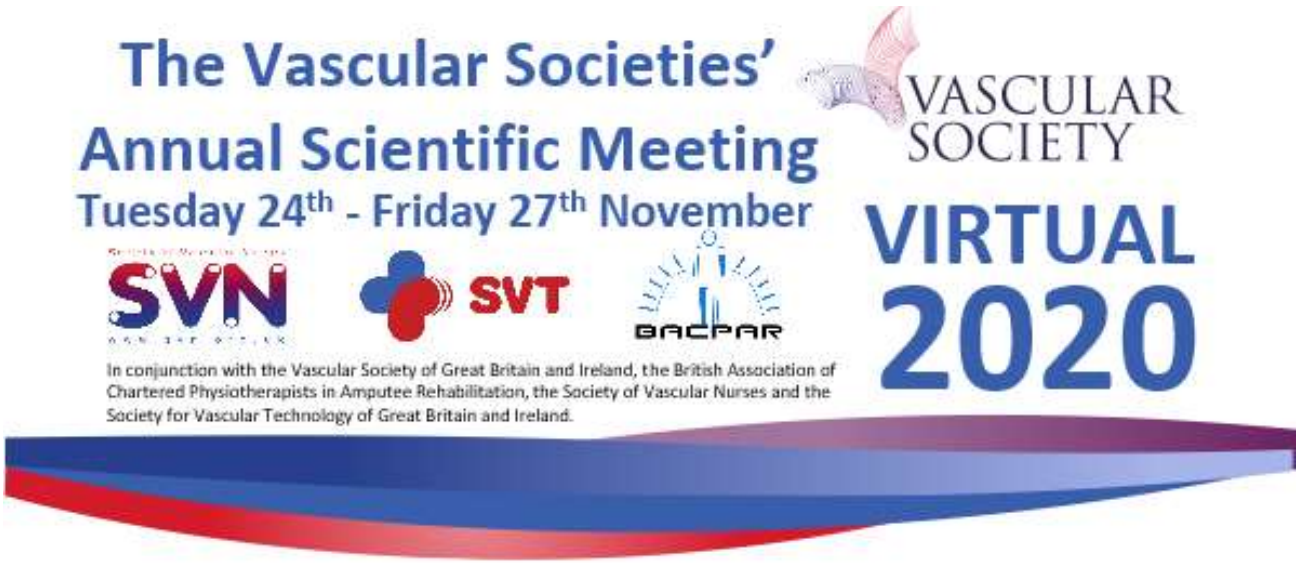

Table of Content

BACPAR Oral Abstracts

BO1

Virtual vascular prehabilitation: effectiveness of a virtual service versus a face-to-face service

Mrs Kate Conneally[1]
[1]*Royal Free Hospital, London, UK*

In 2018 the Royal Free Vascular Therapy Service set up a face to face prehabilitation exercise and education class for all patients undergoing vascular surgery. The aim of the programme was to improve patient fitness for surgery, reduce length of stay and encourage an increase in physical activity following discharge.

The service was set up so that attendees were invited to complete six 60 minute, weekly face to face sessions. Baseline information and outcomes measures were gathered at the initial session and on discharge from the class. Repeat follow up data was also collected at three and 12 month time periods.

Analysis of the service identify excellent patient feedback however referral rates were low. A Plan Do Study Act (PDSA) cycle was commenced to analyse the service effectiveness when the COVID-19 pandemic hit.

In July 2020 the virtual prehabilitation service was established with a virtual exercise class, telephone contact and emailed educational links. The referral pathway was re-designed prior to the service launching. Analysis of this service compared with the face-to-face prehabilitation service is currently underway. This presentation will look to compare the initial virtual prehabilitation versus face to face service to help guide future service planning.

BO2

A Quality Improvement Project: Evaluating the Impact on Patient Outcomes of a Multidisciplinary Vascular Intervention and Early Amputee Rehabilitation on a Vascular Ward

Miss Anya White[1], Mr Geoff Wu[1], Mr Jonathan Weblin[1]
[1]*Queen Elizabeth Hospital, Birmingham,*

Introduction: National guidelines recommend early rehabilitation to improve post-operative outcomes in lower limb amputees [1]. Failure to sit out of bed post-operative day 1 (POD1) increases 30-day mortality risk by 88% [2]. A recent service evaluation at a large UK hospital identified only 37% of patients achieved this target. We aimed to assess the impact of introducing a multidisciplinary vascular intervention on patient outcomes.

Method: A multidisciplinary vascular intervention was introduced in October 2019. This included MDT and patient education, streamlined wheelchair provision and pre-operative assessments. Outcomes for lower limb amputees in the 6 months pre-intervention (n=35) were compared with patients undergoing surgery post-intervention (n=35). Primary outcome was time to sit out of bed. Secondary outcomes included basic amputee mobility score (BAMS), length of stay (LOS), and 30-day mortality.

Results: Significantly more patients sat out of bed POD1 post-intervention (89% vs 37% p=<0.0001). This was associated with significantly higher BAMS on POD1 (2 vs 5, p=<0.001), hospital discharge (4 vs 7, p=<0.001) and decreased hospital LOS (26 vs 15 days, p=0.028). No significant difference was observed in 30-day mortality.

Conclusion: Our multidisciplinary vascular intervention was effective in reducing time to first transfer and improving functional outcomes in lower limb amputees.

References
[1] Gough, M., Juniper, M., Freeth, H., Butt, A. and Mason, M. (2014) 'Lower Limb Amputation: Working Together' National Confidential Enquiry Into Patient Outcome and Death (NCEPOD). Online. URL: https://www.ncepod.org.uk/2014report2/downloads/WorkingTogetherFullReport.pdf

[2] Kristensen, M., Nielsen, A., Topp, U., Holmehave-Brandt, J., Petterson, C. and Gebuhr, P. (2018) 'Development And Psychometric Properties Of The Basic Amputee Mobility Score For Use in Patients With A Major Lower Extremity Amputation.' Geriatrics and Gerontology International, 18 (1) pp. 138-145.

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[1] Gough, M., Juniper, M., Freeth, H., Butt, A. and Mason, M. (2014) 'Lower Limb Amputation: Working Together' National Confidential Enquiry Into Patient Outcome and Death (NCEPOD). Online. URL: https://www.ncepod.org.uk/2014report2/downloads/WorkingTogetherFullReport.pdf

[2] Kristensen, M., Nielsen, A., Topp, U., Holmehave-Brandt, J., Petterson, C. and Gebuhr, P. (2018) 'Development And Psychometric Properties Of The Basic Amputee Mobility Score For Use in Patients With A Major Lower Extremity Amputation.' *Geriatrics and Gerontology International*, 18 (1) pp. 138-145.

Table

	Pre- Service improvement	Post service improvement	P
n	35	35	
Mean Age (SD)	63 (±23)	61 (±21)	
Number of patients with > 5 comorbidities	19 (54%)	18 (51%)	1.0
% sat out POD1	13/35 (37%)	31/35 (89%)	<0.0001
BAMS POD1	2 (1-3.5)	5 (3-5.5)	<0.001
BAMS hospital discharge	4 (3-8)	7 (6-8)	<0.001
Inpatient falls	11	4	0.078
Hospital LOS	26 (12-39.5)	15 days (9.5-22.5)	0.028
30 day mortality	7 (20%)	4 (11%).	0.51

*All data displayed as median/IQR unless otherwise stated

BO3

Experience With Acute Limb Ischemia In A Tertiary Vascular Unit in the UK During The Peak Of The COVID-19 Pandemic

Jack Fairhead[1], Antony Jaipersad[1], Sriram Rajagopalan[1], Mr Isaac Kobe[1], Miss Uzma Sadia[1], Mr Brian Gwynn[1]
[1]*University Hospitals of North Midlands, Stoke on Trent, United Kingdom*

Introduction
Acute limb ischaemia is a common surgical emergency. Due to the presence of a hypercoagulable state in patients with COVID-19, a correlation with acute limb ischemia has been made in recent reports. The first peak of COVID-19 in the UK occurred between March and June 2020.
Methods
Data was collected prospectively into a unit database. Eligibility criteria included patients who were admitted with a diagnosis of acute limb ischemia in the 3 months between April and June 2020.
The primary outcome was mortality. Secondary outcomes were to describe patient profile including COVID status, interventions and complications
Results
Twelve (12) patients were included in the study as compared with three (3) patients who were admitted with acute limb schema in the same period last year. The median age was 78.5yrs (IQR=25). 25% (3) of the patients were COVID-19 swab test positive. The median length of stay was 7 days. One patient was readmitted for a major amputation while one patient had a major amputation in the same admission (one readmission and two patients with limb loss). Overall mortality rate was 16.7%(2).
Conclusion
There was an increase in the number of patients presenting with acute limb ischemia as compared to a similar time period last year.

TABLE 1

Baseline characteristics N=12	Number	Percentage
Sex		
Male	6	50%
Female	6	50%
COVID STATUS		
Positive	3	25%
Negative	9	75%
Anatomy		
Iliofem	2	16.7%
Popliteal	2	16.7%
Axillobrachial	1	8.3%
Brachial	2	16.7%
Aortic	1	8.3%
SFA/Popliteal	3	25.0%
Infrapopliteal	1	8.3%
Rutherford's Classification		
IIA	3	25.0%
IIB	8	66.7%
III	1	8.3%
Treatment		
Heparin Infusion	4	33.3%
Embolectomy	2	16.7%
Embolectomy and bypass	6	50%

BACPAR Poster Abstracts

BP1

BP1 - Effects of invasive peripheral nerve stimulation for tactile feedback recovery with upper limb amputees: a structured literature review.

Mr Matthieu Haentjens[1]
[1]*Glasgow Caledonian University, Glasgow, Scotland*

Aim – This structured literature review aims to explore the effects of invasive peripheral nerve stimulation for tactile feedback recovery with upper limb amputees. A systematic identification, appraisal and synthesis of primary research articles will be undertaken in order to inform practice.
Background – Recent advances in the field of neuro engineering are shaping the future of upper limb amputee's rehabilitation. Invasive peripheral nerve stimulation is a promising method to restore tactile feedback and is based on a complex neural interface between the prosthetic hand and the user.
Perspective and methodology – A structured literature review of quantitative studies will be undertaken in order to assess the best evidence available about this topic. As the intervention researched is at an early developmental stage, small-N sample studies will be the base of the literature review.
Methods - A systematic approach will be used with explicit description and justification of search terms, electronic databases, inclusion and exclusion criteria, quality appraisal tool, data extraction tool.
Conclusion – the results of this review will constitute a basis for practitioners working with upper limb amputees for understanding the use of invasive peripheral nerve stimulation for restoring the ability to "feel" with a prosthetic hand.

BACPAR - BP2

What management approaches do physiotherapists select when assisting patients to manage phantom limb pain?

Mr Ben Herberts

Background: In 2012, the CSP highlighted several research priorities in physiotherapy services including investigating treatment modalities for patients with phantom limb pain (PLP). PLP incidence is reported to affect 60-90% of people after amputation.

Objective: The primary objective was to identify the current available management options for PLP being prescribed in clinical practice by physiotherapists. The research investigated if treatment selection differs between physiotherapy banding, NHS or private and if guidelines are used.

Method: Mixed method approach. All participant completed the same 17-question survey that covered physiotherapy demographic information, PLP treatment selection and clinical reasoning for treatment selection. The survey was advertised via BACPAR, PACE and CSP and completed anonymously. Results were analysed via thematic analysis and a chi square test conducted on a proportion of data.

Results: 18 treatment modalities were identified. 10 different primary/preferred treatments selected. No statistical significance between NHS/private and treatment selection. Four themes emerged for clinical reasoning of treatment selection.

Conclusions: Despite a small sample size a range of treatment modalities were identified for PLP management. The research highlights the need for an individual tailored approach to PLP management and indicates further research is needed to develop guidelines and knowledge on effectiveness of varying treatment selections.

SVN Oral Abstracts

SVNO1

Impact of the COVID-19 pandemic on the workload and case mix of a one-stop Emergency Vascular Clinic in a tertiary referral vascular centre.

Miss Meryl Green[1], Miss Federica Francia[1], Mr Mustafa Musajee[1], Mr Mohamed Sayed[1], Mr Martin Arissol[1], Miss Alpa Lakhani[1], Dr Narayanan Thulasidasan[1], Mr Lukla Biasi[1], Mr Sanjay Patel[1], Mr Hany Zayed[1]
[1]*St Thomas Hospital, Guys and St Thomas NHS Trust, London, United Kingdom*

Introduction

Elective outpatient face-to-face consultations were stopped during COVID-19 pandemic in order to reduce infection risks.

Methods

We compare the nature of presentations to the Emergency Vascular Clinic (EVC) and the overall workload between Period 1 (15th of March till 31st May 2019) and period 2 (15th of March till 31st May 2020- corresponding to COVID-19 pandemic)

Results

Presentations to EVC did not significantly increase (157 to 161, P=0.2), however there was a significant increase in the proportion of patients presenting with Critical Limb Ischaemia (CLI) – Rutherford 5&6, from 24% in Period 1 to 34% in Period 2 (P=0.046).The number and proportion of patients presenting with DVT in the upper or lower limb decreased significantly (11% to 2%, P <0.0001). There was a non-significant trend towards a reduction in the proportion of patients presenting with symptomatic carotid disease (6% to 2%, P=0.08). Urgent admission following review in the EVC did not change (22% to 17%, P=0.10). There was a significant reduction in patients returning with post-operative complications (24% to 12% in periods 1 and 2 respectively, P=0.0039)

Conclusion

EVC served as an important venue to review and assess urgent vascular patients during COVID-19 pandemic especially those with CLI.

SVNO2

Vascular nurse-facilitated “selective” care of elderly (CoE) input on vascular ward

Ms Melissa Hughes[1], Dr San Chen[1], Mr Ansy Egun[1], Mr Mohamed Banihani[1]
[1]*Lancashire Teaching Hospitals, Preston, United Kingdom*

Introduction:

Getting it Right First (GIRFT) report recommends CoE input in the care of vascular patients but the demand for the service is raising with limited resources.
We piloted a model of “selective” input into the highest risk group of vascular patients facilitated by vascular nurse specialist (VN)

Methods:

Prospective cohort study of “selective ” CoE input for vascular inpatients (n=56) in a regional vascular centre over 3 month period. A retrospective control (n=50) was generated from earlier audit.
CoE input was provided through two sessions per week. Patients were “selected” during routine ward round and VN facilitated CoE review and cross-team communication.
Data collected for comorbidities, number and type of interventions, length of stay (LoS).

Results:

The “selective” CoE review patients were older (77y vs 70y p=0.01). There was no significant difference between the two groups in the number of comorbidities, interventions or amputations.
The mean LoS after medically fit for discharge was reduced but was not statistically significant (9d vs 11.7d p=.0.19).

Conclusion

The selective input from CoE team targets the highest risk group for optimisation. It had a positive impact on the overall care with a reduction in referrals to other specialties and reduced LoS.

SVNO3

Comparing the role of the advanced vascular nurse in three countries: a descriptive survey

Vascular Nurse Specialist Tuong Vi Le-magowan[1]
[1]*St Georges Hospital Nhs Foundation Trust, London, UK*

Introduction
To describe and compare the role of the advanced vascular nurse in three different countries US, UK, and Sweden.

Methods
A small-scale descriptive study was carried out using a questionnaire. A convenience sample of vascular nurses was recruited from among those attending a vascular nursing conference from the US and Sweden. In the UK, members of the SVN (UK) were recruited via postal questionnaires.

Results
Of the 316 questionnaires disseminated, 123 were returned yielding a 39% response rate. 96% of the nurses in the sample were female. Over 75% of the sample were in their 40's and 35% were 50 years or older. 52% were educated at the post-graduate degree level and 11% who attained a doctoral degree. Only the American and Swedish nurses reported attaining a PhD. Most of the vascular nurses in the three countries surveyed have taken the vascular course (60%) and other popular courses included assessment skills, tissue viability and prescribing. The majority of the vascular nurses ranked PVD as their number one patient group caseload.

Conclusions
It is encouraging from the findings of this survey that nurses from the UK, US, and Sweden share many similarities than differences in their advanced vascular nursing role.

SVNO4

Provision of Vascular Out Patient Services: Responding to the challenges of Covid-19.

Mrs. Wendy Hayes[1], Mrs Emily Packer[1]
[1]*Worcestershire Royal Hospitals NHS Trust, Worcester, England*

Background: The Covid-19 pandemic has had far reaching consequences for many services. This presentation details the challenges faced in the safe provision of out- patient services for vascular patients within our Trust.
Aim. The aim of our multi-disciplinary team was that we should continue to provide a safe and responsive service to our patients while recognizing and mitigating risk to both patients and staff.
Method: A multi -disciplinary team approach to service design and provision, in keeping with national guidelines and Trust policy. Our presentation will reflect the planning and implementation of changes to our normal practice and the challenges that we encountered.
Results: Implementing changes to established practice resulted in both positive and negative outcomes. Team working, Information technology support, and a willingness to adapt were vital to enable provision of service.
Conclusion: We continue to adapt and respond to ongoing changes in both local and national directives. To date our results indicate that while we continue to plan and deliver our services in a time of great uncertainty we can demonstrate benefits for our patients and our organisation as a whole. Going forward, we will incorporate the lessons that we have learned into our working practices.

SVT Oral Abstracts

SVTO1

A retrospective study investigating the relationship between venous pathophysiology and venous stent outcome.

Lydia Eberhardt[1], Dr Nicholas Thomas[1], Mr Prakash Saha[1], Mr Stephen Black[1], Dr Soundrie Padayachee[1]
[1]*Guy's & St Thomas' NHS Foundation Trust, London, United Kingdom*

Chronic venous disease significantly reduces quality of life for millions of people worldwide. Venous stents are a relatively new intervention, and whilst most studies report high patency rates and considerable improvement of symptoms, it is not fully understood why stent failure occurs in many cases despite anticoagulation therapy. Patient-based physiological factors, such as coagulopathy, inflow DVT and venous reflux, are likely to have an impact on stent outcome, however, there is a paucity of studies investigating the relationship between venous physiology and stent patency.
This retrospective study will assess a cohort of patients treated at the Trust between 2018-19 with iliac vein stents. Measurements of venous reflux and thrombus load obtained from duplex investigations performed pre-operatively, and at 6- and 12-months post-intervention will be compared within different patient groups, and duplex data, patient presentation, and risk factors will be compared to long-term stent patency and clinical outcome.
It is anticipated that this study will help further understanding of the relationship between venous pathophysiology and stent outcome. In addition, the findings may aid in the development and improvement of current surveillance protocols, and identify whether other measurements (e.g., volume in-flow), could be beneficial in evaluating venous pathophysiology.

SVTO2

Patients with an upper-limb arteriovenous fistula may be more likely to experience symptomatic steal due to inadequate palmar arch collateral circulation in the hand.

Mr Matthew Gawel[1]
[1]*Gloucestershire Hospitals NHS Foundation Trust, , England*

Symptomatic steal (SS) following arteriovenous access (AVF) formation affects 10% of patients, reducing the quality of life due to hypoperfusion-related symptoms. A contributing factor in SS aetiology may be the variation in palmar arch collateral circulation (PACC). This study aims to identify differences in symptomatology between AVF-types, to uncover whether radial artery (RA) steal waveforms are associated with SS, and to illuminate whether adequate-PACC prevents severe SS.

Fifteen participants had SS assessed by questionnaire, exploring the intensity and duration of cold sensations, pain, altered sensibility, diminished strength, and cramps. PACC was determined using Duplex ultrasound dynamic test, where changes in blood velocity were observed in the RA following occlusion of a proximal-RA segment.

Participants with brachiocephalic-AVFs (BC-AVFs) and elbow-graft-AVFs (EG-AVFs) exhibited higher SS-scores (135±39SEM) in comparison to those with radiocephalic-AVFs (RC-AVFs) (72±30SEM). There was no difference between RA waveforms and SS-score. Patients with adequate-PACC had lower SS-scores (83±23SEM) in comparison to those with inadequate-PACC (222±70SEM). No differences were significant.

Worse SS was seen in proximal-AVFs in comparison to distal-AVFs. Retrograde RA waveforms did not correlate with severe SS, while monophasic-antegrade waveforms may. Adequate-PACC may protect against severe SS. However, results should be interpreted with caution due to low sample size.

SVTO3

An Evaluation of The Appropriateness of Transient Ischemic Attack (TIA) Referrals for Carotid Duplex Scans

Miss Carly Kingdon[1]
[1]*Portsmouth Hospitals NHS Trust, Portsmouth, England*

A transient ischemic attack (TIA) is a temporary blockage of blood to the brain, which is often proceeded by stroke. Around 11.5% of ischemic strokes are caused by carotid artery disease. NICE guidelines recommend that all patients with TIA that, after specialist assessment, are deemed fit for carotid endarterectomy (CEA), should receive urgent carotid imaging. This is usually of no value in the management of posterior circulation TIAs, however, so should only be performed for anterior circulation TIAs. Between 31-55% of patients diagnosed with TIA, by non-stroke specialist physicians, have not had a TIA. Therefore, to accurately diagnose TIA, patients should be assessed by a specialist stroke physician. An appropriate TIA referral is therefore a TIA of the anterior circulation in a patient fit for CEA, that has been diagnosed by a stroke consultant. Patients that are unfit for CEA, that have posterior circulation TIAs and that have been diagnosed by non-stroke physicians are inappropriate referrals. In our hospital we suspect that many carotid duplex referrals are inappropriate. The purpose of this study was to find out how many inappropriate carotid duplex TIA referrals we receive and to investigate what effect this potentially has on routine arterial duplex waiting times.

SVTO4

Can a novel in-house string-phantom be a viable alternative to a commercial string-phantom for Doppler velocity measurements for routine quality assurance of Duplex Ultrasound Machines in the Vascular Studies Unit?

Miss Aleksandra Kraska[1]

[1]*Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom*

String-phantoms can be used in quality assurance (QA) programmes to test the accuracy of blood flow velocity measurements made using Doppler ultrasound. However, commercial string-phantoms (CSP) are not widely used, partly due to high cost. This study aimed to assess the suitability of a newly developed novel in-house string-phantom (NSP) for use as an alternative to a CSP for a local QA.

The NSP was designed and built to include novel solutions(Fig.1). Velocities in a range of 30-150 cm/s were produced by both phantoms and detected by the same ultrasound system under consistent conditions. Velocity measurements were obtained and maximum velocity accuracy (MVA) and intrinsic spectral broadening (ISB) were calculated before differences and agreements between measurements were statistically analysed.

Significant differences ($p<0.001$) were found when comparing measured velocities between the two phantoms. However, there was no difference between the detected mean velocity and string velocity of the NSP ($p=0.980$). Limits of agreement between commercial and novel phantom were -4.48% and 3.09% for MVA and -2.62% and 0.91% for ISB comparison.

Differences found between phantoms could be attributed to discrepancies in generated velocity values and the novel self-calibration system. With some technical improvement the NSP shows promise for local QA programme.

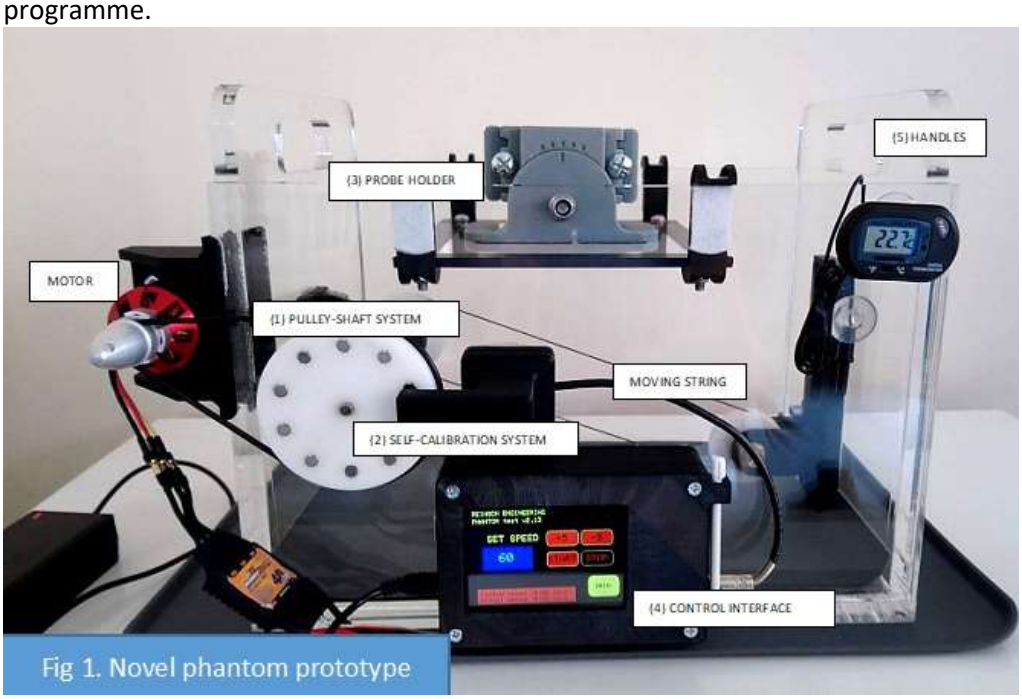


Fig 1. Novel phantom prototype

SVTO5

Rationalising scanning intervals for patients enrolled in aortic aneurysm surveillance programs

Mr Dennis Lui[1], Mr Idowu Adeoye[1], Ms Nung Rudarakanchana[1], Mr Kamran Modaresi[1]
[1]*West London Vascular and Interventional Centre, London North West University Hospitals Nhs Trust, Harrow, UK*

Abdominal aortic aneurysm surveillance is performed at pre-defined intervals in line with national guidelines. The optimal scanning interval for small infra-renal aneurysms is unclear. We aim to assess the risk of adverse aneurysm-related events in patients in our aneurysm surveillance program.
We analysed a prospectively-maintained database of abdominal aortic aneurysm patients enrolled in our local surveillance program. Patient demographics, dates of scans, and mortality data including cause of death were extracted from electronic patient records. We also recorded data on any patients who were subsequently removed from surveillance.
530 patients (88 female) were enrolled into the aneurysm surveillance program (median follow up 20.3 months). 75 patients died, and of those, 2 patients (0.4%) died from a ruptured aneurysm. Size category of aneurysm (3.0-4.5cm, 4.5-5.5cm) was not associated with death (chi-squared=0.35, p=0.55). Malignancy was the most common cause of death (20 patients, 27%), and 12 patients died in the community. 65 patients were subsequently removed from surveillance (50% no longer candidate for surgery, 12% patient choice).
Small aneurysms confer a small risk of aneurysm-related mortality and the majority of patients in surveillance die from other causes. Data from other surveillance programs may help determine the ideal intervals for repeating surveillance scans.

SVTO7

Axial nature of profuda femoris vein and its implication for sonographic practice. A single centre experience and systematic literature review.

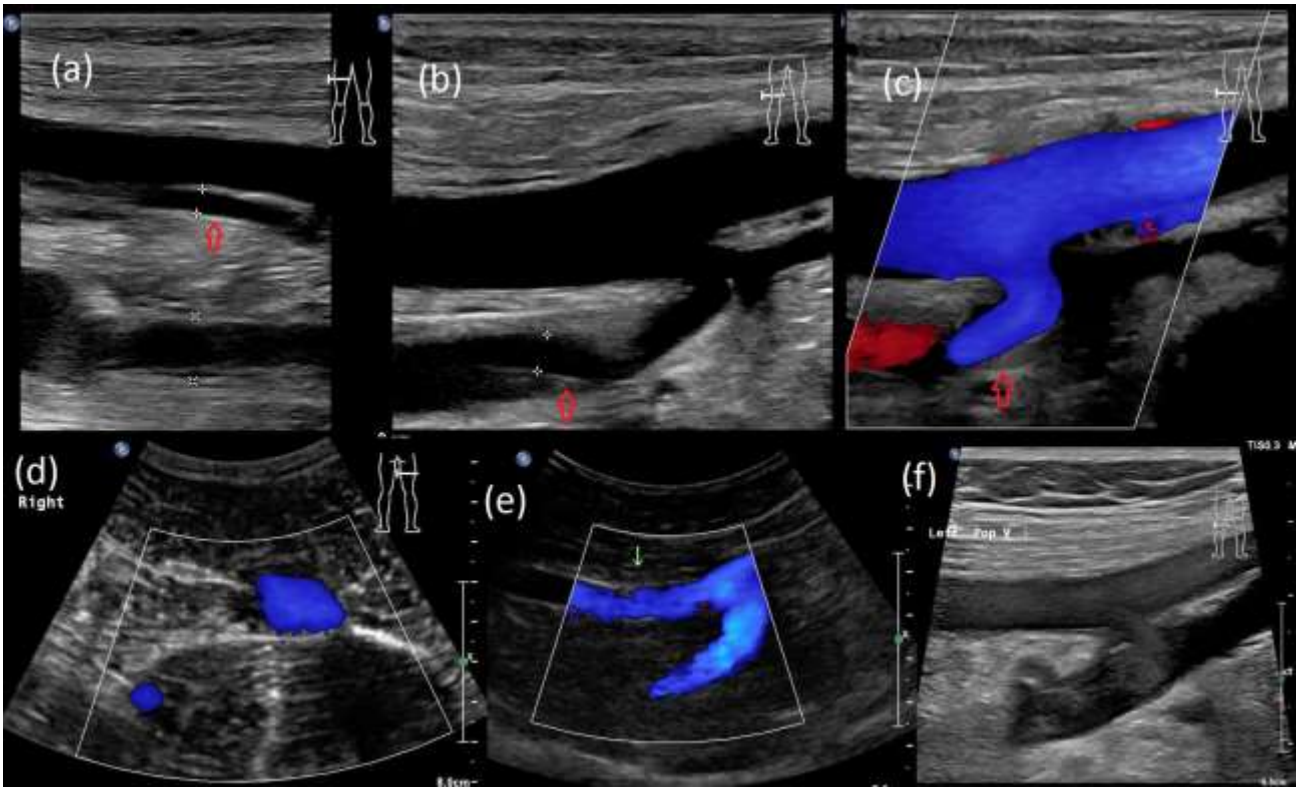
Mr Vladimir Skulbedov[1]

[1]*Guy`s and St Thomas` NHS Trust, London, UK*

The profunda femoris vein (PFV) can form a direct outflow channel connecting popliteal vein with the common femoral vein which present either as a developmental anatomical variant in case of incomplete involution of the embryonic axial vein or as a result of axial transformation in the presence of post-thrombotic obstruction of femoral vein. Identification of the correct venous anatomy is important for management of patient with deep vein thrombosis, chronic venous insufficiency and deep vein harvesting for bypass. Emerging evidence suggests higher cumulative patency rates of iliac stents in cases when PFV constitutes an axial vessel providing improved inflow. Little or no evidence exists on identification of PFV with ultrasound.

A systematic literature review was performed to identify articles related to axial PFV transformation and profundo-popliteal communication. Of the five studies selected, two were retrospective cohort studies providing low level of evidence and three were anatomical dissection studies. A single centre experience on a cohort of 300 symptomatic for DVT patients demonstrated ability of ultrasound to correctly identify axial PFV.

Assessment of PFV should be included in routine examination of symptomatic patients particularly for preoperative assessment for iliac stent placement to better inform on patient management and stratification for intervention.



SVTO8

The effect of using two imaging modalities for imaging head and neck arteries on the TIA pathway.

Ms Isabel Softley[1,2], Mr Christopher Curd[1], Ms Victoria Davies[1], Ms Felicity Woodgate[1]
[1]Royal United Hospital , Bath, Somerset, [2]Newcastle University, Newcastle Upon Tyne, Northumberland

Carotid artery imaging is used to identify significant stenoses that can be surgically removed to reduce the risk of stroke following a TIA. Our vascular network moved from using carotid artery ultrasound (CAU) alone to performing two imaging modalities (CAU plus either CTA or MRA). This study examines the impact of including secondary imaging in the TIA pathway.

This retrospective study identified individuals that had a CAU for a symptomatic significant stenosis between 01/2015 and 12/2019. Those seen before 2017 formed the single carotid imaging (SCI) group whilst those seen after formed the dual carotid imaging (DCI) group. Key dates and treatment decisions (best medical therapy (BMT) or carotid endarterectomy (CEA)) were collected. The NHS19/20 tariff was obtained to calculate an average cost per patient in each group.

Significantly more people with DCI received BMT compared to those with SCI (p=0.021). DCI did not lengthen the time between symptoms and surgery compared to SCI (p=0.403). Average cost per patient was £4139.08 in the SCI group and £3570.84 in the DCI group.

Use of DCI in the TIA pathway may reduce the number of high-risk CEA performed, whilst maintaining a similar time frame and appears cost effective compared to SCI.

Figure 1. *The proportion of patients in each imaging group that received either carotid endarterectomy (CEA) or best medical therapy (BMT). A Pearson Chi Square was used to calculate statistical significance. * denotes p value of <0.05.*

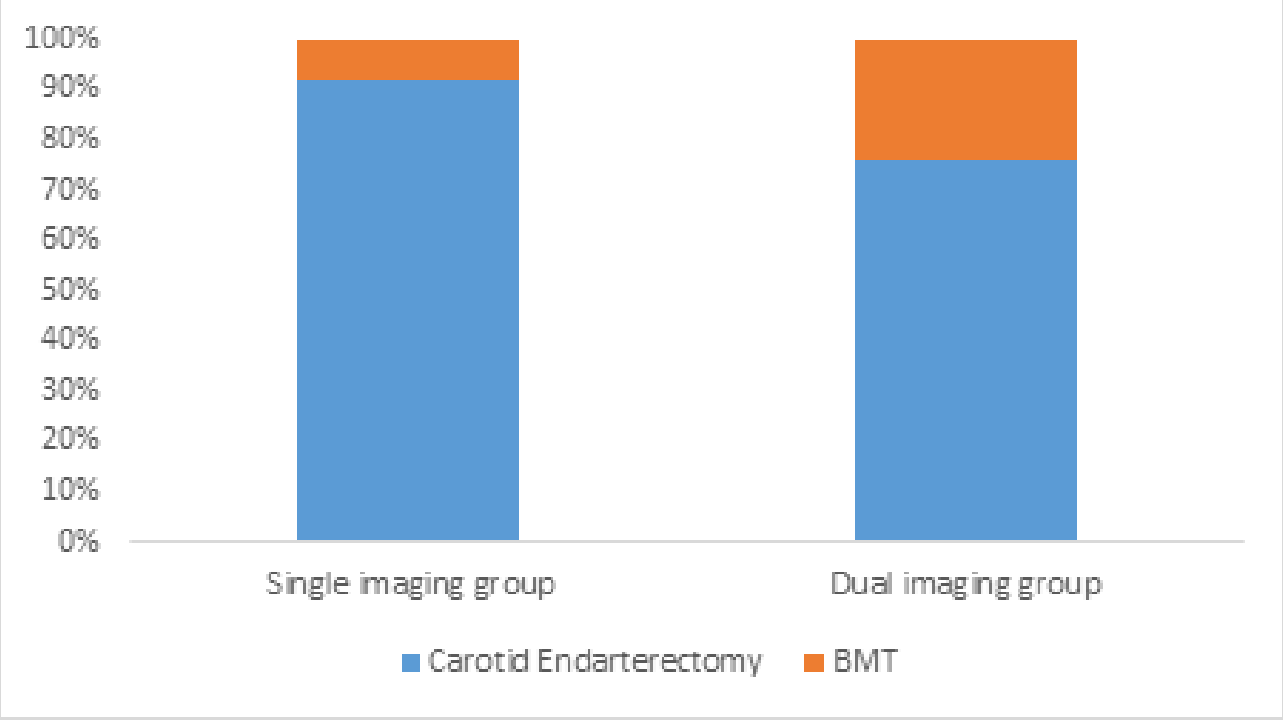
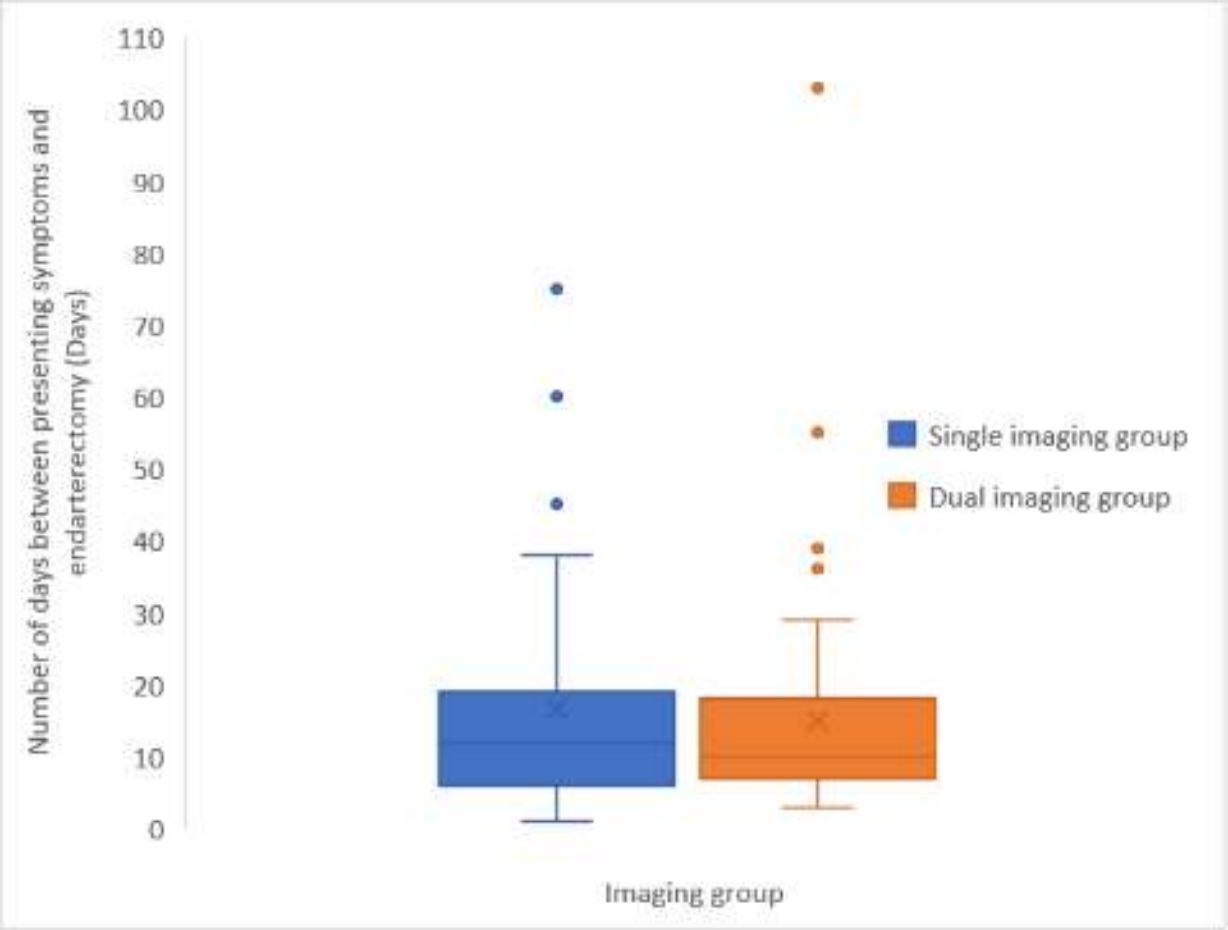


Figure 2. *Time intervals between presenting symptoms and carotid endarterectomy (CEA) in the single and dual imaging groups. No significant difference was found in the number of days from presenting symptoms to carotid endarterectomy between the single carotid imaging and dual carotid imaging groups. There were three high outliers in the single carotid imaging group and four high outliers in the dual carotid imaging group.*



SVTO9

Should iliac veins and veins below the knee be scanned routinely as part of the protocol in ultrasound scanning for deep vein thrombosis diagnosis?

Mr Amine Turay[1]
[1]*Imperial Healthcare Trust, ,*

There is currently a discrepancy between how ultrasound scans should be carried out for deep vein thrombosis (DVT) diagnosis. The national guidelines indicate that only the thigh should be scanned and if a DVT is not present a repeat scan is done a week after the first scan. Whilst the Society of Vascular Technology recommend that as well as the thigh, below the knee should be scanned as part of the initial scan. The Society of Vascular Technology also add that where indicated by the patient's history, referring clinician or clinical findings (i.e. non-phasicity at the groin) the iliac veins should also be scanned. In our department the iliac veins and the veins below the knee are scanned as part of our protocol routinely.

Research has shown that isolated iliac vein DVTs account for 2% of those seen. This suggests that scanning the iliac veins routinely may not be necessary. To establish whether this is the case reports for DVT scans carried out from 1st April 2019 – 31st March 2020 will be manually reviewed. The main aim of this project is to establish whether it is necessary to scan the iliac veins routinely as part of a DVT protocol.

VS Oral Abstracts

O1

Pain management in critical limb ischaemia patients: a clinical audit

Dr Rahul Bagga[1], Dr Genevieve Almond[1], Mr Mohamed Elahwal[1], Mr Mario Caruana[1]
[1]*Department of Vascular Surgery, Brighton and Sussex University Hospitals NHS Trust, Brighton, UK*

Introduction

Critical limb ischaemia (CLI) patients often present with rest pain. Uncontrolled pain can impact on quality of life and complicate definitive treatment. To improve pain control, a set of trust-wide guidelines were developed to standardise pain management for CLI patients.

Methods

Drug charts were retrospectively reviewed for all patients admitted with CLI between 26/05/20 and 26/06/20 to the vascular surgery ward at a tertiary centre. Analgesia prescribed on admission was then compared to the guideline's recommendations.

Results

30 patients were included. 100% of patients were prescribed analgesia. 86% of patients had their regular analgesia prescribed on admission. 77% of patients had regular paracetamol prescribed. 3% of patients were prescribed appropriate doses of PRN opiates and 30% had appropriate gabapentin regimes. Subgroup analysis demonstrated those with normal renal function tended to be under prescribed opiates, and those with poor renal function often were overprescribed opiates.

Recommendations

Prescribing in pain control can be improved. The vascular clerking proforma has been amended to include a clear opiate dosing reference table. Further proposed interventions include an education session for vascular junior doctors and working with the acute pain team to devise a pain management education board. Re-auditing is planned for one month post-intervention.

O2

The need for improving Operating room efficiency is even greater now.

Mr Joseph Jankinson[1], Ms Laura Leeves[1], Ms Elizabeth Faulkner[1], Ms Lily Liu[1], Mr Raghvinder Gambhir[1]
[1]*King's College Hospital, London, United Kingdom*

Introduction

Post Covid -19 there will be a huge pressure on the NHS to get the backlog cleared and yet prior to the pandemic theatre utilisation was sub-optimal.

Methods

Theatre efficiency was measured in terms of Theatre utilisation, First case delay starts (FCDS) and Turn-around times (TAT) between cases from retrospective data for 120 days for vascular theatres. A quality improvement project (QIP) mapped processes, conducted structured interviews and implemented a group email system that pre-warned of any last-minute changes to the list.

Results

2 months after the QIP, Theatre utilisation was up to 86% (above the trust target of 85%) and better than NHS benchmarking data. FCDS improved to 84.2% from 98%, cancellations reduced by 40% and TAT decreased by 23 minutes. Preventable causes of delay identified from staff questionnaire and interview were lack of porter availability, inadequate patient preparation by the ward and last minute changes to theatre lists. There was a mis-match between electronic reporting definitions and clinical practice for FCDS.

Conclusion

Theatres are expensive resources yet are not utilised to capacity. Affordable and sustainable improvements are possible if there is stakeholder buy-in.

O3

Feedback in high-level sport- what lessons can be learned for the training of endovascular operating teams?

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Introduction
We postulated that feedback mechanisms used in high-level sports coaching might be usefully translated to create a purpose-built feedback framework for training endovascular operating teams.

Methods
Key themes were extracted from a systematic literature review on feedback in surgical training which informed the design of a structured qualitative written interview. This was distributed to a group of national team and semi-professional athletes and coaches. A medical multi-professional training collaborative conducted a live thematic analysis of responses via a deductive approach using Kirkpatrick's model of evaluation as an initial pre-defined coding framework. An iterative approach was adopted to identify emerging themes.

Results
We analysed 15 responses from 10 athletes and 5 coaches in 10 different sports. The endpoint was a thematic map outlining four over-arching themes: the environment, providers, nature and recipients of feedback, expanded into nine subthemes. Novel insights for surgical team training include the adoption of functional feedback units, developing resilience and the use of intra-situational feedback.

Conclusion
Based on the novel themes extracted we have designed a practical feedback framework for the training of surgical teams. Our future work will aim to validate this framework and demonstrate its efficacy in training high-performing endovascular operating teams.

O4

Enhancing your recovery: a mobile application for patients undergoing vascular surgery.

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Aim
With increasing demands on the healthcare system, a central (and currently essential) push for remote consultations, and an increasing number of co morbidities in the surgical population, the aim was to create an application that placed the focus on pre-hospital optimisation, education and autonomy – addressing these sector trends to enhance outcomes for patients and ease the burden on healthcare settings.

Methods
After obtaining baseline data, I worked alongside students from the Queensland University of Technology to produce an application suitable for both iOS and android platforms.

Results
The application has four facets which mirror a patient's journey from their initial outpatient appointment through to recovery. The application is easy to use, free to download and readily accessible. On opening the application, the user can select their planned operation and navigate along a personalised decision tree.

Conclusion
The application has been designed to educate and empower a patient to become an active participant in their care, leading to long-term changes in healthcare. Assessment is ongoing but early indications suggest that this will be a valuable tool in optimising outcomes for patients undergoing vascular surgery – leading to fewer post-operative complications and earlier restoration of functional status.

Metro North Hospital and Health Service *Putting people first*

Enhancing Your Recovery

- Before Your Operation
- The Day Of
- My Recovery
- Returning Home
- Glossary
- Contact Us
- Change Operation

O5

A Univariate Analysis to Assess Factors that Affect Fistula Patency Rates

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Introduction
Our unit uses specific size criteria for arteriovenous fistula creation (vessels >2mm in size). We aimed to establish our fistula patency rates.

Methods
Consecutive patients undergoing radiocephalic or brachiocephalic fistula creation between 2016-2018 were analysed. Preoperative arterial and venous diameter was collected. A univariate analysis assessed the effect of variables on 6-week and 6-month patency.

Results
94 radiocephalic and 101 brachiocephalic fistulas were created. Median artery and vein size was; radiocephalic 2.7mm (range 1.6-4.5mm) and 3.0mm (1.6-5.0mm) respectively; brachiocephalic, 4.6mm (2.7-12mm) and 4.3mm (1.9-8.8mm).

Overall six-week and six-month patency for radiocephalic was 92.0% and 72.5% respectively; for brachiocephalic was 92.1% and 80.2%.

On univariate analysis; for both groups, vein size was a significant predictor of maturity at 6-weeks, with larger veins more likely to lead to maturity (p=0.025 radiocephalic, p=0.007 brachiocephalic). Artery size was not predictive in either group (p=0.1 radiocephalic, p=0.5 brachiocephalic). Neither artery nor vein diameter were predictive for maturity at 6-months (veins p=0.101 radiocephalic, p=0.100 brachiocephalic; arteries p=0.403 radiocephalic, p=0.127 brachiocephalic).

Conclusion
We have demonstrated excellent early patency rates using a policy of strict vessel selection. Future work to assess whether there would be more functioning radiocephalic fistulas if smaller diameter vessels are used, is needed.

O6

A 3-year single-centre study assessing outcomes in vascular surgery patients undergoing lower limb fasciotomies for acute compartment syndrome

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Introduction
Acute compartment syndrome (ACS) is a surgical emergency. Delayed diagnosis and fasciotomy can result in irreversible muscle necrosis, permanent disability and major amputation. This study compared patient outcomes following early fasciotomy (within 6 hours of diagnosis) to delayed fasciotomy (after 6 hours) and investigated reasons for delayed diagnosis and treatment of ACS.

Methods
Lower-limb fasciotomy patients from a single vascular centre (January 2017 - June 2020) were reviewed using electronic records. The main outcomes included muscle debridement, foot drop, neuropathic pain, amputation and death. Caldecott approval was obtained.

Results
Fifty-four patients underwent fasciotomies with 27(50.0%) alongside an embolectomy. Pain and pulselessness were recorded in 42(77.8%) and 23(42.6%) patients respectively. Thirty-eight (70.4%) patients were diagnosed within 1 hour of vascular surgery review. However, 20(37.0%) patients underwent fasciotomy more than 6 hours following diagnosis leading to more muscle debridement (30.0%), vacuum-assisted dressing (30.0%) and amputation (35.0%). Diagnostic delay occurred mainly due to 7 patients presenting with fewer characteristic signs and symptoms. Delay in fasciotomy occurred mainly due to lack of theatre slots.

Conclusion
Clinicians awaiting onset of all characteristic signs and symptoms of ACS may risk diagnostic and therapeutic delays. Early communication with emergency theatres is vital to facilitate timely fasciotomies.

