The Vascular Societies' Annual Scientific Meeting 2022

In conjunction with the Vascular Society of Great Britain and Ireland, the British Association of Chartered Physiotherapists in limb Absence Rehabilitation, the Society of Vascular Nurses and the Society for Vascular Technology of Great Britain and Ireland.

23rd - 25th November 2022 | Hilton Brighton Metropole

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BACPAR Oral Abstracts

BO1

Quantifying prosthetic utilisation and functional mobility in new prosthetic users, and exploring their barriers following inpatient rehabilitation

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Prosthetic utilisation is an important rehabilitation goal after major lower limb amputation and is important in maximising functional mobility. During prosthetic rehabilitation, new prosthetic users are trained to utilise their prosthesis, however following discharge, prosthetic utilisation and functional mobility outcomes are not understood, nor the impact of barriers to prosthetic utilisation.

Participants wore an activPAL activity monitor for seven days to measure prosthetic utilisation, completed functional mobility outcome measures and questionnaires detailing barriers to prosthetic utilisation prior to, and at two-weeks post-discharge from inpatient rehabilitation.

Eleven participants (82% male, 82% trans-tibial amputation level, 91% dysvascular aetiology) completed the study. Mean (95% CI) daily minutes in standing and walking at discharge from inpatient rehabilitation was 40.80 (9.806) and 13.42 (3.803), respectively, and at two-weeks post discharge was 68.84 (34.755) and 18.11 (15.862), respectively. Functional mobility improved two-weeks post-discharge. Skin issues, residual and phantom limb pain, and fatigue increased two-weeks post-discharge from inpatient rehabilitation ($p<0.001$) however, there was no significant relationship between barriers and prosthetic utilisation ($r<0.580$, $p>0.062$).

Prosthetic utilisation increased two-weeks post-discharge from inpatient rehabilitation. Functional mobility also improved. Skin issues, residual and phantom limb pain, and fatigue increased two-weeks post-discharge, but did not significantly impact prosthetic utilisation.

BO2

The effect of the MOtivating Structured walking Activity for Intermittent Claudication training for Physiotherapists on therapeutic empathy and psychologically informed behaviour-change approaches

Bearne L[1,2], Galea Holmes M[1,3], Peacock J[1,4], Fisher G[1], Modarai B[1,5], Sackley C[1,6], Weinman J[1], Bieles J[1]
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Introduction: This study evaluated the effect of 2-day bespoke training and ongoing supervision, incorporating motivational interviewing (MI) and psychologically informed behaviour-change approaches on therapeutic empathy, knowledge and confidence of MI, and managing people with Intermittent claudication (IC) as part of a randomised trial.

Methods: Consenting physiotherapists completed questionnaires assessing a) Therapeutic Empathy (5-item modified Helpful Responses Questionnaire); b) perceived knowledge and confidence of MI and skills and confidence managing people with IC (adapted 4-item questionnaire) at 3 timepoints (pre-training, post-2-day training and 6-month). Differences across timepoints were evaluated using the Friedman Test. Post-hoc Wilcoxon signed ranking tests and pairwise effect sizes (r=abs(Z/√N) were calculated.

Results:14 physiotherapists (mean (standard deviation) 7.8+ 4.0 years post-registration) were included. There was a significant difference across all time points: (chi-squared (2)≥11.64, p≤0.003) for all domains. Therapeutic empathy and skills and confidence to manage people with IC increased post-training and remained higher than pre-training at 6-months. MI knowledge and confidence improved post-training and was improvement was sustained at 6-months (Table 1).

Conclusions: This training improved physiotherapist's therapeutic empathy, perceived knowledge and confidence of MI and skills and confidence to manage people with IC. Integrating psychological approaches into physiotherapy practice will enhance existing skills and improve care.

Table 1 The effect of MOSAIC Physiotherapists training on self-reported Therapeutic Empathy, skills and knowledge of Motivational Interviewing and skills and confidence to manage people with Intermittent Claudication (N=14)

	Pre-training Mean (SD)	Post 2-day training Mean (SD)	Pre-training versus post 2-day training effect size	6-month post training Mean (SD)	Pre-training versus 6-month post training effect size
Therapeutic empathy	1.72(0.84)	2.84 (1.18)	0.48	2.29 (0.80)	0.43
MI knowledge	3.50 (1.09)	4.57(0.51)	0.51	4.57 (0.51)	0.50
MI confidence	2.75 (1.13)	4.25(0.58)	0.59	4.29 (0.61)	0.57
Skills to manage people with IC	3.88(0.81)	4.69(0.48)	0.48	4.36 (0.50)	0.39
Confidence to manage people with IC	3.75(1.07)	4.69(0.48)	0.49	4.36 (0.50)	0.44

SD= standard Deviation; MI=Motivational Interviewing; IC=Intermittent Claudication

BO3

Sharing stories of lower limb amputation in practice: An exploration into the relatability, usability, and implementation of an animation video package across UK rehabilitation services

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In 2015, a collaboration between academia and an NHS limb loss rehabilitation centre began. Presented through BACPAR conferences and journal pieces, the partnership has produced research which includes the construction of five narrative trajectories within major lower limb amputation (MLLA) and the translation of these narratives into animation videos. Findings indicated that exposure to the narrative raised less experienced therapists' awareness of MLLA journeys and increase their preparedness for patient care.

When presented in a group activity, people with MLLA connected and resonated with the videos, developed knowledge about what to expect following rehabilitation, and identify helpful behaviours to action. However, it is not known how these videos relate or may be useful to those in differing rehabilitation environments across the UK.

The aim of the presentation is not only to describe, but to do the animation video activity with BACPAR delegates. This will enable delegates to experience the videos as people in MLLA rehabilitation would do. Delegates will be encouraged to discuss and reflect upon the experience with colleagues in the world café event. It is hoped the activity will prompt conversation into the relatability, usability, and implementation of the videos across regional amputee rehabilitation services.

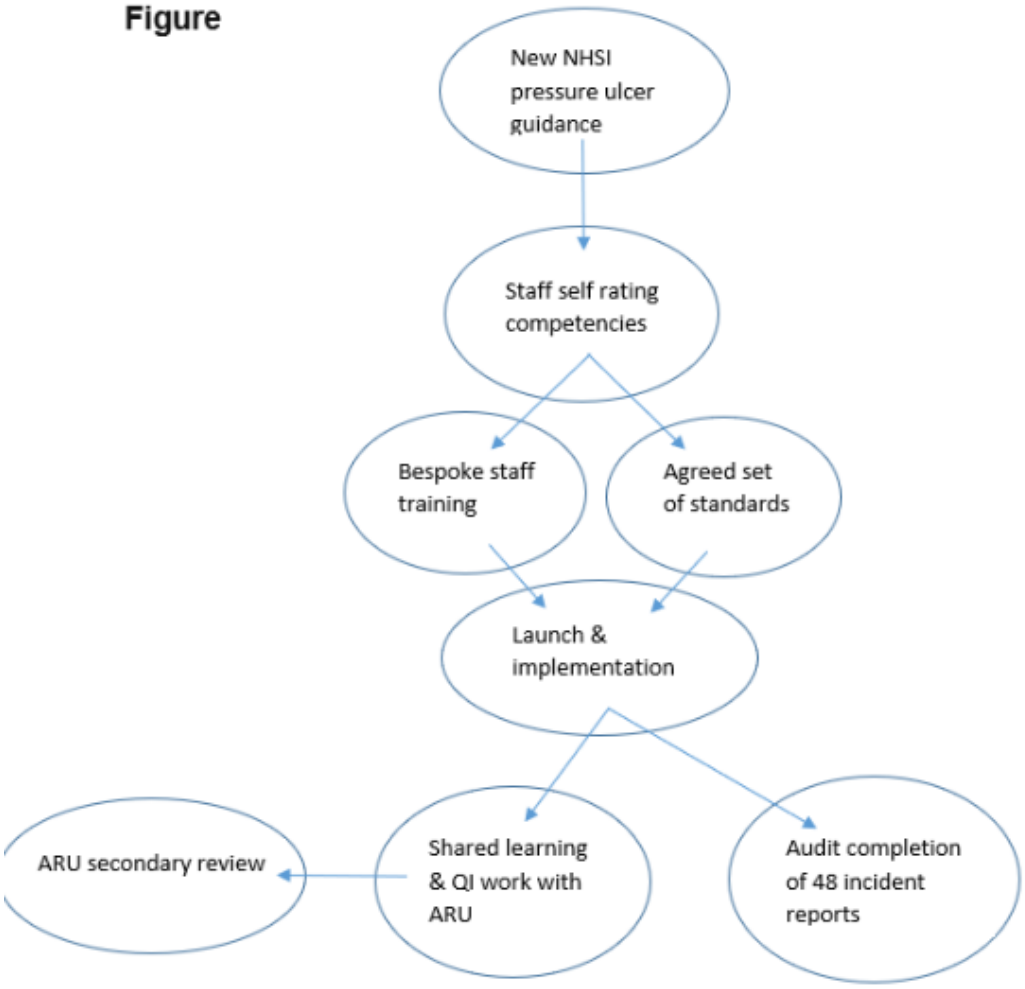
BO4

Managing prosthetic device related pressure ulcers in inpatient and outpatient prosthetic clinics - our experience

Jones A[1], Joseph L[1]
[1]*Guys And St Thomas NHS Trust*

The NHSE Pressure ulcers: revised definition and measurement summary and recommendations document (2018) lead to a piece of quality improvement work that has resulted in a consistent approach to managing and reporting our prosthetic device pressure ulcers (DPUs). It has improved our governance and patient care in our inpatient and outpatient settings. We will to share our key findings, reflections and the standards we have now set and audited against. The work was submitted to the national patient safety awards 2020 and won the category of clinical governance and risk management. Our vision is to see improved standardisation of DPU management and patient advice for amputees who use prosthetics.

Figure



BO5

A quality improvement project to assess whether introducing a home visit by the physiotherapist (PT) and occupational therapist (OT), 3 weeks following discharge from their inpatient primary prosthetic rehabilitation, will increase lower limb prosthetic user's confidence using a prosthesis in their home.

Wilson C[1], Brannigan H[1], Wilson C[1], Porter K[1]
[1]*Belfast Health And Social Care Trust*

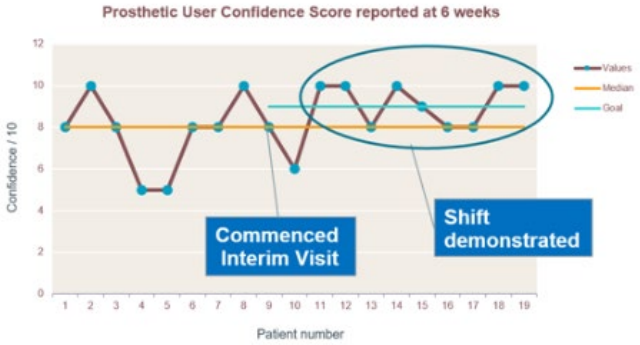
Hypothesis
Following a home visit by PT and OT 3 weeks following discharge from their primary prosthetic rehabilitation, 50% of patients will report a VAS confidence score of at least 9/10 in their ability to use a prosthesis at their 6 week review appointment.

Introduction
A small sample of patients were surveyed on how they had felt about being discharged home following their primary prosthetic rehabilitation, and how confident they felt using their prosthesis at home. Of these 33% said they felt fearful and would have benefited from a home visit.

Methods
The team introduced visiting patients in their homes, 3 weeks following discharge from their primary prosthetic rehabilitation. In order to determine whether this was an effective intervention, the patients' self-reported confidence was recorded using a VAS score at 6 week review appointments

Results
Every patient reported an improved or a maximum confidence score for use of prosthesis around the home, following the OT/PT home visit. The run chart demonstrated a shift in the 6 week review VAS confidence scores following the home visit intervention.

Conclusion
In conclusion, the aim of the project was achieved, with over 50% of patients reporting a VAS confidence score of at least 9/10



BO6

Don't let them take my knee

McGovern D[1], Duncan A
[1]*NHS Greater Glasgow And Clyde*

This case study looks at the management of a failing transtibial stump wound, in a patient with diabetes and peripheral arterial disease. The patient's stump from the primary amputation was failing to heal and despite revision surgery, again at transtibial level, it looked destined for revision to transfemoral level, given the extent of tibial exposure. An 11th hour intervention by the Physiotherapy team led to further amputation surgery being called off, as it was clear the patient would not manage to limb fit as a transfemoral amputee.

A trial of a specialist negative pressure and irrigation wound management system accelerated the healing process as an inpatient. The patient was discharged home and was later cast for a prosthetic limb, over an open wound. Ongoing careful wound management in the community and the prosthetic rehabilitation centre allowed the patient to mobilise on a prosthetic limb, as a below knee amputee.

This case study highlights the importance of good MDT communication, specialist input for wound management, and the conviction to proceed to prosthetic limb fitting despite an open wound.

BO7

Supporting clinicians to shape the future of research; Development of the Amputation Rehabilitation Research Network (ARRN)

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[1]*Portsmouth Enablement Centre*

The Amputation rehabilitation evidence base is not well established. A recent systematic review of randomised controlled trials (RCTs) in prosthetic and orthotics found only 4 RCTs in the past 20 years. (Healy et al.,2018). This paucity of research has led to the use of consensus techniques, such as Delphi, to inform clinical practice guidance (Smith et al.,2016), and many clinicians feel that research does not address issues that are important to their patients, or clinical practice. Fewer clinical trials also leads to a research skills gap with few clinicians in the field who have the capacity and capability to deliver NHS based research.

Collaboration is a key part of clinical research, especially with academic organisations who often need clinical collaborators to provide input for their research ideas. Clinical input is crucial to ensure research is meaningful, that study designs fit cohesively alongside care pathways and more obviously to recruit patients. Knowing how and where to develop collaborations in such a specialist field can be challenging for both academics and clinical teams, especially in the post covid virtual world.

We therefore set about creating a network of multidisciplinary clinicians and academics actively researching in the field of amputation and prosthetic rehabilitation, or with an interest in getting involved in this work. The aim of the network was to enable a cohesive multi-disciplinary approach to the development, delivery, and dissemination of research within the field, and to support and promote evidence-based practice.

The network provides a forum for discussion and collaboration, education, study updates, as well as dissemination of research findings related to amputation rehabilitation. By bringing clinicians and academics together, and enabling them to share experience and learning, the network aims to ensure future research involves and is driven by issues of importance to stakeholders and has meaningful clinical impact.

BO8

Exploring meaningful outcomes of recovery following lower limb amputation and prosthetic rehabilitation: The patient's perspective

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[1]*Portsmouth Enablement Centre*

Purpose: There is currently no consensus regarding what outcome domains to measure following lower limb prosthetic rehabilitation. Prosthetic users will have a unique insight into important outcome domains, little is currently known about their critical viewpoint.

Materials and methods: 37 participants who underwent lower limb amputation in the last five years were recruited from UK limb fitting centres and social media. Data were collected using focus groups and interviews, and analysed using reflexive thematic analysis.

Results: Five themes were identified.
1) The ability to participate in important activities,
2) how participants were able to undertake these activities, i.e. independently, with ease, safely and with minimal equipment.
3) A comfortable, easy-to-use prosthesis,
4) the importance of being able to manage pain and finally
5) adjusting and accepting their new normal. These five themes, or outcome domains, did not exist in isolation, but appeared to interact with each other, contributing to, or inhibiting the participant's holistic sense of recovery.

Conclusions: Understanding important outcome domains that define what recovery means to people following amputation can help to inform outcome measurement consensus and the selection of tools that evaluate prosthetic interventions in a meaningful way.

SVN Oral Abstracts

NO1

Insight into patient and family awareness of peripheral arterial disease and critical limb ischemia

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Background:
Critical limb ischemia (CLI) is the most severe form of Peripheral arterial disease (PAD) with 25% mortality rate within a year and a £200 million cost on the NHS. It is important to ensure that those most at risk are well informed.

Methods
A survey was created utilising the Illness Perception Questionnaires (IPQs) [1,2] examining self-reported knowledge on PAD with focus on understanding, severity, risk factors, consequences, and management. Data collected prospectively from CLI patients on admission or through the hot clinic.

Results
48 responses (31 inpatients and 17 hot clinic). 56% of the patients have NOT heard of PAD before. 58% thought PAD is serious or very serious.
Most of the patients identified the risk factors for PAD but only half of them linked PAD to Stroke, MI and Death.
Most patients (63%) preferred to use professional medical websites to learn about their condition (88% of hot clinic patients). 48% would ask friend or family, 27% would look into medical textbooks and leaflets and 13% would use social media.

Conclusion
There is still a large gap in patients' knowledge of PAD and CLI. More focus is needed on professional medical websites as the preferred first source of information.

NO2

Is peripheral arterial disease (PAD) a mental health disorder?

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Introduction: Several established risk factors for PAD may be influenced by mental health: by affecting behaviours such as smoking, or the management of conditions such as diabetes mellitus. We aimed to investigate the nature and strength of this relationship.

Methods: We conducted a literature review of articles linking PAD with mental health disorders and formed an ongoing pilot study on inpatients at the Manchester Vascular Centre in the form of a questionnaire.

Results: Our questionnaire (n=30) showed 40% admitted mental health issues prior to their recent hospitalisation, although figures in the wider literature vary widely. Only a fraction were diagnosed and on treatment.
This figure increased prior to treatment and decreased after, suggesting PAD may directly influence mental health issues. Nearly half reported their mental health made beneficial behaviour such as refraining from smoking, eating well and exercising less likely, supporting the wider literature finding that better mental health leads to better outcomes. Nearly two-thirds felt they would benefit from intervention focused on their mental health.

Conclusion
PAD and mental health influence each other. We hope our preliminary investigation can help form studies to find effective ways of treating the mental health of vascular patients in order to improve outcomes.

NO3

Factors affecting adherence to guideline recommended treatment in patients with peripheral arterial disease

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Introduction:
Adherence to peripheral arterial disease (PAD) treatment is suboptimal and there is limited data investigating factors affecting adherence. This exploratory study aimed to identify the current adherence levels of PAD patients and how these are related to sociodemographic, clinical factors and illness perceptions.

Methods:
This questionnaire-based study included PAD patients attending their vascular outpatient appointment at a big London Hospital between January and June 2022. Outcome measures were the self-reported Morinsky Medication Adherence Scale (MMAS-8) and the Brief Illness Perceptions Questionnaire (BIPQ).

Results:
105 patients participated in the study. Univariate analysis identified five factors affecting antiplatelet and statin medication adherence respectively: age (p=0.009; p=0.019); previous vascular intervention (p=0.019; p=0.018); smoking history (p=0.021; p=0.019); social support by family or friends (p=0.025; p=0.027); and the B-IPQ treatment control (p=0.007; p=0.006). Older patients had higher medication adherence (p<0.001). Surprisingly, patients who perceived their disease to be more threatening (higher BIPQ) and those who had lower treatment control had lower adherence (p=0.02).

Conclusion:
Perceiving PAD as a threatening disease and negative beliefs about the effectiveness of treatment are associated with low medication adherence. Exploring patients' illness and treatment perception is essential to tackle the issue of non-adherence.

Figure 1. Illness perceptions of PAD patients

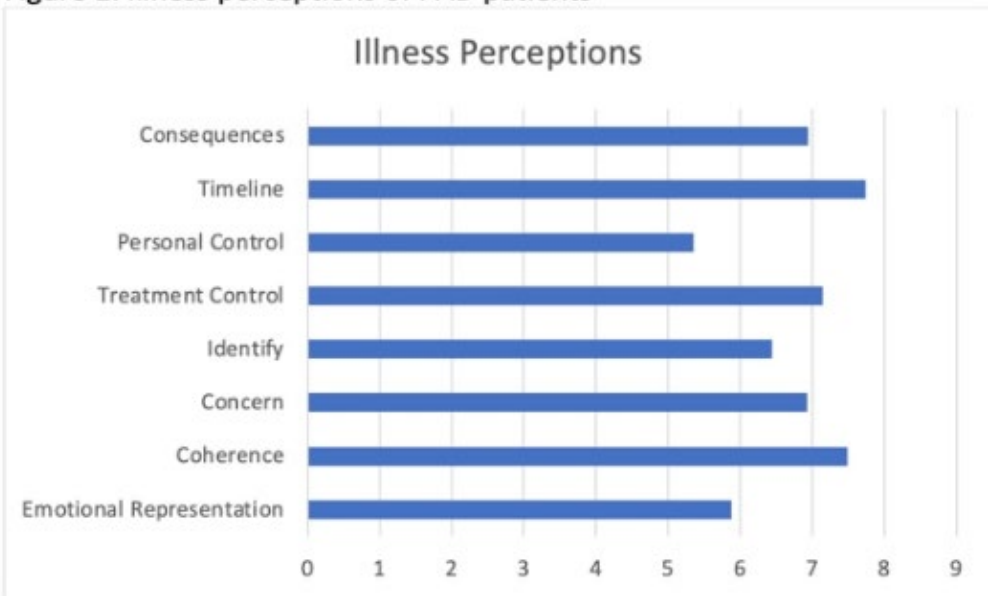

Table 1. Sample characteristics

Sample characteristics (N=105)	
Variables	**n (%)**
Gender (men)	77 (73.3)
Age (mean ± SD)	69.52 ± 9.16
Ethnicity	
White	n= 79 (75.2)
Black	n=13 (12.4)
Asian	n=10 (9.5)
Other	n=3 (2.9)
Employment status	
Retired	n=69 (65.7)
Employed	n=23 (21.9)
Sick	n=13 (12.4)
Index Multiple Deprivation status	
Quintile 1	n=29 (27.6)
Quintile 2	n=21 (20.0)
Quintile 3	n=32 (30.5)
Quintile 4	n=18 (17.1)
Quintile 5	n=5 (4.8)
Partner support	
Yes	n=55 (52.4)
No	n=50 (47.6)
Smoking status	
Current smoker	n= 26 (24.8)
Ex-smoker	n=70 (66.7)
Never smoker	n= 9 (8.5)
Maximum walking distance (median, IQR)	100, 50.00-200.00
Supervised Exercise	
Referred	21(20)
Attended	19
Completed	15
Years of diagnosis (median, IQR)	4.0, 1.0-8.0
Previous vascular surgical intervention	
Bypass	n=22 (50)
Angioplasty	n=14 (31.8)
Angioplasty and endovascular treatment	n=5 (11.4)
Other	n=3 (6.8)
Comorbidities	
IHD	n=34 (32.4)
HTN	n=71 (67.6)
T2DM	n=31 (29.5)
COPD	n= 6 (8.6)
Hypercholesterolaemia	n=45 (42.9)
Cerebrovascular disease	n=10 (9.5)
Depression	n=14 (13.3)
Total BIQP (mean ± SD)	43.16 ± 14.03

NO4

Use of Biodegradable Temporising Matrix (BTM) in vascular surgery

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Introduction
Open wounds over vascular grafts and bone commonly result in graft infection, osteomyelitis and subsequent amputation (1)(2). Traditionally these wounds would be left to heal by secondary intention +/- antibiotics, leading to prolonged treatment. NovoSorb Biogradable Temporising Matrix (BTM) by PolyNovo is a synthetic polymer that can temporarily close the wound allowing for new tissue generation (3). We used BTM in 5 vascular patients for which conventional wound cover was not an option, a first in the UK.

