SCTS CONFERENCE NEWS

The official newspaper of the SCTS Annual Meeting 2025 16–18 March 2025

In this issue

Welcome to Edinburgh!

Welcome to the 2025 SCTS Annual Meeting, the UK's premier cardio-thoracic surgical meeting. It is a great pleasure to welcome you to the Edinburgh International Conference Centre (EICC) and the organisers are honoured and delighted with your presence at this meeting. As ever, the meeting will include a wide range of educational formats presenting the latest and the best information on new technologies and techniques in cardio-thoracic surgery, the presentations will be of interest to all cardiothoracic surgeons and allied health professionals. By emphasising areas that are important in your daily clinical work, we are hoping to create an interactive meeting with the exchange of knowledge and ideas, facilitating discussions and debates between delegates.

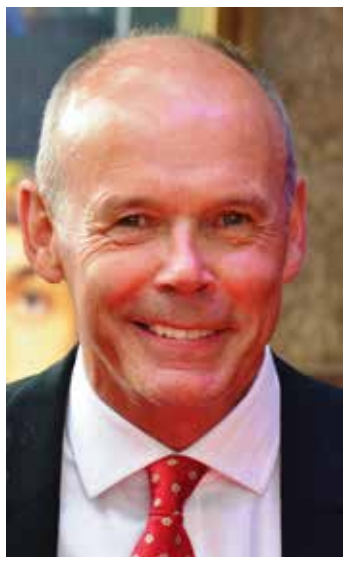
This year's meeting will include presentations of the highest quality from surgical and masterclass presentations to the latest clinical updates and technical innovations. As ever, the meeting will also witness some outstanding debates presented by some of the foremost experts in their field. In addition to the clinical presentations, do not forget to attend this year's Presidential Address by Narain Moorjani (10:10-10:30 Monday, 17 March, Pentland, Fintry and Sidlaw Auditoriums), after former Head Coach of the England Rugby Union team and World Cup Winner, Sir Clive Woodward's presentation on 'Teamship.'

Outside of the meeting, all delegates invited to this year's SCTS Gala Dinner, which will be held on Monday, 17th March at the National Museum of Scotland. Some spaces are still available, please ask at the registration desk for further details.

The organisers would like to extend their thanks to industry for their continued support of the meeting, and all the presenters who have taken the time to contribute to this year's *SCTS Conference News* newspaper.

We hope you enjoy the meeting… and remember to make a note in your diaries for next year's meeting that will be held at the ICC in Belfast, 15–17 March 2026!

Narain Moorjani

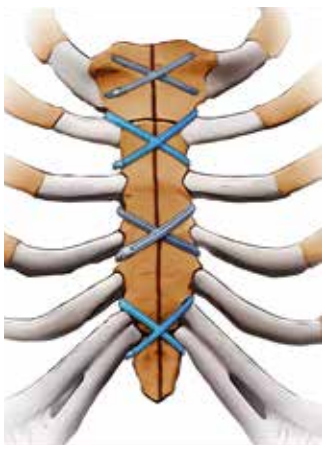


Sir Clive Woodward

Cardiac: General 2
Pentland 09:00-10:30 **Tuesday, 18 March, 2025**

A novel sternal closure technique in cardiac surgery: Polyethylene suture tapes vs steel wires for enhanced outcomes and patient recovery

Steel wire closure



Suture tape closure

Ujjawal Kumar
University of Cambridge, UK

Sternal complications continue to pose a substantial challenge in cardiac surgery, particularly affecting high-risk patients and resulting in increased mortality, morbidity, and healthcare costs. Despite advancements in surgical techniques, conventional steel wire closure may be inadequate for many patients.

We analysed outcomes in 300 consecutive patients who underwent cardiac surgery via median sternotomy over an 18-month period, comparing conventional steel wire closure to a novel polyethylene suture tape system. These are already widely used in orthopaedic surgery, though have not yet found widespread use in cardiac surgery for sternal cerclage closure.

Continued on page 4

Pat Magee - Oral Abstract Presentation
Kilsyth 10:50-12:20 **Sunday, 16 March**

TAPSE and survival in isolated tricuspid valve surgery: Evaluating its potential prognostic value

Tanisha Rajah[1], Edouard Long[2], Sara Volpi[3], Rajdeep Bilkhu[3], Ronak Rajani[3], Gianluca Lucchese[3] 1 University of Birmingham, Birmingham, United Kingdom. 2 King's College London, London, United Kingdom. 3 St Thomas' Hospital, London, United Kingdom

Background

Isolated tricuspid valve (TV) surgery is a high-risk procedure with significant morbidity and mortality. Currently, the optimal timing for TV surgery in patients with severe tricuspid regurgitation (TR) remains uncertain, and current guidelines lack consensus on the best preoperative tools for risk stratification. As right ventricular (RV) dysfunction is a major driver of surgical outcomes, assessing RV function is crucial.

Tricuspid annular plane systolic excursion (TAPSE) is a widely used echocardiographic parameter that quantifies longitudinal RV contraction. There is no established consensus on a TAPSE cut-off value that reliably predicts outcomes in TV surgery. In our study, we aimed to evaluate the prognostic significance of TAPSE in patients undergoing isolated TV surgery.

Our Research

We conducted a retrospective analysis of 38 consecutive patients who underwent isolated TV surgery for TR between 2000 and 2023 at St. Thomas' Hospital, London, with our primary outcome being all-cause mortality. Receiver operating characteristic (ROC) curve analysis identified 22.5mm as the best TAPSE threshold for predicting survival. Patients were stratified into two groups based on this threshold: TAPSE <22.5mm (n=26), and TAPSE ≥22.5mm (n=12).

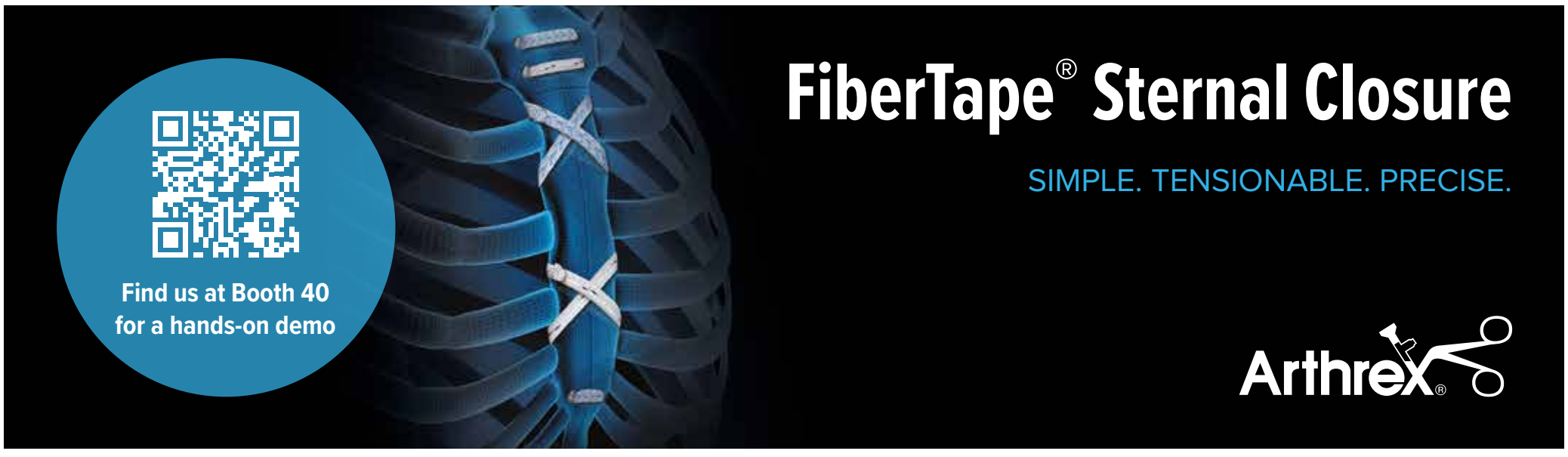
Key Findings

Kaplan-Meier analysis revealed a significantly higher mortality rate in the TAPSE <22.5mm group (log-rank p=0.028), suggesting that patients with worse preoperative RV function had poorer long-term survival. In univariable Cox regression analysis, TAPSE was a significant predictor of mortality (HR: 0.89, 95% CI: 0.80–0.99, p=0.034). In multivariable analysis, TAPSE trended towards significance (HR: 0.87, 95% CI: 0.75–1.02, p=0.078).

Clinical Implications and Future Directions

Our findings indicate that TAPSE may have prognostic value in TV surgery as an independent predictor of survival, with TAPSE <22.5mm associated with increased mortality risk. Our results align with previous research, suggesting that impaired RV function is a key determinant of surgical outcomes.

Given the lack of a universally accepted TAPSE threshold for severe RV dysfunction, our study adds to the growing body of evidence supporting the integration of TAPSE into preoperative risk stratification. Future research, including prospective, larger-scale studies, are required to validate TAPSE's role and refine its predictive accuracy.



Innovative Research- Based Project Implementation in the NHS Moorfoot **09:00-10:30** Tuesday, 18 March, 2025

Evaluating the impact of a neuropathic pain tool on standardising and improving neuropathic pain assessment in adult postoperative thoracic surgical patients

Tanya Jackson Guys Hospital London

Patients recovering from thoracic surgery, can experience acute pain and neuropathic pain (NP) which is managed differently. NP is caused in thoracic surgery by damage to the intercostal nerves from surgical procedures and drains. It has been studied that 20-30% of thoracic patients experience NP post operatively, which is diagnosed post discharge from day 6 up to 12 months post-surgery.

The assessment of NP during the acute phase post thoracic surgery is under-represented in literature. In practice, patients are assessed for acute pain using a numeric rating scale, however this does not differentiate between acute pain or NP.

An audit and root cause analysis found, in current local practice, NP assessments were subjective and varied, due to lack of process. A Quality Improvement Project (QIP), was developed to study whether the introduction of a NP tool improves and standardises assessment of thoracic adult (>18 years) patients in the acute phase post thoracic surgery and improves staff confidence in assessing for NP.

A literature search identified several NP tools used in Thoracic surgery in other centres, in the outpatient setting rather than inpatient. The QIP used Plan-Do-Study-Act (PDSA) cycles, to develop and introduce a NP tool that was agreed among stakeholders to assess thoracic patients post-operatively, throughout their inpatient stay.

The inclusion criteria, was patients undergoing thoracic surgery via robotic or video assisted thoracoscopic surgery or thoracotomy. Although not excluded, data was recorded for patients with a chronic pain or neuropathic history.

The NP tool was integrated into the electronic note's software with the support of IT. Ward-based education was provided to the nurse practitioners and doctors using the tool. Questionnaires were used to assess feasibility, staff confidence and satisfaction. PDSA cycles were adapted accordingly to navigate any barriers and aid successful implementation. Patients were assessed daily, and data was collected to monitor staff compliance and how many incidences of NP were diagnosed as a result of using the NP tool.

Data showed two hundred and fifty-five patients were included in the study. Of which 87% of patients were assessed using the NP tool, with 6 patients diagnosed with NP and started on NP treatment. Staff questionnaire results showed, one hundred percent of staff found the NP tool improved their confidence to assess patients and standardise practice, reducing the potential for clinician bias. However, using it daily was not feasible due to time constraints, as a result, feedback shaped adapting the criteria to allow for clinical judgement on when to use the NP tool.

Future recommendations included expanding the project to the outpatient setting. Patients are typically followed up by the ward nurses during the first week post-discharge and the consultant within one month of discharge. The outcomes of the QIP are being used to guide the implementation of the NP tool into follow-up calls and outpatient clinics. Education is being delivered to the outpatient team to facilitate early assessment and diagnosis of NP post-discharge and support early escalation and management.

Innovative Research- Based Project Implementation in the NHS Moorfoot **09:00-10:30** Tuesday, 18 March, 2025

To understand and clarify patient acceptability of an acute exercise recovery programme following PEA, with identification of safety parameters.

Alicia Page Royal Papworth Hospital NHS Foundation Trust, Cambridge

Pulmonary endarterectomy (PEA) surgery is considered to be a curative procedure for patients with chronic thromboembolic pulmonary hypertension (CTEPH) and is seen as the gold standard treatment for surgical candidates. Exercise training in patients with pulmonary hypertension is thought to improve exercise capacity and quality of life, however, there is limited literature in patients with CTEPH. Furthermore, there appears to be no published consensus on safe parameters for exercising patients following PEA surgery.

Many surgical specialties have an enhanced recovery after surgery (ERAS) pathway to provide a patient-centred, evidence-based approach with the aim to improve patient outcomes, and reduce costs and post operative complications with a reduced length of stay. Currently, there is no ERAS protocol for PEA surgery. One crucial component of ERAS is early mobilisation and exercise, which counteracts the adverse physiological consequences of immobility and surgical stress.

However, a significant factor to consider with patients following PEA surgery is cardiac remodelling, and what impact exertion may have on this process. The small body of existing literature remarks that the remodelling mainly occurs within the first month following PEA surgery, followed by an ongoing slower remodelling phase of the right side of the heart. Given this evidence, it seems pertinent to balance the importance of early exercise without adversely affecting the cardiac remodelling phase following surgery.

There are three phases to the research we are undertaking. Firstly, we are completing a systematic review looking at which patients with a diagnosis of CTEPH are appropriate to partake an exercise intervention following PEA in the early phase of recovery. During the review, we will consider who can be included in early post operative exercise following PEA surgery, what type and intensity of exercise is prescribed, and what is the context of the exercise setting.

Secondly a retrospective review of patients' pre and post-operative cardiac and physical function outcomes who underwent PEA surgery at Royal Papworth Hospital from 1st January and 31st December 2024. We hope this data will help to identify potential predictors of who is safe to exercise in the acute post operative phase.

Lastly, a qualitative research protocol was designed to understand and clarify patient acceptability of an acute exercise recovery programme following PEA, framed by their experience of exercise. The safety of CTEPH patients engaging in physical exercise can be of concern, due to some CTEPH patients experiencing presyncope or syncope straight after exercise. In some cases of more severely affected CTEPH patients, clinicians may recommend the avoidance of physical exercise due to worry of sudden cardiac arrest. Given this potential advice patients might be receiving prior to the PEA operation, it might frame their experience and perceptions of exercise differently for engagement of exercise acutely following their surgery. To be able to understand the potential implications of early exercise from a patient perspective, a qualitative narrative will be explored to understand their lived experience of exercise and perception of acute post-operative exercise.

This study will provide a better understanding of how patients view exercise post operatively, helping frame future feasibility studies piloting safely increased patients exercise in the early recovery phase following PEA surgery in the UK.

Contemporary Lung Cancer Management Fintry **13:30-15:00** Tuesday, 18 March, 2025

Peri-operative Management in Thoracic Surgery Sidlaw **11:15-12:30** Monday, 17 March, 2025

Examining survival outcomes after resection for non-small cell lung cancer using a large regional database

Marcus Taylor[1], Hugh Jacobs[1], Felice Granato[1], Eustace Fontaine[1], Matthew Evison[1], Michael Shackcloth[2] 1.Manchester University NHS Foundation Trust, Manchester, UK; 2. Liverpool Heart & Chest Hospital, Liverpool, UK

The Northwest Thoracic Surgery Research Collaborative comprises Manchester University NHS Foundation Trust and Liverpool Heart & Chest Hospital, two of the largest and busiest thoracic surgery units in the country. Oral presentations from the collaborative this year are the culmination of a major update to the dataset. The database comprises over 7000 patients, including more than 5000 with primary non-small cell lung cancer (NSCLC), and now has five-year survival status available for all patients.

The impact of nutritional status on outcomes after surgery for lung cancer remains unclear. Whilst research has generally demonstrated superior outcomes for patients with higher body mass index (BMI), these findings are not replicated across all studies. Moreover, poor nutritional status (i.e. low BMI and serum albumin levels) are also strongly linked with advanced cancer stage, making meaningful analysis of the nutritional variables in isolation more challenging. We therefore undertook an analysis of 2482 patients with pathologically confirmed stage I NSCLC to examine how BMI and albumin levels affect short and long-term outcomes. 90-day and 5-year mortality were 2.6% (n=64) and 36.1% (n=895), respectively. Only a small proportion of patients were underweight (BMI <18.5kg/m^2): 3.4% (n=84), whilst almost one quarter were obese (BMI ≥30kg/m^2): 24.8% (n=615). 90-day mortality for underweight patients was double that of obese patients (3.6% [n=3] vs 1.8% [n=11]), however, the small number of deaths precluded this observation from reaching statistical significance. The effect of these variables was more apparent when examining long-term outcomes. Median follow-up time for the cohort was 76 months (IQR 40-100) and the estimated median overall survival was 91 months (87-95 months). The Kaplan-Meier curve showed a clear survival difference for underweight patients, with the remaining BMI-stratified cohorts more closely grouped on the survival curve. Additionally, Cox regression analysis revealed that reduced pre-operative serum albumin levels were independently associated with reduced overall survival for this cohort (HR 0.971, 95% CI 0.957-0.985, p<0.001).

Examining the impact of variables on long-term outcomes has the ultimate aim of improving prognostication. This is one of the principle aims of the IASLC, which regularly updates its TNM staging system. We have used a cohort of 1264 patients with pathologically confirmed stage II NSCLC from our dataset to examine the impact of reclassifying T1N1 lung cancer from stage IIB to stage IIA as per the TNM9 proposals. 90-day mortality was 4.7% (n=59) and the estimated median overall survival was 49 months (44-54 months) with a median follow-up time for the cohort of 49 months (18-84 months). Current staging (TNM8) showed a significant survival difference between the IIA cohort (n=252) and the IIB cohort (n=1012) (p=0.008). However, T1N1 patients had significantly better survival than their current IIB counterparts (both T2N1 [p=0.003] and T3N0 [p=0.001]). Furthermore, these two other IIB subgroups (T2N1 and T3N0) had similar survival when compared to each other (p=0.780). When T1N1 was compared to T2bN0 (currently the sole subgroup within IIA), survival was again similar (p=0.783). Finally, when T1N1 was reclassified as IIA, the survival analysis confirmed that IIA (T1N1 & T2bN0, n=460) retained superior survival when compared to IIB (T2N1 & T3N0, n=804) (p<0.001). Our granular dataset with accurate pathological staging and available long-term outcomes has demonstrated that within a large contemporary UK cohort, reclassification of T1N1 from IIB to IIA is an improvement to the current staging system and should allow for more accurate prognostication for patients with stage II NSCLC.

Marcus Taylor

Ongoing progression in thoracic surgery means that contemporary research within the specialty remains relevant and stimulating. We look forward to continued collaboration with other centres across the UK to spearhead research and improve patient outcomes.

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TERUMO CARDIOVASCULAR

Improving Patient Outcomes through Endoscopic Vessel Harvesting (EVH)

Over the past three decades, Endoscopic Vessel Harvesting (EVH) has emerged as a promising technique in the field of coronary revascularization. After it was first introduced in the 1990s[1], the adoption of EVH has been marked by pioneering studies which initially raised concerns around vein graft quality and increases in major adverse cardiac events (MACE)[2]. However, more recent randomized controlled trials, multicenter investigations[3–8], and guideline recommendations[9–11] strongly support EVH as a technique for improving patient outcomes.

Today, an overwhelming amount of clinical studies highlight the substantial benefits of EVH over OVH, showing it provides significant patient advantages and cost savings without compromising conduit quality or long-term clinical outcomes.

Protect Vessel Quality with the VirtuoSaph Plus™ EVH System

Ensuring optimal patient outcomes during CABG, means protecting your most valuable asset - your harvested graft. By incorporating EVH into your practice, you can set new standards for patients requiring vein or arterial grafts for coronary revascularization.

Clinically proven to preserve the structural and functional viability of saphenous vein endothelium[22], the VirtuoSaph™ Plus EVH System supports you to achieve optimal graft quality for your patients. Designed to harvest both saphenous vein and radial artery grafts, the VirtuoSaph™ Plus EVH System is a tool for safe, consistent, and efficient Endoscopic Vessel Harvesting.

Equivalent Conduit Quality and Graft Patency

With EVH, there are no significant differences in mortality, repeat revascularization, or myocardial infarction rates compared to OVH.[3-5]

Reduced Risk of Wound Complications

Due to the smaller incision, EVH significantly reduces the incidence of wound complications compared to OVH and bridging techniques.[1, 5-7.]

Faster Recovery and Lower Readmission Rates

Lower rates of wound complications lead to reduced post-operative care needs, shorter hospital length of stay and lower readmission rates for follow-up treatments.[1, 12, 13]

Improvements in Patient Comfort and Satisfaction

Patients generally benefit from less post-operative pain, earlier mobility and quicker return to normal activities, improved cosmetic outcomes as well as an enhanced overall experience. [1, 6, 12, 14-16]

Overall Cost Savings

EVH has the potential to reduce overall treatment costs, as lower costs further down in the treatment pathway outweigh the initial higher investment for the EVH equipment. Multiple studies have shown that EVH is cost-effective compared to OVH.[7, 12, 17-21]

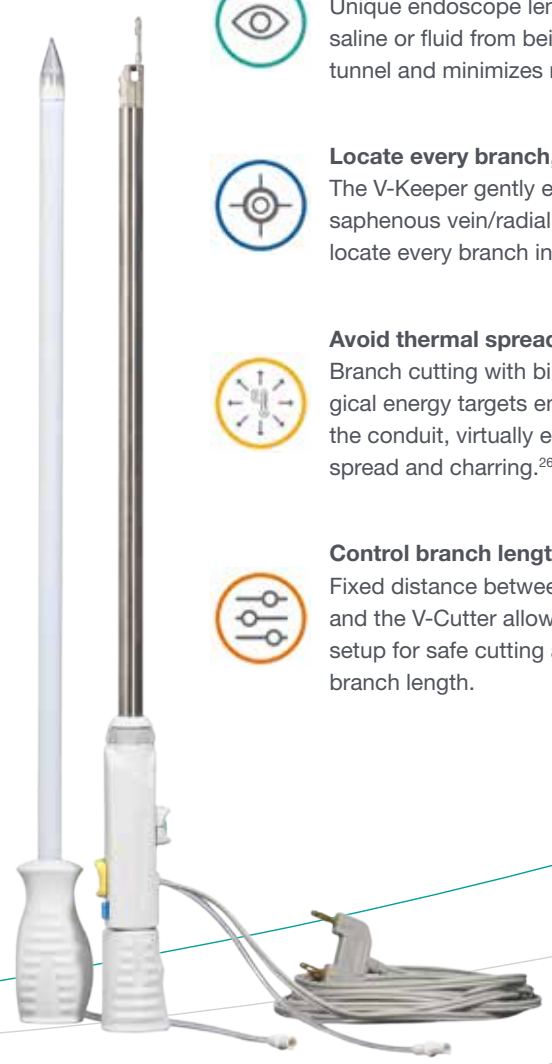
Reduce patient risk
Open CO_2 with distal insufflation reduces the risk of CO_2 embolism and intraluminal thrombus.[23–25]

Visualize without compromise
Unique endoscope lens wiper prevents saline or fluid from being added into the tunnel and minimizes manipulation.

Locate every branch, every time
The V-Keeper gently encapsulates the saphenous vein/radial artery in place to locate every branch in just one pass.

Avoid thermal spread
Branch cutting with bipolar electrosurgical energy targets energy away from the conduit, virtually eliminating thermal spread and charring.[26]

Control branch length
Fixed distance between the V-Keeper and the V-Cutter allows optimal branch setup for safe cutting and consistent branch length.



Build Expertise, Gain Experience & Develop Muscle Memory

At Terumo we understand the importance of a comprehensive, structured training approach. Our focus is for harvesters to achieve optimal vessel quality and positive patient outcomes as effectively and efficiently as possible. Whether you are a novice or an expert harvester, Terumo's EVH training program is designed to meet your individual needs.

Discover our broad range of training options, including observations and trainings at our Centers of Excellence, use of proprietary hands-on simulation materials, and access to an extensive library of resources.

Our newly launched 'EVH Competency Document' outlines a structured training approach to ensure optimal support and success during your EVH learning journey!

Get started today and visit the Terumo Cardiovascular booth #18-19 for further information and a hands-on demo.

Scan the QR-Code to access our variety of training and learning resources on EVH.

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Arthrex

Platelet Rich Plasma reduces the incidence of deep sternal and sternal surgical wound infections

The routine use of platelet rich plasma (PRP) reduces the incidence of deep sternal wound infections (DSWIs) and sternal surgical wound infections (SSWIs), resulting in absolute risk reduction of 7.41%, according to a paper by Patel *et al*[1]. The study, which included 2,000 patients, concluded that the application of PRP during surgical closure is safe, significantly reduces postoperative infection rates in the treatment group and appears to reduce overall costs.

The study's authors from Division of Cardiothoracic Surgery, University of Utah School of Medicine (Salt Lake City, UT, USA), noted that sternal wound complications such as dehiscence and infection following median sternotomy is present in 0.2 to 8% of patients undergoing cardiac surgery[2] and treatment entails extended hospitalisation, long-term antibiotics, multiple operative procedures and high cost, as well as remaining a significant source of mortality.

Several therapeutic strategies such as debridement, continuous antibiotic irrigation, and vacuum-assisted closure therapy procedures have been used to decrease the incidence of DSWI related mortality[3-6]. However, the authors noted that a preventative therapeutic strategy has not yet been developed.

Platelet Rich Plasma

The topical application of autologous platelet rich plasma (PRP) is known to promote earlier wound healing in a variety of settings. Jameson[7] reported that platelets are attracted to a wound or injury site stimulating the clotting and healing cascades. During the inflammatory phase of tissue healing, activated platelets release specific growth factors, such as transforming growth factors-beta, vascular endothelial growth factor and epithelial growth factor. These factors stimulate cell proliferation, migration, differentiation, and matrix synthesis. These same factors can affect chondrocyte metabolism, chondrogenesis, and improve bone healing and regeneration. When platelet-rich plasma is mixed with an activator, a platelet gel is formed. The application of a platelet gel not only accelerates the healing process but also results in a marked decrease in post-surgical swelling and bruising, reduction in surgical site pain, elimination of drains, and acceleration of bone growth and soft tissue healing.

Despite several papers reporting the advantages of using the topical application of PRP for improved postoperative outcomes following median sternotomy[8-10], most were under-powered and did not include a financial analysis of the potential cost savings associated with the use of PRP therapy.

Therefore, the University of Utah School of Medicine researchers sought to determine the incidence and costs of sternal wound complications in 1,000 consecutive patients undergoing sternotomy for cardiac surgery procedures who received standard of care sternal closure plus PRP (composed of autologous platelet rich plasma, calcium and thrombin applied to the sternum at the time of closure) and compared them to 1,000 patients who standard of care sternal closure alone (preoperative intravenous antibiotics within 60 min of the procedure and protocol driven glycaemic management), from December 2009 to January 2013.

It is important to note that this was the first large clinical study to include all patients undergoing median sternotomy including emergencies, reoperations, ventricular assist device implantations, heart transplants, aortic dissections and standard operations (i.e. coronary artery bypass grafting and valve repairs or replacements). Readmissions, sternal wound infections and costs were independently verified via the hospital infection committee.

The diagnosis of DSWI was made in patients who developed one or more of the following: [1] positive culture of mediastinal tissue or fluid; [2] clinical evidence of mediastinitis during sternal reoperation; or [3] chest pain, sternal instability, purulent discharge from the mediastinum associated with a positive blood culture.

Patients in the PRP group had 52mL of whole blood drawn prior to surgery via a central venous line and mixed with 8mL of the anticoagulant citrate dextrose formula A. The anticoagulated blood (60 mL) was then processed to make platelet rich plasma. At the time of the study, the cost of the PRP kit was US$385.00. The automated processing time was 15 minutes and 6mL of PRP was produced for each patient. The prepared PRP was applied with calcium chloride and thrombin topically onto the exposed sternal edges and the subcutaneous tissue of the chest wound at the time of closure with 6mL PRP to 1mL calcium/thrombin ratio.

Outcomes

Two thousand consecutive patients completed the study (1,000 in the PRP group and 1,000 in the control group). The researchers reported significant differences between the two groups with age and body surface area being lower in the control group and more VAD implantations/heart transplants, emergency operations and greater blood transfusion usage in the PRP group.

Compared to the control group, the use of PRP reduced the incidence of deep sternal wound infection from 2.0 to 0.6 %, superficial wound drainage from 8.0 to 2.0 % and the hospital readmission rate within 30 days of operation from 4.0 to 0.8. The time to infection post-surgery demonstrated that all infections in the PRP group occurred in the first two months post-surgery, whereas in the control group, infections occurred up to four months post-surgery (Figure 1).

In addition, there was a significant reduction in the overall actual cost in the total management of deep and superficial wounds (US$1,256,960 in the control group vs US$593,791 in the PRP group). Despite the significant overall reduction in cost in the management of sternal wounds, the researchers found that the number of patients needed to treat to see a benefit is 71 (with 95 % confidence interval 41.8 to 244.5) with a cost of US$27,000 to prevent one deep sternal wound infection and cost break-even point.

However, with superficial sternal wounds the number of patients needed to treat to see a benefit is 17 (with 95 % confidence interval 12.7 to 24.3) with a cost of US$6417 to prevent one infection but cost break-even point does not exist. The overall number of patients needed to treat to see a benefit is 14 (with 95 % confidence interval 10.5 to 18.9) with a cost of US$5203 to prevent one overall wound infection and cost breakeven point.

As deep wound infections are more expensive than the cost of PRP, the authors stated that if one is prevented, PRP sees a cost advantage. However, the number of patients needed to be treated (NNT) and to break even benefit is demonstrated only in the NNT for deep wounds and combined. Because the cost of treating the superficial wounds is so low, PRP is always more expensive. If the NNT was more like 3.5 instead of 17 for superficial wounds, then PRP would be less costly as soon as the first infection occurred.

"PRP is a safe, simple and reproducible therapy that appears to provide both a clinical and a financial benefit to patients undergoing sternotomy for cardiac surgery," the authors concluded. "The addition of PRP to all sternal closure after cardiac surgery brings value by improving care and reducing costs."

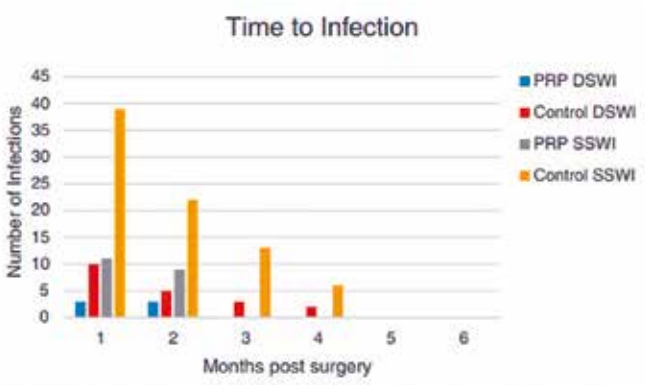

Fig. 1 Time to infection post-surgery. The time to infection post-surgery was reported as number of patients with infections. PRP DSWI- platelet rich plasma deep sternal wound infection, Control DSWI – control with deep sternal wound infection, PRP SSWI- platelet rich plasma superficial sternal wound infection, Control SSWI – control with superficial sternal wound infection

Figure 1: Waiting list for cardiology services and cardio-thoracic treatment in England (in 1000's). Source: NHS England - consultant led referral to treatment waiting times, March data 2024)

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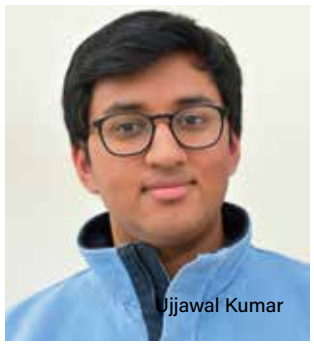
A novel sternal closure technique in cardiac surgery: Polyethylene suture tapes vs steel wires for enhanced outcomes and patient recovery

Continued from page 1

Our findings demonstrated lower complication rates with the suture tape system. Overall sternal wound infection rates were significantly reduced (1% vs 5%), and notably, we observed no cases of sternal dehiscence in the suture tape group compared to 5% in the wire group. Patient comfort was also significantly improved – at both 14 and 30-day follow-up, significantly fewer patients in the suture tape group reported significant pain, compared to 9% and 5% respectively in the wire group. Hospital mortality was also significantly lower in the suture tape group (1% vs 7%).

An intriguing finding was that the wire group exhibited significant variation in closure times and often required additional protective measures such as support vests and negative pressure dressings, particularly in high-risk patients such as obese or diabetic patients. The financial implications are also compelling. Despite higher initial costs for the tapes themselves, the suture tape system eliminated the need for additional sternal protection adjuncts, resulting in potential savings of up to USD 985 per high-risk patient. The system's consistent performance and significantly reduced closure time suggest both clinical and operational benefits.


Ujjawal Kumar

Join us at 09:32 am on Tuesday 18th March in the Cardiac: General 2 session as we explore these findings, discuss the potential need for new sternal closure approaches, and debate how we can optimise outcomes for all cardiac surgery patients – particularly those at highest risk for sternal complications.

Our experience suggests that this novel approach could represent a significant advancement in cardiac surgical care, potentially setting a new standard for sternal closure technique.

Mechanical Circulatory Support Carrick **09:00-10:30** Tuesday, 18 March, 2025

The implementation of prehabilitation on patients on the urgent heart transplant waiting list

Eireann Murray Golden Jubilee National Hospital, Glasgow,

Those with heart failure on the urgent heart transplant list can wait months for a transplant as inpatients. This provides an ideal teachable moment and opportunity for prehabilitation to optimise patients for heart transplant. The aim was to implement a physiotherapy prehabilitation programvme for those on the urgent heart transplant waiting list and evaluate post-operative outcomes.

Methods

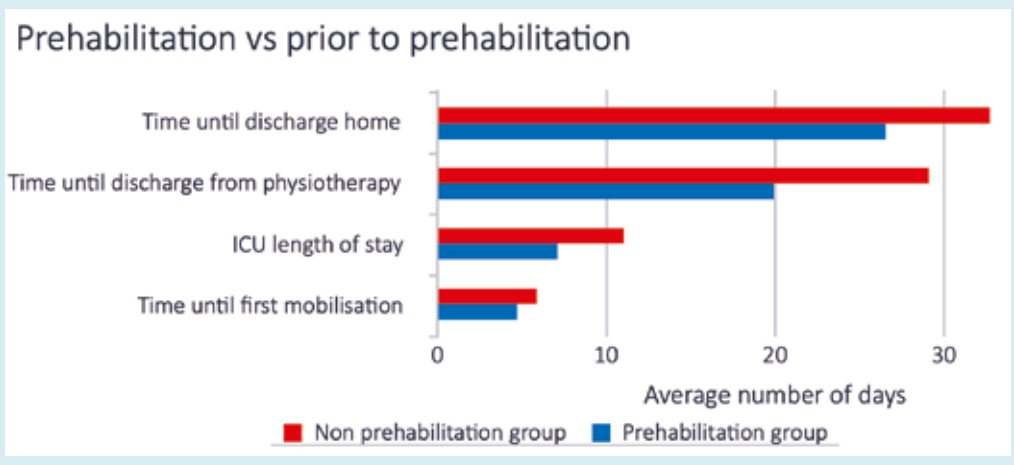
Participants were assessed and issued with a prehabilitation programme within two days of urgent listing for a heart transplant. This included an exercise programme, a step programme and an inspiratory muscle trainer. Their programme was reviewed and adjusted weekly until transplant. Post-operative outcome measures were recorded and were compared retrospectively with those who underwent urgent heart transplants prior to the implementation of prehabilitation.

Results

Twenty patients were included. Ten patients were part of the prehabilitation group (p) and ten who didn't have prehabilitation input (np). No adverse events were reported with the introduction of prehabilitation. Time until first mobilisation (4.72 days (p) vs 5.88 days (np)), ICU length of stay (7.09 days (p) vs 11 days (np)), time until discharge from physiotherapy (19.90 days (p) vs 29.10 days (np)) and time until discharge home (26.54 days (p) vs 32.70 days (np)) all showed improvement with the implementation of prehabilitation.

Conclusion

This was a small pilot study. However, the results are encouraging. A prehabilitation programme for patients on the urgent heart transplant waiting list is safe and effective. Prehabilitation demonstrated improved post-operative outcome measures when compared with those who underwent heart transplants



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Improving Quality in Thoracic Surgery Sidlaw **09:00-10:30** Tuesday, 18 March, 2025

Are operation notes written to a high standard in thoracic surgery? A single centre audit.

Jasmine Bawa, Feba Peter, Jeesoo Choi
Royal Brompton Hospital, London, UK

Introduction

For new surgical trainees, it is often difficult to know what to include in an operation note, as this is not commonly included in medical school or Core Surgical Training curriculums. Many trainees are unaware that the Royal College of Surgeons (RCS) provides guidance on what surgeons should include in operation notes1. Our aim was to review whether operation notes for Thoracic Surgery in our centre follow RCS guidance and include all recommended datapoints at a standard of 100%.

Methods

We obtained 47 Thoracic Surgery operation notes from January 2024 through the Epic electronic healthcare record (EHR) at the Royal Brompton Hospital and assessed them against RCS guidance (Table 1). Our final outcomes were the percentage of operation notes that included each datapoint in Table 1. Due to difficulty in accurate extraction, data was not collected for 'any problems/ complications,' 'any extra procedure performed' or 'antibiotic prophylaxis where applicable.' After initial data collection, educational posters were created and posted around workspaces in theatres and in the coffee room. These consisted of a clear checklist focusing on the datapoints that were regularly being missed out of operation notes in our centre. The department was informed about the posters and encouraged to read the RCS guidance for operation notes. A second audit cycle collected data from forty-eight Thoracic Surgery operation notes in January 2025.

Results

In initial data collection, 100% of operation notes included date, time, name of operating surgeon and anaesthetist, operative procedure, operative findings, details of tissue removed, added or altered and the surgeon's signature. These datapoints maintained 100% compliance in the second cycle of data collection. The inclusion of most of the remaining datapoints in the operation notes improved after the intervention, as demonstrated in Figure 1. However, none of the operation notes before or after the intervention stated whether the procedure was elective or emergency. Furthermore, the inclusion of a detailed postoperative note was static at 88-89% pre- and post-intervention.