Table 1. Cohort demographics for fasciotomy patients

Characteristic	**n (%)**
Gender	
Male	39 (72.2)
Female	15 (27.8)
Age (years)	
<50	7 (13.0)
50-64	16 (29.6)
65-79	22 (40.7)
>80	9 (16.7)
Side of fasciotomy	
Left	29 (53.7)
Right	17 (31.5)
Bilateral	8 (14.8)

Procedure	
Embolectomy and 4 compartment calf fasciotomy	27 (50.0)
Bypass and 4-compartment calf fasciotomy	14 (25.9)
4-compartment calf fasciotomy only	12 (22.2)
Buttock fasciotomy only	1 (1.9)
Indication for fasciotomy	
Thromboembolism	41(75.9)
Trauma	3 (5.6)
Bleeding	3 (5.6)
Ruptured AAA	2 (3.7)
Long lie	2 (3.7)
Post-embolectomy	2 (3.7)
Post-bypass	1 (1.9)
Signs/symptoms recorded	
severe pain	42 (77.8)
pulselessness	23 (42.6)
paraesthesia	20 (37.0)
paralysis	18 (33.3)
cold	16 (29.6)
pallor	10 (18.5)
muscle tightness	3 (5.6)
Time from vascular review to diagnosis	
<1 hour	38 (70.4)
1-6 hours	5 (9.3)
6-12 hours	5 (9.3)
12-24 hours	6 (11.1)
Time from diagnosis of C.S to fasciotomy	
<=6 hours	34 (63.0)
>6 hours	20 (37.0)

Table 2. Comparison of outcomes for patients undergoing early (within 6 hours) and delayed fasciotomy (greater than 6 hours) following ACS diagnosis

Variable	Fasciotomy in <=6 hours, n (%)	Fasciotomy in >6 hours, n (%)
Total no. of patients	34 (63.0)	20 (37.0)
Creatine kinase level measured at diagnosis (normal 30-300 U/L)	15	9
<1000	4 (26.7)	2 (22.2)
1000-4999	6 (40.0)	2 (22.2)
5000-9999	1 (6.7)	1 (11.1)
>10000	4 (26.7)	4 (44.4)
Creatinine level measured at diagnosis	30	19

(normal 60-110 µm/l)		
<100	15 (50.0)	13 (68.4)
100-199	12 (40.0)	4 (21.1)
>200	3 (10.0)	2 (10.5)
GA wound inspection	16 (47.0)	7 (35.0)
<14 days post op	13 (38.2)	7 (35.0)
14-30 days post op	3 (8.8)	0 (0.0)
Muscle debridement	7 (20.6)	6 (30.0)
Loss of anterior compartment	1 (2.9)	3 (15.0)
Foot drop	0 (0.0)	1 (5.0)
Wound infection	2 (5.9)	1 (5.0)
Haematoma	3 (8.8)	1 (5.0)
Primary skin closure	9 (26.5)	4 (20.0)
Vacuum dressing	7 (20.6)	6 (30.0)
Split skin graft	7 (20.6)	3 (15.0)
Neuropathic pain	8 (23.5)	5 (25.0)
Amputation	3 (8.8)	7 (35.0)
<=30 days	3 (8.8)	6 (30.0)
>30 days	0 (0.0)	1 (5.0)
Death	13 (38.2)	6 (30.0)
<=30 days	9 (26.5)	3 (15.0)
>30 days	4 (11.7)	3 (15.0)

Table 3. Reasons for delay in diagnosis of acute compartment syndrome (ACS) and fasciotomy

Time point	Reasons for delay	No. of patients, (%)
Time from vascular review to diagnosis of ACS		11
6-12 hours	Leg being observed post-bypass for improvement	1 (9.1)
	Leg being observed post- ruptured AAA repair	1 (9.1)
	Leg painful and cool only	1 (9.1)
	Leg painful only	1 (9.1)
	Not stated	1 (9.1)
12-24 hours	Leg painful only	3 (27.3)
	Leg feeling swollen only	1 (9.1)
	Leg cool only	1 (9.1)
	Leg being observed post-revascularisation	1 (9.1)

Time from diagnosis of ACS to fasciotomy		20
>6 hours	Awaiting theatre slot	8 (40.0)
	Awaiting imaging	1 (5.0)
	Awaiting cardiology review following MI	1 (5.0)
	Reduced leg sensation only	1 (5.0)
	Too unwell for general anaesthetic	1 (5.0)
	Not stated	8 (40.0)

O7

Cost analysis of vascular admissions in the intravenous drug user population

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Intravenous drug users (IVDU) often present with complex clinical, psychiatric and social needs which pose a challenge for the vascular surgeon. This is likely to cause a disproportionate financial strain when compared to non-IVDU patients of a similar cohort. South Wales has one of the highest death rates relating to drug use.

We utilised our Vascular Sharepoint database to capture all IVDU patients admitted between August 2018 and May 2019. Data was subsequently gathered on various parameters including length of stay and management received. Cost estimates were recovered from the health board's financial department by utilising theatre system coding.

27 IVDU patients were admitted in this time period. 8 were female and 19 were male. 4 patients were admitted on 2 or more separate occasions. Average length of stay was 15.9 days (1-112). The total cost of treatment was £551,948 (£1,600-£108,296). Average cost of treatment was £20,442.52. Treatments offered were conservative management with antibiotics, ligation of artery, above knee amputation, drainage of abscess, ligation of vein, skin debridement, hip disarticulation and groin exploration.

Cost analysis of admissions not only facilitates service design but also prompts consideration of further investment in local harm reduction and prevention interventions.

O8

Rationalising scanning intervals for patients enrolled in aortic aneurysm surveillance programs

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Abdominal aortic aneurysm surveillance is performed at pre-defined intervals in line with national guidelines. The optimal scanning interval for small infra-renal aneurysms is unclear. We aim to assess the risk of adverse aneurysm-related events in patients in our aneurysm surveillance program.
We analysed a prospectively-maintained database of abdominal aortic aneurysm patients enrolled in our local surveillance program. Patient demographics, dates of scans, and mortality data including cause of death were extracted from electronic patient records. We also recorded data on any patients who were subsequently removed from surveillance.
530 patients (88 female) were enrolled into the aneurysm surveillance program (median follow up 20.3 months). 75 patients died, and of those, 2 patients (0.4%) died from a ruptured aneurysm. Size category of aneurysm (3.0-4.5cm, 4.5-5.5cm) was not associated with death (chi-squared=0.35, p=0.55). Malignancy was the most common cause of death (20 patients, 27%), and 12 patients died in the community. 65 patients were subsequently removed from surveillance (50% no longer candidate for surgery, 12% patient choice).
Small aneurysms confer a small risk of aneurysm-related mortality and the majority of patients in surveillance die from other causes. Data from other surveillance programs may help determine the ideal intervals for repeating surveillance scans.

O9

Referral patterns for catheter-directed thrombolysis for iliofemoral deep venous thrombosis

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Objectives
Post thrombotic syndrome (PTS) occurs more frequently and severely following iliofemoral deep vein thrombosis (IFDVT), compared to distal DVT. Catheter directed thrombolysis (CDT) of iliofemoral DVTs may reduce PTS incidence and severity.
We aimed to determine the rate of IFDVT within our institution, their subsequent referral and management, and compliance with NICE guidelines.

Methods
Retrospective review of DVTs was conducted over a 3-year period. Cases and details of IFDVTs were identified using ICD-10 codes, patient notes, and radiology reports. NICE guidance was applied to determine patients suitable for CDT. A survey was conducted to identify clinician awareness of CDT and DVT management guidelines.

Results
96 patients with IFDVT were identified. The median age was 77. 21 patients were deemed eligible for CDT. Only 3 patients were referred to vascular services, and 2 received thrombolysis. The clinician survey results demonstrated a clear knowledge deficiency regarding the correct management for iliofemoral DVT.

Conclusion
CDT has been shown to improve outcomes of patients post-IFDVT, however a lack of awareness regarding CDT as a management option results in under-referral to vascular services. We suggest closer relations between vascular services and their “tributary” DVT clinics, and robust care pathways to improve iliofemoral DVT management.

O10

Vascular prosthetic graft infections – are bio-absorbable antibiotic impregnated beads a treatment option in selected group of patients?

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Objectives: This report details our experience with selective use of bio-absorbable antibiotic impregnated beads as a part of an overall management strategy in vascular graft infections (VGIs).
Methods: A retrospective review of patients who had bio-absorbable calcium sulphate beads impregnated with antibiotics implanted during surgical wound debridement for infected prosthetic grafts in a single vascular centre.
Results: Six patients with prosthetic graft infections were treated with bio-absorbable antibiotics impregnated beads from Nov 2018 to March 2020. Grafts included aorto-bifemoral bypass (2 groin infections) and femoro-popliteal bypass (4 infection sites: 2 at the proximal anastomosis and 2 at the distal anastomosis). One case was Samson 2 (16.7%), 3 cases were Samson 3 (50%) and 2 cases were Samson 4 (33.3%). Pathogens included Gram positive bacteria in 2 cases (33.3%), Gram negative in 2 cases (33.3%), both strain in one case (16.7%) and candida in a single case (16.7%), respectively. Mean time to wound healing was 110 days (SD +/-80.9). Graft patency was preserved in 4 cases (66.7%), 2 grafts occluded (33.3%) and patients required major amputation.
Conclusions: This report demonstrates that antibiotic impregnated bio-absorbable beads can be used as an adjunct to treatment of VGIs in selected patients.

O11

Lymphoscintigraphy unmasks contralateral Latent Lymphoedema.

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Introduction
The diagnosis of lymphoedema is often one of exclusion and lymphoscintigraphy is considered the gold standard diagnostic modality.
Methods
A retrospective analysis of all patients who underwent lymphoscintigraphy for the period 2017 to 2019 was undertaken. Tracer uptake of less than 8% at 2 hours is diagnostic. The main outcome measures were clinical correlation and unmasking of latent contralateral disease.
Results
A total of 85 patients had lymphoscintigraphy. Mean age 53-years, M:F ratio 1:2 and average BMI 38 Kg/m². Limbs affected: Lower limbs bilaterally 62%, unilaterally 33% and 5% in the upper limb. Of these 10% had venous incompetence. An uptake of less than 8% observed in 56% of cases, in the ipsilateral symptomatic limb for unilateral symptoms and bilateral limbs for bilateral symptoms (correct correlation with the side). Greater than 8% uptake was seen in 33% of patients. For patients presenting with bilateral symptoms 11% of cases had greater than 8% uptake in any one limb. Patients who presented with unilateral symptoms more than 50% demonstrated <8% uptake in the contralateral limb (latent lymphedema).
Conclusion
A discrepancy exists between clinical severity and tracer uptake on lymphoscintigraphy, but it is useful in detecting latent contralateral lymphoedema.

O12

A comparison of international guidelines examining recommendations for antithrombotic therapy for atherosclerotic peripheral arterial disease

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Introduction
Antithrombotic therapy is an integral component of the management of peripheral arterial disease (PAD). This study examines international guidelines to compare how the evidence for antithrombotic therapy in PAD has translated into recommendations.

Methods
Twelve UK, US and European guidelines are considered. Guidelines have been explored to determine recommendations for asymptomatic and symptomatic patients, and those undergoing revascularisation.

Results
Three guidelines comment on antithrombotic therapy in asymptomatic patients. CHEST guidelines recommend aspirin, ESVS guidelines advise against antithrombotic therapy, and AHA guidelines state antiplatelet therapy might be beneficial if the ankle brachial pressure index is less than 0.9.
Guidelines agree on the need for antiplatelet monotherapy in symptomatic disease, but some specify preference for clopidogrel, others state a preference for aspirin, or have no stated preference.
Following revascularisation, advice regarding the need for and duration of dual antiplatelet therapy is variable. Only ESVS guidelines consider the use of Vitamin K antagonists following autologous vein bypass.

Conclusion
Guideline recommendations pertaining to the use of antithrombotic therapy in peripheral arterial disease are conflicted. High-quality trials and consistent appraisal of evidence are required to define optimal antithrombotic regimens for patients that take account of their comorbidities, risk, disease and need for intervention.

O13

Are medical students prepared for clinical placements in vascular surgery?

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Introduction
Medical students have limited teaching in vascular surgery, which can lead to apprehension prior to surgical placements. Our aim was to assess how prepared 3rd year medical students felt preceding their vascular surgery placements, and identify methods to support learning.

Methods
An online quantitative questionnaire was sent to all 3rd year medical students at a single university before starting surgical placements. This ascertained preparedness, confidence in history-taking, examination and knowledge specific to vascular surgery. We also asked what format information could be provided in to improve knowledge prior to placement.

Results
39 medical students completed the questionnaire (response rate 54.2%). 69.2% (n=27) did not feel prepared. The most common answers showed students possess poor or very poor knowledge on the topics: surgical management (84.6%), medical management (56.4%) and investigations (53.9%). A workbook was the format of choice as a learning aid (64.1%).

Conclusion
This study shows the majority of medical students perceive they lack adequate knowledge on vascular surgery, prior to placement. Development of a workbook as a learning resource may support students and make them feel more prepared.

O14

Diabetes management in major limb amputees – lest we forget

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Introduction
Persistent hyperglycaemia in patients with a previous major lower limb amputation (LLA) is associated with higher incidence of contralateral limb loss. Therefore, careful diabetic management is prudent. This study aimed to determine baseline and initiate quality improvement in diabetes management of patients undergoing LLA.

Methods
Consecutive patients undergoing major LLA over a 3-month period before (February-April 2019) and after (January-March 2020) quality improvement initiatives were implemented were enrolled. Standards for glycaemic control and monitoring were derived from JBDS guidelines, NCEPOD 2014 report and Vascular Society recommendations. Interventions included diabetes teaching during induction for new junior doctors, multidisciplinary teaching at the local audit meeting and dissemination of an educational poster.

Results
15 patients underwent LLA between February-April 2019 and 13 patients between January-March 2020. Following implementation of the interventions, satisfactory diabetes control improved significantly from 61% to 81% ($p<0.05$), but satisfactory diabetes monitoring remained static from 95% to 94%. Specialist reviews were made for 77% of patients at any time during the admission in the second cycle, as compared to 73% in the first cycle ($p>0.05$).

Conclusion
Diabetes management in this high-risk cohort has previously been sub-optimal. Regular and sustainable education efforts are required to ensure existing recommendations are upheld.

O15

Ligation alone versus immediate revascularisation for femoral artery pseudoaneurysms secondary to intravascular drug use: a systematic review and meta-analysis

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Femoral artery pseudoaneurysms (FA-PSAs) are a common pathology associated with intravascular drug use (IVDU). The aim was to determine the optimal surgical treatment of IVDU associated FA-PSAs.

A systematic search was undertaken following PRISMA guidelines identifying original studies reporting outcomes of ligation and debridement and/or excision with revascularisation. Outcomes included 30-day mortality, 12-month amputation rate and chronic limb threatening ischaemia (CLTI) at follow-up.

A total of 39 cohort studies describing 1217 femoral artery pseudoaneurysm were included, 993 (81.6%) treated by ligation-debridement and 224 (18.4%) by excision-revascularisation. Incidence of 30-day mortality was 0.8% (n=8) and 0.9% (n=2) in the ligation-debridement and excision-revascularisation groups respectively, with one study reporting mortality in both groups. This meta-analysis found no difference in amputation (8.89% vs 8.03%, OR 0.79, P=0.51, 11 studies) or CLTI (21.5% vs 12.4%, OR 1.59, P=0.16, 9 studies) following ligation and debridement compared with excision and revascularisation. There was a significantly higher incidence of rebleeding (7.1% vs 1.6%, n=16 vs n=16, P<0.01) and reintervention rates (21.9% vs 11.7%, n=49 vs n=116, P<0.01) following excision and revascularisation compared with ligation alone.

This study suggests no difference in mortality, amputation or CLTI between approaches but revascularised patient had significantly higher rebleeding and reintervention rates.

Intervention	**Total cases**	**Primary outcomes**		**Secondary outcomes**		
		Amputation	**Death**	**Rebleeding**	**Reintervention**	**CLTI**
Ligation and debridement	993	66 (6.6%)	8 (0.8%)	16 (1.6%)	116 (11.7%)	177 (17.8%)
Excision and revascularisation	224	14 (6.3%)	2 (0.9%)	16 (7.1%)	49 (21.9%)	17 (7.6%)
Total	1217	76	10	32	165	194

O16

Chronic wound microbiota profiling using long-read DNA sequencing technology

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Our skin is a dynamic ecosystem, supporting diverse microbial communities that are collectively termed the skin microbiota. Chronic non-healing skin wounds are commonly associated with vascular disease, placing a massive therapeutic and financial burden on the healthcare system. Despite this, the role of the cutaneous microbiome in wound healing remains largely unexplored. The aim of this study is to explore the relationship between wound microbiota during normal and delayed healing.

We performed a time course-based analysis of microbial community composition and stability. Total genomic DNA was isolated from swabs of the chronic wound environment. A novel long-read nanopore based DNA sequencing approach provided quantitative species level taxonomic identification, also detailing population-level shifts in antimicrobial resistance gene distribution.

This novel sequencing-based approach was used to analyse the presence of microbial communities in a collection of chronic wound samples. Distinct changes in relative bacterial species/ strain abundance were identified, differing in accordance with allocated wound classification and clinical outcomes.

Long read DNA sequencing technology provides an unprecedented opportunity to deliver detailed characterisation of the chronic wound microbiome. This will open up new opportunities in understanding complex host-microbe interactions, while informing the next generation of treatments for poor wound healing.

O17

Intranodal lymphangiography as a diagnostic and therapeutic tool

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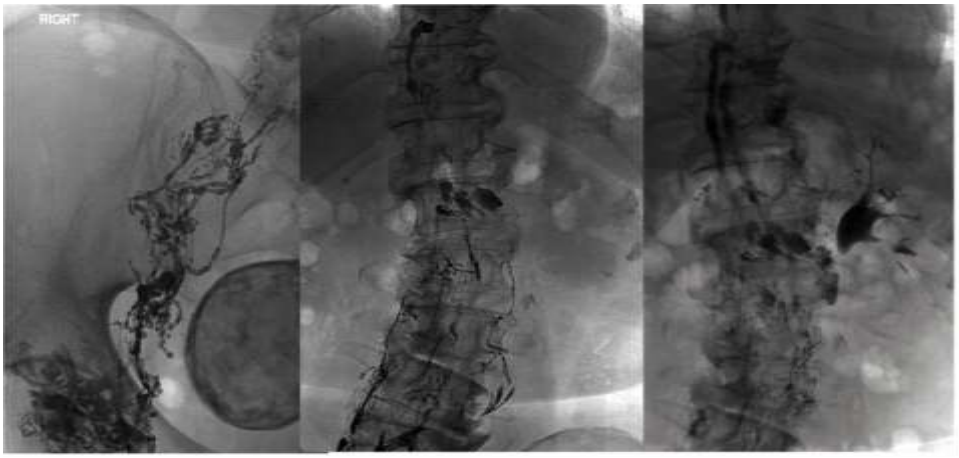
Introduction:
Lymphorrhea is an uncommon condition associated with significant morbidity and mortality.1 It most commonly manifests as chylothorax,2,3 chylous ascites and chyluria.4,5 Intranodal lymphangiography (ILAG) is a recently developed technique where the hilum of inguinal lymph nodes are cannulated and ethiodized poppy-seed oil (Lipiodol) injected. ILAG can both demonstrate lymphatic fistulae and lead to spontaneous healing via a mechanism of localised sclerosis.6

Methods:
Retrospective study of all patients referred with lymphorrhea between 2013-2020 after failure of conservative measures (7 patients identified):

3 thoracic duct injuries post-thoracic/neck surgery; 2 chylous ascites post-abdominal surgery; 2 chyluria. All patients underwent ILAG and 1 who underwent neck surgery also required needle disruption of the cisterna chyli.

Results:
Technical success was observed in all cases
Clinical resolution at median 14 days was seen in 4/7 after 1 ILAG; 1 case required repeat ILAG to achieve clinical success
2 cases had clinical failure (1 died at 4 weeks; 1 awaiting surgical intervention)
Median clinical response 15 weeks (6 weeks- 3years)

Conclusions:
ILAG has high technical-success rates in a) identification of lymphatic fistulae and b) provided rapid therapeutic benefit in the majority of this small cohort of cases.



O18

TARGETING THE LOX-1 SCAVENGER RECEPTOR ATTENUATES ATHEROSCLEROSIS AND NEOINTIMAL HYPERPLASIA IN APO-E NULL TRANSGENIC MICE

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Introduction
The clinical consequences of atherosclerosis and post-procedure neointimal hyperplasia (NIH) represent a significant proportion of the vascular surgeon's workload. Lectin-like oxidized low density lipoprotein receptor-1 (LOX-1) is a class E scavenger receptor expressed in endothelial cells implicated in atherosclerosis and NIH. This study aims to demonstrate the therapeutic potential of LOX-1 targeting using a transgenic mouse model and LOX-1-specific non-antibody synthetic protein scaffolds called affimers.
Method
Apolipoprotein-E (APO-E) null and APO-E/LOX-1 double-null transgenic mice were fed a high cholesterol western diet for 12 weeks. One group of APO-E null mice was treated subcutaneously with LOX-1 affimer. All mice underwent unilateral common femoral artery wire injury at week 8. Mice were culled and tissues harvested for evaluation of atherosclerotic burden and femoral artery NIH. Studies were carried out with Home Office approval.
Result
Compared with APO-E null controls, carotid and femoral bifurcation atherosclerosis ($p<0.05$) and total aortic plaque coverage ($p<0.01$) were significantly reduced in APO-E/LOX-1 double-null mice. Reductions were observed in APO-E null mice treated with LOX-1 affimer, however these were non-significant. Femoral artery NIH was reduced by 16% in APO-E/LOX-1 double null and 11% in LOX-1 affimer treated APO-E null mice compared with untreated APO-E controls, however these reductions were non-significant.
Conclusion
This study demonstrates the therapeutic potential of LOX-1 targeting in large vessel atherosclerotic disease and NIH. Knockout of the LOX-1 transgene produced promising results, while results following LOX-1 affimer therapy were less impressive. Improvements in affimer pharmacokinetics and drug delivery optimisation are avenues for future studies.
Take-home message:
The LOX-1 scavenger receptor is a potential novel therapeutic target in large-vessel atherosclerosis and neointimal hyperplasia.

O19

Genome-wide association analysis and replication in 810,625 individuals identifies novel therapeutic targets for varicose veins

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Introduction :
Varicose veins (VV) impact a third of the UK adult population; 10% of patients develop lipodermatosclerosis and ulceration. VV often requires surgical management, however, there is a high-risk of recurrence. VV is a complex disease, where genetic and non-genetic components contribute to overall phenotypic expression. The genetic architecture of VV is poorly understood; we aimed to uncover its genetic basis.
Method :
We conducted hitherto the largest genome-wide association study of VV. In stage one, using UK Biobank, we compared 22,473 VV patients and 379,183 controls. In stage two, replication and meta-analysis were performed in an independent cohort of 113,041 VV cases and 295,928 controls from 23&Me (California, USA). In-silico analysis was conducted in FUMA, MAGMA, and XGR.
Result:
109 genome-wide significant ($P \leq 5 \times 10^{-8}$) loci were identified in UK Biobank, 45 of which successfully replicated in the 23&Me cohort. Twenty-seven loci have not been previously reported. FUMA positionally-mapped 128 genes at the replicated loci, with 84 having a combined annotation-dependent depletion score (CADD) >12.37, suggesting functional, deleterious variants. MAGMA analysis implicated pathways involved in cardiovascular system development ($P=1.57 \times 10^{-08}$) and tube morphogenesis ($P=9.35 \times 10^{-08}$). Furthermore, XGR revealed enriched pathways in downstream signalling in naive CD8+ T cells (P=0.0017), and encoding structural and core extracellular glycoproteins (both P=0.007).
CONCLUSION:
We identified 45 variants conferring risk of VV, which provide insights into disease biology. Implicated genes are enriched in pathways involved in vascular development, immune cell activity and extracellular matrix function, and provide new targets for therapeutic development.
Take-home message:
Unravelling the genetic architecture of varicose veins may facilitate our understanding of the disease and guide therapeutic approaches.

O20

THE ROLE OF TOURNIQUETS IN TRANSTIBIAL AMPUTATION FOR PERIPHERAL VASCULAR DISEASE: A SYSTEMATIC REVIEW & META-ANALYSIS

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Introduction
The use of lower limb tourniquets is traditionally discouraged in severe atherosclerotic disease. However, blood loss and increased transfusion requirements are associated with post-operative morbidity in patients undergoing major lower limb amputation. The aim of this systematic review is to summarise and pool the available data to determine the impact of tourniquet application when performing trans-tibial amputation for peripheral vascular disease.
Method
This systematic review was conducted according to PRISMA guidelines. A systematic search of Medline, Embase and Cochrane Library was undertaken for articles which compared the use of a tourniquet versus no tourniquet in patients undergoing trans-tibial amputation for peripheral vascular disease. The main outcomes included intra-operative blood loss, post-operative transfusion requirement, need for revision surgery and 30-day mortality.
Result
Four studies met the inclusion criteria for quantitative analysis with a total of 267 patients. A tourniquet was used in 130 patients. Both groups were matched for age, gender, co-morbidities and pre-operative haemoglobin. In patients undergoing trans-tibial amputation, tourniquets were associated with significantly lower intra-operative blood loss (Mean difference= -147.6mls; P=0.03) and lower transfusion requirements (pooled odds ratio (OR), 0.12, p=0.03). The need for stump revision (OR, 0.7; p=0.48), proceeding to transfemoral amputation within 30 days (OR, 0.67; p=0.25) and 30-day mortality (OR, 0.65; p=0.41) all favoured tourniquet use but the differences were not found to be significant.
Conclusion
Tourniquets can reduce intra-operative blood loss and transfusion requirements in patients undergoing trans-tibial amputation without increasing ischaemic complications and need for revision surgery.
Take-home message:
Tourniquets are safe to use in trans-tibial amputation for severe peripheral vascular disease and can reduce intra-operative blood loss without increasing ischaemic complications.

O21

SECONDARY PREVENTION OF CARDIOVASCULAR DISEASE IN PERIPHERAL ARTERY DISEASE PATIENTS

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Introduction
Peripheral artery disease (PAD) is associated with significant cardiovascular morbidity and mortality which can be reduced by the treatment of atherosclerotic risk factors. Recent research demonstrates that novel drugs can significantly enhance PAD outcomes. However, the uptake of these drugs is uncertain. We wished to audit current atherosclerotic management in PAD patients as well as their eligibility for newer drugs - PCSK 9 inhibitors, SGLT2 inhibitors, and DOAC drugs – in accordance with relevant guidelines and trials.
Method
100 PAD inpatients and outpatients seen at a teaching hospital in the UK within the month of March 2019 were assessed. Medications from PAD patients were recorded from hospital records and patient histories were assessed for secondary prevention of cardiovascular disease - lipids, blood pressure, diabetic control, and atherothrombotic prevention.
Result showed that compliance with NICE guidelines had a wide range – from 19% of outpatients on correct lipid control to 89% of inpatients on optimal atherothrombotic management.
Based on the best evidence of eligibility: 0 of 41 eligible patients were taking PCSK9 Inhibitors, 1 out of the 71 was on an SGLT 2 inhibitor and 6 of 98 patients were on Rivaroxaban.
Conclusion
This audit shows adherence to NICE guidelines is variable for secondary prevention of atherosclerosis in PAD patients. Furthermore, very few novel treatments had been prescribed for suitable patients. Overall, prescribing for PAD risk factor management can be significantly improved. A solution could be dedicating risk factor clinics led by nurses, pharmacists or physicians.
Take-home message:
Steps need to be taken to prevent cardiovascular disease in peripheral arterial disease patients. Steps include improvements in the following of guidelines, exploration of novel treatments, and the introduction of special risk factor clinics focused on improving the prognosis of the patients.

O23

Chronic jugular vein stenosis associated with widespread cerebral hypoperfusion and hypoxia in a Multiple Sclerosis cohort.

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Background: Widespread cerebral hypoperfusion in patients with multiple sclerosis (MS) has been extensively reported. Literature has explained this association through elevated levels of vasospastic peptide endothelin-1, with no consideration for the potential role of an impaired venous vasculature. Internal jugular vein (IJV) stenosis and thrombosis has also been extensively reported in patients with MS.
Methods: From February to July 2019, 35 MS patients with IJV stenosis were treated with surgical plastic enlargement of the jugular vein using saphenous or bovine pericardial patch, in an attempt to restore IJV patency. Two sensors in the right and left regions of the frontal lobes were connected to an Invos 5100 system recording intra-procedural Regional Cerebral Tissue Oxygen Saturation (rctSO2). Measurements were carried out at three intervals: pre-clamping, intra-clamping, and declamping of the IJV.
Results: Significant changes in intra-procedural rctSO2 were recorded, associated with the closing and opening of the IJV. Pre-clamping rctSO2 values ranged between 77-82% decreasing to 46-58% ($p<0.05$) intra-clamping. Declamping values returned to 75-79% ($p <0.05$).
Conclusion: The data produced in this preliminary study illustrates that the presence of chronic jugular vein stenosis is associated with widespread cerebral hypoperfusion and hypoxia in patients affected by multiple sclerosis.

O24

Is telemonitoring reliable and effective in supporting community based therapies in the post-COVID-19 era? Wearable activity monitors in home-based exercise therapy for claudicants: a systematic review

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Background: Intermittent claudication (IC) can severely limit functional capacity and quality of life; best medical therapy is supervised exercise. However, the COVID-19 pandemic has caused significant disruption to outpatient services. Therefore, the use of wearable activity monitors (WAM) in home-based exercise has been suggested. This review therefore aims to evaluate the efficacy of WAM as a feedback/monitoring tool in home-based exercise programs for IC patients.

Methods: Databases were searched through to April 2020. Eligible trials had to incorporate WAM as a feedback tool to target walking/exercise behaviour. The primary outcome was the change in walking ability. Study quality was assessed with risk of bias tool.

Results: Eight RCTs and one prospective cohort study comparing a WAM intervention against standard care and/or supervised exercise were included. WAM interventions improved measures of walking ability (i.e. maximal walking distance, claudication distance and six-minute walk), increased daily walking activity (steps/day) and quality of life.

Conclusions: There is evidence that WAM interventions are beneficial for improving outcomes in patients with IC. During and beyond the unavailability of outpatient services, these interventions can improve access to therapy. However, there are limitations in existing studies. Achieving consensus on outcome reporting and study methods is needed.

Study results regarding walking ability

First author (Year)	Outcome measure	Follow-up moment	WAM Intervention		Usual Care			Supervised Exercise Therapy		
			Baseline	Follow-up	Baseline	Follow-up	p-value	Baseline	Follow-up	p-value

Normahani (2018)[27]	MWD (m)	3 months	80 [50-117]	112 [91-210]*				68 [50-70]	80 [50-91]	ns
		6 months		178 [133-270]*					80 [50-91]	0.009
		12 months		147 [131-405]*					68 [51-104]	0.011
	CD (m)	3 months	40 [24-61]	54 [41-88]*				36 [26-41]	36 [26-41]	ns
		6 months		115 [60-162]*					45 [33-85]	0.002
		12 months		110 [57-198]*					45 [33-85]	0.011
Duscha (2018)[21]	PWT (s)	12 weeks	596 (271)	824 (309)*	546 (394)	568 (368)	ns			
	COT (s)	12 weeks	320 (226)	525 (252)*	252 (256)	231 (196)	≤0.05			

McDermott (2018)[20]	6MWT (m)	9 months	330.5 (100.2)	333.4 (115.1)	336.2 (96.6)	348.2 (98.1)	ns			
Gardner (2011)[24]	PWT (s)	12 weeks	402 (285)	526 (374)*	505 (216)	494 (240)	≤0.05	325 (169)	540 (281)*	ns
	COT (s)	12 weeks	204 (137)	337 (250)*	225 (157)	209 (168)	≤0.05	196 (144)	361 (264)*	ns
Gardner (2014)[25]	PWT (s)	12 weeks	380 (274)	490 (350)*	464 (237)	486 (260)	≤0.05	356 (222)	547 (299)*	≤0.05
	COT (s)	12 weeks	195 (171)	300 (242)*	205 (167)	222 (180)	≤0.05	193 (150)	363 (292)*	ns
	6MWT (m)	12 weeks	328 (108)	372 (119)*	376 (73)	380 (81)	≤0.05	326 (94)	341 (87)*	≤0.05
Nicolaï (2010)[22]	MWD (m)	12 months	260 [165-370]	600 [435-1040]*	260 [160-370]	400 [230-490]*	<0.001			

	FCD (m)	12 months	150 [95-245]	460 [295-720]*	150 [100-220]	320 [180-500]*	<0.001	
Mays (2015)[26]	PWT (min)	14 weeks	10.1 (1.8)	12.4 (1.9)	8.2 (1.7)	8.2 (1.9)	0.037	
	COT (min)	14 weeks	5.8 (1.5)	7.4 (1.6)	4.7 (1.4)	4.1 (1.5)	0.045	
Tew (2015)[19]	MWD (m)	6 weeks	585 (322)	655 (308)	375 (299)	323 (253)	-	
	CD (m)	6 weeks	143 (121)	164 (135)	138 (142)	99 (93)	-	
	6MWT (m)	6 weeks	367.3 (94.3)	390.2 (93.9)	355.3 (82.7)	334.6 (77.6)	-	

Data given in mean (sd) or median [IQR].

P-value columns indicate significance of changes between WAM interventions and usual care or SET.

* indicate significant change from baseline.

Abbreviations: 6MWT – six-minute walk test; CD – claudication distance; COT – claudication onset time; FCD – functional claudication distance; MWD – maximum walking distance; ns – no significance; PWT – peak walking time; WAM – wearable activity monitor.

O25

Adapting and maintaining a vascular limb salvage service during the COVID-19 Pandemic

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Introduction

The UK has been badly affected by COVID-19 posing a major challenge to the delivery of safe vascular care for time-sensitive pathologies e.g. CLTI. Our regional vascular limb salvage (VaLS) clinic initiated a COVID protocol to facilitate timely assessment and safe treatment of patients with CLTI during the COVID-19 crisis. We report the experiences of VALS during the first three months of the COVID-19 UK lockdown period.

Methods

Analysis of consecutive patients referred to the VaLS clinic between 23rd March and 1st July, 2020. Data was prospectively collected on: a) time from referral to assessment and revascularisation and b) major amputation rates.

Results

During lockdown 166 new patients with suspected CLTI were assessed within VaLS; 84 patients were diagnosed with CLTI and 31 patients were diagnosed with non-limb threatening PAD. Overall, 55 patients (65%) underwent revascularisation (endovascular = 45 (82%)) following assessment. Four primary amputations were performed and one major amputation was performed following failed revascularisation. Median time from referral to assessment was 3 [IQR= 1-5] days and assessment to first revascularisation was 7 [4-10] days.

Conclusion

The VaLS model of care has facilitated the delivery of timely and safe care to patients presenting with CLTI during COVID-19 pandemic.

O26

The effect of a global pandemic on a carotid endarterectomy service

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Introduction
Throughout the Covid-19 pandemic, guidance has been offered from the Vascular Society (VS). A clinical guide for surgical prioritisation described by the VS recommended that carotid endarterectomy (CEA) for symptomatic carotid disease is offered on an urgent basis. We compare CEA during the pandemic with a historical data set.

Methods
This was a review of CEA performed from March to June 2020, compared with a historical data set. Index cases were identified from a prospectively maintained data set and returns to the National Vascular Registry. Community Health Index numbers were identified and used to complete the data set using electronic health records.

Results
During the Covid-19 pandemic there were 17 CEAs performed, compared with 34 CEAs over the same time period in 2018. Basic patient demographics were comparable. During the Covid period the indications for CEA were stroke (58%) and TIA (24%); in the the historical period these were stroke (41%) and TIA (38%). The median time to surgery was shorter in the Covid period: 5-days vs 7-days (p=0.0347).

Conclusion
An indirect effect of Covid-19 may be an increase in morbidity from symptomatic carotid disease. Reducing the time from referral to intervention suggests an improvement in the surgical pathway.

O27

Systemic arterial thrombosis with COVID-19- underreported or underdiagnosed?

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Introduction
Based on the published literature there is evidence that COVID-19 initiates an immuno-thrombotic state. It is surprising to see an absence of significant systemic arterial thrombosis except as ischaemic strokes.
Methods
Review of all arterial thrombosis patients who presented to the hospital during the COVID lock down period and had either a Covid positive swab or Covid pneumonia on CT chest.
Results
We have seen 7 patients with systemic arterial thrombosis involving descending and infrarenal aorta, subclavian, iliac, femoral and profunda femoris artery presenting with Class I to Class IIA Acute limb Ischaemia (ALI) or as incidental findings when scanned for something else. Majority had raised D-dimers, Lymphopenia, with normal platelet count and haemoglobin levels. Cardiac Echo was normal in 3 patients who had Atrial Fibrillation. One patient presented with an occluded Fem-Fem cross over graft and unsalvageable leg and died within 24 hrs of the presentation from COVID-19. Majority were managed with anticoagulation. All these patients presented to the Emergency department and were not hospital acquired thrombosis.
Conclusion
There is a need to be aware of this group of presentations and remember that procoagulant activity can persist therefore anticoagulation must continue after discharge.

O28

Virtual ward-rounds are a safe and innovative way of preserving resources and reducing infection risk in the Covid-19 era

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Introduction
We introduced virtual ward rounds (VWR) to reduce the potential spread of COVID-19, limit personal protective equipment (PPE) consumption and improve social distancing on ward rounds. The VWR consists of a single doctor carrying out face-to-face consultations wearing a hands-free headset linked to the multi-disciplinary team (MDT) on remote satellite workstations.

Methodology
After a one-month trial in April 2020 a survey was sent to staff and patients to evaluate the VWRs

Results
Fifty-two surveys were returned (21 staff, 31 patients). The VWR reduced staff physical presence by 60% and resulted in 83% fall in face-to-face patient encounters. Compared to traditional ward-rounds, staff felt there were significant improvements in; efficiency, access to patient data, utilisation of the space on the ward with lower risk of infection and use of less PPE. Staff perception was that shared decision-making and training was improved. Patient satisfaction was good with 90% feeling there was a lower risk of infection on a VWR.

Conclusion
VWRs are a good way to manage ward rounds in the COVID era. They are liked by patients and staff and allow safe interaction with the MDT whilst reducing the risk of COVID-19 spread and preserving supplies of PPE.

O29

Arterial thromboembolism in COVID- 19 positive patients: not just an incidental finding

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The outbreak of COVID-19 in the United Kingdom has changed the way we practise both medicine and surgery. Recently published articles have described the association with COVID-19 and a hyper coagulable state. The majority of cases focus on venous and microcirculatory thrombosis risk in those patients in intensive care. Here we present a case of a patient with COVID-19 that developed multiple aortic thrombi.

A 58 year old gentleman presented to the Emergency Department with acute onset epigastric pain and vomiting. A CT angiogram identified partially occlusive thrombus within the aortic arch and distal infrarenal aorta. The patient tested positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and was subsequently treated for COVID-19 pneumonia . At time of presentation the patient showed no signs of end organ ischaemia so was commenced on therapeutic low molecular weight heparin and managed non operatively. A week following presentation, the patient developed acute right lower limb ischaemia and repeat CT imaging identified a splenic infarction. The patient underwent limb salvage embolectomy.

This report highlights the concern regarding the increased risk of arterial thrombosis in patients with COVID-19 and stimulates further discussion regarding the most appropriate management for these patients: including choice of anticoagulant.

O30

A ten-year experience of thrombolysis for lower limb ileo-femoral DVTs at one District General Hospital

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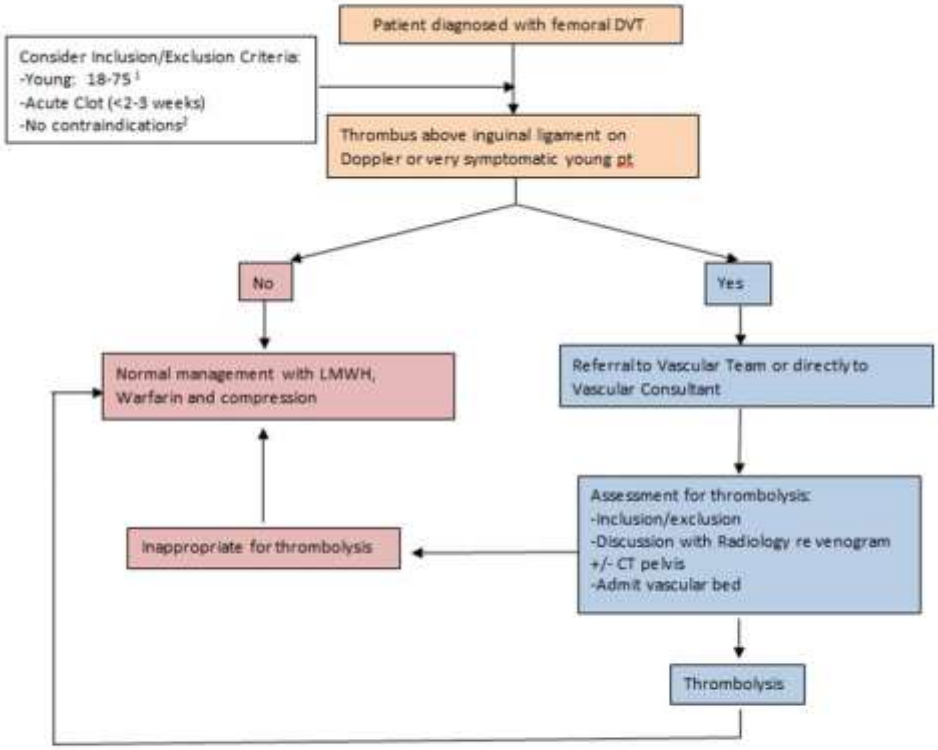
Introduction
Catheter-directed thrombolysis (CDT) for deep vein thrombosis (DVT) can reduce rates of post-thrombotic syndrome (PTS). We report our experience with CDT.

Methods
Consecutive patients undergoing CDT for acute proximal lower-limb DVTs from 2009-2019 were recruited. Eligibility criteria were utilised to decide a patient's fitness for CDT (Figure 1). Patient demographics, complications of CDT and post-CDT stenting outcomes were collected. The Villalta score was collected by telephone consultation between May-July 2019.

Results
Thirty-seven patients were thrombolysed. Median follow-up was 63 months (12-115 months). Mean age was 48 (18-75). Fourteen patients had May-Thurner syndrome. There was one death following CDT; secondary to multi-organ failure from chemotherapy for acute myeloid leukaemia. No other immediate complications of CDT occurred. Fourteen patients (37.8%) had venous stenting; stents were patent in all initial duplex scans. 28 patients were contactable; the median Villalta score was 0 (range 0-15, n=2 score >5). Only two patients (7.1%) developed PTS.

Conclusion
Our CDT burden for lower-limb DVTs is low. However, long-term outcomes are good, with only 7.1% developing PTS, suggesting careful selection of patients can result in favourable outcomes. The optimal endovascular thrombolytic approach warrants further investigation to establish the benefit of CDT compared with best medical management

Figure 1: Referral Pathway for acute proximal lower limb DVT



1. Patients outside this range may be considered on a case by case basis
2. Previous intracranial bleeding at any time, stroke in less than 3months,closed head or facial trauma within 3 months, suspected aortic dissection, ischemic stroke within 3 months (except in ischemic stroke within 3hours time), active bleeding diathesis, uncontrolled high blood pressure (>180 systolic or >100 diastolic), known structural cerebral vascular lesion .

O31

Deep venous procedures performed in the National Health Service in England 5 years on – an update on figures from 2015

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Background
Endovenous therapies, including thrombolysis and stenting, are employed to treat acute iliofemoral and iliocaval deep vein thrombosis (DVT). Recent randomised controlled trials (RCTs) have cast doubt over efficacy of percutaneous interventions for acute DVT.

Methods
Hospital Episode Statistics (HES) database was analysed. The number of patients admitted in England from 2015 to 2019 with primary diagnosis of DVT, and total number of primary open and percutaneous procedures (sub-classified) for deep venous pathology were retrieved.

Results (Figure 1)
From 2012 to 2018, admissions with primary diagnosis of DVT increased from 24,111 to 29,134. Number of open surgical thrombectomy procedures was unchanged since 2006. Frequency of percutaneous thrombectomy procedures between 2011 and 2016 increased from 162 to 404 cases and subsequently plateaued, with 432 cases recorded in 2018. Overall across 2011 to 2016, number of percutaneous deep venous procedures increased from 2120 to 2782, subsequently declining to 2684 in 2018.

Conclusions
Despite increasing hospital admissions for DVT, there has not been an increase in percutaneous deep venous procedures, including venoplasty and venous stenting. This might be contributed to by recent RCT findings, including ATTRACT. High-quality RCT data is awaited for the role of endovenous reconstruction in non-acute obstructing deep venous pathologies.

O32

Risk of hospital acquired COVID-19 in patients undergoing vascular surgery

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INTRODUCTION

In United Kingdom, lock down for COVID-19 started on the 23rd of March. The aim of this study was to assess the risk of acquiring COVID-19 in patients undergoing surgery during lock down in a major vascular hub.

METHODS

Multicentre retrospective electronic medical records audit of vascular inpatients undergoing open or endovascular surgery between 23rd March – 30th June 2020 in large vascular hub and spoke vascular units. We assessed the routine pre and post-operative COVID-19 swab results up to 2 weeks post-admission, taking into account other factors such as CT chest imaging if performed.

RESULTS

A total of 184 patients underwent at least one procedure, 68 (37%) on an elective “green pathway”. On admission 4 patients (2%) were COVID-19 positive (red pathway) and all died from respiratory failure. After initially testing negative, 6 patients (3%) became positive at later stage: 1 “green patient” was readmitted with spinal ischaemia post elective EVAR, 2 (1%) all “amber patients” died from respiratory failure and 3 (2%) all “amber patients” remained asymptomatic.

CONCLUSION

Initial results suggest the risk of hospital acquired COVID-19 was 3% in operated patients, with half developing respiratory or thrombotic complications. Pre-operative COVID-19 diagnosis was a poor prognostic indicator.

O33

Lessons learned regarding the optimisation of chronic limb threatening ischaemia management pathways following Coronavirus pandemic hospital-wide service adjustments.

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Objective
Clinical evidence supports the prompt investigation and revascularisation for chronic limb threatening ischaemia (CLTI). It was hypothesised that the reduction in elective activity during the SARS-CoV-2 outbreak may lead to an inadvertent improvement in line with the Vascular Society quality improvement framework (VSQIF).

Methods
Patients with CLTI referred during the pandemic and pre-pandemic were compared. Data was collected on patient demographics, type of revascularisation or amputation and timeline from referral, as per VSQIF standards.

Results
102 patients were included. There was no difference in severity of presentation, mortality (24% vs 13%, p=0.20) or need for major lower limb amputation (10% vs 5.8%, p=0.46) between COVID-19 and pre-COVID-19 cohorts. There was a significantly longer time between referral and arrival during the COVID-19 period. However, time from arrival to imaging and vascular surgeon review was significantly shorter as was length of stay (5 days [0-14] vs. 13 days [5-30], p=0.005). A higher proportion of patients followed an out-patient pathway.

Conclusions
The changes in service provision secondary to the COVID-19 pandemic have led to a reduction in hospital stay and associated costs, and shorter time to imaging and specialist review. The pandemic has raised a unique, positive opportunity to optimise CLTI pathways.