Methods
A case series covering:
1. Exposed prosthetic graft
2. Exposed vein graft anastomosis
3. Open below knee amputation with bone exposure
4. Open transmetatarsal amputation with bone exposure
5. Post calcanectomy for osteomyelitis with exposed calcaneum

Results
Wounds ranged from surgical bypass wounds to amputation sites. In four cases the BTM integrated well into the wound bed by 6 weeks, covering the critical structures. In the one treatment failure the wound closed by secondary intention.

Conclusion
BTM provides a low-cost option for covering high risk structures, where flaps or grafts are not possible. The thickness of coverage is limited. Further analysis of application technique and patient selection criteria needs to be carried out as well as longer term outcomes.

NO5

A Novel Anatomical Description of the Terminal Peroneal Artery and the Terminal Peroneal Window with its Important Clinical and Radiological Implications. A new access in bypasses to terminal peroneal artery.

Slim H[1], **Archer J[1]**, Kimura S[1], Gambhir R[1], Rashid H[1], Valenti D[1]
[1]KING'S COLLEGE HOSPITAL

Slim et al recently reported new anatomical and radiological findings related to the course of the terminal Peroneal artery and what the author named as the Terminal Peroneal Window (TPW). The findings were crucial in developing a new surgical technique to access the terminal part of the artery fo 5 Terminal Peroneal to Pedal arteries bypass in patients with CLI.

The aim of this study is to assess whether these new findings are consistent in all people, or whether these reported cases were abnormal anatomical variations.

A retrospective analysis of all performed computed tomography (CT) angiography scans of the lower limbs at a single tertiary center in 2019.

A total of 250 CTA were analyzed. 162(65%). The indications for the CT scans were peripheral vascular disease 111(44.4%), acute limb ischaemia 38(15.2%) trauma 53(21.2%), pseudoaneurysm 11(4.4%) and other less frequent indications.
The anatomical course of the terminal Peroneal artery and TPW were present in every CT scan. The mean Terminal Peroneal Window size in the right leg was 7.72mm(range: 2-14mm) compared to 8.17mm(range: 3-16mm) in the left leg.

This study demonstrated that the terminal Peroneal artery anatomical course and the Terminal Peroneal Window was not an anatomical variant, but the norm.

SVT Oral Abstracts

TO1

How often should popliteal artery aneurysms be scanned? A 5-year retrospective local dataset analysis to determine mean growth rate of popliteal artery aneurysms.

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Objectives:
Popliteal artery aneurysm (PAA) occurs in around 0.1-3% of adults, mostly men. Duplex ultrasound (DUS) is used to monitor these aneurysms to determine growth and when to offer treatment. Currently, there is no consensus reached in the research on PAA growth rate and the optimal surveillance frequency. This study aims to calculate the average growth rate of PAA with the prospect to better define surveillance intervals. The secondary aims are to investigate if factors like abdominal aortic aneurysm (AAA), hypertension, diabetes, being a smoker or taking certain medications are linked to an altered PAA growth rate.

Methodology:
Local data will be collected retrospectively and will include PAA patients who have had at least 2 DUS scans between 01/01/2017 and 01/01/2022. Aneurysm size, presence of thrombus and surveillance intervals will be recorded from DUS reports. Clinical letters from the initial vascular consultation will be reviewed to record data linked to the secondary aim investigations. Linear regression will be used to statistically analyse the data.

Future Implications:
The study will offer additional data on PAA growth rate, allowing for better defined surveillance intervals. This will give a more robust and effective local surveillance protocol, ensuring timely treatment and preventing unnecessary scans.

TO2

An application of artificial intelligence assisted software in reporting vascular ultrasound: A feasibility study.

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[1]Guy's and St Thomas' NHS Foundation Trust

Background: Duplex ultrasound (DUS) is the first line non-invasive assessment for peripheral arterial disease. Interpreting duplex images is time-consuming and subject to operator variability. Artificial intelligence (AI) has gained popularity in medical imaging but application to DUS has been mainly directed to the carotid arteries. This project will evaluate the feasibility of a novel AI reporting software to assess DUS images from the superficial femoral artery (SFA). Improvements in efficiency, accuracy and reporting time will be investigated.

Methods: Propriety software will first be tested in a small group of normal volunteers and this will include mapping of anatomical markers. If successful, the software will be applied to 70 patients' lower limb arterial scans with single lesions pre SFA angioplasty. Agreement between the reports generated, historic reports and computed tomography angiography will be calculated using Kappa Statistics, sensitivity and specificity and ROC-AUC curves. The time taken to produce reports using each approach will be compared using an unpaired t-test.

Outcomes: The study intends to evaluate if this propriety reporting software has a future clinical application in the vascular department and will determine if a full-scale study is indicated.

TO3

An audit to determine whether patients receive two forms of carotid imaging pre-operatively when carotid endarterectomy (CEA) is being considered, in line with the European Society for Vascular Surgery (ESVS) 2017 Clinical Practice Guidelines.

Alderson E[1]

[1]*Cambridge University Hospitals NHS Foundation Trust*

Introduction:
The 2017 ESVS Clinical Practice guidelines state two forms of imaging are recommended pre-CEA; this can be a combination of duplex ultrasound (DUS), computed tomographic angiography and magnetic resonance angiography, or two DUS performed by different operators.

Methods:
Data was collected retrospectively from the National Vascular Registry to identify patients who underwent CEA between January 2019-December 2021 (n=205). No exclusion criteria were applied. EPIC electronic patient record system was used to obtain relevant data from patients' files including: pre-CEA imaging modalities, complications, outcomes and patient demographics. Data will be analysed using descriptive statistics and chi squared and Mann-Whitney statistical tests.

Results:
Between January 2019-December 2021, 87.3% of patients met the ESVS guidelines. Of the 12.6% who did not comply with the guidelines; 80.8% received one form of imaging and 19.2% received two DUS performed by the same operator.

Conclusion:
No single reason was identified to explain non-compliance with the 2017 ESVS guideline. Results were disseminated to all interested stakeholders and a common point for intervention in the patient pathway was identified. A six month time lapse (June-December 2022) before re-auditing will enable assessment of the effectiveness of interventions to improve guideline compliance.

TO4

Measurement of claudication distance in patients with peripheral arterial disease using Google Maps Imagery (Google Street ViewTM).

Benbia Z[1], Juszczak M
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Intermittent claudication is the most common presentation of lower limb peripheral arterial disease, occurring because of muscle ischemia during exercise caused by limited arterial flow. Intermittent claudication presents as cramping, occurring at a reproducible distance when walking on a level surface and is relieved by rest. The distance and time to limiting symptoms is reproducible, therefore patients tend to remember key landmarks that they can walk between before experiencing claudication symptoms.

Establishing claudication distance during initial assessment of PAD in clinical practice may be taken through patients being encouraged to estimate their claudication distance which will be reported as self-reported in the patients' clinical notes. However, the accuracy of this distance based on self-reporting is poor. In other clinical settings a corridor walking test is used to estimate exercise and claudication distance in a more accurate way. However, these tests are not always possible to complete in a vascular assessment setting due to lack of time and staff. Proposed that using Google Maps can be an effective way of estimating claudication distance through asking patients to recall common landmarks in the areas of where they live to calculate the distance, they are able to walk between these before experiencing symptoms.

TO5

The prevalence of positive lower limb DVT outcomes in patients with lower limb cellulitis: a retrospective analysis and service evaluation.

Santos G[1]
[1]*Royal Free London NHS Foundation Trust*

According to NICE guidelines, a diagnostic ultrasound duplex is urgently required within 24 hours of a suspected deep vein thrombosis (DVT). The 2-level DVT Wells score is used to predict for a DVT by identifying clinical features including calf swelling, pitting oedema, and tenderness along the deep venous system. Cellulitis of the lower limb often presents with signs and symptoms similar to that of a lower limb DVT (LLDVT), so patients with cellulitis may also be referred for a ?DVT duplex.

The proposed hospital service evaluation will identify how often patients with lower limb cellulitis have a concurrent LLDVT.

Using the hospital's electronic health records system, data will be acquired from between the years 2021-2022 to identify patients with cellulitis who were referred for a ?DVT duplex. This data will be analysed to compare the associated prevalence of positive versus negative LLDVT outcomes in patients with cellulitis.

A chi-squared test will be performed to ascertain any statistically significant difference, which may highlight the need for reassessing the cost-effectiveness of ?DVT referrals in patients with cellulitis, or warranting a novel clinical prediction rule that is more suitable than the 2-Level Wells score at predicting a LLDVT in patients with cellulitis.

TO6

A local service evaluation exploring patients' perceptions of their inpatient care after endovascular or open surgical intervention for Abdominal Aortic Aneurysms (AAAs)

Corby A[1], Bond K[1]
[1]*Oxford University Hospitals NHS Foundation Trust*

Introduction
Positive patient experiences are associated with better outcomes for patients, including reduced hospitalisation and adverse events. There is little published data on the inpatient experiences of patients after open or endovascular abdominal aortic aneurysm (AAA) repair. Therefore, this evaluation hopes to understand the current post-operative experiences of AAA patients at this Trust.

Methods
This evaluation will use a mixed-methods prospective approach. Participants from both intervention groups will complete a qualitative questionnaire after discharge, which asks open-ended questions about their experiences. They will additionally complete the validated Picker Patient Experience 15-item quantitative questionnaire (PPE-15), which identifies the percentage of patients recognising a problem with elements of their care. A subset of participants will complete a semi-structured interview to discuss their care in greater depth.

Results
The qualitative data from the questionnaires and interviews will be analysed thematically using NVivo software. The proportions of patients identifying a problem for each PPE-15 item will be compared between the open and endovascular groups using the Pearson chi-squared test.

Conclusion
The results of this evaluation will aim to identify positive elements of patient care and any areas for development which could be used to improve the post-operative AAA experiences for patients at this Trust.

T07

Can the toe brachial index be used to grade the severity of peripheral arterial disease?

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Introduction

The toe brachial index (TBI) is an alternative to ankle brachial pressure index as a first line investigation for peripheral artery disease (PAD). There is a lack of established TBI grading criteria for diagnosing PAD and a need for improved evidence-based practice. Aim: To determine the ability of TBI to detect significant and severe PAD and identify appropriate TBI cut-off values.

Method

This retrospective pilot study identified patients who underwent TBI and duplex ultrasound investigations. PAD severity was graded using the ANGIO score method. The relationship between PAD severity and TBI was assessed and optimal TBI cut-off values were determined for identifying significant (ANGIO score ≥1) and severe PAD (ANGIO score ≥6).

Results

Spearman's correlation coefficient demonstrated a strong, negative correlation between TBI and PAD severity ($r(49)=-0.72$, $p<0.001$) and a moderate, negative correlation between systolic toe pressure and PAD severity ($r(49)=-0.65$, $p<0.001$). Receiver operating characteristics (ROC) curve analysis demonstrated good ability of TBI in determining patients with significant PAD (area under the ROC curve (AUC)= 0.892) and severe PAD (AUC= 0.820). The optimal TBI cut-off value for severe PAD was ≤0.23.

Conclusion

This pilot study provides further support for the use of TBI in grading the severity of PAD.

TO8

Peripheral bypass graft surveillance: a survey examining current practice in vascular laboratories across the United Kingdom

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The literature surrounding the need for autogenous peripheral bypass graft surveillance is equivocal. The Society of Vascular Surgery (SVS) and European Society of Vascular Surgery (ESVS) endorse surveillance but provide differing recommendations as to when it should be conducted. With the absence of an evidence-based, gold-standard surveillance programme to adhere to, surveillance programmes in the UK anecdotally vary. To improve our understanding of how surveillance is practiced, a survey consisting of 9-questions was disseminated via email to departmental leads in 60 vascular laboratories across the UK.

36 vascular laboratories responded to the survey. Of these, 83% had a formal surveillance programme for autogenous grafts, 14% assessed patients at the discretion of their surgeons and 3% assessed grafts when they became symptomatic. 73% of the formal surveillance programmes were based upon local protocols, whilst 24% and 3% adhered to SVS and ESVS guidelines, respectively. Analysis of the formal surveillance programmes revealed that pre-discharge, 3-months, 6-months and 12-months post-op were the intervals at which patients were most commonly seen.

The findings of this survey indicate that the surveillance of peripheral, autogenous bypass grafts is variable in vascular laboratories across the UK.

TO9

The clinical efficacy of vascular screening prior to kidney transplantation.

Alexander L[1]

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Background: The prevalence of Chronic Kidney Disease (CKD) is increasing with an ageing population and vascular comorbidities. Kidney transplantation (KTx) is the gold standard treatment option for advanced CKD. Patients accepted onto a regional transplant list must undergo a comprehensive screening programme, which includes vascular ultrasound of the carotid and iliac arteries. However, guidance on who should receive vascular screening and how this impacts patient care is limited.

Objective: This audit aims to determine the diagnostic yield of vascular ultrasound in pre-emptive KTx patients and identify significant risk factors that could be used as selection criteria to strengthen screening sensitivity.

Methods: Retrospective analysis of 955 screening reports. Scan results and specific vascular risk factors were obtained. $\chi 2$, t-test and logistic regression analysis were used to determine risk factor significance.

Results: The prevalence of carotid and iliac stenosis was 1.5% (95% CI, 0.88-2.58%) and 1.9% (95% CI, 1.01-2.30%), respectively. Several risk factors were found to be statistically significant with univariable analysis and logistic regression ($p<.05$). Therefore, selective risk factors could be used to mildly improve screening sensitivity.

Conclusion: This audit provides information about pre-transplant ultrasound screening. Universal screening is inefficient and selective screening based on vascular risk factors should be encouraged.

TO10

Do patients enrolled within the iliofemoral venous stent surveillance programme continue to report increased quality of life and venous symptom resolution?

Pason A[1]

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Objectives: Currently ilofemoral venous stent patients undergo regular ultrasound surveillance to help preserve stent patency. A service evaluation at Cambridge University Hospitals (CUH) was conducted to see if stent patency is related to venous symptom resolution and quality of life.

Methods: Questionnaires were sent to 49 eligible patients to measure residual venous symptoms (VEINES-Sym score), quality of life in respect to venous symptoms (VEINES-Qol score) and overall quality of life as determined by the patient (EQ-VAS score). Of the 23 returned questionnaires 11 patients had an occlusion or a >50% in-stent stenosis on their last ultrasound scan and were categorised as diseased while 12 patients had mild or no disease and were categorised as non-diseased.

Results: Significant correlations existed between VEINES-Qol and EQ-VAS scores (0.63, P=.002, CI=95%), and VEINES-Sym and VEINES-Qol scores (0.90, P= <.001, CI=95%). No significant difference was seen (independent samples t-test) between non-diseased and diseased groups for VEINES-Sym score (P=.996, CI 95%), VEINESQol score (P=.400 CI 95%), and EQ-VAS score (P=.151 CI 95%).

Conclusions: In-stent disease was not a predictor of either venous symptoms or quality of life.

TO11

A local evaluation of manual and automated Ankle Brachial Pressure Index techniques currently available within the Vascular Studies Unit

Hiscocks C[1]

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Ankle-brachial pressure index (ABPI) is a simple assessment used to detect peripheral arterial disease. Recently, automated devices have aimed to reduce training needed and assessment times. By comparing automated air plethysmography ABPI (autoABPI) to manual ABPI (manABPI) and duplex ultrasound, this service evaluation determined whether autoABPI should become the primary method used locally.

Data were collected on assessment duration, brachial pressure, highest ankle pressure and ABPI and compared using paired t-test and Bland-Altman. Arterial duplex results determined sensitivity, specificity and agreement (see Table).

Twenty-five patients (11 female, 71 ±10 years-old) underwent bilateral manABPI and autoABPI (50 legs, 9 excluded). Twenty-four patients (35 legs) underwent lower-limb arterial duplex. autoABPI were 10 minutes quicker than manABPI. In relation to limits of acceptability (±5 mmHg, ±0.15 ABPI), brachial pressure, highest ankle pressure and ABPI demonstrated poor agreement between methods. Compared to duplex, autoABPI demonstrated 44% sensitivity and 89% specificity, while manABPI demonstrated 91% sensitivity and 100% specificity. manABPI had 100% sensitivity in patients with diabetes or rest pain/ischaemia, autoABPI had 0% (n=8) and 22% sensitivity (n=11) respectively (see Table).

Preliminary findings suggest autoABPI should not be the primary assessment method and further investigation should focus on differences in measuring ankle pressures between populations.

Table – Manual and automated ABPI sensitivity, specificity and agreement vs duplex.

			n	Sensitivity (%)	Specificity (%)	Agreement
Manual ABPI vs Duplex						
	All Patients		**31**	**91**	**100**	**0.85****
	Diabetics		7	100	100	1.00**
	Non-Diabetics		24	89	100	0.80**
	Claudicants		14	78	100	0.71**
	Rest Pain/Ischemia		11	100	100	1.00**
Automated ABPI vs Duplex						
	All Patients		**32**	**44**	**89**	**0.23**
	Diabetics		8	0	100	0
	Non-Diabetics		24	57	83	0.28
	Claudicants		16	64	80	0.34
	Rest Pain/Ischemia		11	22	100	0.09

*Agreement calculated using Cohen's Kappa (1 = perfect agreement, 0 = no agreement). **p<0.01.*

TO12

The effect of health literacy and socio-economic deprivation on outcomes after lower limb revascularisation surgery for Chronic Limb Threatening Ischaemia

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Introduction:
Health Literacy is the ability to obtain, process and understand health-information needed to make health-related decisions. Research has suggested a relationship between health literacy, socio-economic status and health outcomes. This study aims to assess how health literacy and socio-economic status interact for patients undergoing bypass surgery for Chronic Limb Threatening Ischaemia(CLTI).

Methods:
Surgical bypass graft patients were consented for participation in a cross-sectional observational study(REC:21/NI/0092). The HLS19-Q12 questionnaire categorised participant's health literacy as inadequate, problematic, sufficient, or excellent. Socio-economic status was assess using the Index of Multiple Deprivation(IMD). Primary outcomes were major adverse cardiovascular and limb events.

Results:
Fifty patients(mean age±SD: 70±8.7 years) were included. Participant's health literacy was inadequate(28%), problematic(38%), sufficient(24%) and excellent(10%). 40% lived in areas of highest deprivation. All health literacy groups were comparable for post-operative outcomes, but poorer health literacy was associated with a lower socio-economic status(0.308 (P=0.029)) which was also a significant predictor for amputation(P=0.017).

Conclusion:
This study suggests that a lower health literacy is associated with greater social deprivation which in turn maybe a predictor for amputation following bypass surgery. Health literacy is modifiable through education and may improve potential health inequalities created by social deprivation, addressing a vascular James-Lind Alliance priority.

TO13

Transthoracic ultrasound evaluation of thoracic aortic aneurysms

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Background: Thoracic aortic aneurysms (TAA) can be asymptomatic and life- threatening if they rupture. They are currently detected using computed tomography (CT) which is expensive and uses radiation. A previous study found that ultrasound has the potential to be used as a diagnostic modality for TAA. However, further validation of this methodology is required.

Methods: 15 patients (9 with TAA and 6 controls) had a single ultrasound assessment of the thoracic aorta performed by a single vascular scientist. The maximum diameter at the ascending aorta, aortic arch, mid and distal descending thoracic aorta was measured and compared to diameters from a CT scan at thresholds of 35mm and 40mm.

Results: The thoracic aorta was visualised in all 15 patients. At 35mm, the sensitivity and specificity were 100% and 85% and at 40mm it was 78% and 100%. The Bland-Altman plot showed good agreement between ultrasound and CT measurements for the maximum diameter and at the aortic arch, mid and distal descending thoracic aorta.

Conclusion: There is good visualisation of the thoracic aorta using ultrasound with high sensitivity and specificity at both 35mm and 40mm. Results of this study suggest that ultrasound has a potential to be used to assess TAA.

TO14

Estimating & comparing the performance, clinical effectiveness, and cost-effectiveness of current diagnostic options for patients that present to primary care with suspected venous ulcers.

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The main objective of this project is to determine the role/position of diagnostic imaging in the patient journey for a patient with active or healed venous ulceration.

Within this we hope to determine:-

1. the current practice in primary care for venous ulcer management.
2. the current practice for diagnosis and management of suspected venous leg ulcers in vascular scientist departments across the UK.
3. the minimum diagnostics for this cohort of patients including what scans should be performed and can a set criterion be applied to this cohort of patients.
4. the cost effectiveness of implementing this in both primary and secondary care settings.

Methodology will include the use of Qualtrics surveys, Delphi consensus, in depth interviews and cost-effective modelling.

The hope is that these findings will enable a better understanding of service provision in the UK of diagnostic imaging, being able to identify optimal/suboptimal practise and allow the identification of drivers to improve patient care. This work will complete that being done by the National Wound Care Strategy group. Leading to optimise and standardise patient care pathways for venous leg ulcers and leading to improved patient outcomes.

TO15

Prediction of arteriovenous fistula maturation outcomes in end-stage renal disease patients, using invasive and non-invasive techniques

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Prediction of AVF maturation outcomes remains challenging. This study aims to investigate arterial stiffness and endothelial dysfunction roles in predicting AVF maturation outcomes using advanced ultrasound applications. A prospective observational cohort pilot study where seventeen patients with ESRD who underwent AVF surgery recruited. AVF native artery and vein were scanned and assessed pre-and post-surgery using Ultrasound B-mode, share wave elastography(2DSWE),2D strain speckle tracking(2DSST) and laser Doppler flowmetry(LDF).
During the surgery, BVF was measured using Transonic intraoperative blood volume flow(TIBVF). Patients then followed for six weeks. Seventeen fistulas were created, and four failed to mature. Patients' average age was 56.3±14.1years,80.4% males. BMI average was 28±5.3, hypertension(100%), diabetes (41.2%), and CVD (35.3%). 2DSWE reading among the failure group was higher than patent group 4.23±0.43m/s, 3.90±0.42m/s respectively. 2DSST reading was slightly similar between both groups, failure 2.65±0.52% and patent 2.12±0.70%. LDF significantly correlated with AVF maturation outcome, $p<0.001$,failure 17.3±0.50a.u, patency 22.2±2.24a.u. TIBVF in the failure group was lower than patency group 164.8±135ml/min,434.5±209.5ml/min respectively, $p<0.057$. 2DSST and 2DSWE are promising tools to study arterial wall properties but were not correlated with AVF maturation outcomes, possibly due to the small sample size. LDF and TIBVF measurements showed a strong indicator for predicting AVF maturation outcomes.

TO16

Implementing a rapid access diagnostic service for patients with suspected giant cell arteritis.