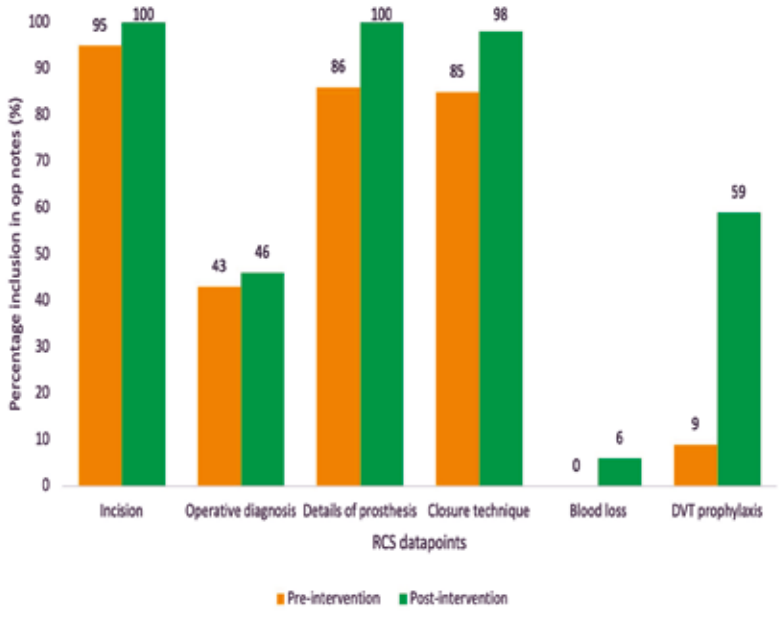

Figure 1: Percentage inclusion of select datapoints in Thoracic Surgery operation notes pre- and post-intervention

Table 1: Royal College of Surgeons guidance on the datapoints that should be included in an operation note. The datapoints with white text were not extracted

Date and time	Any extra procedure performed and the reason why it was performed
Elective/emergency procedure	Details of tissue removed, added or altered
Names of the operating surgeon and assistant	Identification of any prosthesis used, including the serial numbers of prostheses and other implanted materials
Name of the theatre anaesthetist	Details of closure technique
Operative procedure carried out	Anticipated blood loss
Incision	Antibiotic prophylaxis (where applicable)
Operative diagnosis	DVT prophylaxis (where applicable)
Operative finding	Detailed postoperative care instructions
Any problems/complications	Signature

> Introduction of the checklists substantially improved inclusion of most other datapoints, such as DVT prophylaxis plan and details of incision or closure techniques.

Conclusion

The Epic EHR used in our Trust auto-generates operation notes from information already provided in patient records, which ensured many recommended datapoints were automatically included and compliance was maintained at 100%. Introduction of the checklists substantially improved inclusion of most other datapoints, such as DVT prophylaxis plan and details of incision or closure techniques. However, there are still improvements to be made in some domains (inclusion of emergency/ elective procedure, operative diagnosis, approximate vblood loss) to reach a target of 100% across all datapoints.

Detailed operation notes with clear post-operative plans are essential to ensure safe handover of care from operating teams to recovery and ward teams, as well as reduce the incidence of post-operative complications. The introduction of simple checklists like this one is an effective way to improve the quality of operation notes in Thoracic Surgery.

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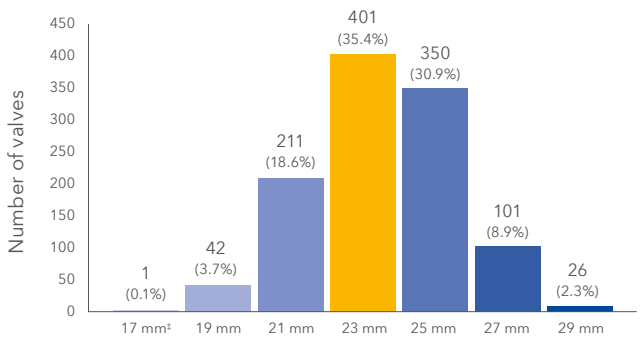
Avalus™ Bioprosthesis

PERIGON Pivotal Trial
7-year clinical update

The PERIGON Pivotal Trial[1] was designed to evaluate the safety and effectiveness of the Avalus stented bovine pericardial bioprosthesis in a patient population undergoing surgical aortic valve replacement. A total of 1,132 patients were implanted with the Avalus valve, with 268 from Canada, 475 from Europe, and 389 from the United States. The pivotal trial had a planned duration of 5 years, which was extended to 12 years to continue data collection. Nineteen sites agreed to participate in long-term follow-up, and 576 patients were re-consented. At 7 years, the survival rate was 83%, and the rate of freedom from structural valve deterioration (SVD) and severe hemodynamic dysfunction (SHD) requiring reintervention was 99%.†

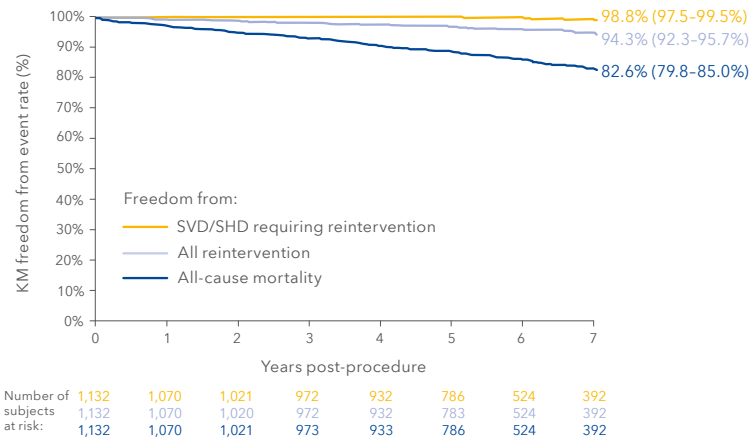
Valve size distribution



‡ The Avalus valve size 17 mm is approved for commercial use only in Japan.

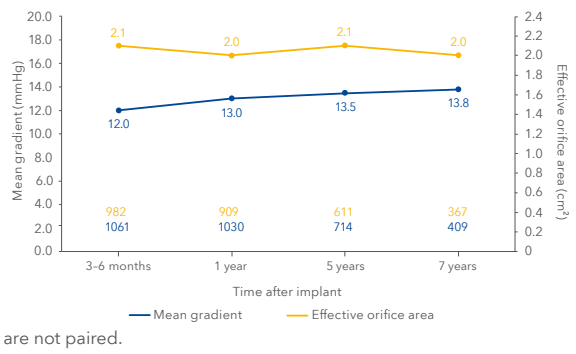
Kaplan-Meier survival analysis

Freedom-from-event rate for SVD/SHD requiring reintervention, all reintervention, and all-cause mortality



Echocardiographic findings

All valve sizes§



§ Data are not paired.

Baseline demographics

Patient characteristics	N = 1,132
Age, years	70.1 ± 8.9
Male sex	75.4%
BSA, m^2	2.0 ± 0.2
STS risk of mortality	2.0 ± 1.4%
NYHA class I/II	58.2%
NYHA class III/IV	41.8%
Atrial fibrillation	10.6%
Coronary artery disease	43.8%

Procedural data

Procedural characteristics	N = 1,132
Primary indication	
Aortic stenosis	84.3%
Aortic regurgitation	5.7%
Mixed AS/AR	9.5%
Failed prosthesis	0.5%
Surgical approach	
Median sternotomy	79.8%
Less invasive approach◊	20.2%
Concomitant CABG	32.2%

† SVD was defined as a confirmed intrinsic abnormality causing stenosis or regurgitation. SHD was defined as severe stenosis and/or severe transvalvular regurgitation and/or reintervention without adequate evidence to adjudicate SVD, nonstructural valve dysfunction, endocarditis, or valve thrombosis.
◊ Hemisternotomy or right thoracotomy. For 1.2% of patients, the surgical approach was classified as "other."

Working Together to Enhance Patient Care Pathways Moorfoot **13:30-15:00** Tuesday, 18 March, 2025

Nurse-led Enhanced Recovery Unit significantly improves flow of cardiac surgical patients

Jonee Dorinila, Michelle Barfoot, Erin Russell, Mike Hoy, Jason Ali Royal Papworth Hospital, Cambridge, United Kingdom

In May 2024, the Royal Papworth Enhanced Recovery Unit (ERU) was opened. The ERU was developed in response to many challenges being faced by our surgical unit. Increasing waiting lists and increased numbers of cancellations due to competing demands for beds in the ITU from our transplantation, respiratory ECMO and cardiology services, prompted the need for change to protect our cardiac surgical activity.

In response to these challenges, a decision was made to establish a nurse-led enhanced recovery unit (ERU). The principle aims were to ringfence beds for cardiac surgery and to develop a team of nurses focused on immediate postoperative cardiac surgical management with the goal of enhancing early recovery and improving cardiac surgical flow. The goal was to establish a standalone unit from within our current Critical Care commissioned capacity of 36 beds – essentially dividing our critical care area. Although the overall workforce establishment was not increased, staff were recruited to work in the ERU, focused on the early postoperative recovery of cardiac surgical patients, Table 1.

Table 1

Quality outcomes	Staff recruitment and retention	Operational
Improving patient flow in line with safer bundle	Opportunities for staff/responding to staff preferred areas of work	Streamline patient pathway
Ring fencing beds for elective surgical activity leading to reduction in patient waiting times	Optimising recruitment of staff with generic CCA skills	More efficient scheduling, reduced patient cancellations, reduction in rescheduling of elective theatre lists
Improved patient experience	Empowering nursing staff/Responsive Nurse led Care	Improved performance
Enhanced recovery pathway leading to better outcome and reduced length of stay	Smaller team allowing for enhanced team support and feeling of belonging. Overall improvement in morale	More efficient use of beds

Over a period of three months, our ERU went from concept to reality with operational team guidance. With the oversight of consultant surgeon and intensive care clinical leads, our nurse-led ERU was developed. Each shift has a 'cardiac surgical specialist nurse' who oversees the immediate postoperative management of patients in the ERU, making autonomous decisions, for example, trouble shooting common problems, stopping sedation, timing of extubation and removal of drains, working within our new ERU protocol and closely with the medical teams when required.

The Enhanced Recovery Unit opened on 13th May 2025 and has been expanded from a 5 to a 10-bedded unit. As of the end of January over 1,000 patients have been admitted, with 86% being discharged to the ward within 48 hours. The readmission rate to intensive care is <3%. In the four months prior to ERU opening, there were 57 elective patient cancellations, compared with only five in the four months after opening. Our surgical capacity has increased – with the same number of total critical care capacity. As a result, our waiting lists are falling. The morale of nursing staff in the unit is very high and there is a defined route for career progression.

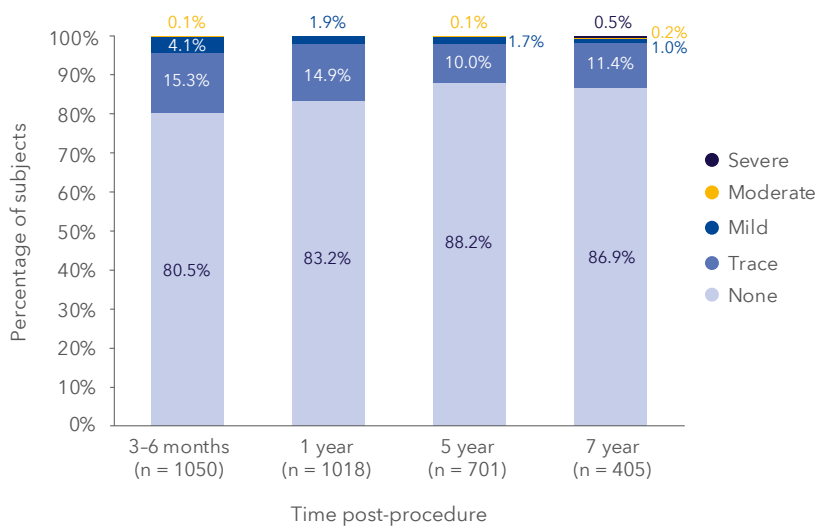
The opening of the Royal Papworth Enhanced Recovery Unit in May 2024

Echocardiographic findings, cont.

Transvalvular regurgitation

All valve sizes¶

Excellent and stable hemodynamics[1]



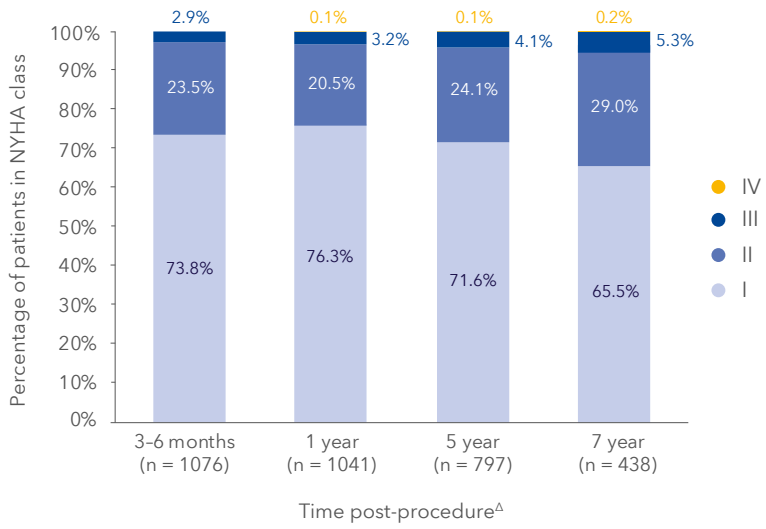
¶ Data are not paired.

NYHA classification by visit

NYHA classification

All valve sizes#

95% of subjects reported NYHA class I or II at 7 years[1]



Data are not paired.
Δ Baseline NYHA: class I, 11.1%; class II, 47.1%; class III, 39.8%; and class IV, 1.9%.

1. Sabik JF III, Rao V, Moront MG, et al. 7-Year follow-up of >1100 patients who received a contemporary pericardial aortic bioprosthesis. Presented at: 38th Annual Meeting of the European Association for Cardio-Thoracic Surgery; October 9-12, 2024; Lisbon, Portugal.

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Indications: The Avalus bioprosthesis is indicated for the replacement of diseased, damaged, or malfunctioning native or prosthetic aortic valves.

Contraindications: None known.

Warnings/Precautions/Adverse Events: Only physicians who have received proper training in valve replacement should use this device. Accelerated structural deterioration due to calcific degeneration of bioprosthesis may occur in: children, adolescents, young adults, and patients with altered calcium metabolism (e.g., chronic renal failure, or hyperparathyroidism). Adverse events can include: angina, cardiac dysrhythmias, endocarditis, heart failure, hemolysis, hemolytic anemia, hemorrhage, infection other than endocarditis, transvalvular or paravalvular leak, myocardial infarction, nonstructural valve dysfunction (leaflet entrapment/impingement, obstructive pannus ingrowth, suture dehiscence, inappropriate sizing or positioning, or other), pericardial effusion or tamponade, prosthesis regurgitation, prosthesis stenosis, prosthesis thrombosis, stroke, structural valve deterioration (calcification, leaflet tear or perforation, or other), thromboembolism, tissue dehiscence, and transient ischemic attack. These complications could lead to reoperation, explant of the bioprosthesis, permanent disability, or death.

Caution: Federal law (USA) restricts these devices to sale by or on the order of a physician.

For a listing of indications, contraindications, precautions, warnings, and potential adverse events, please refer to the Instructions for Use.

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Working Together to Enhance Patient Care Pathways Moorfoot **13:30-15:00** Tuesday, 18 March, 2025

Introduction of pre op carbohydrate loading to an established thoracic surgery ERAS programme: A patient satisfaction survey

Lisa Smith and Carol Holder Royal Papworth Hospital NHS Foundation Trust, Cambridge

Enhanced recovery after surgery (ERAS) programmes are well established in all areas of surgery. In our thoracic surgical population, carbohydrate loading was one of the elements of the programme not offered until 2023. We now provide carbohydrate drinks to patients with the expectation of shorter admission stays and reduced post op symptoms such as nausea.

As part of ERAS we commenced preoperative carbohydrate loading for all non-diabetic thoracic surgery patients. Each patient was given 6 drinks with instructions at preadmission clinic and advised to take 4 the day before surgery and 2 on the morning of surgery with verbal and written information.

A patient satisfaction survey was created to ask 5 specific questions about their experience when telephoned post discharge, these questions were created to be patient friendly and easily understandable.

Since we introduced carbohydrate loading there have been several positive and important benefits observed. At the preadmission clinic the patients have been keen to be involved and take some ownership of their preparation for surgery which has reduced their anxiety with having something to focus on. The patient satisfaction survey of 30 patients was completed which highlighted some important factors- the patients had less nausea and vomiting so reduced antiemetics used, they had increased energy to do physiotherapy and walking, leading to reduced length of stay.

The introduction of carbohydrate drinks to thoracic surgical patients has shown positive outcomes with a reduction in length of stay and post op nausea and vomiting. We will continue to provide drinks to this patient group with a view to expanding to other specialities.

CareCube - the key to true lab and theatre efficiency

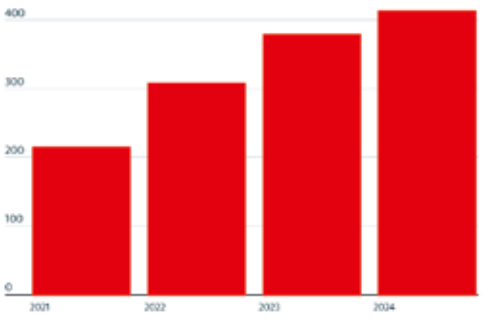

Figure 1: Waiting list for cardiology services and cardio-thoracic treatment in England (in 1000's). Source: NHS England - consultant led referral to treatment waiting times, March data 2024)

In May 2024, the British Heart Foundation (BHF) revealed that waiting lists for cardiology services and cardio-thoracic treatment in England were at a record high reaching 414,596 at the end of March 20241 (Figure1). In addition, the number of people waiting longer than a year for heart tests and treatments has risen to 10,893.

With ever increasing pressures and finite resources placing more stress on cardiology and cardio-thoracic services in the UK, it has never been more apparent that delivering improved productivity and operational efficiencies can make a huge impact upon the number of patients treated, whilst maintaining high safety standards. Cardiac centres are facing more complex cases and with a mixture of elective, urgent and genuine emergency cases, procedure lists are continually changing.

The solution

CareCube, a company committed to the improvement of lab and theatre efficiency, has specifically designed a framework for clinical teams that simplifies and centralises complex scheduling and tracking of patients. Real-time procedure scheduling from CareCube communicates these changes to all staff and their patients, across all clinical areas, from wards to labs and theatres, every minute of every day. The framework has been shown to support patient safety, reduce human error and make the best use of resources – delivering the right treatment to the right patient, at the right time, for every patient, every time.

The networked, integrated platform supports improved efficiency by supporting all teams involved in the organisation and delivery of patient care. Individuals from multiple locations and departments, with varying roles, offering a range of services, each have unique needs. These are all accommodated within CareCube, allowing practitioners to see precisely what they need to see.

"Heart centres rely on many different players across the pathway connecting to deliver safe, efficient outcomes; we are delighted to see the impact CareCube delivers in both theatres and labs, enabling real-time, collaborative work," explained CareCube CEO, Tim Coutts.

Modules

The platform is delivered through a series of interactive modules tracking each aspect of the patient journey, while informing and updating every member of the multi-disciplinary team in real time.

The six modules include:

- The 'Checklist' module is a series of linked interfaces delivered through touch panels in the lab. All records are exported to electronic patient records (EPR) and available in the 'Reporting' module. Case issues can be flagged to lab user groups for continuous open-loop reporting.
- Connected to the Patient Administration System (PAS), the 'Scheduler' module allows multiple access planning of lists and dynamic management throughout the day, as the case-mix evolves. Continuous structured display of all key information, with a built-in facility that accommodates rich clinical data. The Scheduler includes 14 different procedure states – tracking the whole patient journey - from arrival to final discharge, including deferrals.
- The 'Reporting' module allows users to easily access their own reporting suite of data within CareCube such as lab utilisation, lab turn-around, specific case numbers, checklist audits, incident reporting and more. This module is available in both dash-board and bespoke format.
- The 'Status' module gives a structured approach to planning care over a complete admission episode. The real-time interaction with Scheduler gives two-way dynamic updates through the day, eliminating the need for many inter-departmental calls whilst optimising the patient journey.
- The admin console ('Set Up' module) enables local configuration of all staff, locations, procedures, transport and users. Because CareCube is deployed as a complete virtual server, hosted on the hospital's existing network infrastructure, it connects to your hospital PAS and EPR in real-time, attaching documents such as 'Checklist' created in CareCube. The back-end datasets are accessible by the local IT team to query and report on, and for connection to other hospital infrastructure.
- The 'Rotas' module is fully integrated to CareCube's framework enabling efficiency and planning (such as adding other teams for TAVI/GA cases), with consultant lab rota's and on-calls prepared, managed and displayed or alternatively, managed through a link to the current excel system.

CareCube – for the whole team

Regardless of location or role, CareCube is used by the whole team - from consultants, and lab managers, to radiographers, inpatient/day ward co-ordinators, waiting list teams, nurses, secretaries and more – all through one platform, with real-time updates that are communicated to all, including:

- The cardiologist platform provides comprehensive and real-time patient information, serving as a centralised hub for all relevant data and activities. This enhances communication between both patients and the clinical team, streamlining the exchange of vital information. The system ensures effortless data collection, recording, and exporting to patient records, simplifying the management of essential medical data.
- Nurses benefit from a comprehensive system that provides precise real-time patient data. This enables enhanced communication among all staff members, streamlining operations and freeing up valuable time for nurses to dedicate more attention to patients, ensuring a better and more personalised care experience. The platform also facilitates ward teams in tracking patient progress effectively, accommodating planned, acute, and emergency situations seamlessly.
- A manager's role is to optimise the utilisation of existing resources, leading to increased efficiency and improved patient experience. The platform offers detailed reports that can be customised as templates or tailored specifically for patients, departments, or procedure types, empowering you with valuable insights to make informed decisions.
- The improved communication channels ensure patients receive timely updates and vital information, reducing the need for prolonged waiting periods and creating a more efficient and pleasant healthcare experience.

Summary

All theatre and lab areas face similar challenges in terms of optimising both efficiency and safety protocols. Whilst there are underlying similarities between a cardiology lab, a cardiac theatre, a radiology lab and more, each has subtle but critical differences. CareCube accommodates these departmental-specific differences (nomenclature, bespoke procedure types, linked checklists). Centres can now utilise CareCube's platform across multiple departments within one underlying installation, bringing multiple benefits and economies of scale of purchase.

Case study

A retrospective analysis of data from three UK Regional cardiac centres in Blackpool, Leeds and Stoke, suggests that there may be the potential to perform additional cath lab activity within current overhead and staffing resource provision, by better utilising otherwise lost time by reducing unused sessions, late starts and turnaround time between cases. The findings were reported in the paper, 'A Retrospective Study Examining Pre-Pandemic Activity in Three UK Regional Cardiac Centers - Is There Potential for Improvement in the Efficient Use of Operating Facilities for Cardiology Procedures?' published in Cath Lab Digest.

Using data from 2019 (to avoid the impact of the COVID pandemic), the analysis was restricted to routine working hours. Each centre provided a structured download for all cath lab procedures, in spreadsheet format, with each row describing an individual procedure. Spreadsheets were obtained from institutional IT systems capturing data for scheduling or patient movement between clinical areas. The primary outcome measure was the proportion of available cath lab operating time during which a patient was present in a cath lab area.

The study's authors found that the median procedure duration time about 60 minutes and the calculated touch time values were 68%, 66%, and 48% for the three hospitals. Subsequently, the authors noted that there is potential for improved use of the cath lab facilities, perhaps treating more patients within existing real estate and staffing resources.

They also if a cath lab finished early, then potential for extra activity is lost. Unplanned overruns with late finishes can create different problems; for example, with staffing, coordination with day care ward closures, and in the management of emergency cases. The researchers noted that early finishes, late finishes, turnaround time between consecutive cases and days without any cath lab activity could be improved and would help maximise efficiencies.

In the cath lab environment, the researchers noted that there may be advantage in scheduling elective work for only a proportion of the working day to allow flexible accommodation of urgent and emergency cases. This real-time scheduling presents a specific challenge, and may involve adjusting plans and moving cases between lists to better accommodate the case load in the evolving reality of cath lab availability.

Furthermore, better planning and improved communication with ward areas can help to reduce late starts and turnaround time. Clear identification of the most appropriate 'first case' in terms of admission date and time, case preparation needs, and other logistics will reduce the potential for otherwise preventable delays.

"Future work is required to confirm our findings and to examine for change over time," the study's authors concluded. "Cardiac centres will need to collaborate to identify tools and best practice approaches to deliver improvement."

The paper, 'A Retrospective Study Examining Pre-Pandemic Activity in Three UK Regional Cardiac Centers - Is There Potential for Improvement in the Efficient Use of Operating Facilities for Cardiology Procedures?' published in *Cath Lab Digest*, can be accessed at:

https://tinyurl.com/2hyv7fvb

Reference

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Screening and Early Lung Cancer Management Fintry **15:30-17:00** Monday, 17 March, 2025

Using liquid biopsy as a diagnostic tool in lung nodules: A systematic review of health economic analyses

Ee Phui Kew[1,2], Liz Morrell[2], Anna Schuh[2], Preena Patel[1], Sarah Wordsworth[2] 1 Royal Brompton Hospital, London, United Kingdom. 2 University of Oxford, Oxford, United Kingdom

Background

A national targeted lung screening programme was introduced in the UK in 2023. Alongside with the increased use of chest computed tomography in routine medical practice, an increased finding of lung nodules is to be expected. Integrating liquid biopsy into the diagnostic pathway can potentially reduce the need for invasive investigations and lead to faster diagnosis. Liquid biopsy involves analysing the genomic and proteomic components of tumour cells from bodily fluid, such as circulating tumour cells, cell-free deoxyribonucleic acid (DNA), circulating tumour DNA, tumour educated platelets, tumour derived extracellular vesicles, and cell free ribonucleic acid. These tumour components are commonly collected from blood, but it can also be found in other bodily fluids such as urine and saliva. LB through blood testing is less invasive, offers quicker testing turnaround time and lower cost of sample isolation, compared to tissue biopsies. LB also has the advantage of detecting temporal tumour heterogeneity and spatial tumour heterogeneity. The objective was to investigate the cost-effectiveness of using liquid biopsy in lung cancer diagnosis through systematic review of the literature.

Methods

A systematic literature search was conducted on EMBASE, MEDLINE, Cochrane Library, HTA database, and Research Papers in Economics. Qualitative analyses were be used to combine the findings of the eligible articles. Areas of focus include the type of liquid biopsies such as circulating tumour DNA and cell free RNA, types of economic evaluations and health outcomes, decision analytic modelling, and the cost-effectiveness outcomes.

Results

Three studies with full economic analyses fulfilled all the eligibility criteria. Two studies focussed on lung cancer screening population while one study included all patients with indeterminate pulmonary nodules. Liquid biopsy biomarkers included were circulating genetically abnormal cells, Micro-RNA signature classifier, and a hypothetical biomarker with various sensitivity profiles. All studies demonstrated that integrating liquid biopsy into the lung cancer diagnostic pathway is cost-effective when compared against the current diagnostic pathway.

Conclusion

Liquid biopsy can lead to novel lung cancer diagnostic pathways, which could lead to either earlier diagnosis or cost-saving to the NHS.

Future work

New lung cancer diagnostic pathways with integration of liquid biopsy is warranted. The sensitivity profiles of the liquid biopsy tests (e.g. sensitivity, specificity, positive and negative predictive value) are essential in designing new diagnostic pathways. Following this, budget impact analysis of the new diagnostic pathways needs to be carried out, in order to fully understand the potential economic consequences of adopting liquid biopsy in lung cancer diagnosis, whether there could be reduced or increased costs, or negligible changes in costs, as well as estimating the impact on the NHS budget of the wide use of liquid biopsy in this clinical context.

Ee Phui Kew

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Contemporary Lung Cancer Management Fintry **13:30-15:00** Tuesday, 18 March, 2025

Intraoperative lung ultrasound (ILU) enhances the detection rate and prevents thoracotomy conversion during surgery for pulmonary nodules – A first-ever systematic review and meta-analysis

Aamir Amin[1], Cara Mohammed[2], Muhammad Ashir[3], Bardia Bahrami[1], George Doukas[1], Emma Beddow[1] 1 Harefield Hospital, London, United Kingdom. 2 Sangre Grande Hospital, Sangre Grande, Trinidad and Tobago. 3 Jinnah Sindh Medical University, Lahore, Pakistan

Left to right: Aamir Amin, Bardia Bahrami, George Doukas and Emma Beddow (Harefield Hospital)

Why we did it -

Originating from the use of endosonography in laparoscopic procedures, intraoperative lung ultrasound (ILU) has been a subject of research for over 30 years [1-9]. Conventional means of nodule localization include direct visualisation or palpation. However, the accurate localization of pulmonary nodules, particularly subcentimeter lesions, remains a challenge and misdiagnosis or missed nodules can lead to poor patient outcomes [10,11]. ILU has been shown to aid thoracic surgeons in visualizing nodules as small as a 4.0 mm fibrosarcoma metastasis [12]. Although multiple narrative reviews that explore this underutilised technique have been published, a systematic appraisal of the evidence has never been attempted till date.

How we did it -

In this PRISMA compliant review, we conducted a systematic literature search to help identify studies which explored the impact of ILU on primary outcomes including nodule detection rate, prevention of conversion to thoracotomy and lung deflation rates. Additionally, we looked into nodule detection time, total operative time, complication rates and margin accuracy. Calculating the pooled effects required the use of a random effects model and forest plots were subsequently created to display the outcomes using odds ratios (OR) and 95 % confidence intervals. We also used the leave-one-out method which enabled us to identify specific studies that contributed to the observed variations.

What we found -

A total of 15 studies with 554 patients were included in the study. The nodule detection rate was 93.2%, thoracotomy conversion was prevented in 29.1% patients and complete or satisfactory lung deflation was achieved in 95.5% cases – not precluding emphysema patients. The mean nodule detection time was 8.7 minutes and the total operative time was 103.4 minutes (range 73.4-153) with no significant prolongation of surgery or ILU-associated complications.

Why it's important -

Our study highlights the efficacy of ILU in localizing subcentimeter lesions and minimizing the need for conversion to thoracotomy. In comparison to CT-scans, which do not accurately reflect the conditions of a deflated lung, ILU provides real-time imaging without exposing patients to ionizing radiation and can help surgeons navigate around critical brochovascular structures. Although techniques such as 3D reconstruction, methylene blue staining, CT-guided marking for fluoroscopic imaging, closed vacuum aspiration and near-infrared imaging are being employed, they carry the risks of pneumothorax, pulmonary haemorrhage, hook wire dislodgement and require both CT and OR facilities. This study shows that the integration of ILU in lung nodule surgery offers a safe and efficacious alternative, particularly when coupled with thoracoscopy.

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Screening and Early Lung Cancer Management Fintry **15:30-17:00** Monday, 17 March, 2025

Timing matters: the critical role of early surgery in reducing non-small cell lung cancer progression

Ahmed Mandisha, Stamatina Koskolou, Mohammad Ibrahim, Kamran Inamdar, Md Kamrul Hasan, Joshua Samuel, Anfal Farah, Abdelhadi Isamil, Musab Mohammed, Tom Combellack, Malgorzata Kornaszewska, Ainis Pirtnieks, Vasilios Valtzoglou Cardiothoracic Surgery Department, University Hospital of Wales, Cardiff, United Kingdom

Introduction

Non-Small Cell Lung Cancer (NSCLC) remains the leading cause of cancer-related mortality worldwide. While surgical resection is the most effective curative treatment, delays in surgery can significantly impact patient outcomes. Our study aimed to assess whether delaying surgery increases the risk of disease progression and to identify a specific time threshold beyond which this risk rises substantially.

Study Overview

We conducted a retrospective cohort study at the University Hospital of Wales between April 2020 and April 2024, analysing 546 patients with Stage I-III NSCLC.

- Disease progression was defined as an increase in tumour size and/or stage between preoperative confirmatory testing (imaging or biopsy) and operative pathological findings.
- Time to surgery intervals were measured as the period from preoperative confirmatory testing to the scheduled surgery date.

Our statistical approach included Wilcoxon tests, logistic regression, and Youden's Index analysis to determine the impact of surgical delays on cancer progression.

Findings: how delays affect progression

Our data revealed a clear association between delayed surgery and cancer progression, particularly in Stage II NSCLC patients. Key findings include:

- Patients who experienced tumour progression had a median surgical delay of 50 days, compared to 37 days in non-progressing cases (p = 0.005).
- For every additional day of delay, the odds of progression increased by 3% (p = 0.02 in univariate analysis, p = 0.04 in multivariate analysis).
- A critical threshold was identified at 46.5 days – patients operated after this time had significantly higher progression rates.

Why is Stage II NSCLC most affected?

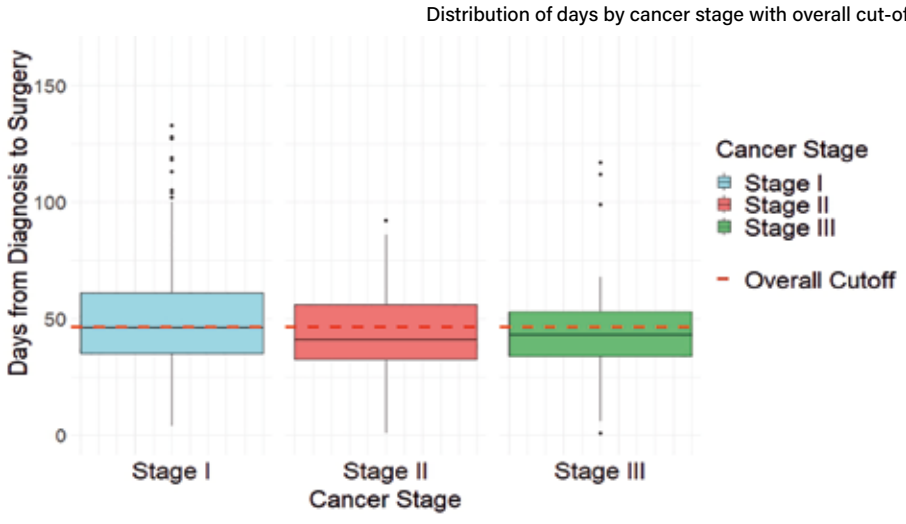
Our statistical analysis confirmed that Stage II tumours had the strongest association between surgical delays and disease progression. Delays beyond 46 days significantly increased the likelihood of tumour upstaging within this group.

Interestingly, Stage III patients did not show a strong association between delays and progression. Possible explanations include:

- Smaller sample size (only 70 patients).
- Minimal neoadjuvant therapy – Only 2 Stage III patients received it, leaving the rest untreated—raising progression risk and a false sense of stability at surgery.
- Potential micrometastases – 77% of these patients underwent surgery more than 30 days after their last imaging, meaning some may have already progressed to Stage IV but remained undetectable.

	Univariate			Multivariate			
Variable	**OR**	**95% CI**	**p-value**	**OR**	**95%CI**	**p-value**	
Days	1.00	0.99-1.01	0.53	1.00 1.01	0.99-	0.99	
Pre-op stage							
• Stage I	1.00			1.00			
• Stage II	1.23	0.80-	0.34	0.39	0.12-	0.12	
• Stage III	0.92	1.90	0.74	1.21	1.23	0.75	
• Stage IV	3.41	0.54-	0.08	0.32	0.39-	0.66	
		1.54			4.00		
		0.93-			0.0007-		
		16.0			51.5		
Days: Stage I	1.00	0.99-1.01	0.95		1.00		
Days: Stage II	1.03	1.00-1.05	0.02 **	1.03 1.05	1.00-	0.04**	For every day passing, the odds of progression increase by 3%
Days: Stage III	0.99	0.97-1.01	0.42	0.99	0.97-1.01	0.51	
Type							
• Adeno	1.00			1.00	1.00		
• Squamous	1.00	0.68-	0.99	1.01	0.68-	0.96	
• Large	0.92	1.46	0.89	0.98	1.50	0.97	
• Carcinoid	0.64	0.23-	0.37	0.67	0.25-	0.43	
• Other	0.98	3.27	0.99	1.17	3.51	0.80	
		0.22-			0.22-		
		1.65			1.78		
		0.68-			0.33-		
		1.46			3.84		

Distribution of days by cancer stage with overall cut-off point



Clinical Implications: The Need for Early Surgery

Stage II tumours showed the strongest link between surgical delay and progression. Without neoadjuvant therapy, these tumours remained untreated, making delays beyond 46 days significantly increase the risk of upstaging and disease progression.

To achieve this, we recommend:

- Streamlining preoperative workflows to minimize unnecessary delays.
- Prioritizing high-risk patients (especially Stage II) for earlier surgical slots.
- Enhancing multidisciplinary coordination to ensure faster decision-making from diagnosis to surgery.

Conclusion

The message from our study is clear: timing matters. Delayed surgical intervention directly increases the risk of disease progression in NSCLC, particularly for Stage II patients. Identifying and respecting a 46-day threshold can help clinicians optimize surgical schedules and improve outcomes for lung cancer patients.

By making early surgery a priority, we can give our patients the best possible chance at long-term survival.

Cardiac: General 1 Tinto **11:15-12:30 Monday, 17 March, 2025**

Stroke after cardiac surgery at a high-volume uk centre: can we improve outcomes for isolated CABG patients?

Ujjawal Kumar[1,2], Ismail Vokshi[1,3], Shagorika Talukder[1], Narain Moorjani[1] 1 Royal Papworth Hospital, Cambridge, United Kingdom. 2 University of Cambridge, Cambridge, United Kingdom. 3 New Cross Hospital, Wolverhampton, United Kingdom

Ujjawal Kumar

Stroke remains one of the most devastating complications of cardiac surgery, significantly increasing mortality, morbidity, and healthcare costs. Despite this, there are no formal European guidelines for stroke prevention in cardiac surgery, leaving clinicians to navigate risk reduction strategies without standardized recommendations. As a high-volume UK cardiac centre, we analysed perioperative stroke rates in all patients who underwent cardiac surgery between April 2019 and March 2022, focusing on the impact of stroke prevention strategies. Cardiothoracic transplantation, pulmonary endarterectomy and other miscellaneous cardiac surgeries were excluded. 4,533 patients were included and stratified by the occurrence of radiologically-confirmed stroke within 30 days postoperatively (thus including intraoperative and early postoperative strokes).

Overall stroke incidence was low (0.95%), with complex surgeries such as combined procedures and major aortic procedures carrying a higher stroke rate. However, compared to previously reported literature, the relative difference in stroke incidence at our centre between high-risk (1.51% for combined procedures, 1.47% for aortic procedures) and lower-risk (0.86% for isolated CABG, 0.59% for isolated valve) surgeries was significantly reduced. Stroke patients had a significantly higher cardiovascular disease burden with significantly higher rates of left ventricular dysfunction, prior stroke and preoperative dialysis. Stroke patients were also of higher operative risk and complexity, with more patients undergoing non-elective surgery or requiring hypothermic circulatory arrest.