Figure 1 - Summary of CLTI patient pathway and outcomes

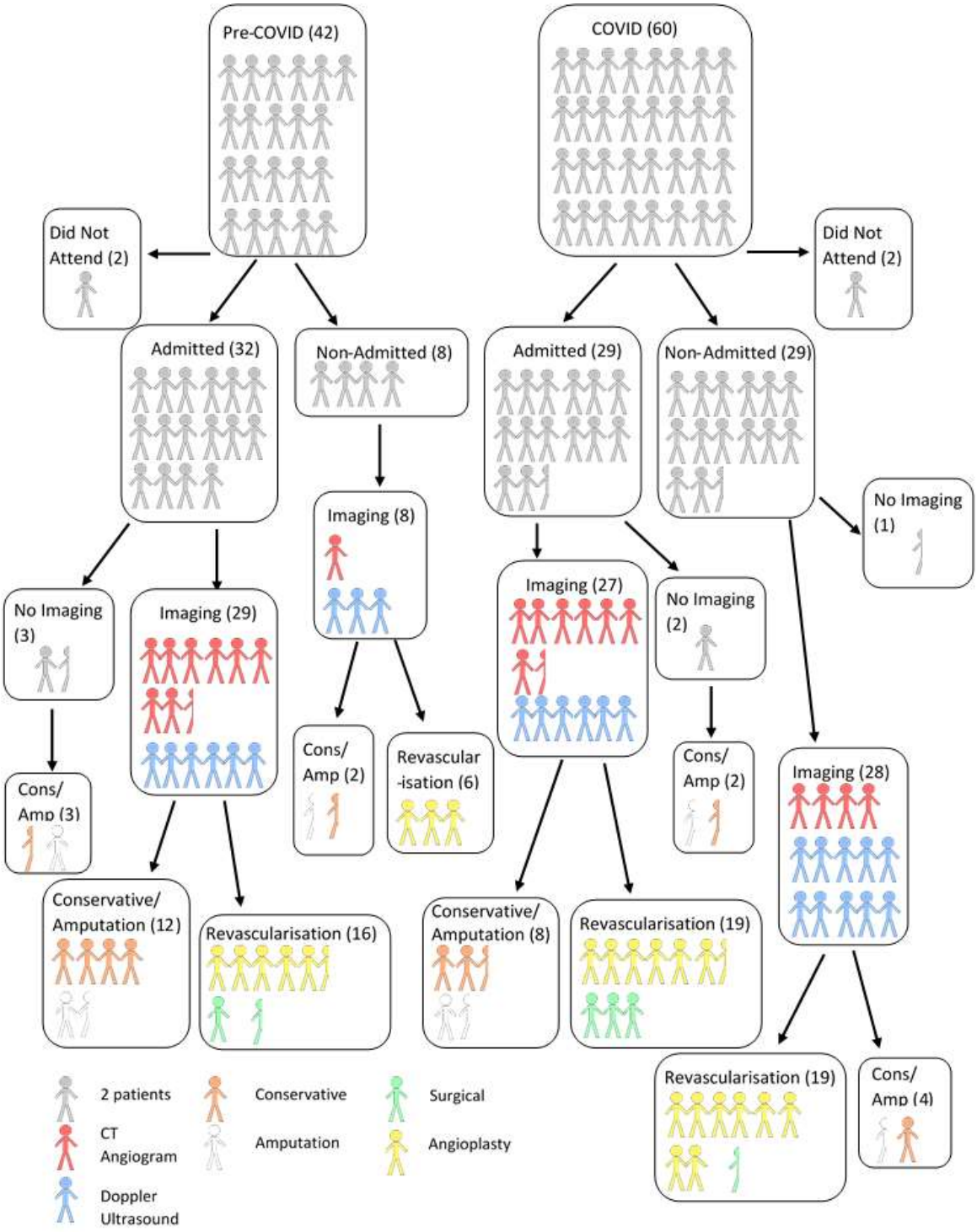
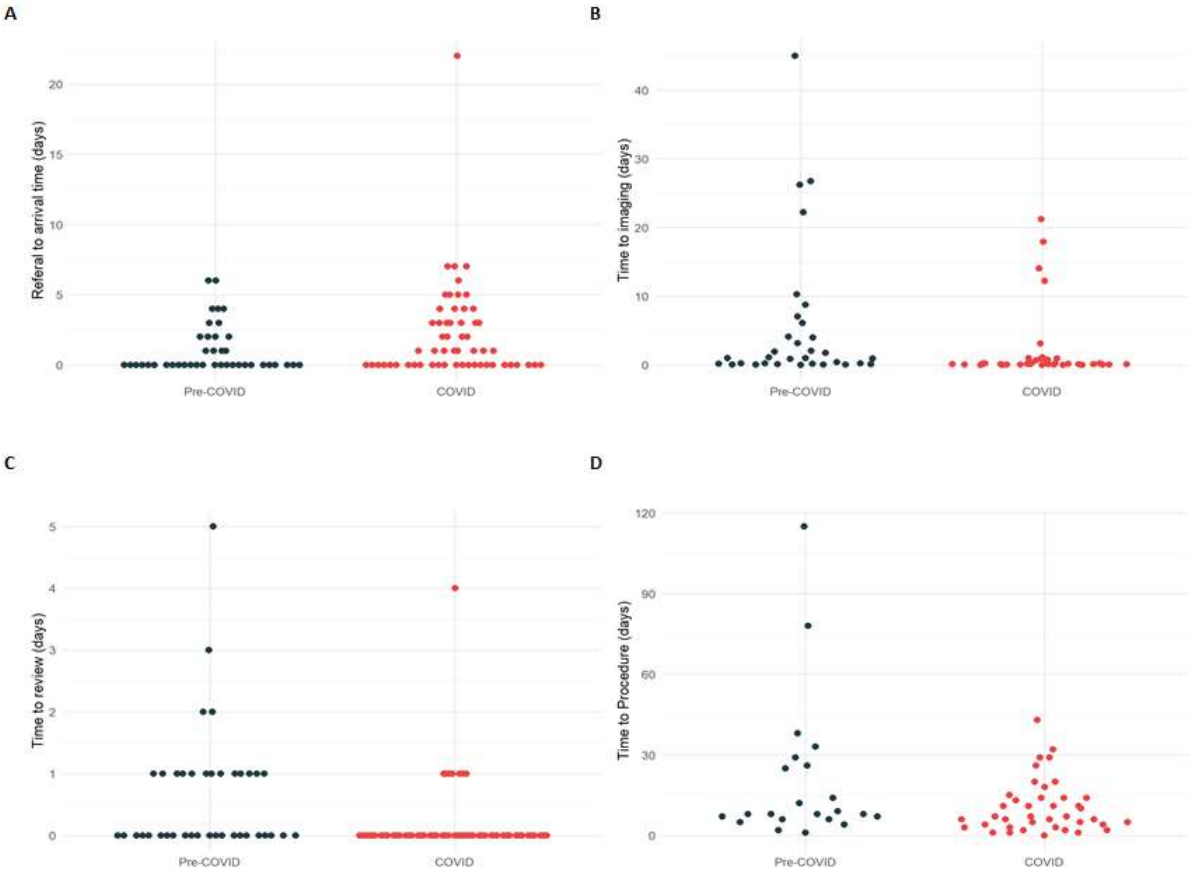


Figure 2 - Timescale analysis. A - Time from referral to SpR to arrival. B - Time from arrival to imaging. C - Time from arrival to review by vascular surgeon. D - Time from arrival to procedure.


A
Referal to arrival time (days)
20
15
10
5
0
Pre-COVID
COVID
B
Time to imaging (days)
40
30
20
10
0
Pre-COVID
COVID
C
Time to review (days)
5
4
3
2
1
0
Pre-COVID
COVID
D
Time to Procedure (days)
120
90
60
30
0
Pre-COVID
COVID

O34

Impact of the COVID-19 pandemic on the workload and case-mix in a tertiary referral vascular unit.

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Introduction

We examined changes in practice and workload during the COVID-19 pandemic on our vascular service.

Method

We compared the overall workload and case-mix between Period 1(15th of March till 31st May,2019 [P1]) and period 2(15th of March till 31st May, 2020 [P2] corresponding to the COVID-19 pandemic)

Results

There was a global reduction (44%) across all areas of emergency admissions from 141 patients in P1 to 79 in P2(P=0.0015). There was a non-significant trend towards an increase in the proportion of patients presenting with Critical Limb Ischaemia(CLI) Rutherford 5 & 6 (30% to 42%,P=0.09) and a decrease in the proportion of admissions related to Aortic Aneurysm (11% to 5%, P=0.21) in P2.

There was a significant (77%) reduction in all Vascular interventions, with a total of 166 procedures performed during P2 compared to 715 during P1(P<0.0001). This was most noted in Carotid(P=0.002), Deep Venous(P=0.003) and Aortic interventions (P=0.001). Although numbers of lower limb interventions also decreased (192 to 93, P=0.0032) there was an increase in the relative proportion to all other interventions in P2(P<0.0001) and non-significant trend favouring endovascular treatment(P=0.25)

Conclusion

We noted a change in various aspects of vascular services with a proportionately significant rise in CLI interventions.

O35

Impact of the COVID-19 pandemic on the workload and case mix of a multi-disciplinary diabetic foot clinic in a tertiary referral vascular centre.

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Introduction

Elective hospital and community face-to-face consultations have largely ceased during COVID-19 pandemic to reduce infection risks.

Method

We compare the nature of presentations and overall workload of a Diabetic Foot Clinic (DFC) between Period 1 (15th of March till End of May 2019) and period 2 (15th of March till end of May 2020- corresponding to COVID-19 pandemic)

Results

There was a significant decrease in the number of patients (374 to 211, P <0.001) and the number of foot care episodes (1572 to 599, P<0.001) in the DFC from Period 1 to Period 2. The median number of foot care episodes/patient decreased from 4(1-9) to 3(1-12). The proportion of patients presenting with Diabetic foot ulcers or infection increased from 41% to 54% (P=0.004), while the number of routine follow-up care appointments decreased from 10% to 3% (P=0.006). The number of non-urgent outpatient encounters decreased from 1553 to 750 during period 2 (P= 0.0027). There was a significant decrease in the proportion of Face-to-Face encounters (93% to 2% P<0.0001), with a concomitant increase in the number of telephonic appointments (7% to 98%,P<0.0001).

Conclusion

DFC served as an important venue to review and assess patients with foot problems during COVID-19 pandemic.

O36

Sirolimus therapy for complex low-flow head and neck vascular malformations in a single specialist centre

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Objective
To assess the efficacy and safety of sirolimus, an mTOR inhibitor, in treating complex head and neck (H&N) low-flow vascular malformations (LFVM) that were challenging and/or refractory to endovascular and open surgery.

Methods
Prospective case series of patients with complex H&N LFVM treated with sirolimus. Each patient had baseline and six-month treatment assessments consisting of clinical history and examination, quality-of –life (QoL) questionnaires, laboratory investigations, and MRI and medical photography. Wilcoxon signed-rank test was used to compare pre- and six-month treatment in QoL and radiological lesion size. $P<0.05$ was considered significant.

Results
Seven patients (median age 43 years, range 23-65 years) were recruited. Six patients completed the six-month course of therapy with all reporting a reduction of swelling. Overall, patients demonstrated a non-statistically significant improvement in QoL at six-months. Five patients demonstrated a minimum of 10% decrease in lesion size at six-months (median 19%, range 12-39%) ($P=0.046$). The most common side-effects found were dyslipidaemia (n-4) and mouth ulcers (n=2).

Conclusion
In our preliminary experience, sirolimus is effective and safe in treating patients with complex H&N LFVM, although larger studies are needed to confirm this. This provides an alternative and possible first-line treatment where standard treatment is challenging and/or refractory.

O37

Outcomes of vascular and endovascular interventions performed during the COVID-19 pandemic: The Vascular and Endovascular Research Network (VERN) COvid-19 Vascular sERvice (COVER) Tier 2 study

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Introduction:
The COVID-19 pandemic forced rapid adaptations to healthcare provision. The COvid-19 Vascular sERvice (COVER) Study aimed to contemporaneously report outcomes for patients undergoing vascular interventions worldwide during the pandemic.

Methods:
COVER is an international multi-centre observational cohort study of outcomes following vascular interventions during the pandemic. The primary outcome was to capture procedural information on all open and endovascular interventions. Secondary outcomes included in-hospital mortality and changes in management resulting from the pandemic.

Results:
1103 patients from 57 institutions in 19 countries were enrolled. Mean age was 66.9±13.9 (75·6% male). The rate of suspected/confirmed COVID-19 infection was 4·0%. Overall, in-hospital mortality was 11.0%. Aortic intervention mortality was 15·2% (23/151), amputations 12·1% (28/232), carotid interventions 10·7% (11/103) and lower limb revascularisation 9·8% (51/521). Increased risk of in-hospital mortality was noted for patients with chronic obstructive pulmonary disease, lower respiratory tract infection, Caucasian ethnicity and those undergoing urgent/immediate surgery. Choice of procedure deviated from standard management in 7·1% cases. Adjusting for confounders, antiplatelet (OR 0·503 (0·273-0·928) and oral anticoagulant (OR 0·411(0·205-0·824) reduced risk of in-hospital mortality.

Conclusions:
Patients undergoing vascular intervention during the pandemic had substantially higher overall and condition-specific mortality compared to pre-pandemic cohort reports, despite low COVID-19 infection rates.

O38

Redeployment of podiatrists into the vascular hot clinic during COVID19 – a concept for service development

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Background: COVID19 caused major disruption to acute vascular services. Redeployment of healthcare workers, cancelled clinics and elective surgery led to delayed assessment and treatment. This audit was conducted to capture the impact of a novel collaboration between podiatry and vascular surgery in a 7 day/week 'hot' clinic set up to reduce hospital footfall for high risk patients.

Methods: A prospective audit of patients attending the daily hot clinic from 25 March - 30 June 2020. Data recorded included diagnosis, podiatry intervention, hospital treatment and outcome.

Results: There were 131 attendances - 72% male (39% of males aged 71-80). Diagnoses included 25% chronic limb-threatening ischaemia (CLI), 13% infection and 15% ischaemic rest pain. Direct admission from clinic was required for 30% of patients. Podiatry input varied from debridement, dressings and offloading to liaison with community services and secondary care. Overall 60% required vascular interventions with 45% needing minor or major amputation.

Conclusion: Podiatry provided a valuable contribution to the Vascular Acute Service during the COVID pandemic, resulting in a one-stop holistic approach and resilient safety netting for high risk patients. The improved understanding of professional roles and skills has improved working relationships and provides a model for future service improvement.

O39

The impact of pausing the abdominal aortic aneurysm (AAA) screening programme due to COVID-19

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Introduction: The COVID-19 pandemic resulted in pausing the AAA screening programme in England in March 2020. The aim of this study was to estimate the impact of different durations of this pause on the number of small, medium and large aneurysms whose detection would be delayed in the affected cohort.

Methods: We retrospectively examined the monthly number of aneurysms that the screening programme detected from 2015/16 to 2018/19 using the AAA SMaRT system, to estimate the average number of AAAs that would have been detected. We used this as a basis for estimating the numbers affected for different durations of pause, ranging from 6 to 24 months.

Results: Our results suggest that, on average between 2015-19, 75,751 men were screened annually whereas in 2019-20, only 13,359 men were screened. Consequently, we estimate that in the 2019/20 cohort, 562 men may have had the detection of their aneurysm delayed while 37 may have had their treatment delayed.

Conclusions: Our results demonstrate the degree of disruption to AAA screening programme and the risk of potential harm from delayed AAA diagnosis and referral for treatment. These results have the potential to inform the recovery of screening and policies for future COVID-19 related suspensions.

O40

Willingness of patients to attend abdominal aortic aneurysm surveillance: The implications of COVID-19 on restarting the National Abdominal Aortic Aneurysm Screening Programme

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Background:
In the United Kingdom, screening detected abdominal aortic aneurysms under threshold for treatment enter community based surveillance. In March 2020 these screening and surveillance services were suspended in response to the COVID-19. Efforts are underway to restart these services.

Aim:
Gauge willingness of men to attend aneurysm surveillance.

Method:
200 men under aneurysm surveillance in South London were surveyed in May 2020. We asked how likely they would be to attend a surveillance appointment in July, their current health concerns, whether they were advised to 'shield' due to COVID-19 risk, specific appointment concerns and how far they would travel for an appointment. Risk if exposed to COVID-19 was calculated from co-morbidities and stratified as low, high or very high risk.

Results:
59% (n=118) reported they would attend. Pre-COVID attendance was 90%. 42.5% (n=85) were more concerned about catching COVID-19 than their aneurysm. 20.6% (n=41) had received advice to shield. 31.7% (n=63) were concerned about using public transport. 56% (n=112) would only travel 1-3 miles for appointments.

Conclusion:
Reduced attendance, perceived risk to COVID-19 and lower preparedness to travel will have implications for restarting screening and surveillance services. If prolonged, reduced invitation uptake may lead to increased aneurysm related mortality.

O41

Outcomes after lower extremity deep venous recanalization for post-thrombotic syndrome

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Lower limb deep venous recanalization and stenting is a promising technique to alleviate the substantial symptomatic burden of patients with post-thrombotic venous outflow obstruction. We report medium-term outcomes from an early adopting centre.

A prospectively collected database was interrogated and consecutive patients undergoing endovascular lower extremity deep venous recanalization for post-thrombotic syndrome at a tertiary centre (Cambridge Vascular Unit, UK) were included. Exclusions included interventions for acute iliofemoral DVT, venous access, upper extremities and open surgical procedures.

Over 250 patients with chronic venous outflow obstruction have been assessed. Between November 2013 and January 2019, 45 patients (22 male, 23 female) met inclusion criteria with mean age of 43.8 (sd +/- 15.5) years. Seven patients (15.6%) underwent intervention for bilateral iliocaval disease. Median operation time was 156 mins (IQR 107–216), technical success was achieved in 42/45 (93.3%) with 40/42 (95.2%) patent on discharge. Reintervention occurred in 14/42 (33.3%). Median follow-up was 1.2 years (IQR 0.5–3.2) and 42/48 (87.5%) of recanalized iliac veins were patent at last follow-up. All patients with patent stents reported significant symptomatic.

Selective deep venous recanalization and stenting results in good patency and symptomatic improvement in the medium term. Reintervention was common highlighting the importance of surveillance.

O42

A randomised controlled clinical trial comparing the effectiveness of bandaging compared to the JuxtaCuresTM device in the management of people with venous ulceration: Feasibility Study

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Introduction

The mainstay of treatment for venous ulceration remains compression therapy. Velcro Wrap devices are being increasingly used in these patients despite limited evidence. This feasibility study aimed to compare standard bandaging to the JuxtaCuresTM Velcro wrap device.

Methods

A single centre, unblinded RCT compared participants with venous ulceration randomised to either the JuxtaCuresTM device or short-stretch bandaging. Participants were followed up for 26 weeks.

Results

160 participants were screened with 40 randomised. 60% in JuxtaCuresTM healed v 55% in bandaging despite larger ulcers in the JuxtaCuresTM arm (9.33cm2 v 6.97cm2). There was no significant difference in time to healing (12.17 v 13.64 weeks). JuxtaCuresTM showed improved ulcer reduction for non-healers (14.91-5.00cm2 v 14.20-8.62cm2; P=0.06).

JuxtaCuresTM had more consistent sub-bandage pressure dropping from 39-36mmHg versus 41-25mmHg between application and removal (P<0.001). Quality of life (EQ5D) was improved in JuxtaCures at 3 months (mean difference 0.14, p=0.04). Cost was lower in JuxtaCuresTM £842.47 v £1064.68. Duration of appointment was shorter in JuxtaCuresTM (41 minutes v 53 minutes; P=0.003).

Conclusion

This study highlights the potential benefits of more consistent pressure, increased self-care, and potential with regards to ulcer healing, cost, nursing resource and quality of life for patients using Velcro Wraps.

Figure 1 – Flow diagram outlining the patient pathway

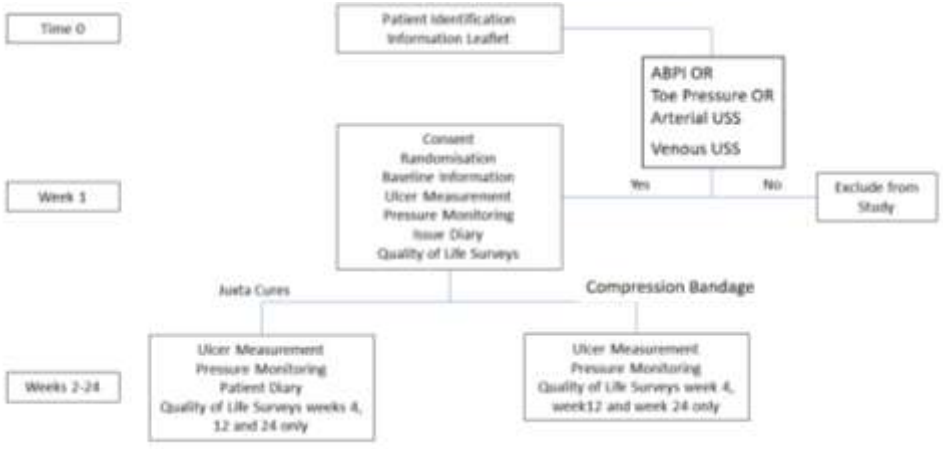


Figure 2 – Consort diagram

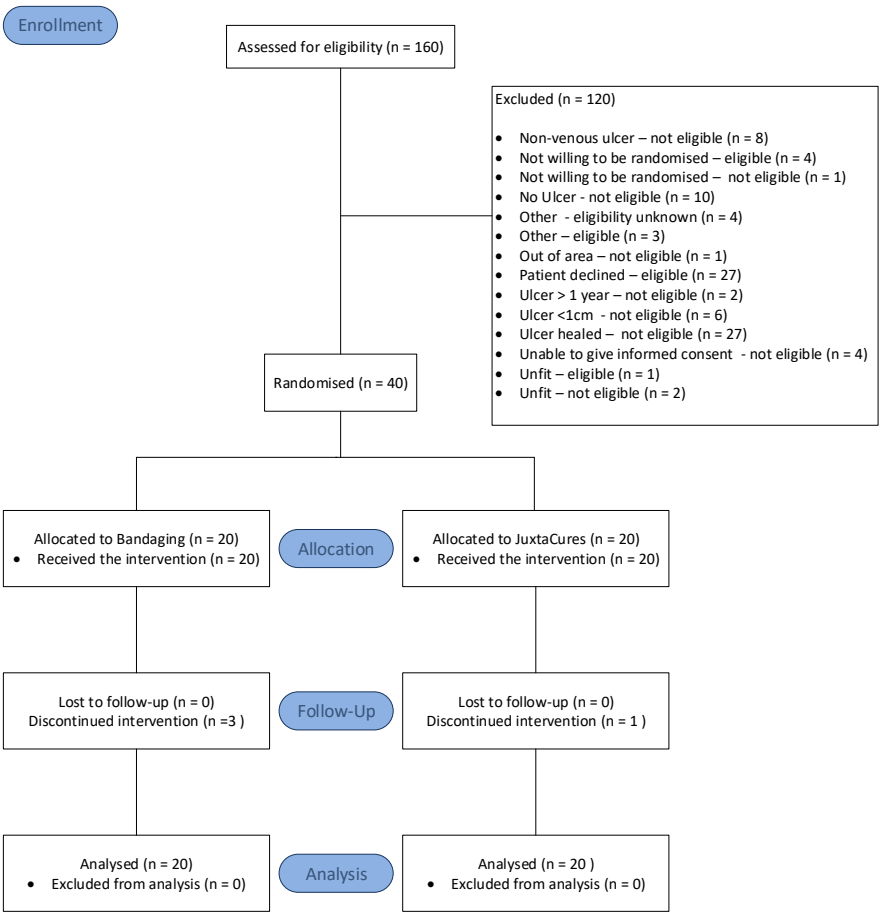


Figure 3 – Kaplan Meier per protocol analysis reporting time to healing for all participants

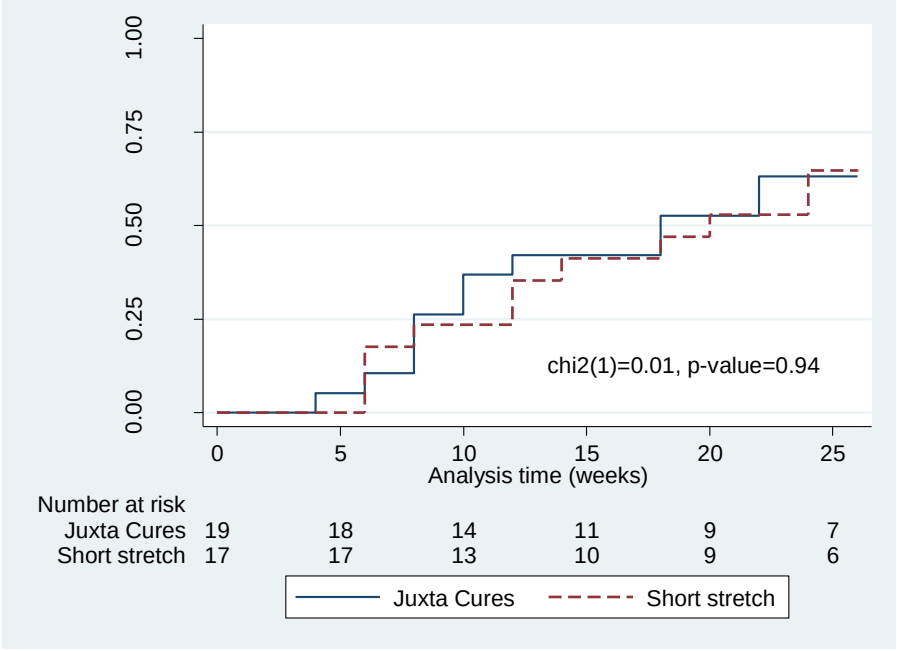
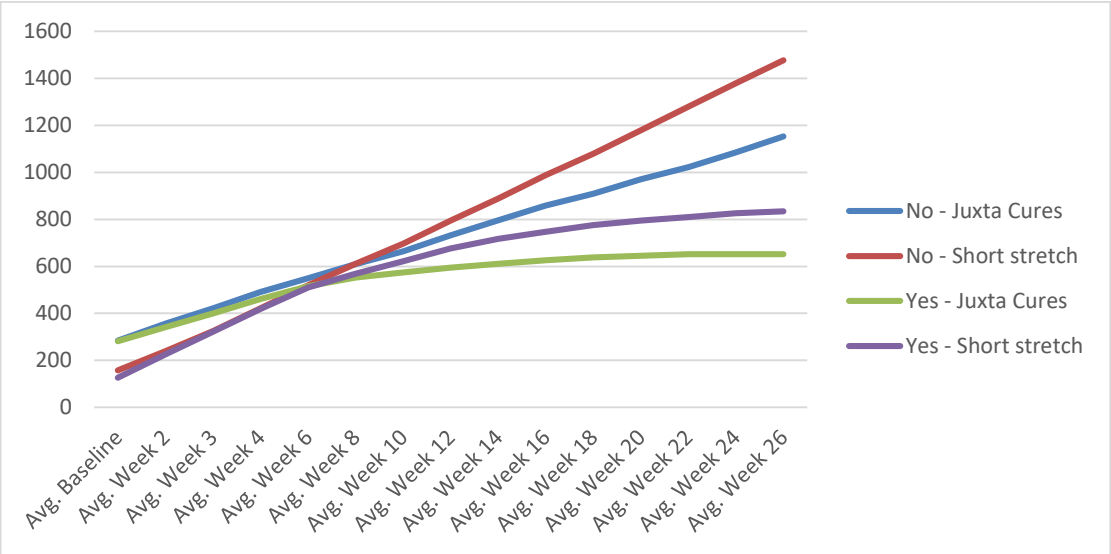


Figure 4 – Cost of treatment in each arm over time, in both healed (Yes) and non-healed (No) participants



O43

Compression after Sclerotherapy – A Systematic Review

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Aims:
To explore the impact of compression therapy post-sclerotherapy.

Methods:
A PRISMA-compliant systematic review was performed. Medline and EMBASE databases were searched to 30th June 2019. Inclusion criteria included English language studies comparing compression type and/or duration in adult patients following either liquid (LS) or foam sclerotherapy (FS) for chronic venous disease.

Results:
10 studies were included (n=5 used LS, n=4 used FS, n=1 used both). In C1 patients, any duration of compression, compared to no compression, resulted in improved clinical outcomes and reduced side effects following LS. In C2 patients, no difference was shown in clinical outcomes between 8-hours and 6-weeks of bandaging. Stockings were associated with higher success rates and considered more comfortable than combined stockings and bandaging. Compression compliance was shown to be the only variable associated with successful FS treatment. Higher grade stockings improved post-FS symptoms such as pain and dysesthesia. However, there was no difference in clinical symptoms or quality of life changes when comparing compression duration.

Conclusions:
Any type and duration of compression post-sclerotherapy likely increases sclerotherapy's therapeutic effect and reduces side effects compared to no compression. Further trials are required to determine optimal compression duration and whether superiority exists between stockings and bandaging.

O44

Piloting a virtual vascular clinic

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Introduction
During the COVID-19 pandemic a virtual vascular clinic was piloted at a large teaching hospital.

Method
A retrospective analysis of different platforms, conditions suitable for the virtual clinic and methods of video examination were identified.

Results
Thirty-six patients were seen from May to June 2020 (14 video, 12 telephone and 10 face-to-face). The mean ages were 58, 74 and 66 years old respectively. There were 24 new patients, and 12 follow ups. Patients in the video group were 16 years younger than the telephone group (ANOVA p=0.03).
The most reliable platforms were FaceTime and WhatsApp, with important stability and user issues noted with Attend Anywhere. Virtual clinics were suitable for stable arterial and venous disease, aortic aneurysm, carotid disease and follow-ups.
Video clinics were unsuitable for biopsies, conditions requiring one-stop imaging such as bleeding varicose veins, ulcers requiring dressings and where video examination was inadequate, for example a carotid body tumour. Useful examinations which could be performed by video link included Buerger's test, capillary refill time and assessment of pitting oedema.

Conclusion
The use of commercial platforms with a dedicated work SIM card is recommended. Virtual vascular clinics were possible in over two-thirds of appointments.

O45

The Clinical Impact of Stent Migration in the Modern EVAR Era: A Ten-Year Review of Contemporary Practice within Two Tertiary Vascular Referral Centres

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Background: Significant heterogeneity in the published definitions of stent-graft (SG) migration following EVARs and the failure in addressing all its contributing factors warrants a standardised and more representative definition, with subsequent analysis of contemporary SG's.

Method: A retrospective review of all infrarenal EVAR's from two vascular tertiary referral centres from 2008-2018 were analysed. Patient baseline demographics, pre/post-operative aortic morphology and measurements, adherence to IFU, SG brand and subsequent aortic reinterventions were recorded. 5mm of caudal displacement of any part of the proximal SG inferred migration.

Results: 223 patients (out of 454), which met the inclusion criteria had a median follow up of 55 months (18-120months), 50(22.4%) cases were found to have migrated. Freedom-from-migration was 93.4%,90.5%,86.5%,83.4% and 77% at ,1,3,5,7 and 10 years respectively. With a median time to migration of 22.3 months (10-84 months), No significant difference was identified in baseline demographics, pre-operative anatomical morphology or SG brands, between the migratory and non-migratory group. Post-operative aortic neck dilation and pre-operative AAA size was significantly higher in the migratory group (p=0.001). 16 out of 50(32%) migrators were clinically significant.

Conclusions: SG migration is a long-term complication which persists, despite advancements in technology, improved adherence to IFU, and patient selection.

O46

Defining aneurysm sac size change post EVAR

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Background:

Continued aneurysm sac expansion has been observed post EVAR and is associated with poorer outcomes. Definitions of sac size change are heterogeneously reported. Post EVAR sac size change over long-term follow-up needs to be understood to contextualise mechanisms of stent-graft related failure.

Methods:

Post standard EVAR aneurysm max AP diameter was assessed in patients treated between 2004-2014 with colour duplex US during surveillance. Non-linear regression modelling was used to assess trends in sac diameter change and identify sub-groups of sac size change.

Results:

1065 patients over 10 years with 8164 aneurysm sac measurements were analysed. Maximal sac size regression was observed at 18 months in patients free from aortic re-intervention, with a gradual increase in sac size post EVAR in long-term follow-up thereafter. Measuring change of sac diameter compared to baseline diameter better identified patients requiring re-intervention versus measurements of consecutive sac size change. Sac regression (>5mm decrease from baseline) at 1 year was predictive for continued sac regression at end of follow up.

Conclusion:

Sac shrinkage >= 5mm at 1 year adequately defines sac regression. Sac diameter should be compared to baseline during surveillance. Continued sac expansion is observed in patients free from re-intervention in very long-term follow-up.

O47

No difference in mid-term mortality and renal function deterioration between open repair with suprarenal clamp and complex endovascular interventions for unruptured juxtarenal abdominal aortic aneurysms

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Management of juxta-renal abdominal aortic aneurysms (JRAAA) remains challenging, with both open repair with a suprarenal clamp (ORSRC) or complex endovascular (EVAR) being feasible.

A retrospective review of prospectively collected data was performed on patients who underwent ORSRC or complex EVAR for unruptured JRAAA between March 2008 and October 2019. Analysis of short and midterm outcomes after treatment was conducted.

During the study period, 173 patients underwent JRAAA repair (56.6% of them having ORSRC). 43.9% of patients in ORSRC group developed acute renal impairment on post-operative day 3 compared to 13.6% in complex EVAR group ($p<0.05$). By 9-12 months, there were similar rates of renal impairment in both groups (54.5% for ORSRC versus 61.9% for complex EVAR, $p=0.765$).

Patients who underwent complex EVAR procedures had shorter length of stay (7.7 (±6.2) days versus 15.3 (±16) days for OR; $p=0.0002$). Mortality at 30 days and 1 years was 6.1% and 7.1% for ORSRC against 6.7% and 13.5% for EVAR ($p=0.884$ and $p=0.166$, respectively).

In context of JRAAA, patients receiving complex EVAR procedures tended to have shorter hospital stays and less risk of AKI in the short term. However, both interventions had similar mortality rate and midterm rate of renal function deterioration.

O48

Mid-term Follow-Up of Percutaneous Access for Standard and Complex EVAR Using the ProGlide Device.

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Objectives: Most centres now perform percutaneous (ultrasound-guided) EVAR. Various percutaneous closure devices are available, with data lacking on efficacy and mid-term safety profile. We present outcomes from a single centre with the Perclose ProGlide™ (Abbott Vascular Devices, CA, USA) suture-mediated system, using the well described "pre-close" technique.

Materials & Methods: Data were recorded prospectively and analysed retrospectively from electronic medical records. Patients undergoing standard (EVAR) or complex (FEVAR/BEVAR/TEVAR) aneurysm repair between March 2015 and September 2019 were included.

Results: 280 patients were included in the study. 184 (65.7%) were standard infrarenal EVAR, with a total of 500 groin procedures performed. Intraoperative closure success was 97.3% (per patient) or 98.6% (per groin procedure). Early groin complication rate was 6.2% (per patient) or 3.2% (per groin procedure). Current cigarette smoking (HR 3.468, CI 1.540 – 7.807, p = .003), and emergency operation (HR 3.789, CI 1.263 – 11.367, p = .017) were predictive of inferior survival outcomes. Median length of stay for elective EVAR was 3.0 (3.0) days.

Conclusions: Our data support the use of percutaneous access with a pre-close technique for a variety of endovascular aneurysm repair procedures;The Perclose ProGlide™ system provides excellent mid-term complication-free and reintervention-free outcomes for groin procedures.

O49

The effect of hybrid operating theatres on early reintervention in EVAR

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Introduction
Hybrid operating theatres are mandated by the MHRA for major arterial surgery. They are thought to allow better visualisation in aortic surgery, whilst reducing overall radiation doses to patients and staff.

Methods
Patients who underwent primary infra-renal EVAR between 2010 and 2019 at a single center were identified from the National Vascular Registry. During this period cases were performed using a high-specification mobile c-arm until 2016, and a hybrid suite subsequently. Imaging and reintervention data were retrospectively collected from procedure to the first 3 months post-operatively. Statistical analysis was performed using Chi-Squared with odds ratios (OR) presented as OR [range].

Results
A total of 822 cases were identified, with 555 in the pre-hybrid theatre cohort and 267 in the post-hybrid. No significant difference was seen between the number of in-patient re-intervention in the pre-hybrid (18/555 (3.2%)) and post-hybrid cohorts (4/267 (1.5%)) (OR 2.21 [0.74-6.59], p= 0.22). A significant difference was seen between these cohorts for re-intervention within 3 months, 39/555 (7.0%) in the pre-hybrid cohort and 5/267 (1.9%) in the post-hybrid cohort (OR 3.96 [1.54-10.17], p= 0.004).

Conclusion
Our results indicate that there has been a decrease in early post-EVAR reintervention since the routine use of a hybrid suite.

O50

The key performance indicators of the abdominal aortic aneurysm screening programme in Scotland discriminate against patients with non-screen detected aneurysms

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Introduction

Key Performance Indicators (KPI) for the Scottish abdominal aortic aneurysm (AAA) screening programme stipulate a patient should be seen by a vascular surgeon (VS) within two weeks from diagnosis, and have a repair within eight weeks. There are no such targets for patients who have an aneurysm diagnosed outside the programme. We hypothesised these patients waited longer for repair.

Method

A retrospective analysis of patients who underwent elective AAA repair between 01/01/2019 – 31/12/2019 from 6 vascular centres across Scotland was performed. Patient demographics were collected in addition to dates of aneurysm diagnosis, vascular surgeon review, preoperative investigations and operative repair.

Results

234 patients were included. 90% were male and the median age was 71 years (49-89). There were 83 (35%) screen-detected and 151 (65%) non-screen detected AAA. The median number of days from referral to review by a VS was 8 days in screen vs 19 days in non-screen detected AAA (p=<0.0001). The median time to repair was 69 days in screen vs 104 days in non-screen detected AAA (p=<0.0002).

Conclusion

Due to the scrutiny of KPIs in the Scottish AAA screening programme, screen detected AAAs are given treatment priority to the potential detriment of non-screen detected AAA.

O51

Factors Associated with the Failure of Percutaneous Closure Devices during Endovascular Aortic Aneurysm Interventions: 2-Year Retrospective Experience from a Large Volume Centre

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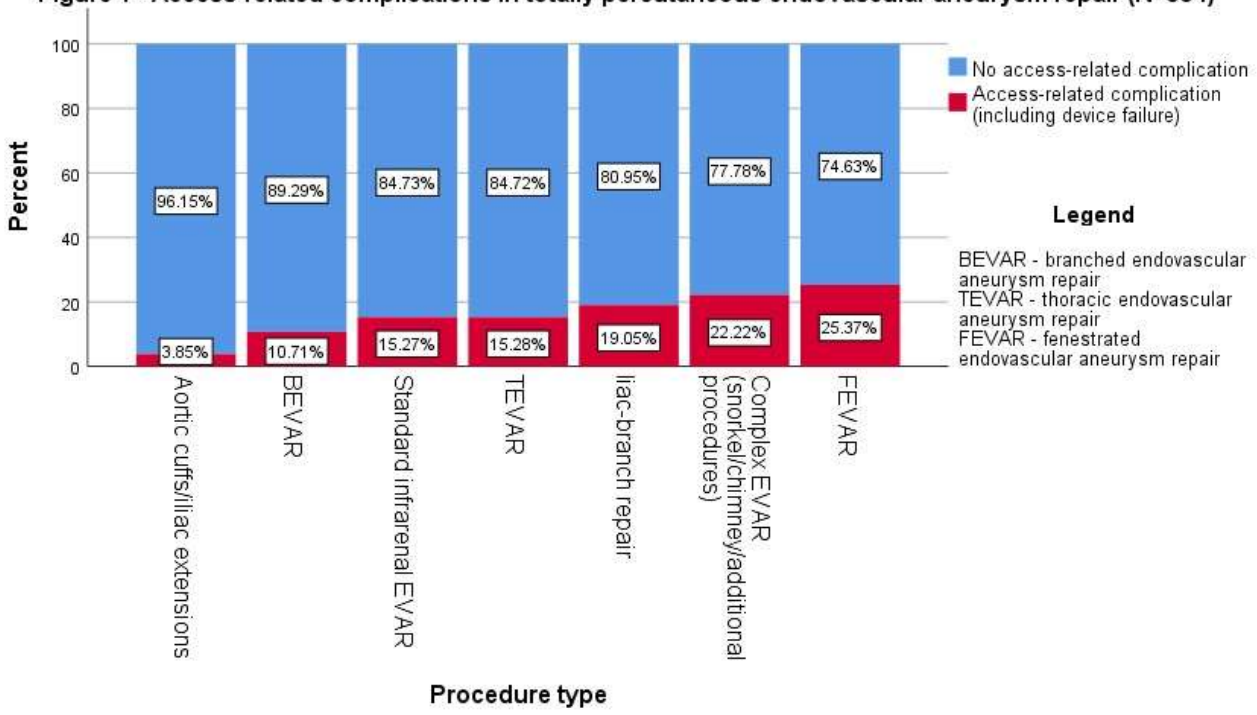
Introduction: Percutaneous endovascular aneurysm repair (EVAR) is becoming increasingly popular due to fewer access-related complications, shorter procedure times and length of stay (LOS).
Methods: We retrospectively analysed 511 consecutive patients undergoing EVAR in our unit between 2016-2017. Access-related complications (ARC) were defined as: bleeding or pseudoaneurysm requiring intervention, or acute limb ischaemia. Statistical analysis was performed using SPSS 24.
Results: Of 511 patients, 354(69%) had a percutaneous approach. In this group, ARC occurred in 16.4% of cases (58/354); ARC rate varied with procedure type (fig.1) (p=0.030). Per-case multivariate analysis demonstrated significant associations between ARC and eGFR (OR 0.982[0.969-0.996], p=0.013), BMI (OR 1.076[1.016-1.138], p=0.012) and CFA calcification (minor–OR 2.820[1.191-6.673], p=0.018; severe–OR 3.171[1.181-8.516],p=0.022). In per-groin multivariate analysis, factors significantly associated with ARC were CFA depth (OR 1.028[1.004-1.052],p=0.02), CFA diameter (OR 0.780[0.631-0.962],p=0.02) and device used (Prostar vs. Proglide (OR 2.596[1.200-5.615],p=0.015). Operation time and median LOS (3 days vs.2 days) were longer for standard elective EVAR patients experiencing ARC.
Conclusion: Our experience has identified physiological (eGFR), anatomical (CFA depth and calcification), and technical factors (procedure and closure device type) as predictors of access-related complications during percutaneous EVAR. These are important data for safe selection of patients that would benefit from percutaneous access.

Figure 1 - Access-related complications in totally percutaneous endovascular aneurysm repair (N=354)



O52

Does prehabilitation prior to AAA repair improve patient outcomes? – long term follow-up of an RCT

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[1]*Hull University Teaching Hospitals NHS Trust, Hull, UK*

Background
Preoperative supervised exercise programmes are shown to improve patient fitness, reduce short-term adverse postoperative outcomes and length of hospital stay in several settings, including an RCT in AAA patients at our institution. The aims of this study were to assess whether prehabilitation before AAA repair provides longer-term benefits in terms of mortality and other major adverse events.

Methods
Patient-level data concerning mortality, major adverse cardiovascular, respiratory and renal events were obtained for participants previously randomised to either a preoperative supervised exercise programme or standard care before elective AAA repair. Survival and time to complication were analysed using Kaplan-Meier methods and Log Rank significance testing.

Results
5-year mortality data was available for all 62 exercise group and 62 control group participants, demonstrating significantly reduced all-cause mortality in favour of prehabilitation (8/62 Vs 18/62, p=0.033) (Figure 1). There were no differences in either individual or composite non-fatal adverse event rates at 5-years (19/54 Vs 20/43, p=0.606), albeit with some missingness of data, particularly at spoke sites.

Conclusion
Physical prehabilitation before AAA repair appears to confer a long-term survival advantage over standard care. Missingness of data, other than for survival, mean the driving factor(s) influencing survival remain elusive. Further research is underway.

O53

A randomised controlled trial of patient-directed, community-based exercise to improve fitness and reduce morbidity and mortality in patients with abdominal aortic aneurysm: The AAA Get Fit Trial

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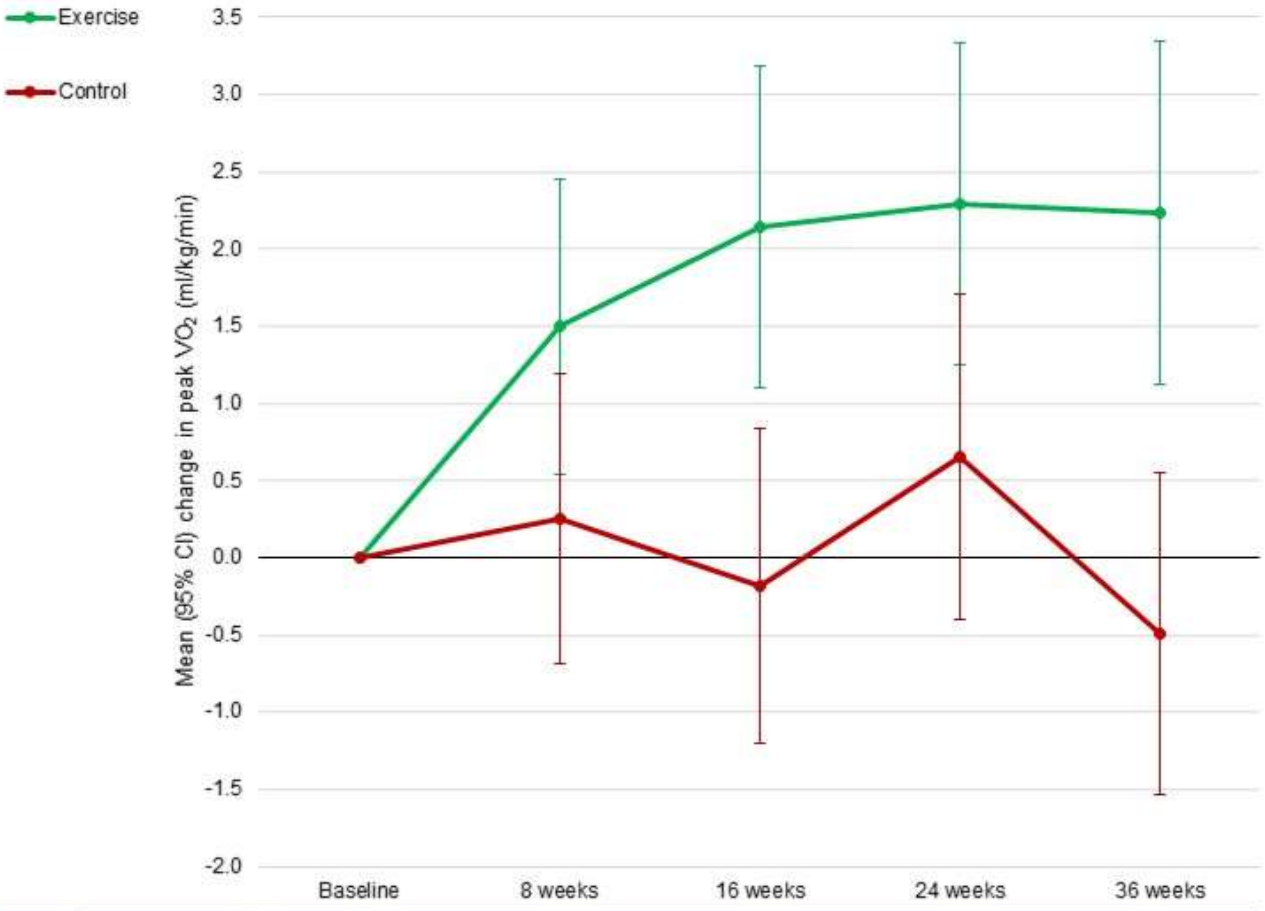
AAA repair has a peri-operative mortality of 3.2% for open and 0.4% for EVAR. This mortality and long-term survival have been shown to be independently associated with the CPET parameters of peak VO_2, anaerobic threshold (AT) and ventilatory equivalent for CO_2 ($VECO_2$). These parameters should be improved by exercise training but what type and duration of exercise that produces meaningful improvements in a AAA population is not yet known.

This was an RCT of 24-week, patient-directed, community-based exercise in AAA surveillance patients. It was powered to a primary outcome of change in peak VO_2 at 24 weeks compared to standard care. Secondary outcome measures included, AT, $VECO_2$, cardiovascular risk and HRQoL. Follow-up intervals were at 8, 16, 24 and 36 weeks to assess changes in fitness over time and whether these were maintained.

There was a significant mean(95% CI) improvement of 1.6 (0.1, 3.1)ml/kg/min (p=0.031) in peak VO_2 at 24 weeks which was maintained at 36 weeks, 2.7 (1.2, 4.2)ml/kg/min (p<0.001)(figure 1). There were also significant improvements in AT, VECO2, exercise capacity, triglycerides and HRQoL.

24-week, patient-directed, community-based exercise significantly improved those CPET-parameters associated with impaired peri-operative and long-term survival in patients following AAA repair and may reduce all-cause mortality.



		Baseline	8 weeks	16 weeks	24 weeks	36 weeks
Exercise	n	28	21	19	19	15
	Mean (95% CI) change from baseline (ml/kg/min)		1.5 (0.5, 2.5)	2.1 (1.1, 3.2)	2.3 (1.2, 3.3)	2.2 (1.1, 3.3)
	Theoretical mean (95% CI) reduction in mortality		8.2 (2.9, 13.4)	11.7 (6.0, 17.4)	12.5 (6.8, 18.2)	12.2 (6.2, 18.3)
Control	n	28	22	19	18	18
	Mean (95% CI) change from baseline (ml/kg/min)		0.2 (-0.7, 1.2)	-0.2 (-1.2, 0.8)	0.7 (-0.4, 1.7)	-0.5 (-1.5, 0.5)
	Theoretical mean (95% CI) reduction in mortality		1.1 (-3.2, 5.5)	-0.8 (-5.5, 3.8)	3.0 (-1.8, 7.9)	-2.3 (-7.0, 2.5)
	Contrast in changes between groups (ml/kg/min)		1.2 (-0.1, 2.6)	2.3 (0.9, 3.8)	1.6 (0.1, 3.1)	2.7 (1.2, 4.2)
	p value		0.069	0.002	0.031	<0.001

O54

Patients on AAA surveillance are at greater threat of cardiovascular events or malignancy than their AAA: Outcomes of AAA surveillance over 19 years at a tertiary vascular centre.

