement first and sort out assessments later. While this will make the first several weeks seem more relaxed, it is often beneficial to set a trend of doing regular assessments early on, not only with yourself, but with your assessors. Spend some time just navigating around ISCP and see if any of the registrars will sit down with you for 5 minutes to get used to the basics.

When ARCP comes around, it is best to give the panel no reason to give you a hard time. Bear in mind that they are not looking to fail you or hold you back, however, they also cannot progress you to the next stage of training simply because you're a run-through trainee. If everything that is required is done, you should pass and progress with no obstacles at all, improving your confidence and allowing you to focus further on training.

First and foremost, get your global objectives from the TPD and take note of anything mandatory, namely:

- **AES and CS Meetings:**

- Find out who your Assigned Educational Supervisor (AES) is early and meet with them. Your AES will be allocated to you and often remains with you throughout your whole programme, while your Clinical Supervisor (CS) is nominated by you (must be someone who works with you regularly in the same rotation/department) depending on your rotation and who is available as a certified trainer on ISCP (you will have to ask consultants in that rotation, ask your TPD if there is any uncertainty). If possible, put down more than one CS on your ISCP for each placement (ask your nominated CSs first), as this will make it much easier to get sign offs. There always has to be one lead CS though who is responsible for initiating and finalising your Multiple Consultant Report (MCR)
- Discuss your objectives with your CS: there is no requirement with the new curriculum for the CS to put an entry in the initial learning agreement (LA) meeting. Take some time to familiarise yourself with ISCP and the global objectives from your TPD and make a list of your own objectives for the year. You can then create a new placement on ISCP, complete the relevant details and your AES and CS names (your TPD will get a message to validate this placement and your AES and CS will get notifications of this). Then under the “Learning” tab you can create the initial LA meeting for that placement. Put the objectives you discuss with your CS relevant to the General Professional Competencies (GPCs) and Capabilities in Practice (CIPs) in the “Objectives” boxes as a draft (do not submit the agreement) as this will help guide your LA meeting with your AES
- Complete your initial learning agreement meeting with your AES (the very first meeting of a placement/year) where you set out your objectives relevant to GPCs and CIPs – these are explained below. Upload your up-to-date CV to your ISCP as a reference for the initial learning agreement meeting
- **Teaching Attendance/Delivery:**
 - Most deaneries run formal teaching for core surgical trainees that you might be required to attend with a minimum attendance percentage (check with your cardiothoracic TPD). These sessions are often very beneficial for those yet to sit their MRCS exams
 - Some deaneries may have a minimum requirement for evidence of teaching delivery by the trainee
- **Audit:**
 - Aim to complete 1 audit loop per year, preferably submitting and presenting it locally or regionally. The certification requirement for your CCT is completing one closed-loop audit cycle in the last two years of your training, but you will find audit and service improvement an important learning activity that can also tick boxes in the presentation sections of your portfolio
- **Research:**

- There usually is no minimum requirement for research/publications per year, but there is a requirement at the end of training to have a minimum of four publications with two as first author, to have completed a Good Clinical Practice course in research governance and to provide evidence of study of research methodology or possess a higher degree. Remember that at the end of training you will be competing against trainees from other deaneries for consultant posts, and involvement in research, even if not formally through a higher degree, is important to demonstrate
- **Workplace Based Assessments (WBAs):**
 - With the new competency-based curriculum many deaneries now have no minimum annual requirement for WBAs (the collective term for the main clinical assessment forms, namely PBAs, DOPS, CEXs and CBDs). The rate-limiting step is to have the required WBAs to demonstrate your phase 1, 2 and 3 competencies at your critical progression points. These are mentioned in detail in the ISCP curriculum but a summary guide is provided in the WBA section below. However, some deaneries still have a minimum annual number of WBAs to complete and it is important to familiarise yourself with this early on
- **MRCS:**
 - Some deaneries require Part A by the end of ST1
 - All will require part B by the end of ST2 to progress to ST3
 - If you do not complete part B by the end of ST2 you will likely get an outcome 3 in your ARCP (more time required to achieve competencies) leading to an extension of your ST2 year
- **JCST:**
 - Along with all other fees, you will be required to pay for your ISCP (run by the JCST (Joint Committee on Surgical Training) – the body which manages certification and training recommendations/requirements) which at the time of writing is £260 per year. The JCST ISCP fee is tax deductible so you can claim a tax rebate for it as part of your professional subscriptions
 - The JCST helpfully outlines quality indicators of training (link: <https://www.jcst.org/quality-assurance/quality-indicators>) which can be used as a reference to arrange or negotiate your training. At the time of writing, it recommends a weekly minimum of 2-3 days in theatre, 1 session in clinic and 1 MDT. Please familiarise yourself with the relevant JCST documents
 - The JCST also provides certification guidelines for completion of training (link: <https://www.jcst.org/uk-trainees/str-trainees/certification/cardiothoracic-surgery-specific-certification-details/>). These are the items you should aim to complete by the end of training. While it seems a long way off in ST1, having a clear vision of what is expected of you at the end of training will help guide you from the beginning