Some stroke mitigation strategies were well utilised, such as pharmacological postoperative atrial fibrillation prophylaxis, as well as concomitant interventions in patients with preoperative atrial fibrillation and adequate post-op haemoglobin management. However, those undergoing high-risk procedures (combined and aortic surgeries) were significantly more likely to receive some key stroke mitigation strategies – such as preoperative CT imaging, cerebral oximetry, and maintenance of adequate perfusion pressure while on cardiopulmonary bypass compared to patients undergoing isolated coronary artery bypass grafting. This discrepancy raises an important question: are isolated CABG patients receiving enough attention when it comes to stroke prevention? Despite their perceived lower risk, the incidence of stroke in CABG patients remains clinically significant, and variable use of mitigation strategies suggests potential for improvement.

Our findings challenge the current approach to stroke prevention in cardiac surgery and call for a more standardized application of protective measures across all patient groups. Join us at 11:47am on Monday 17th March in the Cardiac: General 1 session as we explore these insights, discuss the potential need for new guidelines, and debate how we can optimize stroke prevention strategies for all cardiac surgery patients – particularly those perceived to be at lower risk.

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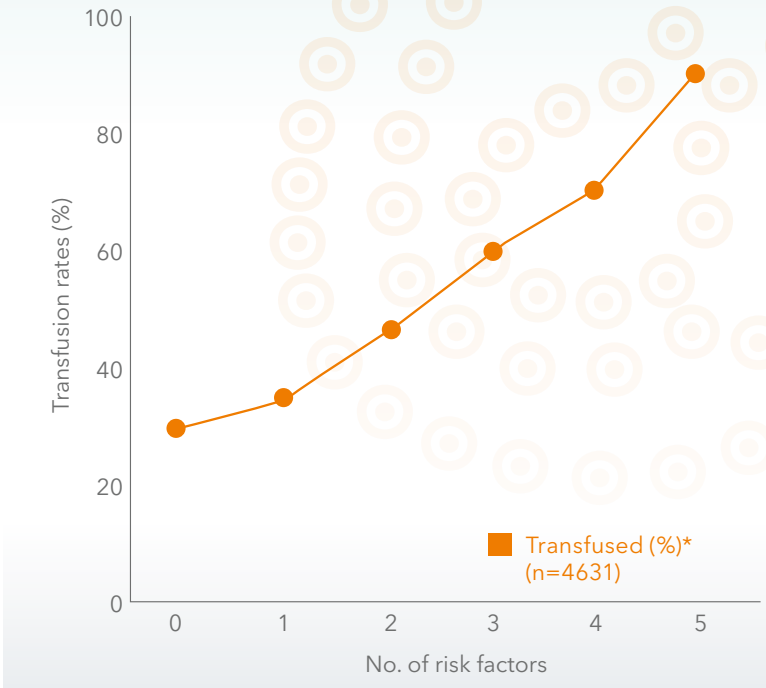
Red blood cell transfusion is the single factor most reliably associated with increased risk of post-operative morbidity and mortality[2]

- Blood loss requiring transfusion remains a risk in cardiac surgery, despite the use of blood-sparing agents and blood management techniques[3-5]
- The graph below shows how multiple patient risk factors compound to increase the risk of transfusions during CABG surgery[6,7]

Risk Factors for Tranfusion in iCABG Patients:



In a study of patients undergoing scheduled coronary artery surgery, a set of pre-defined risk factors were applied.[6]

- Age >70 years
- Female
- Low molecular weight heparin or antiplatelet therapy <5 days pre-operatively
- Estimated Glomerular Filtration Rate <60mL/min
- Insulin dependent diabetes mellitus

Regardless of volume of blood loss, when patient risk factors are compounded, transfusion rates increase[6]

Adapted from Myles PS *et al.* 2017[1,2]
*Any transfusion up until hospital discharge

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UK-TRA-2500002 | February 2025

Screening and Early Lung Cancer Management Fintry **15:30-17:00** Monday, 17 March, 2025

Sublobar Resection or Lobectomy for Stage Ia Non-Small Cell Lung Cancer: A Systematic Review and Meta-analysis

Laura Dixon National Lung Cancer Audit at the Royal College of Surgeons, London

For patients with stage Ia non-small cell lung cancer (NSCLC), an increasing number of studies have evaluated how the outcomes of sublobar resections (segmentectomy and wedge resections) compare with lobectomy, the operation currently recommended in the National Institute of Clinical Excellence (NICE) guidelines.

This systematic review and meta-analysis combined estimates from both randomised controlled trials and observational cohort studies to show both overall survival and disease-free survival at five years are equivocal between sublobar resections and lobectomy for stage Ia NSCLC.

The review included 19 studies, including four randomised trials. Overall survival and disease-free survival at five years following lobectomy and sub-lobar resection for stage Ia NSCLC were equivocal. Sublobar resection was associated with higher rates of local disease recurrence. No difference was found for ten-year survival or post-operative reduction in Forced Expiratory Volume in one second (FEV1).

Based on the findings of this study, the NICE guidelines should be updated to recommend that lobectomy or sublobar resection can be offered to patients as surgical management of stage Ia NSCLC.

Pectus and Other Chest Wall Disorders Fintry **09:00-10:30** Tuesday, 18 March

National Pectus MDT and Cardiothoracic training initiative

Fatemeh Habibi Nameghi[1,2,3,4] 1 Department of Bioscience, King's College London, United Kingdom; 2 Thoracic Surgery, Department of Cardiothoracic Surgery, Royal Papworth Hospital, Cambridge, United Kingdom; 3 Department of Cardiothoracic Surgery, King's College Hospital, London, United Kingdom 4 Norwich Medical School, University of East Anglia, Norwich, United Kingdom

My role as the data-collector for the national pectus multidisciplinary team (MDT) over the past two years has allowed me to witness firsthand the evolution of a much-needed national service, urgently set up after recommissioning of surgery for very severe pectus deformity by NHS England in April 2023[1].

At last census (14/02/2025), 63 multidisciplinary (MDT) meetings have been held virtually, with 341 discussions on 312 referrals (median age 19) and 181 patients (58%) having been accepted for surgery on the NHS. The MDT, which follows a hub and spoke model, with St. Bartholomew's Hospital at its centre, has seen referrals from 27 different hospitals across 24 different trusts, with 113 referrals originating from trusts in the Greater London area and Middlesbrough (Figure 1).

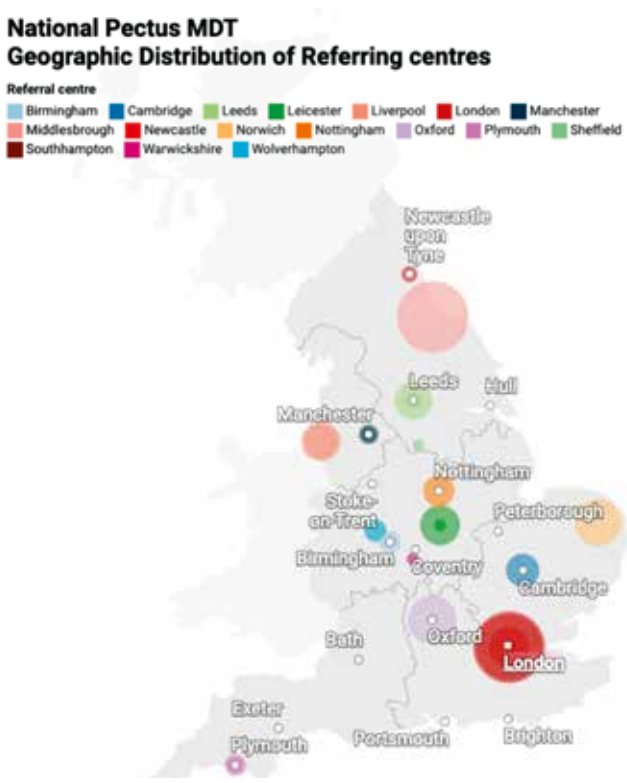

Figure 1 Legend: National Pectus MDT, Geographic Distribution of Referring centres (14/04/2023 - 14/02/2025)

We hope that with the newly published pectus care guidelines[2] as well as collaboration with the NIHR RESTORE trial[3], the MDT will continue to evolve as an essential national service improving the quality of life of those with very severe pectus excavatum.

A few doors south of St. Bartholomew's, at KCH, we present data on the Cardiothoracic department's training program. Our five year results (2018-2023) show 35% of all operations being carried out by specialist registrars (SpR) as first operator (Figure 2). After adjusting for the procedure undertaken, Euroscore II, gender, and bypass duration, surgical intervention by an SpR was associated with an odds ratio of death 0.47 times lower than a consultant (95% CI 0.18-1.26 p=0.13). There was therefore no statistically significant difference in in-hospital mortality between trainees and consultants.

These results reflect the significant training initiative maintained by Kings' consultants who champion the independence of registrars in appropriately selected cases to help trainees navigate the learning curve of difficult Cardiothoracic cases, particularly in minimally invasive surgery.

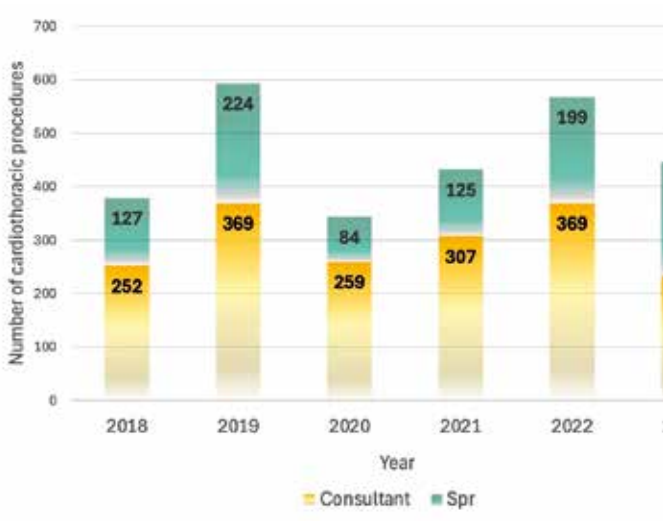

Figure 2 Legend: Number of cardiothoracic procedures undertaken by consultants vs. specialist registrars at King's College Hospital between April 2018 and September 2023.

KCH consultants also maintain an important role in innovating the Cardiothoracic training experience through proctoring preliminary testing of new training facilities. As a faculty member at Heart Research U.K's recent minimally invasive mitral surgery (MIMS) cadaveric course, I was involved in the fidelity testing of Dr. Apurva Bharucha's (Cardiology ST8, Cardiff) innovative 3Dp MIMS trainer (CARMOSIM) (pictured in Figure 3, hand-drawn by myself). We used the course to circulate a short exploratory survey investigating the role of CARMOSIM in MIMS training to the surgical trainees attending. CARMOSIM was deemed an effective adjunct to cadaveric training for improving technical surgical skills, with future iterations in the works to redefine the limits (some might say, if any) of the Cardiothoracic training experience.

The ability to contribute to multi-institutional research as above is a real privilege which I owe to the cooperation and hospitality of many Cardiothoracic departments across the U.K. I would especially like to extend my gratitude to Mr. Aman Coonar and Mr. Habib Khan for their continued support of my research at the Royal Papworth Hospital and KCH respectively.

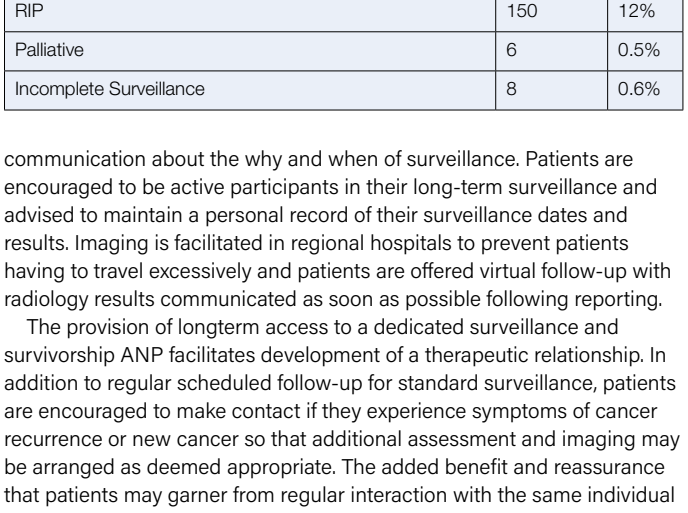

Figure 3 Legend: Hand-drawn image of the 3Dp minimally invasive mitral surgery (MIMS) trainer (CARMOSIM).

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Sharing Best-Practice in NAHP-led Services Moorfoot **11:00-12:30** Monday, 17 March

Compliance with radiological surveillance following resection for primary lung cancer in a nurse led lung cancer surveillance and survivorship service

Niamh Kiely, Aine Ward, Jacinta Flynn, Sian Kneafsey, Darragh Garrahy, Peter Beddy, Ronan Ryan, Gerard J Fitzmaurice St James's Hospital, Dublin, Ireland

Introduction

Lung cancer is the third most common cancer in Ireland and the number one cause of cancer related mortality. Early diagnosis has led to increased numbers of patients being suitable for lung cancer resection with curative intent. The thoracic service in St James's Hospital Dublin consistently undertake > 50% of all lung resections for primary lung cancer carried out in the Republic of Ireland annually, equating to approximately 300 cases / year. The Advanced Nurse Practitioner (ANP) Led Lung Cancer Surveillance & Survivorship Service was established in 2018 to meet both the surveillance and survivorship needs of patients who have had lung resections, who do not need further surgery or adjunct treatment, and are therefore by definition patients who have completed their treatment journey.

Surveillance following lung cancer resection is acknowledged as a routine part of holistic cancer care. It is recommended in order to detect recurrence or metastatic disease and metachronous primary tumours. However despite guidelines recommending clinical and radiological follow-up, there is no consensus on surveillance frequency, duration, or modality and few studies on compliance. Research studies that have addressed compliance indicate rates varying from 36% to 80%.They suggest that disappointing compliance may be attributed to inadequate understanding of the overall benefits and rational for ongoing surveillance while factors such as tumour size, being married and living <100miles from the medical center were associated with an increased number of imaging studies and greater adherence to guidelines.

Objective

The aim of this study was to examine compliance with surveillance radiology of patients referred to the Nurse led surveillance and survivorship service.

Method

A retrospective review of the radiological records for all patients referred to the service between 2018 to 2023 was completed using the National Integrated Medical Imaging System (NIMIS). For this cohort of patients in our institution the minimum standard for radiological surveillance is a CT Thorax at 6 months post-operatively followed by a CT Thorax annually for a minimum of five years following surgery. Compliance was deemed to be completion of a surveillance CT Thorax within a timeframe of three months from the appointment date.

Figure 1: Members of St. James's Hospital Thoracic Surgical Multi-Disciplinary Team on recent recognition as Ireland's First European Accredited Thoracic Surgical Oncology Centre by the European Society of Thoracic Surgeons (ESTS)

Results

1,243 patients were included in this study. Results demonstrated that 87% (1,080 patients) either completed or were on course to complete the minimum imaging standard. 12% (150 patients) were on course to achieve minimum imaging standards; however, died prior to the completion of five years of imaging. 1% (14 patients) had incomplete surveillance.

Of those patients who had incomplete surveillance, two patients (0.1%) missed their 18-month post-operative surveillance scan and then died prior to follow-up or completion. Four (0.3%) completed the appropriate number of scans outside the acceptable timeframe of 3-months from the appointment date. Two patients (0.1%) did not complete surveillance and did not undertake any follow-up imaging. One of these patients emigrated abroad and opted to have surveillance overseas; the second patient did not engage with the service and was non compliant with imaging.

Discussion

In contrast to international studies which report poor compliance with adherence to surveillance imaging, 99% of patients referred to our nurse led service, which combines survivorship care with surveillance, were compliant in meeting our minimum imaging standard. Several strategies are employed to optimise compliance including patient centered education, an initial meeting with patients which includes clear, simple communication about the why and when of surveillance. Patients are encouraged to be active participants in their long-term surveillance and advised to maintain a personal record of their surveillance dates and results. Imaging is facilitated in regional hospitals to prevent patients having to travel excessively and patients are offered virtual follow-up with radiology results communicated as soon as possible following reporting.

The provision of longterm access to a dedicated surveillance and survivorship ANP facilitates development of a therapeutic relationship. In addition to regular scheduled follow-up for standard surveillance, patients are encouraged to make contact if they experience symptoms of cancer recurrence or new cancer so that additional assessment and imaging may be arranged as deemed appropriate. The added benefit and reassurance that patients may garner from regular interaction with the same individual is unmesaurable and whereas some studies indicate a reduction in compliance after the initial two years, the structure within our service may have influenced our long term compliance.

Table 1: Summary results of adherence to minimum standards of imaging follow-up

Adherence to Minimum Standard of Imaging	Number of Patients	%
Adequate active surveillance in St James Hospital	783	63%
Completed 5-years of adequate surveillance & discharged	168	13.5%
Adequate active surveillance following referral to regional surveillance service	128	10.4%
RIP	150	12%
Palliative	6	0.5%
Incomplete Surveillance	8	0.6%

Conclusion

Despite a lack of consensus on radiological surveillance guidelines, it is generally acknowledged that adherence to surveillance can facilitate early detection of cancer recurrence. Early detection can lead to more treatment options which may impact survival, therefore employing strategies that improve compliance are imperative. An ANP led surveillance and survivorship service, incorporating plain language communication with active patient involvement and local scanning options as well as virtual follow-up, can optimize long-term compliance.

Mechanical Circulatory Support Carrick **09:00-10:30** Tuesday, 18 March

Expanding the donor pool: short- and long-term outcomes of donation after circulatory death heart transplantation with extended functional warm ischemic time

Taimoor Khan (Department of Transplantation, Royal Papworth Hospital NHS Foundation Trust, Cambridge Biomedical Campus, Cambridge, United Kingdom)

Heart transplantation (HTx) remains the gold standard and ultimate treatment for end-stage heart failure; however, a significant disparity persists between organ supply and demand. Over the past decade, the United Kingdom HTx waiting list has grown by 162%, with recent NHS Blood and Transplant data revealing 284 adults on the active list in 2024. Median waiting times vary dramatically: 867 days for non-urgent cases, 43 days for urgent cases, and just 15 days for super-urgent cases. Critically, 30% of patients either die or deteriorate to the point of ineligibility while waiting.

To address the challenge, our center, initiated donation after circulatory death (DCD) HTx program in 2015. In DCD, hearts are retrieved following planned withdrawal of life support (WLST) and expected cardiac arrest. Under UK protocol, a mandatory 5-minute observation period following mechanical asystole is required to confirm death, introducing additional complexity to the organ retrieval process. The method of retrieval and timelines have an assertive impact on the outcomes. Hearts procured from DCD donors undergo mandatory functional warm ischemic time (FWIT) after WLST. FWIT is defined as the time from onset of hypoperfusion (systolic blood pressure <50 mmHg) to reperfusion. Two definitions exist: FWIT – CP (time until cardioplegia delivery) and FWIT – ESOP (time until initiation of ex-situ organ perfusion). Traditionally, FWIT exceeding 30 minutes has been considered a risk to cardiac transplantation, yet progression to circulatory arrest in DCD donors is unpredictable and often surpasses this threshold.

To address the critical gap in literature regarding extended FWIT and different FWIT definitions, we analysed data of DCD – HTx from 2015 – 2024, utilizing direct procurement and perfusion (DPP). We compared short- and long- term outcomes between FWIT – CP (n=105) and FWIT – ESOP (n=98) groups, with subgroup analysis for FWIT above and below 30 minutes. Our findings challenge conventional wisdom regarding FWIT limitations. We observed no significant differences in mechanical circulatory support requirements (FWIT – ESOP: 24.8%, FWIT – CP: 23.5%) or intra – aortic balloon pump utilization (FWIT – ESOP: 16.2%, FWIT – CP: 15.3%) regardless of FWIT duration. The hospital length of stay was consistent across all groups at approximately 23.5 days. Thirty – day mortality was comparable between FWIT ≤30 min and >30 min subgroups in both the FWIT – ESOP (3.8% vs. 3.7%, p=1.00) and FWIT – CP cohorts (4.3% vs. 0%, p=1.00). This pattern persisted at 90 days and one year. Kaplan – Meier survival analysis demonstrated no significant differences between groups, regardless of FWIT definition or duration.

These results suggest that carefully selected DCD hearts with FWIT exceeding 30 minutes can be successfully utilized without increased risk of post – transplant complications or mortality. Our findings have profound implications for expanding the donor pool and potentially reducing waiting list mortality. Further research with larger cohorts is needed to determine whether an upper threshold for acceptable FWIT exists and whether one definition of FWIT should be standardized. Nevertheless, our nine-year experience demonstrates that extending FWIT criteria in selected cases may safely increase donor heart availability and improve access to life – saving transplantation for patients with end–stage heart failure.

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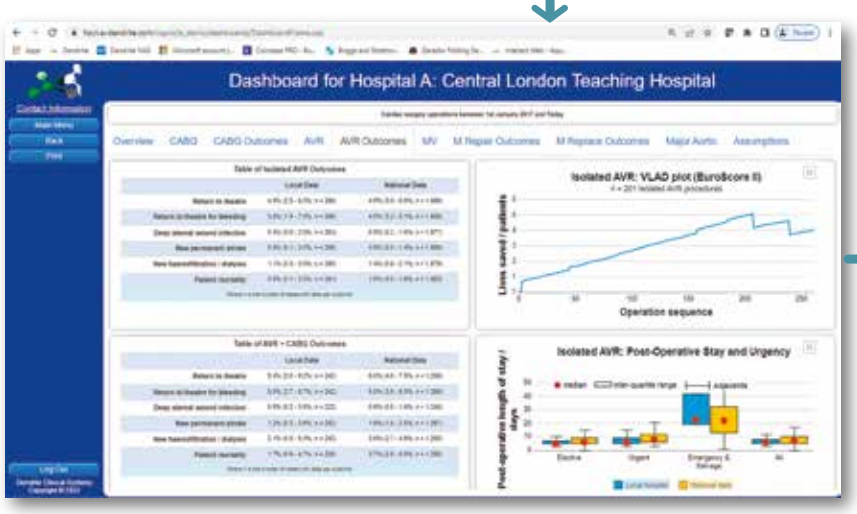

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Cardiac: General 1 Tinto
11:15-12:30 Monday, 17 March

Cardiac surgery in the time of COVID

Norman Briffa[1], Tim Dong[2], Jeremy Chan[2,3], Gianni Angelini[2] 1 University of Sheffield, Sheffield, United Kingdom. 2 University of Bristol, Bristol, United Kingdom. 3 University Hospitals Bristol NHS trust, Bristol, United Kingdom

The COVID-19 pandemic precipitated unprecedented disruption across healthcare systems globally, and the UK's cardiac surgical services were no exception. This study, conducted as part of the Cardiovascular COVID Consortium—a collaboration between the British Heart Foundation, Health Data Research UK, and the National Institute for Health and Care Research—investigated the granular effects of the pandemic on cardiac surgical practice in the UK, utilizing comprehensive national registry data.

The research employed a retrospective cohort analysis of 91,371 unique patients undergoing first-time adult cardiac surgical procedures between 2018 and March 2022. The study period was divided into distinct phases, including the pre-pandemic baseline, the initial lockdown and relaxation periods, and the post-lockdown recovery phase, allowing for a detailed longitudinal assessment.

A striking finding was the significant reduction in overall surgical volume, particularly in coronary artery bypass grafting (CABG) and non-CABG procedures, during the initial lockdown. While a gradual recovery was observed, pre-pandemic levels were not fully restored by March 2022. Concurrently, there was a notable shift towards urgent procedures, reflecting the pandemic's impact on patient pathways and the deterioration of patients awaiting elective surgery. Interestingly, aortovascular operations remained relatively stable throughout the pandemic.

Waiting times for both elective and urgent cardiac surgical procedures experienced a relentless increase across all pandemic phases, exacerbating patient morbidity and potentially affecting long-term outcomes.

The study also examined changes in patient risk profiles. Despite a paradoxical decrease in overall logistic EuroSCORE, likely reflecting patient selection biases, there was an observed increase in the prevalence of high-risk factors, such as poor left ventricular function, emergency presentations, and recent myocardial infarctions.

In terms of outcomes, a small but statistically significant increase in in-hospital mortality was observed early in the pandemic, despite the apparent lower overall risk profile. More critically, a significant decrease in mid-term survival was identified in patients operated on after March 2020, even after adjusting for key confounding variables. This highlights the independent adverse impact of pandemic-related factors on patient survival.

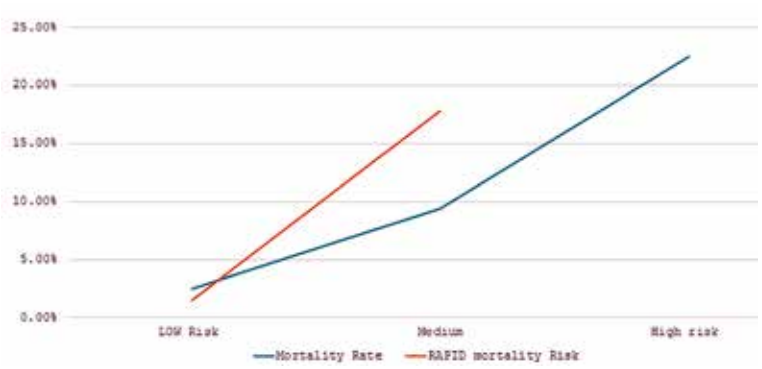
Analysis of intensive care unit (ICU) support revealed no significant changes in the level of respiratory or cardiovascular support provided during the pandemic. This finding, juxtaposed with the increased early mortality, suggests potential limitations in the ability to rescue deteriorating patients during the pandemic period, possibly due to resource constraints or altered care pathways.

Furthermore, recent data from the National Adult Cardiac Surgery Audit (NACSA) reinforces the persistence of these challenges, including continued volume declines, prolonged waiting times, and a sustained shift towards urgent procedures. These issues have led to missed national targets, reduced productivity, and potentially, less optimal treatment pathways for patients.

In conclusion, the COVID-19 pandemic has had a profound and potentially irreversible impact on cardiac surgical practice in the UK. The study underscores the need for strategic interventions to mitigate the long-term consequences of the pandemic, ensuring timely access to optimal cardiac surgical care and addressing the persistent challenges facing the service.

Improving Quality in Thoracic Surgery Sidlaw **09:00-10:30** Tuesday, 18 March, 2025

Medicine Meets Surgery: The Application of RAPID Score in Surgical Practice



Ahmad Asqalan[1], Diana Baltag[1], Jakub Kadlec[1], Waldemar Bartosik[1], Vasileios Kouritas[1], bartlomiej szafron[1], cristina viola[1], obada alqudah[1], ra'fat tawalbeh[1], Haisam Saad[2] 1 Norfolk and Norwich University Hospitals NHS Foundation Trust, Norwich, United Kingdom. 2 Royal Papworth Hospital NHS Foundation Trust, CAMBRIDGE, United Kingdom

Empyema remains a significant cause of morbidity and mortality, requiring effective risk stratification to guide treatment decisions. The RAPID (renal-urea, age, purulence, infection source, diet-albumin) score has been widely used to assess risk in patients with pleural infection. Initially developed from the MIST1 randomized controlled trial and later validated in MIST2, the RAPID score is now recommended by the 2023 BTS guidelines for risk stratification in adults with pleural infection. This tool provides valuable insights into potential outcomes and can aid discussions with patients regarding prognosis.

A key question arises: does the predicted mortality risk based on RAPID scoring align with actual mortality outcomes in surgical patients? Furthermore, can this tool be effectively applied in thoracic surgery for patients with empyema?

To explore these questions, we conducted a single-centre retrospective study of 334 patients admitted and treated surgically for empyema between January 1, 2015, and December 31, 2023. Patients were stratified into three risk categories based on their pre-operative RAPID scores: low (0-2), medium (3-4), and high (5-7), with 157, 128, and 49 patients in each group, respectively.

Facts and figures. Interpretation:

RAPID Score	Risk	3-month mortality*
0-2	Low	1.5%
3-4	Medium	17.8%
5-7	High	47.8%

*From validation study, White 2015.

Our analysis demonstrated a statistically significant correlation between RAPID scores and hospital length of stay (LOS). Patients with higher RAPID scores had a significantly longer LOS. Specifically, the geometric mean LOS for patients in the high-risk category was 16.9 days (95% CI: 13.7-20.8), compared to 11.6 days (95% CI: 10.3-13.1) for those in the low-risk category. This resulted in a high-to-low LOS ratio of 1.5 (95% CI: 1.1-1.9; p=0.0071).

Parameter	Measure	Score
Renal		
Urea, mM	<5	0
	5-8	1
	>8	2
Age,y	<50	0
	50-70	1
	>70	2
Purulence of plueral fluid		
Purulent		0
Nonpurulent		1
Infection source		
Community acquired		0
Hospital acquired		1
Dietary factors		
Albumin, g/L	≥27	0
	<27	1
Risk categories		
Score 0-2		Low risk
Score3-4		Medium risk
Score5-7		High risk

Key factors influencing LOS included urea level, purulence of pleural fluid, and albumin level. Patients with higher albumin levels (≥27) had a shorter LOS, with a geometric mean of 10.8 days (95% CI: 9.1-12.9), compared to 17.5 days (95% CI: 15.6-19.6) in those with lower albumin levels (<27). Conversely, elevated urea levels (>8) were associated with a prolonged LOS compared to lower levels (<5) (p=0.0027).

In terms of mortality prediction, the RAPID score estimate a 3-month mortality risk for low-, medium-, and high-risk RAPID groups at 1.5%, 17.8%, and 47.8%, respectively. However, in our surgical cohort, the observed 3-month mortality rates were 2.5%, 9.4%, and 22.5% for the respective groups.

These findings prompt critical questions for thoracic surgery:

- Can the RAPID score reliably predict surgical outcomes and mortality risk in empyema patients?
- Can we include pre-operative RAPID-calculated mortality risks in patient consent discussions?
- Is there a need for a modified surgical-specific RAPID score to enhance risk stratification in this patient population?

Our study suggests that while the RAPID score provides valuable insights into prognosis and hospital stay, its applicability in surgical decision-making warrants further investigation. A modified surgical RAPID score could potentially refine patient selection, optimize resource allocation, and improve surgical outcomes.

Working Together to Enhance Patient Care Pathways Moorfoot **13:30-15:00** Tuesday, 18 March, 2025

Provision of pre-operative physiotherapy for in-patients waiting for cardiac surgery in an adult tertiary cardiothoracic centre

Kira Neal, Elliott Pattison & Maria Rita Maccaroni
The Essex Cardiothoracic Centre, Mid & South Essex NHS Foundation Trust

Background

Post-operative pulmonary complications (PPCs) occur frequently post cardiac surgery, leading to increased morbidity, mortality and health care costs (1). Whilst the benefit of prehabilitation and pre-operative exercise is well documented within general surgical populations, the evidence in the cardiac surgery cohort is less developed (2). The pre-operative phase for patients waiting in hospital for surgery is often prolonged and gives an opportunity to prepare for the expectations regarding post-operative recovery, teach/practice post-operative breathing exercises and optimise function/mobility (3). Currently patients waiting in our hospital for cardiac surgery do not routinely receive physiotherapy.

Objectives

To provide pre-operative physiotherapy to all patients waiting as inpatients for cardiac surgery for a four-month 'trial' period with the aim of:

- Reducing post-operative length of stay by 10% compared to baseline data collected prior to intervention
- Reducing the incidence of post-operative pulmonary complications (PPCs) by 5% compared to baseline rate of 12%
- Determining feasibility of providing pre-operative intervention to this cohort of patients on current staffing levels

Methods

Baseline data was collected prior to implementing pre-operative physiotherapy to identify length of stay and incidence of PPCs within this cohort.

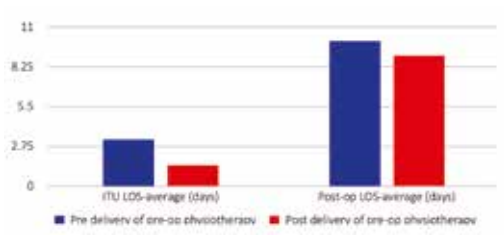
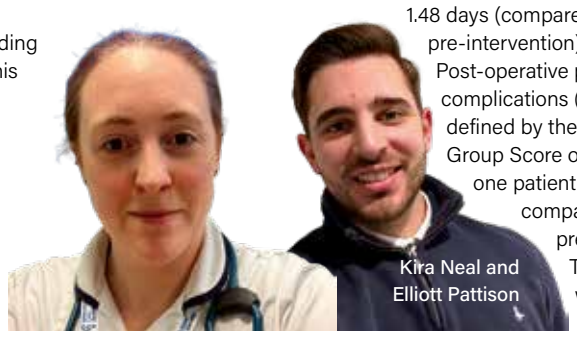


Fig 1: Comparison of length of stay pre & post-delivery of pre-operative physiotherapy intervention (critical care and total post-operative length of stay)

Physiotherapy intervention was then provided which consisted of education, chest physiotherapy and exercise as indicated, at a frequency determined by clinical presentation. Data was concurrently collected for this group to capture length of critical care & post-operative length of stay, incidence of PPCs and number of physiotherapy contacts pre-operatively, as well as patients that were not seen due to staffing/caseload constraints.

Results

25 patients were seen for pre-operative physiotherapy and discharged post-surgery. Average post-operative length of stay was 9.04 days (compared to 10.04 days pre-intervention), and average critical care stay was 1.48 days (compared to 3.23 days pre-intervention) for this group. Post-operative pulmonary complications (PPCs) as defined by the Melbourne Group Score occurred in one patient (rate of 4% compared to 12% pre-intervention). Two patients were not seen due to staffing levels and three patients were listed and worked up for surgery too quickly to be seen pre-operatively.


Kira Neal and Elliott Pattison

Conclusions

Pre-operative physiotherapy intervention appears to benefit post-operative length of stay and incidence of post-operative pulmonary complications. However, to what extent these benefits can be attributed to physiotherapy intervention alone remains unknown, as it is acknowledged that there are a multitude of factors that also impact length of stay post cardiac surgery. There were very few patients who were not seen due to staffing/caseload constraints, indicating the provision of pre-operative therapy intervention is feasible on current staffing levels, therefore this service will be maintained going forwards. It is intended that patient experience/health related quality of life data will also be collected in future.

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Cardiac: General 3 Kilsyth **09:00-10:30** Tuesday, 18 March, 2025

The influence of ethnicity and deprivation levels on the early results of coronary artery bypass surgery: Single centre experience

Ammar Mustafa, Mostafa Mahmoud, Anca Delca, Karen Raybould, Mahmoud Abdelaziz, John Billing, Maciej Matuszewski, Patrick Yiu, Nicolas Nikolaidis, Giuseppe Rescigno Heart and Lung Centre, Royal Wolverhampton Hospitals NHS Trust, Wolverhampton, United Kingdom

Healthcare outcome disparities are avoidable inequalities with strongly interlinked multifactorial determinants. It is a universal challenge which has been recognized by many healthcare systems. The NHS has already developed a scheme called Core20 PLUS 5 to address this challenge. The Core 20 components of this approach target the most deprived 20% of the national population as identified by the Index of Multiple Deprivation (IMD). On the other hand, the PLUS population groups have been identified at local levels as different groups of disadvantaged members of the population including ethnic minorities. While number five on the Core20 PLUS 5 approach refers to the special five clinical areas of focus which require accelerated improvement, not including cardiac surgical services; this was the major motivator for us to explore the impacts of those healthcare disparities on cardiac surgical patients.

Ethnicity and deprivation are major factors not weighted in current cardiac surgical risk scoring systems such as EuroSCORE II and STS score. Our catchment area comprises an ethnically diverse population with high deprivation scores. Therefore, we've tried to assess the impacts of ethnicity and deprivation on early surgical outcomes in a series of isolated CABG patients. 1,069 patients who underwent surgery between January 2022 and August 2024 were included. Ethnicity was expressed as Caucasian, Asian, Black and Other groups of ethnic minorities, and the UK Index of Multiple Deprivation (IMD) was utilized as a surrogate of deprivation level. Primary end points were mortality and composite of complications, and secondary end points were mode of admission and interval between admission and operation.

Index of Multiple Deprivation (IMD) is the most comprehensive parameter used to measure the relative socioeconomic status in small areas called Lower-layer Super Output Areas (LSOAs) containing about 1,500 residents across each of the constituent nations of the United Kingdom. The small areas have been ranked into 5 deprivation quintiles ranging from the most deprived areas (rank 1) to the least deprived areas (rank 5). IMD has been adopted by the Office for Health Improvement and Disparities (OHID) for general NHS practice. The index was last updated in 2019 (IMD2019) but the next release is expected late this year (IMD2025). It is a composite measure that takes into account 39 indicators across seven differently weighted domains of deprivation.

32% of all patients were non-white ethnic minorities and 55% were most deprived. 78% of ethnic minorities were most deprived compared to only 46% of the Caucasian population. There was no significant difference in the mortality based on ethnicity but patients from most deprived areas had significantly higher mortality (1.3% vs 1.0%). Ethnic minorities have scored much higher complication rates 14% compared to 8.6% among the white population. The most deprived ethnic minorities scored the highest urgent admission (68%), complications (14%) and mortality (1.5%) with p-values <0.05%. The wider non-clinical determinants of health, including ethnicity and socio-economic status, might impact surgical outcomes through complex factors such as access to health services, literacy/language barriers, poor previous experience, misinformation and fear. These factors warrant further investigations and subsequent mitigation.

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Mitral Valve Pentland **13:30-15:00** Tuesday, 18 March

Is mitral valve repair justified in octogenarians?

N Mwesigwa, B Omoregbee, D Ngaage
Castle Hill Hospital, Cottingham, East Yorkshire, UK

Advances in healthcare delivery have significantly improved general life expectancy, leading to an increasing clinical demand for definitive cardiac surgical interventions in elderly patients. Octogenarians bear a disproportionately high burden of comorbidities, which complicates surgical outcomes of valvular heart disease.[1] Moreover, patients with mitral valve pathology often present at an advanced stage, characterised by significant decompensated heart failure and diminished physiological reserve, which negatively influences postoperative morbidity and mortality.[2]

A retrospective review of a 10 year data of all mitral valve surgery cases at a UK institution reported a 30-day mortality rate of 3.6% and, 5- and 10-year survival rates of 77%, survival rate of 72%.[3] A multi-centre UK study of mitral valve surgery in octogenarians, documented a 30-day mortality rate of 13.8%, a 5- and 10-year survival rates of 63.7% and 45.5%, respectively.

Whether repair is justified in octogenarians rather than replacement remains an open debate. An analysis of 129 patients aged ≥80 years revealed significantly lower hospital mortality in the repair group (2.7%) compared to the replacement group (18.5%, p=0.004).[4] Similarly, a study of 247 octogenarians demonstrated superior survival rates at 1, 5, and 10 years following repair.[5] Furthermore, a propensity score-adjusted analysis of 322 patients indicated that mitral repair yielded better early and mid-term outcomes.[6] However, a recent report by Ko *et al* did not find any advantage of repair over replacement.[7]

With advances in replacement techniques and valve design technology, it is unclear if the benefits of repair remain. We therefore sought to examine our data over the past decade to determine whether repair is still justified in octogenarians.