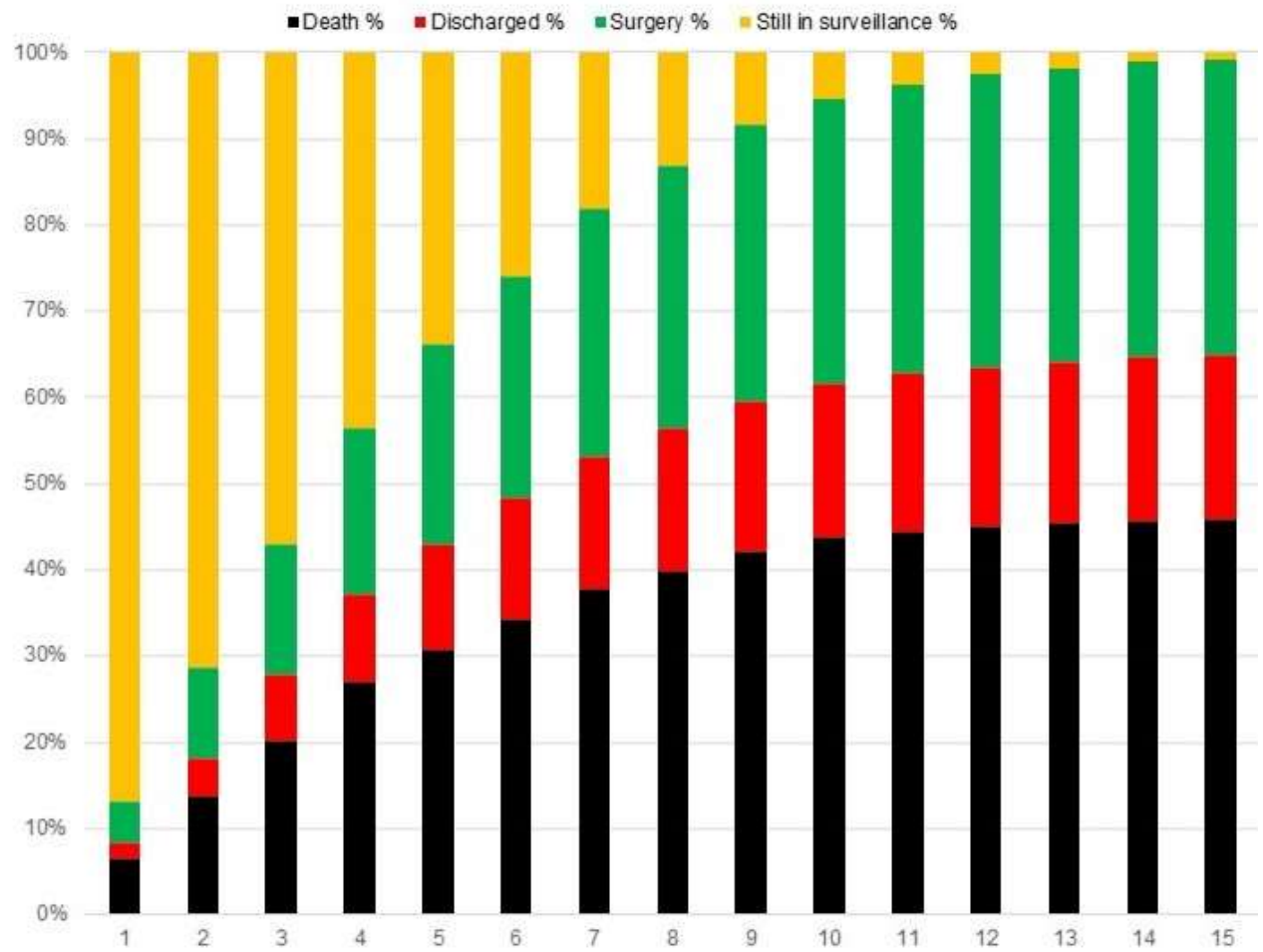
Mr Adam Haque[1], Professor Charles McCollum[1]
[1]*University Of Manchester, ,*

Most patients with AAA will be placed on surveillance programmes. These are currently focused on monitoring AAA growth. There is good evidence to suggest that the AAA population are at increased risk of other health problems, particularly cardiovascular events, which may be more of a threat than the AAA, but this has not been well described. It is also not known if there are any patient or AAA-related factors associated with different outcomes.

This was a retrospective analysis of a prospectively collected database of AAA surveillance patients enrolled at our centre.

1951 patients were included in the analysis of which 32.0% had died, 23.8% had surgery and 13.3% had been discharged due to poor health before surgery. Median(IQR) time on surveillance was 2.8 (1.4, 4.9) years. Impaired survival was associated with increasing age 1.06 (1.05, 1.07)($p<0.001$), initial AAA size 1.56 (1.39, 1.74)($p<0.001$) and female gender 1.40 (1.18, 1.67)($p<0.001$). Death occurred more frequently than operative repair every year after entry onto surveillance(figure). The major causes of death were cardiovascular events (34.9%) and malignancy (27.3%).

Death, primarily through cardiovascular events, is the most likely outcome for patients once entered on AAA surveillance. AAA surveillance programmes should be adjusted to address this risk.



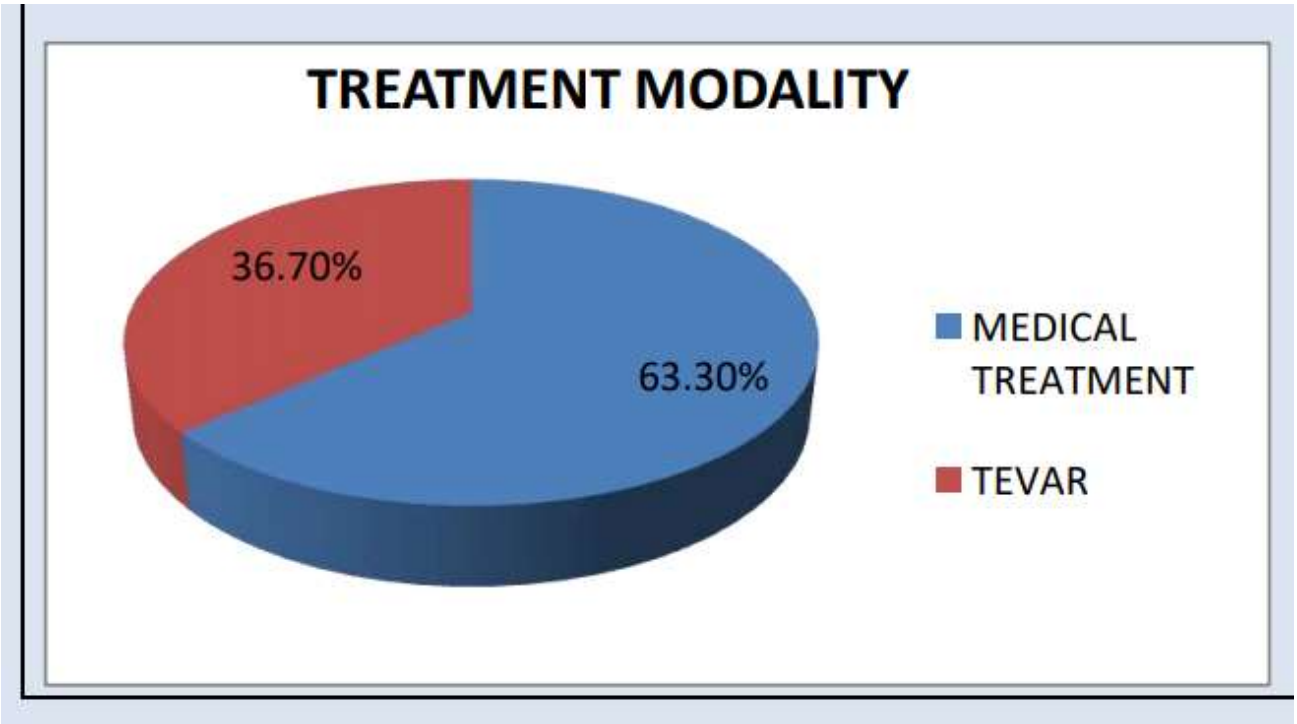
n	1862	1757	1663	1588	1540	1498	1457	1428	1404	1388	1379	1371	1366	1363	1360
Still in surveillance (%)	1618 (86.9%)	1250 (71.3%)	948 (57.0%)	691 (43.6%)	520 (33.8%)	386 (25.8%)	263 (18.1%)	186 (13.0%)	117 (8.4%)	74 (5.3%)	52 (3.8%)	36 (2.6%)	25 (1.8%)	16 (1.2%)	12 (0.9%)
Surgery (%)	87 (4.7%)	186 (10.5%)	252 (15.2%)	304 (19.1%)	358 (23.2%)	387 (25.8%)	419 (28.8%)	436 (30.5%)	449 (32.0%)	457 (32.9%)	460 (33.4%)	463 (33.8%)	464 (34.0%)	464 (34.0%)	464 (34.1%)
Discharged (%)	36 (1.9%)	77 (4.4%)	127 (7.6%)	163 (10.3%)	189 (12.3%)	209 (14.0%)	224 (15.4%)	235 (16.5%)	246 (17.5%)	250 (18.0%)	253 (18.3%)	255 (18.6%)	255 (18.7%)	259 (19.0%)	259 (19.0%)
Death (%)	121 (6.5%)	243 (13.8%)	336 (20.2%)	429 (27.0%)	473 (30.7%)	516 (34.4%)	551 (37.8%)	571 (40.0%)	591 (42.1%)	607 (43.7%)	614 (44.5%)	617 (45.0%)	622 (45.5%)	624 (45.8%)	625 (46.0%)

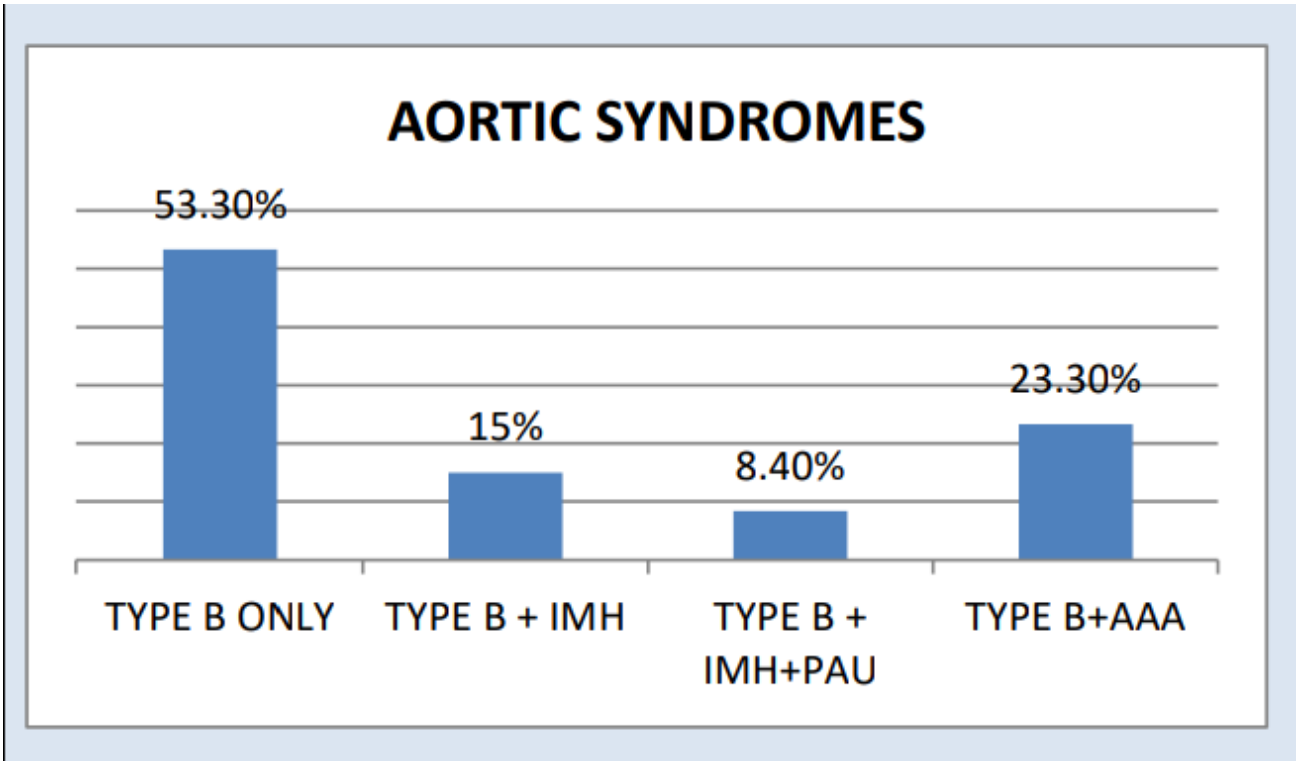
O55

A five year Comparison of Medically Treated Versus Surgically Treated Type B Aortic Dissections at a Tertiary Vascular Unit

Mr Isaac Kobe[1], Mr Eastwood Michael[1], Miss Ana Maria Gardescu[1], Mr Sriram Rajagopalan[1], Mr Robin Calderwood[1], Miss Lorraine Corfield[1], Mr Brian Gwynn[1], Miss Aideen Walsh[1], Mr Jack Fairhead[1], Mr Tony Jaipersad[1], Mr Arun Pherwani[1]
[1]*University Hospitals of North Midlands, Stoke on Trent, United Kingdom*

Introduction
The INSTEAD trial showed no difference in 2 year mortality outcomes between a cohort of patients treated medically vs those offered thoracic stent grafts (TEVAR).
Aims
1. Identify characteristics of patients with type B aortic dissections in our unit.
2. Compare 1 year outcomes between medically and surgically treated patients. 5 year retrospective review of medical records (electronic and chart) from 1st Jan 2014 to 31st Dec 2018 in our unit.
Methods
The inclusion criteria included patients admitted with symptoms of and identified on a formal CTA report by a consultant radiologist to have a type B aortic dissection.
Results
60 patients were included
The average age at diagnosis= 66.9 years. Male to female ratio was 2.5:1. 6.7% of patients had more than one entity of aortic syndrome. 25% of patients had comorbidities in 3 or more organ systems
Overall 1 year mortality was 25.4%. Disease specific mortality was 13.2% (medical Rx) vs 9.5% (TEVAR) p=0.09.
Discussion
The cohort of patients was older and comorbid and which may account for high mortality figures.
Conclusions
There was no significant difference (p=0.09) in one year mortality between patients treated medically or surgically with type B aortic dissection. Treatment should be individualized.


TREATMENT MODALITY
36.70%
63.30%
MEDICAL TREATMENT
TEVAR


AORTIC SYNDROMES
53.30%
15%
8.40%
23.30%
TYPE B ONLY
TYPE B + IMH
TYPE B + IMH+PAU
TYPE B+AAA

O56

Towards Establishment Of An Objective Threshold For Turndown Of Aortic Aneurysms: A Four Year Prospective Study

Mr Isaac Kobe[1], Miss Ana Marie Gardescu[1], Mr Sriram Rajagopalan[1], Miss Lorraine Corfield[1], Mr Mohammed Kabeer[1], Mr Robin Calderwood[1], Mr Brian Gwynn[1], Mr Jack Fairhead[1], Mr Arun Pherwani[1], Mr Tony Jaipersad[1]
[1]*University Hospitals of North Midlands, Stoke on Trent, United Kingdom*

Turning down patients for aortic aneurysm surgery can be a challenging decision. In the absence of validated scores or protocols it is made by comparing the benefit of surgery ,physiological status and risk of mortality. The effect of turndown rates on rates of perioperative aneurysm mortality is largely unknown.
A cross sectional analysis of patients turned down for aortic aneurysm surgery between January 2016 and June 2020 was done based on a prospective institutional database.The Primary outcome was turndown rate and mortality rate. Secondary outcomes were patient characteristics and their relation with mortality.
The number of patients were turned down for surgery was 179, resulting in a turndown rate of 18.2%. Overall mortality was 42.5% with a rate of 21.9% at 6 months and 35.8% at 1 year respectively. The median age of patients was 83.5(IQR=8). The cohort had a high comorbidity burden and infrarenal anatomy was more prevalent at 68.2%. Physiological indices of Glasgow aneurysm score and frailty score had means of 95.8 and 6.1 respectively. Aneurysm size did not significantly correlate with mortality (r=-0.52, p=0.493).
A new matrix to decide on turndown of patients should include physiologic considerations such as GAS, anatomic and frailty as considerations.

O57

The effect of weekend admission on outcomes for ruptured abdominal aortic aneurysms: A call for a seven-day vascular service

Mr Robert Leatherby[1], Mr George Antoniou[1,2]

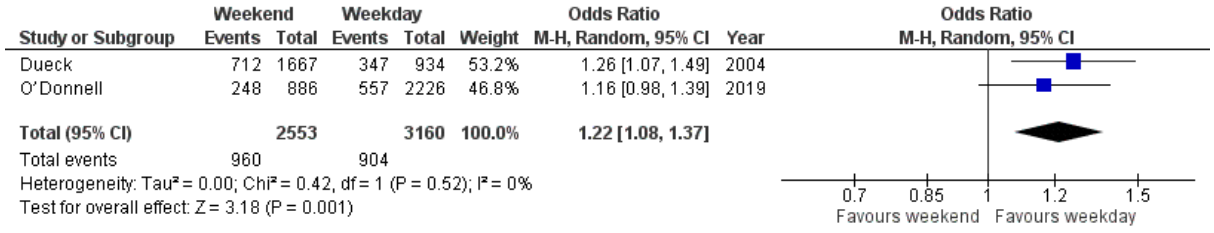
[1]Department of Vascular & Endovascular Surgery, The Royal Oldham Hospital, Pennine Acute Hospitals NHS Trust, Manchester, United Kingdom, [2]Division of Cardiovascular Sciences, School of Medical Sciences, The University of Manchester, Manchester, United Kingdom

Objectives:
"The weekend effect" of higher patient mortality when presenting at a weekend compared to a weekday has been established for several conditions. We aimed to investigate whether this effect exists for the condition of ruptured abdominal aortic aneurysm.

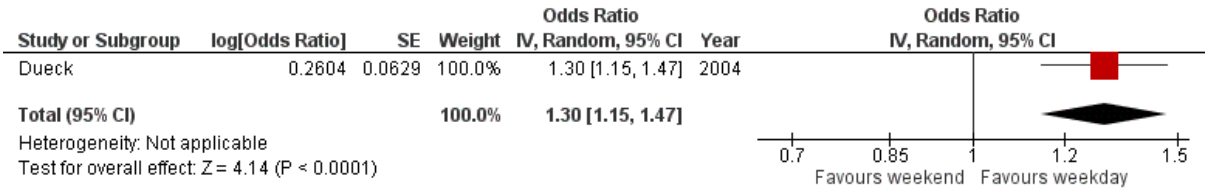
Methods:
Literature review was conducted in accordance with PRISMA guidelines. The prognostic factor of interest was weekend admission. The primary outcome of interest was perioperative mortality, with secondary outcome being hospital length of stay. Random-effects meta-analysis was performed with results reported as summary OR and 95% CI. Meta-analyses were also conducted of risk-adjusted comparative observational studies using the inverse-variance method.

Results:
Thirteen observational cohort studies comprising of a minimum of 91,118 patients were eligible. Patients presenting on a weekend had a significantly higher risk of adjusted in-hospital (OR 1.16, 95% CI 1.09-1.23, p<.00001), adjusted 30-day (OR 1.30, 95% CI 1.15-1.47, p<.0001) and adjusted 90-day mortality (OR 1.16, 95% CI 1.04-1.29, p=.008), with a significantly higher risk of combined in-hospital, 30-day and 90-day mortality evident (OR 1.18, 95% CI 1.10-1.27, p<.00001). Hospital length of stay was not statistically different between the groups.

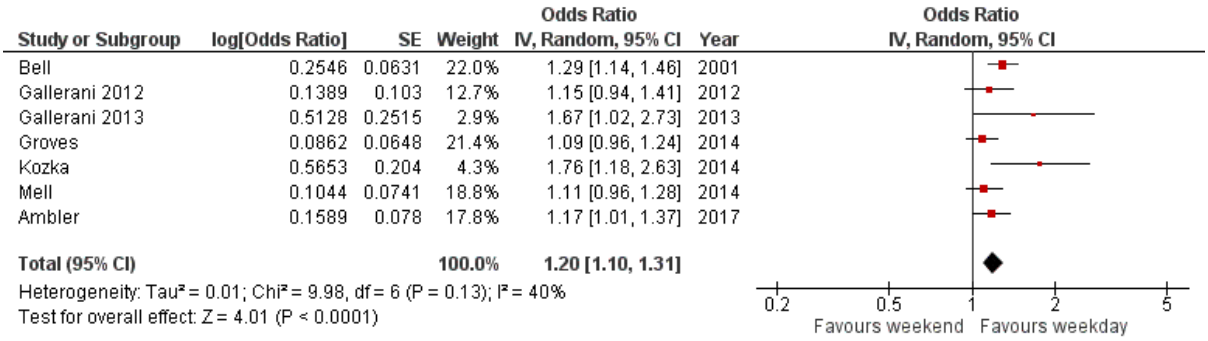
Conclusion:
There is a significant association between weekend admission and higher mortality in patients presenting with ruptured abdominal aortic aneurysms.



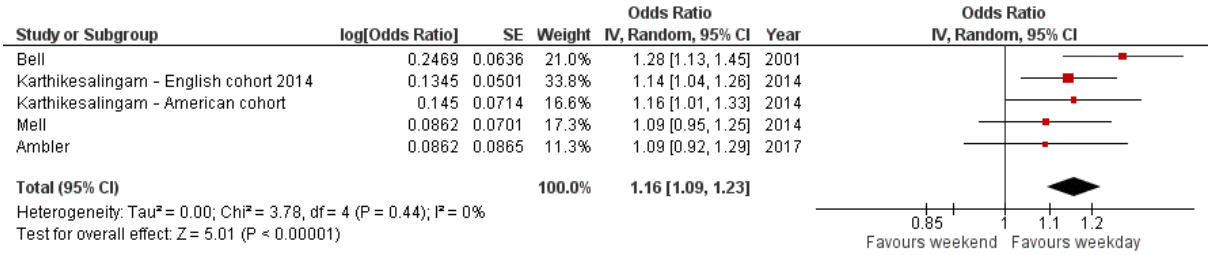
a. 30-day mortality



b. Adjusted 30-day mortality



c. In-hospital mortality



d. Adjusted in-hospital mortality

O58

Integrated Plasma and Tissue Proteomics Reveals Attractin Release by Intraluminal Thrombus of Abdominal Aortic Aneurysms
and Improves Aneurysm Growth Prediction in Humans

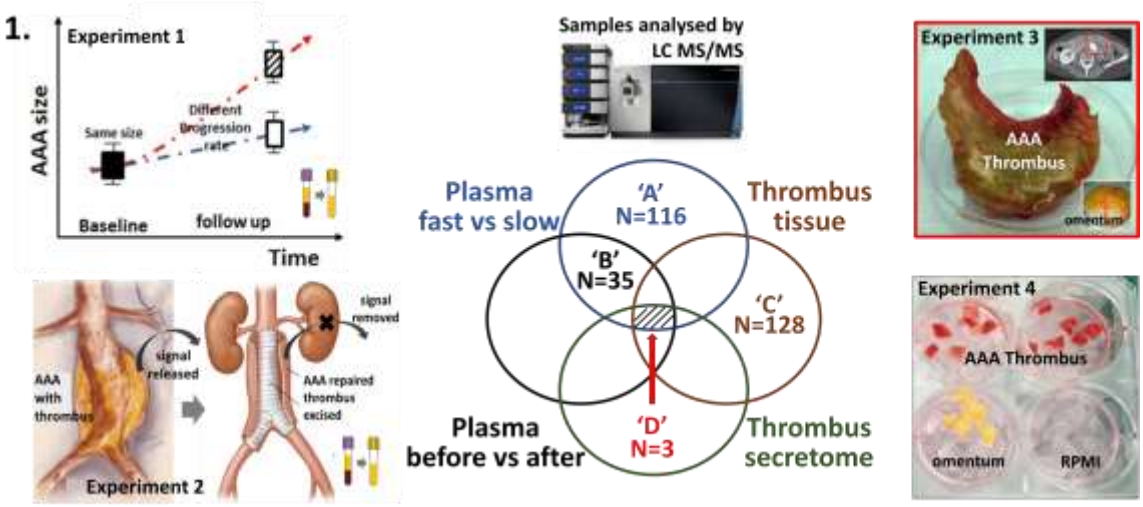
Dr Regent Lee[1], Dr Ismail Cassimjee[1], Mr Pierfrancesco Lapolla[1], Dr Honglei Huang[1], Dr Philip Charles[1], Mr Anirudh Chandrashekar[1], Dr Elisha Ngetich[1], Professor Benedikt Kessler[1], Prof Roman Fischer[1], Prof Ashok Handa[1]
[1]*University of Oxford, Headington, United Kingdom*

Background
Biomarkers of AAA growth is a priority for research. Here we applied a mass spectrometry proteomics pipeline to discover biomarkers for AAA growth prediction.

Methods
Plasma samples were collected at baseline (n=62). AAA growth was recorded at 12 months. In Experiment_1, plasma samples from the fastest and slowest growth patients (n=10 each) were compared. In Experiment_2, plasma samples were collected before and at 10-12 weeks after surgery (n=29). In Experiment_3, paired ILT and omental biopsies were collected during AAA repair (n=3). In Experiment_4, tissue secretome was obtained from ex-vivo culture of paired tissue. We applied a LC-MS/MS workflow to discover novel biomarkers.

Results
We discovered 3 proteins that were: (i) present in ILT; (ii) released by ILT; (iii) reduced in circulation after surgery; (iv) differs between fast and slow growth AAAs. One of these is Attractin. Plasma Attractin correlates strongly with future AAA growth (Spearman r=0.35, P<0.005). Using Attractin and AAA diameter, the AUROC for predicting no growth and fast growth of AAA at 12 months is 85% and 76%.

Conclusion
We show that ILT releases mediators during the natural history of AAA growth. These are novel biomarkers for AAA growth prediction in humans.



O59

Working towards a core outcome set for intact abdominal aortic aneurysm repair, a systematic review of outcomes reported in the literature.

Dr Matthew Machin[1], Dr Pinar Ulug[1], Dr Kamashi Pandirajan[2], Professor Matthew J Bown[2], Professor Janet T Powell[1]

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Background

A core outcome set for abdominal aortic aneurysm (AAA) repair could ensure the representation of all stakeholders and facilitate evidence synthesis.

Methods

PRISMA compliant systematic review with publicly-available protocols (CRD42019130119, COMET-1582). Online databases MEDLINE and EMBASE were searched until 16/06/2020. Included articles, published 2010-2019, reported outcomes by time after intact AAA repair of >100 patients. Outcomes were coded according to COMET taxonomy with further subdivision of vascular outcomes.

Results

From 1640 titles, 231 eligible articles for intact AAA repair were identified including 589255 participants from 13 randomised trials, 10 prospective and 119 retrospective studies. The three most common prespecified outcomes were mortality (181), vascular (137) and further intervention (52): whereas quality of life and costs were listed in ≤15 and 24 reports respectively. Prespecified outcomes varied by time, study design and type of repair, with patient functioning most likely to be reported in RCTs and vascular outcomes (principally endoleak, sac regression and secondary rupture) dominating outcomes at ≥1 year after EVAR.

Conclusion

This review highlights disproportionate emphasis on clinical outcomes, especially vascular outcomes post-EVAR versus patient-functioning or resource outcomes. These data will inform focus groups prior to a pan-European Delphi consensus in development of core outcomes for AAA repair.

O60

A comparative economic analysis of the GORE® EXCLUDER® AAA Endoprosthesis versus competitive grafts: Real world data from two prospective observational multicentre registries.

Dr. Frank O'Neill[1], Mr. Mitesh Nakum[1], Dr. Hillary Alberta[2], Mr Randall Ankera[2], Dr. Matthew Waltham[1]
[1]W.L. Gore and Associates, Livingston, United Kingdom, [2]W.L. Gore and Associates, Flagstaff, United States

Introduction: The GORE® EXCLUDER® AAA Endoprosthesis (EXC) is used for Endovascular aneurysm repair (EVAR) of abdominal aneurysms. The Global Registry for Endovascular Aortic Treatment (GREAT) is an industry sponsored large prospective registry which may provide the gold standard for economic comparisons of EVAR devices. This economic analysis aims to compare data from GREAT with similar real world registries.

Methods: Data was retrieved from (GREAT n=2330) and a single other registry (n=1262). A decision-tree model was developed to simulate economic outcomes at 1 month, through to 1 year from the UK perspective. Device related adverse events, resource utilisation and re-admissions were compared at 1 month and 1 year. Costing information was gathered from national tariffs, existing literature and expert consultation.

Results: EXC was cost-saving by £1,728 at one month and £1,019, through to one year compared to competition. Savings with EXC were driven by resource utilisation and reduced adverse events at 1 month and through to 1 year. The EXC device remained cost-saving in all sensitivity analysis.

Conclusion: EXC was cost saving compared to competitive devices using data from best available real world evidence. Economic modelling should consider prospective multi-centre registries to compare EVAR devices for decision making.

O61

Factors influencing formation and progression of Intraluminal prosthetic graft thrombus following Endovascular Aneurysm repair

Ms Terri-Ann Russell[1], Mr Sivaram Premnath[1], Dr Meera Mogan[1], Dr Grace Langdon[1], Dr Bronte Paice[1], Dr. James Kirk[1], Mr Tim Rowlands[1], Mr Ganesh Kuhan[1]
[1]Royal Derby Hospital, Derby, United Kingdom

Introduction:
Intraluminal prosthetic graft thrombus (IPT) following Endovascular Aneurysm repair (EVAR) can have serious consequences. The aim was to quantify the presence of IPT and to identify the risk factors for formation and progression.
Methods:
Prospective data on 258 patients who had EVAR from 2015 to 2018 were available. Demographic data, comorbidities, operative data, antithrombotic therapy, CT anatomical data, morphology of IPT (site, density, stenosis, progression), reinterventions were collected. Logistic regression analysis and Chi squared test were done for analysis.
Results:
The mean age was 76 years (range 55-95) and 27 (10.5 %) were females. IPT was present in 26 patients (10.1%) with a median occurrence of 6.23 (range 1-24) months. Six patients (23.1 %) developed symptoms and 2 (7.7%) patients had reinterventions. Peripheral arterial disease (PAD) was a significant risk factor for formation (p = 0.003, OR= 7.435 (CI 1.56 – 35.28)) and progression of IPT (p=0 .047, OR= 1.33 (CI .96 – 1.84)). Escalation of antithrombotic therapy was associated with improvement of IPT (p=0 .006, OR= .083 (CI .012 – .568).
Conclusion:
IPT after EVAR warrants prompt escalation of antithrombotic therapy to prevent further progression and complications. PAD is a risk factor for formation and progression of IPT.

O62

The effect of metformin on acute aortic events and death in patients with abdominal aortic aneurysms in England; a population-based cohort study

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[1]*Imperial College London, London, United Kingdom*

Introduction:
We have undertaken a population-based cohort study to examine the association between metformin treatment status and health outcomes amongst patients with abdominal aortic aneurysms in England.

Methods:
Patients with a diagnosis of an abdominal aortic aneurysm from 2006 to 2016 were identified using linked records from the Clinical Practice Research Datalink, Hospital Episode Statistics and Office of National Statistics databases. A Cox proportional hazards model with time dependent covariates was fitted to model time to either an acute aortic event or death.

Results:
6749 patients (77% male, mean age of 82 years old) were identified, of which 369 patients were prescribed metformin. Patients are 26% (HR 1.26 (95% CI: 1.09-1.46)) more likely to suffer from either an acute aortic event or death compared to patients who are treated with metformin. However, this protective effect is not conferred to diabetic patients who are not prescribed metformin (HR 1.03 (95% CI: 0.74-1.60)). In fact, in the absence of metformin, being either diabetic or non-diabetic conferred a protective effect on outcomes when compared (HR 0.89 (95% CI: 0.61-1.17)).

Conclusion:
Metformin has a protective association in patients with abdominal aortic aneurysms with regards to acute aortic events and death, irrespective of diabetic status.

O63

Mid-term outcomes of endovascular aneurysm sealing with chimney grafts: Migration, sac expansion and proximal type 1 endoleaks as modes of failure

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[1]St George's Vascular Institute, London, UK

Introduction

Endovascular aneurysm sealing with chimney grafts (ChEVAS) has been used as an off-the-shelf option in the treatment of juxta- and suprarenal aneurysms that are unsuitable for open repair or custom-made stents.

Methods

All primary ChEVAS cases undertaken at this unit have been included in this study. Detailed pre-, peri- and postoperative data were collected for each patient. Therapeutic failure is a composite of type 1a or 1b endoleak, sac expansion > 5 mm, stent-graft migration > 5mm or secondary rupture.

Results

70 patients with a median age of 73.6 years (77.8% male) underwent ChEVAS. 33 cases used a single chimney, 24 used 2 and 13 used 3. The mean aneurysm diameter was 63 mm. Median follow-up is 4.0 years. The figure shows estimates of freedom from complications. No significant differences were seen in any outcome measures with respect to the number of chimney grafts deployed.

Conclusion

Outcomes following treatment of complex aneurysms with ChEVAS have not met expectations following the promising early results. Incidence of therapeutic failure beyond 2-3 years of follow-up has been high and closely mirrors that of infrarenal EVAS. As such, serious consideration must be given prior to the off-label use of this device.

	Kaplan-Meier Survival Estimate (years of follow-up)						
	0	**1**	**2**	**3**	**4**	**5**	**6**
Therapeutic failure	100	96.6	86.1	71	66.6	62.7	62.7
Migration	100	100	94.8	85.2	80.8	80.8	60.6
Sac expansion	100	100	93	85.2	78.3	74.4	74.7
Secondary rupture	100	100	98.2	96.3	94.2	87.9	87.9
Type 1a endoleak	100	96.6	93.1	87.3	82.9	79.2	79.2
Type 1b endoleak	100	100	100	96.2	96.2	96.2	96.2
Reintervention	100	88.6	85.1	83	83	74	74

All-cause mortality	100	84.3	78.6	69.6	63.3	52.1	41.7
Aneurysm-related mortality	100	92.9	89.6	86.2	84.3	84.3	84.3

O64

Haemodynamic consequences of false lumen thrombus morphology in type B aortic dissections

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Introduction

Partial thrombosis of the false lumen is poorly defined and the clinical implication of different thrombus configurations is uncertain. We aim to investigate the haemodynamic consequences of false lumen thrombus morphologies on aorta-related outcomes following type B aortic dissection.

Methods

High-resolution three-dimensional aortic models were constructed from admission computed tomography angiography of 69 patients with acute type B aortic dissection. False lumen thrombus morphology was categorised as either minimal, proximal, distal or extensive thrombosis. Cyclical blood flow was simulated using computational fluid dynamic techniques through aortic models to calculate haemodynamic metrics. False lumen pressure relative to the true lumen was compared with thrombus morphology and aortic complications.

Results

Proximal thrombosis was associated with reduced false lumen pressure compared to distal thrombosis (Table). False lumen pressure was higher in patients with complicated aortic dissection compared to those with uncomplicated disease (pressure difference, mmHg±SD: -0.66±8.42 vs -6.34±13.42, p=0.028). Proximal thrombosis appeared protective from aortic rupture, repair or death in an adjusted Cox survival analysis (HR 0.28, 95%CI:0.11-0.69, p=0.005).

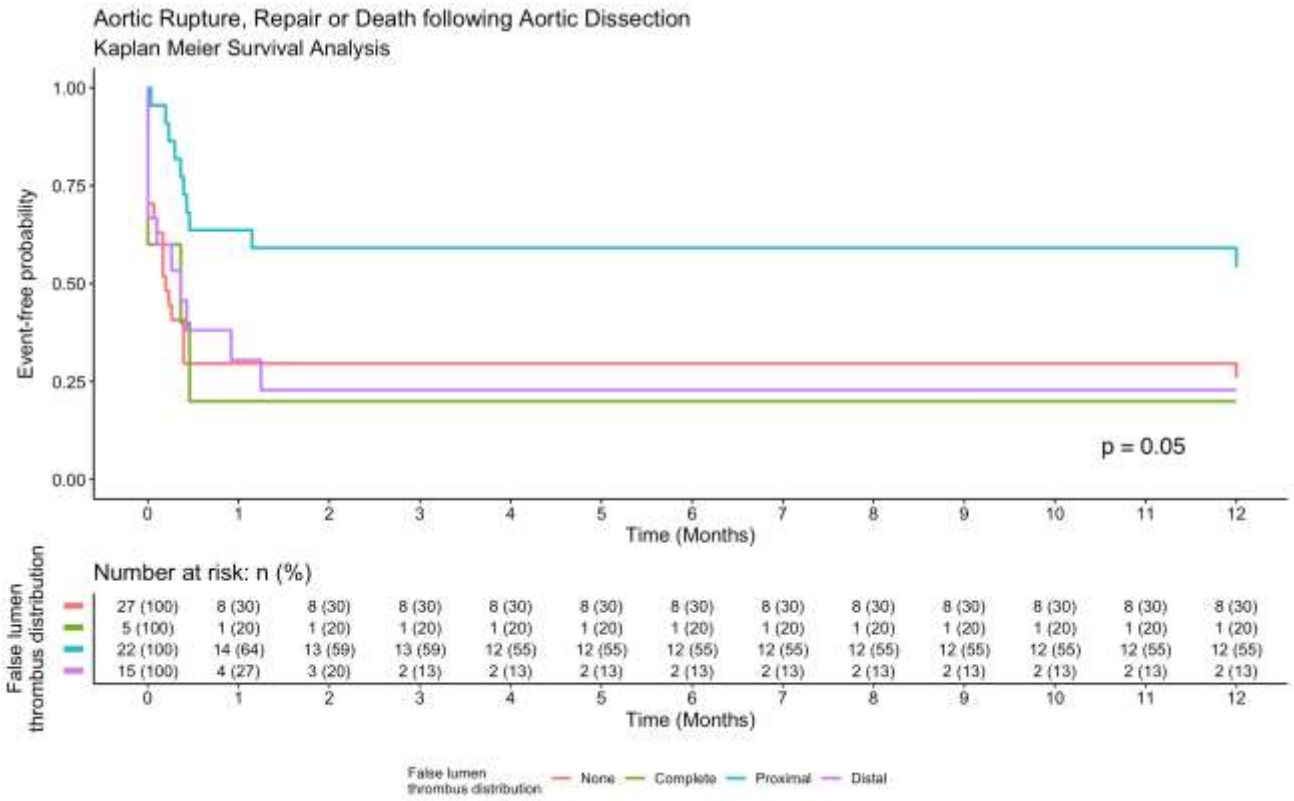
Conclusion

Proximal thrombosis of the false lumen was associated with a drop in false lumen pressure relative to the true lumen. Patients with proximal thrombosis were less likely to experience adverse aortic events.

Table: Pressure difference between true and false lumen of patients with type B aortic dissection. *p < 0.05

	False lumen pressure difference (mean mmHg±SD)	**Survival Analysis**		
		Hazard Ratio	**95% Confidence Interval**	**p**
No false lumen thrombosis	-0.6 ± 5.8	-	-	-

Proximal false lumen thrombosis	-9.4 ± 14.2*	0.28	0.11 – 0.69	0.005*
Distal false lumen thrombosis	+3.4 ± 6.1	0.69	0.28 – 1.72	0.436
Extensive false lumen thrombosis	-2.6 ± 5.8	0.45	0.12 – 1.77	0.256



O65

18F-Sodium Fluoride positron emission tomography / computed tomography in acute aortic syndrome

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Introduction

Fluorine-18 Sodium Fluoride positron emission tomography/computed tomography (18F-NaF PET/CT) is a multimodality imaging technique that detects aortic degeneration. This study characterises 18F-NaF PET/CT findings in patients with acute aortic syndrome.

Methods

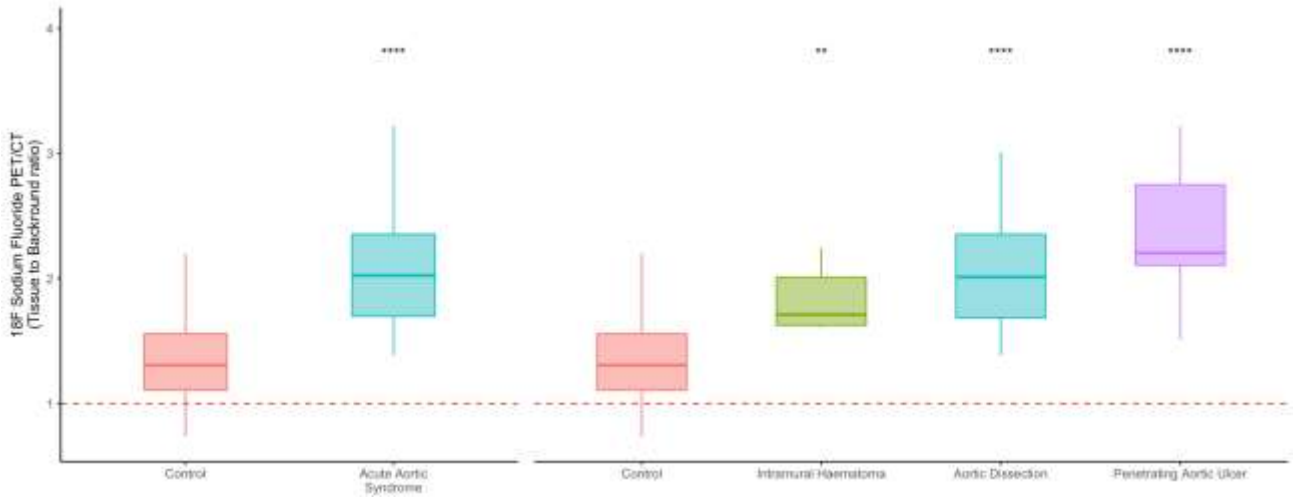
Fifty-six patients with intramural haematomas, aortic dissections or penetrating aortic ulcers and 20 controls underwent 18F-NaF PET/CT. Radiotracer binding was corrected for background blood-pool activity to obtain a tissue-to-background ratio (TBR). Preliminary follow-up was performed over 3 to 12 months for aortic-repair, -readmission or -death.

Results

Patients with acute aortic syndrome had increased 18F-NaF binding compared to control subjects (TBR±SD 2.08±0.46vs1.36±0.39, p<0.001). Individuals with untreated Type B acute aortic syndrome had peak radiotracer binding at the site of intimal disruption compared to proximal aorta (TBR±SD 1.74±0.60vs1.27±0.33 respectively; p<0.001). 18F-NaF binding was increased in larger diameter aortas (p=0.0395). Adverse aortic events occurred in 11 patients on preliminary follow-up, 8 (72%) of which had a stronger 18F-NaF PET/CT signal than the group median.

Conclusion

This proof-of-concept study provides the first description of 18F-NaF PET/CT in patients with acute aortic syndrome. Individuals with acute aortic syndrome had increased radiotracer binding compared to healthy controls. Preliminary follow-up suggests patients that experience adverse aortic events also have increased 18F-NaF PET binding.



O66

The role of cardiopulmonary exercise testing (CPET) as a predictor of mortality in patients turned down for AAA repair

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Introduction:
CPET-derived threshold variables have been correlated with postoperative survival in patients with AAA, but little is reported in patients turned down for surgical intervention. We assessed the validity of CPET variables in predicting mortality in this group.

Methods:
A retrospective observational study of all AAA patients that underwent CPET testing, with a special focus on the turndown group, in a regional vascular centre over 6 years. Patient demographics, CPET-variables, AAA size and date of death were recorded.

Results:
455 patients underwent CPET testing, 126 were turned down. Average follow-up was 41 months. Turndown mortality was 15.1%, 29.4%, and 64.3% at 1, 2 and 3 years respectively. CPET variable groups highly correlated with reduced survival in the whole cohort: VO2 peak ($t = 4.51$, $p < 0.001$), VE/VCO2 ($t = 2.92$, $p = 0.004$), and AT ($t = 3.30$, $p = 0.001$), but no parameter was significant in the turndown group except for a higher VO2 peak at 60 months in those who survived ($t = 2.37$, $p = 0.02$).

Conclusion
CPET variables correlate well with AAA patient overall survival and can help in decision making especially in borderline cases. Only VO2 peak seems to correlate to long-term survival in turndown patients.

O67

Ethical and practical difficulties in relation to life-saving major amputation during the coronavirus pandemic.

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BACKGROUND
We encountered superadded difficulties while treating acute presentations of non-viable lower limbs during the UK's Covid-19 national lockdown in early 2020.

METHODS
1. Selective evaluation of five patients considered for life-saving emergency major amputation during April to June 2020 at two vascular centres.
2. Analysis of difficulties affecting related decision-making and treatment in the context of Covid-19.

RESULTS (Table 1).
1. Diagnostic difficulty regarding the specific cause of severe deterioration affected the care of 4 patients.
2. Findings from recent publications about post-operative exacerbation of covid-19 infection influenced the management of 5 patients.
3. Two patients who were turned down for major amputation died within 48 hours thereafter.
4. Family members of one patient were invited into hospital despite the visiting ban, which helped reverse initial refusal of consent for emergency major amputation.
5. Inability of close relatives to attend in person rendered complex ethical decision-making more challenging with two patients.
6. Three ASA-5 Covid-19 positive patients who were offered emergency transfemoral amputations survived and were discharged.

CONCLUSIONS
1. Coronavirus restrictions and complications confer additional challenges in caring for patients with acutely non-viable lower limbs.
2. It is meaningful to pursue emergency transfemoral amputations in moribund Covid-19 positive patients.

TABLE 1	**ESCALATION:**	**LOGISTICAL:**	**ETHICAL:**	**OUTCOME**
DIAGNOSTIC: Uncertain if deterioration due to chest or dead leg	**Concern about post-surgical exacerbation of Covid-19**			
Pt1 ASA5	Yes	Yes	Language barrier + family secluded by lockdown	No	Stump healed, Discharged

Pt2 ASA4	Yes	Yes	Family unable to help clarify consent	Appeared to withdraw consent when confused	Died <48 hours after op cancelled
Pt3 ASA5	Yes	Yes	No	No	Stump healed, Discharged
Pt4 ASA5	No	Yes	Missed diagnosis due to Covid-19 restrictions	No	Stump healed, Discharged
Pt5 ASA4	Yes	Yes	No	Affected limb already non-functional post-CVA	Died <36 hours after op cancelled

ASA: American Society of Anaesthesiologists preoperative grading
CVA: Cerebrovascular accident

O68

An incomplete Circle of Willis (COW) does not predict the need for a shunt during carotid endarterectomy (CEA)

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Introduction:
COW completeness is variable and may influence cerebral cross perfusion during CEA cross clamping. Shunt insertion aims to reduce cerebral hypoperfusion and perioperative stroke. Often, however, during regional anaesthesia CEA it is not needed and insertion increased operative complexity. This study determines if assessment of the completeness of the COW could predict shunt requirement during CEA.

Methods.
In a retrospective review of patients undergoing CEA under regional block between 2017 and 2019, where a shunt is only used if there is altered neurology on cross clamping, the need for a perioperative shunt was compared with the completeness of the COW on pre-operative CT angiograms. Cases converted from regional to general anaesthesia before carotid cross-clamping and those with incomplete operative details or imaging were excluded.

Results
74 appropriate patients were identified (age 76y range 42-90 years, 25 female). During CEA, 14 shunts were placed of which 5 (35.7%) had an incomplete COW on imaging. In the 60 cases were a shunt was not used, 12 had an incomplete COW (20%) (p=0.2). Shunt use was also not influenced by age, sex or extent of stroke.

Conclusions
Completeness of the COW does not predict the need to use a CEA perioperative shunt.

O69

Carotid plaque volume relates to plaque instability

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Introduction: Stroke secondary to carotid artery disease is embolic and those with asymptomatic disease carry an annual stroke risk of <2%. Given carotid plaque volume (CPV) has been shown to be significantly increased in patients with recent symptoms of cerebral ischaemia we explored the relationship between CPV and histological markers of plaque instability.
Methods: Patients undergoing a primary carotid endarterectomy had their plaques removed en-bloc to calculate CPV by Archimedes' principle and then histologically assessed according to the American Heart Association. Plasma was taken for determination of Lp-PLA2, Hs-CRP and P-selectin levels.
Results: Mean (sd) CPV was significantly increased in patients with symptomatic disease (0.91(0.35)cm3 vs 0.72(0.31)cm3, p=0.012) as well as males, those diagnosed with hypercholesterolaemia, and those who had suffered a previous episode of cerebral ischaemia. Mean (sd) CPV was significantly increased in those with unstable plaques (0.90(0.34)cm3 vs 0.71(0.26)cm3, p=0.004). Mean (sd) Lp-PLA2 was significantly increased in patients with marked plaque inflammation (141.2(45) ng/ml vs 105.3(20.4) ng/ml, p=0.001), and in those with an unstable plaque.
Conclusion: CPV is associated with plaque instability and symptomatic status. These findings further evidence the potential for CPV to serve as an indicator for carotid intervention in the future

O70

Factors associated with delays in revascularisation in patients with chronic limb-threatening ischaemia – a National Vascular Registry cohort study

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Introduction

To improve the timeliness of revascularisation, patients admitted as emergencies with chronic limb-threatening ischaemia (CLTI) should receive revascularisation within 5 days[1]. The aim of this study was to identify factors affecting the timing of intervention for this patient group.

Methods

All patients admitted non-electively with CLTI who underwent bypass or angioplasty between January 2016 and December 2019 were extracted from the National Vascular Registry (NVR). Multivariate Poisson regression was used to examine the association between time-to-revascularisation and patient and admission characteristics.

Results

The study analysed information on 11,626 patients (5,841 open, 5,785 endovascular interventions). Median admission-to-intervention time was 5 days (IQR 2-9). Factors associated with delayed revascularisation were the day of admission, open surgery (compared to angioplasty), Fontaine IV, presenting problem and increased comorbidity burden (Figure). Patients admitted later in the week were less likely to be revascularised within 5-days than those admitted on Sundays and Mondays (Table). Approximately 60% of patients admitted on Sunday and Monday were revascularised within 5 days, compared to 46% on Wednesday.

Conclusion

We have identified several factors associated with delays in time to revascularisation. These represent valuable targets on which to focus in the implementation and assessment of quality improvement for CLTI.

Reference

1. A Best Practice Clinical Care Pathway for Peripheral Arterial Disease. Vascular Society of Great Britain and Ireland; 2019.