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Literature shows that duplex ultrasound is an effective means of diagnosing temporal arteritis. However, the sensitivity of ultrasound decreases rapidly following the commencement of steroid treatment. Patients with symptoms of GCA were routinely being sent for temporal artery biopsy for diagnosis: an invasive test with considerable associated costs, compared to ultrasound. A new rapid access service was set up with an agreement to accept inter-trust referrals. This allowed patients over a wider geographical area who presented with symptoms of GCA to be seen in a central hub. Here they received an urgent ultrasound assessment of the temporal and axillary arteries.

A service evaluation was conducted over a 22-month period and included 65 patients. Amongst this small cohort of patients, ultrasound assessments were shown to have 100% specificity however the sensitivity was still hindered by delays in the referral process.

Implementing this service has reduced the number of patients receiving a temporal artery biopsy, however further education is needed to raise awareness of the new patient pathway and to highlight the importance of early referral, especially for patients who have already commenced steroid treatment.

TO17

“DVT or not DVT.”
Leiomyosarcoma misdiagnosed as a Femoral Deep Vein Thrombosis (DVT).

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Background:
Incompressible lower limb deep veins are routinely diagnosed as DVTs; however, in rare situations, this might result in a delay in treatment for leiomyosarcoma.

Case Presentation:
A 50-year-old woman presented to ambulatory care with a swollen right leg. Ultrasound imaging suggested an occlusive thrombus in the proximal femoral vein (FV). Despite best medical therapy, her symptoms persisted over the following four months. She had two further ultrasound scans, where radiographers again reported DVT. As her DVT was unprovoked, a CT scan was conducted to rule out a malignant aetiology. Six months after her initial symptoms, she was referred to the vascular department, where a Clinical Vascular Scientist conducted a duplex scan.

Results:
A specialised vascular duplex examination revealed mixed echogenic material in the proximal FV (atypical for thrombus) with channels of low resistant arterial flow. The findings were discussed with the vascular consultant, who ordered magnetic resonance imaging, which confirmed the presence of a vascular tumour. A core biopsy subsequently confirmed it to be a metastatic Leiomyosarcoma.

Conclusion:
Despite the rarity of this diagnosis, it emphases the value of specialist Clinical Vascular Scientists, and how they can contribute towards diagnosing rare pathologies within a multidisciplinary team.

TO19

Can Artificial Intelligence detect carotid arterial disease through Duplex ultrasound?

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Objective
The aim of this study is to evaluate the feasibility, applicability, and accuracy of artificial intelligence (AI) in the detection of normal versus carotid artery disease through greyscale duplex ultrasound (DUS) images.

Methods
A prospective image acquisition of individuals undergoing DUS for carotid artery disease was conducted. A total of n = 156 images of normal and stenotic carotid arteries (based on NASCET criteria) were evaluated by using geometry group network based on convolutional neural network (CNN) architecture.

Results
The overall sensitivity, specificity, and accuracy of AI in the detection of normal carotid artery was 91%, 86% and 92%, respectively, and for any carotid artery stenosis was 87%, 82% and 90%, respectively.
Subgroup analyses demonstrated that for stenotic carotid artery (<50%) versus normal, there was sensitivity 92%, specificity 87% and accuracy 94%. This value for group of 50–75% stenosis versus normal was 84%, 80% and 88% and for carotid artery disease of more than 75%, was 90%, 83% and 92%, respectively.

Conclusion
This study demonstrates the feasibility, applicability, and accuracy of AI in the detection of carotid artery disease in DUS images. It can serve as a stratification tool for tertiary referral, further imaging, and overall management.

TO20

Utility of duplex ultrasound in establishing extra-cranial large vessel inflammation and peripheral arterial complications in systemic large vessel vasculitis

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Case presentation:

A 59 year old female developed non-inflammatory aches of both shoulders, bilateral glutei, right leg claudication, right periorbital pain with pulsatile right sided tinnitus over 6 months. Her only cardiovascular risk factor was recently diagnosed hypertension. She does not smoke. Her ESR was 85 and CRP 61, so her GP initiated 40mg prednisolone on suspicion of temporal arteritis.

Management and outcome:

Whilst taking steroids, her initial temporal artery ultrasound (TAUS) was unremarkable. Symptoms recurred with bilateral carotid bruit when prednisolone was weaned. Further Doppler ultrasound identified left internal carotid artery occlusion with an inflammatory 'halo'. Lower limb arterial duplex demonstrated inflammatory stenosis of the right superficial femoral artery. A repeat TAUS found bilateral axillary artery inflammation. Magnetic Resonance (MR) imaging and cerebral angiography later confirmed left carotid artery wall enhancement with occlusion and multifocal cerebral infarction.

Discussion:

Real-time duplex ultrasound identified widespread vasculitis and stenosis of the carotid, axillary and superficial femoral arteries, whilst pending MRA investigation. Classic smooth muscular intimal thickening with "halo" sign helped to distinguish vascular inflammation from irregular atherosclerotic disease. Doppler ultrasound enabled early diagnostic clarity and therapy in this case of widespread large vessel vasculitis, and reduced risk of further vascular morbidities.

TO21

An ultrasonic assessment of inner to inner and outer to outer diameter measurement of the abdominal aorta. A 10-year perspective from an abdominal aortic aneurysm screening technician.

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Objective
Assessing the ultrasonic differences between the inner to inner (ITI) and outer to outer (OTO) measurement of the abdominal aorta between three abdominal aortic aneurysm screening technicians (AAAST) and vascular scientist (VS).

Methods
A retrospective analysis using ITI and OTO measurements in 50 static images of normal-sized aortas and 10 static images of surveillance AAAs by three AAASTs and one VS. The prospective research involved live scanning of the abdominal aorta in 10 men aged 50+ and 10 surveillance patients.

Results
80 patients were included in this study. Retrospectively, the largest variation was observed by VS of 0.5mm between the ITI and OTO. AAAST1 and AAAST2 showed a variation of 0.4mm and, 0.3mm by AAAST3. Using the ITI method 76% (50 static images) were measured lower by the VS whereas AAA screening technicians showed 80% uniformity across ITI measurements. Live scanning (20 patients) showed a variation of 0.2mm in ITI, and 0.4mm in OTO.

Conclusions
Three AAASTs showed higher uniformity compared with VS using the ITI method. Live screening showed a lower variation between VS and AAAST1 in ITI in comparison with OTO. This study prompted further clarity during quality assurance (QA) reviews due to absent cardiac phasic information.

TO22

Systematic review of duplex versus clinical surveillance after endovascular treatment of lower limb peripheral arterial disease

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Introduction

ESVS 2019 guidelines recommend that patients should undergo duplex surveillance at 1, 6 and 12 months. The aim of this study was to establish the benefit of duplex versus clinical surveillance on major amputation.

Methods

Two reviewers performed a systematic review using the PRISMA guidelines for 2 arm studies of duplex versus clinical surveillance. Medline and EMBASE were searched between 1947 to March 2022 and assessed for risk of bias. The primary endpoint was lower limb amputation and the secondary endpoint was primary assisted patency.

Results

Of the 595,104 records initially identified, 135 abstracts were screened and 17 full-text articles were assessed for eligibility. One non-randomised, 2 arm parallel group, retrospective study was found for 248 patients undergoing superficial femoral artery stenting. Over a 56 month period this found a risk of major amputation of 10% (duplex) versus 50% (clinical), $p<0.001$. The primary assisted patency was 54% (duplex) versus 38% (clinical), $p=0.8$.

Conclusion

The authors found only one comparative, low quality study of duplex versus clinical surveillance. The key finding was that patients undergoing duplex surveillance had a significant reduction in major amputations. It is recommended that a prospective randomised controlled trial is designed to answer this question.

TO23

A contemporary retrospective series examining the impact of duplex surveillance on autogenous, peripheral bypass grafts.

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Introduction:
The impact ultrasound-derived surveillance programmes have on the patency rates of autogenous peripheral bypass grafts (BPG) is debated within the literature, yet regimented surveillance is routinely practiced in the UK. This study aims to present a contemporary BPG surveillance population, and its impact on graft patency.

Methodology:
All patients who entered ultrasound surveillance following autogenous BPG surgery between 2014 – 2022 at a single tertiary vascular centre in London were identified. Retrospective data collection was performed to identify patient demographics, past medical history, ultrasonographic surveillance findings and clinical outcomes.

Provisional results:
247 patients (age 72 ± 11 years, 209 male) were identified. Overall primary, assisted-primary and secondary patency rates were 58%, 80% and 80%, respectively.
Ultrasound identified graft-threatening stenosis (>75%) in 40% of patients. Primary patency was significantly lower in this cohort compared to patients without stenosis (25% vs. 80%, $p<0.001$). In the cohort that had significant stenosis, those that underwent re-intervention had better assisted-primary and secondary patency rates than those that did not (84% vs. 78%, $p = 0.043$).

Conclusion:
This retrospective contemporary series indicates that the identification of graft-threatening stenosis with ultrasound may inform treatment, which improves graft patency rates.

TO24

A reflection of measuring and applying qualitative approaches to a Vascular Ultrasound Lab

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Throughout my experiences of working within healthcare, the processes and attention of measuring qualitative data in a clinical setting has taken a back seat when compared to the huge emphasis on quantitative approaches. For example, focus tends to favour on how many scans can be performed on an ultrasound machine per day rather than also assessing patient satisfaction and re-designing patient pathways to facilitate patient centred care.

Vascular sonographers are a vital cog in the patient pathway in assisting in the diagnosis of diseases. However should they wish, they can also play a major role in helping facilitate the qualitative measures to improve patient care given their involvement in large webs of care and their patient facing roles.

This talk is a reflection of my application of qualitative aspects of healthcare through my learning on the Elizabeth Garrett Anderson Program (MSc Healthcare leadership). Topics of reflection include my experiences in the power of honest conversations, the importance of story telling to extract information, sub-conscious behaviours, perceptions, looking beyond the tip of the iceberg the and tools to help facilitate qualitative sciences in a Vascular Ultrasound Lab.

Vascular Oral Abstracts (PAD, Renal Access, Carotid)

VO1

The positive impact of collaborative Vascular-POPS management of inpatients with CLTI: an interim analysis

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Introduction
Frailty is endemic amongst CLTI patients, and significantly influences outcomes. Evidence that medical co-management of vascular patients improves post-operative outcomes is compelling, however most studies were conducted electively. Our unit has undergone phased implementation of a collaborative POPS (Proactive care of Older People undergoing Surgery; consisting of Advanced Practitioner and Consultant in Elderly Medicine with interest in perioperative care) alongside Vascular Surgeons. We present our interim analysis of outcomes in acute CLTI patients.

Methods
Prospective observational cohort study of 530 consecutive emergency CLTI patients over 3 periods: 05/09/2018–04/09/2019 (1 year before collaboration); 05/09/2019–31/12/2021 (ACP-led with phased physician input); 01/01/2022–01/07/2022 (ACP + physician). Covid-positive patients are excluded. The primary outcome is length of stay. Secondary outcomes include MACE/MALE, post-op complications, 30-day readmission, returns-to-theatre and ICU admission.

Results.
The patient cohorts were well-matched for age and frailty. Collaborative input demonstrates a stepwise decrease in length of stay (17 days vs 13 days vs 12 days, $p<0.005$), with reductions in MACE ($p<0.001$), complications ($p<0.001$) and re-admission ($p < 0.05$) amongst the 3 groups.

Conclusion
Our early data demonstrates significantly improved outcomes for acute CLTI patients in a collaborative Vascular-POPS inpatient care model. The service continues to expand and evolve.

VO2

Short-term outcomes from the Peripheral Arterial Disease Quality Improvement Programme

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Background: The Peripheral Arterial Disease Quality Improvement Programme (PAD QIP) was a QI collaborative between 13 English vascular surgery centres from May 2020 to May 2022, aiming to reduce time to treatment for patients with Chronic Limb-Threatening Ischaemia (CLTI). The aim of this study was to evaluate the short-term outcomes of the programme.

Methods: All patients who underwent non-elective lower limb revascularisation for CLTI from January 2019 to December 2021 in the UK were extracted from the National Vascular Registry. The primary outcome was the proportion of patients who underwent revascularisation within 5 days from admission in participating centres compared to other UK centres and the baseline, using difference-in-difference analysis. Secondary outcomes were time-to-revascularisation and length of stay.

Results: Of the 11,169 non-elective revascularisations for CLTI performed in the UK during the study period, 3,381 (30.3%) were in early adopter centres. The outcomes of these patients in early adopters and the rest of the UK before and after their participation in the programme is summarised in Table 1 and depicted in Figure 1.

Conclusion: The PAD QIP participants had a higher average proportion of patients revascularised within 5-days and shorter length of stay compared to other UK centres.

Figure. Statistical process control (SPC) chart depicting the proportion of non-elective CLTI patients that were revascularised within 5-days from admission in early adopter centres compared to the rest of the UK before January 2020 and after May 2020. The time period January-May 2020 was considered a transition period and excluded from the analysis.

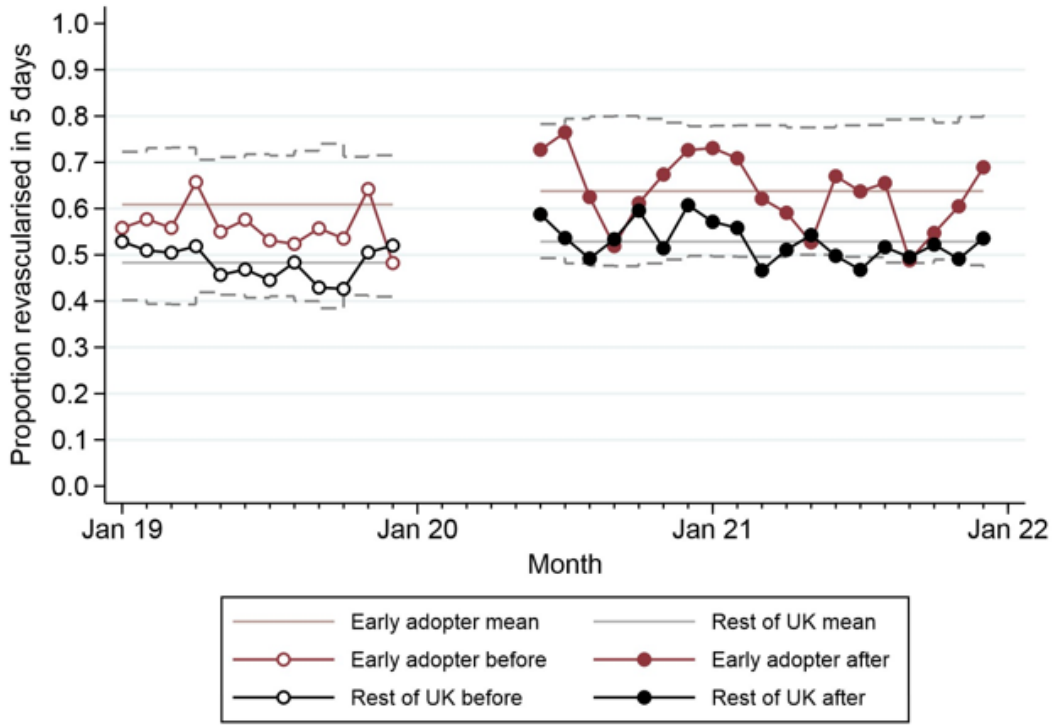

Table. Summary statistics for procedures performed in PAD QIP participating centres (early adopters) before January 2020 and after May 2020 compared to the rest of the UK vascular centres.

	Early adopters		Rest of UK		
	Before	**After**	**Before**	**After**	**p-value**
% revascularised within 5-days (95%CI)	56.4 (53.4-59.4)	63.9 (61.6-66.1)	48.3 (46.2-50.3)	52.6 (51.0-54.2)	0.141
Time-to-procedure (days, median, IQR)	5 (2 - 8)	4 (2 - 7)	6 (2 - 10)	5 (2 - 9)	0.179
LOS (median, IQR)	13 (7 - 25)	11 (6 - 20)	16 (9 - 28)	15 (8 - 26)	<0.001
Postoperative LOS (median, IQR)	7 (3 - 15)	6 (2 - 13)	8 (4 - 17)	8 (4 - 16)	<0.001

Note: 95%CI : 95% confidence interval, IQR: Interquartile range, LOS: Length of stay.
Two vascular units that joined the programme in May 2021 were excluded from the analysis.
The time period January-May 2020 was considered a transition period and excluded from the analysis.

VO3

Does a walking exercise behaviour-change intervention for adults with intermittent claudication change illness perceptions and walking treatment beliefs? Findings from the MOtivating Structured walking Activity for Intermittent Claudication (MOSAIC) randomised controlled trial

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Introduction: Walking exercise is recommended for adults with intermittent claudication (IC), but participation is low. Addressing an individual's perception and understanding of peripheral arterial disease (PAD) and walking treatment beliefs may support walking behaviour-change. This study investigated the effect of a walking exercise behaviour-change intervention on illness perceptions and walking treatment beliefs among people with PAD.

Methods: This randomised controlled trial enrolled adults aged over 50 years with IC between January 2018-March 2020. Illness perceptions were evaluated by the Brief Illness Perception Questionnaire (range, 0 to 80 [indicates negative perception of illness] and walking treatment beliefs (attitude, subjective norms, perceived behavioural control, intentions) were assessed by the Theory of Planned Behaviour Questionnaire (range for each construct, 3 to 21 [21 indicates best]. Outcomes were evaluated on an intention-to-treat basis using multiple regression with baseline value and stratification factors as covariates.

Results: 190 consenting participants (mean age 68 years) were recruited. At three-months, the intervention group had improved illness perceptions and attitude towards walking as a treatment but not subjective norms, perceived behavioural control, intentions, compared to the usual care group (Table 1).

Conclusions: Among adults with IC, MOSAIC improves illness perceptions and some aspects of walking treatment beliefs.

Table 1 Effect of a walking behaviour change intervention on Illness perceptions and walking treatment beliefs in people with intermittent claudication

	Walking-exercise behaviour change group Mean (SD)		Usual Care Mean (SD)		Between group difference[1] Mean (95% CI) *P* value
	Baseline	**3-month**	**Baseline**	**3-month**	
Brief illness Perceptions Questionnaire	45.7 (11.5)	38.9 (11.3)	44.0 (10.1)	45.8 (12.2)	−6.6 (−9.9 to −3.4) <0.001
Attitude score	14.7 (3.1)	15.4 (3.7)	14.6 (3.4)	13.9 (3.6)	1.4 (0.3 to 2.5) 0.02
Subjective norms score	16.2 (4.9)	16.7 (4.9)	15.8 (4.6)	16.0 (4.4)	0.3 (−1.1 to 1.7) 0.67
Perceived behavioural control score	17.5 (3.7)	16.8 (3.4)	17.0 (3.8)	16.8 (3.9)	−0.2 (−1.4 to 1.0) 0.78
Intention score	19.3 (2.8)	18.0 (3.5)	19.0 (2.6)	18.3 (3.7)	−0.3 (−1.5 to 0.9) 0.64
SD=Standard Deviation; CI=Confidence Interval [1]adjusted for baseline measure and trial stratification factors					

VO4

Safety and efficacy of carotid endarterectomy for symptomatic stenosis by age: a systematic review and meta-analysis with individual patient-level data

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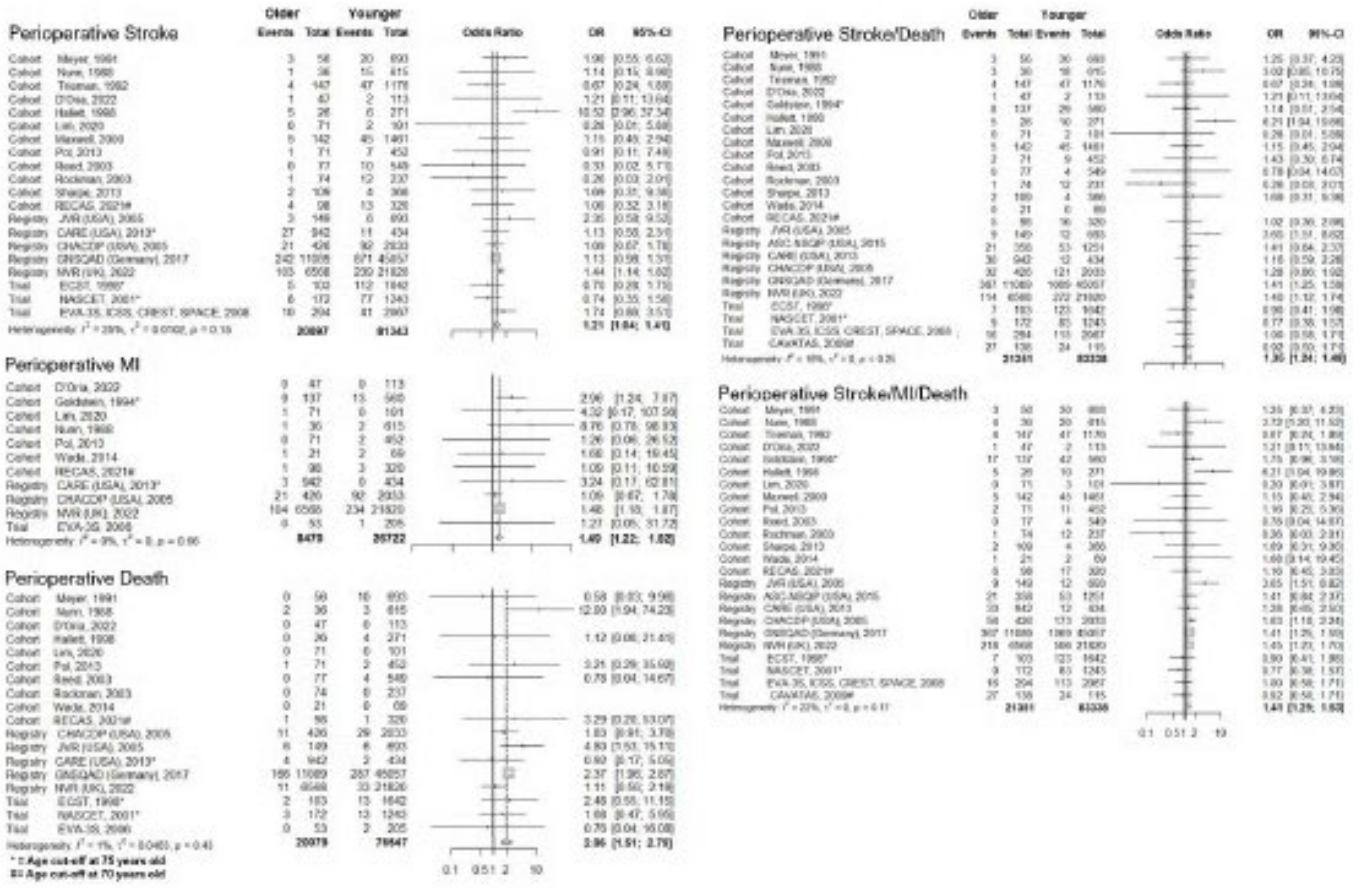
Background: There is uncertainty as to whether elderlies with symptomatic carotid stenosis have more adverse event following carotid endarterectomy(CEA). Few elderlies were included in trials and there has been no systematic analysis of all study types. We aimed to establish whether there is an association between age and post-CEA morbidity in symptomatic patients.