We analysed prospectively collected data for patients aged ≥80 who underwent mitral valve surgery at our institution (January 2014–September 2024). We excluded cases of active infective endocarditis, redo, and emergency/salvage operations. We then compared pre-, intra-, and postoperative variables between mitral repair and mitral replacement groups.

The mean age of study patients was 81.7±1.9 years. Of 61 patients, 31 (51%) underwent mitral valve repair. Concomitant procedures included CABG, AVR, AF ablation, and left atrial appendage occlusion (Fig 1). No significant differences in post-operative outcomes were found between the repair and replacement groups (Fig.2). Operative mortality, lower than predicted for both groups, was 0% in the repair group versus 10% in the replacement group (p=0.07). Postoperative morbidity rates and hospital stays were similar for both groups.

Our results support mitral valve repair over replacement in octogenarians, because of potentially better in-hospital outcomes. A more extensive study is warranted.

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Pat Magee - Oral Abstract Presentation Kilsyth **10:50-12:20** Sunday, 16 March

Failure to rescue: A useful measure of quality of care?

Augusta Paulikaite1,2, Ahmed Shaheen3, Thomas Clewley2, Michael Lewis2 1 Brighton and Sussex Medical School, Brighton, United Kingdom. 2 Brighton and Sussex University Hospitals NHS Trust, Brighton, United Kingdom. 3 Liverpool Heart and Chest Hospital NHS Foundation Trust, Liverpool, United Kingdom

As cardiac surgery patients become increasingly complex, monitoring outcomes is essential for maintaining high-quality care. Traditional metrics like surgeon-specific mortality data (SSMD) offer transparency but have limitations, as they attribute mortality to individuals rather than systemic factors and fail to capture trends in high-risk cases. Given the consistently low mortality rates in cardiac surgery, relying solely on mortality as a quality indicator is inadequate.

Surgical outcome assessments have long focused on mortality and morbidity, but these metrics alone do not fully reflect quality improvement efforts. Research shows some hospitals

with low mortality rates still report high complication rates, while others with higher mortality rates effectively prevent and manage complications.

To address these gaps, failure to rescue (FTR) has emerged. Defined as mortality following a major, potentially treatable postoperative complication, FTR evaluates a hospital's ability to recognise and manage complications before they become fatal. Unlike traditional measures, FTR assesses system-wide responses rather than individual outcomes. Recognising its value, the Society of Thoracic Surgeons (STS) introduced a risk-adjusted FTR metric for adult cardiac surgery in 2023. Our study evaluated the applicability of the STS model in a UK-based cardiac surgery unit.

Our study found that the UK unit's FTR rates aligned with STS model predictions, indicating effective complication management. However, notable differences emerged:

- Higher-than-predicted reoperation rates (5.17% vs. 2.90%, p<0.00001).
- Lower rates of prolonged ventilation and renal failure (1.38% vs. 8.85% and 1.11% vs. 2.42%, respectively, p<0.00001).
- Lower-than-expected mortality in patients without complications (0.3% vs. 0.9%, p=0.00428), reflecting strong surgical and perioperative care.

Despite effective complication management, mortality increased in patients with multiple complications, suggesting challenges in handling highly complex cases.

Key insights from our findings:

1. Beyond mortality metrics – Traditional measures may overlook hospitals' ability to manage complications; FTR provides a more dynamic assessment.
2. Complication prevention vs. rescue – Low complication rates contrast with increased reoperations, highlighting room for procedural improvements.
3. Resource allocation – Higher mortality in patients with multiple complications underscores the need for optimised post-surgical pathways.
4. Insights from NACSA – The NACSA 2023 report also noted higher reoperation rates but lower observed mortality at the UK unit, indicating strong postoperative care.

Reoperation is considered a major complication under FTR but often serves as a rescue strategy (e.g., for tamponade). Failure to intervene could lead to mortality, making bleeding a potentially better complication indicator than reoperation itself.

Currently, the UK's NACSA does not collect FTR data. Incorporating FTR into national audits could refine quality benchmarks and improve patient outcomes. Future multi-centre studies are needed to validate these findings and explore FTR's role in optimising postoperative care.

This study shows that a UK cardiac surgery unit meets international FTR benchmarks while highlighting areas for improvement in complication management. Differences in complication rates and management strategies between UK and US systems may impact outcomes. As healthcare evolves, adopting FTR as a national quality metric could offer deeper insights into surgical effectiveness and patient safety. A future multi-centre study could determine FTR's broader applicability in the UK, aiming to develop a tailored risk-adjusted FTR assessment tool.

Cardiac: General 2 Pentland **09:00-10:30** Tuesday, 18 March, 2025

Pat Magee - Oral Abstract Presentation Kilsyth **10:50-12:20** Sunday, 16 March, 2025

Clinical Outcomes-Based Research Activities (COBRA)

Karim Morcos, Yasser Hegazy, Philip Curry, Hari Doshi, David Varghese, Sadia Aftabm, Jonathan Dalzell[1], Sylvia Yew, Amy Tan[2], Laxmikant Umate Datta[3] 1 Golden Jubilee National Hospital, Glasgow; 2 Glasgow Medical School, Glasgow; 3 Meghe institute of Higher education and research, Maharashtra, India.

Research is at the forefront of improving patient care and health outcomes. Together with other members of the Surgical Cardiothoracic Society (SCTS) community, we are proud to be recognised for our Clinical Outcomes-Based Research Activities (COBRA). COBRA enables us to generate new evidence leading to enhanced patient care and superior clinical outcomes.

Our team has conducted several notable COBRAs that are being presented at SCTS 2025, Edinburgh. One such study examined the efficacy of topical vancomycin paste in reducing the incidence of deep sternal wound infections (DSWIs). DSWIs are a severe complication that can occur after cardiac surgery, resulting in substantial morbidity and extended hospital stays. Our findings indicate that prophylactic topical vancomycin can significantly reduce the incidence of DSWIs.

Another critical area of research within our team is the correlation between preoperative albumin levels and surgical outcomes. Preoperative nutritional status is often overlooked in surgical preparation. Our research has shown that patients with hypoalbuminemia are at higher risk of mortality post-

heart transplantation. Moreover, patients requiring mechanical support before heart transplantation are also at a higher risk of hypoalbuminemia, highlighting the need for more aggressive nutritional therapy within this cohort.

Previous work by our group showed that hypoalbuminemia was associated with higher mortality after surgery for infective endocarditis. Subsequently we were able to demonstrate that in most case there was adequate time to intervene and optimise nutritional status and address malnutrition before surgery.

Our group has also ventured into advanced statistical analysis using propensity matched scoring (PSM). One of our first studies evaluated whether our novel implantation perfusion technique for heart transplantation that eliminates warm ischemic time (WIT) affects outcomes. Our study suggested that our technique is associated with a reduced need for post-operative ECMO and primary graft dysfunction.

Our commitment to COBRA also involves fostering a passion for research among medical students. By involving them in our projects, we enable them to witness the direct impact of research on clinical care. Students can engage in evidence-based practices, conduct studies, analyse data, and contribute to publications, all while integrating learning with real-world application.

The collective endeavours of SCTS in conducting COBRA underscore the paramount importance of SCTS in enhancing patient care. By fostering medical students' participation in research, we continue to build a future where evidence-based medicine flourishes, ultimately elevating healthcare for patients worldwide.

We look forward to demonstrating our 3d printing and focussed surgical simulator at future meetings.

Key points

- Prophylactic topical vancomycin can significantly reduce the incidence of DSWIs.
- Hypoalbuminemia is a significant predictor of mortality post-heart transplantation.
- Hypoalbuminemia is associated with higher mortality in patients undergoing surgery for infective endocarditis however in most cases there is time to intervene
- Our novel implantation perfusion technique of heart transplantation is associated with reduced need for post-operative ECMO and primary graft dysfunction.
- Medical students are invaluable team members for COBRA.
- The collective endeavours of SCTS to give a platform for COBRA will elevate healthcare for patients worldwide.

Embracing New Skills and Digital Healthcare Era Tinto **09:00-10:30** Tuesday, 18 March

Optimising post-operative outcomes: the synergistic role of the surgical site infection surveillance nurse and the isla digital platform

Gina Kealey, Ishtiaq Ahmed University Hospitals Sussex NHS Foundation Trust, Royal Sussex County Hospital; Brighton and Hove, UK.

Surgical Site Infections (SSIs) pose a significant challenge in post-operative care, particularly in high-risk procedures such as cardiac surgery. These infections not only increase patient morbidity but also prolong hospital stays and escalate healthcare costs. A proactive, data-driven approach to infection surveillance is essential to mitigating these risks, and the Surgical Site Infection (SSI) Surveillance Nurse plays a critical role in this process. The integration of digital health solutions, such as the Isla platform, represents an innovative enhancement to traditional surveillance methods, improving patient engagement, enabling early intervention, and optimising clinical outcomes.

The Essential Role of the SSI Surveillance Nurse

The SSI Surveillance Nurse is at the forefront of infection prevention efforts, undertaking systematic data collection, epidemiological analysis, and risk assessment to identify trends and implement targeted interventions. Beyond surveillance, their role extends to education, protocol enforcement, and multidisciplinary collaboration, ensuring that both healthcare professionals and patients adhere to best practice in infection control.

One of the key challenges in post-operative care is the early detection of infection, particularly after a patient has been discharged. Traditionally, patients rely on self-monitoring and scheduled follow-up appointments, which can result in delays in recognising complications. Digital innovations such as Isla are now transforming post-operative recovery, addressing this critical gap in patient care.

Digital Innovation in Infection Surveillance: The Isla Platform

Isla is a secure, cloud-based platform designed to enhance post-discharge surveillance by enabling patients to upload images of their surgical wounds and report symptoms remotely. This allows healthcare professionals to monitor recovery in real time, identifying early signs of infection and intervening promptly when necessary.

Preliminary findings suggest that Isla reduces hospital readmission rates and improves post-operative recovery by bridging the gap between discharge and in-person consultations. Its integration with electronic health records (EHRs) allows for comprehensive data analysis, supporting evidence-based decision-making and refining infection prevention strategies at both individual and organisational levels.

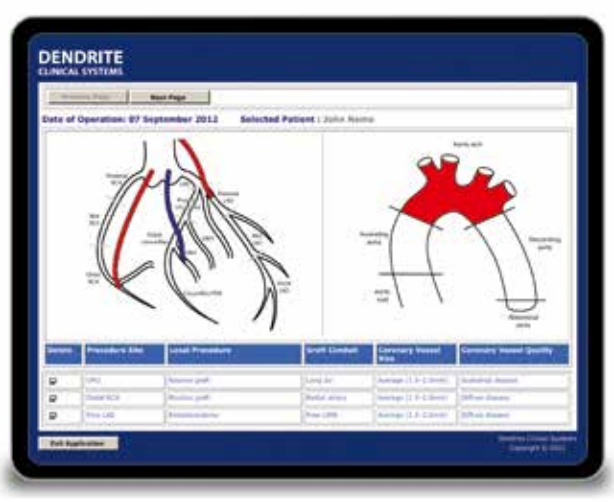
A Collaborative Approach to Post-Operative Care

The partnership between the SSI Surveillance Nurse and the Isla digital platform exemplifies a modern, patient-centred model of care that blends clinical expertise with technological innovation. By harnessing real-time data, remote monitoring, and enhanced communication, this integrated approach empowers patients, facilitates early intervention, and ultimately reduces the incidence of SSIs.

As the healthcare sector increasingly embraces digital transformation, the role of technology in enhancing patient safety, optimising resource allocation, and driving continuous quality improvement is becoming ever more apparent. The future of surgical care lies in the seamless integration of human expertise and digital advancements, ensuring that post-operative pathways are not only efficient and evidence-based but also proactive and patient-focused.

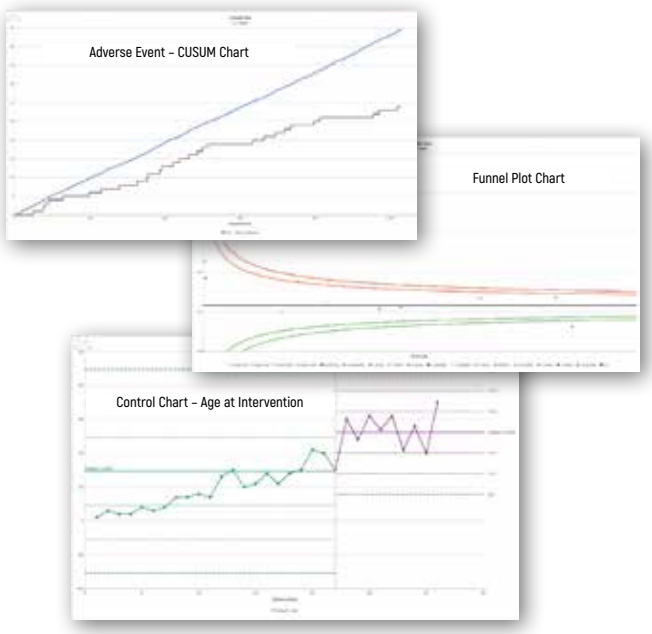
DENDRITE CLINICAL SYSTEMS

Cardiac surgery database software with proms and data benchmarking



Covers all cardiac surgery procedures

PROMs function is designed to collect follow-up data directly from patients



Includes comprehensive risk modelling and outcomes benchmarking tools

The system:

- Can be used for hospitals and national registries
- Integrates with other clinical information systems
- Includes export to national registries

To request a demonstration or additional information please contact

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Scientific Tinto
15:30-17:00 Monday, 17 March

Comparison of FREE and RESILIA pericardial treatment for prosthetic heart valve tissue in a small animal model.

Delphine Szecel, Manon Van Hecke, Tom Langenaeken, Bart Meuris University Hospitals Leuven, Leuven, Belgium

Ever since the first valvular bioprosthesis was used by Carpentier in 1965, one of the main challenges has been to extend the lifespan of such bioprostheses. The main disadvantage of tissue valves remains progressive structural valve deterioration. As calcification is one of the main drivers, numerous anticalcification treatments have been developed. Glutaraldehyde is needed to cross-link and stabilize xenogenic tissue. Nevertheless, over the last decades, several studies have shown that free aldehyde residues can also trigger calcification, leading to different aldehyde detoxification strategies.

In recent years, two different pericardial tissues were brought on the market: the RESILIA treatment used on the Inspiris prosthesis (Edwards Lifescience Corporation) and the FREE treatment used on the Perceval Plus (Corcym group). Our aim was to evaluate and compare both treatments in a small animal model, using glutaraldehyde-fixed pericardium as a control (PC). All samples were subcutaneously implanted in juvenile rats, for a duration of 8 weeks. After macroscopical examination and x-ray imaging, each sample was divided in two allowing to perform calcium quantitative determination and histological analysis.


Delphine Szecel

First, macroscopically, all pericardial control samples were homogeneously stiffened by calcification. FREE and RESILIA samples remained flexible and did not reveal macroscopical signs of mineralization. The X-ray analysis showed dense and clear calcifications on all PC samples, while samples from the FREE and the RESILIA treatment did not show calcification at all.

Calcium content measurement was performed using absorption spectrometry. The calcium content was significantly lower in the FREE (3.03 ± 0.73 ±g Ca /mg dry weight, $p < 0.001$) and RESILIA (3.36 ± 1.45, p 0.001) treatments when compared to the PC treatment (120.51 ± 16.85). There was no significant difference between FREE and RESILIA ($p=0.982$).

Last, histological examination using hematoxylin and eosin and Van Kossa stainings was carried out. FREE and RESILIA samples showed no calcifications in contrast with PC samples.

In light of these results, we can conclude that FREE and RESILIA treatments for bovine pericardial valve tissue show excellent results in a juvenile rat model of subcutaneous implantation. No calcification was observed macroscopically, nor on x-ray and histology. The calcium content of the RESILIA and FREE samples were similarly low and were significantly lower than the calcium content in control group.

Coffee Time! MR SUNIL K. BHUDIA

SCTS Conference News spoke to Mr Sunil Bhudia, a consultant cardiac surgeon and clinical director at Harefield Hospital and SCTS Meeting Secretary (2024-2026) about his career, influences, organising the annual meeting and marathon running...

Did you always want to enter medicine?
I was born and educated in Kenya, and growing up, a career in medicine was never an option, particularly as no one in the family was a doctor. A career in engineering or starting my own business was more likely. My family moved to the UK just before I started applying to universities. By that time, I had already achieved good exam results. Shortly after moving to the UK in 1990, someone suggested I should study medicine and apply to medical school. So, I wrote some letters and sent them off to universities to tell them of my exam results and ask them to consider my application to medical school. Most of them said no, except for Cambridge University and University College London (UCL). Cambridge wanted me to defer for a year, but I did not want to waste another year. Subsequently, I arranged an interview with a professor in UCL and, after a short interview, they offered me a place.

When I went to medical school, initially I wanted to become an ophthalmologist, and after graduating, I never thought of cardiothoracic surgery because it was always one of these really, really competitive fields. It was something that when you spoke to someone in medical school, they said, you only go into cardiothoracic surgery if you always wanted to do that. So that was never an option for me. I was also told that I would never become a cardiac surgeon.

I wanted to pursue a career in ophthalmology because I thought that was interesting, but then when I became a junior doctor, we used to cover ophthalmology clinics and ophthalmology patients, and it did not appeal to me. So, then I looked at paediatric surgery, and when I became an SHO in basic surgical training, I had three months of paediatric neurosurgery. And that was really, really tough in the sense we are not only we're dealing with the patients, but also with families and I thought, this is not for me. The next rotation was cardiothoracic surgery, and instantly, it was something I really enjoyed. I not only enjoyed the operative aspect but also looking after the patients preoperatively and then postoperatively on intensive therapy; that is what got me really interested in cardiothoracic surgery. From then, I started looking into how I could become a cardiac surgeon and started looking at what I needed to have on my CV to become successful in securing a place on the training programme.

Throughout your life, not necessarily just your career, who have been your greatest influences and why?
Obviously, my parents have been a great influence on me because they always instilled in us that you need to be educated. It doesn't matter what you become, but you need to be educated and be happy in what you're doing. They instilled a thirst for education and happiness in your career. Importantly, my wife, Nisha, keeps me grounded and prevents me from developing an ego!

When I went to America to undertake research, there was a surgeon there, a very famous cardiac surgeon called Dr Toby Cosgrove, and I did some research under his sort of supervision together with Dr Eugene Blackstone. I looked at the way Toby Cosgrove went about his day-to-day working, not only operatively, but also how he managed the whole department. I was impressed with how he approached things, how he was organised and thought about the bigger picture - always being a visionary. So he certainly influenced me as to what I needed to do and what I'm doing now. I'm not only doing cardiac surgery, but I'm also interested in leadership and how to get the best out of teams, and that's something that was instilled in me and gave me direction when I worked with Toby Cosgrove.

What experience in your training and career has taught you the most valuable lesson?
One of the most important lessons is that when you are struggling, you need to keep your head down and just make sure that you keep doing the right things, the right way, and everything will fall into place. When you're going through your training programme and you become a new consultant, things can get tough because you are in a very competitive field and a highly demanding environment. When things get tough, what's important is how you get through that period and not lose sight of the bigger picture. The lessons I've learnt is how to become resilient and how to overcome difficult periods and come out a better person. Of course, it is important to learn from such experiences and ask yourself - How am I going to do this better? Why have I got into this situation? How can I avoid getting into that situation in the future?

Another important lesson is not to work as an individual. Yes, you can be a leader, but there's a whole team that you work with, and it's how you nurture that team, how you empower that team because it's the team that makes you look good individually as you perform. But it's a team that, at the end of the day, makes you look great. Always remember that there's a team, and to be successful as a team and individually, collaboration is the key.

What do you think are the biggest challenges facing this speciality over the next ten years?
I think the biggest challenge certainly in cardiac surgery is managing our patients' expectations. Patients want us to deliver innovative, minimal access procedures with quicker recovery. There is clearly pressure from the patients as to how we can be better at what we do. The challenge that we have in moving forward is how we can deliver our current practices in a less invasive manner. That's from the surgical point of view, but there are other things that are coming, such as how we can help patients with emerging technology. Clearly, the impact of artificial intelligence will affect cardiothoracic surgery - it will help us in how we assess patients, how we can get them through our pathways much quicker and also how we can re-stratify our patients and give them a more personalised risk assessment if they are undergoing an operation. Then, we can inform them what they can do to improve their lifestyle, to reap the fruits of the procedure that they've had. The pressures or challenges that we have is pushing the boundaries towards minimal access surgery and quicker recovery for patients whilst managing complex cases that are becoming more and more common as we move forward.

What are your current areas of research?
So my research has changed - when I was working towards my MD - I looked at brain protection during cardiac surgery, and that used to be the vogue; everyone was looking at brain protection. But then I became a consultant, my interest started changing, and I started looking at heart models together with engineers. I had two PhD students who worked on modelling of the heart, mathematical models to see how we can predict outcomes following certain interventions.

Currently, I think about teamworking, how to get the best out of individuals and how to get the best out of teams. Looking at other industries, I think we can learn from them, but they can also learn from us. We can teach other industries why healthcare systems work, and they can learn how they can improve their systems. I think the main focus for me moving forward is teamworking, individual performance, team performance and how we can improve that for the sake of not only individuals and teams but also for patient care.

Moving on to this year's SCTS meeting, as you're the meeting secretary, what are the most challenging and yet rewarding aspects of organising the annual meeting?
Most things you can get by reading on the internet or from journals, but we want to make it interesting for delegates so that they can come and listen to speakers who have something to impart that will tell us what's going to happen in the future, how are we going to help improve our team working etc. The challenge has been how we can make this meeting interesting and exciting for delegates to attend!

Once we have chosen our interesting and informative topics, the next challenge is how do we attract speakers, the right speakers for that particular topic. We identify the speakers, making sure that the speakers agree and fit into the various sessions. Of course, the challenge is always: How do we take it to the next level next year?

I work with an excellent team that is helping put this meeting together, and we've got an excellent admin team. It is very rewarding when you see this meeting evolve from something we had on paper, come together and result in a highly organised and interesting event. I think that is very, very rewarding.

What sessions are you looking forward to at this year's meeting?
Of course, as a meeting secretary, I would not say that I prefer one session over the other! But certainly, the plenary sessions are something I am looking forward to - one is on team working, another is looking into the future and another on leadership. I am really looking forward to those sessions because we've got some really exciting national and international speakers. We also have the previous coach of England's rugby union team, Sir Clive Woodward, speaking at one of the plenaries. University Day, which is on the Sunday, is very, very exciting. Again, we have a programme that has renowned national and international speakers, and I think it's going to be a fantastic day. As a meeting secretary, I also look forward to meeting people and extending my network of contacts, as well as meeting old friends and colleagues.

You're a cardiac surgeon, you're a teacher and you're helping to organise this meeting - if you have any spare time, how would you relax when you are not working?
Of course, at home, I enjoy spending time with my family, listening to what they have been doing, and we always make sure that we have our dinner together so we can listen to each other's exciting days and catch up on what the kids have been doing. We often get a philosophy update from our son and medical challenges from our daughter.

I also enjoy running and have participated in two London marathons in the last two years. I'm running in this year's London marathon, and I enjoy training for the marathon. I am raising money for charity and have raised over £25,000. Running relaxes me. I know when I am training, no one is going to bother me so that I have time to think and reflect. I enjoy that. It's also a great way to get and stay fit. I bring my running kit to work, so if I have a spare moment, I just go out running.

Sharing Best-Practice in NAHP - led Services Moorfoot **11:00-12:30** Monday, 17 March, 2025

The impact of a newly launched Advanced Nurse Practitioner-led Coronary Artery Bypass Graft follow-up clinic

Akhila James, Advanced Nurse Practitioner in Cardiac Surgery; Mr Sunil Bhudia, Consultant Cardiac Surgeon; Mr Shahzad Raja, Consultant Cardiac Surgeon Harefield Hospital, London, United Kingdom

The increasing demand on healthcare services has driven the development of innovative solutions to optimise patient care. One such initiative is the establishment of Advanced Nurse Practitioner (ANP)-led follow-up clinics, which aim to improve patient outcomes while alleviating the burden on traditional physician-led services. This study evaluates the impact of an ANP-led Coronary Artery Bypass Graft (CABG) follow-up clinic.

The clinic was established by a single ANP through a structured multi-phase process. In Phase 1, discussions with consultant cardiac surgeons assessed feasibility, data on workload was gathered, and a visit to a successful existing clinic was conducted. The ANP underwent rigorous training, including shadowing and supervised practice, before obtaining final consultant approval. Considerations such as funding and clinical governance were also addressed. In Phase 2, following these preparations, the clinic was launched on 1st May 2024, providing follow-up care for CABG patients under two consultant cardiac surgeons.

Over a five-month period, 42 patients were reviewed by the ANP in the follow-up clinic. In Phase 3, a structured patient satisfaction survey assessed communication, responsiveness, education, waiting times, and overall experience of the new clinic. Feedback was overwhelmingly positive, with 100% of respondents rating their care as excellent (87.5%) or good (12.5%). All patients reported that their concerns were addressed, treatment plans and medication instructions were clear, and appointments were scheduled promptly. No accessibility issues were reported. Key factors contributing to high satisfaction included clear communication, compassionate care, and short waiting times. However, 10% of respondents suggested better clarification regarding which staff member was responsible for their outpatient review.

In addition to improving patient satisfaction, the clinic demonstrated financial savings of £986.07 for the patients seen during the study period due to the transition from a senior registrar-led service to an ANP-led model. However, the true saving is related to the appropriate allocation of surgical registrars' time (125.5 hours in the year 2022-23).

Despite its success, the number of patients reviewed was limited due to various factors, including the ANP's scheduled days off, annual leave, reduced clinical activity during summer holidays, the resident doctors' strike, reliance on a single ANP, and disruptions caused by the Synnovis cyber-attack.

Mr Sunil Bhudia, Consultant Cardiac Surgeon, Akhila James (centre), Advanced Nurse Practitioner in Cardiac Surgery and Mr Shahzad Raja (right), Consultant Cardiac Surgeon

The success of the ANP-led CABG follow-up clinic highlights its potential as an effective service improvement initiative. By shifting routine follow-ups to an ANP, surgical registrars can focus on complex clinical tasks, enhancing overall healthcare efficiency while ensuring timely and thorough patient follow-up. The model offers significant cost savings by optimising resource use. Additionally, it supports the professional development of ANPs, expanding their role in specialised post-operative care.

This study reinforces the value of ANP-led follow-up clinics in enhancing patient care, improving efficiency, and ensuring the long-term sustainability of healthcare services. The findings support the continued integration of ANPs into specialised follow-up clinics, underscoring their essential role in delivering high-quality, patient-centred care.

The SCTS

Annual Dinner

2025

Monday 17th March
19:00 - 00:00
National Museum of Scotland

Tickets include welcome drink, 3 course meal, wine, entertainment & dance

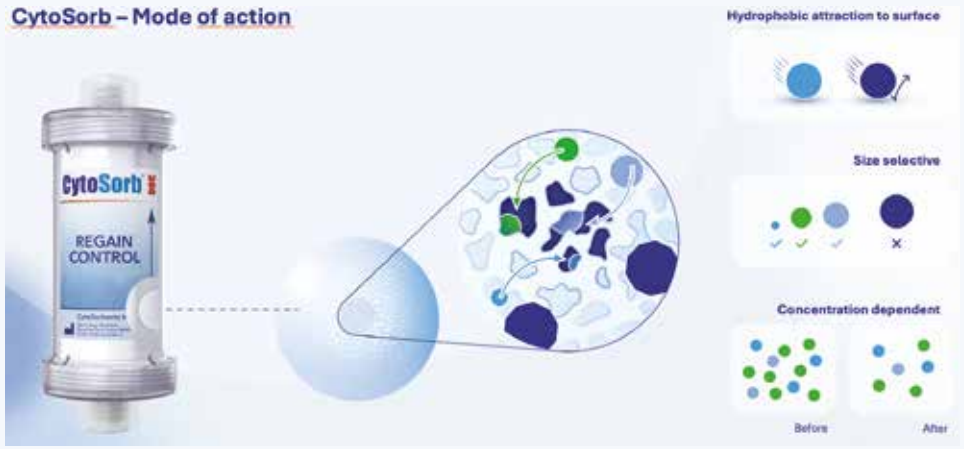
Tickets £80 available online when registering for the Annual Meeting

Dress code: Formal evening attire

The National Museum of Scotland
Chambers Street, Edinburgh, EH1 1JF

www.scts.org

The Cytosorb haemoadsorber is made of highly biocompatible porous polymer beads, designed to be compatible with whole blood and plasma. It offers a significant adsorption capacity for hydrophobic substances weighing less than 60 kDa.



CytoSorb in Cardiovascular Patients

Improving hemodynamics, bleeding risks and operative outcomes

- Antithrombotic removal
- Heart failure
- Infective endocarditis
- Post-operative hyperinflammation
- Aortic surgery
- VA-ECMO

CytoSorb has demonstrated benefit in cardiovascular patients with, or at high risk of hyperinflammation and/or bleeding due to ticagrelor or rivaroxaban.

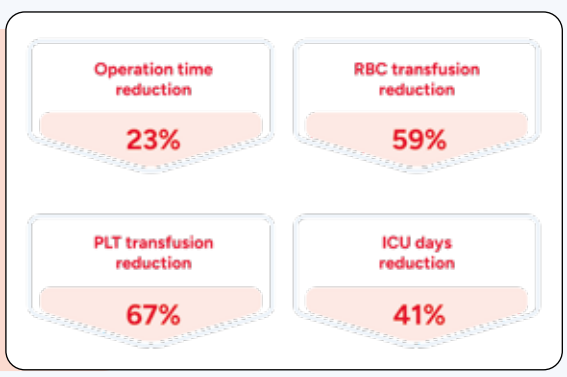
Antithrombotic removal

Master your bleeding risks

Cost saving[1, 2] (highlighted in U.K. NICE MIB for ticagrelor)

Reduction in re-thoracotomies for hemorrhage in post-operative bleeding[3, 4]

Reduction in operating time:'saves time + money' and 'improves efficiency'[3, 4]



Intraoperative drug removal improves clinical and economic outcomes; Incorporating hemoadsorption could be key to reducing costs and harm.

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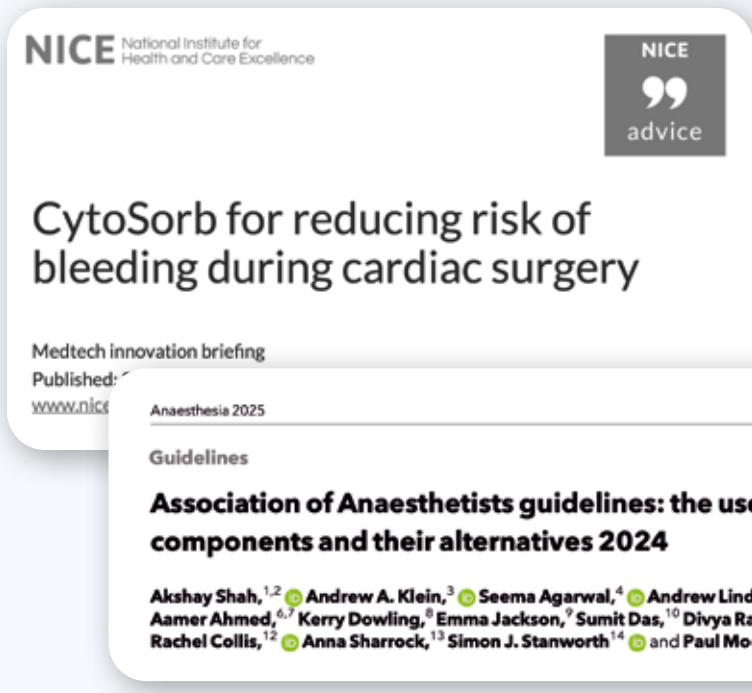
NICE National Institute for Health and Care Excellence

NICE advice

CytoSorb for reducing risk of bleeding during cardiac surgery

Medtech innovation briefing

Published:

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Anaesthesia 2025 doi:10.1111/anae.16542

Guidelines

Association of Anaesthetists guidelines: the use of blood components and their alternatives 2024

Akshay Shah,[1,2] Andrew A. Klein,[3] Seema Agarwal,[4] Andrew Lindley,[5] Aamer Ahmed,[6,7] Kerry Dowling,[8] Emma Jackson,[9] Sumit Das,[10] Divya Raviraj,[11] Rachel Collis,[12] Anna Sharrock,[13] Simon J. Stanworth[14] and Paul Moor[15]

Infective endocarditis

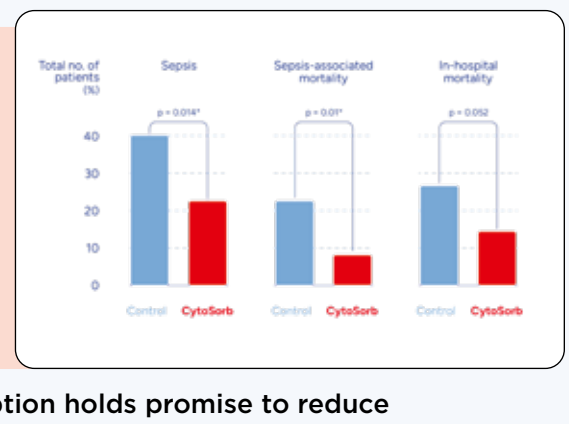
Improve surgical outcomes

Reduction in sepsis & sepsis related mortality[1, 2]

Reduced vasopressor needs & restoration of hemodynamic stability[2, 3]

Control of post-operative hyperinflammation[4]

Reduction in ICU length of stay[4]



Intraoperative hemoadsorption holds promise to reduce sepsis and sepsis-associated mortality after cardiac surgery for infective endocarditis patients.

1. Kalisnik JM *et al.*, J Clin Med 2022;11(14):3954. 2. Haidari Z *et al.*, PLoS One 2022;17(7):e02668203. Träger K *et al.*, Int J Artif Organs 2017; 40(5):240-249. 4. Kühne LU *et al.*, Int J Artif Organs 2019;42(4):194-200.

Infective endocarditis

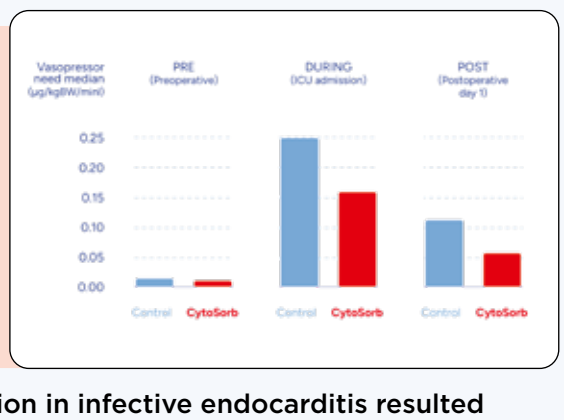
Improve surgical outcomes

Reduction in sepsis & sepsis related mortality[1, 2]

Reduced vasopressor needs & restoration of hemodynamic stability[2, 3]

Control of post-operative hyperinflammation[4]

Reduction in ICU length of stay[4]

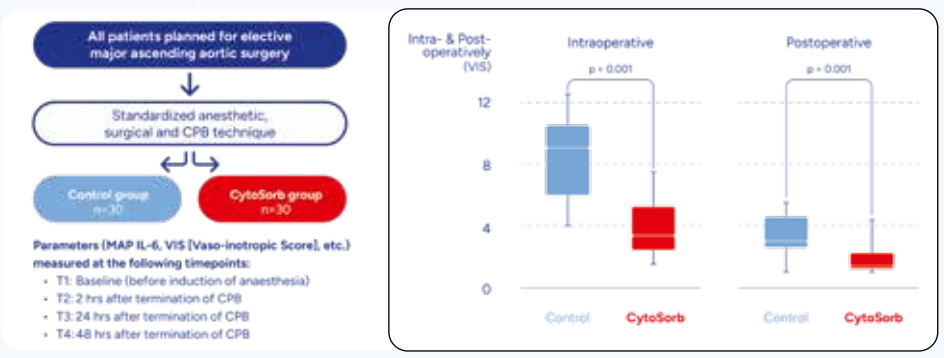


Intraoperative hemoadsorption in infective endocarditis resulted in significant faster recovery of hemodynamics and can therefore attenuate the severity of postoperative sepsis.

1. Kalisnik JM *et al.*, J Clin Med 2022;11(14):3954. 2. Haidari Z *et al.*, PLoS One 2022;17(7):e0266820 3. Träger K *et al.*, Int J Artif Organs 2017; 40(5):240-249. 4. Kühne LU *et al.*, Int J Artif Organs 2019;42(4):194-200.

Aortic surgery

Intraoperative use in patients with complex aortic surgery



Quasi randomized trial in complex aortic surgery in all-comer patients showed a significant reduction of the vasoactive inotropic score in the hemoadsorption group.

Mehta Y *et al.*, Interdiscip Cardiovasc Thorac Surg 2024; 38(4):ivae050

Aortic surgery

Less ARDS – High-risk and complex aortic surgery, TAAA

A trend to shorter ventilation times in the intervention group was observed (median 88 h vs. 510 h, p = 0.08, Δ422 hours).

Severe acute respiratory distress syndrome was significantly less in the intervention patients (p = 0.02).

Postoperative outcomes	Control	CytoSorb	P-value
Ventilation time (hrs)	510 [14 - 954.5]	88 [9 - 337]	0.08
Prolonged ventilation	9 (52.9)	1 (10)	0.03*
Tracheostomy	11 (64.7)	4 (40)	0.023
Pneumonia	11 (64.7)	7 (70)	0.79
ARDS (severe)	7 (41.1)	0 (0)	0.02*

First pilot study showing that the intraoperative use of hemoadsorption in open thoracoabdominal aortic repair patients may be feasible and safe.

Doukas P *et al.*, J Clin Med 2023; 12(2):546

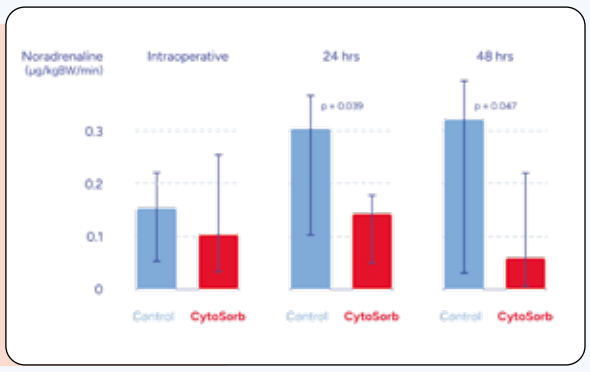
Heart failure

Observational pilot study HTx: 16 matched pairs

Reduced vasopressor needs & restoration of hemodynamic stability

Less frequent post-op RRT (heart transplant)

Nemeth E *et al.*



Intraoperative hemoadsorption treatment was associated with reduced vasopressor demand with a favorable tendency in length of mechanical ventilation, ICU stay and renal replacement therapy (RRT).