Variable	Waiting more than 5 days		aIRR	95% CI	p-value
	n	%			
Day of admission					**<0.001**
Sunday	263	38.5	1	-	
Monday	873	40.9	1.07	0.96-1.19	
Tuesday	1 124	53.7	1.40	1.26-1.55	
Wednesday	1 104	54.4	1.41	1.27-1.56	
Thursday	1 059	52.4	1.35	1.22-1.50	
Friday	984	50.9	1.32	1.19-1.47	
Saturday	358	49.1	1.26	1.12-1.42	
No of comorbidities					**<0.001**
0-1	2 719	45.9	1	-	
2	1 753	51.8	1.11	1.06-1.16	
3 or more	1 293	55.8	1.19	1.14-1.25	
Fontaine score					**<0.001**
III	1 297	43.5	1	-	
IV	4 468	51.7	1.13	1.08-1.19	
Presenting problem					**<0.001**
Chronic ischaemia	2 435	46.2	1	-	
Neuropathy	35	41.7	0.96	0.75-1.24	
Tissue loss	2 844	51.9	1.07	1.03-1.12	
Uncontrolled infection	451	56.9	1.18	1.10-1.26	
Procedure					**0.019**
Bypass	2 902	49.7	1	-	
Angioplasty	2 863	49.5	0.95	0.92-0.99	

Table. Factors associated with waiting more than 5 days from admission to revascularization. Frequency (n) and percentage (%) are given compared to the group that was revascularised within 5 days. The adjusted incidence rate ratio (aIRR) of waiting more than 5 days, 95% Confidence Intervals (95% CI) and p-values are estimated using Poisson regression analysis

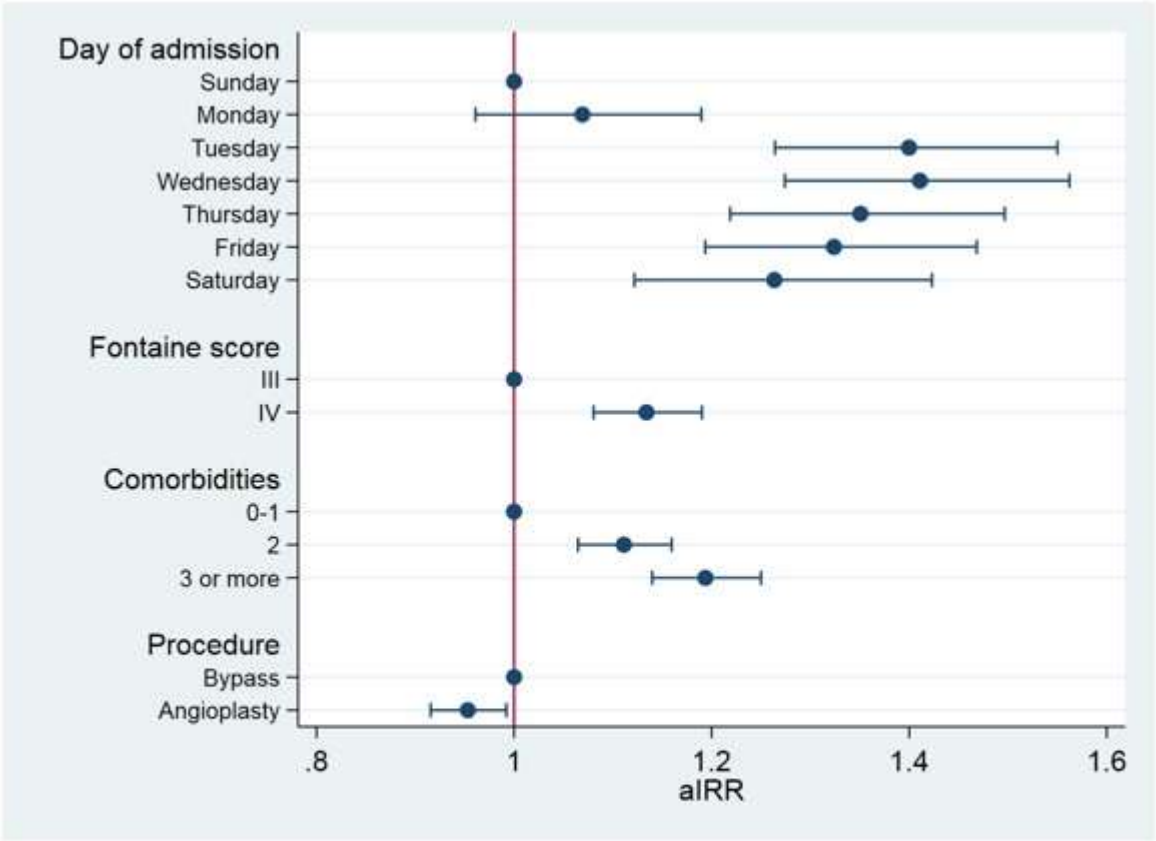

Figure. Adjusted incident rate ratios (aIRR) of waiting longer than 5 days from admission to revascularisation. Data points represent aIRR and ranges 95% confidence intervals using Sunday, Fontaine score III, 0-1 comorbidities and bypass as reference categories

O71

A double-blind, placebo-controlled, randomised trial of extracorporeal shockwave therapy as a novel treatment for intermittent claudication.

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Background: Intermittent claudication (IC) is a prevalent manifestation of peripheral arterial disease and affects about 3% of the UK population. Pilot data has demonstrated that Extracorporeal ShockWave Therapy (ESWT) is effective for improving walking distance in patients with IC. This study aims to consider its effectiveness for improving quality of life (QoL).

Methods: In a double-blind, sham-controlled, randomised trial, patients with IC were randomised in a 1:1 ratio to ESWT or sham treatment. The primary endpoint was change in physical functioning at 12-week follow-up, as measured by the SF-36 QoL questionnaire. Secondary endpoints included changes in walking distances.

Results: 138 patients were randomised. The ESWT group had a significantly higher physical functioning score at 12 weeks (Mdn 41 vs 34, z=-2.1, p=0.033). They also had significantly longer claudication (Mdn 125 vs 88, z=-2.9, p=0.004) and maximum (Mdn 179 vs 129, z=-2.4, p=0.013) walking distances. The change from baseline to 12-weeks was also significantly greater in the ESWT group for claudication (Mdn 51 vs 24, z=-2.8, p<0.01) and maximum (Mdn 63 vs 17, z=-4 p<0.01) walking distance.

Conclusion: This study demonstrates that ESWT is clinically effective for improving QoL and walking distances in patients with lower limb IC.

O72

Specialty specific frailty score predicts long term mortality in patients undergoing open lower limb revascularisation

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The predictive value of assessing frailty in vascular surgery will become an integral part of patient selection. We analysed the value of a speciality specific frailty instrument in determining the outcome of patients undergoing open lower limb surgical revascularisation (OLLSR).

We performed a retrospective review of a consecutive series of patients who underwent OLLSR (01/15 – 12/16). Demographics, indication for treatment and markers of frailty were collected. Frailty was assessed using the previously validated Longer term Addenbrookes Vascular Frailty Score (LAVFS). The primary outcome was long term mortality with a data collection end date of 1/1/20. Multivariate analysis was performed.

261 patients (196 men; median age 68 years) were included with a median follow up of 47 months. 60 patients underwent suprainguinal revascularisation and the indication for intervention was CLTI 142, Claudication 104, popliteal aneurysm 15. In total, 61 patients died during the follow up period. Anaemia, polypharmacy and the requirement for an emergency admission were significant predictors of mortality ($p<0.001$). Overall, the LAVFS predicted long term mortality rates ($p<0.001$).

The LAVFS is a predictor of long-term mortality in patients undergoing OLLSR. The tool shows promise for routine use but will require further prospective evaluation.

O73

Infrapopliteal atherosclerosis and mortality risk in patient with diabetes mellitus.

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Objective
Extensive infrapopliteal atherosclerosis in patients with diabetes mellitus (DM) is associated with poor limb outcomes. This study evaluates the mortality risk in this patient cohort.

Methods
The burden of infrapopliteal atherosclerosis was determined using the Bollinger score in a consecutive series of patients with DM undergoing a lower limb arterial duplex . Patient demographic data was collated. Comparisons were made across tertile groups for the infrapopliteal (IP) Bollinger score. The outcome measure was all cause mortality.

Results
A total of 276 patients were included (median age 74 years). The overall median follow up period was 118 months. Of these, 201 patients reached the outcome measure. Median Bollinger scores across the tertiles was T1 45 (41-55.5), T2 24 (21-30), T3 3 (0-15). Significant difference was seen in long term mortality 85.3%, 73.7% and 62.5% across tertiles. Significance occurred across the tertiles for age (older in T1) and renal function. No difference was seen with regard to IHD and statin / antiplatelet prescription.

Conclusion
Poorer long-term outcomes occur in those patients with DM who have greater burden of IP atherosclerosis. Appropriate identification of these at-risk patients early in their disease process is required to put in place interventions to reduce risk.

O74

Does enrolment in a duplex surveillance programme affect outcomes in patients undergoing superficial femoral artery (SFA) stent insertion?

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Introduction

Despite weak evidence, duplex surveillance (DUS) following infrainguinal vein bypass is common practice. SFA stents are increasingly being used and commonly undergo surveillance but with no evidence to back up this practice.

Methods

We retrospectively reviewed our series of patients undergoing SFA stenting with 2 year follow up. Demographics, treatment indication and enrolment into a surveillance programme were recorded. The primary outcomes were mortality and limb loss.

Results

100 patients were analysed (76 men; median age 75 yrs). 58 patients underwent DUS (SURV group – 45 men; median age 75yrs) and 42 patients did not enrol for DUS (NSURV group – 31 men; median age 76 yrs). 16 SURV and 14 NSURV patients had an indication for stenting of chronic limb threatening ischaemia. The median number of DUS in the SURV group was 3. There was a significant difference in the number of post stent interventions (44 in SURV and 5 in NSURV group; $p<0.001$ Chi squared test). There was no significant difference in mortality (24% vs 33%) or limb loss (1.7% v 7.1%) rate between SURV and NSURV groups respectively.

Discussion

DUS consumes significant resource without obvious patient benefit. The role of DUS post SFA stent needs defining.

O75

Clinician perspectives of through knee amputation

Miss Hayley Crane[1], Dr Maureen Twiddy[2], Mr Dan Carradice[1], Mr George Smith[1]
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Introduction
Through-knee amputation (TKA) is an alternative to above-knee amputation (AKA), but remains infrequently used.
This study aimed to explore experiences and perceptions of TKA from specialist clinicians in amputee rehabilitation.

Methods
An online survey was sent to members of the British Association of Chartered Physiotherapists in Amputee Rehabilitation, the Scottish Physiotherapy Amputee Research Group, and the British Association of Prosthetists and Orthotists. Face to face and telephone follow-up interviews were completed to further explore themes.

Results
57 surveys were returned, qualitative interviews achieved good understanding of responses. Survey data indicates key advantages of TKA are stable sitting balance, and the potential to end weight-bear and self-suspend the prosthesis from the condyles. Criticisms of TKA are unsatisfactory cosmetic appearance and limited prosthetic componentry. Knee disarticulation was preferred to Gritti-Stokes.

Conclusion
Small numbers of patients with TKA are seen in UK rehabilitation services. From the point of view of rehabilitation and functional outcomes, TKA carries some significant benefits. It may be time for a randomised trial to compare outcomes following TKA and AKA.

O76

Peri-operative and long-term outcomes of bypass surgery(BS) vs primary major lower limb amputation(MLLA) for chronic limb threatening ischaemia(CLTI) in patients with infrainguinal disease.

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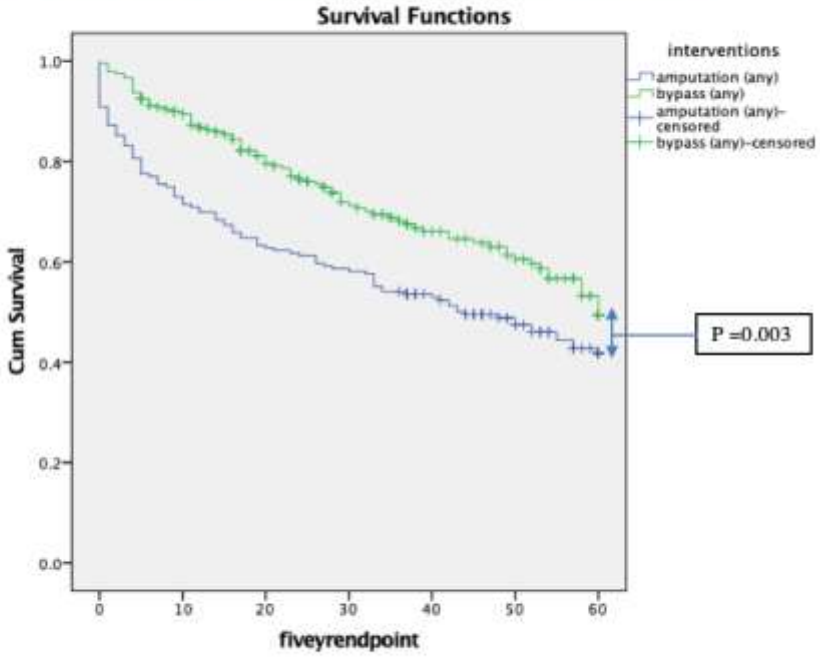
MLLA is assumed to have better survival outcomes than BS and is often selected in "high-risk" patients with CLTI. We studied the validity of these assumptions.

Registry data on patients with CLTI (2010-2019) that underwent either BS (n=240) or MLLA (n=196) were used to compare peri-operative and long-term outcomes.

MLLA group was more likely to have patients age>90 years (p=0.001), with ischaemic heart disease (p=0.024) and active smoking (p=0.016). Risk adjusted 30-day survival was greater in BS group; HR 4.3 (1.4-12.9; p=0.009). BS group demonstrated superior survival at 1 year (87% vs 71%; p<0.001), 2 years (76% vs 62%; p<0.001) and 5 years (53% vs 43%; P=0.003). Risk adjusted 5-year survival was significantly greater for BS group; HR 1.49 (1.1- 2.07; p>0.001) with a median survival advantage of 16 month.
Age >75 years, severe COPD, dialysis dependency and decompensated heart failure were predictors of poor long-term survival for both groups (p<0.01). Diabetes (p=0.003), tissue loss (p=0.024), graft failure (p=0.015) (for BS group) and active smoking (p=0.01), superadded sepsis (p=0.001), above knee amputation (p=0.001) (for MLLA group) predicted poor long-term survival respectively.

Even when adjusted for 'high risk' features, BS results in better peri-operative and long-term survival than MLLA in CLTI.

Figure - Patient survival estimates for patients undergoing infrainguinal bypass or primary major lower limb amputation for chronic limb threatening ischaemia



Months	0	12	24	36	48	60
At risk bypass	240	191	14	103	78	38
At risk ampt	196	137	120	105	74	47

O77

Only 6.8% of UK Vascular Centres offer a fully NICE-compliant supervised exercise programme: A national audit of supervised exercise provisions.

Mr Adam Haque[1], Professor Charles McCollum[1]
[1]*University Of Manchester, ,*

Supervised exercise training (SET) is first-line treatment for patients with peripheral arterial disease (PAD) presenting with intermittent claudication and has been shown to be clinically and cost-effective. NICE recommends 2 hours of SET per week for 12 weeks with exercises working the patient to maximal pain. Previous studies suggested that SET provisions are poor, but these suffered with low response rates and are now historical. The current provision of NICE-compliant SET across the UK is not known, nor are the reasons for its failure well described.

This national audit was based on a questionnaire sent to all UK Vascular Centres to delineate if they offered SET, whether it was NICE compliant and what the barriers to implementation were.

75.6% of centres responded. 45.8% were able to offer a SET service but only 35.6% to all of their patients. Only 6.8% of trusts offered a SET service that was fully NICE-compliant (figure). The most commonly reported barriers to SET were patient compliance, insufficient funding and lack of resource.

The provisions of SET are extremely poor across the UK, denying patients first-line treatment. Methods to overcome the barriers of SET need to be established to provide optimal therapy for patients with PAD.


Trust offers fully NICE compliant SET service for all patients
Trust offers fully NICE compliant SET service for some patients
Trust doesn't offer NICE compliant SET service

O78

Clinical frailty score and one-year outcomes in chronic limb threatening ischaemia

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Background:
Frailty is common in patients with chronic limb threatening ischaemia (CLTI), but its comparative associations with CLTI severity and outcomes are unknown.

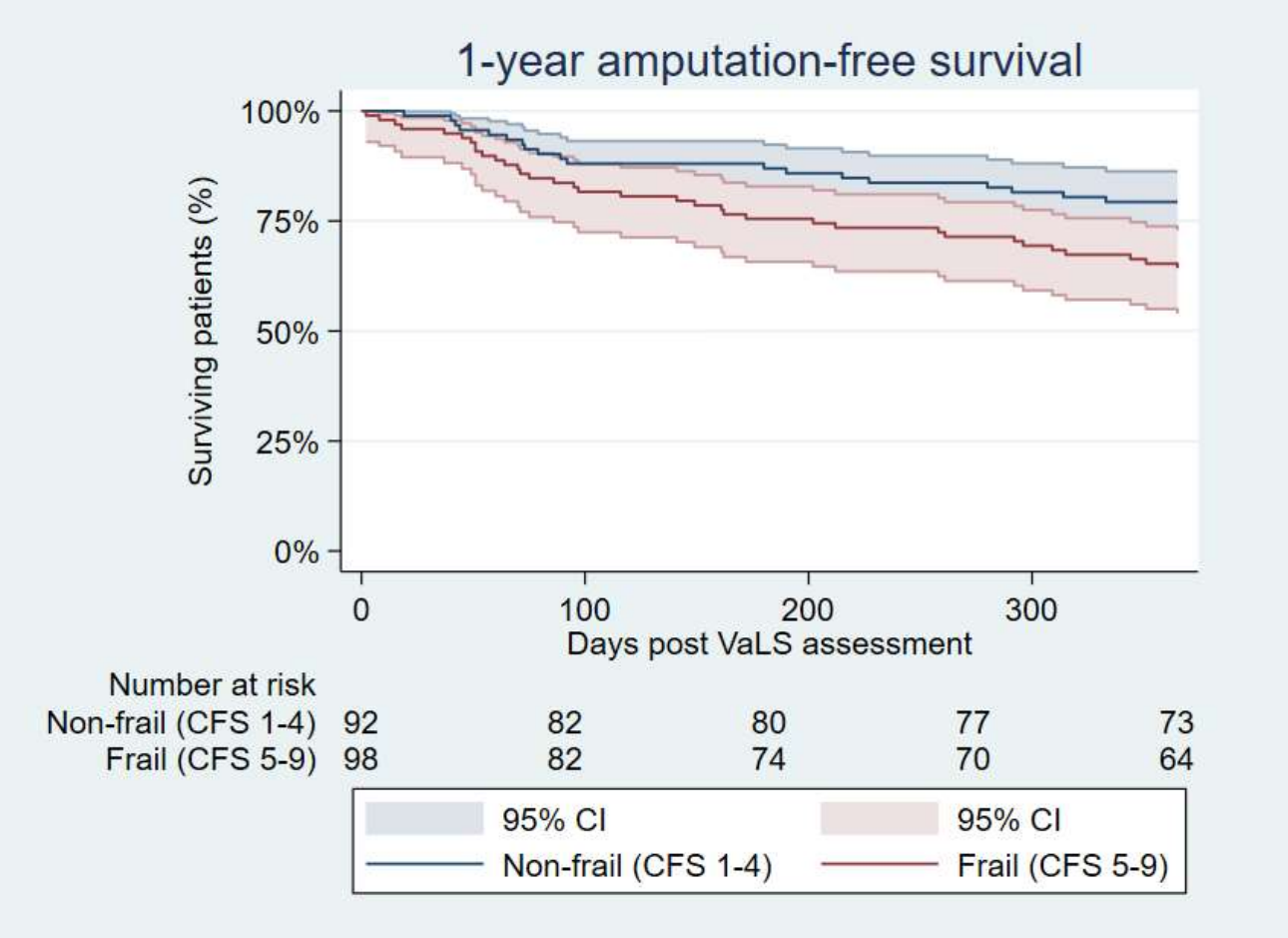
Methods:
Retrospective analysis of a prospective vascular limb salvage clinic database. Patients aged ≥50 presenting with CLTI between February 2018 – April 2019 were included. Frailty was measured using the Clinical Frailty Scale (CFS) and severity of CLTI by the Wound, Ischaemia, and foot Infection (WIfI) score. Primary outcome measure was one-year amputation-free survival (AFS). Associations with outcome were assessed using Cox regression and reported as hazards ratios (HR).

Results:
198 patients were included. 98 patients (52%) were frail (CFS ≥5). 127 patients (67%) initially underwent endovascular revascularisation. Frailty was associated with age, female sex, Charlson comorbidity index and increased WIfI stage. Frail patients were more frequently managed non-operatively.
Frailty (HR 1.94; 95%CI 1.11, 3.39) and increased WIfI stage (HR 1.56; 95%CI 1.19, 2.05) were associated with worse one-year AFS on univariable analysis. WIfI stage (HR 1.41; 95%CI 1.07, 1.86) but not frailty (HR 1.29; 95%CI 0.70, 2.38) were independently associated with lower AFS on multivariable analysis.

Conclusions:
Frailty is associated with CLTI severity and worse one-year outcome, however WIfI stage is a better predictor of AFS.

Non-frail (CFS 1-4) (N=92)		**Frail (CFS 5-9) (N=98)**	
Agea	70.4 (68.3-72.3)	77.0 (75.0-79.1)	P<.001
Female	22 (24%)	42 (43%)	P<.01
Diabetes	49 (53%)	67 (68%)	P<.05
CCIb	1 (1-2)	2 (1-3)	P<.001
Smoking status:	20 (22%)	30 (31%)	P<.05
Never	42 (46%)	52 (54%)	
Ex	30 (33%)	15 (15%)	
Current			
No. Medicationsa	7.1 (6.4-7.8)	9.4 (8.6-10.1)	P<.001
Excessive	19 (21%)	35 (34%)	P<.05
Polypharmacy (≥10 medications)			
ACB scoreb	1 (0-3)	2 (1-3)	P>.05

WIfI stage:	15 (17%)	16 (17%)	P<.05
1	39 (43%)	24 (25%)	
2	22 (24%)	25 (26%)	
3	14 (16%)	30 (32%)	
4			
Initial Management	64 (70%)	63 (64%)	P<.05
Endovascular	17 (18%)	8 (8%)	
Hybrid/Open surgery	0 (0%)	1 (1%)	
Primary Amputation	11 (12%)	26 (27%)	
Conservative			



O79

The impact of an integrated diabetic foot MDT clinic on time to intervention, limb salvage, amputation-free survival, and healthcare costs

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Introduction-Multidisciplinary diabetic-foot clinics (MDFC) are a key clinical-service. Since implementation, there has been little data on impact on time-to-intervention, limb-salvage, and healthcare costs.

Methods-All diabetic-patients with tissue-loss were identified in two populations: Oxfordshire (n724,850); 01/04/2015-31/03/2019, and the Oxford Vascular Study sub-population (n92,728). Patient demographics, time to specialist review+/-intervention, limb salvage, and healthcare-costs were analysed.

Results-Diabetic-patients with tissue-loss are at high-risk of major-amputation and mortality (43.4% and 29.2% at 5-years). Severity of ischaemia on admission, renal dysfunction, prior coronary disease, and age were independently associated with 1-year mortality (P<0.001). 5–year healthcare cost-analysis revealed that CLI in diabetic-patients has a mean healthcare-cost of £45,114, 95%CI:£33,709-£50,620; more expensive than MI and stroke,p<0.0001. Intervention increased cost, but major-amputation dwarfed all other predictors averaging £63,150 for above-knee-amputation.
Prior to MDFC formation (September-2017), median-time to specialist-review was 9 days, and inpatient stay (LOS) 11.5 days, equating to 5457 bed-days (NHS care-cost £1,091,400). Post MDFC implementation, specialist-review+/-intervention occurred <5 days,p<0.01, LOS 6.4 days,p<0.001, 1250 bed-days (cost-saving £841,400). Hospital appointments per-patient reduced from 4.2-2.6, cost-saving £68,370.

Conclusions-The implementation of an integrated MDFC resulted in tangible improvements in patient-care, outcome, and healthcare-costs. The costs of early aggressive intervention are off-set by the savings from reduced LOS and amputation-rates.

O80

Contemporary management of the acutely ischaemic limb in the endovascular era.

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Background
Open, endovascular surgery or hybrid techniques are used to treat acute limb ischaemia (ALI).The aim of this study was to analyse contemporary treatments and outcomes for ALI.

Methods
A prospectively maintained database of patients admitted with ALI between 2014-2019 was analysed. The primary outcomes were successful target lesion revascularisation(TLR),death and amputation.

Results
288 patients presented with ALI; 85%(n=244) had lower limb ischaemia (LLI) and 15% (n=44) upper limb ischaemia (ULI). The distribution of disease for LLI was aorto-iliac:14%, femoral:59%,popliteal:14%,multi-level in 13%.Medical treatment alone, or palliation, was the best treatment for 44% ULI and 27% of LLI.
In 180 patients with LLI, 9 patients required immediate amputation, remaining 171 patients underwent either open(47%), endovascular(30%) or hybrid(22%) revascularisation. No significant difference in TLR success between open(86%), endovascular (81%) and hybrid surgery(76%) respectively. The overall amputation rate was 20%(n=34) of which 47% were above knee. The 30-day mortality was7% with overall mortality of 35% within follow-up period.
24 patients with ULI,83% underwent open surgery with 95% TLR success. The 30-day mortality was 7% with overall mortality of 14%.

Conclusions
Over 50% of patients presenting with ALI are suitable for endovascular or hybrid surgery and technical success rates are comparable to open surgery.

O81

Fitting with a prosthesis following major lower limb amputation is associated with improved survival

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Introduction
Factors that may influence long-term survival following major lower limb amputation are incompletely understood. The aim of this study was to explore the effect of fitting with a prosthetic limb on survival following major limb amputation.

Method
Scottish Physiotherapist Amputee Research Group (SPARG) data were examined for major lower limb amputations performed within a single vascular service (2008-2010). Follow-up ended in 2020. The primary variable of interest was fitting with a prosthetic limb and the principle outcome measure survival.

Results
There were 370 patients discharged from hospital following major lower limb amputation – 197 patients successfully fitted with a prosthetic limb; 173 were discharged wheelchair dependent or bed-bound. Median follow-up was 1428 days, at the end of which 304 patients (82.2%) had died. There was a significant improvement in survival for patients who successfully limb-fitted ($p < 0.05$). Failure to limb-fit was the most significant predictor of reduced survival in statistical modelling (HR 3.091).

Conclusion
Failure to fit with a prosthetic limb is associated with reduced long-term survival. Cardiorespiratory function may decline more rapidly if a patient becomes wheelchair bound. Whether this is simply an association or a causative effect is unclear, but merits further investigation.

O82

Does deprivation affect the risk of mortality following major amputation for chronic limb-threatening ischaemia? A population-based cohort study utilising the Clinical Practice Research Datalink (CPRD)

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Introduction

The effects of deprivation on mortality following major amputation are unclear. We investigated the relationship between deprivation and mortality in patients undergoing major amputation for chronic limb-threatening ischaemia (CLTI).

Methods

A population-based cohort study utilising the CPRD was undertaken, including all patient undergoing major amputation for CLTI between 01/01/2000-31/12/2016. Patient-level data on local deprivation were measured using Index of Multiple Deprivation (IMD) quintiles. The primary outcome was 1-year all-cause mortality. Patients from least deprived areas (IMD 1) were compared to those from most deprived areas (IMD 5) using the chi-squared test and Cox's proportional hazard modelling. P<.05 was deemed significant.

Results

3258 patients were included of which 520 (16.0%) were from least deprived and 638 (19.6%) from most deprived areas. Comparisons of baseline characteristics are shown in Table 1, with a greater proportion of males and current smokers identified in the most deprived areas. 1-year post-amputation mortality was 35.2% (n=408). No difference in the risk of mortality was identified when comparing patients from most deprived to those in least deprived areas (HR 0.86, 95% CI 0.71-1.05, p=.134).

Conclusion

Although deprivation may affect lifestyle and health-seeking behaviours, this study indicates it doesn't affect the risk of mortality following major amputation.

Table 1

	IMD 1 (n=520)	IMD 5 (n=638)	
	n (%)	n (%)	p
Sex (male)	322 (61.9)	435 (68.2)	.026
Comorbidities			
Ischaemic heart disease	204 (39.2)	251 (39.3)	>.999
Diabetes mellitus	251 (48.3)	297 (46.6)	.560

Hypertension	367 (70.6)	404 (63.3)	.009
Medications			
Antiplatelet	254 (48.8)	321 (50.3)	.617
Lipid lowering agent	218 (41.9)	260 (40.8)	.689
Current smoker	57 (11.0)	159 (24.9)	<.001

O83

Eversion Endarterectomy for Occlusive External Iliac Artery Disease

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Background
Endovascular intervention lacks durable patency for external iliac artery (EIA) TASC C-D lesions. Aorto-femoral bypass reports superior long-term patency but is unsuitable in patients with significant co-morbidities. Eversion endarterectomy provides an alternative to both endovascular and extensive open aortoiliac reconstruction.

Methods
A single-centre, retrospective review of all patients undergoing eversion endarterectomy for EIA disease between 2000-2020. Demographic, clinical, operative and follow-up data was recorded.

Results
Fifty eversion endarterectomies were performed in 47 patients. The median age was 65.0 years and thirty-three(66%) were male. Thirty-four(68%) were ASA grade 3. Indications for intervention were disabling claudication (44%) and critical ischaemia (56%). Angiography demonstrated 22 TASC C and 28 TASC D lesions. The median follow-up was 18.5 months (range 0-149). There was 100% technical success and 84% (n=42) experienced an immediate symptomatic improvement. Primary and primary-assisted patency at one and five years was 86% and 74%, and 100% and 92%, respectively. The five-year limb salvage rate was 96%. Eight limbs required reintervention to maintain patency. Thirty-day mortality and morbidity rates were 2% (n=1) and 10% (n=5).

Conclusion
Eversion endarterectomy is a safe, effective alternative treatment for occlusive EIA disease. We report durable five-year patency and a low perioperative morbidity and mortality

O84

A systematic review and narrative synthesis of risk prediction tools used to estimate mortality, morbidity and other outcomes post-major lower limb amputation

Mr Ryan Preece[1], Dr Nafi Dilaver[1], Dr Cherry-Ann Waldron[2], Dr Philip Pallmann[2], Dr Emma Thomas-Jones[2], Mr Brenig Llwyd Gwilym[1], Dr Daniel Norvel[3], Professor Joseph Czernieck[4], Mr Christopher Twine[5], Mr David Bosanquet[1]

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Introduction:
The decision to undertake major lower limb amputation (MLLA) is often complex. This review evaluates the utility of risk prediction tools for estimating mortality, morbidity and/or other outcomes following MLLA.

Methods:
A systematic review and narrative synthesis was performed following PRISMA guidelines. MEDLINE, Embase and Cochrane databases were searched to identify studies reporting on risk prediction tools that estimate outcomes following MLLA. Outcome measures included the accuracy of prediction tools in estimating post-operative mortality, morbidity, need for re-amputation and ambulation success.

Results:
518 publications were identified and 12 observational studies included. Nine tools provided risk estimations for mortality, two tools provided predictions for postoperative morbidity and ambulation and only one tool estimated need for re-amputation. Mortality prediction tools demonstrated acceptable discrimination performance with C-statistic values 0.65–0.81. Tools estimating the risk of post-operative complications (0.65–0.74) and necessity for re-amputation (0.72) also performed acceptably. The BLARt (Blatchford Allman Russell) tool demonstrated outstanding discrimination for predicting functional mobility outcomes post-amputation (0.94). Only three studies included external validation analyses.

Conclusions:
Several risk prediction tools were identified that demonstrate acceptable to outstanding discrimination for objectively predicting an array of post-operative outcomes. However, current implementation into clinical practice is limited by insufficient external validation studies.

O85

The use of Point-of-Care Bacterial Autofluorescence Imaging in the Management of Diabetic Foot Ulcers: A Pilot Randomised Controlled Trial

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[1]Leeds Teaching Hospitals NHS Trust, Leeds, , [2]University of Leeds, Leeds,

Background/Aims:

Diabetic foot ulcers (DFU) have considerable morbidity and mortality, negatively impact patients' quality of life and are of significant cost to health services. Bacterial autofluorescence imaging has been suggested to improve healing of chronic wounds[1]. We aim to investigate the clinical effectiveness and decision making associated with its use in the management of DFU.

Methods:

A single centre, pilot randomised controlled trial (RCT) in DFU patients, with blinded outcome assessments. Randomisation was in 1:1 allocation to 'treatment as usual' (TAU) informed by bacterial autofluorescence imaging, or TAU alone. The primary outcome is the proportion of ulcers healed at 12 weeks. Secondary outcomes include ulcer healing rate, quality of life and management decisions following autofluorescence imaging.

Results:

56 patients were recruited and randomised. The proportion of ulcers healed with autofluorescence imaging (n=13, 45%) at 12 weeks was significantly higher than those with TAU alone (n=5, 19%; p=0.035). Further wound debridement was the most common intervention in those with positive imaging.

Conclusion:

To our knowledge, this is the first RCT assessing the use of auto fluorescent imaging in the management of DFUs. We have shown it to be a valuable adjunct to standard care, guiding adjuvant interventions with promising results.

References

DaCosta RS, Kulbatski I, Lindvere-Teene L, Starr D, Blackmore K, Silver JI, et al. (2015) Point-of-Care Autofluorescence Imaging for Real-Time Sampling and Treatment Guidance of Bioburden in Chronic Wounds: First-in-Human Results. PLoS ONE10(2): e0116623

O86

The impact of atrial fibrillation on patients with peripheral arterial disease. A retrospective study of a large healthcare database in United Kingdom.

Mr Antonios Vitalis[1,4], Dr Krishnarajah Nirantharakumar[1], Dr Rasiah Thayakaran[1], Dr Alena Shantsila[2], Mr Mark Kay[3], Professor Rajiv K Vohra[3], Professor Gregory Y H Lip[2]

[1]University of Birmingham, Birmingham, United Kingdom, [2]Liverpool Centre for Cardiovascular Science, University of Liverpool and Liverpool Heart & Chest Hospital, Liverpool, United Kingdom, [3]Department of Vascular Surgery, University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom, [4]East of England Vascular Rotation, , United Kingdom

Introduction

Coexistence of peripheral arterial disease (PAD) with atrial fibrillation (AF) is linked with high rates of adverse cardiovascular outcomes, stroke and mortality. This study aims to investigate the prognostic impact of AF in a cohort of patients with PAD.

Methods

This is a retrospective study of The Health Improvement Network (THIN) database, which contains primary care records from over 600 general practices in the UK.

We searched the database to detect patients with newly diagnosed PAD during the study period (1995-2017) and relevant demographics, comorbidities (including AF), medication and adverse outcomes were recorded. Every patient with PAD and AF (case) was matched with a patient with PAD without AF (control) using propensity score matching. Cox-regression analysis was performed and hazard ratios(HR) calculated for every adverse outcome.

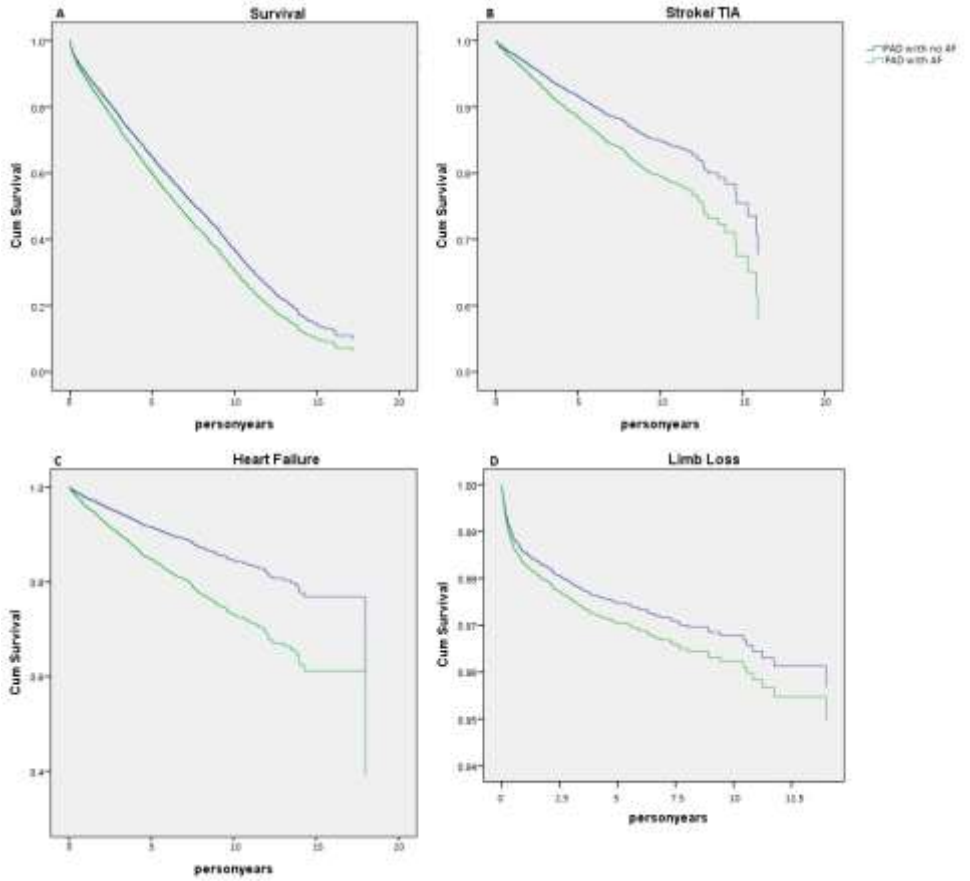
Results

The study included 11.370 patients (5.685 cases and 5685 controls). AF was associated with higher rates of death (HR:1.18, 95%CI 1.16-1.25, p<0.001), stroke/TIA (HR:1.40, 95%CI 1.20-1.63, p<0.001) and heart failure (HR:1.87, 95%CI 1.62-2.16, p<0.001). There was no significant association with IHD (p=0.92) or limb loss (p=0.16).

Conclusion

AF is an independent risk factor for adverse outcomes in patients with PAD. Close surveillance and risk factor modification in this group is mandated.

Figure: Kaplan–Meier curves for A: survival, B: stroke/TIA, C: heart failure, D: limb loss, comparing PAD patients with AF and PAD patients without AF.


A
Survival
Cum Survival
personyears
B
Stroke/ TIA
Cum Survival
personyears
PAD with no AF
PAD with AF
C
Heart Failure
Cum Survival
personyears
D
Limb Loss
Cum Survival
personyears

O87

The psycho-social implications of surgical management in diabetic foot disease

Dr Arsalan Wafi[1], Mr James Budge[1], Mr Bilal Azhar[1], Ms Katherine Stenson[1], Mr Muzzafer Chaudery[1], Mr Paul Moxey[1], Professor Ian Loftus[1], Professor Peter Holt[1]
[1]*St Georges University Hospital, London, United Kingdom*

Introduction

Assessment of patients' psychological status and concerns about limb loss is understudied in vascular surgery and therefore, such concerns may not be addressed in the pre-operative period.

Methods

67 consecutive patients receiving social psychotherapy from a dedicated diabetic-foot psychologist in a tertiary diabetic foot service in 2019 were identified. Data was collected on demographics, comorbidities and foot status. Patients were screened for depression and anxiety and interviewed in 30-minute sessions. Retrospective thematic analysis of interview documentation on patient concerns was performed.

Results

Median age was 65 years, and 71.6% were male. Black and ethnic-minorities comprised 28.4% of the cohort, and 10.4% had English-language problems. Foot presentations were tissue loss (45.4%), recent minor-amputation (36.4%) and pre-major amputation (18.2%). Prevalence of diagnosed mental-health problems was 28.4% (73.6% of these being depression), and 26.2% were taking regular antidepressants. 35.8% of patients lived alone and 9.0% had no documented next-of-kin. Thematic analysis identified social isolation, immobility and dependence, economic concerns and access to healthcare as prevalent concerns in patients at risk of limb loss.

Conclusion

Decisions regarding surgical management, in particular major amputations, should aim to address specific patient concerns such as loss of mobility and independence, social isolation, and access to healthcare.

O88

Functional outcome after major lower limb amputation in vascular surgery

Mr Arsalan Wafi[1], Mr Bilal Azhar[1], Mr James Budge[1], Ms Katherine Stenson[1], Mr Muzzafer Chaudery[1], Mr Paul Moxey[1], Professor Ian Loftus[1], Professor Peter Holt[1]
[1]St Georges University Hospital, London, United Kingdom

Introduction

There is paucity of knowledge on functional outcomes post major lower-limb amputation (MLA) in vascular surgery. Understanding outcomes of rehabilitation therapy may improve pre-operative decision-making and addressing patient concerns.

Methods

From 2007-2018, 714 consecutive vascular MLA patients receiving specialist rehabilitation were identified from prospectively kept records. Data on demographics, comorbidities, amputation type, medications, post-therapy mobility and long-term mortality were analysed.

Results

Median age was 67 years, 77.7% were male, 64.4% had below-knee amputations and 31.8% died at 5 years. At discharge from rehabilitation, 60.7% of patients were dependent-household mobilisers. Risk factors for dependent-household mobility at discharge were being female (OR 2.69, 95%CI 1.83-3.94, p<0.001), aged over 70 (OR 3.49, 95%CI 2.53-4.79, p<0.001), having above-knee amputation (OR 1.53, 95%CI 1.19-1.88, p<0.001). Pre-operative frailty scores were not significantly different within these comparison groups. Therapy-related factors associated with poorer mobility were: if time-to-therapy commencement was 1-month or longer (OR 1.63, 95%CI 1.12-2.36, p=0.01), rehabilitation in an outpatient-only setting (OR 1.47, 95%CI 1.09-1.99, p=0.012), and lack of early-walking-aid use post-amputation (OR 2.72, 95%CI 1.66-4.47, p<0.001).

Conclusion

Functional outcome after rehabilitation for major lower-limb amputation is poor. Timely pre-operative assessment for rehabilitation potential and early inpatient rehabilitation is recommended to improve decision-making and outcomes.

VS Poster Prize Abstracts

P1

P1 - EVAR practice in the UK and NICE draft guidelines - A medical ethics perspective

Dr Benjamin Armon[1], Mr Sriram Rajagopalan[2,1]
[1]*Keele University Medical School, , ,* [2]*University Hospitals of the North Midlands, Stoke-on-Trent,*

Endovascular Aneurysm Repair(EVAR) is often used in older patients who are high risk for open surgical repair(OSR) of their abdominal aortic aneurysms(AAA). In 2018, the National Institute for Health and Care Excellence(NICE) released a draft guideline on the management of AAAs - NICE advised against the use of EVAR in patients unsuitable for OSR. The aim of this review is to examine whether this decision is discriminatory against elderly patients and is therefore an example of unjust ageism.

Conduct a literature review of the ethics of ageism and apply this to the proposed NICE guideline.

-

Restricting access to EVAR is indirect discrimination; elderly patients unsuitable for OSR but suited for EVAR are prevented from having any treatment (no intervention). NICE justify this decision on the basis that EVAR is less cost-effective than OSR. However, EVAR can be more cost-effective than no intervention; when patients have a large aneurysm with a high chance of rupture, but the risks of OSR are too high. In this instance, indirect discrimination is unjustifiable; withholding treatment that could improve life expectancy is unjust. NICE have subsequently revised the guideline(2020); when OSR is medically or anaesthetically too high risk, EVAR should be considered.

P2

P2 - The Effect of Post Endovascular Aneurysm Repair Sac Size Change: Systematic Review and Meta-Analysis

Mr Bilal Azhar[1], Mr Arsalan Wafi[1], Mr James Budge[1], Ms Kate Stenson[1], Professor Ian Loftus[1], Professor Peter Holt[1]
[1]*St Georges Vascular Institute, London, United Kingdom*

Background

There are concerns over the long-term durability of EVAR, with reported device related complications and increased late aneurysm related mortality compared to OSR. This review aims to identify the association between aneurysm sac size change post EVAR and clinical outcomes.

Methods

A systematic review was performed in accordance with PRISMA statement. Post EVAR sac size regression versus failure to regress were compared. Outcomes of interest were death, rupture, re-intervention and endoleak (type 1 and 3). Random effects meta-analyses were performed.

Results

Of 177 studies identified, 7 studies with a total of 18297 patients met the inclusion criteria. The proportion of patients failing to achieve sac size regression post EVAR was 55%. The OR for patients failing to regress post EVAR versus sac regression was 1.68 (CI 1.38-2.05) for mortality, 3.51 (CI 1.06-11.57) for aneurysm rupture, 2.67 (CI 1.79-3.98) for re-intervention and 2.90 (CI 1.37-6.13) for endoleak.

Conclusion

Failing to achieve aneurysm sac regression post EVAR is common and associated with worse mortality, risk of rupture, re-intervention and endoleak compared to those who achieve sac regression. Post EVAR sac size change is an important marker of successful treatment and its role in informing surveillance and EVAR durability warrants further investigation.

P3

P3 - The Effect of Frailty on Outcomes in Patients with Critical Limb Ischaemia

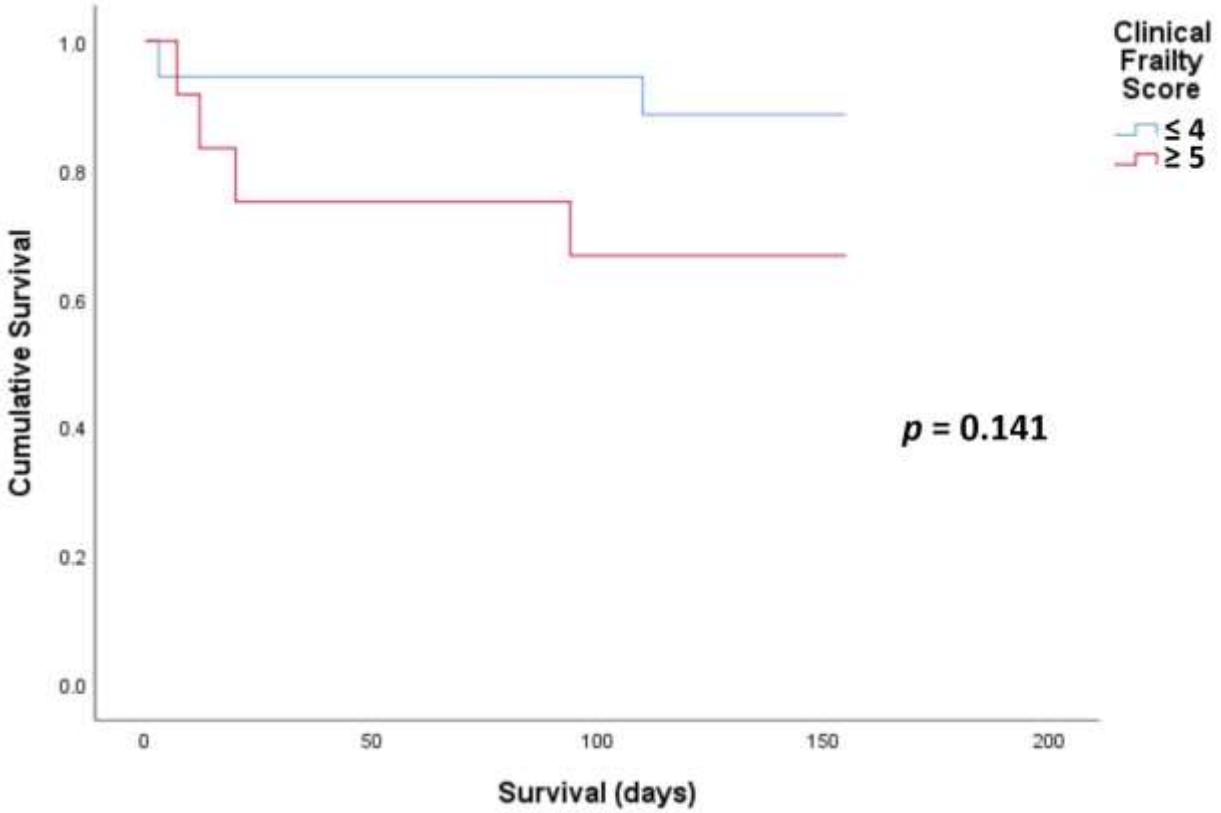
Mr Nicholas Bradley[1], Dr William Harrison[1], Dr Amy Walter[1], Dr Christina Beecroft[1], Mr Stuart Suttie[1]
[1]*Ninewells Hospital, Dundee, Scotland*

Introduction
Frailty is a complex syndrome associated with inferior health outcomes (increased mortality, reduced independence, perioperative complications). Frailty can be defined using scoring systems such as the 7-point Clinical Frailty Scale (CFS). Studies describing frailty in vascular surgical populations are largely retrospective and consist of non-critical limb ischaemia (CLI) populations. This study describes the effect of frailty on outcomes in patients admitted with CLI by presenting preliminary data (study recruitment postponed due to the SARS-CoV-2 pandemic).

Methods
Patients with CLI presenting to our vascular surgery unit were prospectively recruited. Data were recorded from electronic records. Primary outcome was freedom from major adverse cardiovascular and limb events (MACLE). Secondary outcomes included overall survival (OS), reintervention and readmission rates.

Results
There were 37 eligible patients; 29 (78.4%) male, mean age 72.6 (SD 11.7) years. 40.0% of patients had a CFS greater than 4. There was a trend toward inferior survival in patients with CFS greater than 4 (143.8 vs. 114.4 days; p = 0.141). Thirty-day mortality was 11.1%, 30-day MACLE rate was 13.3%.