Methods: We did a systematic review and meta-analysis of all studies reporting post-CEA risk of stroke, myocardial infarction(MI), and death in patients with symptomatic stenosis. Individual patient data(IPD) from four prospective cohorts enabled multivariate analysis.

Results: Of 47 studies(107,587 patients), risk of perioperative(≤30-days of surgery) stroke was 1.89%(95%CI 1.79%-1.95%) overall; 2.04%(1.94%-2.14%) in octogenarians (390 strokes/19,101 patients) and 1.85%(1.75-1.95) in non-octogenarians(1,395/75,537);p=0.046. Perioperative death was 0.65%(0.60%-0.70%) overall; 1.09%(0.94%-1.25%) in octogenarians (203/18,702) and 0.53%(0.48%-0.59%) in non-octogenarians (392/73,327);p<0.0001(Figure1). In IPD multivariate analysis(5,111 patients), age ≥85 years was independently associated with perioperative stroke(p=0.00021) and death(p=0.005)(Table1). Survival was similar for octogenarians vs non-octogenarians at 1-year (95.0%[93.2%-96.5%] vs 97.5%[96.4%-98.6%];p=0.08), as was 5-year stroke risk(11.93%[9.98%-14.16%]) vs (12.78%[11.65%-13.61%];p=0.24)(Figure2).

Conclusion: We confirm increased perioperative risk with age in symptomatic patients undergoing CEA. This is modest compared to the increased stroke risk on medical therapy with age, so our findings support selective urgent intervention in elderly symptomatic patients.

Figure 1. Meta-analysis of perioperative any stroke, MI, and death via in-study cut-point analysis.



Age cut-off at 80 years old unless otherwise specified. *= Age cut-off at 75 years old. #= Age cut-off at 70 years old

Table 1. Univariate and multivariate analysis of risk factors for perioperative adverse events

	Stroke						MI						Death					
	Univariate			Multivariate			Univariate			Multivariate			Univariate			Multivariate		
	OR	CI	P value	OR	CI	P value	OR	CI	P value	OR	CI	P value	OR	CI	P value	OR	CI	P value
Age <65	1	0.46 1.51	0.28	1	0.68 1.42	0.30	1	0.27 1.64	0.30	1	0.56 1.43	0.14	1	0.28 1.61	0.59	1	0.44 1.56	0.82
65-69	1.18	0.71 1.95	0.52	1.13	0.67 1.90	0.29	1.73	0.81 3.72	0.16	1.29	0.78 1.80	0.19	1.78	0.66 4.79	0.26	1.21	0.57 1.88	0.53
70-74	1.00	0.61 1.64	0.99	1.00	0.61 1.63	0.40	0.97	0.43 2.22	0.95	0.95	0.49 1.41	0.89	1.37	0.51 3.70	0.53	1.22	0.87 1.57	0.76
75-79	1.46	0.92 2.30	0.11	1.43	0.90 2.27	0.10	1.48	0.70 3.16	0.31	1.45	0.81 2.09	0.29	1.43	0.83 2.85	0.48	**1.33**	**1.03 1.63**	**0.0012***
80-84	**1.28**	**1.08 1.48**	**0.0042***	1.27	0.85 2.21	0.49	**2.06**	**1.09 4.31**	**0.045***	1.49	**1.10 2.68**	**0.023***	1.63	0.47 5.59	0.44	1.54	0.40 5.55	0.11
≥85	1.42	0.86 1.63	0.61	**1.35**	**0.91 2.26**	**0.0021***	1.67	0.65 4.27	0.29	1.55	0.47 2.63	0.34	2.35	0.92 6.00	0.07	**1.77**	**1.12 2.42**	**0.005***
Female sex	0.88	0.63 1.18	0.17	0.84	0.61 1.63	0.26	0.83	0.53 1.30	0.20	0.80	0.33 1.27	0.77	0.80	0.45 1.40	0.21	0.80	0.37 1.53	0.97
Hypertension	1.09	0.77 1.53	0.31	1.05	0.78 1.46	0.31	0.90	0.57 1.43	0.32	0.66	0.41 1.07	0.09	0.98	0.54 1.78	0.48	0.78	0.50 1.33	0.33
Diabetes	1.28	0.91 1.81	0.08	1.23	0.82 1.79	0.21	1.23	0.76 1.98	0.20	1.21	0.61 3.01	0.81	1.06	0.57 1.97	0.43	1.02	0.40 2.14	0.21
CAD	0.95	0.65 1.40	0.41	0.94	0.69 1.45	0.10	1.26	0.77 2.07	0.18	1.23	0.70 1.76	0.09	1.06	0.55 2.03	0.44	1.06	0.34 2.38	0.45
Chronic Lung conditions	0.96	0.56 1.63	0.44	0.95	0.57 1.62	0.65	**1.71**	**0.95 3.08**	**0.03545***	1.59	0.33 2.85	0.12	**2.40**	**1.17 4.92**	**0.0067***	**2.11**	**0.96 4.27**	**0.048***
Smoking	0.79	0.43 1.44	0.21	0.90	0.44 1.68	0.76	0.60	0.24 1.15	0.14	0.79	0.27 1.80	0.6098	0.79	0.28 2.21	0.44†	0.79	0.24 2.88	0.71†
Prior Stroke	**3.02**	**2.13 4.29**	**<0.001***	**2.98**	**1.35 4.61**	**<0.001***	**2.59**	**1.58 4.25**	**<0.001***	2.52	0.94 4.10	0.0507	**4.55**	**2.21 9.38**	**<0.001***	**3.22**	**1.81 4.63**	**<0.001***
Prior TIA	**1.53**	**1.36 1.77**	**<0.001***	1.50	0.65 3.12	0.09	**1.64**	**1.23 1.74**	**<0.001***	1.34	0.51 2.17	0.9171	**1.54**	**1.26 2.09**	**0.043***	**1.19**	**1.08 1.30**	**0.011***
Prior Amaurosis Fugax	**1.33**	**1.18 0.62**	**<0.001***	0.91	0.32 2.21	0.25	0.78	0.41 1.48	0.28	0.78	0.44 3.93	0.54	1.05	0.86 1.46	0.08511	**1.05**	**1.01 1.09**	**0.003***

*p<0.05, †Fisher exact tes

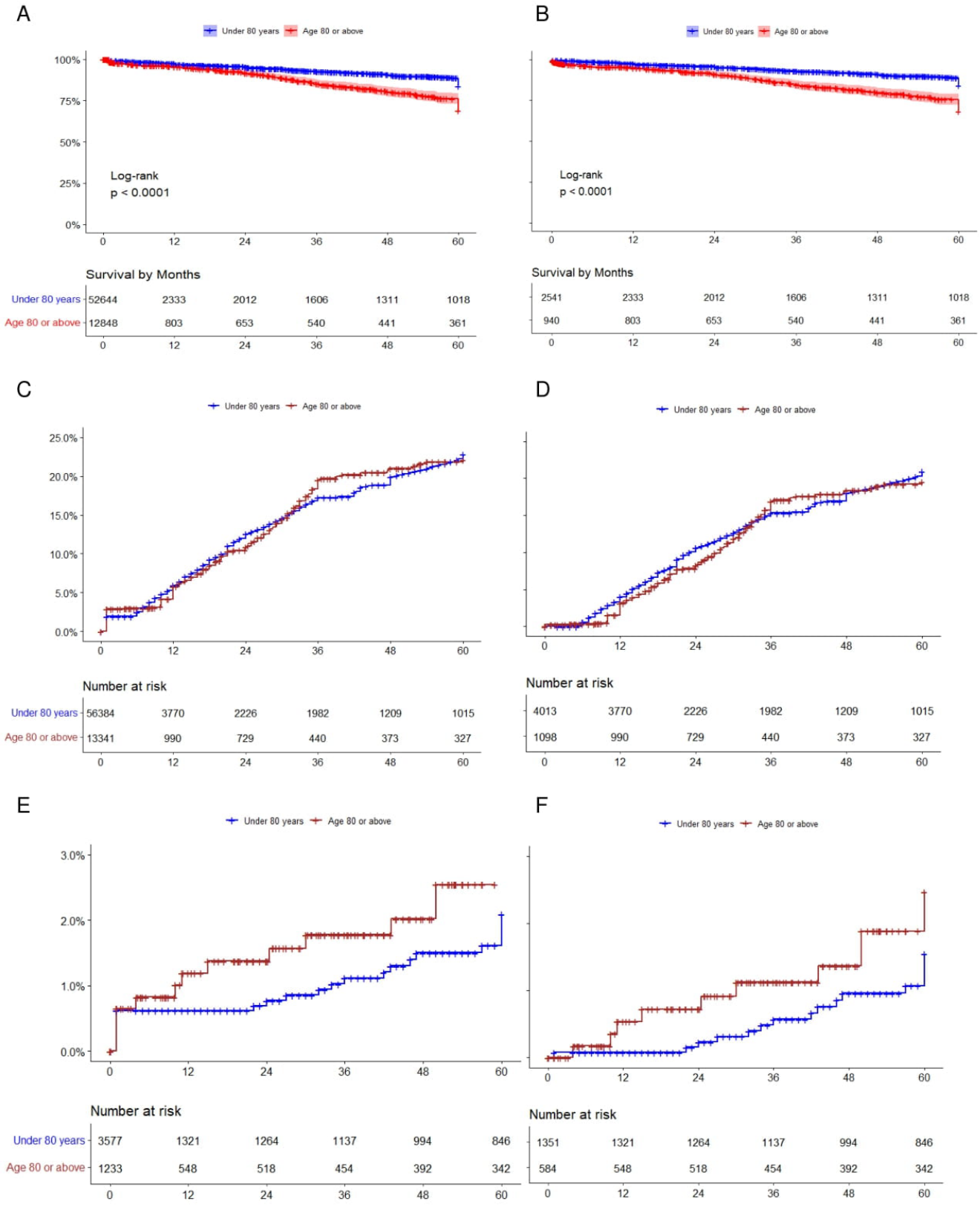


Figure 2. Kaplan Meier curve of survival including (A) and excluding (B) papers reporting perioperative events only, cumulative incidence of stroke including (C) and excluding (D) papers reporting perioperative events only, cumulative incidence of MI including (E) and excluding (F) papers reporting perioperative events only

VO5

The impact of the COronaVIrus Disease 2019 (COVID-19) pandemic on the clinical management of patients with vascular diseases. Findings from Tier 3 of the COVID-19 Vascular sERvice (COVER) Study.

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Introduction

Tier-3 of the COVID-19 Vascular sERvice (COVER) Study aimed to understand the severity and impact of changes on vascular referrals and acute presentations during the first wave of the COVID-19 pandemic in an international cohort.

Methods

Four-week multi-national prospective observational study (March 2020). Clinicians recorded their management plan for each patient and how the pandemic had changed their decision-making. All cases where management plans differed from 'ideal' underwent analysis to quantify the severity of alteration.

Results

1801 patients (52 centres, 19 countries) were included, with 2.3% having a confirmed diagnosis of COVID-19. Deviations in management occurred in 24.7% of patients overall: 34% of unruptured (≥5.5cm) abdominal aortic aneurysms, 24.7% of patients with carotid artery disease, 17% with acute or chronic limb-threatening ischaemia and 12.7% with diabetic foot conditions. 40.7% of deviations were deemed significant, 38.1% were major (non-operative instead of operative management). Life-changing/ending plans (major amputation or palliation when limb or life salvage procedure would otherwise have been performed) were made in 4.9% of cases.

Conclusion

COVER Tier-3 demonstrated that approximately 1:4 management plans were affected during the height of the pandemic, with 1:20 life changing/ending in nature. Many involved deferred treatment, causing significant impact on waiting lists.

Table 1: Alterations to management of the five key conditions (n=1334).

Condition	Total number of presentations	Number of management plans changed	Severity of change to clinical management	
			Score / Class	n (%)
AAA <5.5cm	31	0	N/A	N/A
AAA ≥5.5cm	66	23 (34.8%)	3b	14 (21.2%)
			4	9 (13.6%)
Ruptured / symptomatic AAA	50	4 (8%)	4	4 (8%)
Acute aortic syndrome	47	3 (6.4%)	3b	2 (4.2%)
			4	1 (2.1%)
Acute limb ischaemia	224	38 (17.0%)	1	2 (0.9%)
			2	6 (2.7%)
			3a	13 (5.8%)
			3b	4 (1.8%)
			4	6 (2.7%)
			5	5 (2.2%)
			4 (positive)	2 (0.9%)
Asymptomatic carotid presentations	33	5 (15.2%)	4	5 (15.2%)
Symptomatic carotid presentations	129	35 (27%)	1	1 (0.8%)
			2	3 (2.3%)
			3a	9 (7.0%)
			3b	3 (2.3%)
			4	19 (14.7%)
CLTI	517	88 (17%)	1	8 (1.6%)
			2	11 (2.1%)
			3	9 (1.7%)
			3a	15 (2.9%)
			3b	14 (2.7%)
			4	30 (5.8%)
			5	1 (0.2%)
Diabetic foot infection	237	30 (12.7%)	2	3 (1.3%)
			3a	7 (3.0%)
			3b	2 (0.84%)
			4	12 (5.1%)
			5	5 (2.11%)
			3a (positive)	1 (0.4%)

1: Minor deviation in management, including imaging modality change (so long as recognised form of imaging); changing what oral medication prescribed, changing the IV medication prescribed
2: Minor deviation in management, which can have more significant impact, including changing of medication from PO to IV/IV to SC; change in out-patient movement/flow, including seen in a different clinic; not being discussed in MDT; not having assessment of fitness (CPET/PFTs); not referring to specialist when otherwise would have
3: Deviation from practice, including being managed as an OP when would have been IP; increase in threshold of intervention (for aortic surgery)
3a: Less significant deviation in surgical/interventional practice or threshold – i.e., ward-based amputation vs. theatre-based amputation; slight technical difference in treatment, i.e. different type of surgical bypass, different type of endo intervention
3b: More significant deviation – i.e., endo intervention rather than open for AAA
4: Major deviation from practice, including amputation vs. revascularisation; no revascularisation vs revascularisation; major amputation vs minor amputation
5: Palliation, where otherwise a patient would have been treated

VO6

Specialist chronic limb-threatening ischaemia (CLTI) clinics provide a viable alternative to emergency admission

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Introduction
In line with the PAD QIF, we implemented CLTI clinics at our unit and present our first year results.

Methods
A prospective observational study comparing all CLTI patients assessed in a thrice-weekly CLTI clinic (OP) against CLTI emergency inpatients (IP). Outcomes included MACE/MALE, post-operative complications stratified according to the Clavien-Dindo classification and discharge destination. Patients were propensity-matched based on age, sex, frailty, WIfI score and smoking.

Results
389 patients were included (OP n=184, IP n=205). Groups were well-matched for age, sex and frailty on admission, but inpatients presented with a greater severity of CLTI . After excluding non-revascularised patients (OP = 148 IP = 127), outpatients were half as likely to experience MALE (OR 0.476 p=0.01 95%CI 0.263–0.864), four times less likely to be amputated (OR 0.253 p=0.01 95%CI 0.081–0.794), over four times more likely to be discharged home (OR 4.545, p=0.001 95%CI 1.870–11.051) with fewer post-operative complications (p=0.038) and a much shorter length of stay (1 day vs 17 days p<0.001) at the point of hospital discharge, with no difference in revascularisation strategy (p=0.317).

Conclusion
A well-resourced CLTI clinic can provide favourable limb-salvage outcomes and is a viable alternative to acute admission.

VO7

The effect of health literacy and socio-economic deprivation on outcomes after lower limb revascularisation surgery for Chronic Limb Threatening Ischaemia

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Introduction:
Health Literacy is the ability to obtain, process and understand health-information needed to make health-related decisions. Research has suggested a relationship between health literacy, socio-economic status and health outcomes. This study aims to assess how health literacy and socio-economic status interact for patients undergoing bypass surgery for Chronic Limb Threatening Ischaemia(CLTI).

Methods:
Surgical bypass graft patients were consented for participation in a cross-sectional observational study(REC:21/NI/0092). The HLS19-Q12 questionnaire categorised participant's health literacy as inadequate, problematic, sufficient, or excellent. Socio-economic status was assess using the Index of Multiple Deprivation(IMD). Primary outcomes were major adverse cardiovascular and limb events.

Results:
Fifty patients(mean age±SD: 70±8.7 years) were included. Participant's health literacy was inadequate(28%), problematic(38%), sufficient(24%) and excellent(10%). 40% lived in areas of highest deprivation. All health literacy groups were comparable for post-operative outcomes, but poorer health literacy was associated with a lower socio-economic status(0.308 (P=0.029)) which was also a significant predictor for amputation(P=0.017).

Conclusion:
This study suggests that a lower health literacy is associated with greater social deprivation which in turn maybe a predictor for amputation following bypass surgery. Health literacy is modifiable through education and may improve potential health inequalities created by social deprivation, addressing a vascular James-Lind Alliance priority.

VO8

Outcomes at 1 year in patients undergoing intervention from a vascular “hot” clinic.

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Introduction

Patients with stable chronic limb threatening ischaemia (CLTI) can be assessed in a vascular “hot” clinic with access to timely investigation and treatment. Early intervention may increase the chance of successful revascularisation and prevent limb loss. We assessed the outcomes of patients attending our hot clinic with time to revascularisation and outcomes at one year.

Methods

All new patients attending the hot clinic from 1/1/21 to 30/6/21 were identified and, using the electronic patient record, results of those who underwent intervention were analysed.

Results

239 new patients with CLTI were seen (23% Rutherford stage 4, 63% stage 5, 6% stage 6) and 154 (64%) underwent intervention. Patients were assessed at a median of 6 days from referral, and had intervention at a median 13 days following this, in keeping with national guidelines. 41% had open surgery, 29% endovascular intervention and 31% a hybrid procedure.
At 1 year, 32 (21%) of the cohort had died. Of those alive, 95 patients (78%) had a revascularised leg and 27 (22%) had undergone major limb amputation.

Conclusion

Early revascularisation of patients seen in a hot clinic is possible and outcomes at one year show encouraging rates of limb salvage.

VO9

Exploring vascular surgeons views of palliative care for patients who have chronic limb threatening ischaemia: a Vascular Society Peripheral Arterial Diseases specialist interest group survey

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Introduction
There have been national reports showing poor provision of palliative care in the UK. The provision of palliative care for patients with Chronic Limb Threatening Ischaemia (CLTI) is currently unknown.
The aim of this survey is to understand surgeons views of palliative care for patients with CLTI, and the provision of specialist palliative care for these patients in the UK.

Methods
Questionnaire of UK vascular consultants

Results
65 responses were received. 95% would not be surprised if a patient with CLTI were to die within the next year. 82% discussed this risk when no further surgical options were available and 20% did so during initial encounter with the patient.
Specialist palliative care teams were only involved 5% of the time in decisions around intervention, and 33% of the time in decisions around amputation.
79% of respondents supported further research to more easily identify vascular patients as they enter their last year of life.

Conclusion
Palliative care is underutilised for patients with CLTI. Surgeons recognise that these patients may be in their last year of life, but do not use this as a trigger for specialist palliative care referral. Research needs performing to aid identification of this group of patients.

VO10

Short-term outcomes of directional atherectomy in treating peripheral arterial disease

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Introduction: Directional atherectomy has become a safe endovascular option in treating patients with peripheral arterial disease. This study reports a UK single centre short term outcomes of using directional atherectomy.

Methods: A retrospective analysis of directional atherectomy procedures in the Freeman hospital, Newcastle. Mean lesion length, technical success, 12 month -primary and secondary patency, limb salvage, adverse events, and mortality rates were analysed.

Results: 26 patients (median age 69 years [35-88]) underwent directional atherectomy between 2019 and 2021 for debilitating short distance claudication (n=8) or chronic limb threatening ischaemia (n=18). Patients were either unfit or had hostile groins for conventional revascularisation. HawkOne™ Directional Atherectomy System (Medtronic, USA) treated 19 Femoral-Popliteal, 3 External Iliac, and 4 External Iliac and Common Femoral segments with a mean lesion length of 101mm (±10.46).
96% technical success with 12-month primary patency of 85%. Four patients (15%) required re-intervention resulting in secondary patency of 96%. Three adverse events with 2 distal embolisation and one intimal dissection. 96% limb salvage rate and 4% mortality from intra-operative bleeding.

Conclusion: Directional atherectomy showed promising short-term outcomes in selective cases. Multi-centre randomised controlled trials are required for better understanding the long-term outcomes of directional atherectomy in managing peripheral arterial disease.

VO11

PERCEIVE: PrEdiction of Risk and Communication of outcome following major lower limb amputation – a collaborative study. Results of 1-year outcomes.

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Introduction
Shared decision making relies on accurate estimation of outcomes. The aim of the present study was to evaluate healthcare professionals' (HCPs) accuracy in predicting outcomes 1-year after major lower limb amputation (MLLA).

Methods
A Health and Care Research Wales funded multicentre prospective observational cohort study was conducted with the Vascular and Endovascular Research Network, enrolling patients undergoing MLLA from 01/10/2020-01/05/2021. Healthcare professionals' pre-operative predictions of 1-year mortality, revision surgery, and ambulation status were evaluated.

Results
41 centres (25 UK, 16 international) enrolled 553 patients. >2,500 pre-operative outcomes predictions were recorded. 1-year following a BKA, 48/243 (19.8%) patients died, 30/243 (12.3%) required revision surgery and 108/242 (44.6%) were bed/chair bound. 1-year following an AKA 88/238 (37.0%) patients died, 21/238 (8.8%) required revision, and 141/238 (59.2%) were bed/chair bound. Healthcare professionals predicting mortality with acceptable discrimination (C-statistic=0.714); the most accurate group were anaesthetic consultants who used a risk prediction tool (C-statistic=0.793). Healthcare professionals were less accurate in prediction 1-year surgical revision risk (C-statistic=0.628) and ambulation (C-statistic=0.659).

Conclusions
Healthcare professionals are reasonably accurate at predicting mortality at 1-year following MLLA but are less accurate when predicting revision risk and ambulation. Further analyses will compare risk prediction tools to healthcare professional accuracy.

VO12

Ten-year experience of paediatric acute limb ischaemia within an intensive care setting – insights into a tertiary vascular unit within the United Kingdom

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Introduction
Paediatric acute limb ischaemia (ALI) is commonly caused by iatrogenic vessel injury in the intensive care environment. There is little evidence on best management of paediatric ALI in this context, nor patient or limb outcomes. This study explores the management and outcomes of paediatric ALI in a tertiary vascular unit.

Methods
Cross-sectional analysis of all Paediatric ICU acute limb ischaemia cases between 2012 and 2022. The local Paediatric Intensive Care Audit Network (PICANet) database was used to ascertain the patient cohort.