Nemeth E *et al.*, J.Clin Transplant 2018; 32(4):e13211

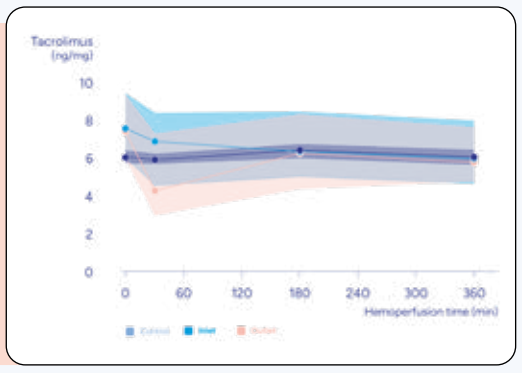
Heart failure

Heart transplantation and immunosuppression

Pharmacokinetics of immunosuppressive agents during hemoperfusion

CytoSorb hemoperfusion in a sheep model appears to have a limited effect on the clearance of Tacrolimus, Mycophenolate Mofetil, Prednisolone, Cyclosporin A, Everolimus, Basiliximab and Methylprednisolone

Leber B *et al.*



No concerns regarding immunosuppression!

"Lack of removal for basiliximab and prednisolone and very limited influence on the blood levels of tacrolimus, cyclosporin A, mycophenolate mofetil, everolimus, and methylprednisolone. PK modeling revealed negligible clearance attributable to hemoadsorption for the latter substances."

Leber B *et al.*, Front Med (Lausanne). 2023;10:1258661

Heart failure

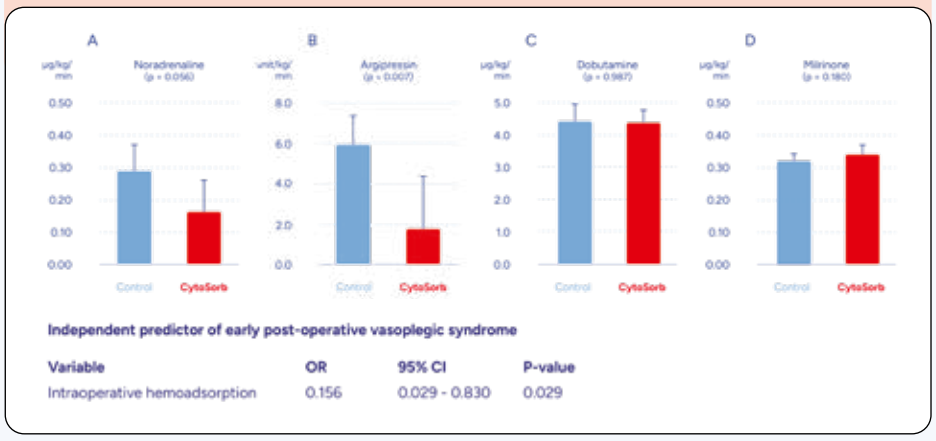
Use of intraoperative hemoadsorption in HTx patients: a proof-of-concept RCT

Intraoperative hemoadsorption was associated with better hemodynamic stability

lower rates of post-operative AKI and RRT, better hepatic bilirubin excretion, and shorter durations of MV and ICU stay.

6.4 fold decrease in early vasoplegic syndrome (p=0.029)

- No effect on mycophenolic acid concentrations
- No increase in the frequency of early allograft rejection



Independent predictor of early post-operative vasoplegic syndrome

Variable	OR	95% CI	P-value
Intraoperative hemoadsorption	0.156	0.029 - 0.830	0.029

This RCT suggest that intraoperative hemoadsorption during HTx is associated with better hemodynamic stability compared to standard care.

Nemeth E *et al.*, ESC Heart Fail. 2024;11(2):772-782

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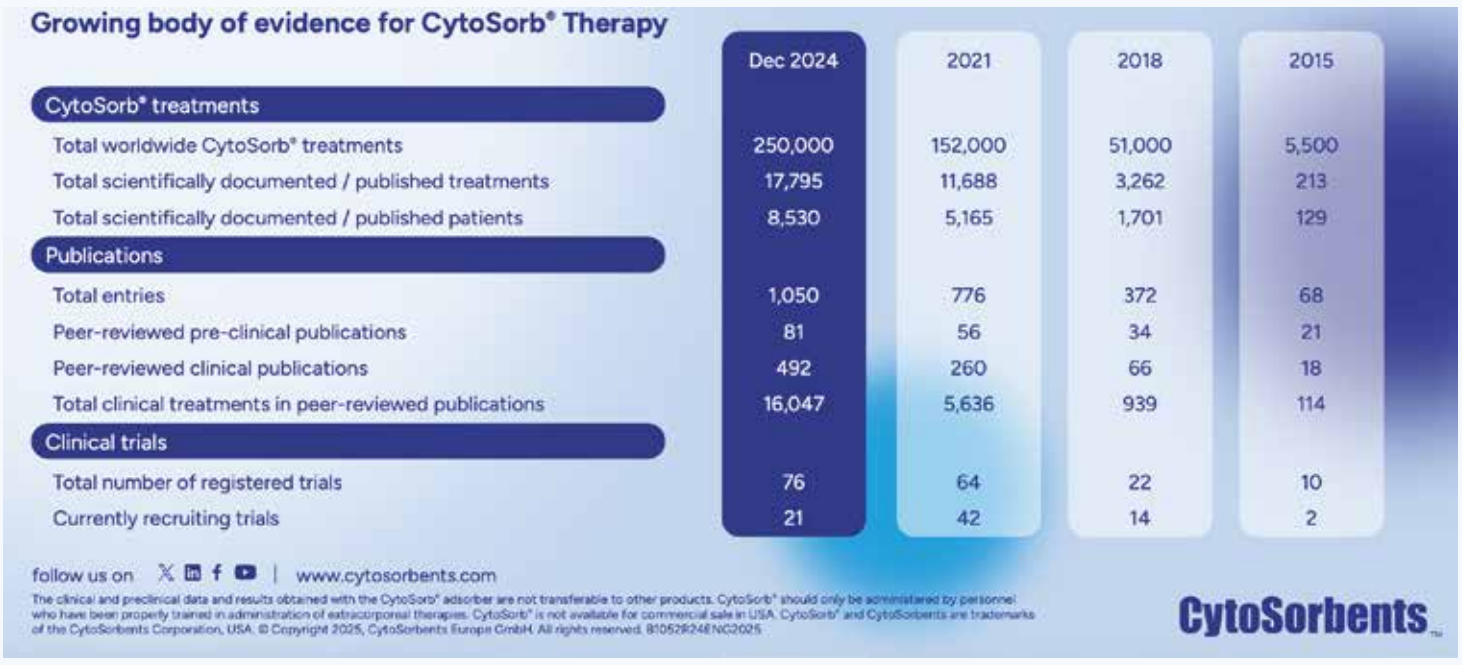
In conclusion, CytoSorb can provide effective removal of hydrophobic substances (<60 kDa) such as cytokines[1], bilirubin[2], myoglobin[3], rivaroxaban and ticagrelor [4-7]

CytoSorb treatment has been associated with:

- Reduced vasopressor needs & restoration of haemodynamic stability [8-13]
- Mitigation of collateral damage caused by excessive vasopressor doses [13]
- Modulation of the excessive inflammatory response [1, 9-10]
- Protection of organ function [12]
- Faster patient recovery, including shorter length of stay (LOS) after cardiac surgery and faster weaning from ECMO or respiratory support [12, 14]
- High survival rates [8, 14-16]



cyto.news/literature

1. Jansen *et al.*,Critical Care 2023; 27(1):117
2. Scharf C *et al.*, Scientific Reports 2021; 11(1):10190
3. Albrecht *et al.*, Blood Purif. 2024;53(2):88-95
4. Schmoeckel M *et al.*, J Throm Thrombolysis 2024; 57(6):888-897
5. Koertge A *et al.*, Blood Purif 2018; 45:126-128
6. Tripathi R *et al.*, Eur Heart J Cardiovasc Pharmacother, 2022; 8(8):847-856
7. Roed-Undlien H *et al.*, J Cardiothorac Vasc Anesth 2022; 36(6):1636-1644
8. Rugg C *et al.*, Biomedicines 2020; 8(12):539
9. Holmen A *et al.*, J Cardiothorac & Vasc Anesth 2022; 36(8 Pt B):3015-3020
10. Boss K *et al.*, PLoS One 2021; 16(2):e0246299
11. Haidari Z *et al.*, Ann Thorac Surg 2020;110(3):890-896
12. Träger K *et al.*, Int J Artif Organs 2017; 40(5):240-249
13. Leonardis F *et al.*, Case Rep Crit Care 2018; 2018:1205613
14. Akil A *et al.*, Thorac Cardiovasc Surg 2021; 69(3):246-251
15. Kogelmann K *et al.*, J Clin Med 2021; 10(13):2939
16. Brouwer WP *et al.*, Crit Care. 2019; 23(1):317

As featured in

SCTS CONFERENCE NEWS
The official newspaper of the SCTS Annual Meeting 2025 16–18 March 2025

Disclaimer

CytoSorb® is approved in the European Union with distribution in more than 75 countries around the world.

CytoSorb is indicated for use in conditions where elevated levels of cytokine and/or bilirubin and/or myoglobin exist. CytoSorb is indicated for use intraoperatively during cardio-pulmonary bypass surgery for removal of the P2Y12 inhibitor Ticagrelor and/or the Factor Xa inhibitor Rivaroxaban.

The CytoSorb device has been authorized by the FDA under an Emergency Use Authorization (EUA). The CytoSorb device is approved only for the duration of the declaration that circumstances exist justifying the authorization of the emergency use of the CytoSorb device under section 564(b)(1) of the Act, 21 U.S.C. § 360bbb-3(b)(1), unless the authorization is terminated or revoked sooner.

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CytoSorbents™

Cardiac: General 2 Pentland **09:00-10:30** Tuesday, 18 March, 2025

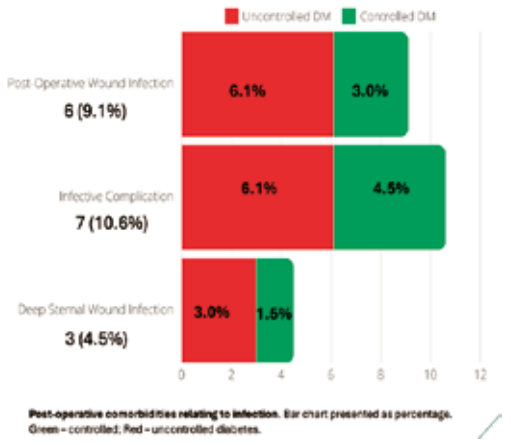
Pre-operative HbA1c is elevated... What do we do about it?

Adequacy of pre-operative diabetic assessment and glycaemic control in patients undergoing cardiac surgery

Aishah Mughal, Ahmed ElZeki, Ahmed Gamal, Mohsin Uzzaman, Mahmoud Abdelaziz New Cross Hospital, Wolverhampton, United Kingdom

Aishah Mughal

Mahmoud Abdelaziz



Post-operative comorbidities relating to infection. Bar chart presented as percentage. Green = controlled; Red = uncontrolled diabetes.

Are we doing enough to prepare diabetic patients for cardiac surgery?

Diabetes is a commonly encountered comorbidity amongst our cardiac surgical population, affecting around 30-40% of patients. Given its prevalence, ensuring proper glycaemic control before surgery is essential. ERAS Guidelines 2019 recommend HbA1c <53mmol/mol prior to cardiac surgery. The British Diabetes Society recommend diabetic referral if HbA1c >69mmol/mol... but are we actually following these recommendations?

Taking a closer look

A clinical audit was performed in the cardiac surgery department at The Royal Wolverhampton NHS (November 2023 - April 2024). This aimed to truly ascertain how well diabetic patients were assessed and managed before undergoing elective cardiac surgery. The audit included 66 patients, with an average age of 67 and BMI of 30.7. Most patients were put forward for elective CABG (65.2%), aortic (24.2%) and mitral valve surgery (16.7%). Type 1 and Type 2 diabetes were observed in 9.1% and 90.9% of patients, respectively.

Encouragingly, HbA1c testing was performed in 95.5% of cases. 43.9% were deemed to have 'uncontrolled' diabetes, however, no action was performed in 82.8% of cases despite an abnormal result. Only a small portion of patients (16.7%) were appropriately referred for diabetic intervention. Furthermore, the rates of post-operative wound infections were higher in uncontrolled diabetic patients than controlled diabetics (6.1% vs 3.0%)

Where do we go from here?

While it's clear that pre-operative testing is happening, however, action on abnormal results is falling short. The findings suggest a need for more proactive interventions, emphasising the importance of early assessments and improved glycaemic management before surgery. By focusing on optimising diabetes care, we can work to improve post-operative outcomes and reduce post-operative complications such as wound infections.

Overall, this audit serves as a reminder that testing alone isn't enough...it's how we implement appropriate and timely interventions to optimise glycaemic control in this high-risk patient group.

Robotic Thoracic Surgery
Fintry 11:15-12:30 **Monday, 17 March, 2025**

Is next day discharge feasible in Robotic –Assisted Thoracic Surgery Anatomical Lung resections?

Vasileios Kouritas, Ra'fat Tawalbeh, William Ansley, Obada Alqudah, Ahmad Asqalan, Hammad Hassan, Cristina Viola, Bartlomiej Szafron, Jakub Kadlec, Waldemar Bartosik Norfolk and Norwich University Hospital, Norwich, United Kingdom

Robotic-assisted thoracic surgery (RATS) is rapidly transforming the field of lung surgery. Its minimally invasive approach promises quicker recovery times. Many studies have shown an important decrease in length of stay of patients receiving RATS lung resections. Next day discharge is already known to be feasible in small number of patients undergoing minimally invasive procedures but it is not known if this is feasible or safe in patients undergoing RATS lung resections.

The Shift Towards Shorter Hospital Stays

Traditionally, lung resections required lengthy hospital stays due to concerns about postoperative complications. However, advances in minimally invasive surgery and robotic technology more specifically, have improved surgical precision and have led to decrease of surgical trauma, leading to better patient outcomes and quicker recovery. In this study, we hypothesized that next-day discharge is a safe and feasible option after RATS anatomical lung resections.

Examining the Evidence

The study analyzed 145 patients who underwent robotic lung resections and who did not develop any complications. Of these, 42 (29%) were discharged within 24 hours, while the remaining patients stayed longer due to non-medical reasons such as logistical delays or personal preference. Both groups received identical post-operative care, including early mobilization, standardized pain management, and physiotherapy.

The results were encouraging. Readmission rates were not increased by discharging patients the next day. No patients required re-intervention, and importantly, there were no deaths within 30 days of surgery.

Interestingly, the study found that patients who underwent sublobar anatomical resections—a less extensive but possibly more complicated procedure compared to lobectomies—were more likely to be discharged the next day. This suggests that the extent of surgery plays a role in determining the feasibility of early discharge.

Implications for Healthcare

The potential benefits of next-day discharge are significant. Reducing hospital stays can ease the burden on healthcare systems, improve resource allocation, and lower costs. Additionally, shorter hospital stays may reduce the risk of hospital-acquired infections and enhance patient satisfaction.

However, it is essential to ensure that safety remains the priority. Proper patient selection, standardized post-operative care, and efficient hospital workflows are crucial in making early discharge a routine practice.

Looking Ahead

While this study provides promising evidence, further research is needed. Larger, multicenter trials could help validate these findings and establish guidelines for early discharge after robotic lung surgery.

In the evolving landscape of thoracic surgery, robotic technology is proving to be a game-changer. If next-day discharge can become the norm for suitable patients, it could mark a new era of efficiency and patient-centered care in lung surgery.

Lung Volume Reduction and Pleural Disease
Sidlaw 15:30-17:00 **Monday, 17 March, 2025**

Outcomes of Anatomical Lung Volume Reduction Surgery (LVRS) compared with traditional LVRS

Vasileios Kouritas[1], Ra'fat Tawalbeh[1], William Ansley[1], Obada Alqudah[1], Ahmad Asqalan[1], Hammad Hassan[1], Paula Browne[2], Rachel Braithwaite[2], Hilmar Spohr[3], Akesh Dhrampal[4], Sadiyah Hand[5], Malcolm Marquette[5] 1 Department of Thoracic Surgery, Norfolk and Norwich University Hospital, Norwich, Norwich, United Kingdom. 2 Oxygen and COPD services, Norfolk and Norwich University Hospital, Norwich, Norwich, United Kingdom. 3 Department of Radiology, Norfolk and Norwich University Hospital, Norwich, Norwich, United Kingdom. 4 Department of Anesthesia and Critical Care, Norfolk and Norwich University Hospital, Norwich, Norwich, United Kingdom. 5 Department of Respiratory Medicine, Norfolk and Norwich University Hospital, Norwich, Norwich, United Kingdom

Lung Volume Reduction Surgery (LVRS) has been a cornerstone in the surgical management of severe emphysema, aiming to improve lung mechanics and alleviate respiratory symptoms. Traditionally, LVRS involves the non-anatomical removal of emphysematous lung tissue to enhance the function of the remaining parenchyma. However, a newer approach—Anatomical Lung Volume Reduction Surgery (A-LVRS)—has emerged, which follows defined segmental or lobar anatomical boundaries. While anatomical lung resection is commonly performed in lung cancer patients who also have emphysema, its role as a primary intervention for emphysema alone has been relatively underexplored. A recent study sought to compare the outcomes of A-LVRS with those of traditional LVRS (T-LVRS), shedding light on their respective advantages and limitations.

A retrospective analysis was conducted in Norfolk in Norwich university hospital over two years, including patients who underwent surgical treatment for emphysema. Nineteen patients were included in the study, with eight undergoing A-LVRS and eleven undergoing T-LVRS. The groups were well-matched in terms of age, gender, preoperative lung function, COPD Assessment Test (CAT) scores, Modified Medical Research Council (MRC) dyspnea scores, six-minute walking distance, oxygen dependence, and comorbidities.

Postoperative outcomes were closely examined, revealing notable differences. While overall complication rates, critical care complex readmissions, and hospital readmissions were similar between the two groups, A-LVRS demonstrated a significantly shorter hospital stay and reduced chest drain duration. These findings suggest a potentially smoother recovery process for patients undergoing anatomical resections.

Perhaps more compelling were the functional improvements observed in the A-LVRS group. Forced expiratory volume in one second (FEV1) improved by 6.85% in A-LVRS patients compared to only 2% in the T-LVRS group, indicating a superior ventilatory benefit. Additionally, residual volume (RV), a key marker of lung hyperinflation, was reduced by 61% in A-LVRS versus 44% in T-LVRS. This greater reduction in hyperinflation is particularly significant, as it correlates with improved respiratory mechanics and symptom relief. Symptom scores reflected this trend, with a greater improvement in CAT scores and a more favorable reduction in MRC dyspnea scores in the A-LVRS group.

One of the most striking differences between the two techniques was the volume of lung tissue resected. Patients in the A-LVRS group had significantly larger resections, yet despite this, the in-hospital and 30-day mortality rates remained comparable between the two groups. This suggests that a more structured and anatomically guided approach to LVRS may enhance lung function without increasing surgical risk.

By following anatomical planes, A-LVRS may allow for a more predictable postoperative lung expansion and better overall functional outcomes. The significant improvements in lung function and quality of life measures, coupled with a shorter hospital stay, suggest that A-LVRS could represent a paradigm shift in the surgical treatment of emphysema.

This study provides compelling evidence that anatomical LVRS is not only a safe alternative to traditional LVRS but may also offer superior clinical benefits. As thoracic surgeons continue to refine their techniques, A-LVRS stands out as a promising evolution in the surgical management of advanced emphysema.

SCTS ANNUAL MEETING 2025

SUNDAY 16TH MARCH

	SIDLAW	FINTRY	PENTLAND	TINTO	MOORFOOT	KILSYTH	HARRIS	CROMDALE HALL	CROMDALE HALL	CROMDALE HALL
09:00-10:30	Exciting World of Cardiothoracic Transplantation	Alternatives in Cardioplegia	Improving Quality in Thoracic Surgery		Research Equity in Cardiac Surgery	Medical Student Session		Trainee Wetlab: CABG Surgery Session	Advanced Skills Lab TERUMO CARDIOVASCULAR	
10:30-10:50	Refreshments - Strathblane Hall									
10:50-12:20	From Aortic Root to Aortic Arch	British Heart Valve Society: Patient Prosthesis Mismatch in Aortic Valve Intervention	Pleural Disease		Translating Research Into Practice	Pat Magee - Oral Abstract Presentation		Trainee Wetlab: Aortic Valve and Aortic Root Session	Advanced Skills Lab TERUMO CARDIOVASCULAR	NAHP Wetlab & Drylab
12:20-12:30	Grab lunch box to attend session - Strathblane Hall									
12:30-13:30	Terumo Aortic Lunchbox	Medtronic Cardiac Lunchbox Medtronic	AtriCure Cardiothoracic Lunchbox AtriCure	Zimmer Biomet Thoracic Lunchbox ZIMMER BIOMET	Edwards (Cardiac) Lunchbox Edwards	AstraZeneca Thoracic Lunchbox AstraZeneca	Medtronic Thoracic Lunchbox Medtronic	Lunch Break		Lunch Break
13:30-15:00	Acute Aortic Dissection - Challenges	Mitral Valve Surgery	Early Stage Lung Cancer Management	Congenital	Post-operative Complications Following CT surgery	Medical Student Session - *Wetlab in Cromdale Hall*		Trainee Wetlab: Mitral Valve Surgery Session	Advanced Skills Lab TERUMO CARDIOVASCULAR	NAHP Wetlab & Drylab (13:10 - 15:00)
15:00-15:30	Refreshments - Strathblane Hall									
15:30-17:00	Improving Quality in Coronary Surgery	Minimally Invasive Cardiac Surgery	SACT and Lung Cancer surgery		Training and Development: The Future for SCP's	Medical Student Session		Congenital Wetlab Ross Procedure	Advanced Skills Lab TERUMO CARDIOVASCULAR	
17:00-19:00	Welcome Reception - Exhibition Hall					Trainee Meeting (17:00 - 19:15)				
19:30-22:00	Pub Quiz: Kimpton Charlotte Square Hotel									

MONDAY 17TH MARCH

	SIDLAW	FINTRY	PENTLAND	TINTO	MOORFOOT	KILSYTH	HARRIS	CARRICK	MENTEITH	ORGANISER'S
08:00 -08:55						Breakfast Session - MSD MSD				Congenital Surgery Sub-committee Meeting (08:00-08:55)
09:00-10:30	Presidential Plenary - Pentland, Fintry and Sidlaw Auditorium									
10:30-11:15	Refreshments - Exhibition Hall									
11:15-12:30	Peri-operative Management in Thoracic Surgery	Robotic Thoracic Surgery	Aorta - Aneurysm	Cardiac: General 1	Sharing Best-Practice in NAHP - Led Services (11:00 - 12:30)	Coronary	Moderated Posters: Cardiac 1	Management of Aortic Congenital Disease (11:00 -12:30)	SCTS digital rehabilitation Fit4Surgery trial in Lung Meeting (11:00-12:00)	
12:30-13:30	Lunch - Exhibition Hall • Pet Therapy - Platform 5								FARSTER-care Trial Investigators Meeting (12:30-13:30)	AFFECT Investigators Meeting - South Tees Hospital (12:30-13:30)
13:30-15:00	Plenary: Leadership in Surgery – Pentland Auditorium							Congential Abstracts		
15:00-15:30	Refreshments - Exhibition Hall • WiCTS Networking Event - Platform 5								James Lind Alliance Priority Setting Partnership Meeting (15:00-16:30)	
15:30-17:00	Lung Volume Reduction and Pleural Disease	Screening and Early Lung Cancer Management	Aortic Valve	Scientific	Learning Different and Thinking Outside the Box to Escape the Coffin	Cardiothoracic Surgery Training and Success	Moderated Posters: Thoracic 1	Congential Abstracts and Movies		
17:10-18:10				Symposium - AtriCure AtriCure	Symposium - Intuitive INTUITIVE	Symposium - MSD MSD		UKAS Meeting (17:00-18:00)	RESTORE Investigators Meeting - South Tees Hospital (17:00-18:00)	Audit Sub-Committee Meeting (17:00-18:00)

TUESDAY 18TH MARCH

	SIDLAW	FINTRY	PENTLAND	TINTO	MOORFOOT	KILSYTH	HARRIS	CARRICK	MENTEITH
08:00 -08:55									Thoracic Audit Sub-Committee Meeting (08:00-08:55)
09:00-10:30	Improving Quality in Thoracic Surgery	Pectus and Other Chest Wall Disorders	Cardiac: General 2	Embracing New Skills and Digital Healthcare Era	Innovative Research-Based Project Implementation In the NHS	Cardiac: General 3	Moderated Posters: Cardiac 2	Mechanical Circulatory Support	Thoracic Surgery Sub-Committee Meeting (09:00-10:00)
10:30-11:00	Refreshments - Exhibition Hall								Women in Cardiothoracic Surgery Sub-Committee Meeting (10:00-11:00)
11:00-12:30	Plenary: Looking into the Future - Pentland Auditorium								
12:30-13:30	Lunch - Exhibition Hall • Pet Therapy - Platform 5								
13:30-15:00	Chest Wall Resection and Pain Management	Contemporary Lung Cancer Management	Mitral Valve	Moderated Posters: Cardiac 3	Working Together to Enhance Patient Care Pathways	Aortic Dissection Heart Research UK	Moderated Posters - Thoracic and Transplant	Heart Valve Voice	Communications Sub-committee Meeting (13:30-14:30)
15:00-15:30	Refreshments - Strathblane Hall								Sustainability in Cardiothoracic Surgery Meeting (14:30-15:30)
15:30-17:00								Cardiac Research	

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Cardiac · Congenital · Industry Sessions · NAHP Wetlab/Session · Plenary · Satellite Meetings · Skills Lab · Student Engagement · Thoracic · Trainee

Multi-faith room: Dressing Room 1 & 2 • Mindfulness & Wellbeing Area - Platform 5 • Care giving room: Dressing Room 3 • Speaker Preview: Soutra Room

Learning Different and Thinking Outside the Box to Escape the Coffin Moorfoot **15:30-17:00** Monday, 17 March, 2025

Revolutionizing competency: the design, implementation, and impact of a new assessment for cardiac surgery specialist nurses

Scott Hopkins-Brown
Royal Papworth Hospital, Cambridge, United Kingdom

Cardiac Surgery Specialist (CSS) Nurses play a crucial role in managing patients during the first 48 hours following cardiac surgery. Their specialized training enables them to lead recovery efforts, potentially improving patient care through timely and effective interventions. Historically, the competency of CSS Nurses was evaluated by a Consultant Intensivist through informal VIVA-style examinations. However, this approach faced challenges due to variations between different Consultants, resulting in inconsistent and insufficiently robust assessments.

To address these issues, a new assessment method was developed with the aim of being valid, fair, reliable, and transparent. This new method was meticulously designed to align seamlessly with predefined learning objectives, ensuring a structured and objective evaluation process. Initially, the assessment was planned as an Objective Structured Clinical Examination (OSCE), incorporating elements based on multi-modal theory instruction, including study days, an online module provided by CSU-ALS, and supervised practice.

The Angoff method was employed to establish the pass mark, with Senior Cardiothoracic ICU Nurses and Doctors serving as expert judges. Originally an OSCE was planned but upon implementing and testing the assessment, it was found to be better suited for a VIVA (Oral Examination). Each assessment was conducted by a Senior ICU Nurse along with a Surgical or Intensive Care Consultant, ensuring a comprehensive evaluation of the CSS Nurses' competencies.

Following the assessment, staff were requested to complete an evaluation of the process using digital form. This employed a Likert Scale to gauge both the content and assessment process. Additionally, it included a question to measure confidence in utilizing this method for future CSS assessments, as well as a provision for staff to provide qualitative feedback.

The summarized feedback highlighted several areas for improvement. Staff suggested that using a mannequin would make scenarios more realistic and help in structuring answers. Providing the assessment program details beforehand could reduce participant anxiety. Additionally, scenarios could cover more topics such as bleeding and pacing and include more physiology. Daily practice and better-structured questions were also recommended for improvement.

The feedback clearly indicated that staff viewed the new assessment method as a positive change. As a result, the process will continue, with plans to expand the pool of scenarios for even greater variety. There is also potential to replicate this assessment approach for ECMO Specialist Nurses, further enhancing the evaluation of specialized nursing competencies.

The new assessment method for cardiac surgery specialist nurses represents a significant advancement in clinical education. By aligning with predefined learning objectives and employing a structured approach, the assessment ensures a more valid, fair, and reliable evaluation of competencies. The shift to VIVA examinations, based on pilot feedback, has further enhanced the robustness and relevance of the assessment.

This initiative underscores a commitment to excellence in clinical education and patient care, setting a higher standard for future assessments. By continuously refining the assessment process and incorporating feedback from staff, the goal is to ensure that CSS Nurses are well-equipped to provide the highest level of care to their patients.

Congenital Abstracts Carrick **13:30-15:00** Monday, 17 March, 2025

A new way to reconstruct the pulmonary valve

Bobur B Turaev Tashkent Pediatric Medical Institute, Tashkent, Uzbekistan

For decades, surgeons have faced a tough challenge when reconstructing the right ventricular outflow tract (RVOT) in children with congenital heart defects. The most common approach, the transannular patch (TAP), effectively relieves obstruction but leaves patients with severe pulmonary regurgitation, leading to right ventricular (RV) dysfunction over time.

At this year's SCTS Annual Meeting in Edinburgh, I'll be presenting a new surgical approach that could change the way we treat these patients. My team and I have explored using the right atrial appendage (RAA) to create a pulmonary neovalve, offering a more physiological alternative to TAP.

Why Change the Standard Approach?

TAP has been widely used because it is simple and effective in widening the outflow tract. However, it often sacrifices the function of the pulmonary valve, leaving the patient with chronic regurgitation. Over time, this can lead to RV dilation, dysfunction, and the need for future interventions.

The idea behind the RAA neovalve is to use the patient's own tissue to recreate a valve-like structure, restoring some of the pulmonary valve's function and significantly reducing regurgitation. This technique has been studied before, but our recent findings suggest it could become a preferred alternative in selected cases.

How Is the Procedure Performed?

The RAA neovalve is created by harvesting the right atrial appendage and shaping it into a valve-like structure. The tissue is sutured to the native pulmonary annulus, forming a functional neovalve that preserves leaflet mobility and allows more controlled blood flow. Unlike TAP, which leaves the RVOT open, this method provides partial valve function, helping to reduce regurgitation while still maintaining an adequate outflow tract diameter.

This approach is particularly beneficial because it utilizes autologous tissue, reducing the risk of rejection or calcification, which are common issues with prosthetic or homograft valves.

What Did We Find?

In our retrospective study, we compared two groups of pediatric patients:

- One group received the new RAA neovalve,
- The other underwent traditional TAP repair.

The results were remarkable. Patients with the RAA neovalve had significantly lower rates of severe pulmonary regurgitation and better RV function in the early postoperative period. They also had shorter ICU and hospital stays, suggesting a faster recovery.

Although the RAA neovalve technique requires slightly more operative time, the potential long-term benefits—less regurgitation, better RV function, and reduced need for reoperations—make it a promising alternative to TAP.

What's Next?

This study is just the beginning. Longer follow-up is needed to determine how well the RAA neovalve holds up over time and whether it significantly reduces the need for future valve replacements. However, our initial results suggest that for children requiring RVOT reconstruction, this technique could help preserve heart function better than conventional approaches.

As we continue to refine our methods and study long-term outcomes, I believe the RAA neovalve technique has the potential to shift the paradigm in pediatric cardiac surgery. I look forward to discussing these findings with colleagues at SCTS 2025 and exploring how we can further improve surgical options for our youngest patients.

Scientific Tinto **15:30-17:00** Monday, 17 March, 2025

The role of the cardiac lymphatics and LYVE1-dependent macrophages during neonatal mouse heart regeneration

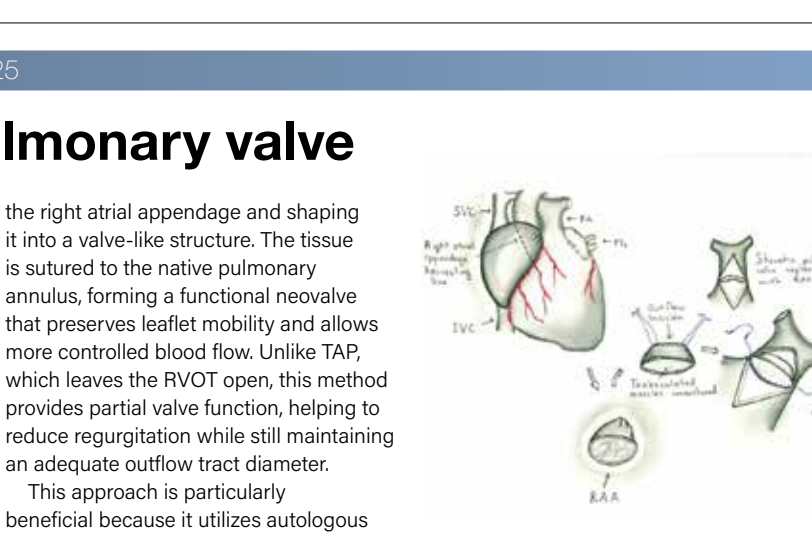
Benjamin Chapman Institute of Regenerative and Developmental Medicine, University of Oxford

The neonatal mouse heart possesses the remarkable ability to undergo complete scarless regeneration following cardiac injury, but this capacity is lost by the end of the first week of life (Gunadasa-Rohling, M. *et al.*, 2018; Porrello, E. R. *et al.*, 2013). In the Riley Group, we examine the changes across this "regenerative window" to identify variables required for endogenous myocardial regeneration. Understanding the cellular microenvironment that facilitates re-activation of developmental programmes will be essential not only to the feasibility of future exogenous cellular therapies, but also to the ultimate goal of inducing endogenous regeneration in adults.

In the present work, we investigated the capacity of the lymphatics to drain macrophages across the regenerative window and identified a surprising role for the receptor LYVE1 (Lymphatic vascular endothelial receptor 1) on macrophages in facilitating infarct revascularisation. The function of LYVE1 on lymphatic endothelial cells is in facilitating immune cell transmigration (Jackson *et al.* 2019), but its function on macrophages is largely unknown.

Initially, we considered adult mice, where myocardial infarction (MI) activates the cardiac lymphatics which undergo sprouting, drain interstitial fluid, and traffic macrophages to mediastinal lymph nodes (MLNs). This prevents oedema and reduces inflammatory immune cell content to improve cardiac function (Vieira *et al.*, 2018). Given the importance in the adult, we investigated their role across the neonatal regenerative window. Following MI at post-natal day 1 (P1), cardiac regeneration occurs but is macrophage-dependent (Aurora *et al.*, 2014), whereas the scarring following equivalent injury at day 7 (P7) is driven by pro-fibrotic macrophages. We hypothesised that lymphatics respond and function differently during this window to clear macrophage-specific subtypes depending upon their requirement for regeneration versus fibrotic repair.

Extensive lymphatic growth and sprouting was evident in intact neonatal hearts until P16. The response to injury revealed limited lymphangiogenesis and minimal clearance of macrophages from P1 compared to P7 infarcted hearts, as determined by adoptive transfer experiments and monitoring of cleared macrophages to MLNs. This is coincident with maturation of lymphatic endothelial cell junctions across the neonatal period via transition from "zipper" (impermeable) to "button" (permeable) -type junctions.



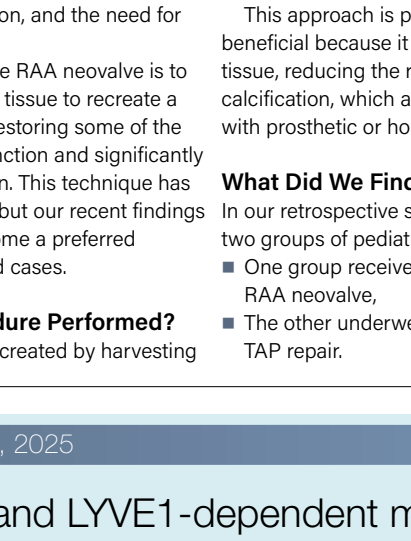


Figure 1. Clockwise from upper-left: (1) Whole mount neonatal heart rendered transparent to visualise cardiac veins. (2) Neonatal heart with a surgically-induced infarct, macrophages visible in green migrating to infarct zone. (3) Close-up of the infarct zone showing migration of LYVE1+ macrophages in blue. (4) LYVE1+ macrophages in cell culture. (5) Comparison between revascularisation of the infarct zone in wildtype neonatal mice (left) and macrophage-specific Lyve1 knockout mice (right) showing reduced neoangiogenesis.

Finally, in mice lacking LYVE1, that exhibit impaired transmigration of interstitial macrophages to lymphatic vessels, magnetic resonance imaging (MRI) revealed a surprising impaired functional outcome in P1 mice 28 days post-MI. Given our observations that pro-regenerative macrophages at P1 are not trafficked, this suggested a distinct role for LYVE1 in tissue-resident (TR) macrophages, consistent with its expression in developing and post-natal hearts. Macrophage-specific deletion of Lyve1 during neonatal heart injury revealed impaired heart regeneration, characterised by reduced neovascular response and function, suggesting a hitherto unappreciated role for LYVE1 in regulating the pro-regenerative function of TR macrophages. The molecular role of LYVE1 was interrogated by scRNA-Seq, capturing Lyve1-KO and wildtype macrophages following MI at P1. We observed a reduction in the CCR2- subpopulation and subsequent replacement by inflammatory and pro-fibrotic monocyte-derived populations in the knockout, indicating that Lyve1 is indispensable to the established role of CCR2- macrophages as inhibitors of monocyte recruitment post-MI.

Collectively, we reveal that cardiac lymphatics are developmentally compromised for immune cell clearance in early neonates, which enables retention of pro-regenerative TR macrophages, and that LYVE1 plays an essential role in TR macrophages enabling heart regeneration via the induction of coronary angiogenesis and inhibition of inflammatory monocyte recruitment.

Aortic Valve Pentland **15:30-17:00** Monday, 17 March, 2025

Aortic single point of referral process: a single-centre review of the aortic pathway timelines

Kerry Pena, Yama Haqzad, Sotiris Papaspyros, , Antonella Ferrara, Walid Elmahdy, Kalyana Javangula, Michael Cunnington, Dominik Schlosshan, Betsy Evans, Pankaj Kaul Leeds General Infirmary, Leeds, United Kingdom

Leeds Teaching Hospitals NHS trust (LTHT) is one of the largest tertiary cardiac units in the UK, serving a population of over 3 million, with a clear vision to provide the highest quality specialist and integrated care. We pride ourselves on providing cohesive care for patients with aortic valve disease through multidisciplinary collaboration between cardiology and cardiac surgery.