Conclusions
CLI patients are a frail population. Longer follow-up, larger sample size, and further analysis of our preliminary data may reveal significant association between CFS and inferior MACLE outcomes.



Days	0	30	60	90	120	150
Number at Risk (CFS ≤ 4)	18	17	17	17	15	5
Number at Risk (CFS ≥ 5)	12	9	9	9	8	2
Number at Risk (Total)	30	26	26	26	23	7

P4

P4 - An evidence map of non-invasive electrical stimulation in peripheral arterial disease

Mr Sean Paul Carroll[1], Dr Ukachukwu Abaraogu[1,2], Dr Stuart Gray[3], Dr Les Wood[1], Dr Chris Seenan[1]
[1]Glasgow Caledonian University, , United Kingdom, [2]University of Nigeria, , Nigeria, [3]University of Glasgow, , United Kingdom

Introduction

Electrical stimulation (ES) may improve functional outcomes in people with Peripheral Arterial Disease (PAD). There is uncertainty whether this is uniform across modalities and treatment parameters through different stages of the disease and any mechanisms that underlie any benefit.

Methods

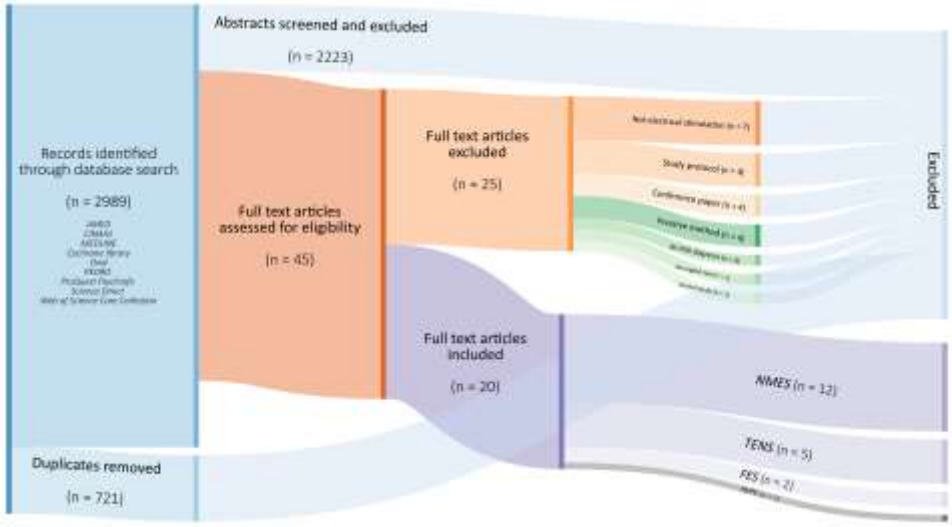
A scoping review mapped the evidence on electrical stimulation modalities and outcomes. Screening was conducted by 2 authors. Risk of bias (RoB) assessment was conducted using the Cochrane risk of bias tool-2 and the ROBINS-I by 3 authors.

Results

From 20 included papers, there were 4 ES modalities, Neuromuscular ES (NMES) n=12, transcutaneous electrical nerve stimulation (TENS) n=5, Functional ES n=2, and High Voltage Pulsed Current n=1 (Figure 1). PAD severity: intermittent claudication (IC) n=13, critical limb ischemia (CLI) n=3, and mixed n=4. Studies were generally low quality and high/unclear RoB but improved with recent research. Maximum walking distance (MWD) significantly improved in IC (n=7) and CLI (n=2) with ES. ABPI did not change (n=4). Microvascular and resting limb temperature results conflicted (n=2). Effect may vary in diabetic PAD v non-diabetic (n=1), and there may be fibrinolytic benefits in ES (n=1).

Conclusion

Trend toward NMES and TENS to improve MWD. Optimum modality/stimulation and any mechanisms of effect remain unclear.



P5

P5 - The influence of socio-economic deprivation scores in Scotland on the elective treatment of abdominal aortic aneurysms

Mr Samuel Debono[1], Ms Kirsten V Hamilton[1], Dr Isabella Faliszewski[1], Miss Eilidh Gunn[2], Miss Fiona Kerray[3], Miss Darja Kremel[2], Mr Douglas J MacKenzie[4], Miss Caitlin S MacLeod[5], Miss Jennifer Nash[4], Dr Hannah O'Neill[5], Dr Elliot Tilling[1], Mr Douglas Orr[1]

[1]Queen Elizabeth University Hospital, Glasgow, United Kingdom, [2]Royal Infirmary of Edinburgh, Edinburgh, United Kingdom, [3]Raigmore Hospital, Inverness, United Kingdom, [4]University Hospital Hairmyres, East Kilbride, United Kingdom, [5]Ninewells Hospital, Dundee, United Kingdom

Introduction

Low socio-economic status (SES) is associated with increased mortality among surgical patients. We hypothesised that patients with low SES have increased comorbidity, wait longer for abdominal aortic aneurysm repair (AAA), have higher peri-operative mortality, and are more likely to undergo endovascular repair.

Methods

A retrospective analysis of patients who underwent elective AAA repair between 01/01/2019 – 31/12/2019 from 6 vascular centres across Scotland was performed. Type of repair, 30-day mortality, and time to repair was collected. The Scottish Index of Multiple Deprivation (SIMD) was applied to stratify patients into quintiles (SIMD1 = most deprived). To ensure adequate numbers, patients were analysed according to SIMD in three groups (Group-1-SIMD1&2, Group-2-SIMD3, Group-3-SIMD4&5).

Results

234 patients were analysed with 92 Group-1, 58 Group-2, and 80 Group-3. Median ages were 70/71/72 years across the groups. A total of 4 deaths occurred (<0.5%) within 30 days postoperatively. There was no significant difference in mortality, or time to repair, between the three SIMD groups. The ratios of open to endovascular AAA repair were similar in each group with no statistical significance identified.

Conclusion

Low SES, and the presumed increased comorbidities, was not associated with delays to repair, mortality, or mode of AAA repair in Scotland.

P6

P6 - Patient fitness and long-term survival following Elective infrarenal Abdominal Aortic Aneurysm (AAA) repair - The utility of the Carlisle Risk Calculator (CRC)

Mr Ahmed Elbasty[1], Dr Judith Gudgeon[1], Dr Ziyad Rassam[1], Mr David Gerrard[1], Mr Patrick Chong[1]
[1]*Frimley Park Hospital NHS Foundation Trust, Frimley , United kingdom*

Aim
The aim of this study is to identify whether the CRC is able to predict mid to long-term survival rates following elective infra-renal AAA surgery to help in patient selection for intervention.

Methods
A retrospective study of consecutive patients undergoing elective infrarenal AAA repair. The CRC utilizes the following variables: date of operation; sex; age; height; weight; pre-operative haemoglobin concentration; creatinine concentration; variables from cardio-pulmonary testing and type of aneurysm repair (open or endovascular). Patients were stratified into three groups - High Risk, Intermediate Risk and Low Risk according to CRC. A comparison was performed to analyse CRC predictive survival scores against observed survival rates.

Results
105 patients were identified (male=94) with a mean AAA diameter of 60.9 cm (SD=7.98). 57 patients (54.3%) underwent Elective EVAR and 48 (45.7%) had an elective open surgical repair (OSR).
The post-interventional mortality rate at 3 years and 5 years was 33% and 61% in the CRC High Risk patients vs. 11.7% and 20% in the CRC Intermediate Risk patients. One death (3%) occurred in the CRC Low Risk cohort at 5 years.

Conclusion
Our study shows that the CRC may be a useful predictive tool that can help identify high risk patients

P7

P7 - The impact of COVID-19 on vascular services

Mr Ahmed Elmetwally[1], Mr Hazem Elsanatawy[1], Mr Aamr Abdelhaliem[1], Mr Ravi Goel[1], Mr Haytham Al-Khaffaf[1]
[1]*East Lancashire NHS Hospital Trusts, blackburn, GB*

Aim: To evaluate the impact of the Covid 19 pandemic on the delivery of vascular services in East Lancahsire hospitals Trust (ELHT).
Method: In this retrospective study, the medical records of patients presenting to East Lancashire hospital requiring vascular surgical procedures between March to July 2019 and the same period 2020 were reviewed.
Results:
A total number of 238 vascular procedures were performed in 2019 compared to 162 cases in 2020 (32% reduction, P =0.226). Table 1 shows the numbers of different procedures performed during the selected periods with their respective P values. Mortality rate was 6 for the same period in both years , while morbitidty was 40 and 29 in 2019 and 2020 respectively.
Conclusion:
Our study has shown that the COVID-19 pandemic has had a negative effect on the total number vascular actitivy in ELHT but this was not statistically significant. The main impact has been on carotid and lower limb ischaemia cases. Despite this there was no effect on the rate of amputation. Better planning for the future peak (if any) should be in place with a clear plan to minimize waiting time and patient suffering.

Table 1: The total number of cases performed for each vascular procedure and the % reduction

	2019	2020	% reduction	P-value
AAA	15	9	40	0.108
Carotid endarterectomy	28	8	71	0.003
Angioplasty	133	94	29	0.016
• intermittent claudication	59	34	49	
• critical limb ischemia	74	60	-3.2	
Bypass	41	34	17	0.460
Amputation	17	16	-5.9	0.890

P8

P8 - Roles of EVAR in management of Secondary Aorto-Enteric Fistula

Mr Barnaby Farquharson[1], Miss Leanna Erete[1], Professor Sadasivam Selvakumar[1], Mr Mike Guest[1], Dr Kate Steiner[1], Dr Luke Morgan-Rowe[1], Mr Matthew Metcalfe[1]
[1]*Lister Hospital, Stevenage , England*

Secondary aorto-enteric fistulas (AEF) are an uncommon but serious complication of abdominal aortic aneurysm (AAA) repair surgery. This case series aims to assess a single centre's experience of secondary AEFs and endovascular surgery.

Case review of three cases of secondary AEF. First case of an 81 year old male 3.5 years post primary EVAR complicated by Type 1 and Type 2B endoleak led to development of secondary AEF. Second case involved a 75 year old male who presented with AEF 1 year post emergency AAA repair, successfully managed with emergency EVAR without complication. Third case involved a 75 year old male patient 1.2 years post open AAA repair for inflammatory aneurysm who presented with an iliac-enteric fistula. Managed with aorto-iliac stent and subsequent laparotomy with resection of the affected portion of small bowel.

Graft infection common to all three presentations of secondary AEF. Two patients managed with emergency EVAR resulted in no in-hospital 30-day mortality. Both patients on lifelong antibiotics without further complication or mortality.

Evidence is provided for the versatility of endovascular techniques in emergency management of secondary AEF. This study advocates multidisciplinary vascular surgery and interventional radiology approach to case selection and management of secondary AEFs.

P9

P9 - Single-centre mortality outcomes for the use of paclitaxel-based devices for the treatment of infra-inguinal peripheral vascular disease

Ms Nancy Hadjievangelou[1], Ms Anisha Perera[1], Dr Stephanie Worrall[1], Dr Kivraj Sabarwal[2], Ms Robina Aslam[1], Dr Jeremy Taylor[2], Mr Patrick Chong[1]

[1]Regional Vascular Unit, Frimley Park Hospital, , United Kingdom, [2]Department of Interventional Radiology, Frimley Park Hospital, , United Kingdom

Introduction:
There is a paucity of data regarding safety outcomes for use of paclitaxel-coated devices (PCD) in the treatment of peripheral arterial disease (PAD), both intermittent claudication (IC) and critical limb threatening ischaemia (CLTI) in the UK.

Methods:
A retrospective single-centre analysis was performed of patients undergoing infra-inguinal PAD intervention between April 2012 and December 2017. Mortality outcomes for PCD (drug-eluting balloons and stents) vs non-PCD (plain balloon angioplasty and bare metal stents) interventions were compared.

Results:
500 patients were treated; 73% male, 67.8% CLTI, 48% PCD. Overall, mortality in the cohort was 4% at 30-days, and 15.6% at 1, 23.4% at 2 and 36.4% at 5-years post-intervention. There was no difference in mortality rates at 30 days (p=0.116) or 1 (p=0.902), 2 (p=0.672) and 5 (p=0.577) years between PCD and non-PCD groups. Mortality was significantly higher in CLTI compared with IC patients at 30 days(p=0.047) and 1, 2 and 5-years post-intervention(p=0.0001).

Conclusion:
Our results demonstrate PCD usage does not appear to increase risk of mortality for patients undergoing intervention for the treatment of both IC and CLTI. The mortality risk for patients undergoing treatment for infra-inguinal PAD is significantly higher in the CLTI cohort compared to the IC cohort.

P10

P10 - Preoperative frailty as a predictor of survival following major limb amputation

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[1]NHS Greater Glasgow & Clyde, Glasgow, United Kingdom, [2]University of Glasgow, Glasgow, United Kingdom

Introduction
Frailty is the process of functional decline associated with advancing age and medical comorbidities resulting in loss of physiological and cognitive reserve. The association between frailty and major limb amputation (MLA) is not well described. The primary aim of this study was to determine the association of preoperative frailty and mortality following MLA.

Methods
This was a retrospective analysis of MLA (January 2016 to December 2018). The Clinical Frailty Score (CFS), Modified Frailty Index (mFI) and Geriatric Nutritional Risk Index (GNRI) were calculated and patients stratified into risk groups. The primary outcome measure was mortality at one year.

Results
There were 413 MLAs performed - 288 patients were male, mean age was 65-years (range 26 to 94-years). The 12-month mortality for a CFS <4 and >4 was 17.1% and 33.6% respectively. The 12-month mortality risk with mFI progressively increased with the score 0.18-0.27; 0.36-0.45; 0.54-0.63 and >0.63 to 17.1%; 31.2%; 41.8% and 50% respectively. With GNRI the 12-month mortality in the no risk/low risk group was 12% and in the high-risk group 32%.

Conclusion
Progressive frailty is associated with an increase in mortality. This data may support the notion that frailty scoring could be used prospectively to guide decision-making.

P11

P11 - The impact of a global pandemic on inpatient rehabilitation and length of hospital stay following major limb amputation

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[1]*NHS Greater Glasgow & Clyde, Glasgow, United Kingdom*

Introduction
Different models of care exist for patients following major limb amputation (MLA). In local practice patients frequently remain in hospital until a prosthetic limb has been provided – median duration of admission 31-days. The COVID pandemic required revision of the standard operating procedure. We have explored this in relation to post-operative stay.

Method
A prospective database recording MLA has been maintained (16/03/2020 to 31/05/2020). Demographic data was recorded, as was the duration of admission and discharge destination. The previous standard of median duration of admission from the date of amputation to discharge of 31 days was used for comparison.

Results
There were 44 consecutive MLAs performed over the study period. The majority of patients were male (81%), with a median age of 65-years. Transtibial:transfemoral amputation ratio was 3:1. Two patients died in the post-operative period (these patients were excluded from analysis). Median time to discharge was 17 days; 30 patients were discharged to their own homes.

Conclusion
Changes in the rehabilitation pathway have significantly reduced the duration of hospital stay following MLA. Readmission rates were low. The impact of these changes in successful limb fitting is uncertain.

P12

P12 - Assessment of a chronic limb threatening ischaemia service during a global pandemic

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[1]*NHS Greater Glasgow & Clyde, Glasgow, United Kingdom*

Introduction

There are multiple measures of good clinical practice for patients with chronic limb threatening ischaemia (CLTI). Primary major limb amputation (MLA); when combined with MLA following a limb salvage attempt may be a useful metric when assessing a CLTI service during a global pandemic.

Methods

A prospective database recording MLA has been maintained (16/03/2020 to 31/05/2020). Demographic data was recorded. MLA was defined as primary (without imaging/intervention), primary with imaging and secondary (attempt at arterial reconstruction within the previous 12-months). These data were compared with a historical data set (2008 to 2010).

Results

There were 44 consecutive MLAs performed during the study period and 438 MLAs performed in the historical data set. Patient demographics were comparable. The ratio of transtibial:transfemoral amputations 3:1 in the contemporary study and 3:2 in the historical data set. In the contemporary series primary MLA rate was 48% and secondary MLA 52%; in the historical series primary MLA was 55% and secondary MLA 45%.

Conclusion

Despite concerns that the changes in service provision associated with COVID-19 may be detrimental to patients with CLTI, we have been able to demonstrate consistency in our practice.

P13

P13 - A pilot randomised controlled trial or REmotely SuPervised ExerCise Training for patients with Peripheral Arterial Disease: The RESPECT-PAD pilot trial

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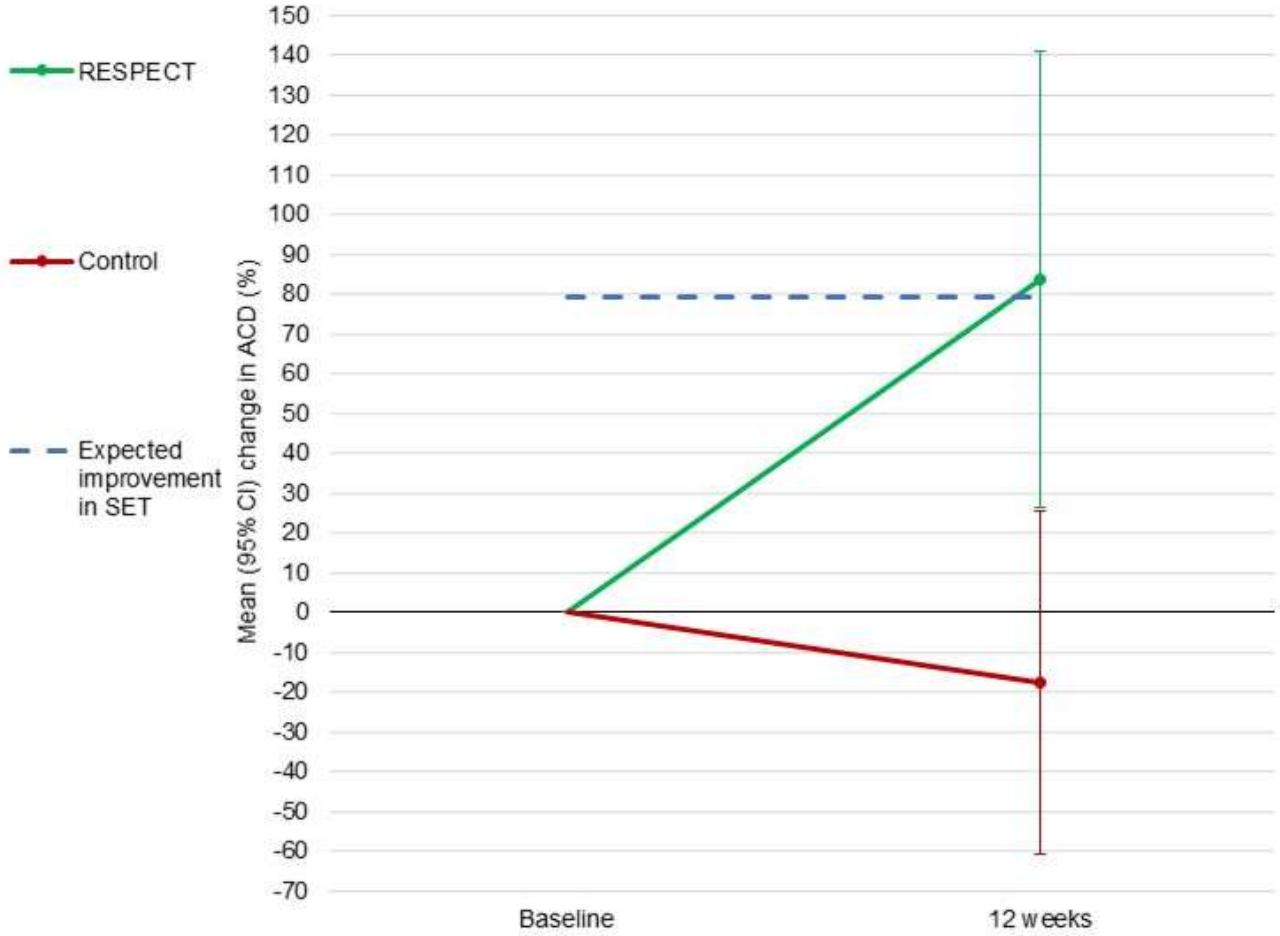
Supervised exercise training (SET) is the first-line treatment for patients presenting with intermittent claudication. However, lack of funding, poor patient compliance and scarcity of resource means only 6.8% of UK Vascular Centres offer a NICE-compliant SET service. REmotely SuPervised ExerCise Training (RESPECT) is a 12-week community-based exercise programme where patients perform prescribed exercise at their own convenience whilst wearing an activity tracker. The data is synced to an online platform monitored by the clinical team who provide guidance and/or motivation as required. As this is a novel intervention, data on its clinical effectiveness and acceptability is needed.

This was a pilot RCT of RESPECT compared to currently available clinical care in our centre, consisting of advice only. Primary outcome measure was change in absolute claudication distance (ACD) at 12 weeks. Secondary outcome measures included initial claudication distance (ICD) and HRQoL.

RESPECT delivered a mean(95% CI) improvement in ACD of 101.0 (7.6, 194.5)%(p=0.037) compared to control(figure). There were also improvements in ICD.

RESPECT is acceptable to a PAD population and promotes improvements in walking distances which seem to be comparable to SET. A definitive RCT may provide evidence for RESPECT as a cheaper, less resource-heavy, and more acceptable alternative to SET.



RESPECT	n	8
	Mean (95% CI) change in ACD (%)	83.5 (26.2, 140.8)
	Median (IQR) change in ACD (%)	61.4 (28.2, 139.2)
	Total range of change in ACD (%)	-4.2, 200.0
Control	n	3
	Mean (95% CI) change in ACD (%)	-17.5 (-60.7, 25.7)
	Median (IQR) change in ACD (%)	-27.3 (N/A)
	Total range of change in ACD (%)	-27.8, 2.6
Mean difference (95% CI) between the groups (%)		101.0 (7.6, 194.5)
p value		0.037

P14

P14 - Survival after EVAR in women. Outcomes from 17 years of practice in a tertiary vascular centre

Mr Adam Haque[1], Mr Faris Saleh[2], Mr Michael Twigg[2]
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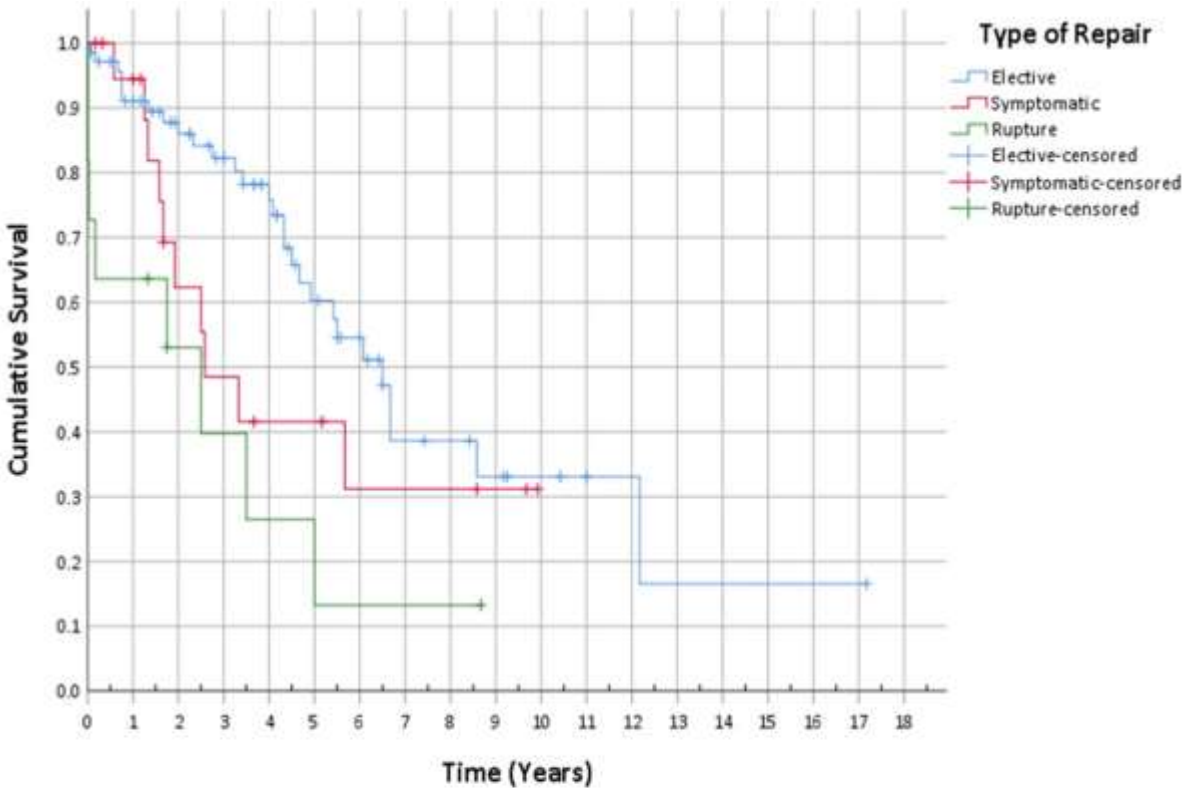
AAA causes significant morbidity and mortality though high-quality research has led to much improved outcomes over the last 15 years. Unfortunately, women are under-represented in most of the seminal trials, leading to a lack of female-specific guidance. Outcomes after open AAA repair are known to be worse in women but the long-term outcomes after EVAR are not well-established. This paper reports on EVAR outcomes in women over 17 years in a large tertiary Vascular Centre.

This was a retrospective observational analysis of a prospectively collected clinical database of women undergoing EVAR at a single centre from June 2002 to September 2019.

12.1% (n=109) of all EVARs performed were in females. 30-day, 90-day mortality rates were 1.4% and 2.9% respectively with a median (IQR) survival time of 6.5 (5.4-7.6) years (figure). Increasing age at time of repair was not significantly associated with survival, HR (95% CI) 1.02 (0.94-1.11) (p=0.602), nor was size of AAA, 1.12 (0.62-2.01) (p=0.716). 30-day morbidity was 32.8% with a reintervention rate of 10.0% at 2 years and 21.4% at 5 years.

This local data suggests an impaired long-term survival and increased in-hospital morbidity rate in women after EVAR compared to non-gender-specific nationally reported data.


Type of Repair
Elective
Symptomatic
Rupture
Elective-censored
Symptomatic-censored
Rupture-censored
Cumulative Survival
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Time (Years)

P15

P15 - The effect of Covid-19 on Chronic Limb Threatening Ischaemia pathways

Mr Craig Forrest[1], Dr Bella Faliszewski[1], Dr Lauren Devers[1], Mr Kevin Daly[1], Mr Keith Hussey[1]
[1]*Nhs Greater Glasgow And Clyde, ,*

Introduction
The Covid-19 pandemic created organisational challenges; standard operating procedures (SOP) were re-written with an emphasis on provision of an ambulatory model of care for patients with chronic limb threatening ischaemia (CLTI). The Peripheral Arterial Disease Quality Improvement Framework (PAD-QIF) has defined clear standards of care. We examined the effect of these changes.

Methods
This was a retrospective review of outpatients seen in a standard clinic (1st February 2019 and 31st July 2019) and in a rapid access clinic (2nd March to 14th May 2020). Specific metrics investigated included times from referral to review and referral to intervention (defined as 7 and 14-days respectively).

Results
There were 68 and 45 new referrals seen over the respective time periods. Patient demographics and sources of referral were comparable. Prior to the Covid pandemic 22 (54%) patients were seen within 7-days with 5 (8%) having intervention within 14-days. During the Covid pandemic 31 (69%) patients were seen within 7-days with and 21 (58%) having intervention within 14-days.

Conclusion
Development of a rapid access clinic model has had a positive effect on the pathway for patients with CLTI. This model should be adopted when revised SOP are written.

P16

P16 - Re-lining delays non-type II endoleaks after endovascular aneurysm repair (EVAR) at a regional vascular unit

Miss Emily Khoo[1], Dr Muhammad Husnoo[1], Dr Peng Yun Ng[1], Mr Aazeb Khan[1], Mr Mohamed Banihani[1]
[1]*Lancashire Teaching Hospitals NHS Foundation Trust, Preston, United Kingdom*

Introduction: Delayed type I, III and V endoleaks after EVAR are associated with significant morbidity and mortality. EVAR re-lining is a recognised approach in such high-risk cases. We evaluate the characteristics and outcomes of late non-type II endoleaks treated with relining at a regional vascular centre.

Methods: EVAR cases involving type I, III and V endoleaks were identified retrospectively through the regional vascular multi-disciplinary team meeting (MDT) between 2014 and 2018. Data was collected from electronic patient records and MDT outcomes.

Results: 58 cases of late non-type II endoleaks were identified. 26 cases(45%) were treated with re-lining. The mean age of the patients was 80years. The median time from EVAR to detection of endoleak or sac expansion was 48months (range 19-108months). Sac expansion was implicated in all but 1 case which presented with a rupture. Emergency EVAR relining for leaking abdominal aortic aneurysm (AAA) was conducted in 7 cases (27%), with no inpatient mortality. 2 cases(8%) required further intervention after re-lining. 1-year mortality was 12.5%.

Conclusion: Delayed type I, III and V endoleaks with sac expansion affects an older high-risk group. Re-lining procedures are relatively less invasive and associated with good outcomes even in the event of a leaking AAA.

P17

P17 - Retrospective review of the characteristics and management of type I, III and V endoleaks after endovascular aneurysm repair (EVAR) at a regional vascular unit

Dr Muhammad Husnoo[1], Miss Emily Khoo[1], Dr Peng Yun Ng[1], Mr Aazeb Khan[1], Mr Mohamed Banihani[1]
[1]*Lancashire Teaching Hospitals NHS Foundation Trust, Preston, United Kingdom*

Aim: To evaluate the characteristics and management of type I, III and V endoleaks after EVAR in a vascular centre over a period of centralisation.

Methods: Cases involving type I, III and V endoleaks were identified through the regional vascular multi-disciplinary team meeting(MDT) between 2014 and 2018. Type II endoleaks were excluded. Data was collected from electronic patient records and MDT outcomes.

Results: 256 EVARs were performed during the observation period with 58 cases of late non-type II endoleaks identified. 70% of cases were inherited from other units post-centralisation of services. Type I endoleaks represented 60% of cases, type V 24% and type III 6%. Median time to detection of endoleak or sac expansion was 46 months. 42 patients(72%) required intervention. 26 patients were treated with complete re-lining, 8 required proximal-cuff extensions and 8 needed limb extensions. 36% of cases presented as an emergency, and 26% were ruptured with one mortality 6weeks post-repair. 8 patients(19%) required further re-intervention for management of persistent endoleak. 16 patients were treated conservatively or declined surgery.

Conclusion: Late non-type II endoleaks are complex and highly demanding, with significant impact on regional vascular units, particularly on the emergency service. Variations in pre-centralisation practices can be significant.

P18

P18 - Time-to-event data meta-analysis of late outcomes of endovascular versus open repair for ruptured abdominal aortic aneurysm

Dr. Nikolaos Kontopodis[1], Dr. Nikolaos Galanakis[2], Prof Christos Ioannou[1], Prof Dimitrios Tsetis[2], Dr. Jean-Pierre Becquemin[3], Mr George Antoniou[4]

[1]Vascular Surgery Unit, University Of Crete, Medical School, Heraklion, Greece, [2]Interventional Radiology Unit, University Of Crete, Medical School, Heraklion, Greece, [3]Department of Vascular Surgery, Henri Mondor Hospital, Créteil, France, [4]Division of Cardiovascular Sciences, School of Medical Sciences, University of Manchester, Manchester, UK

Objectives: The perioperative survival advantage of emergency endovascular aneurysm repair (EVAR) over open repair is well demonstrated. Our objective was to investigate whether such benefit is sustained in follow-up.

Methods: A systematic review was conducted to identify studies that reported follow-up data of endovascular versus open repair for ruptured abdominal aortic aneurysm. A time-to-event data meta-analysis was conducted and mixed effects regression was applied to investigate outcome changes over time.

Results: Three randomized trials and 22 observational studies reporting 31,383 patients were included in quantitative synthesis. Mean duration of follow-up ranged from 232 days to 4.9 years. The overall all-cause mortality was significantly lower after EVAR (HR 0.79, 95% CI 0.73-0.86), but the post-discharge all-cause mortality was not significantly different (HR 1.10, 95% CI 0.85-1.43). The aneurysm related mortality, was not significantly different between groups (HR 0.89, 95% CI 0.69-1.15). Meta-regression showed the mortality difference in favour of EVAR was more pronounced in recent studies (P=0.069) and recently treated patients (P=0.062).The certainty for overall and post-discharge all-cause mortality was judged to be low, and for aneurysm-related mortality was high.

Conclusions: EVAR has a sustained mortality benefit in follow-up over open repair. A wider adoption of an endovascular-first strategy is justified.

P19

P19 - Systematic review on the benefit of graduated compression stockings in the prevention of venous thromboembolism in low-risk surgical patients

Dr Matthew Machin[1], Dr Helen-Cara Younan[2], Dr Safa Salim[1], Ms Sasha Smith[1], Professor Alun Huw Davies[1], Mr Joseph Shalhoub[1]

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Background

This systematic review aimed to assess the performance of graduated compression stockings (GCS) in comparison to no venous thromboembolism (VTE) prophylaxis in the prevention of hospital-acquired thrombosis (HAT) in low-risk surgical patients undergoing short-stay procedures.

Methods

Aligning with PRISMA guidelines, online databases MEDLINE and EMBASE, Cochrane Library® and trial registries were searched. Eligible articles reported the VTE rate in low-risk surgical patients either receiving GCS or no VTE prophylaxis.

Results (Table 1)

Narrative synthesis was performed on a single eligible article. The included study arm consisted of participants undergoing knee arthroscopy with the use of GCS alone reporting a total of 29 VTE events(4.4%), 16 of which were asymptomatic DVTs(2.4%). There were 9 RCTs and 20 non-randomised studies of interventions excluded as they included moderate and high-risk surgical patients. This is reflected by the rates of HAT in these articles being much higher, as high as 48.9% in abdominopelvic procedures, in comparison to the 2% symptomatic HAT rate reported in the included study arm.

Conclusion

There is a complete lack of evidence to support the use of GCS in the prevention of HAT for low-risk surgical patients. Current UK practice is not based on high-quality evidence.

P20

P20 - Prediction of Survival Following Elective Repair of Abdominal Aortic Aneurysm Using a Random Forest Classifier Algorithm

Mr Reza Mofidi[1], Mr Andrew Hollingsworth[1], Dr Simon Milburn[1], Dr Matthew Cheesman[1], Professor Gerry Danjaux[1]
[1]*James Cook University Hospital, Middlesbrough, United Kingdom*

The decision to repair an AAA involves balancing the risk of rupture, procedure related mortality and life expectancy of each patient. The aim of this study was to construct and validate a random forest classifier to predict survival in the first 2 years following elective repair of AAA.

All patients who underwent elective open or endovascular repair of AAA between 01/01/2008 and 31/03/2018, were assessed using the VSQIP pathway. This involved cardiopulmonary exercise testing as well as CT scan of aorta. Following elective repair, patients were followed up for at least 2 years. A random forest classifier was developed using 70% of the dataset and validated using 30% of the dataset to predict survival following repair of AAA.

702 patients underwent elective repair of AAA (periprocedural mortality: 1.13%)of whom 72 (10.3%) died during the first 2 years . The sensitivity and specificity of the random forest classifier for prediction of survival in the 2 years following surgery was 96.3% (95%CI: 92.4–99%) and 61.5% (95%CI: 51–72%), yielding an overall accuracy of 91% (95%CI: 86.8-94.8%).

A random forest classifier based on readily available clinical data can successfully predict survival in the first 2 years following elective repair of AAA.

P21

P21 - Stenting for thoracic aortic injury (TAI) – a major trauma centre (MTC) experience

Mr Mojahid Najem[1], Dr Francis Sanders[1], Mr Patrick Coughlin[1]
[1]*Cambridge University Hospitals NHS Foundation trust, Cambridge, UK*

Introduction:
TAI is routinely treated with endovascular repair(TEVAR). Regionalisation of the trauma networks provides challenges with multi-specialty involvement and rehabilitation often in non-MTC hospitals. We aimed to identify follow-up practice of TAI patients undergoing TEVAR within our MTC.

Methods
Patients undergoing an emergency TEVAR from 01/01/2015 to 30/06/2020 were identified. In patients with a TAI we collated mechanism of injury, other associated injuries, time from injury to surgery, length of stay in MTC and follow up with vascular team.

Results:
42 patient had emergency TEVAR. 11patients had TAI (9RTC, 1fall, 1stab injury). All had multiple injuries requiring treatment by more than one specialty.
Time from injury to surgery was 7hrs to 14days. There were no stent related complications or mortalities.

10patients were discharged with average stay in the MTC of 27.5days (7-52days), (4discharged home. 5 to other hospitals for rehabilitation, 1to a cardiac hospital for further management). 1patient still in hospital.

5patients were followed up or have planned follow-up, 4were not followed up and 1didn't attend the follow-up appointment.

Conclusion: TEVAR in TAI has a good early outcome. There is no clear consensus on how to follow up such patients with the model of the MTC's providing challenges in follow-up.

P22

P22 - Adaptation of the vein cuff in distal arterial anastomosis

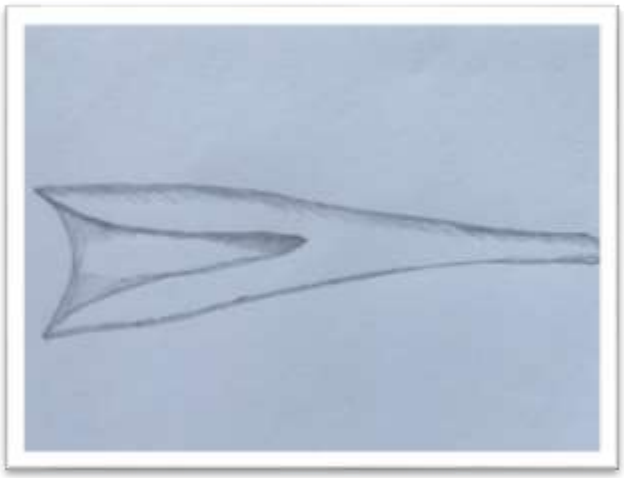
Mr Tim Nash[1], Mr Mohamed Elahwal[1], Mr Mark Edwards[1]
[1]*Brighton And Sussex University Hospitals, Brighton, UK*

Vein cuff's as an adjunct to patency in lower limb prosthetic bypass grafts were described in 1979. Over time there have been several adaptations to the original description most notably the Miller cuff and St Mary's boot.

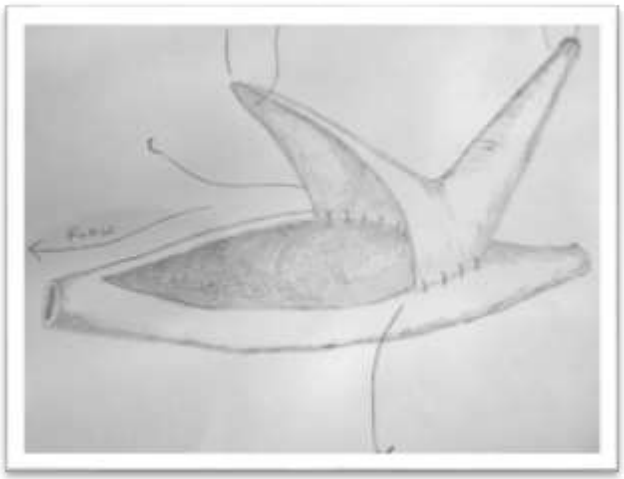
Cuff's are believed to offer improved patency by the formation of a cohesive vortex within the distal anastomosis leading to increased wall shear stress and reduced neo-intimal hyperplasia.

We present our own adaptation of the cuff technique colloquially known as the Brighton Sock. (see figure attached).

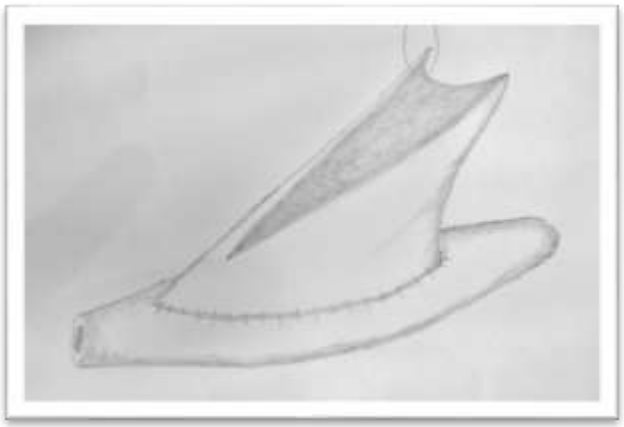
Our experience in using this technique has resulted in a low profile, easily reproducible interface between graft and artery which requires less tissue coverage than a traditional cuff or boot, thus allowing use on more distal target vessels. Post operative duplex imaging suggests the establishment of a cohesive vortex.



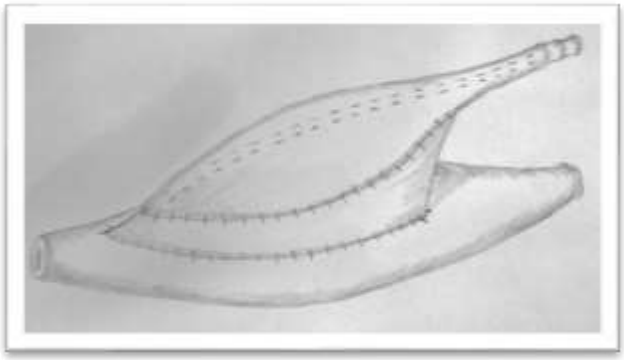
1. Spatulate a short length of LSV



2. Sew the spatulated end to the recipient artery



3. Open the free end towards the toe



4. Anastomose the conduit to the vein

P23

P23 - Do anaemia and red blood cell transfusion affect outcomes for patients who undergo revascularisation for chronic limb-threatening ischaemia?

Miss Francesca Theuma[1], Mr Andrew Nickinson[2], Professor Rob Sayers[2], Mr Robert Davies[1]
[1]University Hospitals of Leicester NHS Trust, Leicester, UK, [2]University of Leicester, Leicester, UK

Introduction

Anaemia is potentially associated with unfavourable outcomes following vascular surgery. This study investigates the relationship between peri-procedural anaemia and transfusion on amputation-free survival (AFS) in patients with chronic limb-threatening ischemia (CLTI).

Methods

An analysis of patients undergoing revascularisation for CLTI between February 2018-2019, was undertaken. Haemoglobin measured at primary assessment and subsequent peri-procedural red blood cell (RBC) transfusion were identified using electronic records. Sex-specific WHO criteria were used to diagnose and determine anaemia severity. 1-year AFS was the primary outcome. Kaplan Meier analysis and Cox's proportional hazard models (adjusted for age, sex, Rutherford score and severity of anaemia) were utilised.

Results

283 patients were analysed (median age=73yrs). 152 (52.1%) patients were anaemic at baseline: 86 (30.4%) mild, 64 (22.6%) moderate and 2 (0.7%) severe. 54 (19.1%) patients received RBC transfusion. At 1-year, AFS was significantly lower amongst anaemic patients (78.4% vs 63.2, p=.005; Figure 1), with the severity of anaemia also being associated with reduced AFS (p=.005). Upon multivariable analysis, RBC transfusion was the only independent risk factors for amputation/death (HR 3.46, 95% CI 2.08-5.74, p<.001)

Conclusions

Peri-procedural anaemia is associated with poorer outcomes for patients. Whilst optimisation is important, alternatives to RBC transfusion should be considered.

P24

P24 - Development of a comprehensive protocol on the treatment and follow up of Mycotic Abdominal Aortic Aneurysms

Mr Sivaram Premnath[1], Mr Timothy Rowlands[1], Mr John Quarmby[1], Mr Sanjay Singh[1]
[1]*University Hospitals Of Derby And Burton NHS Foundation Trust, Derby, United Kingdom*

Introduction:
Mycotic Abdominal Aortic Aneurysm (MAAA) is a rare and life-threatening disease. Because of the rarity, there is a lack of adequately powered studies and consensus on its treatment and follow up. This project aims to formulate a protocol on the management of MAAA based on available evidence and expert opinion.

Methods:
A PubMed and Medline literature search on mycotic abdominal aortic aneurysms was performed, and available evidence on diagnosis, duration of antibiotics, open/endovascular repair and follow up schedule was collected. A draft protocol on treatment and follow up was formulated. It was then reviewed and modified as per expert opinion from multidisciplinary discussions.

Results:
The attached figure is a concise flowchart depiction of the devised MAAA treatment and follow up protocol.

Conclusion:
The paucity of literature makes it difficult to formulate firm evidence-based recommendations and hence underline the need to rely on expert consensus. It also needs further studies and continued amendments from upcoming evidence. This warrants the need for additional input from discussions in national and international forums.

P25

P25 - A higher Body Mass Index is related to worse satisfaction outcome in obese patients undergoing varicose vein surgery

Mr Sivaram Premnath[1], Ms Elafra Nour[1], Mr Amr Abdelhaleim[1], Mr Timothy Rowlands[1], Mr Ganesh Kuhan[1]
[1]*University Hospitals Of Derby And Burton NHS Foundation Trust, Derby, United Kingdom*

Introduction
Obesity (Body mass index (BMI) >30) with lower limb venous disease is a common problem, yet the evidence is sparse in its management. This study aimed to carry out a satisfaction survey on obese patients following varicose venous surgery (VVS) from a single centre.
Methods
The records of 87 patients with BMI >30 who underwent VVS from January 2017 to April 2018 were analysed. Fifty-three patients had telephone follow up to assess satisfaction in terms of symptoms and appearance. Logistic regression analysis was carried out to identify factors contributing to worse satisfaction.
Results
Mean age was 53.1(50.6 % were males) and mean BMI was 36.1(30-56). Most patients were treated by radiofrequency ablation (81.6% (71/87)). The median follow up was 22 months (14-30). Symptomatic improvement was reported in 74% (39/53) while 5.6% (3/53) reported worsening. In terms of appearance, 71.6 % (38/53) reported improvement, while 7.5 % (4/53) reported worsening. Logistic regression analysis identified higher BMI to be a significant risk factor for poor patient satisfaction (p-value 0.04 OR 1.257 95% CI 1.004 - 1.575).
Conclusion
Patients with higher BMI had poor satisfaction after VVS. This information can help in better patient selection and informed consent for venous interventions.

P26

P26 - Positive and Negative Well-Being of Older Adults with Symptomatic Peripheral Artery Disease: A Population-BasedInvestigation

Dr Snorri Rafnsson[1], Prof Gerry Fowkes[2]
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Objective: We investigated positive and negative subjective well-being in relation to lower-extremity peripheral artery disease (PAD) in a sample of older adults. Method: 4760 participants in the English Longitudinal Study of Ageing (ELSA) provided baseline data on symptomatic PAD, sociodemographic characteristics, lifestyle risk factors, and co-morbid conditions. Baseline and two-year follow-up data were available for life satisfaction, quality of life, and depressive symptoms. Results: Participants with PAD symptoms had lower baseline levels of life satisfaction ($\beta = -0.03$, $P<0.05$) and quality of life ($\beta = -0.04$, $P<0.01$), and more depressive symptoms ($\beta = 0.03$, $P<0.05$). These associations remained statistically significant in multivariate analyses. Baseline PAD did not, however, influence well-being levels at two-year follow-up. Discussion: Greater awareness of the potential for chronic vascular morbidity to disrupt the lives of older adults is needed to inform effective multidisciplinary support and interventions that help maintain the quality of life of those affected.

P27

P27 - Intrinsic adaptation of vascular service in UK's large tertiary centre, our performance and concordance with VSGB&I recommendations during COVID-19 pandemic

Miss Rebecca Lefroy[1], Mr Adam Heyes[2], Mr Anthony Jaipersad[1], Mr Arun Pherwani[1], Mr Jack Fairhead[1], Ms Georgina Shenton[1], Mr Robin Calderwood[1], Mr Sriram Rajagopalan[1,2]
[1]University Hosp.North Midlands , Stoke On Trent, UK, [2]Keele university, Keele, UK

Introduction:
Individual trusts' created COVID-19 protocols and imbibed national guidelines to rationalize workload. Our aim was to assess our unit's response to crisis, compliance to guidelines and performance.

Method:
An eight-week working pattern was compared to the previous year's continuous eight-week period. Surgical procedures, indication for surgery, overall mortality, and compliance to guidelines were documented.

Results:
We performed 84 surgical procedures in 16 all-day-lists and 22 in CEPOD vs. 196 in 50 all-day-lists and 19 in CEPOD (2020 vs.2019). Daily hot-clinics and Interventional radiology lists for limb salvage continued. A significant difference in post-operative mortality rate was seen: 9.5% vs. 3.1%, p=0.036 (2020 vs. 2019). Allowing for a narrow period, a non-significant higher incidence of acute limb ischaemia was seen in 2020.

Conclusions:
Our trust's COVID-pathway incorporated national guidelines on its release. In practice, we were in concordance with all VSGB&I recommendations. Our prospective two tier-day/night consultant-rota and exclusive vascular registrar rota enabled us to function throughout, allowing for sickness absenteeism without compromising care.The study of entire period of the entire pandemic is likely to reveal more findings and learning outcomes.The efficiency of our recovery pathway and patient outcomes which will be the second stage of this prospective observational study.