- The JCST also set your CCT date in conjunction with your TPD and yourself. If you have any training delays, planned or otherwise, you and your TPD will need to let them know so they can set your new CCT date

WBAs

Some deaneries still stipulate a minimum number of WBAs (for example 60 for Wales ST1s and 40 for London ST1s are required per year) but many do not anymore with the new competency-based curriculum. Aim to do at least 1 per week to achieve these numbers. You are often required to get a percentage (e.g., half of them) signed off by a consultant, but that should be half of the minimum, not the total. If you do 50 WBAs but your minimum is 20 for example, you will only need 10 signed off by consultant.

Types of WBAs:

- Mandatory CST WBAs: CST will have some mandatory WBAs that you need to do by the end of ST2/CT2. These are extremely simple to do and fortunately count towards your total WBAs for those years. It is best to try and get them done early on
- DOPS (Direct Observation of Procedural Skills): this is an assessment for a procedural skill (e.g., sternotomy, vein harvesting, chest drain insertion) but not the whole procedure (PBAs are used instead for this). It is best to go through ISCP and see what skills can be used as a DOPS. Click the icon next to the text box. There will be a list for each speciality. A good tip is to always do a DOPS for any new skill/procedure and then try and repeat it later to show progression. For example, send a DOPS for your first chest drain, then after a few more, send another DOPS and hopefully your rating for that procedure will have improved, an important evidence of progression on your ISCP. Each DOPS has a “global summary” of how proficient you are at performing that procedure. You should aim to have some procedures rated at “4” (at the level of a day-one consultant) by the end of your ST1/ST2 years
- PBAs (Procedure-Based Assessments): are a more in-depth version of a DOPS. They require you to be formally assessed during a whole procedure on several technical and non-technical domains. In your ST1/ST2 years some procedures can be done as a PBA (e.g., simple VATS procedures as lung biopsy, talc pleurodesis, indwelling pleural catheter (IPC) insertion, empyema drainage, appendicectomy, dynamic hip screw fixation etc...) depending on your rotations. Check ISCP for the list and opt for PBA over DOPS whenever you can. You would have to have performed the operation as a supervise trainer-scrubbed (S-TS) or supervised trainer-unscrubbed (S-TU) or performed (P) coding on your logbook to complete a PBA for it

- CEXs (Clinical Evaluation Exercises): this is based on clinically evaluating patients, and might be clerking in A&E, reviewing clinic patients, seeing new referrals on the ward or conducting a ward round. Clinic can often be the easiest place to get consultant validated CEXs
- CEX-C (CEX for Consent): this requires you to be assessed consenting a patient. It is best to do this early as the feedback will be useful to develop your skill with consenting (an often understated but very important skill for your career)
- CBDs (Case-Based Discussions): ideally and regardless of the need to accumulate WBAs, you should know the patients' history before going to theatre. It will enrich your learning experience in theatre but also allow you to discuss the case before scrubbing and send as a CBD afterwards. Try and do some reading on the case if it is a new condition or procedure to you
- Other Assessments: as Observation of Teaching (OoT), Assessment of Audit (AoA) and Multi-Source Feedback (MSF) are all important to do in the first couple of years (most deaneries have a requirement of 1 MSF every year/two), and getting them done early on will allow you to focus on the technical skills for the remainder of the year