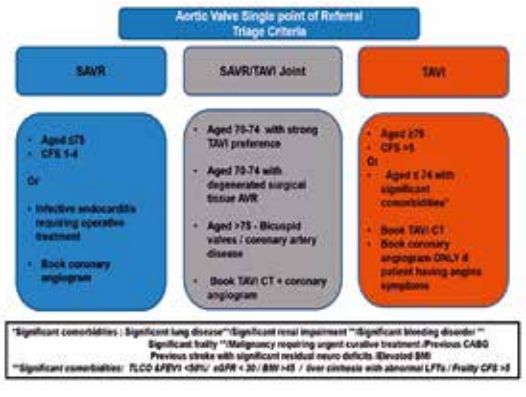
In 2008, Leeds became one of the first centres to perform Transcatheter Aortic Valve Implantation (TAVI) for patients with severe aortic valve disease who were inoperable or high risk for Surgical Aortic Valve Replacement (SAVR). The service has grown exponentially with over 500 TAVI cases last year.

However, the demand for aortic valve treatment began to outstrip the capacity therefore pathway modification had to be made to address this. Further, the longer patient waits for the treatment, increases their chances of deterioration requiring hospitalisation and/or death. Aortic valve single point of referral process was introduced in 2023 to streamline the clinical pathway, aiming to reduce the timeline from referral to treatment with efficient utilisation of finite health resources. The ESC guideline criteria were then implemented in 2024 to guide the assessment and treatment pathway for the patients.

This process allows referrers to send a referral form to a single point of access. The form is then triaged to the appropriate pathway by cardiac valve nurse specialists. This triaging of cases means the number of patients requiring discussion in the heart team meetings has reduced. Patients are still discussed if there is any query about the appropriate treatment option (see figure). Patients on the joint SAVR – TAVI pathway will be discussed only following completion of assessment by cardiac surgeons and cardiologists in a joint clinic.

Our single point of referral process has reduced the time from Referral to Treatment (RTT). Although there were a similar number of referrals in 2023 and 2024 (637 vs 632), the single point of referral and nurse specialist triage process has reduced the RTT for patients on all parts of the pathway. The reduction was most significant for patients on the joint pathway where a 32-day difference was seen. (See table)

Number of Referrals	2023	2024
Joint SAVR/TAVI	90	20
SAVR	62	80
TAVI	485	532
Total	637	632
RTT (average in days)		
SAVR	156	124
TAVI	149	121
Joint pathway – decision for SAVR	146	111
Joint pathway – decision for TAVI	151	112



The implementation of ESC guidelines and the single point of referral process significantly reduced the time from referral to treatment for both TAVI and SAVR patients. Additionally, there was a notable decrease in the number of patients needing joint TAVI-SAVR clinic evaluations, leading to improved resource utilization.

Scientific Tinto **15:30-17:00** Monday, 17 March

Neutrophil activation in Acute Type A Aortic Dissection

Liverpool Aortic Biomechanics and Biochemistry Research Group (LABB; University of Liverpool and Liverpool Heart and Chest Hospital)

Jillian Madine University of Liverpool, Liverpool, United Kingdom.

Increased systemic inflammatory markers are associated with poorer clinical outcomes in many conditions, including acute type A aortic dissection (ATAAD), but the significance of the inflammatory cell infiltration and activation is not fully understood. Supported by funding from the aortic dissection charitable trust we have investigated mechanisms underlying the role of neutrophils in ATAAD, and the potential to use neutrophil associated markers in diagnostic and prognostic pathways.

Our Research

Human aortic tissue and serum samples from aortic patients (ATAAD, chronic dissection and aneurysm) together with serum from healthy controls were probed for neutrophil markers and neutrophil extracellular trap (NET) debris. RNAseq of isolated neutrophils was performed alongside assessment of neutrophil activation. Additionally, the relationship between baseline systemic and novel inflammatory markers, time to presentation and outcomes for patients undergoing surgery at Liverpool Heart and Chest Hospital were evaluated.

Findings

Baseline neutrophil levels are a key indicator of post-operative clinical outcome. Markers of neutrophil biology in the damaged aorta, particularly the false lumen, correlate with those seen in the blood. Higher levels of NET marker (citrullinated histone 3) and NET DNA were detected in tissue and serum from ATAAD patients compared with other aortic conditions and healthy controls. Unstimulated neutrophils from ATAAD have a greater oxidative burst than healthy controls. However, stimulating the neutrophils does not produce a similar increase, suggesting exhaustion. Reactome from RNAseq of isolated neutrophils identified multiple genes connected to neutrophil degranulation as differentially expressed between healthy controls and ATAAD providing opportunities for future biomarker development. We have also identified an association between serpin, adiponectin and migration inhibitory factor (MIF) with post-operative prognosis.

Clinical Implications

Inflammatory markers at admission may be useful in risk stratifying patients with time from index event an important modifying variable. Neutrophils from ATAAD patients exhibit an activated phenotype, with NETosis markers and degranulation products in the blood acting as markers for tissue damage. Elevated levels of neutrophil associated inflammatory markers are associated with poorer outcomes, with several candidates identified that predict post-operative healing and outcome providing opportunity for incorporation into prognostic models.

Aorta - Aneurysm Pentland **11:15-12:30** Monday, 17 March, 2025

Impact of lung cancer screening on detection of thoracic aortic aneurysms

Philip Hartley Royal Sussex County Hospital, Brighton, United Kingdom

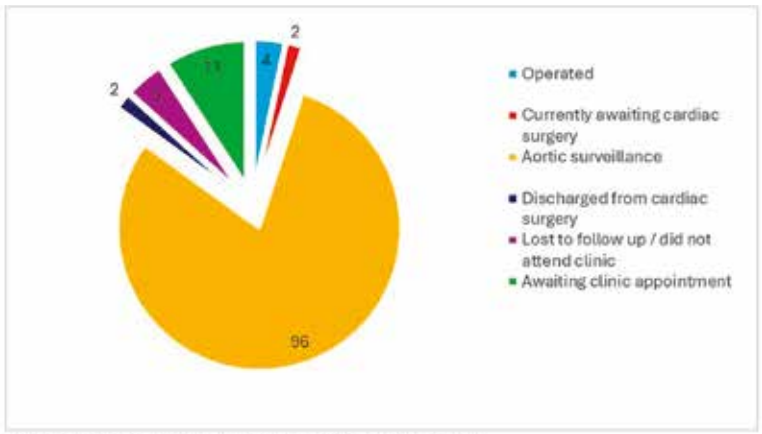
Over the last 15 years several large randomised control trials have established the effectiveness of screening, with low-dose computed tomography (LDCT), in reducing the mortality associated with lung cancer. These studies have formed the evidence base for the development of lung cancer screening in high risk groups, and lung cancer screening programmes are at various stages of development across the world. The UK was one of the first countries to pilot lung cancer screening through the targeted lung health check programme (TLHC), which was launched in 2017. Following the success of regional schemes, the UK government announced in June 2023 that TLHC would be developed into a national lung screening programme, which is expected to be available nationwide by 2029.

Unlike established screening programmes, LDCT is not highly specific for the index condition and has the potential to detect a wide range of incidental findings. The most common incidental findings are coronary artery calcification, emphysema, bronchiectasis, extra-pulmonary masses, vertebral wedge fractures, and thoracic aortic aneurysms (TAAs). Often the clinical significance of incidental findings is unclear and how best to approach the management of unexpected findings is an area of current debate.

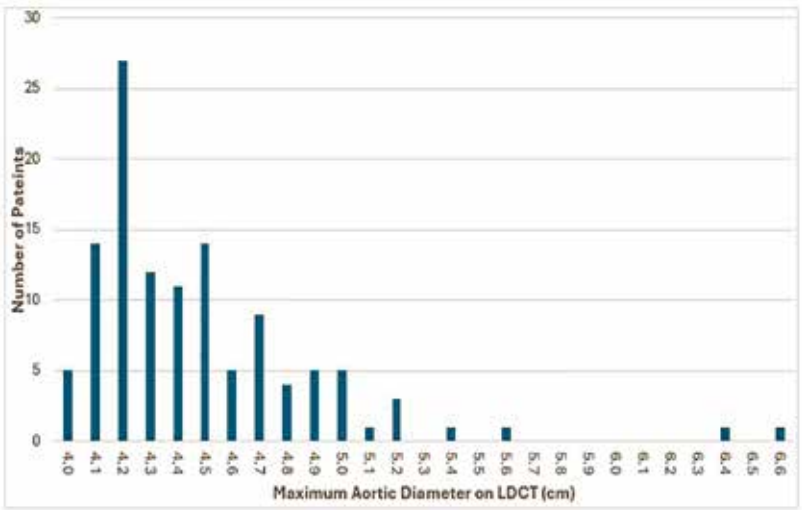
Estimating the potential case load arising from the incidental detection of TAAs during the development of lung cancer screening programmes is challenging since TAAs tend to be clinically silent and their prevalence within the general population is uncertain. To date, there has been little research on the impact of lung cancer screening on the detection of TAAs and the outcomes for these patients who are referred to cardiac surgery centres. During the current research we examined the prevalence of TAAs in patients undergoing lung cancer screening and their outcomes following referral to cardiac surgery.

During the study period from September 2022 until June 2024 17,918 CTs were completed as part of the TLHC programme in Sussex. An initial cutoff of a maximum aortic diameter greater than 4.0 cm on LDCT was used to trigger referral to cardiac surgery. This was increased to 4.5 cm from April 2024. 120 individuals were referred to the cardiac surgery centre at Royal Sussex County Hospital for incidentally detected TAAs, representing an overall detection rate of 0.64%. 96 patients (80.0%) were subsequently referred for aortic surveillance, 2 patients are currently on the waiting list for aortic surgery and 4 patients have undergone aortic surgery. The average number of referrals each month prior to April 2024 was 5.7 and this decreased to 1.5 after April 2024.

The further investigation and management of incidental findings is a potential obstacle to the wider adoption of lung cancer screening. In the case of TAAs a balance needs to be struck between finding and operating on patients with significant TAAs, against committing large numbers of patients to aortic surveillance, who will never require surgical intervention. An increase in the maximum aortic dimension referral threshold on LDCT from 4.0 cm to 4.5 cm is an attempt to redress this balance in favour of reducing the number of patients undergoing unnecessary aortic surveillance. However, due to the uncertainty in the natural history of TAAs. and the clinical significance of any individual aneurysm, it is likely some patients with an aortic diameter below 4.5 cm will go on to develop a significantly larger aneurysm or a complication from their aneurysm. Further work to better understand which aneurysms are likely to progress and, which not, is necessary to risk stratify these patients and guide the management of incidentally detected TAAs.



Clinic outcomes following referral of TAAs from TLHC



Frequency of maximum aortic dimension measured on LDCT during lung cancer screening.

Mitral Valve Pentland **13:30-15:00** Tuesday, 18 March

Sex-related differences in patients with mitral regurgitation undergoing mitral valve surgery: a propensity score-matched study

Edouard Long King's College London, London

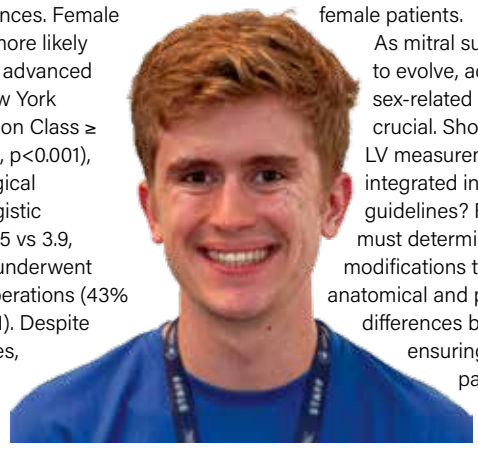
Are women with mitral regurgitation (MR) receiving surgery too late? There has been a growing awareness that there are sex-related differences in the presentations and outcomes of patients with MR undergoing mitral valve (MV) surgery.

Our recent study, conducted at St Thomas' Hospital in London, revealed that female patients with MR present with more severe symptoms, higher surgical risk, and have longer post-operative lengths of stays with similar long-term mortality compared to males.

We conducted a retrospective analysis of 143 consecutive patients undergoing MV surgery between 2017-2018, using propensity-score matching to control for baseline differences. Female patients were more likely to present with advanced symptoms (New York Heart Association Class ≥ III: 73% vs 45%, p<0.001), had higher surgical risk scores (Logistic EuroSCORE: 5.5 vs 3.9, p=0.006), and underwent more urgent operations (43% vs 16%, p<0.001). Despite these challenges, long-term overall survival rates were not significantly different (median follow-up 6.67 years).

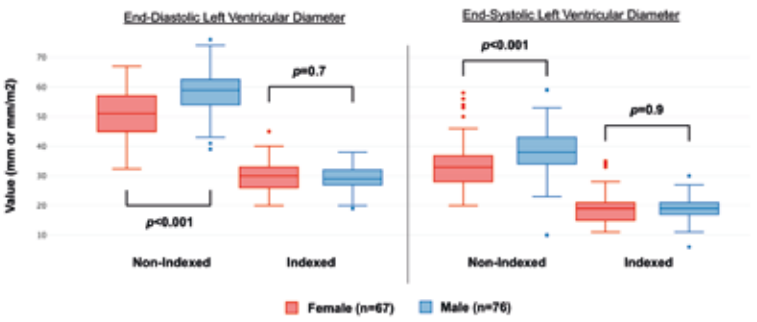
Additionally, our study found that female patients undergoing concomitant tricuspid valve procedures or urgent operations had worse prognoses than men. These findings highlight the importance of personalized treatment strategies in cardiac surgery.

One key finding was the discrepancy in left ventricular (LV) measurements between sexes. Female patients had significantly smaller non-indexed LV dimensions pre-operatively, which may delay intervention for MR based on current non-indexed echocardiographic thresholds. When indexed to body surface area, these discrepancies vanished. This suggests a need to consider indexed measurements to ensure timely intervention for female patients.



As mitral surgery continues to evolve, addressing sex-related disparities is crucial. Should indexed LV measurements be integrated into international guidelines? Future research must determine necessary modifications to account for anatomical and physiological differences between sexes, ensuring optimal patient outcomes.

Figure caption: Comparison of indexed to non-indexed left ventricular diameters by sex.



Improving Quality in Thoracic Surgery Sidlaw **09:00-10:30** Tuesday, 18 March

Analysis of readmission causes and predictive factors after thoracic surgery: Insight from a cohort of 544 patients.

A Saad[1] P Ellacuria[2], O Addallah[2] and S Ganti[2] 1 Northen General hospital, Sheffield Teaching Hospitals; 2 Wythenshawe hospital, Manchester University NHS trust.

Background

The National Lung Cancer Audit identified a readmission rate of 41% following lung cancer surgery, ranging from 22.7% to 53.8% across different trusts. However, this readmission rate encompasses both elective and acute admissions for various conditions. Consequently, the precise rate and causes of readmission remain unclear.

Objective

To determine the precise rate of readmission after thoracic surgery, as well as the predictive factors and impact associated with readmission.

Patients and Methods

This study analyzed patients who underwent thoracic surgery from January 1 to June 30 (total of 544 patients). Data were collected for each patient individually, identifying those who were readmitted.

	Non Readmission (n = 502)	Readmission (n = 42)	Test of Sig.	P
Gender				
Male	216 (43.0%)	25 (59.5%)	χ^2= 4.274*	0.039*
Female	286 (57.0%)	17 (40.5%)		
Mean ± SD.	62.6 ± 14.3	61.90 ± 18.60		
Hospital stay				
Min. – Max.	0.0 – 78.0	1.0 – 23.0	U = 7394.0*	0.002*
Mean ± SD.	4.35 ± 5.99	6.07 ± 5.51		
Median (IQR)	3.0 (2.0 – 5.0)	4.0 (3.0 – 7.0)		
Ambubag				
No	455 (90.6%)	27 (64.3%)	χ^2= 26.652*	FEp <0.001*
Yes	47 (9.4%)	15 (35.7%)		
Site				
Right	279 (55.6%)	35 (83.3%)	13.065*	0.001*
Left	173 (34.5%)	7 (16.7%)		
Approach				
VATS converted to thoracotomy	27 (5.4%)	6 (14.3%)	5.396*	FEp=0.034*

Patients were divided into two groups: the readmission group (42 patients) and the non-readmission group (502 patients). Statistical comparisons were performed between the two groups. patients who were re-admitted for reasons unrelated to thoracic surgery I.e Oncology treatment, GIT problems, were excluded.

Results

The overall readmission rate was 7.7%. Statistically significant predictive factors for readmission included male sex (P=0.039), right-sided surgery (P=0.001), conversion from VATS to thoracotomy (P=0.034), discharge on an ambulatory bag (P<0.001), and prolonged hospital stay (P=0.002).

The most common causes of readmission were pleural effusion (31%), pneumothorax (22%), and pneumonia (12%).

Patients who were re-admitted had a significantly longer total hospital stay than those who weren't readmitted.

Conclusion

The readmission affects the finance by significantly prolonging hospital stay. Efforts to reduce readmissions should focus on minimizing operative and postoperative complications, specifically targeting the reduction of conversions from VATS to thoracotomy, prolonged air leaks necessitating discharge on an ambulatory bag, and extended post operative hospital stays.

Total hospital stay				
Min. – Max.	0.0 – 78.0	3.0 – 59.0	U= 2036.50*	<0.001*
Mean ± SD.	4.35 ± 5.96	16.05 ± 12.43		
Median (IQR)	3.0 (2.0 – 5.0)	12.0 (7.0 – 18.0)		

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Pat Magee - Oral Abstract Presentation Kilsyth **10:50-12:20** Sunday, 16 March

Outcomes of Valve-Sparing Aortic Root Replacement Surgery (VSARR): Does BAV morphology impact VSARR durability?

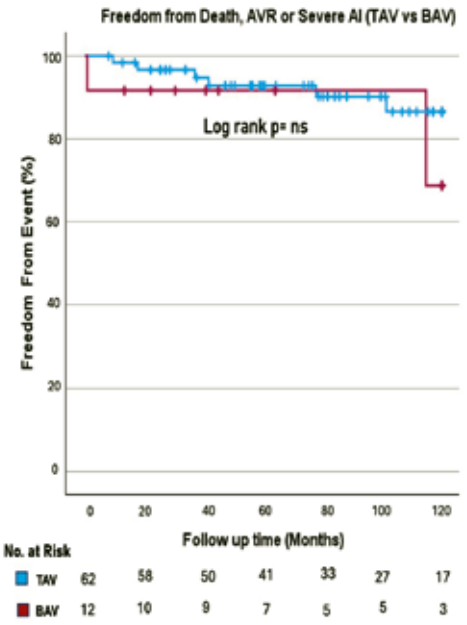
Abdullah Aziz[1], George Gradinaru[2], Kenneth MacArthur[2], Edward Peng[2], Mark Danton[2,1] 1 University of Glasgow, Glasgow, United Kingdom. 2 Golden Jubilee National Hospital, Glasgow, United Kingdom

VSARR is an established technique for treating aortic root aneurysms, offering the advantage of native valve preservation and avoiding lifelong anticoagulation. While outcomes in tricuspid aortic valve (TAV) patients are well-documented, bicuspid aortic valve (BAV) patients have historically been considered higher risk due to concerns about structural durability and post-operative valve function.

BAV is the most common congenital cardiac abnormality, affecting 1-2% of the population, and is often associated with aortic dilation. In many centres, these patients are routinely offered valve replacement over VSARR, despite emerging evidence that VSARR may be a viable alternative.

Our study sought to evaluate mid-term VSARR outcomes in BAV versus TAV patients to determine whether BAV morphology compromises post-operative durability.

Abdullah Aziz[1]



Key Findings

We retrospectively analysed patients undergoing VSARR and found:

- 10-year survival was excellent (95.9%), with no significant difference between BAV (n=12) and TAV (n=62) patients.
- Despite worse pre-operative aortic insufficiency (AI) in BAV, post-operative AI rates were similar, suggesting effective restoration of valve competence.
- At 10 years, no significant difference was observed between BAV and TAV in rates of severe AI, AVR, or death.
- Valve plication repair was performed in TAV (n=14, 22.6%) and BAV (n=8, 66.7%) and had no significant impact on mid-term outcomes, independent of valve morphology.

These results support VSARR as a viable option for well selected BAV patients, with mid-term outcomes comparable to those seen in TAV patients at 10 years.

Clinical Relevance

In this small study cohort, we found VSARR to be a safe and effective option for BAV patients, with mid-term durability comparable to TAV. These findings contribute to the growing evidence supporting VSARR in select BAV patients and could help refine clinical decision-making.

Our study provides strong real-world evidence that VSARR should be considered a valuable surgical option in appropriately selected BAV patients and should not be prematurely excluded from valve preservation strategies

Future Directions

Given the promising findings of this study, to solidify VSARR's role in BAV patients future research should focus on:

- Larger cohort studies – To strengthen statistical power and validate these results in a larger population.
- Longer-term follow-up – To determine whether BAV durability continues beyond 10 years.
- Multi-centre studies – To evaluate whether these positive results can be replicated across different surgical teams and institutions.
- Younger patient cohorts – To assess outcomes in patients who require lifelong valve function.

By expanding the evidence base, we can refine patient selection criteria and ensure VSARR remains a durable and effective option for the right BAV patients.

Coronary Kilsyth **11:15-12:30** Monday, 17 March

In-hospital outcomes in South Asian patients following coronary artery bypass graft surgery: a comparison with caucasian patients

Marsioleda Kemberi [1], Eduardo Urgesi [2], Jing Yong Ng [2], Wael I Awad[2,3] 1 Barts and the London Medical School; 2 Barts Heart Centre; St Bartholomew's Hospital; William Harvey Research Institute, QMUL.

Coronary artery disease (CAD) remains a leading cause of morbidity and mortality worldwide, with significant ethnic disparities in disease burden and outcomes. Compared to other populations, South Asian (SA) individuals exhibit a higher prevalence of three-vessel disease, left main disease, and systolic dysfunction. Multiple studies suggest that SA ethnicity is an independent predictor of poorer outcomes following coronary artery bypass grafting (CABG). Despite this, widely used risk models such as EuroSCORE II do not incorporate ethnicity as a determinant in their calculations.

This study retrospectively analysed all patients who underwent isolated CABG at a high-volume tertiary cardiac centre serving a large SA population between January 2018 and March 2024. Patients requiring concomitant valvular or aortic surgery were excluded to ensure a homogenous cohort. Clinical characteristics, operative details, and postoperative outcomes were compared between SA and Caucasian patients using appropriate statistical methods, including the Mann-Whitney U test and Chi-squared test.

A total of 5,398 patients were included, of whom 2,216 were Caucasian and 1,517 were SA. SA patients were significantly younger at the time of surgery (60.3±10.5 vs. 64.9±9.8 years, p<0.001) but had a markedly higher prevalence of Type II diabetes (63.1% vs. 34.3%, p<0.001), insulin-dependent diabetes (11.4% vs. 8.3%, p=0.002), hypertension (85.2% vs. 82.5%, p=0.014),

Marsioleda Kemberi

and severe renal impairment (14% vs. 9.9%, p<0.001).

Conversely, Caucasian patients had higher rates of obesity (BMI>35) (14.6% vs. 5.7%, p<0.001), smoking history (18.3% vs. 13.7%, p<0.001), chronic obstructive pulmonary disease (11.2% vs. 7.7%, p=0.001), left main stem disease (26.5% vs. 22.1%, p=0.002), and preoperative atrial fibrillation (3.2% vs. 0.9%, p<0.001). EuroSCORE II values were slightly higher in Caucasian patients (2.1±3.2 vs. 2.0±2.3, p=0.026), reflecting a more diverse risk profile.

While operative parameters, including the number of bypass grafts, cross-clamp time, and cardiopulmonary bypass duration, were similar between the groups, SA patients experienced significantly worse postoperative outcomes. In-hospital mortality was nearly twice as high in SA patients compared to their Caucasian counterparts (2.4% vs. 1.3%, p=0.01). Additionally, hospital length of stay was prolonged among SA patients (12.3±11.0 vs. 11.2±9.4 days, p<0.001). Despite these differences, rates of major postoperative complications such as stroke, re-sternotomy for bleeding, and haemodialysis requirement did not differ significantly between groups.

Implications and Future Directions

These findings suggest that SA patients face a disproportionately higher risk of mortality and prolonged hospitalization following CABG, despite undergoing surgery at a younger age. Given the distinct cardiovascular risk factor profile in this population, existing surgical risk prediction models may not fully capture the true perioperative risk faced by SA patients. Larger and multicentre studies are required to validate these findings and to confirm whether ethnicity should be included in future risk models for operative mortality.

Sharing Best-Practice in NAHP - led Services Moorfoot **11:00-12:30** Monday, 17 March

Criteria-led discharge in adult cardiac surgery: Our experience and an audit of the pilot project

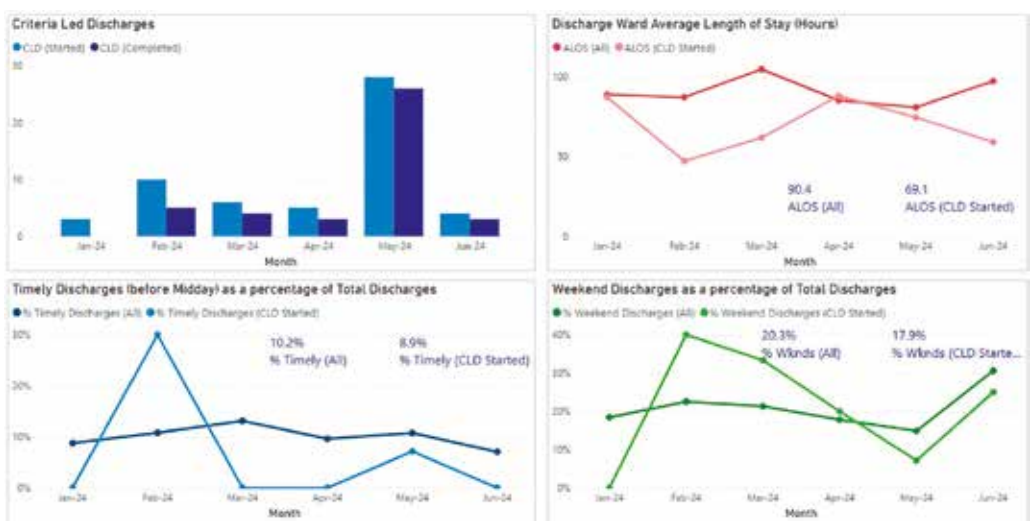
Pol Cabusora, Louise Bailes, Dennis Garcia, Kim Gow, Cha Rajakaruna - Bristol Heart Institute Bristol Heart Institute, Bristol, United Kingdom

Pol Cabusora

Criteria Led Discharge (CLD) is a process that uses pre-defined clinical criteria for discharge (CCD) to guide clinical decisions regarding hospital discharge. It empowers healthcare teams to discharge patients based on these parameters, without ongoing clinician approval. The aim is to facilitate timely discharges and reduce Length of Stay (LOS) without compromising patient safety. This is a key part of our Trust's SAFER Flow Bundle where the CCD are essential towards setting an estimated date of discharge. The main goals of CLD are aimed at improving patient / staff experiences, improving discharge processes; and reducing length of stay (LOS) and reducing surgery cancellations.

Prior to the introduction of CLD via digital clinical note for adult cardiac surgery in the Bristol Heart Institute which went live in July of 2023, the following underpinning principles were in place:

1. Provision of SOP / Policy / Workflow / Communication leaflet.
2. Clinical parameters (Clinical Criteria for Discharge) with ongoing monitoring.
3. Appropriate training and sign off from staff competency packs.
4. Suitable identification of patients suitable for CLD.
5. A clear hand-back process if patient fails to meet the CCD, and CLD is not possible.
6. An audit and monitoring process for service improvement purposes.



Pilot data was collected over 6 months between 01/01/2024 – 31/06/2024, analysing the number of patients eligible for CLD, actual discharge rates and LOS. Comparison was then made between Medical Led Discharge (MLD) and CLD by clinical area and time of the week. Our initial aim was for 33% of patient discharges before midday via CLD.

There were 597 discharges, of which, 62 (10.3%) patients were discharged via CLD. The average LOS in hours comparing CLD with MLD was 69.1hours and 90.4 hours respectively. There was small reduction in the weekend discharges between CLD (17.9%) and MLD (20.3%). Discharges before midday for MLD and CLD were 10.2% and 8.9% respectively.

From the data collected, we found that CLD is feasible in cardiac surgery, demonstrating reduction in patient's LOS without compromising safety. This approach not only improves flow but also enhances resource allocation. Further work is required in identifying suitable patients to be included in CLD and implementing the process to its completion.

Additionally, further audits are required to determine areas around CLD that needs improvement, specifically: service improvement, retrospective research studies and collaboration and benchmarking with other trusts.

Pat Magee - Oral Abstract Presentation Kilsyth **10:50-12:20** Sunday, 16 March

Sex differences in long-term survival after isolated CABG. A single centre experience.

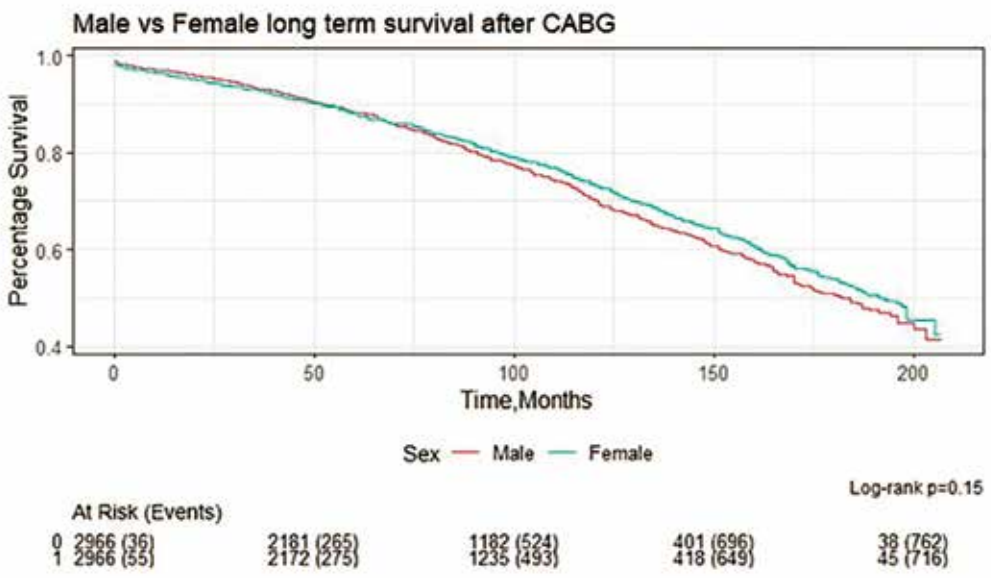
Kaitlyn Gilbert, Gustavo Guida, Jeremy Chan, Gianni D Angelini Bristol Royal Infirmary, Bristol, United Kingdom

Background

Heart disease is the leading cause of death globally, and yet it is widely reported within observational studies that female patients have poorer outcomes following cardiac surgery compared to male patients.

Analyses of different national databases contain conflicting evidence on the impact of female sex on mortality following cardiac surgery; whilst some report that women have higher mortality rates than men, others find no statistically significant difference. Previous studies have demonstrated females are at a greater risk of short-term mortality than males following Coronary Artery Bypass Grafting (CABG) surgery in the UK, however, fewer focus on long-term survival specifically within contemporary practice in the UK.

The aim of our study was to quantify the differences in outcomes between sexes following CABG within our unit. Our primary outcome was long term survival, with our secondary outcomes including short-term mortality, return to theatre, post-operative stroke, deep sternal wound infection and need for dialysis.



Kaitlyn Gilbert

Methods

A retrospective analysis of prospectively collected data was conducted including all patients within our centre who underwent isolated CABG between 1996-2023. Patients who had previous cardiac surgery, emergency or salvage CABG were excluded. Log-rank test was used to establish whether there was a statistically significant difference in survival rates between male and female patient groups. Results following Propensity Score Matching (PSM) are presented on a Kaplan-Meier Curve.

Results

A total of 18,078 patients were included in our study, of which 14,889 (82.36%) are male. Propensity score matching resulted in 2,966 pairs, with a total of 5,932 patients included in final analysis.

After PSM we found no difference in long-term survival between males and females who underwent CABG (p=0.15), with the median survival of male patients 182 months (CI: 171 - 196) and female patients 191 months (CI: 182 - 199). Additionally, there was no difference in short-term survival, post-operative stroke, deep sternal wound infection or need for dialysis. In our study females are less likely to undergo off pump CABG (51% vs 55%, p<0.001) and receive fewer grafts (2.49 vs 2.74, p<0.001) compared to males.

Discussion

In our dataset we found no difference in long-term survival between males and females after isolated CABG procedure. Our findings contribute to a wider study of the disparities in outcomes between sexes following cardiac surgery.

It is understood that women present later in the disease process than men, resulting in an increased burden of risk factors. It has been suggested that this results from women presenting more commonly with 'atypical' symptoms compared to men, thus delaying investigations and limiting women's access to revascularisation surgery.

Female sex is recognised as an independent risk factor within the literature, a finding supported by a previous meta-analysis from our centre. It is proposed that factors such as smaller, more operatively challenging arteries and a stronger influence of risk factors predispose female patients to poorer outcomes. However, there are studies that disagree with this finding, instead attributing the difference in outcomes to the increased risk profile of female patients undergoing surgery. Despite the inconclusive evidence, female sex forms a part of prediction scores such as STS and Euroscore II.

One possible reason for the lack of clarity within this field is how notably underrepresented women are within clinical trials. In the context of an increasing number of female patients undergoing surgical management for heart disease, our findings highlight the critical need for further study to determine the sex-related differences in outcomes for procedures such as CABG, to investigate the underlying reasons and implement evidence-based techniques into standard practice to appropriately tailor care for patients.

Contemporary Lung Cancer Management Fintry **13:30-15:00** Tuesday, 18 March

Is a benign diagnostic segmentectomy such a bad thing?

Michelle Lee, Al-Rehan Dhanji, Henrietta Wilson, Sasha Stamenkovic, David Waller Barts Thorax Centre, London, United Kingdom

Robotic assisted thoracoscopic surgery (RATS) facilitates targeted segmentectomy of suspicious small pulmonary nodules in a one-stage diagnostic and therapeutic procedure (1). However, the main criticism is the high rate of benign results and presumed harmful futile operations. To answer these questions, we explored the characteristics and outcomes of the benign resections in our initial experience.

A total of 571 patients underwent diagnostic RATS segmentectomy without preresectional diagnosis between December 2017 and May 2024. A non-malignant diagnosis was found in 79 patients (13.8%) [36M:43F, median age 54(33-88) years] (Figure 1) (Table 1).

Diagnosis	n	% of total (n=571)
Granulomatous inflammation	23	4
Emphysema	13	2.3
Organising pneumonia	11	1.9
No nodule (resolved)	11	1.9
Specific benign diagnosis	10	1.7
Fibrosis	9	1.6
Mycobacterium Kansasii	2	0.3
TOTAL	**79**	**13.8**

Table 1. Benign histopathology from RATS segmentectomy (n=79)

The median nodule size in these cases was 15(8-30) mm with 69% PET avid. The median Herder risk score was 35(9-97) %. The median number of segments resected was 2(1-5) with 67 of 79 (85%) lesions in the apicoposterior segments. The length of stay was 3(0-23) days with no 30- or 90-day mortality, and two required reoperation for persistent air leak/empyema. The diagnoses included 23 patients with proven tuberculosis or granulomatous inflammation who went on to receive definitive medical treatment. In 10 patients a specific benign diagnosis was made including: hamartoma (4), aspergilloma (3), rheumatic nodule, neuroendocrine hyperplasia, Langerhans cell histiocytosis and intrapulmonary lymph node (1 each). These lesions may have been amenable to a less invasive biopsy method. In the remaining 44 patients (0.8%) the operation found either normal lung tissue or a condition that would have resolved on observation. However, whether a non-invasive biopsy would have prevented subsequent resection can be debated.

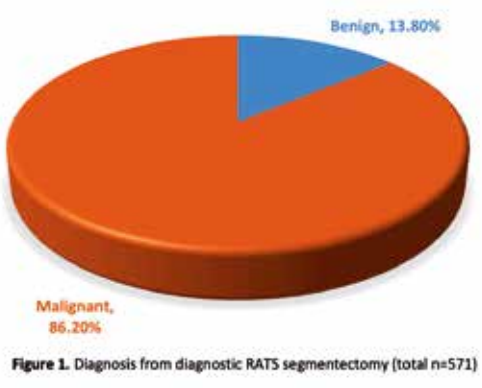


Figure 1. Diagnosis from diagnostic RATS segmentectomy (total n=571)

Robotic assisted diagnostic segmental biopsy of suspicious pulmonary nodules leads to a benign result in less than 1 in 7 cases with minimal harm. A truly futile result which did not lead to treatment or specific outcome for the patient was found in 1 in 12. We continue to advocate this approach in carefully selected cases.

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Cardiac: General 3 Kilsyth **09:00-10:30** Tuesday, 18 March

Pericardiectomy at Barts Health Centre: 10-year experience

Evgeny Raevsky, Michelle Lee, David Lawrence Barts Heart Centre, London, United Kingdom

Constrictive pericarditis, though relatively rare, presents complex challenges due to its multifactorial nature and pathophysiological changes. Patients typically exhibit symptoms associated with right heart failure, primarily driven by restricted diastolic filling. More than a century has passed since the first pericardiectomy was performed, yet surgical intervention remains the definitive treatment modality.

Perioperative mortality rates, as reported in contemporary literature, range from 2 to 15%. Significant risk factors impacting these outcomes include NYHA functional class, history of previous cardiac surgeries, and the presence of renal or hepatic dysfunction. Additional factors like tricuspid regurgitation and pulmonary hypertension also play critical roles in patient prognosis.

Median sternotomy has gained universal acceptance for its efficacy. However, discussions continue regarding the optimal extent of pericardial resection. A comprehensive approach, termed 'complete pericardiectomy' has been shown to offer substantial advantages. This method is generally subdivided in the literature into:

- **Wide Excision**: Removal of the pericardium from phrenic to phrenic, including the diaphragmatic surface and involving mobilization of the heart.
- **Radical Excision**: Utilizes the principles of wide excision with additional removal of the pericardium posterior to the phrenic nerves.

In contrast, Incomplete or Partial Excision should be defined as any resection less extensive than Wide Excision.

At Barts Heart Centre, we reviewed our 10-year experience, analysing 48 cases of surgically managed constrictive pericarditis across a diverse patient demographic (37 males and 11 females, ages 29 to 83 years). Each case involved a sternotomy, with the vast majority undergoing 'complete wide' pericardiectomy.

Our findings indicate that operative mortality and long-term survival are comparable to those documented by other centres. More than 85% of our patients experienced significant improvements in NYHA functional class, and the recurrence rate was notably low.