Results
14 cases (8M:6F, median 2.8 years [IQR 0.9 – 5.0]) of ALI were identified; all were secondary to arterial catheters, although the location of these varied. In most instances an intravenous heparin infusion was administered, with additional treatment methods including active warming of the limb, milrinone and GTN patches. 8 patients improved with medical management alone, while 2 required surgical intervention.

5 of the 14 cases died from their underlying illness; all survivors had successful limb salvage with no long-term sequelae.

Conclusion
Medical management of ALI typically achieves good limb outcomes in a paediatric population who are often very sick. Additional case identification and research using PICU registries will aid with consolidating further guidance within the UK.

VO13

Efficacy and safety of different anti-thrombotic options following open surgical revascularisation for peripheral arterial disease: a systematic review and network meta-analysis

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Background
Current guidelines are inconsistent in recommendations for anti-thrombotic therapy following revascularisation for peripheral arterial disease. We aimed to review evidence for different anti-thrombotic regimens following surgical revascularisation, with Major Adverse Cardiovascular and Limb events (MACE/MALE) as efficacy outcomes and Major Haemorrhage as primary safety outcome.

Methods
MEDLINE, EMBASE and Cochrane CENTRAL were searched from inception until June 2022 for Randomized Trials comparing antithrombotic regimens following surgical revascularisation for peripheral arterial disease (PAD). Risk of Bias was assessed, and Bayesian Network Meta-analysis performed to compare antithrombotic regimens.

Results
4754 articles were screened, with 18 studies, including 9,453 patients, meeting inclusion criteria. Most trials were small, with significant Risk of Bias. Vitamin-K Antagonists (VKA) resulted in fewer MACE compared to Aspirin (Relative Risk(RR):0.716, 95%CI 0.524-0.976) or Dual-Antiplatelet Therapy (DAPT – RR:0.538, 0.330-0.877), at a cost of higher major haemorrhage rates than Aspirin (RR:1.93, 1.41-2.65). There was no significant difference in risk of MACE or MALE with Aspirin+Rivaroxaban when compared to Aspirin alone (RR:0.829, 0.583-1.18); DAPT (RR:0.623, 0.374-1.04); or VKA (RR:1.16, 0.724-1.85).

Conclusion
This systematic review and network meta-analysis highlights the difficulties when choosing optimal anti-thrombotic regimens following surgical revascularisation for PAD, and the need for further large studies in this area.

VO14

Factors affecting adherence to guideline recommended treatment in patients with peripheral arterial disease

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Introduction:
Adherence to peripheral arterial disease (PAD) treatment is suboptimal and there is limited data investigating factors affecting adherence. This exploratory study aimed to identify the current adherence levels of PAD patients and how these are related to sociodemographic, clinical factors and illness perceptions.

Methods:
This questionnaire-based study included PAD patients attending their vascular outpatient appointment at a big London Hospital between January and June 2022. Outcome measures were the self-reported Morinsky Medication Adherence Scale (MMAS-8) and the Brief Illness Perceptions Questionnaire (BIPQ).

Results:
105 patients participated in the study. Univariate analysis identified five factors affecting antiplatelet and statin medication adherence respectively: age (p=0.009; p=0.019); previous vascular intervention (p=0.019; p=0.018); smoking history (p=0.021; p=0.019); social support by family or friends (p=0.025; p=0.027); and the B-IPQ treatment control (p=0.007; p=0.006). Older patients had higher medication adherence (p<0.001). Surprisingly, patients who perceived their disease to be more threatening (higher BIPQ) and those who had lower treatment control had lower adherence (p=0.02).

Conclusion:
Perceiving PAD as a threatening disease and negative beliefs about the effectiveness of treatment are associated with low medication adherence. Exploring patients' illness and treatment perception is essential to tackle the issue of non-adherence.

Figure 1. Illness perceptions of PAD patients

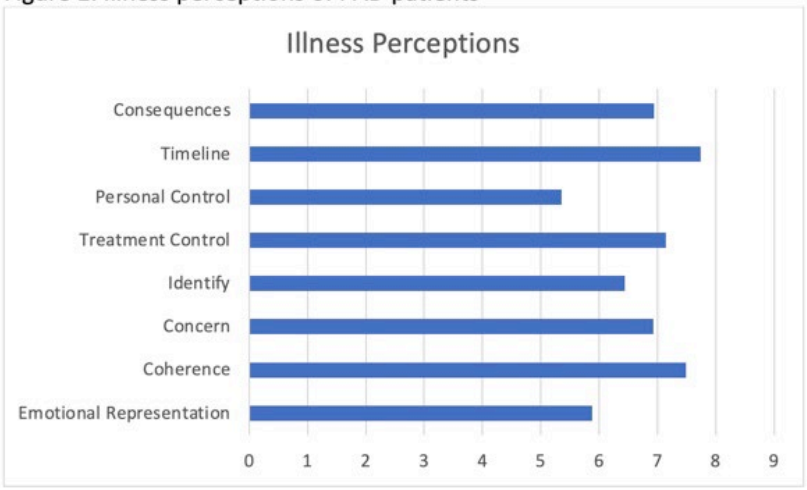

Table 1. Sample characteristics

Sample characteristics (N=105)	
Variables	**n (%)**
Gender (men)	77 (73.3)
Age (mean ± SD)	69.52 ± 9.16
Ethnicity	
White	n= 79 (75.2)
Black	n=13 (12.4)
Asian	n=10 (9.5)
Other	n=3 (2.9)
Employment status	
Retired	n=69 (65.7)
Employed	n=23 (21.9)
Sick	n=13 (12.4)
Index Multiple Deprivation status	
Quintile 1	n=29 (27.6)
Quintile 2	n=21 (20.0)
Quintile 3	n=32 (30.5)
Quintile 4	n=18 (17.1)
Quintile 5	n=5 (4.8)
Partner support	
Yes	n=55 (52.4)
No	n=50 (47.6)
Smoking status	
Current smoker	n= 26 (24.8)
Ex-smoker	n=70 (66.7)
Never smoker	n= 9 (8.5)
Maximum walking distance (median, IQR)	100, 50.00-200.00
Supervised Exercise	
Referred	21(20)
Attended	19
Completed	15
Years of diagnosis (median, IQR)	4.0, 1.0-8.0
Previous vascular surgical intervention	
Bypass	n=22 (50)
Angioplasty	n=14 (31.8)
Angioplasty and endovascular treatment	n=5 (11.4)
Other	n=3 (6.8)
Comorbidities	
IHD	n=34 (32.4)
HTN	n=71 (67.6)
T2DM	n=31 (29.5)
COPD	n= 6 (8.6)
Hypercholesterolaemia	n=45 (42.9)
Cerebrovascular disease	n=10 (9.5)
Depression	n=14 (13.3)
Total BIQP (mean ± SD)	43.16 ± 14.03

VO15

Does using GENTA-COLL® resorb minimise the risk of Groin surgical site infection in vascular surgery?

Abdel Rahim A[1], Tam A[1], Hassan H[1], Mittapalli D[1]
[1]*University Hospitals Plymouth Nhs Trust*

Background:
Groin dissection is the most common vascular exposure in vascular surgery with high risk of groin wound infection (GWI). Infection results in significant morbidity including limb loss. Novel haemostatic and antimicrobial agents such as GENTA-COLL® resorb are used to try and reduce infections.The recent GIVE audit did not investigate the use of these agents and thus the aim of this study was to determine their effect on GWI.

Methods:
A retrospective review of patients between June 2020 and February 2022 was undertaken. Patients undergoing groin dissections were included.Patient demographics, co-morbidities, Rookwood clinical frailty score, operative details and complications were recorded. The primary outcomes were GWI, morbidity and mortality.

Results:
210 patients were identified, and 90.0% were in elective settings.The mean age of the study group was 70.8 ± 10.9 years. 36.2% were diabetics and 28.1% had ischaemic heart disease. The average Rookwood clinical frailty score was 4.2 ± 1.4. Haemostatic usage: 93 GENTA-COLL® (44.3%), 117 Fibrillar (55.7%) , 87 both (41.4%) and 87 none (41.4%). The perioperative GWI was 12.9%. 16 GWI had GENTA-COLL®used (17.2%).This showed no statistically significant reduction in GWI was found.

Conclusion:
Our study showed that using the GENTA-COLL® does not significantly reduce the risk of GWI in vascular surgery.

VO16

Parallel group study of antibiotic impregnated bone graft substitute for diabetic foot osteomyelitis versus long-term antibiotics

Venkateswaran V[1,2], Braimah F[1], Majeed M[1], Jageer P[3], Dindyal S[1,2], Tiruveedula M[1,2], Graham A[1], Mulcahy M[1], Thapar A[1,2]
[1]Mid And South Essex NHS Trust, [2]Anglia Ruskin University , [3]University College London

Introduction
Diabetic foot osteomyelitis is associated with prolonged intravenous antibiotic therapy and a high risk of amputation. Cerament is a Gentamicin or Vancomycin eluting injectable bone graft substitute which delivers highly concentrated antibiotics to bone for one month. The aim of this study was to establish the risk of clinical osteomyelitis recurrence with 2 different strategies:

1. Injection of Cerament into the marrow cavity
2. Long-term antibiotics

Methods
Non-randomised, single centre, retrospective parallel group study of patients with foot osteomyelitis (positive bone biopsy) treated between 01/03/2020 to 01/06/2022. Group 1 (n=19) were managed with Cerament and short term oral antibiotics to treat soft tissue infection. Group 2 (n=27) were managed with long-term antibiotics.

Results
The recurrence rate of clinical osteomyelitis at 3 months was 10% in the Cerament group and 19% in the control group (p=0.45, OR 0.46 (95% CI 0.09-2.71). 17% of Cerament group wounds remained unhealed compared to 26% in the control group. 16% of Cerament patients had a major amputation compared to 19% in the Control group. Only 1 patient in the Cerament group required a PICC line.

Conclusion
Cerament implantation showed a trend towards reduced recurrent osteomyelitis and avoids the need for PICC lines.

VO17

Does the novel CQUIN 2022-23 vascular indicator effectively incentivise improvements in the revascularisation pathway for critical limb-threatening ischaemia (CLTI)?

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[1]*Department of Vascular Surgery, Cambridge University Hospitals NHS Foundation Trust*

Introduction

The Commissioning for Quality and Innovation (CQUIN) 2022-23 guidance includes an indicator to financially incentivise revascularisation within 5 days of non-elective admission with critical limb-threatening ischaemia (CLTI), steered by Vascular Society advice . These authors sought to determine the impact of this financial incentivisation on revascularisation pathways.

Methods

Non-elective admissions to a regional vascular centre for CLTI, with revascularisation as outcome, were audited. Diagnostic/treatment pathway timescales were compared between two 3-month cohorts (peri-CQUIN) by descriptive statistics and parametric analyses.

Results

For pre-CQUIN vs. post-CQUIN cohorts, 17/223 vs. 17/219 total admissions met inclusion criteria, respectively. Mean admission-to-revascularisation times were 6.8±3.7 vs. 4.6±2.1 days (p=0.0487), respectively. Mean referral-to-admission times were similar between cohorts (1.7±3.2 vs. 2.1±6.6 days). Following CQUIN introduction, a greater proportion of patients received revascularisation procedures within 5 days of admission (41.2% vs. 58.8%), and a greater proportion of patients received imaging within 2 days of admission (58.8% vs. 70.6%). Retrospectively, reasons for delays were often unapparent, but included operative list pressures and operative unsuitability e.g., active COVID-19 infection.

Conclusion

Implementation of CQUIN indicators appears to have raised the profile of CLTI treatment paradigms across the Trust, ameliorating revascularisation delays among CLTI patients.

VO18

High INtensity Interval Training In pATiEnts with intermittent claudication (INITIATE): a multicentre, proof-of-concept, prospective interventional study

Pymer S[1], Harwood A[2], Ibeggazene S[3], McGregor G[2], Huang C[4], Twiddy M[4], Nicholls A[5], Ingle L[5], Carroll S[5], Long J[1], Rooms M[6], Chetter I[1]

[1]Academic Vascular Surgical Unit, Hull York Medical School, [2]Centre for Sport, Exercise and Life Sciences, Faculty of Health and Life Sciences., [3]College of Health, Wellbeing and Life Sciences, Sheffield Hallam University., [4]institute of Clinical and Applied Health Research, Hull York Medical School, University of Hull., [5]Faculty of Health Sciences, University of Hull., [6]Independent PPI member

Introduction: Provision, uptake, adherence, and completion rates for supervised exercise programmes (SEP) for intermittent claudication (IC) are low. For patients, SEPs are too time intensive. High-intensity interval training (HIIT) may be a time-efficient, effective alternative.

Methods: This was an NIHR funded, multicentre, proof-of-concept study. HIIT was performed three times per week for six-weeks and involved a 1:1 work to rest ratio. Outcomes were feasibility, tolerability, safety and potential efficacy.

Results: 279 patients were screened, 59% were eligible and 25% were recruited for HIIT. 78% of patients completed HIIT, though 3 patients (7.5%) were unable to tolerate it. Patients attended 99% of training sessions, with 84% of sessions completed in full, largely at the required intensity. There were no related serious adverse events.
The mean improvements in MWD and physical functioning were 94m (95%CI=66.6-120.8m), and 4.4% (95%CI=-1.1–9.9%) respectively.

Conclusion: Uptake to HIIT was comparable to SEPs, but completion rates were higher. Most sessions were completed in full with no related serious adverse events. There was an improvement in MWD.
HIIT appears feasible, safe, tolerable and potentially beneficial for patients with IC. It may provide a more deliverable, more acceptable, SEP. A non-inferiority trial of HIIT vs. SEPs appears warranted.

VO19

The Diabetic Foot Roadshow – The Impact of Community Teaching Sessions on Onward Referral to Specialist Diabetic Foot Services

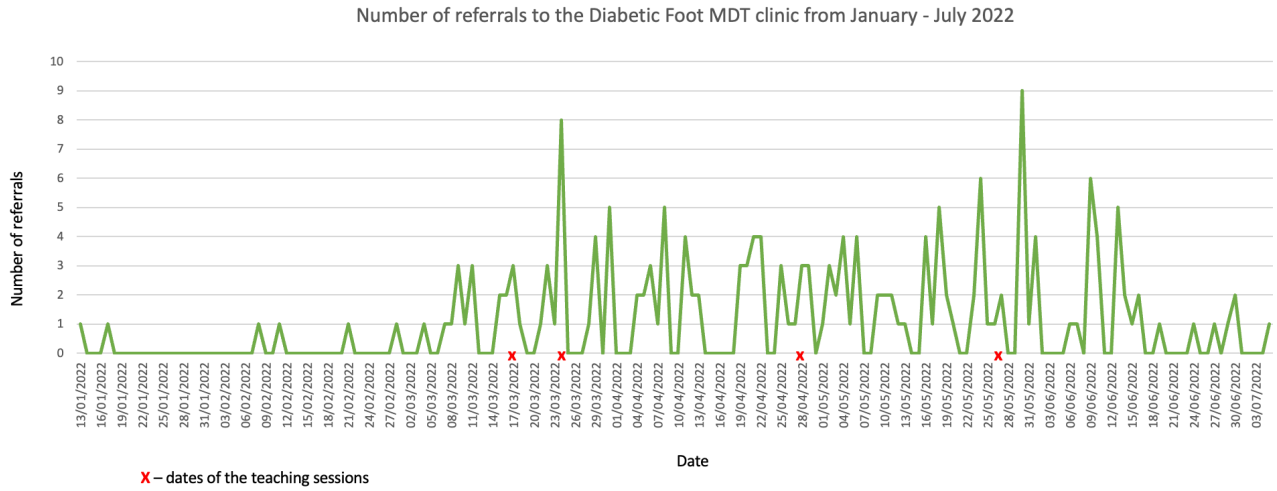
Al-Saadi N[1], Beard N[1], Al-Hashimi K[1], Suttenwood H[1], Jones S[1], Merriman C[1]
[1]*Royal Shrewsbury Hospital, Shrewsbury & Telford Hospital NHS Trust*

Introduction: As per NICE guidance patients with active diabetic foot ulceration (DFU) should be referred to specialist services within 1 working day. This permits timely assessment of these patients and improves patient outcomes. We wanted to determine the impact of education in the primary care setting on onward referrals to our specialist Diabetic Foot Clinic (DFC).

Methods: As part of a Diabetic Foot Roadshow, 4 teaching sessions were delivered in primary care settings across Shropshire by our specialist team from 17th March to the 25th May 2022. Attendees included podiatrists, district nurses and wound care practitioners. Hospital records were used to identify all referrals to our DFC from January to July 2022, and the number of referrals received both before and after the start of the roadshow were compared.

Results: 184 referrals were made to the DFC from January to July 2022. There were 0.3 referrals per day in the 10 weeks prior to the roadshow versus 1.5 referrals per day in the 14 weeks after. This increase in number of referrals was statistically significant ($p<0.0001$).

Conclusion: Teaching sessions delivered to community specialist healthcare professionals significantly increase onward referral of patients to specialist services, facilitating more timely assessment and management of patients with DFUs.



VO20

Target outflow vessel compromise after failed endovascular interventions for infra-inguinal arterial disease
(Fate of failed angioplasty in infra-inguinal disease)

Elkassaby M[1,2], Madhavan P[1]
[1]St James's Hospital, [2]Mansoura University Hospital

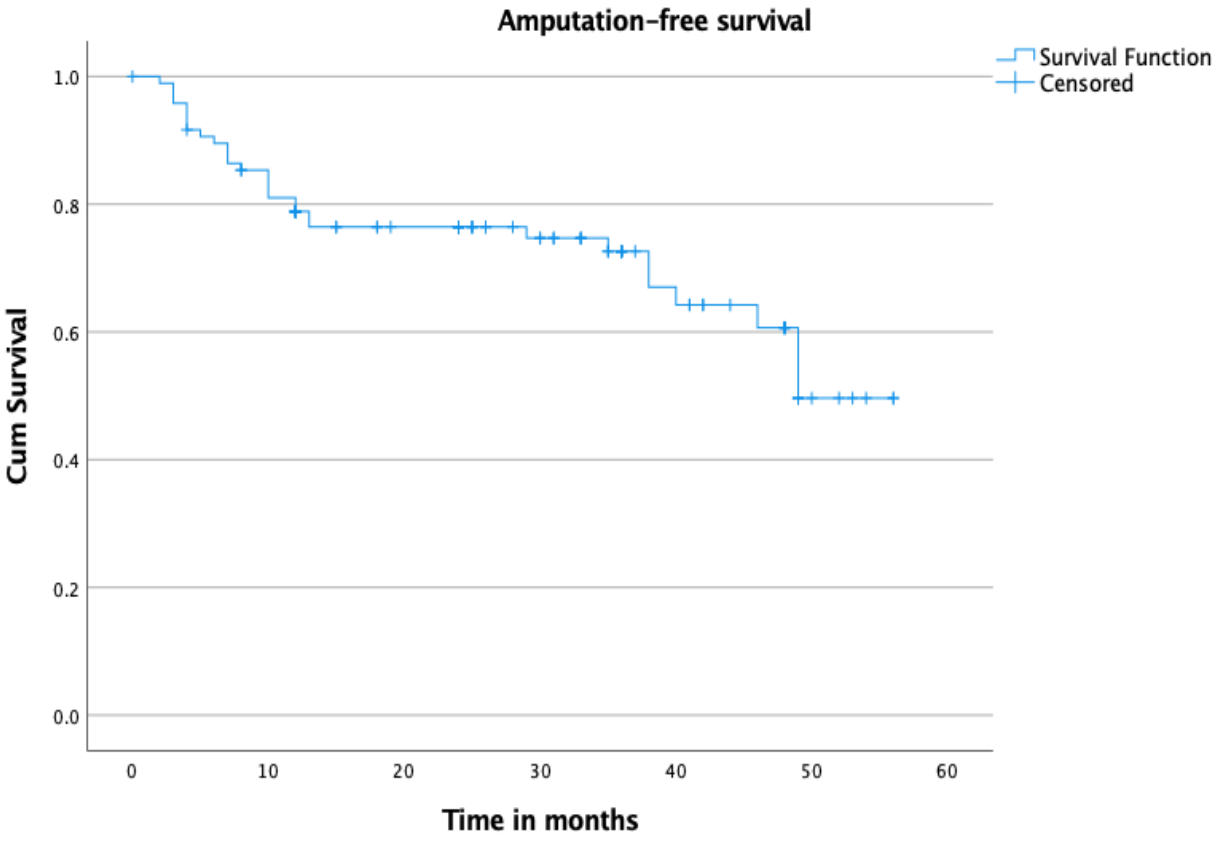
Background:
Although peripheral arterial disease (PAD) and chronic lower limb ischaemia (CLI) represent a huge burden globally, the evidence for the best treatment strategy remains controversial. Some centres have adopted an "Endovascular-first strategy", for all cases, independent of complexity. Many vascular surgeons however are sceptical of this strategy and worry about the possibility of damage to outflow target vessels after failed endovascular attempts. The objective of this study was to look at the target outflow vessels after failed endovascular interventions to examine for any compromise to future surgical bypass options.

Methods:
This was a retrospective single-centre study which looked at consecutive infra-inguinal endovascular interventions between January 2017 and January 2022 and included procedures that were carried out for patients with intermittent claudication, rest pain and tissue loss. Failed angioplasties were identified and target outflow vessels damage was assessed using pre, intra and post op images from CTAs, duplex scans as well as on table angiograms.

Results:
724 infra-inguinal angioplasties were carried out in our centre in the study period. Mean follow up was 26 months (range 0-56 months). Primary success rate was 86.6%. The total number of failed procedures was 97 cases (13.4%). The target for angioplasty was the superficial femoral artery (SFA) in 68%, the popliteal artery in 10.3%, and the tibial arteries in 21.7% of the cases. The indication for surgery in the procedures that failed was IC in 32%, rest pain in 24.7%, and tissue loss in 43.3%. The amputation-free survival was 78.5% at 1 year, 75.8% at 2 years and the 3-years estimate was 66.9%. There was no damage to target outflow vessels after failed angioplasty in 75 cases (77.3%). There was damage to 1 segment in 16 cases (16.5%), 2 segments in 5 cases (5.2%), 3 segments in one case (1.0%), and there were no cases that suffered from 4 segments damage or complete compromise to all outflow target vessels.

Conclusion:
An endovascular-first strategy for treatment of PAD is reasonable given the low complication rate with failure. The concern about compromised targets for future bypasses after failed endovascular interventions is not justified.