<p>Critical Conditions - To ensure that trainees have the necessary skills to manage the defined critical conditions</p>	<p>Trainees must be able to demonstrate knowledge and understanding of the management of the following critical conditions:</p> <ol style="list-style-type: none"> 1. Aortic dissection 2. Stridor 3. Secondary / tension pneumothorax 4. Cardiac tamponade 5. Acute haemothorax 6. Low cardiac output following Cardiac Surgery 7. Endocarditis of the native or prosthetic valve 8. Respiratory failure following Thoracic Surgery 9. Myocardial ischaemia / infarction <p>By certification there should be documented evidence of performance in the critical conditions at the level of a day-one consultant in the portfolio by means of the CEX or CBD as appropriate (to level 4 as shown in appendix 3).</p>
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Summary of critical conditions: these need to be assessed through CBDs or CEXs and the minimum rating achieved for critical progression points as above. Level 4 is needed at the end of phase 2.

Guide for ARCPs, Critical Progression Points Cardiothoracic Surgery

	Phase 1 (indicative 3 years)		Phase 2 (indicative 2 years)			Phase 3: Certification * (indicative 2 year)		
		All		Card	Thor		Card	Thor
Capability in practice <i>Assessed via MCR (MSF, AES report)</i>	Outpatient clinic Emergency take Ward & inpatients Operating Multi-disc working Critical care area Surgical outcomes	Level II III III II II III II	Outpatient clinic Emergency take Ward & inpatients Operating Multi-disc working Critical care area Surgical outcomes	Level III III IV II III III III	Level III III IV II III III III	Outpatient clinic Emergency take Ward & inpatients Operating Multi-disc working Critical care area Surgical outcomes	Level IV IV IV IV IV IV IV	Level IV IV IV IV IV IV IV
Index procedures <i>Competency assessed via PBAs</i>	CARDIAC Isolated CABG Isolated AVR AVR + CABG THORACIC Lung resection Decortication Pneumothorax surg	Level 2 2 1 2 2 2	CARDIAC Isolated CABG Isolated AVR AVR + CABG THORACIC Lung resection Decortication Pneumothorax surg	Level 3 3 3 2 2 2	Level 2 2 1 3 3 4	CARDIAC Isolated CABG Isolated AVR AVR + CABG THORACIC Lung resection Decortication Pneumothorax surg	Level 4 4 4 2 2 2	Level 2 2 1 4 4 4
Critical Conditions <i>Knowledge & understanding assessed via CBDs and CEXs</i>	Aortic dissection Stridor Pneumothorax Cardiac tamponade Acute haemothorax Low cardiac output Endocarditis Resp failure post op Myocardial isch / MI	Level 3 3 3 3 3 2 2 3 3	Aortic dissection Stridor Pneumothorax Cardiac tamponade Acute haemothorax Low cardiac output Endocarditis Resp failure post op Myocardial isch / MI	Level 4 4 4 4 4 4 4 4 4	Level 4 4 4 4 4 4 4 4 4	Aortic dissection Stridor Pneumothorax Cardiac tamponade Acute haemothorax Low cardiac output Endocarditis Resp failure post op Myocardial isch / MI	Level 4 4 4 4 4 4 4 4 4	Level 4 4 4 4 4 4 4 4 4
Exams	MRCS		Eligible for specialty exam after satisfactory completion of Phase			FRCS(CTh)		
Logbook	Major Cardiac Cases (inc. Index Procedures) <ul style="list-style-type: none"> CABG alone or in combination Valve repair or replacement Thoracic aortic surgery Other major cardiac case using CPB Implantation of heart or lung (transplant) Heart-lung block retrieval Congenital cardiac operation Major Thoracic Cases (inc. Index Procedures) <ul style="list-style-type: none"> Anatomical lung resection Surgery for Pectus Decortication Thoracotomy for trauma Chest wall resection / reconstruction Tracheal resection Pneumothorax surgery (VATS / open) 					Indicative number of 250 major cases performed with the majority in the area of special interest		