These outcomes affirm that pericardiectomy, particularly when executed to the extent of complete wide excision, remains the benchmark for treating this challenging pathology.

Congential Abstracts and Movies Carrick **15:30-17:00** Monday, 17 March

Kommerell's diverticulum – old foe revisited

Tjasa Zaletel1, Christopher Rutter2, Pooja Shetty1, Arun Beeman1, Nagarajan Muthialu1 1 Great Ormond Street Hospital, London, United Kingdom; 2 The Ohio State University College of Medicine, Columbus, USA

Vascular rings are unique congenital vascular anomalies that arise from the aberrant development of the aortic arch system during fetal life. They encircle and compress the trachea and oesophagus, leading to respiratory and feeding difficulties, particularly in infants and young children. Among these, Kommerell's diverticulum in the right aortic arch with an aberrant left subclavian artery (RAA/ALSA) remains a clinical challenge, not only in diagnosis but also in determining the most effective surgical approach for symptom relief and long-term outcomes. As such, we set out to revisit the surgical approach and outcomes for managing this complex congenital vascular anomaly.

At Great Ormond Street Hospital, we conducted a retrospective review of a decade's surgical experience in managing children with RAA/ALSA subtype, where a large Kommerell's diverticulum was the primary culprit in persistent symptoms. Among 262 vascular ring surgeries performed over 10 years, 71 patients with RAA/ALSA were identified with 66 of them undergoing primary diverticulum resection and subclavian artery reimplantation. Remaining five patients underwent redo thoracotomy following initial vascular ring surgery (wherein diverticulum was not addressed) to complete diverticulum resection and subclavian artery reimplantation. The primary aim of our study was to assess symptom relief, while secondary end points focused on risks to anastomosis of subclavian artery to common carotid artery, risk of left recurrent laryngeal nerve injury, incomplete resection or reintervention.

All children included in this study underwent left thoracotomy at third intercostal space, sparing latissimus dorsi and serratus anterior muscles. Our findings showed no persistent airway symptoms in those who had undergone primary resection, while two patients in the redo group continued to experience mild respiratory symptoms at six months follow-up. One patient exhibited a minor anastomotic gradient of 4 mmHg without the need for further intervention. With no recurrent laryngeal nerve injuries or major complications, our results affirm that meticulous surgical management can yield excellent outcomes with minimal risk. These findings support the necessity of complete diverticulum resection and subclavian artery reimplantation in symptomatic children.

With a growing understanding of vascular ring pathology, it is evident that Kommerell's diverticulum should not be overlooked when addressing symptomatic airway and oesophageal compression. Our findings contribute to the evolving consensus on the surgical management of Kommerell's diverticulum, emphasising the importance of early intervention and complete resection for achieving long-term symptom relief and improved quality of life for children with RAA/ALSA. Moving forward, long-term follow-up will be key to understanding the durability of symptom resolution and any late complications. Additionally, exploring less invasive techniques may further improve recovery and patient outcomes. By refining our surgical approach, we aim to standardise the management of Kommerell's diverticulum, ultimately improving the quality of care for paediatric patients with this complex vascular anomaly.

Sharing Best-Practice in NAHP - led Services Moorfoot **11:00-12:30** Monday, 17 March

IVAC – project management and evaluation

Hannah Carrington, Robert Gannon, Eleonora Iervella, David Jenkins, Aravinda Page, Doreen Pullen, Gemma Sciales Royal Papworth Hospital, CAMBRIDGE, United Kingdom

Background

Following a move in 2019 from our old hospital site at Papworth Everard to a new build hospital in Cambridge city, the hospital experienced an immediate and sustained rise in cardiac surgery related sternal wound infections. As a part of a multifaceted response that included a focus on patient pathway surgical site infection prevention interventions and initiating projects linked to adapting to a new build environment, a decision was made following a review of an increasing evidence base of the effectiveness of IVAC systems, the Prevena IVAC system (3M KCI Solventum) was chosen to support wound infection prevention. This brand of IVAC was chosen as it is an electrically powered unit achieving -125mmHg suction which is among the highest level of IVAC negative pressure available on the market.

Initial pilot

With the evidence base in cardiothoracic surgery around the use of IVAC relatively weaker compared to other surgical disciplines, an initial pilot was carried out from July 2022 to January 2023 with the dressing device applied to 29 CABG patients with a history of diabetes and an unhealthy BMI. The IVAC outcomes were compared with 89 patients with the same diabetes and BMI characteristics not treated with VAC during this period. The pilot observed a rate of infection in the IVAC group to be 6.9% versus 14.4% in the group who had their wound covered with a standard post op island dressing. UKHSA definitions for depth of infection were used to describe the presence of an infection. The pilot outcomes were evaluated at our surgical M&M and our surgical site infection stakeholder meeting and agreement was reached to make the dressing device available to all diabetic patients with an unhealthy BMI undergoing cardiothoracic surgery and any patient the parent surgical team felt would benefit from application. The pilot project was a very useful learning exercise for our theatre, critical care and ward teams in respect to using the device effectively ahead of broader role out. One learning point was we did not need to buy the more expensive customisable version of the dressing as a 20 cm peel and place version was not only easier to apply, but it also covered the majority of our incisions. Another learning point noted was the cardiac drains required an exit point more distal than what was the current practice in order to prevent contact between the drain tubes and the dressing which was a source of device leak alarms.

Broad adoption

In the first period of broad scale evaluation from May 2023 to April 2024, 551 CABG patients treated with IVAC were assessed for wound infection and compared with a cohort of 820 patients from the period 12 months before the introduction of this dressing device -July 2021to June 2022. For all patients, the rate of infection in the cohort treated with IVAC was 4% versus a 6.6% rate of infection observed prior to dressing device introduction. In patients with diabetes, the rate of infection for the IVAC cohort was observed to be 4.7% versus 8.7% prior to dressing device introduction. In the non-diabetic cohort treated with IVAC, the rate of infection was 3.1% versus a rate of infection of 5.5% ahead of introduction to the trust.

Summary

The use of the Prevena IVAC system appears to be an effective component of a multi-faceted strategy to reduce the rate of sternal wound infections in cardiac surgery. Formal adoption and broader evaluation support its role in improving wound infection outcomes for higher risk patients in particular.

Screening and Early Lung Cancer Management Fintry **15:30-17:00** Monday, 17 March, 2025

Overall and surgical outcomes of a regional Targeted Lung Health Check (TLHC) screening programme

Shreyaa Ramadore[1,2],Daniel Offen[2], Bradley Yee[2], Edwin Woo[2], Aiman Alzetani[2] 1 University of Southampton, Southampton, United Kingdom. 2 University Hospitals Southampton, Southampton, United Kingdom

Lung Cancer is the leading cause of cancer-related death in the world. It is typically detected in its more advanced stages as it usually progresses without symptoms[1]. Symptoms start to present due to local effects/ metastasis, and this often means that by the time symptoms occur, the disease has likely progressed to a much less treatable stage[2]. Early detection of lung cancer while at an asymptomatic stage would increase the likelihood of more curative surgeries and a better prognosis for the patient.

Lung cancer screening has been successful in this regard, with previous studies conducted in the US and Netherlands/ Belgium showing a 20% decrease in mortality through low-dose CT screening[3]. This has been trialled in the UK through the Targeted Lung Health Check (TLHC) Screening Programme, and my research focused on the surgical outcomes of this screening programme in a major English city.

My study used data from 2020-2024 to assess diagnosis rates and outcomes of lung cancer patients identified through the screening programme, in particular those who had undergone surgical resections such as lobectomies and segmentectomies. I used the TLHC's database to identify eligible patients and collected data about their timelines for screening, treatment, surgical interventions, and outcomes using the hospital CHARTS system. 240 suspected lung cancer patients were detected from a screened population of 8154 (2.94% of the total screened population) over that period. 109 of these patients had undergone surgical resections (45.42% of suspected patients). 73/109 patients (30.42% of all suspected patients) had solely curative radical resections, which is greater than the average surgical resection rate for England of 24.6%[4].

The most common surgical procedure conducted was a Video-Assisted Thoracoscopic Surgery (VATS) Lobectomy. 99 patients had undergone other treatments such as chemotherapy/ radiotherapy (25 of these patients had other treatments alongside surgical intervention). With 195 patients (81.25%) being diagnosed at stage I or II, the results of this screening programme have been very positive with regard to earlier diagnosis and a better prognosis for patients.

As a medical student with an interest in cardiothoracic surgery, this project was an amazing opportunity to see first-hand how the cardiothoracic team have worked with the TLHC team to create better outcomes for these patients, along with how they have integrated new advancements in the field such as robotic surgery and navigational bronchoscopy into their practice. I have been able to attend a few of these procedures alongside completing this project which has aided my learning. The opportunity to speak to patients who have undergone TLHC screening to hear about their experiences of how the team has addressed their needs beyond surgical intervention, as well as how the early detection has aided their quality of life for better outcomes has allowed me to see beyond the statistics I have researched and see the direct impact of the programme.

Low-dose CT used in TLHC screenings

It has also enabled me to understand the barriers to screening better, for which I have looked into ways to combat this. With all the new research being conducted into the early detection of lung cancer, I am excited to see how this field will develop further to improve patient outcomes.

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Lung Volume Reduction and Pleural Disease Sidlaw **15:30-17:00** Monday, 17 March

An updated, 25-year systematic review and meta-analysis of surgical outcomes among 1,182 thoracic endometriosis patients

Aamir Amin[1], Ilia Baryshnikov[1], Vinci Naruka[1], Sten Kajitani[2], Hemangi Chavan[3], Martin Hirsch[4], Rob J Hallifax[4], Nizar Asadi[1] 1Harefield Hospital, 2University College Cork, 3Royal Brompton Hospital, 4Oxford University Hospitals NHS Foundation Trust.

Our rationale and approach

Albeit underdiagnosed, thoracic endometriosis is the most common extrapelvic manifestation of endometriosis, a disease that affects 10-15% of women globally1. In addition to variability in clinical presentation and lack of clinician awareness, the absence of standardised guidelines has left both patients and clinicians in the lurch on best practices for TES management1-5. Previous appraisals on the subject have consistently reported high recurrence and reoperation rates, but there is very little data on post-operative complications, hospital length of stay (LOS) and duration of chest tube drainage (CTD).

Our updated systematic review and meta-analysis includes the largest number of patients till date from studies published over a 25-year period. We aimed to assess outcomes following TES surgery by looking into symptom recurrence, reoperation and post-operative complication rates, with a special focus on the incidence of air leaks, as well as the duration of CTD and LOS. Study-specific sample sizes were determined using descriptive statistics and the Der Simonian-Laird method was used to assess binary outcomes, whereas continuous outcomes were assessed using a weighted mean technique within a random-effects model producing combined estimates and 95% confidence intervals.

Our findings

The meta-analysis incorporated data from a total of 28 studies including 1,182 patients from 8 countries (France, Japan, Italy, United States, Nigeria, United Kingdom, Canada and Korea). The most common clinical manifestation was pneumothorax which occurred in 89.4% of patients, with a catamenial association determined in 73.9% cases. We found a consistently high symptom recurrence rate of 28.2% , a reoperation rate of 14%, an overall complication rate of 30.8% and, in particular, a post-procedural air leak incidence of 24.2% across studies. The mean duration of CTD was 4 days and patients remained hospitalised for 6 days on average.

Clinical Implications

With these results we provide the most up to date overview of the efficacy and safety of surgery for TES. Although indispensable in treating this enigmatic disease alongside hormonal manipulation, our research calls for improvements in surgical approaches and an imperative need for standardization and multi-disciplinary care pathways at a national level. Moreover, the average duration of CTD and LOS highlight important considerations during the consenting process. Despite its limitations, our study shows that traditionally held beliefs whereby all catamenial pneumothoraces are treated the same as other symptomatic cases of pneumothorax requiring surgical intervention is associated with high rates of recurrence and reoperation – calling for greater expertise in handling such cases. Within the United Kingdom, the need for centralised care was recognised over two years ago in a joint statement on Thoracic Endometriosis care by the British Society for Gynaecological Endoscopy (BSGE) and Royal College of Obstetricians and Gynaecologists (RCOG) in 20226.

References

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Pectus and Other Chest Wall Disorders Fintry **09:00-10:30** Tuesday, 18 March

Comparative outcomes of surgical fixation versus nonsurgical management in patients with flail chest: experience from a lower middle-income country

Sameera Fernando[1], Dhammike Rasnayake[2], Saman Iddagoda[2] 1 Senior Registrar Thoracic Surgery - National Hospital for Respiratory Diseases, Sri Lanka; 2 Consultant Thoracic Surgeon - National Hospital for Respiratory Diseases, Sri Lanka

Flail chest remains a significant challenge in trauma care, especially in resource-limited settings. Traditionally, its management has relied on mechanical ventilation and supportive care. However, surgical stabilization of rib fractures (SSRF) has emerged as an alternative approach, demonstrating benefits in reducing ventilator dependency and hospital stay. Our study evaluates the comparative outcomes of these two treatment modalities in a lower-middle-income country (LMIC) setting.

Study Design and Key Findings

We conducted a retrospective study at a Level 1 trauma center in Sri Lanka, analyzing 39 patients with flail chest admitted to the intensive care unit (ICU) between July 2023 and August 2024. Of these, 19 (48.72%) underwent surgical fixation, while 20 (51.28%) received nonsurgical management. Baseline injury severity was comparable between the two groups (mean Injury Severity Score: surgical 32.42 vs. nonsurgical 30.25; p = 0.338).

Sameera Fernando, Dhammike Rasnayake and Saman Iddagoda

The results strongly favored surgical fixation, with significant reductions in both ICU and hospital length of stay (LOS). ICU stay averaged 3.89 days in the surgical group versus 10.9 days in the nonsurgical group ($p < 0.001$), while total hospital LOS was 10.61 days compared to 18.50 days ($p < 0.001$). Moreover, surgical patients required fewer days on mechanical ventilation (1.72 vs. 5.25 days, $p < 0.001$) and showed a notable improvement in oxygenation, with a higher mean PaO2/FiO2 ratio increase upon ICU discharge (149 vs. 22, $p < 0.001$).

Clinical Implications

The findings reinforce the growing body of evidence supporting SSRF as the preferred management strategy for select flail chest patients, even in LMICs. The benefits of shorter ICU stays and reduced ventilator dependence translate into decreased healthcare costs and improved patient recovery. Despite these advantages, the adoption of surgical fixation remains limited in many centers due to resource constraints and the need for specialized training.

The LMIC Perspective

While SSRF is now a standard of care in many high-income countries, its implementation in LMICs presents unique challenges. Limited access to surgical expertise, financial constraints, and variability in trauma care infrastructure all contribute to disparities in treatment availability. Our study underscores the feasibility and efficacy of surgical fixation even in resource-constrained settings, advocating for broader adoption where feasible.

Future Directions

Further prospective studies and cost-benefit analyses are essential to guide policy changes and investment in SSRF programs in LMICs. Additionally, enhancing surgical training in trauma centers can help bridge the gap in access to advanced rib fixation techniques.

Our study adds to the global discourse on optimizing trauma care and highlights the potential for surgical intervention to improve outcomes in severe thoracic injuries, even in economically challenged environments. As SSRF becomes increasingly recognized for its benefits, efforts should be made to ensure its accessibility to all patients, regardless of geographical or economic barriers.

Chest wall resection and pain management Sidlaw **13:30-15:00** Tuesday, 18 March

Evaluation of efficacy and safety of intercostal cryo-analgesia: early single- centre experience

Hanan Hemead, Kath Hewitt, Charlotte Watson, Siobhan Keegan, James Barr, Eustace Fontaine, Aleksander Mani, Annabel Sharkey, Vijay Joshi, Kandadai Rammohan, Felice Granato
Wythenshawe, Manchester, United Kingdom

Thoracic surgery results in significant post-operative pain which is linked to increased morbidity, prolonged hospital stay and adverse patients experience. Multimodality analgesia is, therefore, a cornerstone in Enhanced Recovery After Thoracic Surgery (ERAS). There are wide institutional variations in postoperative analgesic protocols with opioids being an integral part of most of them.

Intercostal cryoanaelgesia nerve block (CryoNB) has been recently introduced as an effective, non-narcotic analgesic modality replacing catheter-delivered analgesia and reducing opioid consumption. Several retrospective and randomised trials showed promising outcomes. However, the efficacy and safety of CryoNB is still under debate.

We prospectively reviewed 97 patients who underwent CryoNB between April 1st and August1st 2024 excluding patients with known chronic pain and/or opioid dependence. An Atricure cryoprobe was applied between the 3rd - 8th intercostal nerves for a minimum of 3 levels. The cohort of analysed cases included open, robotic-assisted and video-assisted surgeries for lung resection and mediastinal surgeries. All patients received patient-controlled analgesia (PCA), intercostal blocks. +/- paravertebral catheter. Patients who underwent thoracotomy had paravertebral catheter inserted. Numeric pain rating scale (NPRS) and morphine equivalent dose (MED) were assessed compared to a matching cohort receiving standard analgesic approach (intercostal block, paravertebral catheter, PCA).

There was no statistically significant difference (p=0.98) of NPRS of CryoNB and standard cohort at 4 hours from surgery. However, CryoNB group showed statistically significant lower NPRS (p=0.03) and MED (p=0.04) at 24 hours. There was no significant difference in PCA utilization between the two groups within the first 12 hours (p=0.031).

We also used the Leeds Assessment of Neuropathic Symptoms and Signs (S-LANN pain score) to evaluate the onset of chronic pain syndrome at 6-8 months postoperatively. S-LANN is a user-friendly, seven -question, 24-point screening tool for neuropathic pain with scores of greater than 12 are suggestive of neuropathic pain. The assessment was conducted via telephone interviews of the patients belonging to the CryoNB group as well as a matched cohort of patients treated with standard analgesia without CryoNB.

Among the 73 patients who agreed to participate, only 14 19(%) scored 13 or higher. Of those 13 patients with S-LANN greater than 12, only 4 were using medications for neuropathic pain. There was no significant difference between the CryoNB and matched group regarding S-LANN scores.

We acknowledge a few limitations of this study. This is an observational study and not randomised trial, and the group of studied patients were heterogenous including both open and minimally invasive approaches. Within those limitations, we can conclude that CryoNB is effective in reducing postoperative surgical pain and opioid consumption at 12 hours postoperatively and onwards. CryoNB is feasible and well tolerated as a sole analgesic modality or as adjunct in analgesic protocols with acceptable and safe long-term outcomes. CryoNB, was not associated with increased incidence of neuropathic pain. Larger randomised trials with thorough validated pain assessment questionnaires should be conducted on wider scale to confirm these initial findings.

Chest wall resection and pain management Sidlaw **13:30-15:00** Tuesday, 18 March

Chest wall reconstruction utilising OviTex® Reinforced Tissue Matrix: Early single centre experience

Hanan M. Hemead[1]; Vijay Joshi[1] ; James Barr[1] ; James DC Bedford[2]; Adam Reid[2]; Eustace J. Fontaine[1] 1 Department of Cardiothoracic Surgery, Wythenshawe Hospital, Manchester, United Kingdom; 2 Plastic and Reconstructive Surgery, Wythenshawe, Manchester, United Kingdom

Hanan M. Hemead

Eustace J. Fontaine

Wide en bloc resection remains the cornerstone treatment for primary chest wall tumours and selected locally advanced or metastatic neoplasms. Reconstruction of resultant chest wall defects remains a challenging scenario. Successful reconstruction should restore chest wall stability and maintain pulmonary dynamics. Reconstruction should be customised to the patient based on the size and location of the defect in relation to surrounding structures and requires the input of the multidisciplinary team (MDT).

Several synthetic, biological, and hybrid materials have been utilised. Each has its respective strengths and weaknesses. The optimal material should be durable, rigid, yet offers a degree of malleability to allow adjustment to the defect and ideally allowing a scaffold for host tissue remodelling. Synthetic materials are rigid and offer tensile strength, however, carries higher potential for infection. Biological meshes offer better integration with host's tissues ,however, are less rigid. The OviTex® Reinforced Tissue Matrix offers the advantages of resistance to infection and provides a robust framework for tissue integration and remodelling. Its unique design encompasses a hybrid biosynthetic ovine-derived polymer reinforced mesh and showed promising outcomes in small series of chest wall and hernial repairs.

We present our experience in utilising the OviTex® mesh in chest wall resection and reconstruction. A total of 15 patients underwent chest wall reconstruction using OviTex®. Patients underwent reconstruction for chondrosarcoma (n=9), metastatic tumour (n=4), Ewing sarcoma (n=1) and traumatic lung herniation (n=1). All cases were discussed in the MDT. Rigid reconstruction was performed using OviTex® mesh, and when required, soft tissue coverage was completed by the plastic surgeons.

All patients had clear margins except for one patient who underwent a second resection due to involvement of the superior margin and subsequent reconstruction was performed with OviTex® mesh. Partial sternectomy was performed in seven patients. Following manubriectomy in one patient the sternoclavicular joint was reconstructed using neotendons. The median number of resected ribs was 3 (range 0-6). The postoperative complications included one in-patient death due to cardiac event, infected seroma requiring drainage (n=1) and admission to intensive care for respiratory failure and pneumonia not requiring ventilation(n=1). None of the patients received postoperative chemotherapy or radiotherapy.

The median follow-up time was 20 months. In one patient, PET CT scan was performed postoperatively as part of surveillance for previously resected melanoma. The scan demonstrated an SUV higher than the mediastinal blood pool around the OviTex® mesh which is suggestive of vascularisation and incorporation into the host tissue.

OviTex® mesh is permeable and results in a low incidence of seroma following soft tissue coverage in our series. There was evidence of good tissue incorporation of the mesh for the patient requiring further surgery. The mesh is very easy to handle and provides adequate rigidity and maintenance of chest wall dynamics without rigid reinforcement in our series. The early results are promising and may be of benefit in infected wounds as there was no infection of the mesh in the patient who developed an infected seroma.

Scientific Tinto **15:30-17:00** Monday, 17 March

Unravelling the circadian connection: BMAL1 alterations in aortic aneurysms and insights into cardiovascular health

Bojin Marinov, Rama Ijaz, Vanja Pekovic-Vaughan, Jillian Madine, Riaz Akhtar University of Liverpool, Liverpool, United Kingdom

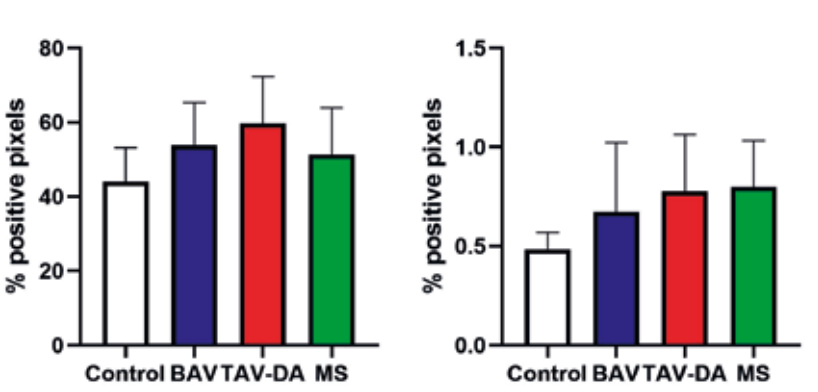


Figure 1. Column bar plot of the percentage positive pixels obtained from IHC staining against A) Bmal1; B) MMP-9 of the three aortic aneurysm control compared to control tissue.

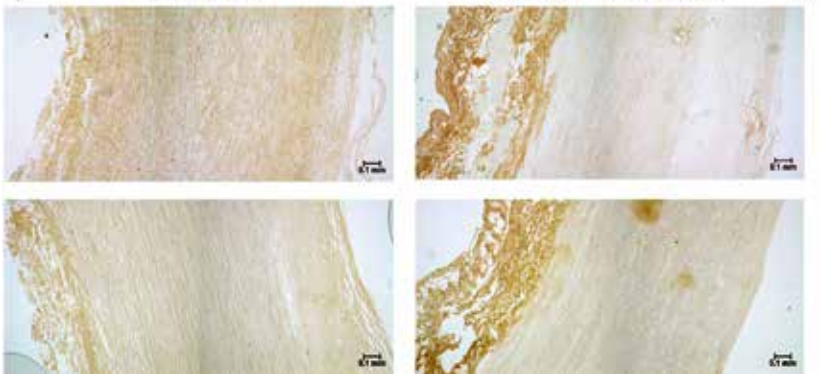


Figure 1. Representative images from IHC staining of TAA tissue against Bmal1 taken at 10x magnification using Brightfield microscopy. Side A) NHS-BT Control tissue; Side B) Marfan syndrome TAA;

Our cardiovascular health is influenced by complex molecular mechanisms, some of which are controlled by environmental factors. The circadian rhythm (biological clock) is a natural 24-hour oscillation of the cycles of alertness and sleep regulated by the day/night solar cycle. Disruptions in the biological clock have been linked to an increased risk of cardiovascular events such as myocardial infarctions and aortic dissections. This study aimed to investigate the role of the circadian marker Bmal1 in thoracic aortic aneurysms (TAA) by comparing its levels in patients with and without genetic predisposition to aneurysm.

In this study we investigated three distinct aneurysmal cohorts: Marfan syndrome (MS), Bicuspid aortic valve (BAV) syndrome and an idiopathic degenerative cohort (DA). A total of five samples per cohort were collected from elective open-heart surgery at Liverpool Heart and Chest Hospital (LHCH) together with control tissue obtained from NHS-BT. The tissue samples were sectioned to a thickness of 6μm and immunohistochemically stained using Bmal1 and MMP-9 primary antibody.

The study revealed that all aortic aneurysm tissue samples had increased Bmal1 and MMP-9. Bmal1 presence was significantly elevated in DA patients compared to controls, with a 23% increase in the inner aortic wall and a 17% increase in the outer region. Marfan syndrome patients also exhibited an increase in Bmal1, with a 9.41% increase in the inner layer and 7.6% in the outer layer compared to control. In contrast, BAV patients showed only a minimal increase in Bmal1 across all aortic layers, with an average increase of 4.75% relative to control tissue. Our study revealed that MMP-9 was increased in all aortic tissue samples. MMP-9 was increased with 38% in BAV compared to control tissue. Marfan syndrome aortic tissue showed a 60% increase in MMP-9 compared to control tissue. Degenerative aneurysm cohort showed a 64% increase in MMP-9 compared to control.

Bmal1 is a critical regulator of the circadian rhythm and is known to activate the NF-κB signaling pathway, which subsequently upregulates matrix metalloproteinase-9 (MMP9). MMP9 plays a significant role in extracellular matrix degradation by breaking down collagen and elastin, weakening the aortic wall and contributing to aneurysm progression. The significantly higher Bmal1 expression in DA tissue suggests that circadian dysregulation may contribute to the pathogenesis of these aneurysms, potentially making them more susceptible to degeneration compared to aneurysms associated with BAV or Marfan syndrome.

Our findings support the notion that BAV-related aneurysms structurally more closely resemble non-pathogenic aortic tissue than DA aneurysms. Overall, this study highlights the importance of circadian rhythms in vascular health and suggests that Bmal1-driven pathways may play a role in aortic aneurysm progression, particularly in DA patients. Understanding these mechanisms could lead to improved risk stratification and targeted therapies for individuals with TAA. Further research into the interplay between circadian regulation, inflammatory signalling and extracellular matrix remodelling could provide deeper insights into TAA development and potential diagnostic tools.

SCTS meeting full page advert for 2026 (waiting for)

Lung Volume Reduction and Pleural Disease Sidlaw **15:30-17:00** Monday, 17 March

Impact of intraoperative microbiology sample analysis in the video assisted thoracoscopic surgery management of empyema: a single centre study.

Adeleye D Oyediran[1], Philemon Gukop[2], Ahmed Abdalla[2], Amr Awad[2], Mahmud Yusuf[2], Abdullah AlShammari[2], Jeremy Smelt[2], Periklis Perikleous[2], Melanie Jenkins[2], Ian Hunt[2]. 1 Former, St George's University Hospital; 2 St George's University Hospital

BTS and AAT guidelines recommend appropriate antimicrobial therapy and tube thoracostomy drainage plus initial pleural fluid sampling for the early management of empyema thoracis. Further surgical management by video assisted thoracoscopic or open surgical approaches are indicated following failed conservative management. During these surgical procedures, second pleural fluid samples are routinely collected for further microbiological analysis. Available evidence on the yield of this second sample and its impact on the outcome of postoperative management is limited.

Objective

To support value based empyema thoracis management, the study objectives were to determine the microbiological yield of VATS assisted pleural fluid sampling during further surgical management of empyema and assess the effect of positive intraoperative pleural fluid sample on the selection of antimicrobial therapy, duration of chest tube drainage and length of hospital stay.

Methodology

A three-year (July 2021 - 2024) retrospective cohort single-center study involving 100 patients who underwent VATS treatment for all stages of empyema thoracis. Data collected included patients' demographics, preoperative microscopy and culture, intraoperative microscopy and culture, change in antimicrobial treatment course, dates of VATS and chest tube removal and dates of admission and discharge.

Results

A total of 100 patients were included, with 72 (72 %) male and a mean age of 54.2 ± 16.8 years; 75 (75%) patients had stage III empyema while 23 (23%) and 2 (2%) were diagnosed at stages II and I respectively; 97 patients had a closed thoracostomy tube drainage (CTTD) done at presentation prior to surgical referral. Microbiological sampling (MCS) result was documented prior to VATS in 75 patients with results retrieved for 70 patients. Of these retrieved results, 52 (52%) patients yielded no growth while 18 (18%) had positive cultures. These determined the course of antibiotics administered (empirical/definitive) prior to surgical management.

All patients subsequently underwent VATS debridement (75% requiring decortication with no conversions), and intra-operative microbial (fluid/debris) samples were taken and sent for MCS in all patients regardless of prior MCS. The positive rate of intra-operative microbial culture was 10 % (10) with 90 % being negative. There was a change in the antimicrobial course in 6 patients out of the 10 positive results as 4 patients were sensitive to antibiotics administered preoperatively. The mean durations of chest tube drainage and hospital stay were 4.98 days ± 2.23 and 7.10 days ± 4.23 respectively. The duration of chest tube drainage between positive and negative results was not statistically significant (p = 0.83). The length of hospital stay between positive and negative results was also not statistically significant (p = 0.68).

Conclusion

Prior studies have suggested initial fluid microbiology analysis is diagnostic and adequate to guide antibiotic treatment in >80% of cases. This is supported by this study which showed negative intra-operative microbiology results in 90% of patients, with growth seen in 10% of samples. No statistical differences were noted in the post-operative course of patients with a negative culture (90%) compared to the 10% with a positive culture or the 6% requiring a change in antibiotic course.

Peri-operative Management in Thoracic Surgery Sidlaw **11:15-12:30** Monday, 17 March, 2025

Digital prehabilitation: a new frontier in surgery recovery

Matar Alzahrani[1,2], Salma Kadiri[2], Joan Duda[1], Louisa Stonehewer[3], Babu Naidu[1,2] 1 University of Birmingham (UoB), Birmingham, United Kingdom. 2 University Hospitals of Birmingham Trust (UHB), Birmingham, United Kingdom. 3 Birmingham, United Kingdom

Thousands of patients in the UK undergo major chest and abdominal surgery annually, with many experiencing complications that increase hospital stays and intensive care admissions. An innovative feasibility study is exploring the potential of a personalised digital prehabilitation programme, Fit 4 Surgery (F4S), to improve recovery outcomes and reduce healthcare burdens.

The need for prehabilitation

Surgical prehabilitation, which involves preoperative exercise and conditioning, has been shown to improve patients' fitness levels before major procedures, potentially mitigating complications. However, traditional face-to-face rehabilitation programmes require significant resources and are not easily accessible to all patients, particularly in the NHS, where overstretched services and financial constraints pose challenges. The COVID-19 pandemic further complicated access due to self-isolation measures before and after surgery. This is where digital solutions, such as F4S, offer an innovative alternative.

The F4S app is a digital prehabilitation and rehabilitation programme designed to support patients undergoing major surgery by delivering structured exercise programmes, tailored nutritional advice, and personalised health information via a user-friendly platform. The programme enables patients to engage in rehabilitation remotely, eliminating the need for in-person sessions and allowing them to integrate prehabilitation into their daily routines at their convenience. By leveraging wearable technology, the app monitors patients' progress and provides real-time feedback, ensuring they adhere to their rehabilitation plans effectively.

The research study

This multi-centre feasibility study aims to determine whether F4S can be integrated into surgical pathways to improve post-operative outcomes. Researchers are assessing the acceptability, effectiveness, and adherence rates of the programme among patients and healthcare professionals. The study also evaluates its impact on key clinical outcomes, including length of hospital stay (LOS), post-operative pulmonary complications (PPC), and Quality of Life scores.

Preliminary findings

Initial results indicate that patients using F4S experienced better recovery outcomes, with increased exercise capacity and improved quality of life scores. The study found that participants who engaged with the app before surgery demonstrated improved physical function post-surgery, with notable gains in their incremental shuttle walk test (ISWT) and sit-to-stand (STS) test performances.

Furthermore, there was a trend toward a reduction in PPC and hospital LOS, suggesting that digital prehabilitation could play a vital role in enhancing surgical recovery. Beyond physical benefits, the study also highlights patient acceptance of digital prehabilitation as shown in the following quotes:

"I'd say it's beneficial because for one, you're not leaving the house. So you haven't got any problems about transport or getting to certain places while doing it, you can do it sitting in your own home, which was good"

"I was when I first met. I really thought you know, what's he is on about, you know, outcome for surgery. That's my priority number one game. But then on reflection, after we've had the discussion and doing some of the exercises, you know, I realised they knew everything for my benefit. And I progressed quite well because of it"

"I think that was very good. It's just straightforward, because a lot of apps go into too much detail, this is enough for what you need to be doing"

The Technology Acceptance Model (TAM) questionnaire results indicate that most participants found F4S easy to use and beneficial in their recovery journey. The ability to access structured rehabilitation guidance at home has been particularly well-received by patients, who appreciated the flexibility it provided.

Quality of Life (QoL) outcomes

A key focus of the study is the impact of prehabilitation on quality of life (QoL), particularly in areas such as physical function, emotional wellbeing, and social engagement.

The figure illustrates how functional scores tend to decline postoperatively before improving at six months, demonstrating the potential long-term benefits of structured prehabilitation.

Implications for the NHS

Given the NHS's drive to improve surgical outcomes and reduce hospital costs, integrating digital prehabilitation solutions like F4S could be a cost-effective strategy to enhance recovery and reduce healthcare resource utilisation. By empowering patients to take an active role in their pre- and post-operative care, digital prehabilitation could transform the standard approach to surgical recovery.

As the study progresses, researchers will continue to evaluate the feasibility of a larger-scale clinical trial. If proven effective, F4S could be a game-changer in perioperative care, offering a scalable and sustainable model for improving patient outcomes and easing NHS pressures.

Summary and future work

Fit4Surgery app improved QoL and physical function for patients before surgery and after it, which ultimately led to better surgical recovery. Ongoing work is recruiting UGI cancer surgery patients and an HTA trial of 300 out of the 900 recruited from the 20 sites. Future work will include other cancer surgeries and potentially other modalities.

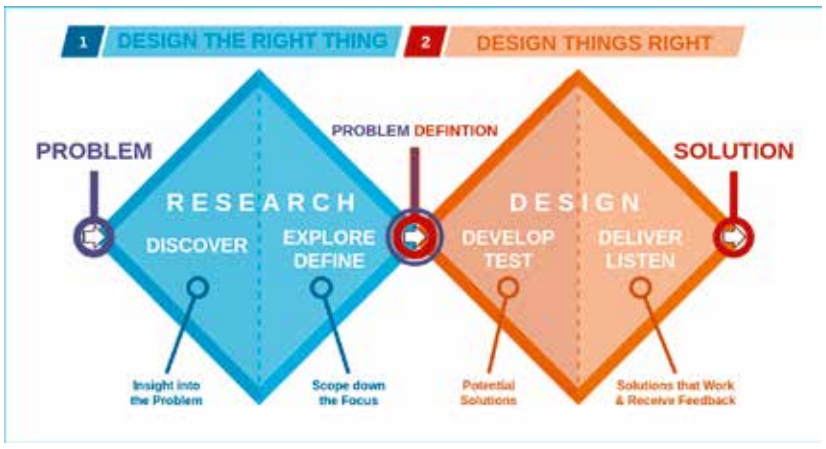


Figure 1: The Double Diamond Model is a design thinking framework used to develop the F4S app

Figure 2: Public & Patient Involvement group (PPI) that helped in the development process of the F4S app

Figure 2: ISWT Before and After Surgery

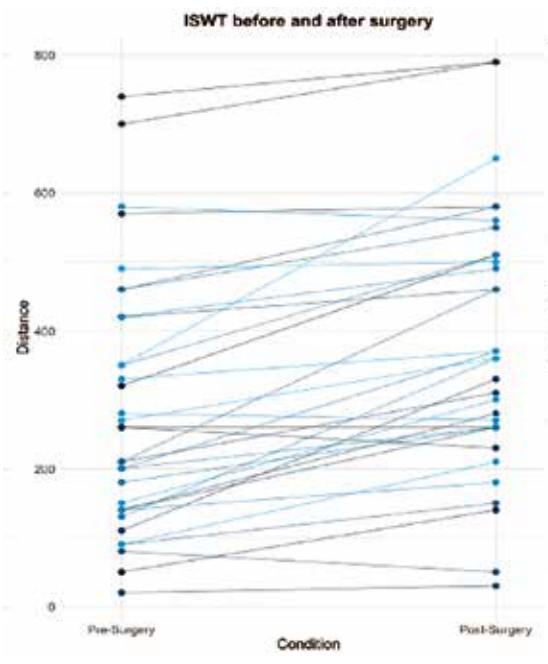


Figure 3: line plot that compares STS performance over three time points for individual patients

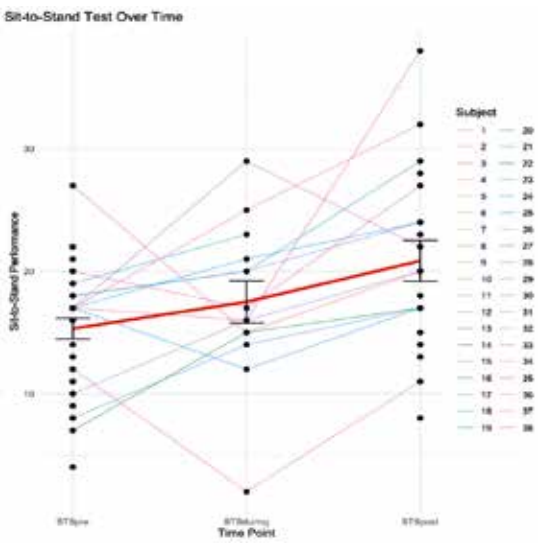
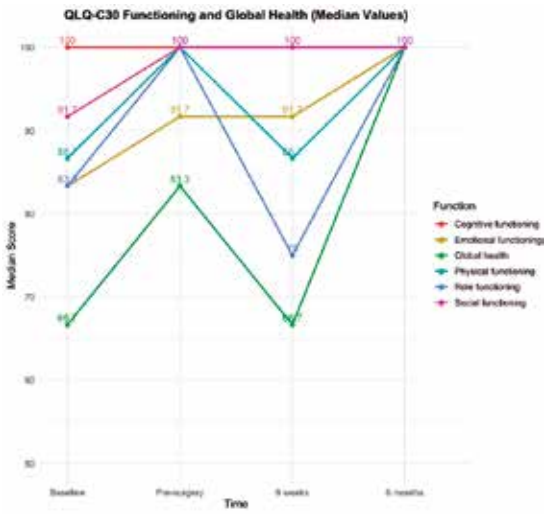


Figure 4: The trajectories of EORTC QLQ-C30 functioning and global health domains at baseline, during the surgery, six weeks, and six months after lung cancer surgery.