P28

P28 - Diabetes management of patients undergoing major lower limb amputation during the COVID-19 pandemic

Dr Bhavna Ramachandran[1], Mr Aminder Singh[1]
[1]*Addenbrooke's Hospital, Cambridge, United Kingdom*

Background
Vascular patients are at high risk of perioperative mortality from COVID-19 and diabetes is highlighted as a risk factor for negative surgical outcomes and severe COVID-19 infection. We aimed to compare the diabetic management of major lower limb amputation (LLA) admissions before the pandemic, and emergency LLA admissions ongoing during the pandemic.

Methods
A retrospective review of case notes of patients undergoing major LLA amputations from January-March 2020 (pre-pandemic) and from April-July 2020 (during pandemic) was conducted. The expected standards were derived from the NaDIA report and the NCEPOD LLA report.

Results
13 patients pre-pandemic (270 diabetes days) and 12 patients during pandemic (172 diabetes days) were included. Satisfactory diabetic monitoring during the pandemic was similar to pre-pandemic (96% vs. 94%), as were average number of hypoglycaemic episodes (1.9 vs. 2.1) however overall satisfactory control was significantly worse (61% vs. 81%, $p<0.01$). Perioperative specialist reviews of these patients were more commonly performed during the pandemic than before (91% vs. 77%, $p<0.01$).

Discussion
This audit demonstrates the significant impact of service disruption during the COVID-19 pandemic on diabetic management in this high-risk cohort. Re-configuration of services resulted in displacement of medical staff but also more prompt specialist ‘remote reviews’.

P29

P29 - Vascular Ultrasound Service Experience during the COVID Pandemic

Miss Amy Reed[1], Dr Andrew Arnold[1], Dr Nicholas Thomas[1], Dr Soundrie Padayachee[1]
[1]*Guys And St Thomas', London, England*

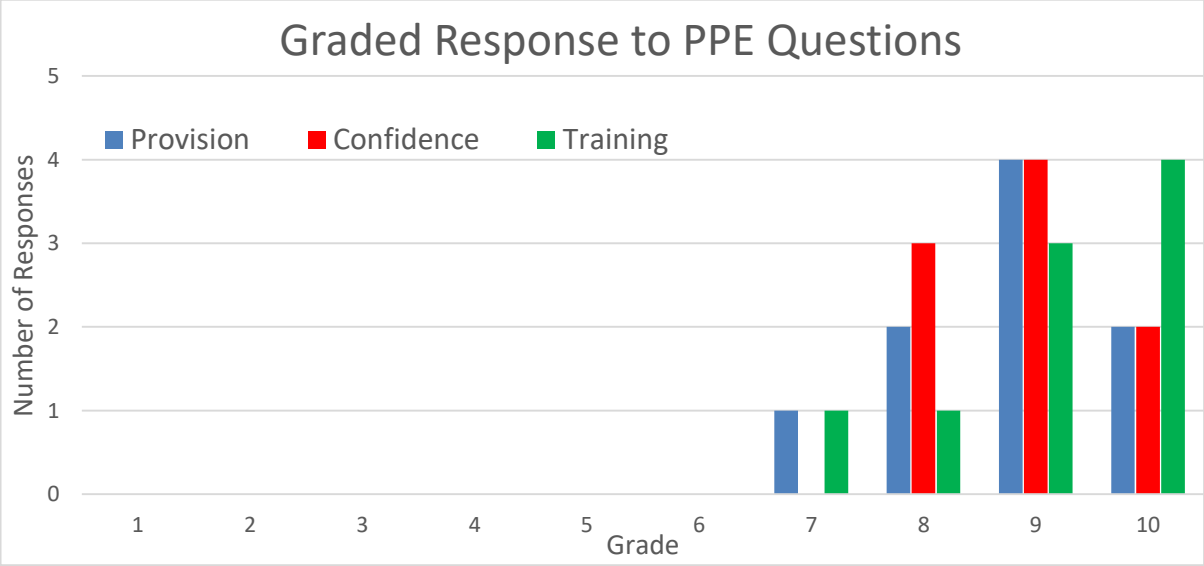
Introduction
The Trust has high consequence infectious disease (HCID) centre and has extracorporeal membrane oxygenation (ECMO) facilities. The COVID pandemic prompted a change in workload, including many ITU COVID+ve referrals to the vascular ultrasound team for diagnostic investigation.

Aim
To document staff morale, assess consistency of personal protective equipment (PPE) and support resource planning in a 'COVID world' through a questionnaire.

Methods
A survey of 20 scaled and open-ended questions was designed and distributed to 10 clinical scientists, 57 days after the first COVID+ patient was scanned. It examined PPE provision across different settings, staff training in use of PPE, the emotional aspect of working during the pandemic and opinions on future working patterns. Responses were graded as a numerate score of 1-10, with 1 being poor.

Results
Nine completed surveys were received. Key points on PPE provision and training, and associated staff confidence are in attached graph.
Confidence in PPE provision varied due to different protocols across the trust and mask fit-test failures. Anxiety levels varied across the department (fine to very anxious). No staff developed COVID+ antibodies during this period.

Conclusions
A considered approach to PPE application can provide a safe, supported scanning service in a 'COVID world'.



P30

P30 - Lessons learned from vascular surgery during the pandemic and implications for future second wave conditions.

Mr Alexander Rolls[1], Mr Abhilash Sudarsanam[1], Dr Xun Luo[1], Mr Chris Aylwin[1], Mr Colin Bicknell[1], Professor Alun Davies[1], Mr Richard Gibbs[1], Mr Usman Jaffer[1], Mr David Nott[1], Miss Celia Riga[1], Mr Joseph Shalhoub[1], Dr Ganan Sritharan[1], Professor Nigel Standfield[1], Mr Michael Jenkins[1]
[1]Imperial College Healthcare NHS Trust, ,

Introduction: The COVID-19 pandemic has had a profound effect on surgical practice. We prospectively audited our caseload and outcomes (between 2 March and 4 May, 2020) with the aim of informing our practice going forward.

Methods: We evaluated case-type, and COVID-associated mortality for all patients who were managed by the vascular unit.

Results: The audit captured data on 123 patients; 91 received a vascular procedure and 32 were managed non-operatively. Table 1 gives a breakdown of index cases performed before and after the start of the lockdown period. There were reductions in both the total number of cases and emergency/urgent cases performed following lockdown commencement. There were 13 COVID diagnoses in the operatively managed group (2 diagnosed pre- and 11 post-operatively), of which 7 (3 males, 4 females, 5 BAME, 2 Caucasian, 1 had spent time on ITU) died from the virus, giving a fatality rate of 54%. There were 9 COVID diagnoses in the non-operative group, of which 4 died as a result of COVID-complications (3M, 1F, all Caucasian), giving a fatality rate of 44%.

Conclusion: SARS-CoV-2 testing and appropriate counselling and consent are mandatory for vascular patients. Modification of practice will be needed again during any future spikes.

Table 1.

CASE TYPE	Number (pre-lockdown)	Number (during lockdown)
CLI revascularisation	11[a]	8[$]
Claudication revascularisation	5	0
ALI revascularisation	4	5
Aorta	4	5[*]
Carotid	2	2[£]
Ablative[^]	17	12
Trauma	2	1

P31

P31 - Statins in peripheral arterial disease (PAD): A meta-analysis exploring the link between dose and patient outcomes.

Mr Xiaoyu Chen[1], Dr Samick Sofat[2], Mr Mohammed Chowdhury[1], Mr Patrick Coughlin[1]
[1]Department of Vascular Surgery, Addenbrooke's Hospital, Cambridge, United Kingdom, [2]Department of Vascular Surgery, Colchester General Hospital, Colchester, United Kingdom

Statin therapy is indicated in patients with PAD. NICE guidelines suggest the use of 'high dose' statins, although evidence with PAD-specific data is lacking. We investigate the effect of statin dosage on outcomes in PAD.

Studies measuring statin usage in PAD patients with predetermined outcomes were identified using MEDLINE and PUBMED. 21 observational cohort studies and 2 randomised control trials were included (n= 267,894). Similar outcomes and measures were collated; pooled estimates of dichotomous outcome data were then calculated using the odds/hazard ratio (OR/HR) and 95% confidence interval (CI). Meta-analysis was conducted using the inverse-variance or Mantel-Haenszel method. Outcomes included all-cause mortality (ACM), cardiovascular mortality (CVM), and major adverse cardiac events (MACE).

High doses of statins (vs. standard doses) were significantly protective against ACM (HR 0.74, 95% CI 0.62-0.89) but work less effectively for MACE (OR 0.77, 95% CI 0.49 to 1.21). Amputations were less frequent in patients on high dosages (HR 0.78, 95% CI 0.69-0.90). Statin therapy (vs. no statin therapy) was significantly protective for ACM, CVM, MACE, and amputations.

Our analysis shows higher dosing of statins confers a significant improvement in patient outcomes, especially ACM and MACE. Such findings now need to be confirmed in prospective clinical trials.

P32

P32 - An endovascular approach is safe and effective in the treatment of abdominal aortic aneurysms detected by the National Abdominal Aortic Aneurysm Screening Programme

Miss Katherine Stenson[1], Prof Peter Holt[1], Prof Ian Loftus[1]
[1]St George's Vascular Institute, London, UK

Introduction

The National Abdominal Aortic Aneurysm Screening Programme (NAAASP) commenced in England in 2009 with the aim of reducing death from aneurysm rupture. This study reports the outcomes of men treated at our institution for screen-detected abdominal aortic aneurysms (AAA).

Methods

Patients who underwent repair of a screen-detected aneurysm between February 2010 and 2019 were identified from prospectively-kept records held by the local screening programme. Pre, peri- and postoperative details were collected from case notes and online hospital records.

Results

119 men underwent repair of a screen-detected aneurysm. 88 aneurysms were infrarenal, 26 juxta- and suprarenal and 5 thoracoabdominal. The median aneurysm diameter was 59 mm. 2 repairs were open and 117 endovascular, using a variety of stent-grafts. Median follow-up is 3.65 years. 4 aneurysm-related deaths have occurred. There were 20 deaths from all causes. 20 patients (16.8%) have required reintervention. 84 cases were elective infrarenal AAA repairs of which 83 were endovascular repairs. Of these patients, there were no aneurysm-related deaths. Kaplan-Meier estimates of freedom from all-cause mortality and reintervention are shown in figure 1.

Conclusions

This study shows that an endovascular first approach to the treatment of screen-detected AAA is a safe and effective one.

	Kaplan-Meier estimates (%) of freedom from complication									
	0 years	**1 year**	**2 years**	**3 years**	**4 years**	**5 years**	**6 years**	**7 years**	**8 years**	**9 years**
All-cause mortality	100.0	100.0	98.6	95.0	85.9	85.9	85.9	85.9	85.9	85.9
Reintervention	100.0	84.4	84.4	84.4	84.4	84.4	84.4	79.7	79.7	79.7

P33

P33 - A systematic review and meta-analysis of reflux patterns in chronic venous disease

Dr Matthew Tan[1], Mr Roshan Bootun[1], Miss Sarah Onida[1], Mr Tristan Lane[1], Professor Alun Davies[1]
[1]*Imperial College London, London, United Kingdom*

Aims:
To quantify the relationship between chronic venous disease (CVD) clinical manifestations and reflux patterns.

Methods:
Medline and EMBASE databases were searched to 30th June 2019. Inclusion criteria: English language; ≥16 years old; reflux documentation in ≥2 anatomical systems (deep, superficial, perforator); reflux patterns related to CVD manifestations. Meta-analysis was performed to generate pooled odds ratios (OR) for C4-6 disease with specific patterns of reflux.

Results:
The search retrieved 21 studies. Greater superficial, deep, and perforator reflux prevalence were associated with C4-6 disease compared to C1-3. Meta-analysis only showed significant OR for C4-6 disease with deep or perforator reflux. Three studies significantly associated combined reflux to C4-6 disease, but two studies showed otherwise. Ulcer development was associated with deep and combined reflux. Highest CVD progression risk was related to combined deep and superficial reflux. Increasing chronic venous insufficiency grade was associated with increasing isolated deep and superficial reflux prevalence and combined reflux (deep and superficial, superficial and perforator).

Conclusion:
Isolated and combined reflux patterns are associated with CVD severity; similarly, an association between deep and combined reflux exists with leg ulceration. This may help determine health policy for venous disease treatment. This review however is limited by the study heterogeneity.

P34

P34 - Freedom from ulceration after recanalisation and venous stenting in ex-intravenous drug users: a case series

Miss Mei Nortley[1], Dr Ahmed Elzein[2], Dr Andrew Wigham[2], Miss Emma Wilton[1]
[1]*Department of Vascular Surgery, Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom,*
[2]*Department of Interventional Radiology, Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom*

Introduction:
Venous leg ulcers carry significant financial burden. Successfully rehabilitated ex-intravenous drug users' (ex-IVDUs) residual quality of life (QoL) can be poor due to chronic venous disease. Exclusion from treatment over concerns regarding compliance and complexity of venous lesions may occur. Limited data exists on venous intervention in this patient group.

Methods:
Data were collected retrospectively. 8 ex-IVDU patients (11 limbs) with venous outflow obstruction and ulceration were assessed for recanalisation and stenting over 3-year period (January 2017-2020).

Results:
9/11 eligible limbs were suitable for recanalisation. Technical success (crossing occluded venous segment and restoring in-line flow) was 67% (6/9 limbs). Primary assisted patency at 1 year was 75%. Relining one stent was undertaken for compression at inguinal ligament. Another stent repeatedly occluded and was unsalvageable. All patients with patent stents reported ulcer healing, no new ulceration and consistent improvement in Villalta score.

Conclusion:
The disease pattern in this group is challenging and different to typical post-thrombotic venous obstruction, invariably affecting CFV and lower EIV, often with poor in-flow vessels. With careful selection, including rigorous pre-procedure assessment and follow-up, patients can undergo successful venous recanalisation and stenting. This facilitates longer periods of ulcer free time, improving QoL and reducing healthcare costs.

P35

P35 - Safe delivery of a regional endovascular service during the UK Covid-19 pandemic March to June 2020 – challenges, mitigations and outcomes.

Mr Yousef Yousef[1], Miss Hiba Abdalla[1], Dr Ganesh Alluvada[1], Mr Maher Hamish[1], Ms Alison Edwards[1], Mr Séan Matheiken[1], Dr Davis Thomas[1]
[1]*Northampton General Hospital, Northampton, United Kingdom*

INTRODUCTION
Multiple bodies issued specialty advice during the UK's first Covid-19 pandemic wave. We reviewed available guidance and produced a Covid-19-proofed pathway for local endovascular service provision, prior to availability of widespread testing.

METHODS
1. Formulation of local treatment policy [Table 1].
2. Implementation of operational changes.
3. Overview of clinical outcomes.
4. Effectiveness of Covid-19 safety measures

RESULTS
1. Triage outcomes are shown in Table 1, column 6.
2. Implementation:
a. All non-essential IR suite visits redirected to phone/email.
b. Temperature screening at entrance.
c. All out-patients as Day-case.
d. In-patient cases 'last on list'.
e. Face masks at all times by all individuals.
f. PHE guidance and local IPC policy followed.
g. Staff numbers precluded staggered or segregated working rotas.
3. Lower limb angioplasties, fistuloplasties, thrombectomies, re-interventions and EVARs were performed with <2% major complications and no immediate perioperative mortality or limb loss.
4. No out-patients (incomplete data) and no involved staff tested Covid-19 positive within a fortnight of IR encounters.

CONCLUSIONS
Our practice embodied consensus across four major guidance documents.
Most advice (BSIR, VS, NHS) was generic and not condition specific.
All specialty specific guidance omitted haemodialysis access.
Our Covid-19 operational policy produced safe clinical outcomes.

Table 1.

Type of Vascular procedure	**NHS specialty guidance 20.03.2020**	**British Society of IR 23.03.2020**	**Vascular Society 27.03.2020**	**Joint statement RCS x 4 11.04.2020**	**Local Practice Outcome**
Angioplasty for IC	Non-operative management (G)	Liaise with referring teams (G)	Should be deferred (S)	Perform after 3 months	**Did not perform**

Angioplasty for CLTI	Obligatory; minimize IP stay (G)	Perform if urgent (G)	Require urgent intervention (S)	Perform within 1 month (S)	**Service provision unaffected**
AV fistuloplasty	No specific guidance	Perform if urgent (G); no (S)	No guidance	No guidance	**Service provision unaffected**
EVAR for AAA	Reduce LOS; minimise level 2/3 dependency; reduce exposure to hospital environment (G)	Liaise with referring teams (G)	Weigh up risk of rupture; operate if >7cm. (S)	7 cm AAA: treat within 1 month. 5.5 – 7 cm: treat within 3 months (S)	**Performed selectively**
Percutaneous thrombectomy	Consider increased utilization of endovascular techniques (G)	Liaise with referring teams (G)	Urgent and emergency (procedures) should continue (G)	Perform within 24-72 hours (G)	**Service provision unaffected**
Embolisations	No specific guidance	Perform if urgent (G); no (S)	Urgent and emergency (procedures) should continue (G)	Perform within 24 hours (G)	**Service provision unaffected**
Secondary interventions	No specific guidance	Perform if urgent (G); no (S)	Urgent and emergency (procedures) should continue (G)	Perform within 1 month (G)	**Service provision unaffected**

(G) Generic guidance as best interpreted to apply to this condition
(S) Specific condition-specific guidance provided within the document
IC: intermittent claudication
CLTI: chronic limb threatening ischemia
IP: In-Patient
LOS: Length of Stay
IR: Interventional radiology
RCS: Royal collage of surgeons

P36

P36 - A Review of National and International Scientific Meeting abstracts in response to the Draft NICE Aortic Aneurysm Guidelines NG156

Dr. Sofian Youssef[1,2], Mr Matthew Popplewell[3], Mr Ryan Peysner[1], Mr Mohamed Elkawafi[4], Mr Sriram Rajagopalan[1,2]

[1]Keele University School of Medicine, Newcastle-under-Lyme, United Kingdom, [2]University Hospitals of North Midlands NHS Trust, Stoke-on-Trent, United Kingdom, [3]University of Birmingham, Birmingham, United Kingdom, [4]Countess of Chester Hospital, Chester, United Kingdom

Background

NICE draft guidelines (2018) regarding elective infra-renal EVAR were disputed across centres. We aim to appraise abstracts from 3 meetings related to the guidelines.

Methods

Three Vascular surgical meetings (2019) were reviewed: The Vascular Society for Great Britain and Ireland (VSGBI), British Society for Endovascular Therapy (BSET) & Charing Cross Symposium (CX). Abstracts were reviewed for methodology, sample size, collection period and conclusions.

Results

115/549 (20.9%) abstracts were EVAR related; 26/115 (22.6%) contradicted draft guidelines. Median (interquartile range) collection period: 4 years (2.25-6.75 years); median (interquartile range) sample size: 102 patients (55-171 patients).

BSET (n=43): 7 disputed guidelines (50% of EVAR; 16.3% of BSET; 6 retrospectives; 1 prospective).

VSGBI (SVS n=131): 9 disputed guidelines (36% of EVAR; 7% of SVS; 7 retrospectives; 2 prospective).

CX (n=375): 10 disputed guidelines (13.2% of EVAR; 2.7% of CX; 6 retrospectives; 2 prospective; 1 case series; 1 case report). 1 supported draft recommendations.

Outcomes

20/26 concluded EVAR is safe; 3/26 concluded refusal is unsafe; 2/26 concluded guidelines are not financially or practically implementable; 1/26 concluded guidelines are not robust method of allocating treatment. 1 quoted more EVAR complications.

Conclusion

A significant response to the draft guidelines was found. Outcomes were reflected in NG156.

P37

P37 - Visceral Artery Aneurysms (VAA) – A Single Centre Experience Over 6 Years

Countess of Chester hospital NHS trust Shady Zaki[1]
[1]*Countess Of Chester Hospital Nhs Trust, Chester, United Kingdom*

Background
The incidence of visceral artery aneurysms (VAA) varies from 0.01-0.1%. They are significant with a mortality risk of up to 75% if ruptured. Given there are no national guidelines we decided to conduct this study to assess the management of VAA in our trust and recommend local guidelines.

Methods
We retrospectively identified patients who had a detected VAA between April 2014 and April 2020. Medical records and relevant imaging were reviewed in detail. MDT outcomes and subsequent mortalities noted.

Results
We identified 62 VAA in 59 patients (23 male), median age 65 years, and mean diameter 18.1 mm. 95 % were detected on CT, the indication was mostly malignancy. MDT outcomes were to continue surveillance for 43 patients with yearly scans, 5 patients had primary surgical repair, 7 patients had endovascular interventions, 1 patient had primary endovascular intervention that failed and required surgical intervention. 7 patients were discharged from follow up due to age and size (12 mm) or VAA completely thrombosed.

Conclusion
In our unit decisions to intervene were based on size > 20mm, rapid increase in size on surveillance, the presence of portal hypertension or possibly the patients' young age. There were no mortalities linked to VAA.

VS Poster Abstracts

P38

P38 - Patient outcomes following exercise therapy for claudication at a tertiary vascular surgery centre: a four-year retrospective study

Dr Karthik Rajendran[1], Dr Majid Al-Khalil[1], Ms Christina Theophilus[1], Mr Jason Constantinou[1]
[1]*Royal Free Hospital, London, United Kingdom*

Introduction:

Exercise improves total and pain free walking distance for patients with intermittent claudication (IC) and is an alternative to surgical therapy.

We aimed to identify IC patients referred for exercise therapy at a tertiary vascular surgery centre and evaluate improvements in total walking distance (TWD) and pain free walking distance (PFWD).

Methods:

A retrospective notes review was conducted and data collected on TWD and PFWD at baseline, 3-6 months and 9-12 months. A patient satisfaction questionnaire was administered on discharge.

Results:

Fifty patients were identified: 33 attended exercise classes and 17 had telephone support only. Median time from referral to first session was 115 days. Mean follow up length was 3-6 months for 23 patients and 9-12 months for 25.

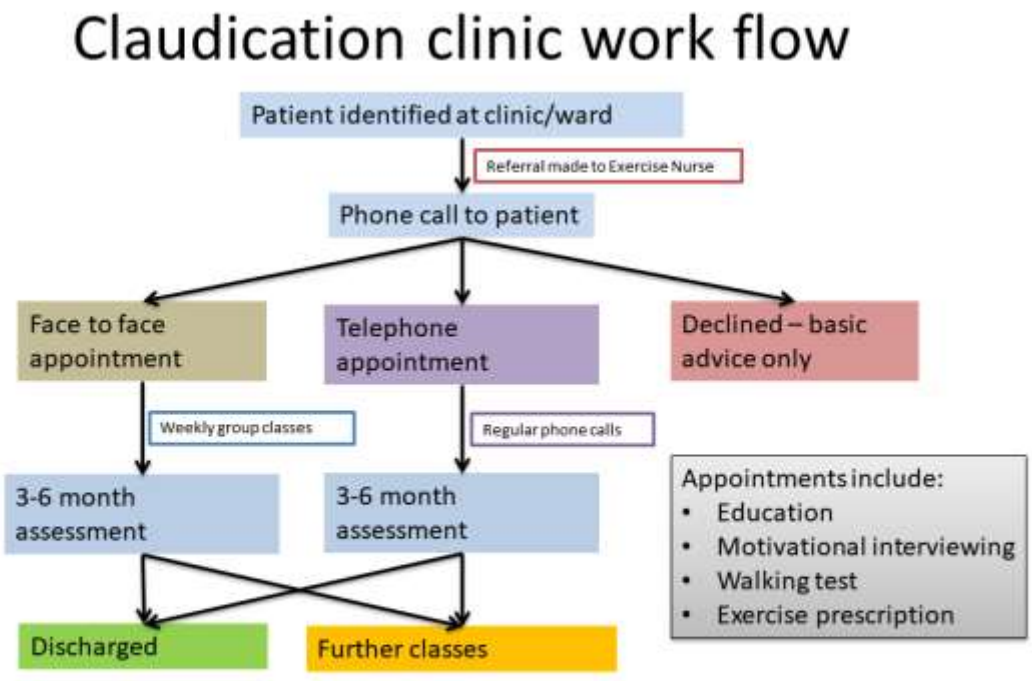
Mean improvements in TWD at 3-6 months were 140m ($p<0.01$) in exercise classes and 121m ($p<0.01$) for those with telephone support. Mean improvements in PFWD were 88m ($p<0.01$) in exercise classes and 71m ($p<0.02$) in telephone support.

43 patients completed the questionnaire. On a scale 1-10 for usefulness, exercise classes scored 9.3 and telephone support scored 9.2.

Conclusion:

Exercise improves TWD and PFWD in claudicants. Supervised exercise classes performed better than telephone support but patients reported similar satisfaction rates.

Exercise class improvement	Telephone support improvement
PFWD (3-6 months): 88m	PFWD (3-6 months): 71m
PFWD (9-12 months): 121m	PFWD (9-12 months): 48m
TWD (3-6 months): 140m	TWD (3-6 months): 121m
TWD (9-12 months): 160m	TWD (9-12 months): 151m



P39

P39 - Limb occlusion after EVAR

Mr Melvinder Basra[1], Mr Sebastian Ho[1], Mr Hardeep Sahota[1], Miss Mimi Li[2], Mr Adam Howard[2], Mr Matthew Armon[1], Mr Sohail Choksy[2]
[1]Norfolk & Norwich Hospital, , UK, [2]Colchester Hospital, , UK

Background

Limb occlusion is a serious consequence of EVAR: this study identifies predisposing factors.

Methods

895 patients undergoing EVAR in two centres from 2007-2017 were studied retrospectively using patient records and 3-d reconstruction software. The factors analysed included:
demographics (age, gender, diabetes, smoking), aneurysm size, morphology, iliac tortuosity, presence and distribution of occlusive disease, stent details, landing zone vessel, diameters and distal patency, intra-operative events, and post-operative surveillance.

Results

50/895 (6%) patients developed limb occlusion.
The commonest association was oversizing by >10% of the native vessel diameter affecting 44/50 (88%) and oversizing >20% affecting 25/50 (50%).
Other factors included external iliac artery landing zone 11/50 (22%) and kinking 5/50 (10%).

50 controls with similar baseline characteristics were randomly selected. Oversizing was significantly greater in the limb occlusion group compared to controls: Mann-Whitney U test ($P < 0.05$). Iliac tortuosity did not contribute to limb occlusion.

The Cook graft had 9% and 7% limb occlusion rates across sites compared to 3% for Medtronic and Vascutek.

Conclusion

Oversizing of iliac limbs >10% is a key factor contributing to limb occlusion after EVAR, and the Cook endograft is possibly more susceptible to this phenomenon. As a modifiable factor, this finding could change practice.

P40

P40 - Retrospective study of infra-inguinal bypasses: results of a single-center 3 years surveillance

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Introduction
Infra-inguinal bypass remains a mainstay in dealing with lower extremity ischemia many times after failed endovascular attempts. However maintaining patency of any bypass graft is challenging. The aim of this study was to review our experience on the outcomes and patency of all the infra-inguinal bypasses.
Methods
Retrospective analysis of a prospectively collected database was performed of 180 patients with infra inguinal bypasses over 3-year period (2015-2017). Major adverse limb effects, mortality and patency rates were analysed.

Results
180 Infra-inguinal bypasses were performed with a mean age of 73 years and 80% males. 75% of them were autologous vein grafts .50.56% of patients required re-intervention within the study period. 56.3% had patent grafts at 1 year, this fell to 39% at 2 years. At 1 year 14% had major amputations which increased to 18% at 2 years. 15% patients were dead at 1year and 25% within 2 years. The overall loss of life or limb rate was 42%.

Conclusion
Our study re-emphasizes the complex nature of leg bypasses with significant adverse outcomes within 2 years. We strongly suggest that every tertiary unit should re-evaluate and rethink about their decisions prior to offer bypasses to their CLTI patients.

P41

P41 - Can styloid process and internal carotid artery anatomy be used to predict carotid artery dissection?

Mrs Lucinda Bhattacharya[1], Dr Michael Joffe[2], Mr Daryll Baker[2]
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Introduction
Carotid artery dissection is a common cause of stroke in the young. Our aim was to assess whether there is an association between styloid process length, internal carotid artery position and cervical carotid artery dissection (CCAD). This information would provide potential radiological measurements, which could prevent delays in diagnosis of CCAD.

Methods
Data was collected from two central London hospitals over five years. Individuals who underwent computer topography angiography of the neck for suspected CCAD were assessed. The following data was collected: evidence of CCAD; bilateral styloid process length and presence of stylohyoid ligament calcification; bilateral styloid process-carotid distance; calcification of carotid arteries and whether their position was aberrant.

Results
Three hundred and twenty-six individuals were identified. Forty-four individuals had CCAD, compared with 282 controls. In individuals with CCAD, average styloid process length was 27.6mm and styloid process-carotid distance was 4.9mm. There was not a significant association between styloid process length or styloid process-carotid distance, and CCAD. None of the patients with CCAD had an aberrant internal carotid artery.

Conclusions
In our study, there is no clear association between styloid process length and styloid process-carotid distance with CCAD. Internal carotid artery aberrancy may be protective of CCAD.

P42

P42 - The content of prehabilitative interventions for patients undergoing surgical repair of abdominal aortic aneurysms and their effect on post-operative outcomes; a systematic review

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Introduction

Prehabilitation describes the enhancement of functional capacity and tolerance to an upcoming physiologic stressor, however, its role in abdominal aortic aneurysm (AAA) repair is unclear. Literature investigating the effect of prehabilitive interventions on the post-operative outcomes of patients undergoing AAA repair was systematically reviewed.

Methods

EMBASE and Medline were searched from inception to October 2019. Two authors screened titles for inclusion, assessed risk of bias, and extracted data. Primary outcomes were post-operative 30-day mortality, composite endpoint of 30-day post-operative complications, hospital length of stay (LOS), and health-related quality of life (HRQL) outcomes.

Results

Seven randomised controlled trials (RCTs) with 901 patients were included (3 exercise-based, 2 pharmacological-based, and 2 nutritional-based). Risk of bias was mostly unclear or high and the clinical heterogeneity between the trials precluded the pooling of data for meta-analyses. The quality of intervention descriptions was highly variable. One exercise-based RCT reported significantly reduced hospital LOS and another reported improved HRQL outcomes. Pharmacological nor nutritional-based RCTs reported significant differences.

Conclusions

There is limited evidence to draw clinically robust conclusions about the effect of prehabilitation on post-operative outcomes following AAA repair. Well-designed RCTs are urgently needed to establish the clinical-effectiveness and cost-effectiveness of prehabilitation interventions in AAA repair.

P43

P43 - Quality assessment of patient information on Abdominal Aortic Aneurysm repair on the internet using the modified ensuring quality information for patients tool.

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Introduction

The internet is a major source of medical information for patients. However, little is known about the quality of websites regarding Abdominal Aortic Aneurysm (AAA) repair. The ensuring quality information for patients (EQIP) tool, a 36-point checklist, has been used extensively in other fields of medicine to assess online patient material.

Methods

The 12 most used search terms relating to AAA repair where identified using Google trends, with the first 109 websites retrieved for search term. After removal of duplicates and application of inclusion/exclusion criteria, websites were EQIP scored. The presence of accurate mortality, complication rates and emergency guidance was also recorded.

Results
1297 viable websites were identified with 235 (18%) eligible for analysis. The median EQIP score for all websites was 18 (IQR 14-21). 78% of the websites originated in the USA with a median EQIP score of 17, while 13% came from the UK with a median score of 22. Only 18% of the websites provided mortality rates, 12% complication rates and 20% emergency guidance.

Conclusions

The quality of most websites concerning AAA repair is low. Thus, health practitioners should be aware of this issue and the whereabouts of high-quality material to which patients can be directed.

P44

P44 - Protocol driven reduction of haematoma following symptomatic carotid endarterectomy (CEA)

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Introduction
Symptomatic CEA are usually undertaken in patient on dual antiplatelet therapy. This increases the likelihood of post-operative haematoma and return to theatre to 2.3% nationally (2019 NVR report). A previous audit in our unit identified a high (6%) return to theatre rate for neck haematoma. This study assesses the outcomes of introducing a haemostasis pathway for patients undergoing CEA in a single unit.

Method
A prospective cohort outcome study between June 2019 and June 2020 following the introduction of a step-wise pathway (Figure 1) aimed at reducing post symptomatic CEA haematoma rates was undertaken. This was implemented at the end of successful patch closure, for each CEA.

Results
Data from all 55 cases were available (Table 1). During this period, 2 patients had neck haematoma, with only 1 needing to return to theatre. Two further patients had minor skin bleeding, not needing transfusion or return to theatre. Of the 55 patients undergoing endarterectomy, 30 received protamine, tranexamic acid or both. None required platelets transfusion

Conclusion
Our protocol appears to reduce post-CEA haematoma rates to a level below the national average without an increased peri-operative stroke rate. This is however a small cohort preventing meaningful statistical analysis.

	Pre intervention (%) (n=100)	Following intervention (%) (n=55)
Haematoma	7(7)	2 (3.6)
Return to theatre for haematoma	6(6)	1 (1.8)
Minor bleeding*	(0)	2 (3.6)
Stroke	5(5)	1 (1.8)
Acute coronary syndrome	1(1)	1 (1.8)

* Not requiring transfusion or return to theatre

P45

P45 - Reducing the risk of face to face aneurysm screening appointments in the post COVID-19 era.

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Introduction
In mid March 2020 due to the COVID-19 pandemic the North London Abdominal Aortic aneurysm screening programme was suspended. At the time of suspension there were 3090 men requiring appointments.
In the post Covid era, it is encumbent on clinicians to reduce face to face consultations where possible.
The aim of the study was to identify whether the 2019-20 screening cohort of men still to be invited had undergone imaging which allowed definitive measurement of the diameter of the infrarenal aorta; thereby reducing the need for men to attend the aneurysm screening programme.
Methods
A cohort of men awaiting invitations living in the boroughs of Camden, Barnet, Islington and Enfield were taken and imaging systems at three hospitals were interrogated to determine whether any of the cohort had undergone cross sectional imaging which allowed measurement of the infrarenal aorta in the last 18 months.

Results
Presented in Table 1

Conclusion
This study identified 13.5% of men who had undergone imaging of their aorta. Adopting this study nationally would significantly reduce the number of screening appointments needed. Furthermore, an automated process could streamline the process and reduce exposure for this high risk group of patients

Borough	No. of men pending invitations to screening	Number of men with imaging	%
Barnet	194	31	16%
Camden	151	27	17.9%
Enfield	166	16	9.6%
Islington	223	25	11.2%
Totals	**734**	**99**	**13.5%**

P46

P46 - Multicentre interrogation of Covid-19 mask guidance as practised in hospital ward settings

Miss Delphine Couderq[1], Mr Yousef Yousef[1], Miss Hiba Abdalla[1], Mr Adam Farr[3], Mr Sobath Premaratne[5], Ms Maria Mousley[2], Prof Janice Tsui[3,4], Mr Séan J Matheiken[1]

[1]Northampton General Hospital, , United Kingdom, [2]Northamptonshire Healthcare Foundation Trust, , United Kingdom, [3]Royal Free Hospital, London, United Kingdom, [4]University College London, London, United Kingdom, [5]Queen Elizabeth Hospital, Birmingham, United Kingdom

BACKGROUND

PHE UK issued 27 updates to Covid-19 IPC guidance between 15th January and 2nd April 2020. Ward-based observations revealed frequent inconsistencies in the use of FRSM and FFP masks. Fit testing of single-use respirator masks has ceased in many Trusts.

METHODS

1. From 28th June 2020, expert opinion sought from 22 professionals across seven organisations in Vascular Surgery, Infectious Diseases and Microbiology, Diabetic Foot MDT, Acute Medicine, NHS Management and IPC, Haematology, Psychiatry, Vascular Sonography and Anaesthesia.
2. Specific questions [Table 1] posed regarding mask use in ward settings.
3. Responses received by 9th July 2020 correlated with PHE guidance and local practices.

RESULTS

1. Respondents overwhelmingly agreed that hospital in-patients should wear FRSM when not safely distanced. Responses and observations indicate this is not uniformly practised.
2. No respondents' workplace policies specify changes to PPE use by staff when Covid-19 patients cannot retain face masks during care provision.
3. Majority of respondents believe FFP3 masks continue to require fit testing, in line with current PHE guidance.

CONCLUSION

Existing national guidance regarding FRSM, FFP3 masks and fit testing is being variably interpreted and implemented in multiple NHS Trusts. More specific national advice and local policies may reduce this disparity.

Designation	Q1: Should all IPs wear FRSM?	Q2: What PPE should HCW use when Covid19+ patient doffs FRSM?	Q3: Is fit testing no longer needed for safe use of FFP3?
Consultant, Vascular Surgeon and Diabetic foot MDT	Yes	Unsure if guidance clear, acceptable to use FFP3	Necessary
Consultant, Vascular Surgeon	Yes	FFP3	Necessary – guidance must clarify if not.
Senior Registrar, Vascular Surgery	Yes	FFP3 - as per WHO guidance	Necessary
Lead Podiatrist, and Diabetic Foot MDT	Yes	Current practice for acute mental health team to use FFP3	All podiatrists across one county are being fit tested

Senior Podiatrist, and Diabetic Foot MDT	Yes	No response	No response
Consultant, Acute Medicine and Diabetic Foot MDT	There is no evidence, it is driven by pragmatic rationing	"Anyone shouting / coughing / spitting is creating their own aerosol"… "should be nursed by those in PPE"	No response
Consultant, Anaesthetist	Yes for positive patients	FFP3	Fit testing is subjective, therefore useless
Consultant, Acute Medicine and Cardiology	Yes; additional point that masks minimise shedding onto bedside fomites.	Ambivalent about use of FFP3 (but if so should be sessional use)	Believes necessary "common sense to know if it works"
Assistant Director IPC	Lacks evidence to support this	FFP3 should be "available if necessary"	Necessary as per CoSHH regulation 7

PHE = Public Health England
WHO = World Health Organisation
CoSHH = Control of Substances Hazardous to Health
IPs = In-patients
HCW = HealthCare Worker
MDT = Multidisciplinary Team
IPC = Infection Prevention and Control
PPE = Personal Protection Equipment
FRSM = Fluid Resistant Surgical Mask
FFP3 = Filter Face Piece 3 respirator mask

P47

P47 - An Assessment of Available Information On the World Wide Web for Patients with Lower Limb Arterial Disease

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Introduction: In the current global pandemic, patients are becoming more reliant on online resources to supplement their professional consultations. This is the first study to comprehensively assess the quality of patient information relating to lower limb arterial disease on the World Wide Web.

Methods: We analysed the first 50 hits from the three largest search engines and the first 20 videos from YouTube using the search terms “intermittent claudication” (IC) and “peripheral arterial disease” (PAD). Quality, readability, and reliability were assessed using separate scores outlined in Table 1.

Results: Overall scores are shown in Table 1. Of the 76 websites analysed, the majority were rated as weak (IC= 51.7%, PAD= 72.3%) and requiring an above average reading level (IC= 69%, PAD= 68.1%). The median Michigan score for IC was lower than that for PAD (p=0.03). Of the 22 videos analysed, the median scores for quality and reliability were rated suboptimal for both IC and PAD.

Conclusions: The educational quality and reliability of information on the internet is low. Given the current pandemic, it is now more important than ever to focus on improving the quality of all forms of information delivery to allow proper advocacy for our patients.

Table 1: scores in each domain for IC and PAD. Reported as median and IQR.

Website assessment (n=76)				
	IC		**PAD**	
	Median	**IQR**	**Median**	**IQR**
Quality: University of Michigan Consumer Health Web Site tool	27	15-32.5	31	25.5-48.8
Readability: Flesch Reading Ease	55.9	46.6-60.6	55.3	44.6-59.3
YouTube video assessment (n=22)				
Quality: Global Quality Score	3	3-4	3	3-3
Reliability: JAMA benchmark criteria	2	2-2	2	2-3
Educational content: Subjective score	5.5	5-8	8.5	7.25-11.5

P48

P48 - A systematic review of the impact of foot-care education on self-efficacy and self-care in diabetic foot disease

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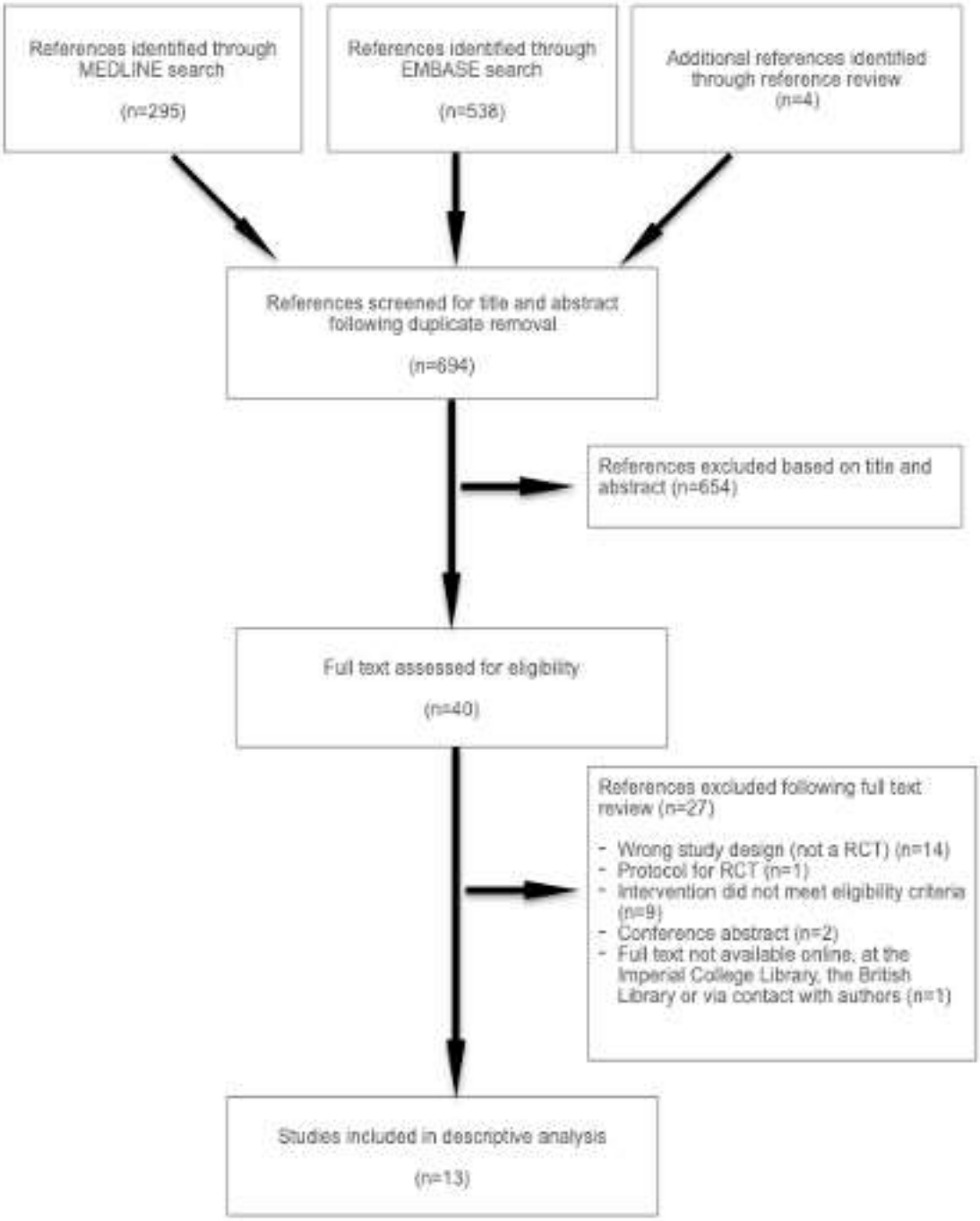
Diabetic foot disease is a serious complication of diabetes mellitus with significant morbidity and mortality.

The aim of this study is to summarize the evidence reported on the impact of foot-care education on self-efficacy, and self-care in individuals with diabetes.

This was a PRISMA compliant systematic review. A systematic search of EMBASE and MEDLINE databases was performed. All included studies were prospective, randomised controlled trials that assessed foot-care education interventions in individuals with diabetes. Risk of bias was assessed using the Cochrane risk-of-bias tool.

Thirteen randomised controlled trials were included, reporting on a total of 3948 individuals. The risk of bias was deemed high or unclear in 11 of the 13 included studies, and low in 2 studies. Eight of 11 studies identified significantly better foot self-care behaviour scores in individuals randomised to education compared with controls. Self-efficacy scores were significantly better in education groups in four of five studies reporting this primary outcome. Foot-care knowledge was significantly better in intervention versus control in three of seven studies. Studies assessing secondary end-points including quality of life, mood and ulcer incidence tended not to identify significant clinical improvements.

Foot-care education likely improves foot self-care behaviour and self-efficacy in individuals with diabetes.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Full text assessed for eligibility
(n=40)
References excluded following full text review (n=27)
- Wrong study design (not a RCT) (n=14)
- Protocol for RCT (n=1)
- Intervention did not meet eligibility criteria (n=9)
- Conference abstract (n=2)
- Full text not available online, at the Imperial College Library, the British Library or via contact with authors (n=1)
Studies included in descriptive analysis
(n=13)

P49

P49 - A multi-centre technology validation to analyse the efficacy and efficiency of the SocketSense sensor embedded in the patient prosthesis

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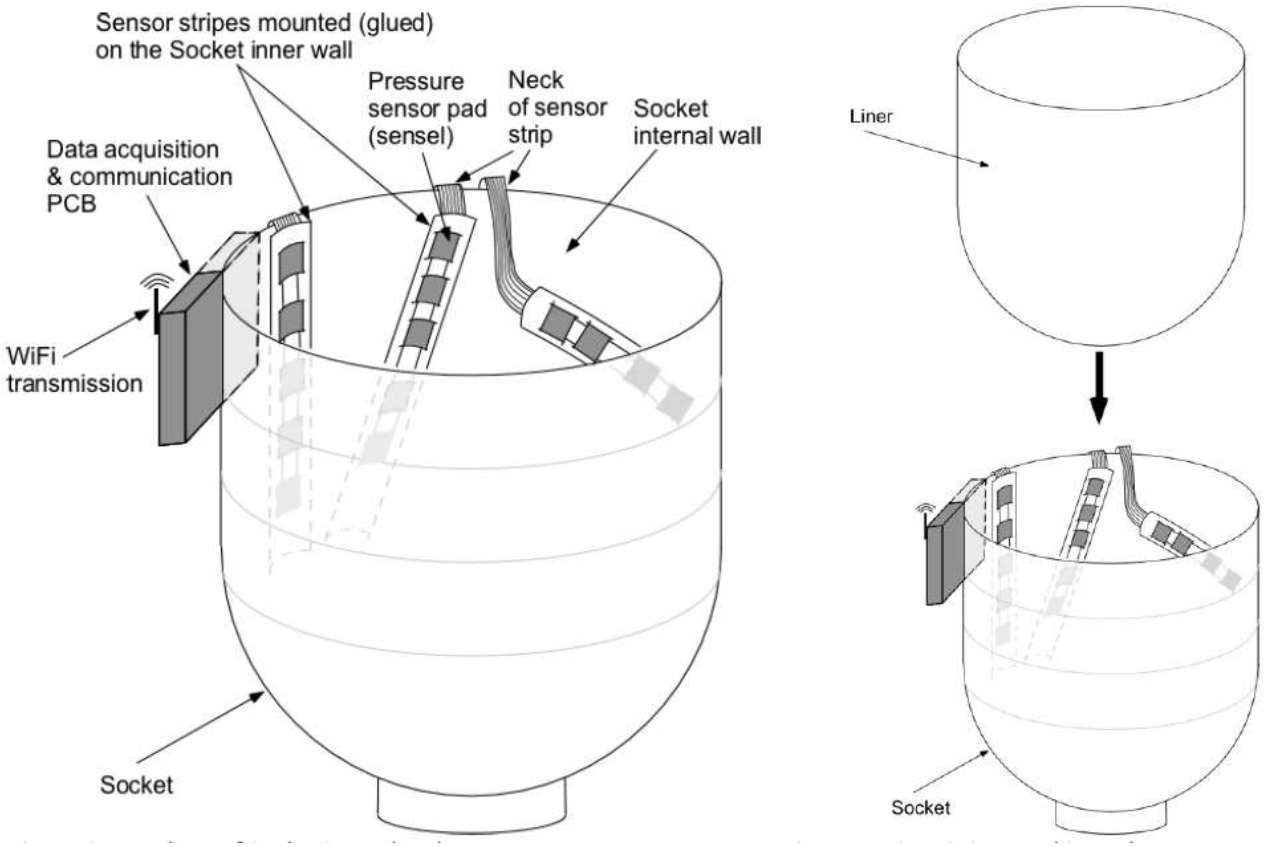
Introduction
Transfemoral amputees experience stump-related pain, instability during walking, and pressure sores. Poor prosthetics socket fit and misalignment are currently managed by the "touch and feel" technique that requires a skilled prosthetist without any quantitative calculations.
SocketSense aims to provide an innovative real-time quantitative assessment of pressure areas in the socket-stump interface through a sensor-embedded socket using algorithms for a more comfortable socket design.