All = All trainees Card = Cardiac trainee Thor = Thoracic trainee

Disclaimer

- This is only a guide – the current published Cardiothoracic curriculum is the definitive document – see www.iscp.ac.uk
- This is not a checklist, there is an emphasis on equivalence at all stages
- These should be seen as indicative of minimum expectations – most trainees will exceed all these requirements
- * There are several additional requirements required for certification – see current curriculum

Cardiothoracic SAC May 2023

Summary guide for ARCPs: this is based on the ISCP curriculum and shows the required competencies for the critical progression points: phase 1 (indicative 3 years = ST1-ST3), phase 2 (indicative 2 years = ST4-ST5) and phase 3 (indicative 2 years = ST6-ST7).

BOOKS

Once you have passed your MRCS exams, you can start to focus on learning about cardiothoracic related topics! To that end, try and get a hold of a copy of the below books. There are plenty of other fantastic, more in-depth books out there, but these 5 should get you started. Speak to senior registrars who've recently done their FRCS, they might be looking to offload some copies:

- Manual of Perioperative Care in Adult Cardiac Surgery by Robert M. Bojar
- The Oxford Specialist Handbook of Cardiothoracic Surgery
- Key Questions in Cardiac Surgery
- Key Questions in Thoracic Surgery
- The Oxford Specialist Handbook of Cardiothoracic Intensive Care

The Key Questions books can be a bit advanced for ST1, especially the later chapters. They can however they can be useful to revise some key topics before going into theatre or clinic if you're expecting to get quizzed on anatomy/physiology/pathophysiology.

Just note, it is best to get a solid grounding in the basics first. It can be tempting to get caught up in the fine details of complex disease however you will be expected you to know the basics well. Do not get caught out trying to impress everyone with knowledge that you are not expected to have at your stage of training, especially at the expense of the things you should be reading.

SURGICAL SKILLS

Below is a non-exhaustive list of skills to start working on inside and outside of theatre. Whilst they aren't mandatory, they are a good way to get a grounding in cardiothoracic procedures.

Vein Harvesting:

- One of the most important skills to focus on as a junior trainee. It is a whole operation in itself and develops nearly all aspects of basic surgical skills, tissue handling and closure
- In centres that do not routinely do open vein harvesting, try and learn endoscopic techniques (these are routinely taught on many courses). Additionally, try and be available if you can, for when an open vein is taken to observe/assist so you can do it the next time round

- Be sure to know the anatomy of the long saphenous vein well and all landmarks. In some cases, you might need to start at the knee or thigh. Knowing your landmarks well will help to locate the vein much easier and can prevent creating an unwanted soft tissue flap in the leg
- If you get the opportunity, also try and observe and perform radial artery harvesting as the techniques are slightly different
- Vein harvesting is a good way to learn the basics of using bedside ultrasound for vascular access as some centres routinely perform this preoperatively to map/check the calibre of the long saphenous vein. While not essential, it is another skill to add to your arsenal and is particularly useful for CVC and arterial line insertion

Consenting Patients:

- It is useful to learn how to consent patients early. You should at a minimum be able to consent patients for procedures that you are performing, but also learn how to consent for more advanced procedures as very soon you will need to do this as a registrar or earlier. Watch a few different people consent and takes some pointers from each (everyone has their way of explaining things to the patient and you will develop yours based on what seems sensible and satisfies the GMC guidance on informed consent). With time and exposure to different procedures you will be able to appropriately consent for more operations, but make sure at the start you are consenting for procedures you can either perform or have sufficient experience with and can explain the benefits and potential risks to patients (as per GMC guidance)

Chest Drain Insertion:

- This is one of the most common procedures you will have to do as a registrar; you will be called on countless times to place a drain for other specialities as well as for your own patients. It is a useful skill to refine early in your training, and it is important try and learn both open (surgical) and Seldinger techniques for drain insertion if you can as they both have different indications as well as pros and cons. Many surgical skills courses offer teaching on these and similar principles apply for both central venous catheter (CVC) and Seldinger chest drain insertion

Bronchoscopy:

- This is a skill you need to know particularly as a thoracic trainee. It is used in elective (preoperative thoracic surgery patients) and emergency settings (it is not uncommon for patients after cardiac or thoracic surgery to deteriorate due to an endobronchial problem such as mucus plugging)
- Try to learn the bronchial tree anatomy early and it will make a lot more sense of what you're looking at down the bronchoscope. The technique is fairly simple for flexible

bronchoscopy (more complex for rigid bronchoscopy which is usually done in theatre) and is taught on SCTS courses

Sternotomy (Opening and Closure):

- After vein harvesting, this is likely to be the next step you will learn in cardiac theatres. Some consultants will be more willing than others to allow SHOs to do a sternotomy. If the patient is large, diabetic or is having bilateral mammary artery harvesting, seniors will often be keener for you to watch than take part. Do not be disheartened by this, it is often best to observe the difficult ones at first rather than have an early complication that might knock your confidence later (sternotomy complications can be horrendous as you might have seen)
- There are different techniques and nuances when opening the chest but the main principle of staying in the middle of the sternum applies to all patients! Some like to use a pen to mark the skin, others use instruments to dent the soft tissues and some use needles/forceps or diathermy to identify the intercostal spaces. Whichever technique you use, take your time at the start and be sure to stay in the midline. Make sure you also take your time with the pneumatic saw as this may take some time to get used to initially. There is little point in perfectly dissecting the soft tissues right down to the middle of the sternum if you then do not control the saw properly and end up off-centre. There is usually no praise for doing a very quick sternotomy but plenty of room for criticism if you damage the tissues because you were rushing!
- Sternotomy closure tends to come after you have learned how to do sternotomy. Again, there are many different techniques, each with their pros and cons and you will need to observe a few before performing the procedure

Thoracotomy (Opening and Closure):

- Thoracotomies aren't performed as often as they used to with advancements in video-assisted thoracic surgery (VATS) and robot-assisted thoracic surgery (RATS) but are still an essential skill to have. You can start off by opening and closing the utility port in VATS cases. If your centre doesn't do many open cases, try and get hold of the list for the week and you can note any elective thoracotomies. You're much more likely to take part in an elective thoracotomy rather than an emergency conversion from VATS to open

Central Venous Catheter (CVC) and Arterial Line Insertion:

- Neither of these skills are essential for cardiothoracic surgeons have but they are nonetheless useful. They will also improve your Seldinger technique for chest drains. It is best to speak to an anaesthetist or an experienced registrar if you're keen to do these. CVC insertion is done with ultrasound guidance and usually in a more elective

setting (in theatre after anaesthetic induction or once a patient has been stabilised on ICU) so anaesthetists are better placed to help with this

SIMULATION

Simulation has become a key tool in not only developing surgical and clinical skills but also in maintaining them throughout your training and career. High and low fidelity wet or dry labs allow you to learn and practice with relative impunity. Both cardiac and thoracic surgery can be high risk specialities thus getting the chance to do risky procedures for the first time in theatre can be difficult. When planning to start doing a procedure such as aortic cannulation, proximal anastomosis or hilar dissection, simulation can not only let you have a feel for it before trying on a patient but can also be used to demonstrate that you have the dexterity for this particular procedure. You can make your mistakes in the comfort of lab so you do not make them in theatres when it counts.

Another important consideration is the reduced amount of operating time available in the current climate. Whilst simulation cannot be a direct replacement for theatre exposure, it can certainly supplement and aim to fill some of the gaps.

NON-CTS PLACEMENTS

There is a lot to learn from other specialities and it is important to show each speciality the respect it deserves. Try not to think of the time away from CTS as an obstacle or wasted time but more of a chance to get a new perspective and set of skills. Cardiothoracic patients commonly have many co-morbidities and they often have post-operative complications that require input from other specialities. Being able to assess other ailments based on experience outside of the speciality will always stand you in good stead in your career, and taking an interest in learning new skills will help develop a good rapport with other teams. Upper GI, vascular and ENT surgery as well as cardiology, respiratory and intensive care are very closely allied specialties that will enhance your range of knowledge and skills. The surgical skill and finesse gained from rotations in high-volume surgeries can sometimes allow you to do more in theatre and be transferred to cardiac and thoracic procedures to give you more confidence early in your training.