Cardiothoracic Surgery Training and Success
Kilsyth 15:30-17:00 **Monday, 17 March**

Advancing training in cardiac surgery: S afety and mid-term survival of mitral valve repair performed by trainees

Suthagar Subramaniam, Jeremy Chan, Saifullah Mohamed, Gianni D Angelini Bristol Heart Institute, Bristol

Introduction

Mitral valve repair is a specialised field within adult cardiac surgery, requiring dedicated training. This study evaluates early clinical outcomes and mid-term survival of mitral valve repairs performed by trainees at our institution.

Key Highlights

The study period spanned from 2016 to 2023 and included a total of 850 patients, with 168 procedures performed by trainees, representing 19.76 percent of cases. The mean patient age was 65 years, and 78 percent of patients were male.

Trends in Training Since the introduction of the mitral valve repair fellowship in 2016, trainees have performed between 15 and 30 percent of cases annually. A temporary decline occurred in 2020 due to the COVID-19 pandemic, but surgical volume increased again in 2022.

Clinical Outcomes

Operative metrics showed that aortic cross-clamp time was slightly longer in trainee-led cases at an average of 91.18 minutes compared to 85.54 minutes in consultant-led cases. In several key areas, postoperative outcomes showed no significant differences between trainees and consultants. In-hospital mortality was 1.2 percent for trainee-led cases compared to 2.3 percent for consultant-led cases. The return to theatre rates were equal at 4 percent. The incidence of postoperative dialysis was 0 percent for trainees and 1.2 percent for consultants. Deep sternal wound infection occurred in 1.7 percent of trainee cases and 0.9 percent of consultant cases.

Mid-Term Survival Rates The study found no significant difference in survival outcomes between consultant- and trainee-led surgeries. One-year survival was 96.1 percent, three-year survival was 92.5 percent, and five-year survival was 88.4 percent.

Conclusion

Trainees can safely perform mitral valve repairs under supervision without compromising patient outcomes. These findings support structured training programs that enhance surgical competency in mitral valve repair. The study reinforces the importance of supervised hands-on experience in cardiac surgery training programs.

Join us for the Full Presentation in the session titled "Cardiothoracic Surgery Training and Success" at 15:30-17:00 on Monday, 17 March 2025 in Kilsyth Hall

Aortic Valve Pentland **15:30-17:00** Monday, 17 March,

Readmission after heart valve surgery in the United Kingdom

Jeremy Chan, Pradeep Narayan, Tim Dong, Daniel Fudulu, Gianni D Angelini
Bristol Heart Institute, Bristol, United Kingdom

Introduction

Unplanned emergency admission following cardiac surgery is associated with significant morbidity and places a high burden on the healthcare system. This study evaluates hospital readmission rates in the UK within the first 12 months after heart valve surgery.

Key Highlights

The study included all patients who underwent heart valve surgery from January 2013 to April 2023. Readmissions to any NHS hospital within 12 months of discharge were analyzed, with a focus on trends, primary and secondary diagnoses, and procedure-related causes.

Study Findings

A total of 45,494 patients were included, with a median age of 69.26 years. Males comprised 61 percent of the cohort. Of these patients, 44.64 percent had at least one readmission within 12 months, while 23.15 percent had two readmissions and 11.95 percent had three. The overall 30-day readmission rate was 12.92 percent, while the 12-month readmission rate reached 44.64 percent, totaling 42,151 readmissions. The median time from discharge to readmission was 61 days.

Consistent Trends

Throughout the study period, the overall 12-month readmission rate remained above 40 percent. Cardiovascular-related readmissions accounted for 24.48 percent of the total, with arrhythmia being the most common primary diagnosis in 37.56 percent of cases. Among these, 82.35 percent involved atrial fibrillation or atrial flutter. Other major causes included heart failure at 16.12 percent and valve-related dysfunction at 15.18 percent.

Procedure-Related Readmissions

Surgical valve procedure-related readmissions accounted for 24.99 percent of total readmissions. Common diagnoses included non-cardiac chest pain at 41 percent, respiratory tract infections at 16 percent, and pleural effusion at 10 percent.

Conclusion

Nearly half of all patients required at least one readmission within 12 months following heart valve surgery. Cardiovascular and procedure-related factors accounted for a significant proportion of these readmissions. These findings highlight the need for improved post-discharge care strategies to reduce hospital readmissions and enhance patient outcomes.

Join Us for the Full Presentation in the aortic valve session at 15:30-17:00 on Monday, 17 March, 2025, Pentland

Coronary Kilsyth **11:15-12:30** Monday, 17 March

Mid-term survival in patients who underwent isolated coronary artery bypass grafting with underlying with/without concomitant left atrial appendage occlusion

Jeremy Chan, Gianni D Angelini
Bristol Heart Institute, Bristol, United Kingdom

Introduction

Atrial fibrillation is a common comorbidity among patients undergoing coronary artery bypass grafting. The role of concomitant left atrial appendage occlusion in improving mid-term survival remains uncertain. This study investigates whether left atrial appendage occlusion provides a survival benefit in patients with atrial fibrillation undergoing isolated coronary artery bypass grafting.

Methodology

A retrospective analysis was conducted using the UK national cardiac surgery database, with long-term survival data linked to the Office for National Statistics. Patients with atrial fibrillation who underwent isolated coronary artery bypass grafting between 2013 and 2023 were included. Kaplan-Meier survival curves were used to estimate mid-term survival, and the log-rank test was applied to assess differences between those who underwent left atrial appendage occlusion and those who did not. The primary outcome was survival at 60 months.

Key Findings

Among 3,503 patients included in the study, 15.7 percent underwent left atrial appendage occlusion. At five years, the survival rate was significantly higher in the left atrial appendage occlusion group at 48 percent compared to 12 percent in the non-left atrial appendage occlusion group. After adjusting for confounders such as age, comorbidities, and surgical characteristics, multivariate analysis confirmed an association between left atrial appendage occlusion and improved mid-term survival.

Conclusion

Concomitant left atrial appendage occlusion during coronary artery bypass grafting may have a favorable impact on mid-term survival, possibly by reducing thromboembolic risk in patients with atrial fibrillation. These findings highlight the potential benefits of left atrial appendage occlusion in coronary artery bypass grafting patients, but further prospective studies are necessary to validate these results and refine patient selection criteria.

Join Us for the Full Presentation in the Coronary session at 11:15-12:30 on Monday, 17 March, 2025, Kilsyth

Coronary Kilsyth **11:15-12:30** Monday, 17 March,

National variation in the use of multiple arterial grafting in isolated coronary artery bypass grafting in the United Kingdom

Jeremy Chan, Gianni D Angelini
Bristol Heart Institute, Bristol, United Kingdom

Introduction

Recent studies have shown a decline in the use of multiple arterial grafting in coronary artery bypass surgery. Given its potential benefits for long-term outcomes, understanding the factors influencing its adoption is crucial. This study evaluates national variations in multiple arterial grafting at both the surgeon and hospital levels in the UK.

Methodology

The study analysed data from the national adult cardiac surgery database, including patients who underwent first-time, elective or urgent isolated coronary artery bypass grafting between 2010 and 2019. Multiple arterial grafting was defined as the use of two or more arterial grafts. A three-level multilevel logistic regression model was used to assess variability at the patient, surgeon, and hospital levels.

Key Findings

Among 135,914 patients included in the study, 11.26 percent received multiple arterial grafting. Patients who were younger, male, had fewer comorbidities, and came from higher socioeconomic backgrounds were more likely to receive multiple arterial grafts.

Hospitals with a higher volume of off-pump coronary artery bypass procedures were more likely to perform multiple arterial grafting, while individual surgeon volume was not a determining factor. The study found that 30 percent of the variation in multiple arterial grafting use was attributable to differences between surgeons, while 19 percent was due to hospital-level variations.

Conclusion

The use of multiple arterial grafting has declined over time despite its potential benefits. There is significant variation at both the surgeon and hospital levels, indicating the need for further research and potential standardisation of practice to improve patient outcomes.

Join Us for the Full Presentation in the Coronary session at 11:15-12:30 on Monday, 17 March, 2025, Kilsyth

Robotic Thoracic Surgery Fintry **11:15-12:30** Monday 17 March

Five years of advancements: revolutionising thoracic surgery with robotic assistance - a new era of minimally invasive thoracic surgery

Ahmed El Zeki, Aishah Mughal, Ahmed Abdullah Oliemy, Patrick Yiu, Ahmed Habib
The Royal Wolverhampton NHS Trust, Wolverhampton, United Kingdom

Robotic-assisted thoracic surgery (RATS) has transformed minimally invasive thoracic surgical techniques in recent years, offering an alternative to traditional open surgery and video-assisted thoracoscopic surgery (VATS). RATS has been used to treat a wide range of thoracic conditions. After accumulating five years of robotic surgical experience at The Royal Wolverhampton NHS Trust, we aim to present the outcomes of patients following robotic surgery.

Our Experience

A retrospective study was performed of all patients who underwent RATS at the Royal Wolverhampton NHS Trust between October 2019 and August 2024. The study analysed patient demographics, surgical complexity, and clinical outcomes, providing valuable insight into the progress of robotic-assisted procedures we perform.

Amongst the 475 patients included in our study, the median age at surgery was 69 years. Most patients had a performance status of 1, ASA grade of 3, and a history of smoking (current/ex-smokers). Pulmonary function tests showed an average FEV1 of 85% and DLCO of 82%.

Across five years, RATS was predominantly used for lobectomies (48.2%). However, its versatility extended to complex lung resections requiring chest wall resection, Pancoast tumour resection or sleeve resection (3.2%); mediastinal mass resections (10.5%); and tracheobronchial surgeries (0.6%). The conversion rate to open thoracotomy was 2.9%, highlighting the efficiency of robotic-assisted techniques. Patients also benefited from a median hospital stay of three days, and the 30-day in-hospital mortality rate was 0.8%.

The Future of Thoracic Surgery

Our five-year experience has demonstrated the effectiveness and safety of robotic-assisted thoracic surgery in enhancing patient care, extending to almost all thoracic procedures. The low conversion rate to open thoracotomy, reduced hospital stay, and minimal in-hospital mortality highlights the growing role of robotic technology in thoracic surgery. RATS is particularly beneficial for complex lung resections, mediastinal mass excisions, and tracheobronchial surgeries, offering enhanced precision and improved patient outcomes.

As technology continues to evolve, robotic-assisted surgery will undoubtedly become the mainstay surgical approach for most thoracic procedures, driving the future of minimally invasive surgery.

Peri-operative Management in Thoracic Surgery Sidlaw **11:15-12:30** Monday, 17 March

User-centered design of an integrated, web-based smoking cessation intervention in the thoracic surgical pathway ('Quit4Surgery') app

Mohammed Alsanad[1,2] Joyce Yeung[2] Salma Kadiri[3] Aya Osman[3] Amanda Farley[4] Babu Naidu[3,4] 1. King Saud bin Abdulaziz for Health Sciences, Jeddah, Saudi Arabia; 2. University of Warwick, Coventry, UK; 3. University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK; 4. University of Birmingham, Birmingham, UK.

Mohammed Alsanad

Babu Naidu

Introduction

Smoking cessation before surgery significantly improves postoperative outcomes, yet existing interventions often lack personalisation, usability, and engagement, making it difficult for surgical patients to quit effectively. The Quit4Surgery (Q4S) app, developed as part of Project MURRAY, was designed using a user-centred co-design approach to address these challenges.

A Two-Cycle Design Process

The Double Diamond methodology was used to iteratively develop and refine the Q4S app, ensuring that patient and healthcare professional (HCP) feedback directly informed each stage. Each cycle followed four phases: Discover, Define, Develop, and Deliver (Figure 1).

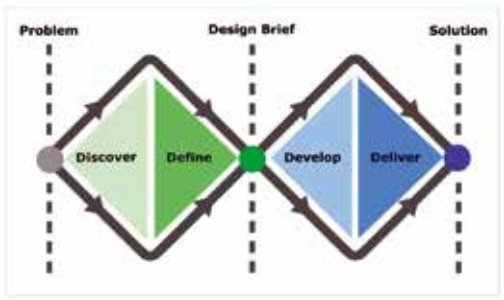


Figure 1: Overview of the Double Diamond design approach

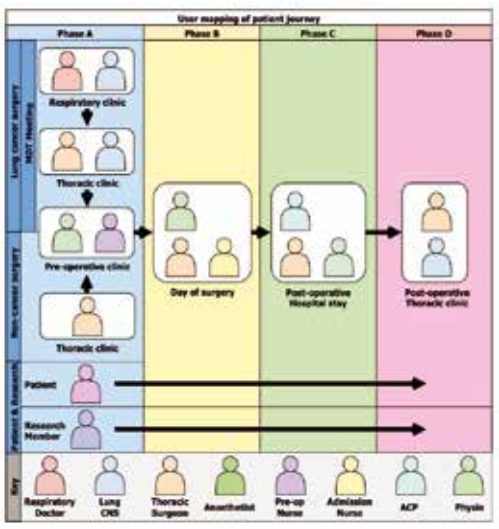


Figure 2: Results from Workshop 1 - user mapping of patient journey in the major thoracic surgery pathway. MDT, multidisciplinary team; CNS, clinical nurse specialist.; ACP, advanced clinical practitioner.

First Cycle: Establishing the Foundation

The first cycle aimed to create the foundational version of the Q4S app. The Discover phase mapped the patient journey (Figure 2) and identified nine key themes from focus group workshops, such as the need for personalised care and standardised HCP training (Figure 3).

These insights shaped the Define phase, which prioritised solutions such as a digital patient passport, an outcome tracking tool for clinicians, and HCP training resources.

The Develop phase produced an initial prototype, which was tested with patients and HCPs. Eavrly feedback showed high acceptability but highlighted the need for better usability and engagement. A minimal viable product (MVP) was developed and used by patients, leading to further refinements.

Second Cycle: Refining the Q4S App

The second cycle focused on addressing usability issues identified in patient interviews and focus group discussions. Key concerns included:

- Lack of visual appeal
- Unclear navigation
- Difficulty using the app

From these insights, seven major themes were identified, including user-friendly experience, accessibility, and supportive content (Figure 4).

The Define phase prioritised three core areas for improvement (Figure 5):

- Personalised engagement & motivation
- Supportive content & strategies
- Accessibility & user experience

The Develop phase is currently underway. The refined prototype has been developed and will be tested with a small group of patients using tablets, allowing them to explore the app and provide real-time feedback on usability and engagement. This iterative testing process ensures that refinements from the Define phase are effectively implemented.

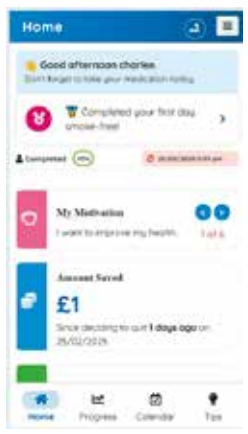


Figure 6: Screenshots of Q4S old version
Figure 7: Screenshot of Q4S new prototype

Here are examples of the old version and the new prototype of Q4S (Figure 6 and 7).

Preparing for Final Release

In the Deliver phase, final usability testing will be conducted to ensure seamless navigation, engagement, and effectiveness. The app will undergo final refinements before the release of the final version.

Conclusion

Q4S is the first app designed specifically for surgical smoking cessation using the Double Diamond methodology. The second cycle focuses on enhancing engagement, accessibility, and personalisation based on direct user feedback. With further testing and refinements planned, the app is being prepared for final release, aiming to provide effective, patient-centred smoking cessation support in the thoracic surgical pathway.

Figure 3: Sub-theme and major themes generated through discover phase. HCP, healthcare practitioner; MDT, multidisciplinary team.

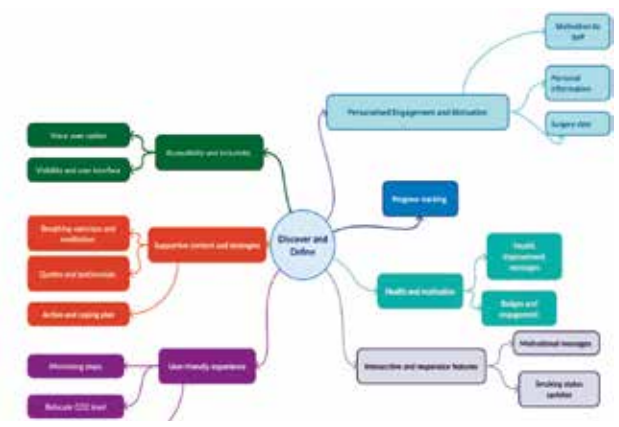


Figure 4: Sub-theme and major themes generated through discover phase.

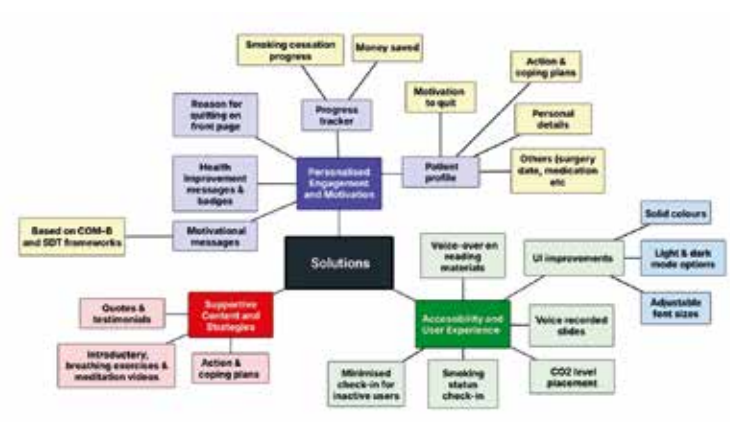


Figure 5: solutions were derived to define the design brief

Cardiothoracic Surgery Training and Success Kilsyth **15:30-17:00** Monday, 17 March

Enhancing thoracic robotic surgery education in the digital realm: a learner analysis

Kunal Bhakhri[1], Davide Patrini[1], David Lawrence[1], Thomas Roberts[2] 1 University College Hospital at Westmoreland Street, London, United Kingdom. 2 UCL Medical School, London, United Kingdom

Introduction

Virtual learning environments (VLEs) have emerged as essential tools in modern surgical education, particularly in specialised fields such as thoracic robotic surgery. We studied the effectiveness of an e-module used by the Royal College of Surgeons of England in teaching thoracic robotic surgery skills to surgical trainees and by evaluating learner engagement, skill acquisition, and educational alignment, we were able to highlight the transformative potential of digital platforms in surgical training.

Study design and methods

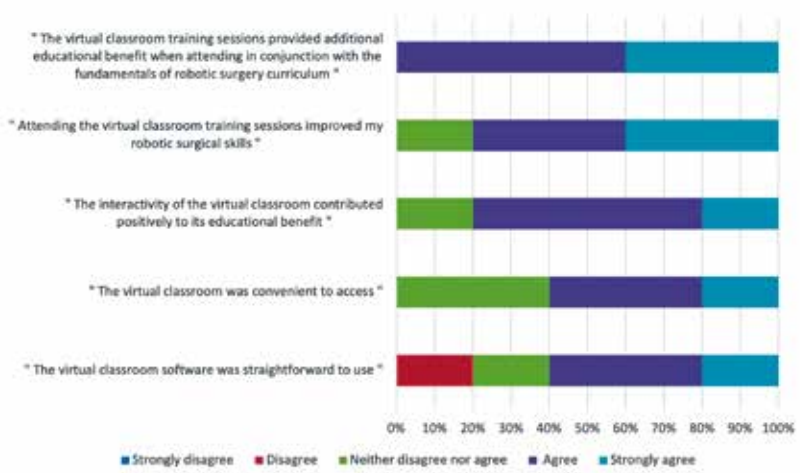
360 participants, including both surgical specialty trainees and consultants across various disciplines, undertook the self-paced e-module which incorporated interactive videos, reflective questions, and case studies to enhance learning. It featured both formative and summative assessments, including multiple-choice and short-answer questions, ensuring a structured and comprehensive educational experience.

Using a mixed-method approach, the study integrated qualitative interviews and questionnaires with quantitative statistical analysis. Grounded in Knowles' theory of andragogy, the research assessed how well the e-module aligned with key adult learning principles such as self-directedness and intrinsic motivation.

Key Findings

Improvement in Knowledge Acquisition

Participants' scores on multiple-choice questions improved significantly, rising from an average of 60% before the module to 75% after completion ($t99 = 6.32$, $P < .001$). This demonstrated the module's effectiveness in enhancing knowledge retention even from a virtual medium.



Correlation Between Virtual Training and Educational Alignment

A strong positive correlation ($r = 0.7$) was observed between frequent virtual training sessions and alignment with trainees' educational needs. Analysis of variance (ANOVA) revealed significant differences in learning outcomes based on prior experience ($F2,97 = 4.56$, $P = .013$).

Participant Feedback and Engagement

As shown by the provided image, feedback provided by the participants was overwhelmingly positive, with some of the key points being:

- 100% of learners either agreed or strongly agreed that the virtual sessions provided additional educational benefits when used in conjunction with the fundamentals of the robotic surgery curriculum.
- 80% of learners either agreed or strongly agreed that the virtual sessions improved their robotic surgical skills.
- 20% highlighted usability challenges, indicating room for interface improvements.

Implications for Surgical Education

The study underscores the potential of VLEs in meeting the evolving demands of surgical education. Digital learning platforms offer:

- Flexibility: Self-paced learning accommodates varying schedules and skill levels.
- Interactivity: Engagement-driven content enhances retention and application.
- Scalability: VLEs facilitate widespread accessibility for trainees across different institutions.

To optimize VLEs further, ongoing research should focus on refining content delivery, incorporating AI-driven feedback, and enhancing user interface design. Future studies should also explore long-term impacts on surgical competency and patient outcomes.

Conclusion

Virtual learning environments represent a paradigm shift in thoracic robotic surgery education, offering accessible, interactive, and effective training solutions. This study highlights the value of digital platforms in fostering self-directed learning and improving knowledge acquisition. As technology continues to evolve, integrating innovative digital tools into surgical education will be crucial in preparing the next generation of thoracic robotic surgeons for clinical excellence.

Upcoming SCTS Education Courses 2025

Course	Location	Date
Revision & Viva Course for FRCS CTh	Virtual & Ashorne Hill	4th – 7th March 2025
ST5.2 Phase 2: Cardiothoracic Intensive Care and Critical Conditions Course	Ashorne Hill	28th – 29th April 2025
ST3.1 Phase 1: Operative Cardiothoracic Surgery Course	Medizin im Grünen, Germany	8th – 9th May 2025
SCTS Harefield Core Thoracic Organ Transplantation Course	STaR Centre	29th – 30th May 2025
ST5.1 Phase 2: Cardiothoracic Surgery Sub-specialty Course	TBC	TBC
ST4.2 Phase 2: Core Thoracic Surgery Course	Pinewoods Campus	10th – 11th June 2025
Cardiothoracic Surgery Update and Wetlab for Trust Appointed Doctors	Pinewoods Campus	12th – 13th June 2025
ST7.1 Phase 3: Cardiothoracic Practical Pre-Consultant Course	Keele Anatomy & Surgical Training Centre	25th – 26th June 2025
ST2: Cardiothoracic Surgery Course	Nottingham City Hospital	TBC
Curriculum Review Course for Trust Appointed Doctors	Pinewoods Campus	24th – 25th September 2025
ST3.2 Phase 1: Non operative technical skills for surgeons	Bristol Simulation Centre	TBC
Portfolio Pathway (formerly CESR) Course	Ashorne Hill	7th November 2025
ST4.1 Phase 2: Core Cardiac Surgery Course	Ashorne Hill	18th – 19th November 2025
ST7.2: Leadership and Professionalism Course	Ashorne Hill	27th – 28th November 2025
ST1: Introduction to Cardiothoracic Surgery Course	Ashorne Hill	5th December 2025

SCTS EDUCATION

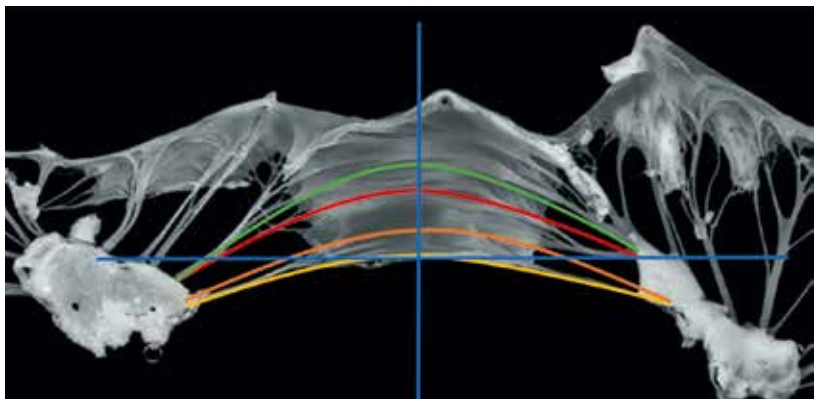
For more information, please visit: https://scts.org/events

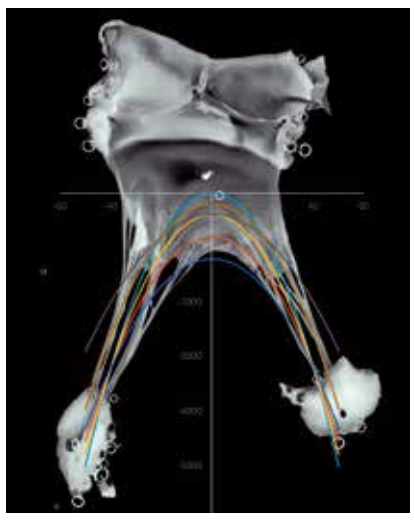
Mitral Valve Pentland **13:30-15:00** Tuesday, 18 March

Structure-function relationships in porcine mitral valve leaflets

Jeevan Francis (right), Keith Buchan
Dept of Cardiothoracic Surgery, Aberdeen Royal Infirmary, Aberdeen, United Kingdom

Figure 2: Posterior Mitral valve leaflet. P3 can be seen on the left side, and P1 on the right. The anterior leaflet has been cut and can be seen at the sides of P1 and P3.





Figures 3 (left) and 4 (above): The quadratic equation y=ax2+bx+c is a good fit for describing the observed collagen patterns in the anterior mitral leaflet (Figure 3) and in the P2 scallop (Figure 4). The homologous series of quadratic curves for each specimen had their roots in the associated papillary muscle heads.

Mitral valve pathology in the UK is dominated by degenerative mitral regurgitation. Taking as our guide the fact that form and function are often closely related in biological systems we set out to perform a qualitative assessment of the abundant collagen bundles found in the mitral valve leaflets using traditional Van Gieson stained whole mount specimens. These were then photographed and analysed.

One of the greatest variations was in the sinusoidality of the mitral valve annulus. This varied from a gentle undulating pattern (Figure 2) to one with marked indentations reminiscent of the outstretched wings of a bat (Figure 4). Both patterns were equally common. Anatomists like to think of the left atrioventricular junction as being a uniplanar ring as they do for the aorto-ventricular junction but the reality is more complex. Matching the undulating MVA to an artificially superimposed linear ring may be one explanation for the echocardiographic phenomenon of mitral annular dysjunction.

The most consistent finding from our study was the constant appearance of a homologous series of quadratic curves that could be seen in all AML and P2 specimens. Collagen networks in heart valves are related to the mechanical properties of the leaflets and explain their observed anisotropic behaviour. If the MVA is imagined as being circular then in the main the collagen fibres either run parallel to the MVA (called circumferential fibres) or perpendicular to it (the radial fibres). There are also intermediate forms if the collagen bundles form a curve. Anisotropy is the mechanical property of differential elasticity of a material, usually a planar structure, such as a sheet of rubber or a heart valve leaflet. Whereas the rubber sheet extends to the same extent in all directions when a given tensile stress is applied this is not the case with heart valve leaflets which behave more like a garden trellis. Depending on the starting position of the trellis it can easily be made to open much more in one direction than in the perpendicular one for a given applied force. This phenomenon is called mechanical anisotropy. Our group has previously published on the anisotropic behaviour of the mitral valve leaflets[1] and as one would expect they displayed enhanced elasticity in the radial direction rather than the circumferential direction. This also happens to be the direction which will assist in achieving effective valve closure in life. That they have enhanced elasticity in the radial direction is due to their collagen orientation which being predominantly circumferential resists extension in that direction whereas the collagen bundles are only weakly held together laterally (see figure 4). There are still many mysteries to be unravelled in understanding the structure-function relationship of the mitral valve but we hope this simple study will help to stimulate further endeavour.

Reference

1. Baxter J, Buchan KG, Espino DM. 2017. Viscoelastic properties of mitral valve leaflets: an analysis of regional variation and frequency-dependency. Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine 231 (10): 938-944.

Peri-operative Management in Thoracic Surgery Sidlaw **11:15-12:30** Monday, 17 March

Feasibility study for introduction of a Day 1 discharge programme post anatomical lung resection and major thoracic surgery

Stacey Stockdale, Hayley McNaught, Rachel Calvert, Leanne Connelly, Lydon Metson, Joel Dunning, Jonathan I. Ferguson, Ian Paul, Benjamin R. Waterhouse. South Tees Hospitals NHS Foundation Trust

The Thoracic Surgical service cares for around 800 patients/ year, serving a population of 1.5 million covering North Yorkshire, Teesside and County Durham who undergo thoracic procedures for diagnostic, therapeutic or palliative intent for both benign and malignant disease.

At SCTS 2024 Plenary speaker Dr Cerfolio showcased his POD1 (Post Operative Day 1) Discharge Programme at NYU Langone. Following this meeting we were keen to explore how we could implement this programme locally. Prolonged length of stay (LOS) post-surgery reduces hospital bed capacity, increases costs, and potentially exposure to infection. Our unique Community Thoracic Service which was established five years ago already provides post-discharge visits at home that has already reduced LOS and readmission rates. The Community Thoracic Nurses visits patients at home 24-48 following discharge, allowing a nurse with specialist knowledge in relation to thoracic surgery to review the patient, manage symptoms, provide reassurance and support, whist facilitating earlier discharge from hospital and reducing readmissions.

Our main objective of this study was to assess feasibility of a POD1 Discharge Programme following anatomical lung resection. We would also like to reduce length of stay further whilst also maintaining patient safety, preventing readmissions and further enhancing patient experience.

To further understand POD1 discharge, our team visited the established New York programme in May 2024 to learn from their experiences. We then developed a Standard Operating Procedure which was agreed for the feasibility programme locally. Prospective database was then maintained for 10 consecutive patients discharged POD1 after anatomical resection from May-October 2024.

In terms of results, during our feasibility study, the average age of our 10 patients was 62 (range 44 – 71), with 6 female and 4 male patients. 9 underwent lobectomy (4 RUL, 2 RLL, 3 LLL) and 1 segmentectomy (RS6). All patients had a community visit POD2 and five patients received a second visit. There was 1 readmission deemed unlikely to have been preventable by prolonging index admission.

Following review of this data and feedback from patients, relatives and the clinical team involved in patients care, we felt that there was a clear need for patients being discharged POD1 should have access to multiple home visits as needed and that additional physiotherapy support would also be beneficial. A successful bid was made to the Regional Cancer Alliance to fund a dedicated Band 7 Prescribing Community AHP aiming to expand for additional community visits on POD3-5.

In conclusion, the regional funding award has formed the basis for a two-year Pilot Phase allowing the programme to be further developed. We recognise patients may encounter difficulties in the days that follow review on POD2 and so we propose multiple community reviews to reduce potential readmissions and further improve patient experience.

Aortic Dissection Kilsyth **13:30-15:00** Tuesday, 18 March

Reoperation after Acute type A dissection repair: single centre experience.

Laura Viola University Hospital Southampton NHS Trust, Southampton, UK

Objective

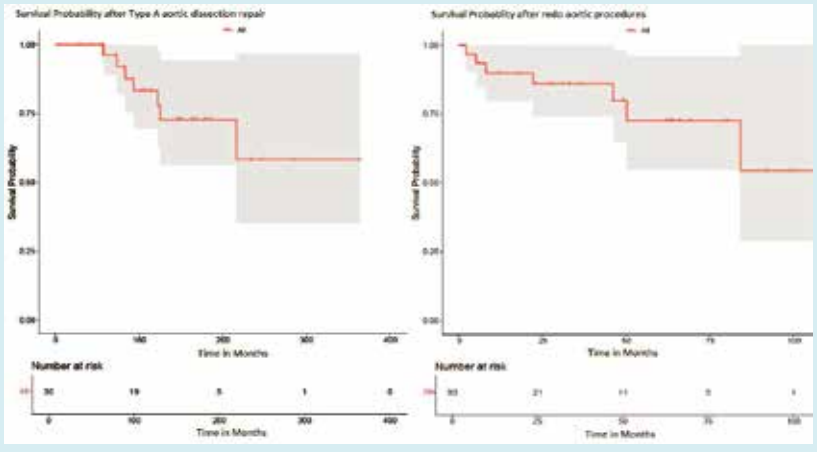
Type A aortic dissection remains one of the most serious cardiovascular emergencies, requiring timely surgical intervention. Primary goal in patients with Type A aortic dissection is in-hospital survival, but several pathological mechanisms can contribute to the need for reoperations in the future: aortic valve regurgitation, progressive proximal or distal dilatation of the aorta, false aneurysms' development.

Ongoing surveillance is required to monitor the repair and the residual aorta.

This review aims to analyse the causes, timing and outcomes of reoperation after primary repair for acute type A dissection.

Findings

Reviewing prospectively collected bespoke hospital database, we identified 30 patients who required a reoperation following type A aortic repair; 23 of those had their 1st operation in Our Institution and 10 (3,3%) patients had the 1st operation between 2015 and 2024, over a total of 303 type A aortic dissection repair. The median time to the first reoperation was six years (range 1-28 years).



The cohort had a mean age of 59.8 years (±12.7), with 23 males (76.7%) and 7 individuals (23.3%) having underlying connective tissue diseases (4 Marfan syndrome, 2 Loeys-Dietz, 1 Ehlers Danlos syndrome). Initial surgeries predominantly involved proximal aortic resections, with ascending aorta replacement performed in 18 patients (60%), aortic root replacement in 11 patients (40%) and 1 aortic arch replacement (3,3%), ± concomitant procedures.

Reoperations were prompted by complication or dilatation arising from both proximal and distal aortic segments, with the most frequent cause being distal aortic complications (22 patients). The remaining cases involved infection (3 patients), proximal aortic dilatation (1 patient) and false aneurysm development (4 patients).

The outcomes of the first redo operations showed a relatively low in-hospital mortality rate of 3.3% (1 patient, due to infection).

Long-term survival rates after the first redo operation were favourable. Actuarial survival after the first redo at 1, 5, and 8 years were 90% ± 5%, 73% ± 10%, and 54% ± 17%, respectively. For the cohort, overall survival after the initial Type A aortic dissection repair at 8, 16, and 25 years was 83±8%, 72±9% and 58±15%, respectively.

However, complications remained a significant concern, affecting a considerable number of patients. Notable complications included dialysis requirement due to renal failure 30% (9 patients), the need for tracheostomy 16,6% (5 patients), stroke 10% (3 patients) and paraplegia 3,3% (1 patient).

10 patients required additional re-interventions: including thoracic endovascular aortic repair (TEVAR) in eight patients, a total arch replacement with frozen elephant trunk (FET) in one patient and a thoracoabdominal aortic repair in 1 patient.

Conclusion

The debate regarding whether a less or more radical surgical approach is best for repairing acute aortic dissection remains still unresolved. Progression of aortic disease is a common indication for reoperation after Type A aortic dissection repair with limited distal aortic resection. When subjected to adequate aortic surveillance and active management by a multidisciplinary aortic team, good long-term survival is achievable. However, redo surgery carries high morbidity.

Laura Viola

Floorplan

Company	Stand Number
AtriCure	**46**
Abbott	**44**
ABIOMED	**24 & 25**
Acumed	**22**
Ambu Bioplastic	**20**
Aortic Dissection Awareness	**5**
AQUILANT	**35**
Arthrex	**40**
Artivion	**51 & 52**
AstraZeneca	**54**
BD	**9**
Brennan & Co	**6**
BVM MEDICAL	**58 & 59**
Corcym UK Ltd	**14**
CUI Internatonal	**48**
Custodiol PharmaPal	**49**
Cytosorbents Medical UK Ltd	**10**
Dendrite Clinical Systems	**63**
EACTS	**68**

Company	Stand Number
Edwards Lifesciences	**47**
Getinge Limited	**30 & 32**
Ideal Medical Solutions	**41**
IntoCare Medical	**42**
Intuitive	**45**
Inventive Medical Solutions and Torbay Pharmaceuticals	**69**
Johnson & Johnson Medtech	**36**
LaproSurge Ltd	**11**
Leib Medical Ltd.	**35a**
Lemonchase / Designs for Vision	**61**
Lexington Medical	**33 & 31**
LINC Medical Systems Ltd	**50**
LYNTON / KLS Martin	**3 & 4**
M.E.D. Surgical	**13**
MEDELA UK LTD	**39**
MEDISTIM UK LTD	**60**
Medivate	**53**
Medtronic	**34**

Company	Stand Number
Merck Sharp & Dohme (MSD)	**70**
MERIL UK LIMITED	**43**
National Cardiac Surgery Clinical Trials Initiative	**8**
Nordic Pharma Ltd	**57**
Olympus	**27**
Pectus Matters	**65**
Pulmonx GmbH	**12**
R&D Surgical Ltd	**26**
SERB Pharmaceuticals	**64**
Siemens	**23**
Sinapi Biomedical	**17**
Solventum	**16**
Stago UK Ltd	**15**
Surgical Reality	**37**
TenaTac	**7**
Terumo Aortic & Terumo Cardiovascular	**18, 19, 21**
Transonic	**38**
Zimmer Biomet	**1 & 2**

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