Methods:
A multi-centre technology validation clinical trial that includes three groups; group one for benchmarking the elastomeric measurements for the bio-model development; group 2 (2-4 amputees) is the pilot phase for soft tissue measurement and socket fitting tests; and group 3 (50 amputees) is to validate the protocol and provide data about the socket-stump interface. A computer-aided design file and a pressure map of the socket-stump interface will be produced using data analysis and algorithms, suggesting socket required modifications. Recruitment will be over 18 months.
Primary outcome is to develop multi-touch and multi-functional quantum technology super sensors embedded in the prosthetic socket. Secondary outcome is to validate biomechanical algorithms to analyse the detected dynamic sensor data to design an optimised socket. The study is funded by the European Union Horizon 2020 Framework Programme, Project No.: 825429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Data acquisition
& communication
PCB
WiFi
transmission
Socket
Liner
Socket

P50

P50 - 11 years' experience in profundoplasty as a sole procedure for revascularization of critically ischemic limbs

Mr Mohamed Elsharkawi[1], Mr Mohammed Elkassaby[1], Mr Niall McVeigh[1], Mr Ahmed Elmallah[1], Mr Joseph Dowdall[1], Ms Mary Barry[1], Mr Stephen Sheehan[1]
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Introduction
This study investigates the clinical efficacy of profundoplasty as a sole procedure in patients presenting with CLI.

Methods
Retrospective, single-center study. Patients who presented with CLI and underwent profundoplasty for PFA disease combined with SFA occlusion were included. Outcomes were compared between the rest pain and the tissue loss groups.

Results
Between 2009 and 2019, 51 procedures were performed in 49 patients. Technical success was 100% in both groups. Incidence of MACE was higher in the tissue loss group (p=0.05). 85.2% of patients with rest pain experienced clinical improvement compared to only 33.3% in the tissue loss group (p<0.001). Higher rates of re-intervention were recorded in the tissue loss group, statistically insignificant. Amputation-free survival at 3,6 and 12 months was 96%, 96% and 92% in the rest pain group respectively compared to 77%, 67% and 54% in the tissue loss group (p=0.004). At one-year, freedom from MALE was lower in patients with tissue loss at 43% compared to 81% in patients with rest pain (p=0.009).

Conclusion
Our results suggest that profundoplasty may be more effective in treatment of rest pain rather than in the setting of tissue loss when a combined SFA angioplasty or distal bypass may be required.

P51

P51 - Aortic Endarterectomy for Aortic occlusive disease and old operation with a re-emerging role

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Introduction:Current day practice involves dealing with most cases of Aorta-Iliac disease using endovascular techniques. However, open repair remains superior. Most of the available data are historic. The aim of this study is to determine whether it is a feasible option in the current day practice.
Patients and methods: Ten years data was collected retrospectively. Clinic letters, radiologic scans, operative records and discharge letters were reviewed.
Results: Ten cases were identified. The average age was 55 and the mean BMI was 29.4. The mean hospital stay in days was 12 (Range: 4 to 22). The mean follow up period was 147 days (Range: 30 to 360 days). Four of the patients were TASC B, Four were TASC C and two were TASC D. Two cases had to return to theatres. One patient was readmitted for Urosepsis. All cases are alive to date except one case which only survived three years after procedure.
Conclusion: AE is a procedure that should be considered in selected cases where endovascular approach is not feasible. There is a trend towards lower mortality compared to the historic data. Larger case series or registry data may be required to accurately estimate the current day mortality and morbidity figures.

P52

P52 - Patient concerns surrounding COVID are not being addressed: a survey of patients undergoing vascular procedures

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Introduction: Given the RCS and SAGES guidelines it is imperative that during the informed consent process the risk of contracting COVID-19 in hospital be discussed with patients.
Methods: A survey, including open and closed questions, was conducted. Patients undergoing or having had surgery were recruited from wards and outpatient clinics (target recruitment 100). The data collected was entered into a database and answers to open questions were analysed using thematic analysis.
Results: A pilot survey of this ongoing study showed that 91% (n-10) of patients reported that they did not receive information regarding the risk of contracting and how their care may alter should they contract COVID-19 in-hospital. However once in the hospital they expressed satisfaction with the precautions being followed and did not have concerns regarding contracting COVID-19. Only 15% of registrars and consultants were quoting the 0.45% risk of infection during the consent process.
Conclusion: Determining patient understanding of the risk and impact of developing COVID as an inpatient and their concerns surrounding COVID are not being addressed adequately and more needs to be done if patients are to make truly informed decisions.

P53

P53 - Effectiveness of dietician led tutorials on perioperative nutritional assessment and outcomes in vascular surgery patients

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Aim:-

Vascular surgery patients have multiple comorbidities and poor nutrition. Perioperative optimisation of surgical patients is important. This is a quality improvement assessment in vascular patients undergoing surgery.

Methods:-

Consecutive vascular patients undergoing surgery over two 3 month periods were included. Dietician led tutorials on nutritional assessment were delivered to nursing staff prior to the second data collection period. A retrospective electronic case note review was performed.

Results:-

Between July-October 2019 and Jan-March 2020 286 (213 male, 73 female) underwent surgery. Mean age was 67 and median length of stay 6 days (IQR 10). Each patient had a mean of 2.1 comorbidities. Median weight was 75.5kg (IQR 30.85). 8.4% of patients received preoperative supplements. In the first cycle 26% of patients did not have nutrition screening on admission versus 14% in the second cycle. 18% experienced wound healing complications versus 7.5%. Baseline albumin was not measured in 48% of patients versus 34%. 58% of patients that met trust guidelines for dietician referral did not have dietician input versus 26%.

Conclusions:-

Dietician led tutorials are effective in improving perioperative nutritional assessment and outcomes. Appropriate nutritional assessment and action alongside preoperative vitamin supplementation could help reduce postoperative complications.

P54

P54 - Adherence to NICE Best Practice Statin Guidance in Patients with Peripheral Vascular Disease in the Primary and Tertiary Care Setting, Dorset: Are We Doing Enough?

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Introduction: To investigate the adherence to best practice statin therapy (Atorvastatin 80mg) amongst patients with peripheral vascular disease in Dorset primary and tertiary care settings as per guidance from National Institute for Clinical Excellence guidance.

Methodology: Primary care data was collected from the Shelley Manor & Holdenhurst Medical Centre patient database (Bournemouth). Patients with peripheral arterial disease were selected (n=100). Tertiary care data was collected from The Royal Bournemouth Christchurch Hospital. Patients discharged from the Vascular ward in April 2019 were selected (n=33). Patients with pre-determined confounding factors were excluded from analysis.

Results: Data showed that 10% of primary care patients and 12% of tertiary care patients were on best practice statin therapy (Atorvastatin 80mg). Unfortunately, 17% of primary care patients and 18% of tertiary centre patients were on no statin therapy with no documented rationale.

Conclusions: The data suggests few patients in Dorset primary and tertiary care settings are being treated with best practice statin therapy for the management of peripheral vascular disease. Troublingly, there were a higher percentage of patients on no statin therapy than on best practice. The specific reasons for these findings aren't completely clear, however, it has highlighted an area of targeted improvement.

P55

P55 - Management of acute ilio-femoral deep venous thrombosis in inflammatory bowel disease: two case reports

Miss Stacie Hodge[1], Miss Katarzyna Powezka[1], Mr Taha Khan[1]
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Deep vein thrombosis (DVT) is a frequent complication in patients suffering from inflammatory bowel disease (IBD). It is more common in those with frequent relapses of the disease or extensive inflammatory lesions. The aetiology for the increased risk is most probably multifactorial.

Literature evidence on management of proximal acute ilio-femoral DVTs in patients with IBD is very scarce and only case reports from single centres are obtainable. Here we present a case series of two patients with IBD who during an active flare of their disease developed acute ilio-femoral DVTs : both patients were treated successfully with catheter-directed thrombolysis (CDT).

In our case series, CDT was shown to be very effective in clearing the clot burden from iliac veins and both patients experienced significant symptomatic improvement without major complication.

We suggest an individualised approach to every patient with IBD presenting with acute ilio-femoral DVT. Careful assessment is imperative to assess the risk to benefit ratio of thrombolysis.

P56

P56 - Assessmentof the accuracy of detection for iliac arterialstenosis by ultrasound versus magnetic resonance imaging

Mr Gavin Hope[1]
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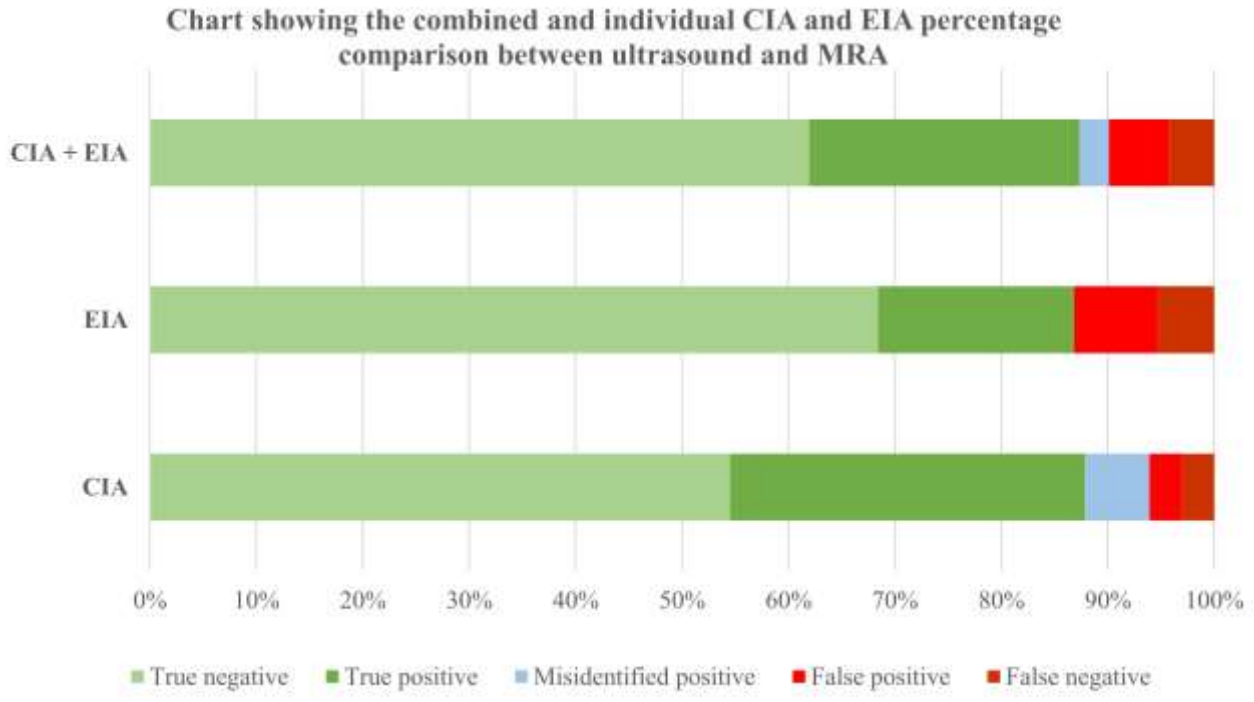
Introduction
This audit aims to assess the accuracy of ultrasound detection of stenosis within the external iliac and common iliac arteries (EIA and CIA respectively).
Methods
This is a quantitative retrospective study. The ultrasound accuracy of iliac vessel stenosis is assessed by comparison of ultrasound-detected stenosis against MRA scans within one year commencing December.2016, where a corresponding MRA report was produced within three months of the scan. As MRA does not specifically separate significant stenosis into 50-74% and 75-99%, these gradings from ultrasound are considered together; classification is thus significant stenosis (50-99%) or occlusion.
Results
The audit is not a perfect comparison as MRA relies on the visual assessment of stenosis/occlusion. This audit may therefore be considered as a pilot-scale study that has suggested good accuracy of ultrasound assessment when compared to MRA.
40 valid studies were identified. When true positive, true negative and misidentified positives are combined, ultrasound is 90.2% accurate in true prediction of presence/absence of significant stenosis/occlusion when compared to MRA.
Conclusions
This audit has compared the accuracy of ultrasound iliac scans to MRA. Overall, for the study group considered, the hypothesis may be accepted that ultrasound appears comparable to MRA which assessing EIA and CIA stenosis.



P57

P57 - A novel simplified percutaneous distal axillary artery access technique for complex endovascular interventions

Mr Dominic Howard[1,2]

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Introduction-The aim of this study was to assess the safety and effectiveness of upper extremity percutaneous access of the axillary artery (PAXA) for complex endovascular aortic and cardiac interventions.

Methods-34 consecutive patients underwent a PAXA procedure (June-2017-2020). Ultrasound and fluoroscopic micropuncture with off-label use of ProGlide device for endo-arterial closure. Primary and secondary technical-success and outcome were analysed. 30-days and 6-month outcome were recorded.

Results-Mean age 81.2 (S.D.6.7), Male 73.5%. 16/34(47.1%) were TAVI-procedures, 18/34(52.9%) were complex aortic-interventions. Prevalence of co-morbidity and frailty were significant: Severe valvular heart disease 61.7%, IHD 38.2%, COPD 26.5%, CKD 29.4%, Occlusive PAD 64.7%, Rankin Score≥3; 44.1%, ASA≥3 100%. Percutaneous access was successful in all-patients. Sheath-sizes were 10-22Ch (Median-16Ch). Primary technical success was achieved in 29/34 (85.3%); 5 patients required a 22-38mm covered stent to be placed from ipsilateral radial-artery access for haemostasis (4/5 with ≥16Ch sheath-access). No further procedures, nerve-injuries, nor open-conversions were required. All patients were alive at 6 month follow-up with no mid-term complications observed in relation to access site.

Conclusions-This simplified PAXA technique enables large-sheath access for patients with limited access options. Despite most patients being elderly, frail, and heavily co-morbid; technical feasibility, success rates and outcome were acceptable.

P58

P58 - Routine surveillance with duplex ultrasound following infra-inguinal bypass can reduce the rate of major limb amputation.

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Introduction
A systematic review and meta-analysis of vein graft surveillance following infra-inguinal bypass could not clearly recommend routine duplex ultrasound (DUS). The authors acknowledged that the evidence on which these conclusions were based was poor. Despite this DUS surveillance is often employed in patient follow-up. The present study sought to define its effect on limb salvage.

Methods
A retrospective review of infra-inguinal bypass between May 2015 and February 2017 was performed. Two groups were defined – those that were enrolled into routine DUS surveillance and those that were not. A data set was completed using case-linkage. End-points included major limb amputation (MLA) and death.

Results
There were 97 consecutive cases identified - 68 (70%) male patients, mean age 66-years (range 45 to 86-years) and 43 (44%) patients had a diagnosis of diabetes mellitus. There were 64 patients enrolled into surveillance. Demographics were comparable. During follow-up there were 7 (10.9%) MLA in the surveillance group and 14 (42.4%) in the non-surveillance group. Amputation free survival was significantly improved in the surveillance group (p=0.0003). Surveillance had no effect on survival (p=0.23).

Conclusion
These data demonstrate improvement in amputation free survival that supports the use of routine DUS following infra-inguinal bypass.

P59

P59 - Endovascular treatment of the inferior mesenteric artery can offer durable solution to patients with symptomatic occlusive arterial disease of the visceral segment.

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Introduction
Symptomatic chronic mesenteric ischaemia (CMI) is a product of multi-vessel atherosclerotic disease. If direct revascularisation of the superior mesenteric artery (SMA) cannot be achieved there may be a role for indirect revascularisation. There is collateralisation between inferior mesenteric artery (IMA) and SMA territories. We describe outcome of endovascular revascularisation (ER) of the IMA in patients with CMI.

Methods
This was a retrospective review of consecutive interventions for mesenteric ischaemia. Patient demographics, IMA intervention and subsequent interventions were recorded.

Results
There were 92 interventions performed. In 4 cases ER of the IMA was performed. All patients were female, with a mean age of 57-years (range 44 to 78-years). All patients had multi-vessel occlusive disease (with SMA involvement). In 3 cases primary ER of the IMA was performed, in the remaining case the intervention was performed following acute occlusion of an ilio-SMA bypass (angioplasty n=1; stent n=3). There was 1 acute treatment failure salvaged with bypass. During the follow-up period IMA occlusion occurred in a further two cases – both at 4-years. In the remaining case the IMA stent is patent at 18-months.

Conclusions
ER of the IMA is a durable option that should be considered in patients presenting with CMI.

P60

P60 - EPAR: a durable alternative in management of popliteal artery aneurysm, a single center experience

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introduction: Despite being minimally invasive, EPAR (endovascular popliteal aneurysm repair) is often not preferred due to concerns about durability of repair. The aim of the study was to evaluate the durability of EPAR compared to open repair (OR) in a single regional center.

Methods: This is a retrospective study of 70 cases of popliteal artery aneurysms (PAAs) who presented to our center between January 2010 and December 2019. Twenty cases (28.6%) underwent EPAR and 50 (71.4%) underwent OR. The two groups were compared regarding intervention outcomes at 5 years using Kaplan–Meier curves and log-rank test.

Results: Median duration of follow-up was 32 months (range 1:156). Five-year survival was 100% in ER group and 68% in OR group (p = 0.19, log-rank 1.7). Primary patency was 25% in ER group and 20% in OR group (p = 0.625, log-rank 0.238). Freedom from re-intervention was 70% in ER group and 53% in OR group (p = 0.762, log-rank .091). Secondary patency was 74% in ER group and 71% in OR group (p = 0.372, log-rank 0.797). Limb preservation was 92% in ER group and 81% in OR group (p = 0.348, log-rank 0.882).

Conclusion: EPAR appears to be a durable technique.

P61

P61 - Patients knowledge and compliance with government guidelines for COVID 19

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Background
Since the outbreak of COVID-19; social distancing and recognized effective precautions were recommended by various governments to fight the viral spread.
Our aim was to assess the inpatient knowledge and compliance with the government guidelines during their hospital stay and at their discharge in two different NHS hospitals.
Methods
We Included here only the vascular and non-vascular patients' groups of a single NHS hospital. We invited inpatients to answer an anonymized questionnaire which was designed to include the contemporary government guidelines. We excluded patients with cognitive impairment and those who were not expected to be discharged within days.
Results
Out of 162 patients, 45% were not aware of the mouth-covering technique when coughing. Lack of awareness of guidelines was reflected in the answers as 17% didn't know the recommended safe distance. As for the self-isolation period when symptomatic, the awareness was 87%. Forty percent of patients never used the bay sink in handwashing and 20% weren't aware of the 20-second handwashing rule.
Conclusions
A significant number of patients lack essential information needed to minimize the spread of the virus in the society and in-hospital. We recommend providing patients with information leaflets and direct advice on admission and discharge.

P62

P62 - Our 12-year Institutional experience of fenestrated EVAR for complex aortic aneurysms using the Zenith Fenestrated Stent Graft

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Introduction: Fenestrated EVAR (fEVAR) describes a custom-made endograft intended for juxta renal aneurysms. Many centres advocate fEVAR as a viable alternative to open repair. We present our 12-year experience of the fEVAR programme and describe the short and medium-term surgical outcomes.

Methods: Patients who underwent fEVAR using Zenith Fenestrated stent graft between November 2007 and September 2019 were included. Retrospective data was collected.

Results: There were a total number of 98 patients with male: female ratio of 6:1. 43% underwent 4 vessel fEVAR. 30-day mortality was 2.6%, in hospital mortality 3.9%. Secondary intervention prior to discharge was 6.6% and post discharges 7.9%. 100% target vessels were patent postoperatively (2 vessels could not be stented). Follow up results with CTA demonstrated no significant sac expansion but 8.7% had an occluded vessel and 1.4% had a threatened vessel. Most of these were either renal or coeliac vessels with no clinical sequelae, but one was SMA which led to mortality. None of the patients suffered from aneurysm rupture.

Conclusion: A substantial proportion of patients in our cohort were a high-risk category. Our study suggests that fEVAR is a safe and effective procedure in treatment of juxta renal aneurysms.

P63

P63 - Outcomes of type V endoleaks after endovascular aneurysm repair (EVAR) at a regional vascular unit

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Introduction: Continued sac expansion post-EVAR in the absence of a detectable endoleak is well-recognised. This may be attributed to endotension, but the pathogenesis of this phenomenon remains unclear. We evaluate the characteristics and outcomes of type V endoleaks (endotension) in a regional vascular unit.

Methods: Cases of type V endoleaks were identified through the regional vascular multi-disciplinary team meeting (MDT) between 2014 and 2018. Data was collected from electronic patient records and MDT outcomes.

Results: 14 cases of type V endoleaks were identified. 29% of cases presented with a leaking abdominal aortic aneurysm (AAA), with an average aortic sac size of 8.3cm. These patients were successfully treated with emergency relining, without subsequent inpatient mortality. Median time from EVAR to rupture was 48.5 months. One-third of the patients were receiving anticoagulation. 2 patients died from non-aneurysmal causes during follow-up period.

Conclusion: Pure endotension post-EVAR is rare, but is more likely to present with rupture. There may be links between endotension and the use of anticoagulation, but we are unable to draw reliable conclusions due to an insufficient sample size. We would recommend an approach though multi-centre collaboration to identify similar trends and predisposing factors for post-EVAR endotension.

P64

P64 - Posterior cerebral circulation stroke secondary to fetal origin of posterior communicating artery – an indication for carotid endarterectomy

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Introduction: Fetal origin of posterior communicating artery (PComA) is a Circle of Willis anatomical variant that can rarely result in paradoxical posterior cerebral territory infarction arising from internal carotid artery (ICA) thromboembolism. We present a case report and review of the literature.

Methods: Review of the MEDLINE, EMBASE and Cochrane databases was performed for any articles concerning posterior circulation stroke in the presence of the fetal PComA variant.

Results: A 71-year-old male was admitted with seizures, headache and confusion. Examination revealed a left-sided homonymous hemianopia. MRI brain revealed an acute right posterior circulation infarction with haemorrhagic transformation. Duplex ultrasound revealed a heavily calcified mixed echogenic right ICA plaque with 80-90% stenosis and normal vertebral arteries. Subsequent CT angiogram showed a large right fetal PComA (See Figure 1). Following a good functional recovery, the patient underwent uneventful right carotid endarterectomy (CEA) to reduce future stroke risk. Only four such cases were previously reported in literature, of which, three patients underwent CEA.

Conclusion: In patients presenting with posterior circulation infarction, clinicians should consider paradoxical embolism from an atheromatous ICA via the fetal PComA. If significant ICA stenosis detected and no other cause for posterior circulation stroke is detected; CEA should be considered.

P65

P65 - Epidemiology of major lower-limb amputation using routinely collected electronic health data: a systematic review

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Introduction: The incidence of major lower-limb amputation in the UK is debated, with regional variation unexplained. Data sources may affect incidence estimates. This study aims to estimate the prevalence/incidence/number of major lower-limb amputation in the UK and to explain differences in the numbers reported.

Methods: Systematic searches of electronic databases and grey literature were conducted. Articles reporting a UK incidence/prevalence/number of major lower-limb amputations with the cases being sourced using routinely collected electronic health data were considered for inclusion.

Results: From the 3306 records found, 24 met the inclusion criteria. Due to high levels of heterogeneity in the article methodology, a narrative synthesis was performed. Incidence proportion ranged from 8.8 to 51.1 per 100,000 people for the general population and from 7.0 to 29.1 per 10,000 people for the population with diabetes. Methodological differences included; reported statistics, standardisation methods, definitions of major lower-limb amputation, exclusion criteria, geographical area included. Direct comparisons were not possible. The predominant case data source was Hospital Episode Statistics.

Conclusions: This review confirms the discrepancies between sources in the reporting of major lower-limb amputation in the UK. Guidelines for reporting the incidence of major lower-limb amputation should be agreed upon to enable comparisons to be made.

P66

P66 - Patient-reported outcome measures for major lower limb amputation due to peripheral artery disease or diabetes: a systematic review

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Objectives Just 40% of patients who undergo major lower limb amputation for peripheral artery disease (PAD) or diabetes will use a prosthesis, yet measures of surgical success commonly focus on prosthesis use. This review aims to identify and describe Patient-reported outcome measures (PROMs) available to assess health-related quality of life (HRQL) in patients after amputation for PAD or diabetes.
Methods A search was conducted based on the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) for systematic reviews of PROMs. Included were articles describing the development, measurement properties or evaluation of HRQL via a PROM in patients after amputation for PAD or diabetes.
Results Of 3317 abstracts screened, 111 full-text articles were assessed for eligibility and 64 included. 56 studies evaluated HRQL, with 23 (46%) of these using an amputation-specific PROM to do so. 11 different amputation-specific PROMs were identified, 10 (91%) of which were developed only for prosthesis users. One measure was suitable for use in all patients after amputation. This 'Amputee single item mobility measure' includes a single item evaluating mobility.
Conclusions A well-tested, multi-dimensional PROM developed applicable to wheelchair and prosthetic users after amputation is lacking and urgently needed for studies in this field.

P67

P67 - Temporal trends in the anatomical level of major lower limb amputations and the effect of amputation level on the success of rehabilitation with a prosthetic limb: A single center retrospective observational study

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Introduction
Anatomical level is an important factor influencing ambulation following major lower limb amputation. We aim to determine trends in amputation level over time and the effects of change on prosthetic mobility.

Methods
Patients having major lower limb amputations in the first 6 months of 2013 were identified and compared to those having major amputations in the first 6 months of 2018. Anatomical level, patient characteristics, attendance for prosthetic rehabilitation and prosthetic use at 6 months were end points for analysis.

Results
Significant increases in amputation numbers were detected between groups. The proportion of trans femoral versus trans tibial amputations also significantly increased (31.6% vs 65.2% p=0.02). The 2018 cohort was less likely to be seen in rehabilitation clinic and achieve functional mobility than the 2013 group but without statistical significance.

Conclusion
More patients are receiving higher levels of major amputation in 2018 compared to 2013 in Sussex and rehabilitation outcomes are worse.

Discussion
Factors affecting temporal trends in our hub and spoke vascular service are multiple and include changes to the structure of our department, the effects of previous vascular reconstruction and socio-economic deprivation leading to unfavourable results. We propose conducting a prospective study to further evaluate our findings.

P68

P68 - Feasibility and acceptability of a prehabilitation (Prehab) inpatient exercise and inspiratory muscle training programme for critical limb ischaemia (CLI) patients undergoing surgery.

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Introduction: The aim of this study was to explore whether a Prehab inpatient upper body exercise programme with inspiratory muscle training (IMT) was acceptable and practical in CLI patients.
Methods: The IMT, using a POWERbreathe®, consisted of 30 breaths twice per day at 30% of maximal inspiratory pressure. The 30-minute, daily upper limb aerobic training (ULT) programme consisted of arm ergometry and resistance exercises. Key outcomes were; eligibility, recruitment and withdrawal rates; adherence to training; evaluation of data collection methods and adverse events.
Results: 88 patients were screened, 63% were eligible and of these 52% (n=25) were consented and 84% completed. 1 patient withdrew and in 3 patients surgery was cancelled. The mean adherence to training was 70% with 48% having an adherence of ≥80%. 52% of patients could do both IMT and ULT but all achieved some form of exercise even at lower target time/weight. There were 4 mild adverse events related to the training. Due to localised muscle fatigue prior to an appropriate heart rate increase, the fitness test was not fit for purpose.
Conclusion: ULT and IMT are feasible and acceptable to CLI patients during a hospital admission for surgery. However, the fitness assessment needs further refinement.

P69

P69 - An audit of Outcomes of Major lower limb Amputations

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Introduction:
Patients undergoing major lower limb amputations are frail and have extensive co-morbidities. We aimed to assess outcomes of major lower limb amputation in our Vascular Network.

Methods:
All consecutive major lower limb amputations between 2014 and 2018 were included. Patient demographics and co-morbidities and mode of admission were reviewed. Overall mortality and length of stay were primary outcomes.

Results:
Of 199 amputations performed; 59 were above knee amputations (AKA) and 140 below knee amputations (BKA); with an AKA to BKA ratio of 0.4; compared to 0.9 nationally.
154 were males and 45 females with a median age was 71 years(range 44-92). Whilst 62 were performed as elective surgery 137 were emergency.

Whilst overall 30-day and 1 year mortality for BKA were 3.6% (5/140) and 20%(29/140) respectively; for AKA the mortality rates were 17%(10/59) and 39%(23/59) respectively. Median length of stay was 15 days(range 3-115).
30-day readmission rates were 9.1% and 10.9% for AKA and BKA respectively.

Conclusion:
Our audit results show that our network's mortality was better compared to the national average for BKA. Although AKA to BKA ratio was much better than the national average, mortality outcomes of AKA were above national average and needs to be addressed.

P70

P70 - Symptoms to Surgery: Factors associated with Delays to CEA in an Irish Tertiary Vascular Centre

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Intro: Carotid endarterectomy (CEA) is the accepted treatment for stroke prevention in symptomatic 70-99% carotid artery stenosis. The ESVS guidelines recommend surgery be performed within 14 days of index symptoms to achieve maximum benefit.

Methods: All symptomatic CEA between January 2017–December 2019 were extracted from a prospectively-maintained database and analysed.

Results: 124 CEAs were performed for 62 strokes and 62 TIAs. 71.8%(n=89) were male, and median(IQR) age was 71.0 years(64-76.75).
Sixty-six patients (53.7%) had surgery within 14 days (range 2-183).
Those undergoing CEA within 14 days were more likely to have presented with FAST symptoms 53/88 (60%, p=0.021). Patients with amaurosis were less likely to have surgery within 14 days 15/41 (36.5%, p=0.007).
Median symptoms-to-surgery interval was shorter in patients presenting directly versus those referred from external hospitals (median 12.0 vs 25.0 days, p=0.001).
Factors associated with delayed CEA were delayed presentation to acute medical services and referral to the vascular unit from external sources.

Conclusion: A significant number had surgery outside the 14-day target. Specific pathways need to be developed between referring hospitals and vascular centres to expedite the treatment of symptomatic carotids, and this should be formalised as a KPI for stroke management.

P71

P71 - Endovascular Repair of Abdominal Aortic Aneurysm – A Retrospective Analysis of Outcomes from a UK Teaching Hospital

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Aims: the aim of this paper is to evaluate long term outcomes of EVAR with a focus on survival and aneurysm related reinterventions.
Methods and Material: we retrospectively analysed all elective EVAR procedures performed for Abdominal Aortic Aneurysm (AAA) between May 2010 and June 2016 in our institution. We collected data concerning comorbidities, post-operative survival and post-operative aneurysm related interventions.
Statistical analysis used: Skewed continuous variables are shown as median and range, categorical data are shown as percentages. Survival analysis was performed using the Kaplan-Meyer method. We build a Cox Proportional-Hazard model to identify factors associated with increased mortality.
Results: n=182. Median age was 77 years (50-92). Median follow up was 65 months (31-104). During the follow up period we recorded 41 death. 30 day mortality was 0.5% , 2 year mortality was 8.7% (16). 17 patients (9.3%) required reintervention during the follow up period (2.4 reinterventions per 100 patient-years). Older age, male sex and higher ASA were associated with increased mortality.
Conclusions: Our medium and long term outcomes following EVAR are comparable with what has been reported in the literature. A higher ASA grade and an older age were associated with increased mortality.

P72

P72 - Impact of crural vessel run-off on patency and amputation rates following femoro-popliteal bypass grafts

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Introduction:
This study aimed to determine whether the number of patent crural vessels impacted on the patency and amputation rates of femoro-popliteal bypass grafts, as there is limited published data currently available.

Methods:
Single network data were collected from the National Vascular Registry for all patients who underwent a femoro-popliteal bypass. Outcomes measured were graft patency and major amputation. Chi-squared analysis and t-testing was used to detect inter-group differences between patients with 1 or ≥2 patent vessel run-off

Results:
Of 140 included patients with at least one-year follow-up; median age was 69 years (range: 36-88 years) with 74% male. Median graft surveillance follow-up was 444 days (range: 1-3164 days). Overall bypass patency was 63%. Patency rates for patients with one-vessel run-off was 56% (15/27) compared to 65% (73/113) for those with ≥2 vessel run-off (p=0.38). Median time to graft occlusion for one-vessel run-off was 98.5 days compared to 147.5 days for ≥2 vessel (p=0.53). 11/27 (41%) patients with one-vessel run-off underwent major ipsilateral amputation, compared to 21/113 (19%) with ≥2 vessels (p=0.01).

Conclusion:
Following femoro-popliteal bypass, patients with only one patent crural vessel have comparable patency rates but significantly higher amputation rates than those with ≥2 patent vessels.

P73

P73 - An updated systematic review and meta-analysis of home-based exercise programmes for individuals with intermittent claudication

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Introduction: This study aimed to provide a comprehensive overview of the evidence base for home-exercise programmes (HEP) for patients with intermittent claudication (IC).
Methods: The Medline, EMBASE, CINAHL, PEDro and Cochrane CENTRAL databases were searched from inception to March 2020 for terms relating to HEP and IC. We included randomised and non-randomised trials comparing HEP to supervised exercise programmes (SEP), exercise advice or no-exercise controls, and performed a meta-analysis of the randomised controlled trials. Primary outcome was maximum walking distance.
Results: 23 studies were included. HEPs were inferior to SEPs ($p = 0.004$), although HEPs that included monitoring were equivalent to SEPs in sub-group analysis ($p = 0.86$). For HEPs versus exercise advice, narrative review suggested HEPs can be superior, though not always significantly so. HEPs did however, appear superior to no-exercise controls ($p = 0.05$).
Based on a combination of effective HEP interventions, appropriate frequency (≥3x/week), intensity (to moderate-maximum pain), duration (20 progressing to 60 minutes) and type of exercise (walking) appears important. As does monitoring, education, goal-setting, self-regulation and action-planning.
Conclusion: When SEPs are unavailable or impractical, HEPs can be recommended. However, to elicit maximum benefit, they should be specific and structured, based on the effective elements identified.

P74

P74 - Does obesity help to improve outcomes for patients with chronic limb-threatening ischaemia?

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Introduction:

The obesity paradox is poorly understood. We investigated the relationship between body-mass index (BMI) and amputation-free survival (AFS) for patients with chronic limb-threatening ischaemia (CLTI) at a tertiary vascular centre.

Methods:

An analysis of all patients undergoing revascularisation for CLTI between February 2018-2019 was undertaken. The primary outcome was 1-year AFS. Baseline demographics and outcomes were collected using electronic records. Patients were stratified by BMI using WHO criteria. Kaplan-Meier analysis and Cox's proportional hazard models (adjusted for age, sex, diabetes and Rutherford score), were used to compare groups to those with 'normal' BMI. P<.05 was deemed statistically significant.

Results:

197 patients were included. Comparisons of baseline characteristics are shown in Table 1. No difference was identified in AFS across all groups (Figure 1; p=.335). Compared to patients with 'normal' BMI, 'obese' patients showed a trend towards reduced risk of amputation/death (HR 0.44, 95% CI 0.19-1.02, p=.057), however no difference was observed in 'overweight' (HR 0.95, 95% CI 0.51-1.80, p=.882), 'morbidly obese' (HR 1.13, 95% CI 0.41-3.12, p=.811) or 'underweight' individuals (HR 2.03, 95% CI 0.63-6.60, p=.236).

Conclusion:

Despite the prevalence of cardiovascular risk factors, obesity may paradoxically improve outcomes for patients with CLTI, compared to those with 'normal' BMI.

Baseline characteristic of the included patients with their corresponding BMI group	Normal (%) n=67	Overweight (%) n=62	Obese (%) n=44	Morbidly obese (%) n=12	p
Underweight (%) n=12					

Age [IQR]	**78.5 [68.3-82.8]**	**75 [65-83]**	**74 [65-83]**	**68 [56.3-78]**	**69.5 [63-72]**	**.027***
Sex (man)	5 (41.7)	47 (70.1)	46 (74.2)	35 (79.5)	7 (58.3)	.097
First procedure (angio)	8 (66.7)	54 (80.6)	47 (75.8)	36 (81.8)	10 (83.3)	.263
Diabetes	**0 (0.0)**	**35 (52.2)**	**38 (61.3)**	**34 (77.3)**	**12 (100.0)**	**<.001**
IHD	2 (16.7)	18 (26.9)	19 (30.6)	12 (27.3)	2 (16.7)	.786
HTN	5 (41.7)	35 (52.2)	41 (66.1)	29 (65.9)	7 (58.3)	.294
Stroke	1 (8.3)	9 (13.8)	7 (11.3)	7 (16.3)	1 (8.3)	.898
Anti-platelet (baseline)	6 (50.0)	29 (43.3)	34 (54.8)	24 (54.5)	7 (58.3)	.655
Lipid lowering agents (baseline)	3 (25.0)	42 (62.7)	31 (50.0)	30 (68.2)	8 (66.7)	.043
Rutherford	5 (45.5)	17 (25.8)	17 (27.4)	11 (25.6)	1 (8.3)	
score 4	6 (54.5)	5 (71.2)	5 (71.0)	31 (72.1)	11 (91.7)	
5	0 (0.0)	2 (3.0)	1 (1.6)	1 (2.3)	0 (0.0	
6						

P75

P75 - Midterm outcomes following endovascular aneurysm sealing for infrarenal abdominal aortic aneurysm: Off-IFU use and implications for therapeutic failure

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Introduction

Endovascular aneurysm sealing (EVAS) was developed as a new concept in the treatment of abdominal aortic aneurysm (AAA). The incidence of therapeutic failure has been well documented by our unit and others.

Methods

Pre-, intra- and postoperative data were collected and analysed for all patients undergoing EVAS at a single institution for unruptured, infrarenal AAA between March 2013 and October 2017. Therapeutic failure is a composite outcome comprising type 1a or 1b endoleak, sac expansion > 5 mm, stent migration > 5mm or secondary rupture.

Results

185 patients (88.1% male) with a median age of 77.3 years were included. Mean aortic diameter was 64.3 mm. 49.2% of cases adhered to the original instructions for use (IFU) and 18.4% adhered to the revised IFU of 2016. Median follow-up is 4.4 years. The table shows estimates of freedom from adverse events.

Conclusion

Whilst rates of therapeutic failure have been unacceptably high with this device, evidence suggests that durability was significantly better with treatment complying with the manufacturer's guidelines. Furthermore, the incidence of therapeutic failure appeared to stabilise beyond 4 years of follow-up. It is therefore suggested that EVAS should only be employed with strict adherence to all aspects of the IFU.

		Kaplan-Meier Survival Estimate (%)							
Event		0 years	1 year	2 years	3 years	4 years	5 years	6 years	Log-rank P value
Therapeutic failure									
	Whole cohort	100.0	92.8	86.6	72.3	50.3	40.1	38.5	
	On 2013 IFU	100.0	95.6	92.0	76.5	55.4	47.5	47.5	**.034**
	Off 2013 IFU	100.0	90.1	80.3	68.0	41.5	32.5	28.9	
Migration									
	Whole cohort	100.0	98.9	97.1	89.5	74.8	65.8	59.1	

	On 2013 IFU	100.0	98.9	96.5	88.8	78.2	69.8	61.7	.473
	Off 2013 IFU	100.0	98.9	97.6	88.5	70.6	61.1	56.7	
Sac expansion									
	Whole cohort	100.0	99.4	95.2	88.9	73.9	66.2	58.9	
	On 2013 IFU	100.0	100.0	97.6	89.6	80.2	70.4	63.6	.184
	Off 2013 IFU	100.0	98.9	92.6	88.3	66.5	61.2	53.2	
Type 1a endoleak									
	Whole cohort	100.0	94.5	92.7	83.8	74.9	66.6	63.4	
	On 2013 IFU	100.0	96.7	95.5	86.3	83.2	80.6	77.9	**.001**
	Off 2013 IFU	100.0	92.4	89.9	81.5	65.4	50.1	45.6	
Type 1b endoleak									
	Whole cohort	100.0	99.5	98.8	96.8	94.2	93.2	89.7	
	On 2013 IFU	100.0	98.9	98.9	96.3	93.4	91.5	88.3	.473
	Off 2013 IFU	100.0	100.0	98.7	97.2	95.1	95.1	91.3	
Secondary rupture									
	Whole cohort	100.0	99.4	97.7	94.9	92.4	92.4	92.4	
	On 2013 IFU	100.0	100.0	98.8	96.1	94.5	94.5	94.5	.290
	Off 2013 IFU	100.0	98.9	96.4	93.6	90.2	90.2	90.2	
Type 2 endoleak									
	Whole cohort	100.0	98.9	98.3	97.7	95.9	95.9	95.9	
	On 2013 IFU	100.0	100.0	100.0	100.0	98.5	98.5	98.5	.077
	Off 2013 IFU	100.0	97.8	96.6	95.2	93.1	93.1	93.1	
Reintervention									
	Whole cohort	100.0	91.8	86.4	78.4	68.3	58.5	56.6	
	On 2013 IFU	100.0	94.5	91.0	83.0	74.0	65.9	62.3	**.041**
	Off 2013 IFU	100.0	89.1	81.8	73.7	62.3	50.6	50.6	
All-cause mortality									
	Whole cohort	100.0	94.1	85.9	74.5	65.9	59.4	55.3	
	On 2013 IFU	100.0	95.6	90.1	79.1	73.4	71.8	66.3	**.006**
	Off 2013 IFU	100.0	92.6	81.9	70.0	58.6	47.8	45.4	
Aneurysm-related mortality									
	Whole cohort	100.0	98.4	97.8	95.8	94.3	89.7	89.7	
	On 2013 IFU	100.0	98.9	98.9	98.9	98.9	96.8	96.8	**.008**
	Off 2013 IFU	100.0	97.8	96.7	92.7	89.6	82.1	82.1	

P76

P76 - Investigating the 3-year mortality, and predictive factors thereof, in patients undergoing major lower limb amputation

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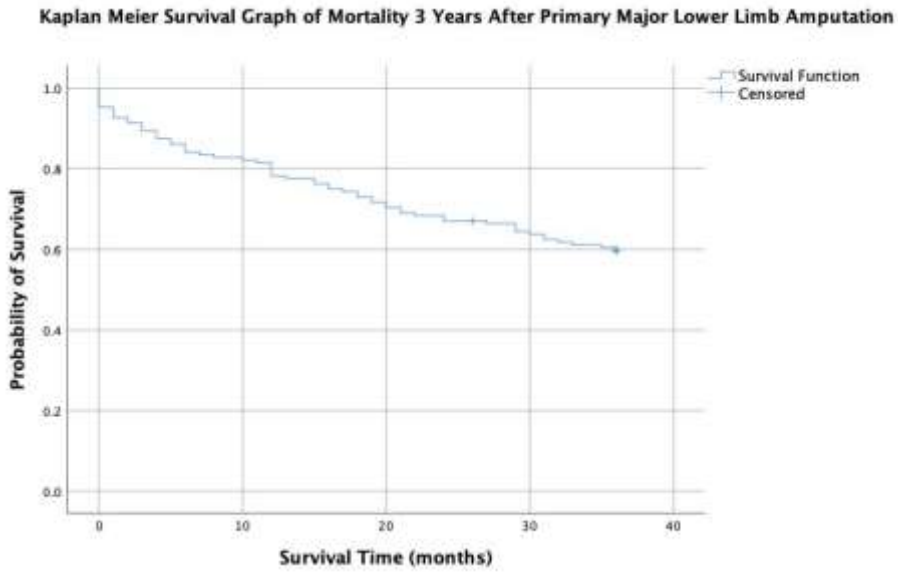
Major lower limb amputations (MLLA) are common, with a rising incidence(1), and typically a high postoperative mortality rate (30-70%) (2). Our objectives were to identify contemporary MLLA mortality figures, identify predictive factors and potential areas to improve outcomes.
We comprehensively reviewed medical records of 152 patients who underwent MLLA from 2012 to 2015 in the vascular unit. Survival was calculated using the Kaplan-Meier method, with univariate and multivariate regression analysis of potential predictive factors.
The all-cause 3-year mortality was 40% (Figure 1). Factors significantly associated with mortality on univariate analysis were revisional surgery, further amputation on the index leg and history of cerebrovascular or cardiovascular disease. However, the multivariate regression model was not statistically significant.
These results reflect the complexity and extensive comorbidity of the patient population. MLLA outcomes are likely influenced by complex multifactorial associations including increasing age, diabetes, cardiovascular disease, perioperative management and further revisional surgery (3); no single measure alone is likely to make a significant impact on outcome in this group who may be considered to have "end-stage" cardiovascular disease. This study provides useful contemporary data with which to counsel patients regarding the implications of MLLA and facilitate strategic methods to optimise patient outcomes.

Investigating the 3-year mortality, and predictive factors thereof, in patients undergoing major lower limb amputation
Figure 1



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P77

P77 - The burden of social isolation in lower limb vascular surgery: a mixed-methods systematic review

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Introduction

Understanding the prevalence and impact of social isolation, due to poor mobility, may improve decision making in surgical management in lower limb vascular surgery.

Methods

A mixed-methods systematic review of quantitative and qualitative studies between 1974 and 2019, reporting social isolation in lower limb vascular patients, was performed. Prevalence of social isolation was extracted from quantitative studies, thematic analysis was used to synthesise qualitative findings organised by the social-ecological framework, and an convergent segregated method was adopted to integrate findings of both syntheses.

Results

Fifteen studies met the inclusion criteria, eight quantitative and seven qualitative. Of the 1721 patients (aged 18-85, 53.0% male) included in the quantitative syntheses, 15% were major amputees. Prevalence of isolation among new major-amputees was 59%, and 73% among established amputees. Qualitative synthesis identified 4 levels of influence of isolation; at the individual level (depression and dependence), interpersonal level (problems in family, associate and key-helper relationships), economic level (employment and financial), and healthcare level (poor treatment compliance).

Conclusions

Social isolation due to poor mobility in lower limb patients is prevalent and detrimental to patient-centred outcomes. Assessing the risk of dependence and social isolation should be an important pre-operative step in decision-making, especially in major amputations.

P78

P78 - Cancer prevalence and its association with survival in patients undergoing major lower limb amputation in vascular surgery

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Introduction

Cancer is associated with poor prognosis in lower limb revascularisation surgery, but its impact on outcomes of major lower limb amputation is poorly understood.

Methods

304 consecutive major lower limb amputations performed in a tertiary vascular centre between 2013 and 2018 were identified. Data was retrospectively collected on demographics, cancer type, comorbidities, laboratory results, peri-operative complications, length-of-stay, suitability for rehabilitation and mortality.

Results

Median age was 70 and 72.3% were male. Prevalence of active cancer was 10.2%, with 45.2% diagnosed during admission for amputation. Failure of a recent bypass graft was the only aetiology shown to be significantly different between the cancer and non-cancer groups (12.9% vs 4.0%, respectively, p=0.031) and no significant difference was seen in other co-morbidities or demographics. There were no significant difference in amputation level, rate of peri-operative complications, or length of stay between the two groups. A significantly greater proportion of amputees with cancer were deemed unsuitable for rehabilitation at discharge (25.8% vs 8.8%, p=0.005) and significantly more died within a year of their amputation (38.7% vs 17.9%, p=0.008).

Conclusion

Cancer is prevalent among vascular amputees, with a large proportion diagnosed coincidentally. Furthermore cancer is associated with poor prognosis of rehabilitation and 1-year survival.

P79

P79 - Surveillance following endovascular intervention for peripheral arterial disease: a systematic review and narrative synthesis

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Introduction:
The optimal surveillance strategy following endovascular intervention for peripheral arterial disease is controversial. This systematic review aimed to examine the evidence for post-intervention surveillance.

Methods:
Medline, Embase and Cochrane Library databases were searched for randomised trials comparing post-procedural surveillance strategies, and again for trials comparing peripheral endovascular interventions. Surveillance protocols of included trials were assessed for completeness, modalities, duration, and intensity.

Results:
No randomised trials examining post-procedural surveillance strategies were identified. Eighty-nine different surveillance protocols were reported in the 94 trials comparing endovascular interventions. Protocol specification was incomplete in 32% of trials.

A median of 3 modalities were used, most commonly involving clinical examination (96%), ankle-brachial index (81%), duplex ultrasound (72%) and angiography (52%). Trials involving infrapopliteal intervention used more angiography and more frequent early surveillance compared to trials involving femoropopliteal intervention, which more often used ankle-brachial index ($p<0.05$ for all comparisons).

The mean surveillance duration was 21 months. Trials involving drug-eluting devices had longer surveillance duration compared to those without (mean 26 vs. 19 months; $p=0.026$).

Conclusion:
There is huge variation in the modality, duration, and intensity of surveillance protocols used in trials comparing different peripheral endovascular intervention. Further work is needed to identify optimal post-intervention surveillance strategies.

P80

P80 - Perclose Proglide Device Adds a Cost Effective Minimally Invasive Technique to EVAR

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Background
Percutaneous EVAR (PEVAR) is a minimally invasive technique gaining popularity worldwide. Our aim is to identify whether PEVAR is cost effective compared to open access.

Methods
We retrospectively identified patients undergoing EVAR for unruptured AAA over a 4-year period (April 2014- December 2018). Demographic, procedural, and financial data were collected. Exclusion criteria were complex EVARs and EVARs with planned adjunct procedures. Outcome measures were length of stay (LOS), number of Perclose devices used, number of failures, need for adjuncts, theatre time, and total cost of each.

Results
318 patients (88.4% male) underwent EVAR between January 2015 and October 2018, average age 76.9 years and median maximal aortic diameter 60mm. A sample of consecutive Sixty-one open access EVARs were compared to the latest 92 consecutive PEVARs to prevent bias. The median LOS following PEVAR was 1 day less (2 vs 3 days). Mean Proglides used were 5. 2.7% of devices failed, and no surgical cut-down was required in this cohort. Mean theatre time used for PEVAR was 179 minutes vs 213 minutes for open access. All considered, PEVARs cost £124 less.

Conclusions
PEVAR is associated with a shorter length of hospital stay, and is more cost effective than open access.