LOGBOOK

Again, with the competency-based curriculum, many deaneries now have no minimum annual logged cases requirement, but some still do, and you should clarify this early on with your TPD

and the global objectives. There is a requirement of 250 major cases (defined in the ISCP curriculum) as first-operator (S-TS, S-TU or P procedures) to be certified (CCT) at the end of your training, with the majority in your chosen subspecialty (cardiac/thoracic/congenital). For minimum annual requirements, there will often be a minimum number for scrubbed cases (assisted/observed) and cases performed by the trainee as first-operator.

Make sure you have registered with the e-Logbook website as this will be uploaded to and accessed from your ISCP. There is also a smart-phone application to easily upload procedures which costs £10 per year after the first year to allow you to upload your cases. The e-Logbook website has undergone a significant makeover to help make the procedure names and steps consistent and there are further improvement expected.

Cardiothoracic surgery does not offer many small cases and so the number of cases required for the year may seem daunting and unachievable. However, there are some tips for maximising your numbers. One acceptable technique for ST1-ST2 years to help achieve annual case numbers is logging more than operation for the same patient; for example, CABG can count as two operations if you assist with/perform the vein harvest and then go to assist on the chest. The e-Logbook website allows you to list part-procedures (as vein harvesting or sternotomy) as a case with the patient's details and you can choose to do this in your early years if there is a case number requirement you need to achieve. In your ST3+ years however you are usually assessed on full cases so avoid logging part-procedures as cases (you can log a whole procedure but also specify which parts of the procedure you performed/assisted with).

For thoracic surgery, you can again log part-procedures on the same patient separately; if you do a flexible or rigid bronchoscopy at the start, log that as a separate case, then log the VATS wedge resection you assisted in/performed separately. Additionally, if you do more than one procedure in the chest on the same patient (e.g., lung biopsy and pleural biopsy) you could log that as two cases.

It is always useful to check with your TPD/AES what they will allow. It is definitely not advisable to list all the steps of a case as a separate procedure, and it is more useful to list a step you performed as a separate case than one you only assisted in/observed. For example, listing sternotomy opening and closure, LIMA harvest, cannulation/institution of bypass, distal coronary anastomosis, proximal coronary anastomosis and weaning from bypass all as separate procedures is not giving a true representation of your case numbers at ARCP and may be seen as excessive or misleading.

While the e-Logbook system is important and used in ARCPs it does have several flaws, and it is advisable to keep a separate logbook (in an Excel sheet) for greater detail and flexibility in documentation.

LOUPES

While not mandatory, it is advisable to get yourself a set of loupes at some point early in your training. Some consultants will not allow you to progress to steps such as LIMA harvest or coronary anastomosis without them. There is a vast range available with varying price tags to match. There are plenty of cheap, universal ones on Amazon or eBay to get you started if you do not want to commit thousands of pounds very early in your training. Eventually, you will likely want to get a bespoke set made for you, especially if you are planning on a career in cardiac surgery.

Many people recommend 2.5x magnification as that is usually enough for most if not all cardiac procedures, and also takes less time to get used to. Some surgeons use 3.5x magnification for finer work such as coronaries and some have more than one set with different magnifications. You can discuss this at length with whichever company you choose to go for. Do remember you can meet with multiple company reps to get a feel for what they offer without any obligation to buy.

Loupes are quite expensive, but bear in mind they are tax deductible, so you will get a decent percentage back in your tax code, if you fill out your self-assessment. There are also a few educational, charitable or research funds to help with the cost of loupes, speak to your TPD or fellow trainees to see if they are aware of any.

EXTENDED LEARNING

Your first year should be spent getting a good grounding in cardiothoracic surgery including ward care, common medications, ward emergencies and theatre basics. It is always useful to expand your knowledge on the conditions your patient present with. Here are some topics that are worth learning about early on to help you along the way:

Guidelines:

- As you gradually become more familiar with conditions and presentations, it will be more and more useful to read up national guidelines and evidence base. The main guidelines used are the ESC/EACTS guidelines for cardiac conditions and BTS guidelines for thoracic conditions, amongst others. Having an idea about these guidelines will come into play when seeing patients in clinic and referrals on the wards

Angiography:

- As you go to theatre more, the expectation to be able to interpret angiograms will also increase. We cannot rely solely on the angiogram report when committing to surgery. Basics can be covered in online videos and local cardiology departments often have good teaching. Speak to the cardiology SHOs to know when this is planned and sit down with a cardiac surgery registrar who can go through some angiograms and explain

the views and findings in detail. CTh Surgery (link: <https://www.cthsurgery.com/>) is an excellent online resource for angiography teaching.