Technical details		Frequency (N=97)	%
Site of intended angioplasty	SFA	66	68
	Popliteal	10	10.3
	Tibial	21	21.7
Angioplasty plane	Intraluminal	10	10.3
	Subintimal	87	89.7
Auxiliary techniques	Stent	1	1
	DCBs	0	0
	Atherectomy	1	1
	Retrograde access	2	2.1



VO21

Systematic review and network meta-analysis comparing antithrombotic use after endovascular intervention for peripheral arterial disease

Murigu A[1], Davies L[1], Hinchliffe R[2,3], Twine C[3], Ambler G[3,4]
[1]University of Bristol Medical School, [2]Bristol Surgical Trials Centre, University of Bristol, [3]Department of Vascular Surgery, North Bristol NHS Trust, [4]Centre for Surgical Research, University of Bristol

Introduction
Antithrombotic therapy is used to reduce post-procedural thrombosis following peripheral endovascular intervention, at the cost of an increased risk of bleeding. We aimed to examine trials comparing antithrombotic regimens, with Major Adverse Limb Events (MALE) as the primary efficacy outcome and Major Bleeding as the primary safety outcome.

Methods
MEDLINE, EMBASE and Cochrane Databases were searched from inception until June 2022 for Randomized Trials comparing antithrombotic regimens following peripheral endovascular intervention. Risk of Bias was assessed, and Bayesian network meta-analysis (NMA) was performed to allow comparison between antithrombotic regimens which may not have been directly compared.

Results
The search identified 4754 studies. 17 studies, comparing 13 different antithrombotic regimens and involving 7,033 patients, met inclusion criteria. Most studies had a high Risk of Bias. NMA found that adding Cilostazol or Rivaroxaban to Aspirin reduced the risk of MALE compared to Aspirin alone (RR 0.404, 95% CI 0.258-0.609 and 0.876, 95% CI 0.786-0.976 respectively), at the cost of increased risk of Major Bleeding.

Conclusion
There is a paucity of high-quality evidence to guide antithrombotic therapy after peripheral endovascular intervention. The increased risk of bleeding associated with escalation of antithrombotic therapy must be carefully weighed against reductions in adverse limb events.

VO22

Development of a bespoke mHealth application for Peripheral Arterial Disease

Sivagangan P[2], Harwood A[3], Stather P[2], Vascular Society Peripheral Arterial Disease Special Interest Group V[4]

[1]Norfolk and Norwich University Hospitals , [2]Norwich Medical School, University of East Anglia , [3]Coventry University , [4]Vascular Society Peripheral Arterial Disease Special Interest Group

Introduction:
The recent upsurge of mobile health applications has opened new potential for delivering exercise therapy for patients with peripheral arterial disease (PAD). We undertook both patient and public and healthcare professional (HCP) surveys to guide developmental features to improve app design.

Methods:
The survey was distributed through twitter, the Circulation Foundation, and at local outpatient appointments.

Results:
62 patient responses were obtained. 76% of patients were highly interested in measuring their walking distances with 79% wanting HCPs to be able to view walks. 74% were very interested to watch example exercise classes. 74% were extremely keen on a communication and picture platform with their clinician. Only 37% were interested in interacting with other patients on the app and group challenges were not highly desired (39% not at all interested).
44 staff responses were recorded with 95.5% agreeing they would be interested in monitoring their patients. 72.7% strongly agreed on the ability to show example exercise classes, however only 40.9% strongly agreed on a communication platform.

Conclusion:
The surveys showed that a bespoke mHealth app for PAD linking to their HCP is wanted, with exercise videos and a communication tool preferred components. This will guide development of the Walk-A-Cise App.

VO23

Current evidence does not support the concept of smoking impacting durability of peripheral angioplasty and stenting: A meta-analysis

Talbot A[1], Batchelder A[1], Sidloff D[1]
[1]*Queen's Medical Centre, Nottingham*

Introduction
Smoking is a risk factor in the development of peripheral arterial disease (PAD) and its impact on durability of arterial bypasses has been demonstrated. The impact of continued smoking on peripheral angioplasty is less clear. We sought to estimate this effect by performing a systematic review and meta-analysis.

Methods
A literature search was performed of studies including patients whom had undergone peripheral angioplasty or stenting. Demographic and outcome data was recorded including primary patency, re-intervention and adverse limb events. Meta-analysis was performed using med-calc.

Results
30 eligible studies were included totalling 8310 patients. Smoking had no significant effect on overall primary patency (OR 0.73-1.88;P=0.48). Smoking reduced primary patency in the fem-pop region (OR 1.02-3.96;P=0.04) but not in the aorto-iliac. 4 studies showed that smoking was associated with re-intervention (HR 1.34 and 2.7) and adverse limb events (HR 1.40 and 2.037). There was no increased loss of primary patency based on the length of follow-up.

Conclusion
Smoking has not been shown to have a detrimental impact on the durability of endovascular intervention in patients with PAD. Smoking may contribute to re-intervention and adverse limb events. More distal arterial segments may be more at risk of failed primary patency in smokers.

VO24

Perception and acceptability of Open vs Endovascular treatment of Common Femoral Artery disease: Barriers and facilitators for Randomised Controlled Trials

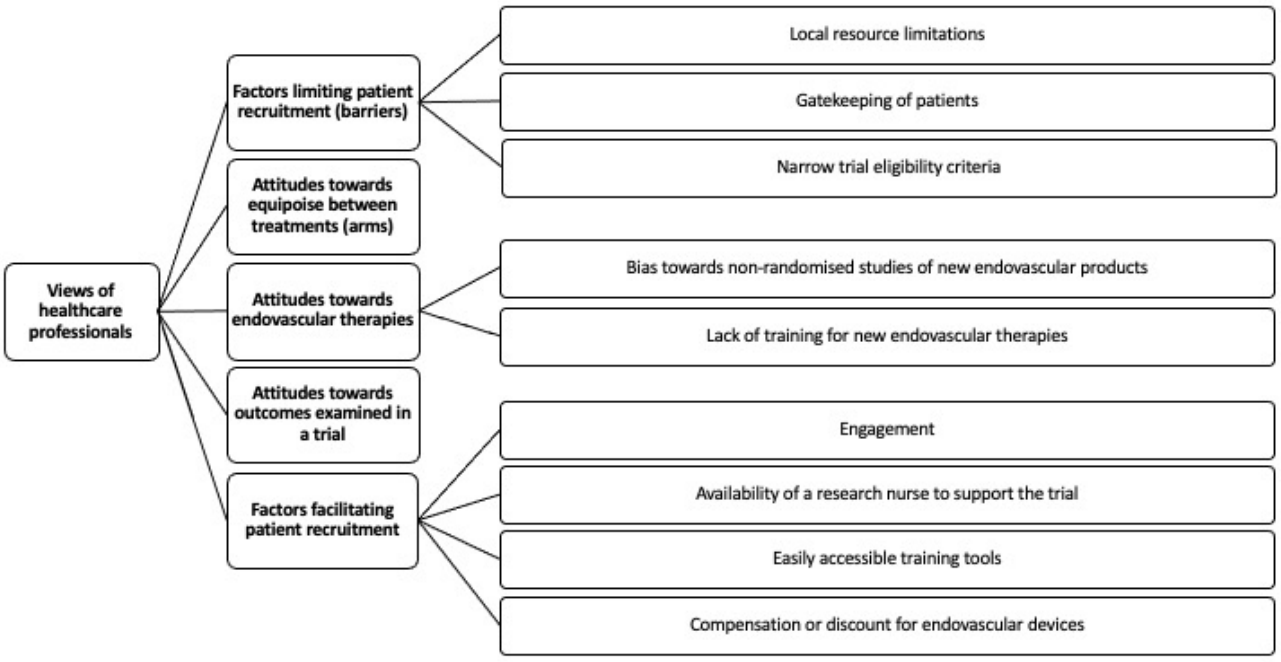
Kaneta G[1], Saratzis A[2], Zayed H[1]
[1]*Guy's And St Thomas' NHS Foundation Trust,* [2]*Department of Cardiovascular Sciences, University of Leicester*

Introduction: Even with recent advances in endovascular therapies, CFA Endarterectomy (CFAE) remains the standard of care for CFA disease requiring revascularisation. RCTs comparing treatments, though, have suffered from multiple pitfalls. This research assessed barriers and enablers of delivering high-quality RCTs in this context, from a healthcare professionals' point-of-view.

Methods: A mixed-methods qualitative study was performed, including a structured online survey and a face-to-face semi-structured interviews with healthcare professionals. Survey content and interview topic guides were developed following a literature review to identify ongoing and completed RCTs comparing CFA treatments. Results were analysed using thematic analysis.

Results: A total of 121 participants completed the online survey, including vascular surgeons (75, 62%) and interventional radiologists (22, 18%). 61 participants (51%) would be willing to take part in a RCT comparing open vs. endovascular and 89 (74%) believed that such an RCT is urgently needed. 15 participants were interviewed face-to-face and five main themes emerged regarding barriers and facilitators (figure 1).

Conclusion: The majority believed an RCT comparing CFA treatments is necessary and would not oppose taking part in it. We have also identified important barriers and enablers, which should be taken into serious consideration when designing and delivering such an RCT.



VO25

Extracorporeal Shockwave Therapy compared to Standard Care for Diabetic Foot Ulcer Healing: An Updated Systematic Review

Hitchman L[1], Mesri M[1], Totty J[1], Smith G[1], Carradice D[1], Twiddy M[2], Iglesias C[3], Russell D[4], Chetter I[1]
[1]Hull York Medical School, [2]Institute of Clinical and Applied Health Research, Hull York Medical School, [3]Department of Health Sciences, University of York, [4]Leeds University Teaching Hospitals, [5]University of Leeds

Background
Emerging evidence suggests extracorporeal shockwave therapy (ESWT) may improve time to DFU healing. The aim of this review was to appraise the evidence on role of ESWT in DFU healing and impact of different ESWT doses.

Methods
Databases were searched for trials comparing ESWT plus standard care to standard care alone in participants with DFUs. Search results were reviewed by two independent reviewers. The Cochrane Risk of Bias 2 tool and GRADE approach was used to assess bias and certainty. The primary outcome was time to healing.

Results
The search identified 345 papers after duplicates removed. Six trials consisting of 471 participants were included. There was unclear or high risk of bias across all domains. Time to ulcer healing was probably shorter in patients treated with ESWT compared to standard ulcer care alone (GRADE: low certainty). Patients treated with ESWT were more likely to heal at 20 weeks post ESWT compared to those treated with standard ulcer care alone (GRADE: low certainty). There was significant heterogeneity.

Conclusion
ESWT remains a promising new treatment but the translation into routine clinical practice is still limited by the low certainty of evidence surrounding its effectiveness, case selection and optimum dose.

VO26

Survival and Limb Salvage of patients with Diabetic Foot Ulcer Associated Calcaneal Osteomyelitis

Jones A[1,2], Boyer M[1], Russell D[1,2]
[1]Leeds Teaching Hospitals NHS Trust, [2]Leeds Institute of Clinical Trials Research, University of Leeds

Introduction
Diabetic foot ulcer (DFU) associated calcaneal osteomyelitis (OM) is a challenging condition to manage. Long term outcomes are not well described.

Methods
A retrospective review of patients with DFU and calcaneal OM between 01/01/2017 and 31/07/2020 in a single centre. Outcomes of interest were survival, major amputation rate, wound healing and mobility status. Kaplan-Meier survival analysis was performed for time-to-event data.

Results
30 patients were included, median follow-up of 24.4 months. Seven patients underwent partial calcanectomy, with Integra and split skin graft used in two, seven underwent surgical debridement, 16 patients were managed medically. 93% received microbiologically targeted antimicrobial therapy. Of those managed surgically, 42.9% wounds healed, with 14.2% patients requiring major amputation. 64.3% maintained baseline mobility status, two patients became bedbound. One- and two-year survival was 78.6% and 42.9% respectively. Of those managed medically, 45.5% wounds healed, with 18.8% patients requiring major amputation. 81.3% maintained baseline mobility status. One- and two-year survival was 68.8% and 37.5% respectively. Overall cohort median survival was 16 months.

Conclusion
Calcaneal OM is associated with poor survival. However, with a strategy of optimal wound preparation, targeted antimicrobial therapy and appropriate revascularisation, acceptable limb salvage and maintenance of baseline mobility can be achieved.

VO27

Renal outcomes after femoropopliteal intervention in the elderly

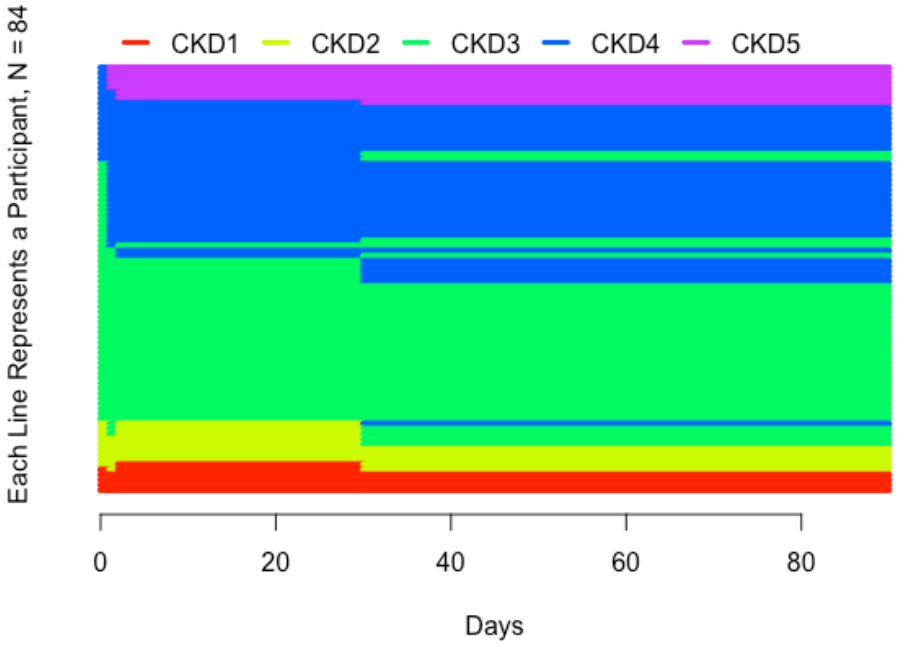
Katsogridakis E[1], Davies R[2], Diamantopoulos A[3], Zayed H[3], Saha P[3], Bown M[1], Saratzis T[1]
[1]University Of Leicester, [2]University Hospitals of Leicester NHS Foundation Trust, [3]Guy's and St Thomas's NHS Foundation Trust

Background: Acute kidney injury is a common complication of endovascular therapy of peripheral arterial disease. Little is known however about the incidence of AKI after endovascular treatment in the elderly.

Methods: The proportion of patients developing AKI within 48 h, and the proportion developing the composite Major Adverse Kidney Events (MAKE) endpoints (death, dialysis, drop in estimated glomerular filtration rate at least 25 per cent) at 30 and 90 days (MAKE90) were calculated. We also investigated the natural history of CKD in those patients, to assess medium-term renal function.

Results: Of 505 treated patients AKI was observed in 84 patients (16.63%) patients, with seven requiring renal replacement therapy or being dialysis dependent at 90d. AKI was associated with a sustained increase of serum creatinine at 90 days in this group (223.5 ± 89.0 μmol/L) which was significantly different to their baseline value (152.4 ± 53.5 μmol/L, $p < 10\text{-}4$) but also to the 90 day values for those who did not develop AKI (172.5 ± 58.9 μmol/L, $p < 10\text{-}4$).

Conclusions: The development of AKI was associated with a persistent deterioration of kidney function, at 90 days and a higher risk of cardiovascular morbidity


CKD1
CKD2
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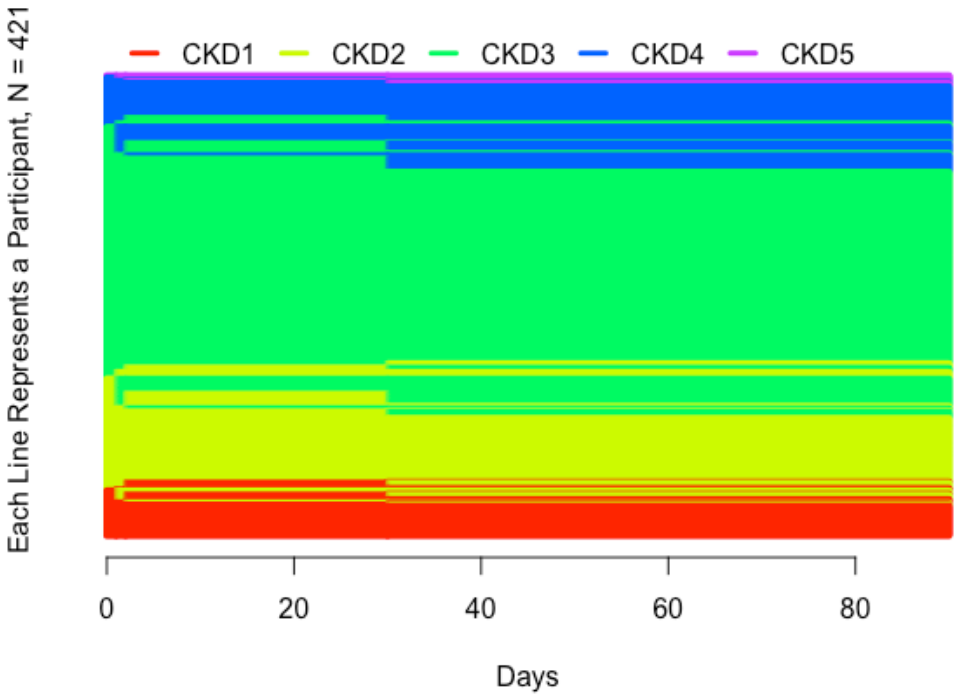
Each Line Represents a Participant, N = 84
0
20
40
60
80
Days


CKD1
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CKD5
Each Line Represents a Participant, N = 421
0
20
40
60
80
Days

VO28

The effect of heat therapy, neuromuscular stimulation and intermittent pneumatic compression in peripheral arterial disease: A systematic review and meta-analysis

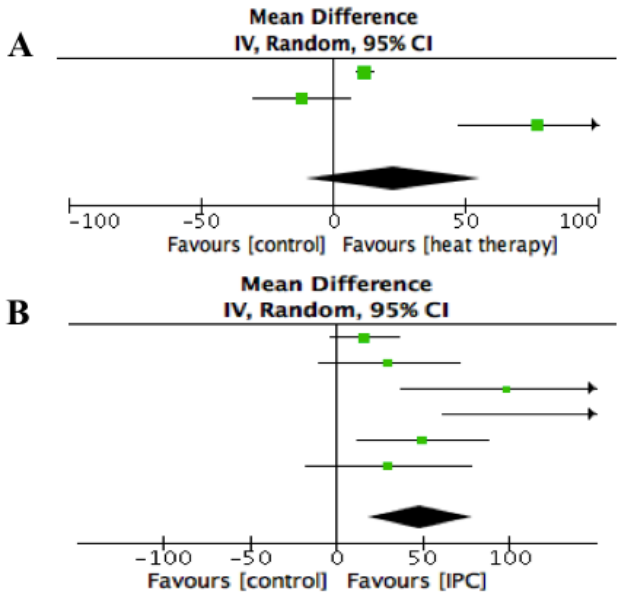
Sanders I[1], Otify E[1], Sivagangan P[1], Stather P[2]
[1]*Norwich Medical School,* [2]*Norfolk and Norwich University Hospital*

INTRODUCTION: Patients with peripheral arterial disease (PAD) should undergo supervised exercise therapy however many patients are unable to exercise due to comorbidities. Recent studies into alternative devices for PAD have been shown to improve blood flow. This meta-analysis aims to review the current evidence regarding non-pharmacological and non-surgical interventions for PAD.

METHODS: Nine databases were searched according to PRISMA guidelines, search terms heat therapy (HT) OR intermittent pneumatic compression (IPC) OR neuromuscular stimulation (NMS) OR GEKOTM AND claudication OR peripheral arterial disease. Primary outcome was walking distance. Other outcomes included haemodynamic assessments and quality of life (QoL). Review Manager 5.4 was used for statistical analysis.

RESULTS 484 studies were identified, 41 included for meta-analysis, totaling 1215 participants. Nine studies investigated HT (n=169), seven NMS (n = 159) and 27 IPC (n = 887). Meta-analysis showed a significant improvement in six-minute walking distance after HT (MD=12.01m, p<0.001). NMS significantly improved initial claudication distance (MD=32.9m, p=0.012) and IPC (MD=25.08, p=0.001). QoL and arterial flow were improved with each intervention.

CONCLUSION This meta-analysis illustrates the benefits of HT, NMS and IPC on walking distance, arterial flow and QoL in PAD patients. Adopting these accessible treatment options into PAD management protocols could be beneficial.



VO29

The Use of Dermal Substitutes in Vascular Patients and the Potential for Limb Salvage - A Case Series

Al-Saadi N[1], Al-Hashimi K[1], Suttenwood H[1], Jones S[1], Merriman C[1]
[1]*Royal Shrewsbury Hospital, Shrewsbury & Telford Hospital NHS Trust*

Introduction:
Using dermal substitutes in the management of non-healing wounds, which would otherwise require major limb amputation, is an important consideration in limb salvage. We present a case series of vascular patients who received dermal substitutes as part of their operative management in a single centre.

Method:
Operative theatre records were used to identify all patients at our trust who received dermal substitutes from 2016 to 2022. Data regarding patient characteristics, procedural details and outcomes was extracted from patient notes.

Results:
Twenty-one vascular patients received dermal substitutes as part of their management. In 15 of these patients the dermal substitutes were used with the intention of limb salvage, in the remaining 6 patients they were used with the intention of superficial wound healing. Limb salvage was achieved in 8 of the 15 patients (53%). Reasons limb salvage was not achieved in the remaining patients included infection, bleeding and unsuccessful maintenance of VAC therapy post-operatively. Superficial wound healing was achieved in all 6 patients.

Conclusions:
Dermal substitutes can be used to help achieve limb salvage. Larger scale studies are needed to determine the perfusion targets required for use of dermal substitutes with this intention, and whether healing is achieved more slowly in these cases.

Vascular Oral Abstracts (Academic, Training & Audit)

VO30

Vascular Education iN Undergraduate Medicine (VENUM) Part One

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Intro
Peripheral Arterial Disease (PAD) is undertreated compared to cardiovascular disease (1). Whether this finding relates to the education of medical students or beyond into post-graduate training is unknown. UK vascular undergraduate teaching of medical students has been poorly documented (2,3). VENUM aims to establish student's perceptions of vascular surgery and their confidence in performing vascular OCSE skills.

Methods
In 2022, final year medical students, were invited to complete a JISC survey (collaborative authorship). 77 research leads were recruited to disseminate the survey. The survey focused on student perceptions of vascular surgery and a knowledge assessment. Quantitative and thematic analysis was used for the results. Ethical approval was granted.

Results
198 final year medical students answered, 56% female. 22 medical schools were represented. 42% of students said they have never had a vascular placement, 22% not undertaken a vascular patient assement, 14% not experienced a vascular lecture. 58% expressed difficulty in performing an ABPI (figure 1). PAD knowledge was incorrect in 80% of the questions asked, compared to 15% for IHD. The thematic analysis is shown in table 1.

Conclusion
Students have perceived little exposure to vascular surgery. This may affect future recruitment and overall knowledge of vascular conditions.