Echocardiography:

- Similar to angiography, you will need to be able to interpret echo images and findings. Transthoracic Echocardiograms (TTE) can be easier initially to get your head around. If you spend some time with patients having echocardiograms, and also have a go yourself, you will be able to appreciate how the probe positions capture different slices of the heart. Transoesophageal Echocardiograms (TOEs) can be a bit more difficult at first but follow similar basic principles apart from the views and probe positions, and anaesthetists are a brilliant resource to learn more about this modality

Pulmonary Function Tests:

- For both cardiac and thoracic surgery, it is important to have a good understanding of pulmonary function tests (basic spirometry and full lung function tests) to establish a patient's fitness for surgery, whether the proposed procedure is appropriate for them (in lung resections) and what level of care they are likely to need post-operatively

ITU Management:

- It is important to spend some time in your cardiac ITU to get used to looking after patients with complex physiology. Some training programmes have allocated rotations in ITU, if yours does not, it would be useful to try and spend some time there early on if you can (will make a huge difference for your registrar years). This will help in managing complex situations such as patients with mechanical cardiovascular support, ventilated patients with respiratory failure, renal failure, renal replacement therapy and inotropes/vasopressor use.
- It is also essential to become familiar with post-operative epicardial pacing. These boxes can be daunting at first and they are dangerous if used incorrectly. Spend some time practicing with a box not attached to a patient and again, speak to the registrars about basics and advanced teaching. The Cardiac Surgery Advanced Life Support (CALS) course will also cover the basics

COURSES

There are several SCTS Education courses (generally 1 or 2 for each training year, link: https://scts.org/professionals/education/career_groups/ntn_trainees/courses.aspx) that are very useful to attend and there is an expectation of NTN's to engage with them. Whilst attendance does not form part of the CCT requirements, these courses are provided free of charge to SCTS

members with support from industry and align with the cardiothoracic curriculum approved by the SAC. The SCTS runs several free events and courses and you need to be an SCTS member to take advantage of these (membership also offers discounted registration fees for the SCTS Annual Meeting amongst other benefits). ATLS is mandatory for CST so make sure you complete it by the end of your ST2. It lasts 4 years and there is a shorter version of the course for reverification. It will not be uncommon to be called to A&E resus for trauma cases as the cardiothoracic registrar so it is best to keep up to date on your ATLS principles.

Basic surgical skills and CCrISP are no longer mandatory but are advisable for CST.

CALS is a very good course to understand ALS for patients who have undergone recent cardiac surgery. Principles such as re-sternotomy, intra-aortic balloon pump (IABP) insertion and use and epicardial pacing will be discussed.

Focussed Intensive Care Echocardiography (FICE – now known as FUSIC Heart) can also be useful for multiple reasons. Learning how to interpret an echocardiogram is a valuable skill and one you will be required to develop. Learning to perform bedside echocardiography can be even more helpful in deteriorating patients when these services aren't readily available.

Research skills courses can also be very helpful whether you plan to take time out to do formal research or not. It is a good idea to get a solid foundation on the basics of research, especially considering you will need four publications by CCT.

CONFERENCES

Conferences can be a great place to learn new techniques, present your projects, get inspired about new projects and meet fellow trainees and consultants. There are a few to be aware of in the UK and Europe and many in Asia and America that you can keep an eye on if interested. You should have delivered six national/international presentations by the end of your training (two of them international). Aim to get at least one presentation each year and it should relieve the pressure towards the end of your training.

SCTS

- The Society for Cardiothoracic Surgery in Great Britain and Ireland (SCTS) is the main association for the specialty. The Society has several committees (link: <https://scts.org/professionals/committees>) that oversee various aspects of the specialty including subspecialty representation, recruitment and workforce planning, research, training, education, innovation and communication. The committees meet regularly to discuss relevant matters and make recommendations to the national education bodies. Besides organising its Annual Meeting, the Society has various activities and resources for surgeons (link: <https://scts.org/professionals>) and regularly seeks feedback from all those involved in the specialty. The Society relies on NTN engagement and feedback (regularly sought through NTN reps or at the deanery level) to inform discussions on

several important topics relevant to training and workforce planning, and invites NTN's to get involved with its various roles and activities

- The SCTS Annual Meeting usually takes place in March over three days. The first day is the university day which is great for educational courses/events. The following two days are more focussed on novel and developing ideas
- There is usually a trainee meeting and fully sponsored dinner where you will get to meet other cardiothoracic trainees from all around the country and discuss training-related topics as well as have a fun night out!
- Keep an eye on the abstract entry deadlines as it is a good place to present a poster or oral presentation. Tickets for the meeting can be bought at early bird prices and can be claimed from your study budget

RSM

- During a typical year, the Royal Society of Medicine (Cardiothoracic Section) will host two educational days, alternating between cardiac and thoracic. These are usually held in the RSM offices in central London and is another great chance to meet people and get a project presented
- You can get RSM membership for a reasonable price which does offer benefits including access to the RSM library

EACTS

- The European Association for Cardio-thoracic Surgery (EACTS) Annual Meeting is similar to the SCTS Annual Meeting but held on a larger scale and usually in a glamorous European city! This conference includes all the benefits of the SCTS with the chance to squeeze in a city break in Europe. It is more difficult to get a project accepted for presentation here, but still worth submitting something as it will count as internationally presented if accepted

STUDY LEAVE AND BUDGET

It is useful to find out early what you are entitled to with regard to study leave (usually 20 days with an additional 10 days for deanery teaching) and study budget. It is easier to pay for mandatory courses with the study budget rather than aspirational courses so it is best to prioritise those first. Make sure you apply with plenty of notice (usually 6 weeks) to avoid disappointment. The study budget in several trusts follows a national guidance which is worth

reading to know what can be claimed and how much you can claim in a given year (most deaneries in England now have an unlimited study budget).

DIFFICULTIES

It is not unheard-of for trainees to face some difficulties at any point in their training, be these personal or professional. Cardiothoracic training can be very rewarding but also demanding. It is important to maintain good mental and physical health through your entire training period.

If, for whatever reason, you are struggling with something, escalate early through the appropriate channels. Raising a concern midway through the year would allow something to be done about it and show insight regarding your progression and training rather than raising it at ARCP.

You can escalate things in your department, firstly to your CS then your AES and finally to your TPD. This does not have to follow an order, some things can be discussed with all three simultaneously or with the TPD straightaway, depending on the circumstances. If this does not yield the result you need or is not appropriate, you can get in touch with the Cardiothoracic Surgery Special Advisory Committee (SAC) liaison representative for your region or the SCTS NTN Representatives who will discuss this matter at the SCTS-level and give further advice/support. In contractual/medicolegal matters you may want to contact any medical union or indemnity organisations you are part of, earlier rather than later. Talk to your colleagues and remember you are not alone in this journey, nor are you the only person to feel under pressure and getting some help/advice is always better than struggling in silence!

ST1 OBJECTIVES

An important aspect of your initial AES meetings is to establish a personal development plan (PDP) which needs to be tailored to your aims and current situation. Ideally, it should be a mix of improving yourself in the job that you are currently doing but also working towards the next level. It is important not to neglect one aspect for the other (e.g., prepare for life as a registrar should not come at the expense of being a good SHO). Set some realistic and aspirational goals and use them as a tool to prompt your registrars and consultants to help with your training. Remember that the transition from ST2 to ST3 can take some time at first to get used to, and your registrar colleagues as an ST3 will have varying levels of experience so you should aim to make the most of your ST1 and ST2 training to be a competent and knowledgeable registrar.

Above all, we hope you enjoy your first couple of years as a cardiothoracic trainee (and certainly the rest of it!) and look forward to seeing you at the next SCTS conference.