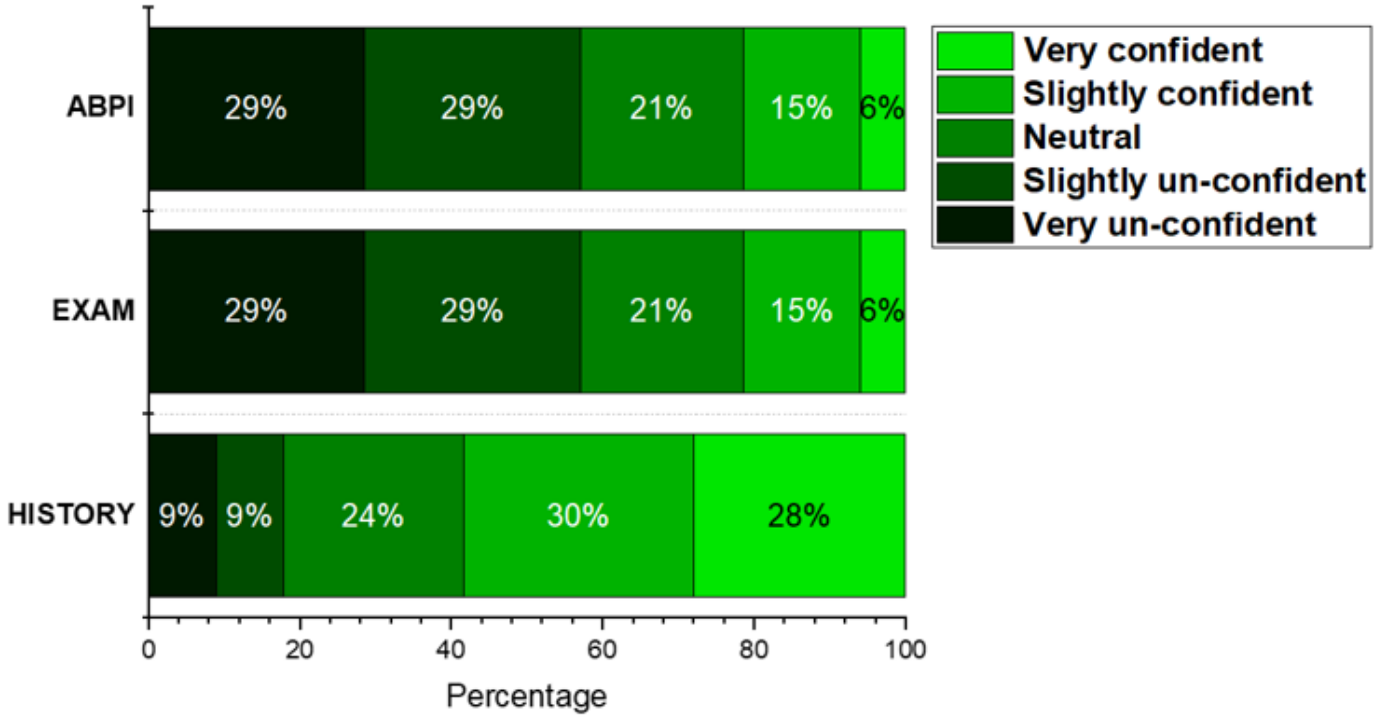
References

1. Sucharitkul PPJ, Jones KL, Scott DJA, Bailey MA. Lipid optimisation in lower extremity peripheral arterial disease. Annals of Vascular Surgery [Internet]. 2021 May 2 [cited 2021 May 3];0(0). Available from: https://www.annalsofvascularsurgery.com/article/S0890-5096(21)00364-2/abstract

2. Lee KS, Ng JJ, Choong AMTL. A scoping review of vascular surgery education in the medical school curriculum. Journal of Vascular Surgery [Internet]. 2021 May 1 [cited 2021 Jun 23]; Available from: https://www.sciencedirect.com/science/article/pii/S0741521421006637

3. Sucharitkul P, Safdar N, Jain K, Forsyth J, Bridgwood B, Coughlin P, et al. VENUM (Vascular Education iN Undergraduate Medicine) Protocol. jVascSocGBIrel [Internet]. 2022 [cited 2022 Jul 24];1. Available from: https://jvsgbi.com/venum-vascular-education-in-undergraduate-medicine-protocol/

Student's self-perceived confidence across Vascular OCSE skills



Positive	Negative
Varied (n=9)	Poor work-life balance (n=12)
Interested/interesting (n=9)	High proportion of acute/emergency workload (n=10)
Rewarding (n=3)	Competitive (n=9)
	High level of technical skill (n=8)
	High pressure/intense (n=7)
	High proportion of out-of-hours/on-call working (n=6)
	Male dominated (n=3)

Table 1: Positive and Negative perceptions of a career in vascular surgery

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Vascular learning from the Confidential Reporting System for Surgery (CORESS)

Smith F, Wilkins D, Corbett H, Kapur N

Introduction

CORESS, a pan-specialty confidential reporting system, is an educational service for surgical teams, receiving anonymised reports of adverse incidents and near misses, disseminated to surgical audiences as educational vignettes.

Methods

Between 2006-2022, 306 reports were received and analysed using a novel patient safety framework to determine influence of contributory themes related to 5 domains: staff; information; tasks; patients and environment. Each domain was sub-categorised to include 4-9 criteria.

Results

Vascular cases comprised 52/306 reports. Categories included aortic, 5; carotid, 4; limb ischaemia, 12; visceral, 5; thoracic outlet, 3; venous, 4; other, 19.

Cases had multifactorial contributory factors and involved vascular lines, 11; diagnostic errors, 8; drug / injection errors, 5; closure devices, 4; inadequate history or examination, 4; situational and technical errors; 4; communication deficiencies, 3; errors associated with pooled lists, 3; and failure to review investigations, 3.

Of the 5 framework domains, contributory factors included issues related to:
staff, 33; information, 10; tasks, 4; patients, 6; and environment, 18.

Conclusion

Confidential reporting provides a valuable tool, alerting surgical teams to potential pitfalls relevant to practice. Determination of effects on patient outcomes remains key to evaluating systematic effectiveness.

VO32

The DEFINITE Audit – Prospective Audit on Diabetic Foot Debridement in Theatre

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[1]*Vascular and Endovascular Research Network*

Background:
Foot infection in those with diabetes commonly requires surgical source control. The DEFINITE audit aimed to identify global variation in diabetic foot infection surgery by assessment of adherence to relevant guidelines.

Methods:
A global multicentre prospective audit of consecutive patients undergoing debridement or minor amputation in theatre for a diabetic foot infection was undertaken. The primary outcome was adherence to International Working Group on the Diabetic Foot and Global Vascular Guidelines. Secondary outcomes were ulcer-related, amputation rate and mortality at 90 days.

Results:
704 patients from 50 centres in 11 countries were included. Most cases underwent debridement plus minor amputation(559; 82.2%), the hallux was most commonly amputated(250; 35.5%). Only 128(18.8%) patients had WIfI staging documented. 265(39.0%) patients had pre-operative perfusion assessment. Sampling for microbiological analysis occurred in 333 (74.7%) cases where OM was suspected, an additional 118 (52.7%) were sampled when infection was not suspected. Separate 'clean' instruments were used in 368(54.1%) procedures. The 90-day outcomes will be available in September 2022.

Conclusion
There were wide variations in practice surrounding diabetic foot debridement and amputation in theatre. Comprehensive longitudinal analysis will identify any associations that might lead to research for improved patient outcomes.

VO33

Vascular nurse- facilitated “selective” Care of Elderly (CoE) input on a vascular unit, a quality improvement project.

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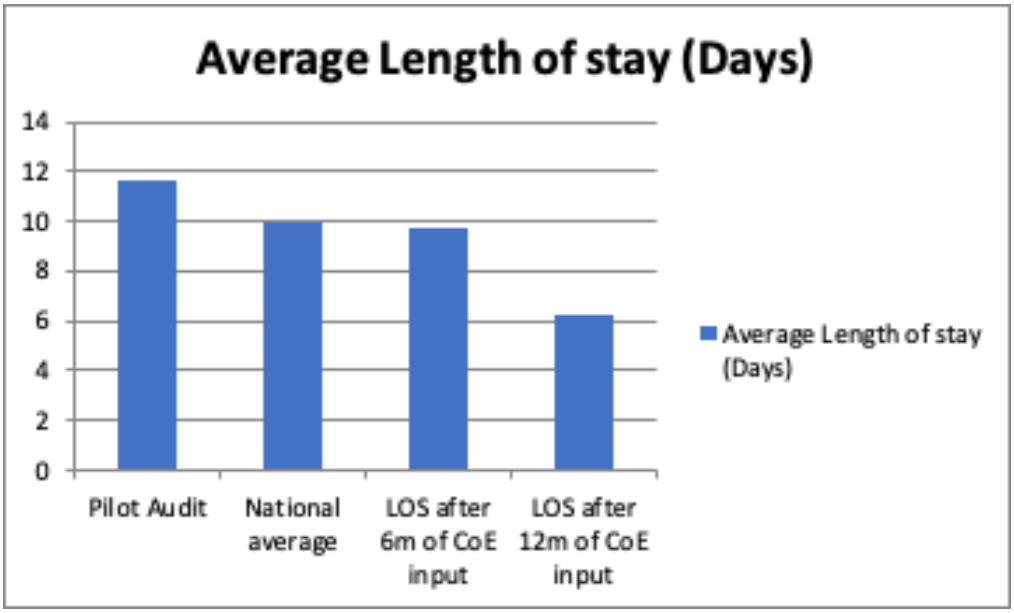
Introduction:
The benefits of Care of Elderly (CoE) input is increasingly emphasised across all surgical specialties. However, the access to such service is proving particularly challenging.
We aimed to optimise the use of such a valuable resource with more selective approach in vascular patients.

Methods:
Retrospective pilot study on 50 patients demonstrated significant delay byeond “surgically fit for discharge” (SFFD) in vascular patients. CoE input was funded for only 2 sessions per week. Patients were prioritised for CoE input based on age, frailty and comorbidities. Data was collected Prospectively for patient demographics, comorbidities, LoS, complications and referrals to other specialties.

Results:
The patients were matched to the pilot group in terms of comorbidities, frailty and interventions.
Frailty score>6, major amputations and sepsis on admission were associated with significant delay in discharge. Selective CoE input reduced delay in discharge from 11.7 days to 6 days over 12 month period. Medical inpatient referrals were reduced from 90% to 39%.

Conclusion:
Selective input from CoE team based on age, frailty score, sepsis and those undergoing major amputation has a significant impact on patient care and LoS.



Comparison of age/ gender pilot group Vs prospective group

	Pilot/ Control group	**CoE input group**
Male: Female	3:1	3:1
Age	70 (45-90)	77 (60-89)
<64 Years	24%	10%
65-74 Years	36%	25%
>75 Years	40%	65%
No of Co morbidities	5	5
Diabetes	50%	40%
Frailty score ≥6	42%	41%
Percentage of Patients having intervention	90%	82%
Number of interventions per patient	1-4	1-3
Major amputation	38%	32%

(Table 1)

VO34

The digital transformation of the ASPIRE 7 programme

Crichton A[1,2], Fairhead J[4], Charlwood N[3], Graham T[1], Garnham A[1,2], Jones K[5], Ahmed U[1,3], Al Shakarchi J[3]
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Introduction: The ASPIRE 7 programme has integrated a Post-Graduate Virtual Learning Environment (PGVLE) into the delivery of this programme over the last two years. This study aims to evaluate a virtual (2021) and hybrid (2022) delivery of this course.

Methods: In 2021, all pre-course and in course content was delivered virtually. In 2022, a hybrid course was developed, with lectures and resources housed on the PGVLE and mock scenarios delivered face to face. Centralised feedback using integrated PGVLE software was gathered which once completed, allowed autogenerated candidate and faculty certificate distribution. A quantitative and qualitative analysis of pre-course materials/guides, lectures and mock scenarios was completed.

Results: 2021: 39 candidates attended the course. Pre-course lectures, overall educational course value and PGVLE good/excellent ratings were 91%, 100% and 97% respectively. 90% of the faculty found the PGVLE easy to use.
2022: 24 candidates attended. Pre-course online lectures, face to face mock stations and PGVLE good/excellent ratings were 87%, 100% and 86% respectively. 100% of trainees found the PGVLE pre-course resources useful. 87% of the faculty found PGVLE easy to use.

Conclusion: The integration of digital technology through the PGVLE has resulted in high quality education for vascular trainees preparing for FRCS.

VO35

Comparing Augmented Reality to Traditional In-Person Teaching for Vascular Anastomotic Surgical Skills Training – A Randomized Controlled Trial

Stoner R[1], **Ahmad M[2]**, Patel S[3], Hurkxkens T[3], Cowell A[3], Caradu C[4], Bastrot L[4], Amiras D[2,3], Shalhoub J[2,3]
[1]London North West University NHS Trust, [2]Imperial College Healthcare NHS Trust , [3]Imperial College London , [4]Bordeaux University Hospital

Introduction: Augmented Reality (AR) superimposes computer generated content to real-world environments and is used across multiple training fora. Its use in vascular surgery is investigated in this study.

Aims: To compare the feasibility and effectiveness of teaching vascular anastomosis skills using AR using the HoloLens2TM Head Mounted Display technology (HMD) with traditional in-person (IP) teaching. A remote trainer used the HMD to teach the skills.

Methods: 28 participants underwent a 20-minute pre-assessment performing an end-to-end vascular anastomosis on an artificial vessel. They were randomly allocated to two groups – AR or IP and underwent two 40-minute teaching sessions. Individuals then completed post session feedback and a 20-minute post-feedback assessment. Anonymised video assessments were recorded marked by two blinded, independent assessors using the Objective Structured Assessment of Technique Skills (OSATS) scoring.

Results: There was an overall improvement in both cohorts in OSATS score post intervention by +7.083 (IP group) and +8.275 (AR). Independent T-test showed no statistical significance (p=0.422) in OSATS scores when comparing the IP and AR teaching.

Conclusion: AR is feasible and effective for teaching vascular surgical anastomosis skills and non-inferior to in-person teaching.There is scope for development of the use of AR in vascular surgical skills training.

	Number of participants		*I am familiar with the steps of performing a vascular anastomosis.*		*I am familiar with the instruments required to perform a vascular anastomosis.*		*I am familiar with the technique required to perform a vascular anastomosis.*		*I am confident in performing a vascular anastomosis.*	
	AR	**IP**	**AR**	**IP**	**AR**	**IP**	**AR**	**IP**	**AR**	**IP**
Pre-Assessment Mean	**13**	**15**	1.69	2.07	1.77	2.13	1.62	2.00	1.23	1.47
Post Session 1 Mean	**12**	**15**	4.00	4.07	4.17	4.27	3.92	3.93	3.33	3.20
Difference after session 1			2.31	2.00	2.40	2.13	2.30	1.93	2.10	1.73
Pre-Assessment 2 Mean	**13**	**9**	4.46	4.33	4.62	4.56	4.38	4.22	4.00	3.78
Post Session 2 mean			2.77	2.27	2.85	2.42	2.77	2.22	2.77	2.31

Table 3: Mean self-assessment agreement scores reflecting perception between the augmented reality and in-person cohorts prior to the intervention and following teaching. Likert scale 1-5 (strongly disagree – strongly agree).

	Difference in OSATS score following in-person teaching intervention	*Difference in OSATS score following AR teaching intervention*
	2.5	11
	3.25	3
	3.5	6.5
	5	12
	6.5	11
	7.5	6
	8	9.5
	8	10
	9.75	12.5
	10	1.25
	10.5	-
	10.5	-
Mean score change	+ 7.083	+ 8.275

Table 2: Change in OSATS scores comparing the augmented reality and in-person teaching.

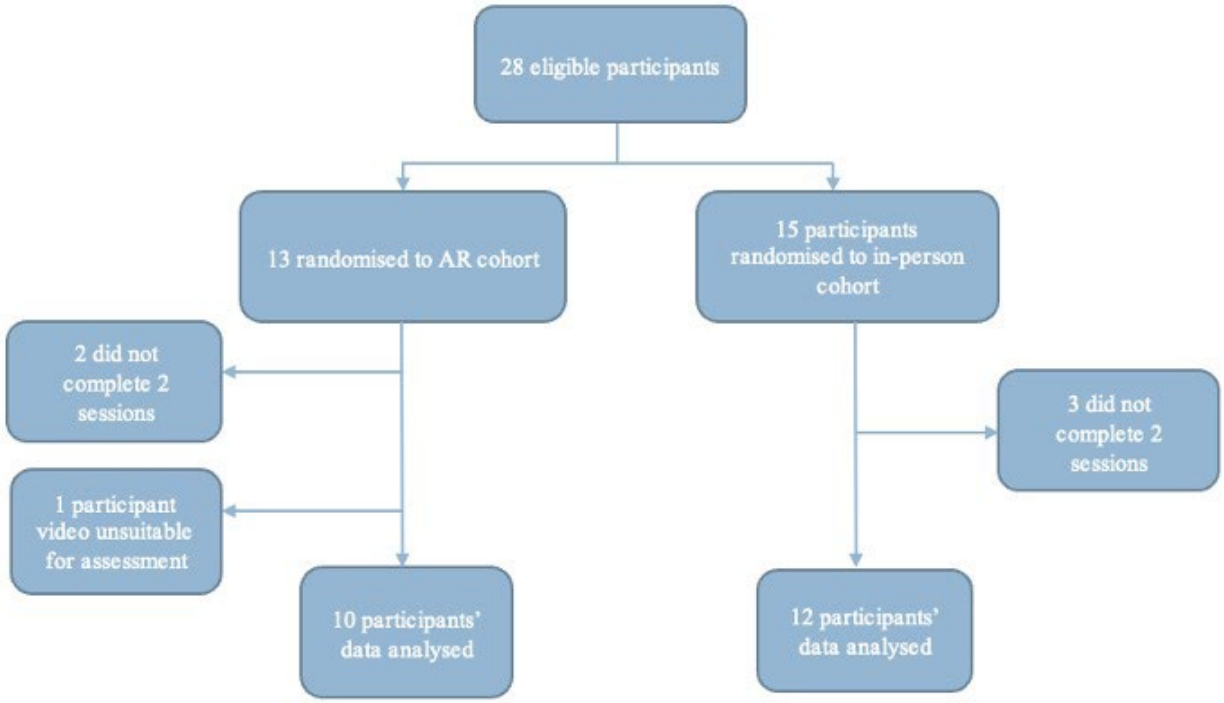

Figure 1: Allocation of eligible participants to the augmented reality and in-person arms of the study.

VO36

Operative learning curves in UK Vascular Surgery trainees before and after the introduction of a separate Vascular surgery curriculum.

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[1]*Health Education And Improvement Wales*

Background
Certification of completion of training in Vascular surgery in the UK requires the demonstration of operative competency, achieved through attaining 3, level 4 procedure-based assessments (PBA). In 2013 Vascular Surgery became an independent surgical speciality in the United Kingdom. The aim of this study was to compare operative learning curves related to PBA performance with respect to caseload before and after the separation of Vascular surgery from General surgery.

Methods
Logbook data from consecutive 157 Vascular surgery trainees (101 General surgery, 56 Vascular) were compared with PBA evaluations to determine the relationship between PBA level and operative experience.

Results
Median caseload to achieve competency ranged from 33 (interquartile range 24-47) for open AAA repair to 56 (38-76) for EVAR, with significant variation between all procedures ($p< 0.001$). Trainees on the new Vascular surgery curriculum required significantly higher caseloads than those on the General surgery curriculum to achieve competency for carotid endartectomy (median 60 vs. 42, $p< 0.001$) and lower limb bypass (median 43 vs. 21, $p< 0.001$).

Conclusion
Significant learning curve variance was observed, with discrepancies between trainees on the Vascular surgery curriculum and the general surgery curriculum.

VO37

Telemedicine in Vascular Surgery during the COVID-19 Pandemic: a passing phase or here to stay?

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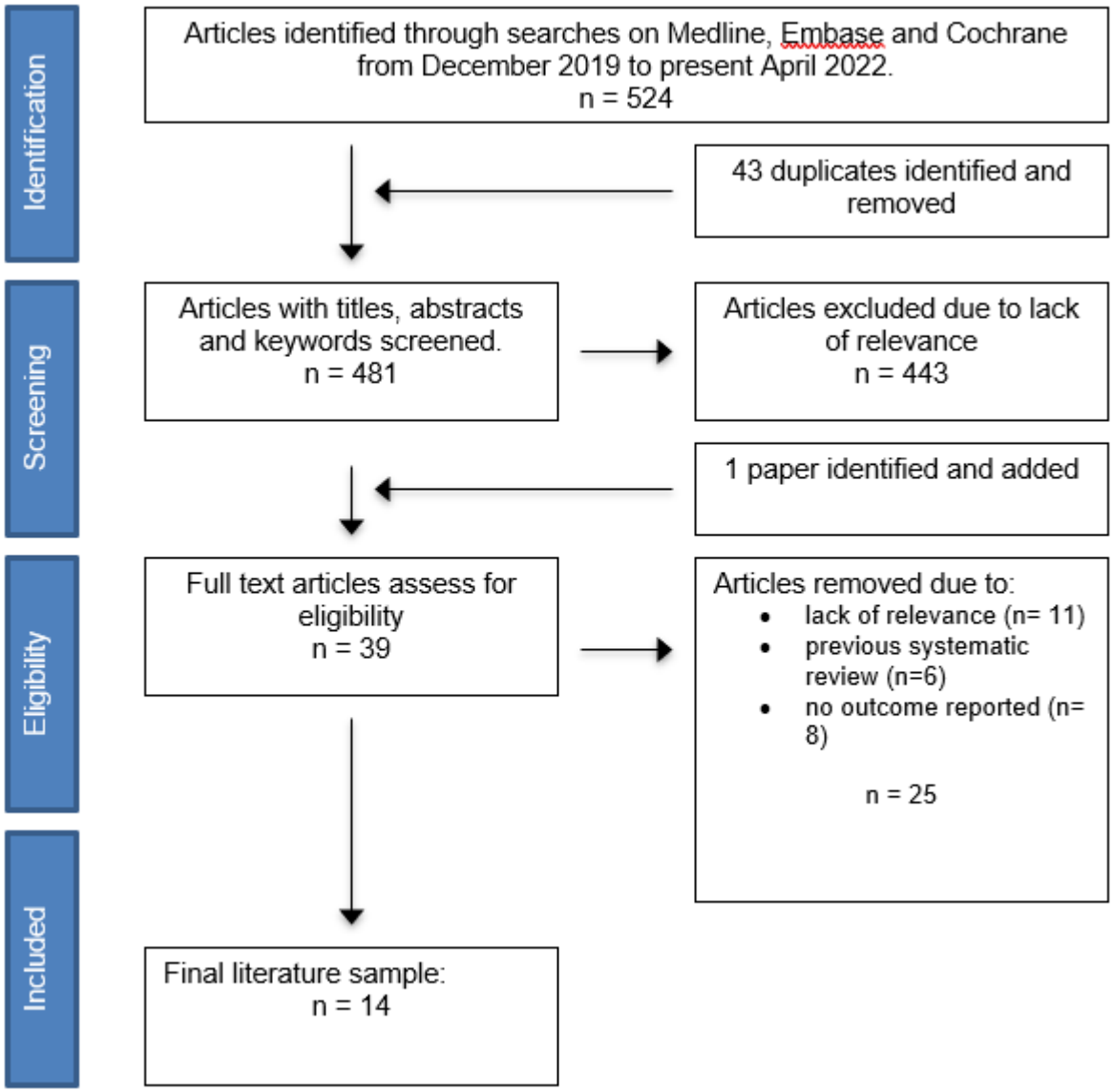
Background
The COVID-19 pandemic resulted in seismic changes to healthcare service delivery. The use of telemedicine was widely adopted during the pandemic, although its value in the safe care of vascular patients is unknown.

Method
A systematic review was undertaken to identify articles that described outcomes or patient/clinician views of telemedicine (telephone or video) services in vascular surgery during the pandemic. Two reviewers independently searched the databases, selected papers, extracted data and undertook a narrative synthesis.

Result
Fourteen papers were included. All reported increased telemedicine use during the pandemic. Most patients (80.6%-100%) were satisfied with telephone or video consultation. >90% of the patients felt that telemedicine was a good substitute during the pandemic to avoid travelling and reduce transmission risk. One study showed a strong preference (74%) for patients continuing the use of telemedicine post-pandemic. Two studies evaluating patients with arterial ulceration and venous diseases reported no significant difference in clinical outcome between patients reviewed face-to-face and those seen remotely. No studies analysed the financial impact of telemedicine.

Conclusion
Telemedicine was an effective alternative to face-to-face clinics during the pandemic. Its role post-pandemic is uncertain, although one study suggests a significant proportion of patients would appreciate them in the future.


Identification
Articles identified through searches on Medline, Embase and Cochrane from December 2019 to present April 2022.
n = 524
43 duplicates identified and removed
Screening
Articles with titles, abstracts and keywords screened.
n = 481
Articles excluded due to lack of relevance
n = 443
1 paper identified and added
Eligibility
Full text articles assess for eligibility
n = 39
Articles removed due to:
lack of relevance (n= 11)
previous systematic review (n=6)
no outcome reported (n= 8)
n = 25
Included
Final literature sample:
n = 14

VO38

Variations in elective and emergency work patterns across named arterial hubs in England's vascular networks.

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[1]*University Hospitals of Northamptonshire*

Changes subsequent to those of the 2012 reconfiguration have further altered the landscape of arterial centres in England. We interrogated their present day functional structure.

Hospitals designated arterial hubs by the Vascular Society (VS; correspondence July 2022) and NHS Trusts reporting to the National Vascular Registry were tabulated. Each hub was contacted to ascertain (a) types of elective vascular surgery performed and (b) grade, specialty and base hospital of on-call clinicians in- and out-of-hours.

Of 62 VS-designated hubs, seven currently perform no arterial surgery. Elective case-mix at 55 sites varied; A=all standard activity including Aortic=52; B=peripheral including Bypass=2; C=Carotid=1. First-on-call clinicians were not vascular-specific registrars or were based at a different hospital for 5/52 'A' sites all-hours and another 7/47 'A' sites out-of-hours. Consultant vascular surgeons were first-on-call out-of-hours at four 'A' sites. Local populations of the 12 'A' sites without 24/7 vascular registrar cover ranged from 21,000 – 537,000 (mean=190,000; median=119,000) and they were evenly distributed north and south of Watford.

Not all designated arterial hubs in England are equal in terms of elective caseload and out-of-hours vascular support. It is possible that these variations could have an influence upon stability of work force, patient satisfaction and clinical outcomes.

Hospital Name	NHS Trust name	A/B/C/D	Mon-Fri 9-5	Mon-Fri overnight	Sat / Sun
The Royal London Hospital	Barts Health NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Addenbrookes, Cambridge	Cambridge University Hospitals NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Countess of Chester	Countess of Chester Hospital NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Kent & Canterbury Hospital	East Kent Hospitals University NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Royal Blackburn Hospital	East Lancashire Hospitals NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Colchester Hospital	East Suffolk and North Essex NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Frimley Park Hospital	Frimley Health NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
St Thomas', London	Guy's and St Thomas' NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Hull Royal Infirmary	Hull University Teaching Hospitals NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
St Mary's, London	Imperial College Healthcare NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
King's College Hospital London	King's College Hospital NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Royal Preston Hospital	Lancashire Teaching Hospitals NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Leeds General Infirmary	Leeds Teaching Hospitals NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Royal Liverpool Hospital	Liverpool University Hospitals NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Manchester Royal Infirmary	Manchester University NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Basildon Hospital	Mid and South Essex NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Norfolk and Norwich University Hospital	Norfolk and Norwich University Hospitals NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Southmead Hospital	North Bristol NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Northampton General Hospital	Northampton General Hospital NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Royal Oldham Hospital	Northern Care Alliance NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Queen' Medical Centre, Nottingham	Nottingham University Hospitals NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
John Radcliffe Hospital, Oxford	Oxford University Hospitals NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Royal Free Hospital, London	Royal Free London NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Northern General Hospital, Sheffield	Sheffield Teaching Hospitals NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Royal Shrewsbury Hospital	Shrewsbury and Telford Hospital NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
James Cook University Hospital, Middlesbrough	South Tees Hospitals NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Sunderland Royal Hospital	South Tyneside and Sunderland NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
St George's Hospital, London	St George's University Hospitals NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Russells Hall Hospital, Dudley	The Dudley Group NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Freeman hospital, Newcastle	The Newcastle upon Tyne Hospitals NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Royal Stoke University Hospital	University Hospital of North Midlands NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Southampton General Hospital	University Hospital Southampton NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Brighton and Sussex University Hospital	University Hospital Sussex NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Heartlands Hospital, Birmingham	University Hospitals Birmingham NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
University Hospital, Coventry	University Hospitals Coventry and Warwickshire NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Royal Derby Hospital	University Hospitals of Derby and Burton NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Glenfield Hospital, Leicester	University Hospitals of Leicester NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Watford General Hospital	West Hertfordshire Hospitals NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Worcestershire Royal Hospital, Worcester	Worcestershire Acute Hospitals NHS Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
York Hospital	York and scarborough Teaching Hospital NHS Foundation Trust	A	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Derriford Hoital, Plymouth	University Hospitals Plymouth NHS Trust	A	VR-INTERNAL	VR+GR-INTERNAL	VR+GR-INTERNAL
Queen's Hospital, Romford	Barking, Havering and Redbridge University Hospitals NHS Trust	A	VR-INTERNAL	GR-INTERNAL	GR-INTERNAL
Bradford Royal Infirmary	Bradford Teaching Hospitals NHS Foundation Trust	A	VR-INTERNAL	GR-INTERNAL	GR-INTERNAL
Lister Hospital, Stevenage	East and North Hertfordshire NHS Trust	A	VR-INTERNAL	GR-INTERNAL	GR-INTERNAL
Pilgrim Hospital, Boston	United Lincolnshire Hospitals NHS Trust	A	VR-INTERNAL	GR-INTERNAL	GR-INTERNAL
Cumberland Infirmary, Carlisle	North Cumbria Integrated Care NHS Foundation Trust	A	VR-INTERNAL	CONS-INTERNAL	CONS-INTERNAL
Royal cornwall Hospital, Truro	Royal Cornwall Hospitals NHS Trust	A	VR-INTERNAL	CONS-INTERNAL	CONS-INTERNAL
Bedford Hospital	Bedfordshire Hospitals NHS Foundation Trust	A	GR-INTERNAL	GR-INTERNAL	GR-INTERNAL
Doncaster Royal Infirmary	Doncaster and Bassetlaw Teaching Hospitals NHSFT	A	GR-INTERNAL	GR-INTERNAL	GR-INTERNAL
Musgrove Park Hospital, Taunton	Somerset NHS Foundation Trust	A	GR-INTERNAL	GR-INTERNAL	GR-INTERNAL
Royal Devon & Exeter Hospital, Exeter	Royal Devon University Healthcare NHS Foundation Trust	A	CONS-INTERNAL	CONS-INTERNAL	CONS-INTERNAL
Royal Bournemouth Hospital	University Hospitals Dorset NHS Foundation Trust	A	CONS-INTERNAL	CONS-INTERNAL	CONS-INTERNAL
Northwick Park	London North West University Healthcare NHS Trust	B	VR-INTERNAL	VR-INTERNAL	VR-INTERNAL
Medway Maritime Hospital, Gillingham	Medway NHS Foundation Trust	B	GR-INTERNAL	GR-INTERNAL	GR-INTERNAL
Southend Hospital	Mid and South Essex NHS Foundation Trust	C	VR-EXTERNAL	VR-EXTERNAL	VR-EXTERNAL
Wythenshawe Hospital, Manchester	Manchester University NHS Foundation Trust	D	VR-INTERNAL	VR-EXTERNAL	VR-EXTERNAL
University College Hospital, London	University College London Hospitals NHS Foundation Trust	D	VR-EXTERNAL	VR-EXTERNAL	VR-EXTERNAL
Huddersfield Royal Infirmary	Calderdale and Huddersfield NHS Foundation Trust	D	VR- EXTERNAL	VR- EXTERNAL	VR- EXTERNAL
St Peters Hospital, Chertsey	Ashford and St Peter's Hospitals NHS Foundation Trust	D	GR-INTERNAL	GR-INTERNAL	GR-INTERNAL
Royal Brompton Hospital, Chelsea	Guy's and St Thomas' NHS Foundation Trust	D	CR-INTERNAL	CR-INTERNAL	CR-INTERNAL
Torbay Hospital, Torquay	Torbay and South Devon NHS Foundation Trust	D	CONS-INTERNAL	CONS-EXTERNAL	CONS-EXTERNAL
Princess Alexandra Hospital, Harlow	Princess Alexandra Hospital NHS Trust	D'	CONS-INTERNAL	VR-EXTERNAL	VR-EXTERNAL

Glossary			
A	all activity incuding Aortic	VR	Vascular Registrar
B	peripheral including Bypass	GR	General Registrar
C	limited to Carotid	CONS	Consultant
D	arterial work Discontinued		

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Paraclavicular Total Rib Excision for Thoracic Outlet Syndrome is Safe and Effective. A single centre case series.

Whing J, Hassan M, Ismail K, Howard A

Introduction
Vascular and neurogenic Thoracic Outlet Syndrome (TOS) presents a diagnostic challenge due to the myriad of symptoms which overlap with cervical spine and shoulder pathology. Treatment outcomes can be poor due to initial inaccurate diagnosis and postoperative recurrence.

Method
We developed a treatment pathway including specialist physiotherapy, scalene muscle injection, paraclavicular total first and cervical rib resection with supraclavicular brachiolysis and posterior rib transection followed by infraclavicular anterior rib transection. Pre and post-operative pain, neuropathy and function were assessed by Likert scales and DASH. Data from a prospectively maintained database were analysed retrospectively.

Results
77 cases (70 rib resection and 7 injections alone); 63 with scoring data: 43(86%) females, 10(20%) were bilateral, 38(60.3%) had mixed TOS, 3(4.76%) had venous, 22(34.92%) had neurogenic. Patients with rib resection surgery; median preoperative pain score was 8/10(IQR 2.5-8.5), neuropathy was 7/10(IQR 0-8) and function was 3/10(IQR 0.5-4); postoperative median scores 2 (0 – 3), 2 (0 – 6) and 8 (1 – 10) respectively. Recurrent or persistent moderate symptoms were present in ten patients. There were no major complications.

Discussion
Para-clavicular total rib resection with brachiolysis offers a safe exposure of the whole rib and potentially more complete treatment.

VO40

Barriers and facilitators to implementing change in the vascular surgery setting

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Background
The Peripheral Arterial Disease Quality Improvement Programme (PAD QIP) was a QI collaborative between 11 English vascular surgery centres from May 2020 to May 2022, aiming to expedite treatment for PAD. The aim of this qualitative study was to explore beliefs about the PAD QIP, and barriers and facilitators to implementation of changes in vascular surgery.

Methods
Sixteen semi-structured interviews were conducted with clinicians from the vascular centres that participated in the PAD QIP and were analysed using Framework analysis, based on the Consolidated Framework for Implementation Research (CFIR).

Results
Regarding the QI collaborative, participants stated that the concrete timeframes, external performance monitoring, peer comparison and the programme's national reach helped them obtain resources to implement changes. Learning from and sharing experiences with others was also useful. Accurate performance data were considered essential for leveraging resources, but data entry was onerous and required dedicated staff. The main factors that facilitated and hindered change are presented in table 1.

Conclusions
A QI collaborative facilitates the implementation of changes according to participants, while team and organisational support is crucial.

Table 1. The main factors that facilitated and hindered change

Factors facilitating change	Barriers to change
Stakeholder buy-in	Resistance to change
Supportive "like-minded" colleagues	Differing opinions on resource allocation
Approval of changes with a bottom-up approach and minimal managerial delays (due to COVID-19)	Conflicting organisational/departmental priorities
	Lack of organisational leadership support
	Lack of resources (staffing, imaging slots, operating lists slots, bed capacity, time)

VO41

Evaluating the effectiveness of an online Vascular Surgery teaching programme

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Introduction
We created an online Vascular Surgery teaching programme for Medical Students and Junior Doctors. Our aims were to increase participant confidence in basic Vascular Surgery topics and better prepare them for a rotation in Vascular Surgery as a Foundation Doctor.

Methods
Nine webinars were run across a three-month period. Speakers included Foundation Doctors, Vascular Registrars, Consultant Vascular Surgeons and a Vascular Nurse Specialist. Post-webinar feedback surveys presented as a 5-point Likert scale were used to assess the effectiveness of the course. Wilcoxon Signed Rank tests were used to analyse the data.

Results
We obtained feedback from 346, out of the total 564 participants (64.6%). We demonstrated a statistically significantly higher overall post-session confidence level (4.03), compared with the pre-session level (2.82) ($Z = -14.31$, $p < 0.05$). Generally, participants rated webinars highly in the domains of engagement (mean 4.31), helpfulness of the content (mean 4.50) and interest (mean 4.39). In total, 66% of participants reported that attending the webinar, better prepared them for a Vascular Surgery rotation.

Conclusion
Our webinar based online programme successfully increased participants confidence and their preparedness for a role in Vascular Surgery. As a result, the programme is a useful adjunct to undergraduate Surgical education.

VO42

MODAMP 2: Modern practice of diabetic foot sampling, protocols, pathways, treatments and techniques: An audit of specimen transport time, from theatre to laboratory for diabetic foot tissue

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Osteomyelitis should be considered in patients with diabetic foot infections[1]. The Infectious Diseases Society of America recommend that specimens suspected of osteomyelitis are processed by the microbiology laboratory within two hours[2]. Failure to achieve this may result in delays to starting targeted antibiotic therapy, increased risk of recurrence and higher levels of amputation.

Four hospitals in the VARICS collective collected retrospective data on minor amputations in patients with diabetic foot infection between December 2021 and February 2022. Data on the procedure, specimen collection time, transport medium and specimen receipt time were reported.

The total number of procedures performed was 129; samples were sent from 99 (77%). 42 (42%) of specimens were processed within 2 hours. 39 (39%) samples were collected out of hours; of these, 6 (15%) were processed within two hours. The transport medium was recorded in 72 (73%) samples, 56 (78%) of bone and tissue samples were transported in no medium.

Patients with diabetic foot infections should be treated with appropriate antibiotics based on culture results[1]. The delay in specimen processing presents a risk to patient care. Adherence to international guidelines is essential and identifying any delays may aid centres in overcoming challenges with patient sample processing.

References

(1) National Institute for Health and Care Excellence (NICE) (2019) Diabetic foot problems: prevention and management
(2) UK Standards for Microbiology Investigations. Investigation of bone and soft tissue with osteomyelitis. Public Health England. Bacteriology | B 42 | Issue no: 2 | Issue date: 14.12.15

VO43

Systematic review of groin wound surgical site infection incidence after arterial intervention

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Introduction
Groin wound surgical site infection (SSI) incidence varies considerably in the literature. The objectives were to determine the incidence of SSI (overall/superficial/deep) after arterial intervention through non-infected groin incisions and identify variables impacting reported rates.

Methods
MEDLINE, EMBASE, and CENTRAL databases were searched for randomised controlled trials (RCTs) and observational studies of adults undergoing arterial intervention through a groin incision and reported SSI. Relevant variables were subjected to meta-regression.

Results
117 studies (33 RCTs, 84 observational) reporting 65,138 groin incisions (42,347 patients) were included. Overall SSI incidence per incision was 8.1% (1,730/21,431): 6.3% (804/12,786) were superficial, 1.9% (241/12,863) were deep. Superficial SSI incidence was higher in RCTs (15.8% (278/1,762)) compared to observational studies (4.8% (526/11,024)); deep SSI incidence was similar (1.7% (30/1,762) and 1.9% (211/11,101) respectively). Variables independently predicting lower SSI incidence were studies only including aneurysmal pathology (β=-10.229, p<0.001) and retrospective observational design (β=-1.118, p=0.002). SSI being a primary outcome independently predicted higher incidence of SSIs (β=3.429, p=0.017).

Conclusions
Many superficial SSIs are being missed in observational studies; the higher incidence of superficial SSI in RCTs is likely due to more robust follow-up. These results should be considered when benchmarking practice and designing RCT.

VO44

Reduction of Surgical Site Infection using several Novel Interventions in the Groin (ROSSINI-G) Feasibility Survey

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Introduction
There is a lack of consensus and evidence to inform the use of interventions to prevent groin wound SSI despite being relatively common.

Methods
We surveyed participants at the VSGBI 2021 Annual Scientific Meeting to assess feasibility, equipoise and consensus regarding three separate interventions designed to prevent SSI in the groin; impregnated incise drapes, diakylcarbomyl chloride dressings and antibiotic impregnated collagen sponges. Results were collated via an online survey using the REDCap platform.

Results
Seventy-five participants completed the survey, most of which were consultant vascular surgeons (50/75, 66.7%). The majority agree that groin wound SSI is a major problem (73/75, 97.3%). Most would be content using either of the three interventions (61/75, 81.3%) and had clinical equipoise to randomise patients to any of the 3 interventions versus standard of care (70/75, 93.3%). There was some reluctance to not use impregnated incise drapes as some considered this 'standard of care' and some were unwilling to leave an antibiotic impregnated collagen sponge in the groin wound.

Conclusions
Groin wound SSI is major problem for vascular surgeons, with an increasing prevalence of diabetes and antibiotic resistance it is crucial that preventative measures are rigorously tested against standard of care.

VO45

Use of a disposable negative pressure device in the management of vascular wounds: indications, outcomes and experiences of a London vascular hub

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Introduction: Negative pressure wound therapy (NPWT) provision post-discharge varies resulting in increased length of stay (LoS), reduced mobility, and delayed mobilisation. Use of disposable NPWT (dNPWT) as a strategy for admission avoidance, reduced LoS and early ambulation is presented.

Methods: Data were obtained from a prospectively collected database between January 2019 and June 2022. All dNPWT patients with complete records were included and compared with an advanced wound dressing (AWD) group.

Results: Wounds included hallux, metatarsophalangeal joint excision, and multiple-toe amputations. Mean wound severity (SINBAD) classification was 4.5 and wound area 1740 mm2. Median dNPWT duration was 12.5 days. dNPWT was applied in 59% of patients as a bridge to outpatient NPWT, with a LoS reduction of 17.5 days. Subsequent NPWT application occurred in 36% of patients. NWPT use was discontinued in the remaining patients due to satisfactory granulation tissue development. All patients returned to baseline mobility upon dNPWT application. Compared to AWD, reduced time to 50% wound area reduction (8.4 weeks versus 11.4 weeks) and time to healing (20 weeks versus 23.4 weeks) was observed with dNPWT use.

Conclusion: dNPWT use resulted in reduction of LoS, rapid ambulation, and improved patient NPWT system tolerance in patients requiring NPWT post-discharge.

VO46

The Limb-related Complications of Injecting Drug Use and the Collateral Consequences for Vascular Surgery: The East of Scotland Experience, a Nine-year Retrospective Cohort

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The UK has one the highest rates of illicit drug use in Europe. People who inject drugs (PWID) are at risk of a range of injecting-related infections and injuries that can threaten life and limb. This study aimed to characterise the limb-related complications of injecting drug use.

Retrospective data collection between 01/12/2011-31/12/2020. Patients were identified through discharge codes and a prospective vascular operative database. Demographic and admission details were extracted from electronic records and a database created. Two diagnoses could be recorded, reflecting the realities of clinical practice.

There were 805 admissions for 445 patients (1-10 admissions/patient): mean age 37.5 (21.2-61.5) years and 488 (60.6%; 277 patients, 62.2%) were male. Admissions were generated by: 333 groin abscesses; 75 other abscesses; 109 pseudoaneurysms; 126 necrotising soft tissue infections; 137 cellulitis cases; 168 deep venous thromboses (DVT); 59 infected DVTs and 138 other pathologies. Surgical specialties managed 570 (70.8%) admissions, with vascular surgery managing 412 (51.2%; 72.3% of all surgical admissions). Surgery was required for 409 admissions (50.8%), with 534 operations performed (1-7/admission). There were 31 lower limb amputations. During follow-up 97 (21.8%) patients died, mean age 43.6 (26.8-62.8).

Limb-related complications of injecting drug use represent a substantial burden for vascular surgery.

VO47

Acute analgesia prescribing for patients presenting with critical limb ischaemia: a closed loop audit

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Background: The National Institute for Clinical Excellence (NICE) provides guidelines for acute prescribing in critical limb ischaemia (CLI): patients must have paracetamol, breakthrough strong analgesics, laxatives and anti-emetics. We assessed general surgical doctor compliance with these guidelines.

Methods: A prospective data collection of patients classified with Fontaine Classification stage III/IV peripheral vascular disease admitted over two one-month periods was performed. Between the cycles, quality improvement interventions to optimise management of these patients were undertaken; comprising a doctor survey and tailored education. A closed-loop audit was conducted.

Results: The survey revealed 80% of general surgical doctors lacked confidence in prescribing in CLI. 27 and 23 patients were recruited per cycle. Initially, only 19 (70%) had regular paracetamol prescribed, improving to 100% on re-audit. Similarly, 22 (81%) had breakthrough opioid analgesia; which again improved to 100% on re-audit. Only 3 (11%) had laxatives and 10 (43%) anti-emetics initially; improving to 10 (37%) and 22 (96%) respectively in the second-cycle.

Conclusions: Doctors lack confidence in prescribing for patients with CLI. Targeted education achieved greater compliance with the NICE guidance for pharmacological management of these patients. There is still room for improvement, especially with laxatives, which would minimise side-effects from strong analgesics.

VO48

Strain Analysis and Mapping of the Plantar Surface (STAMPS): A novel technique proposed to measure plantar load in patients with diabetes - Healthy participant study

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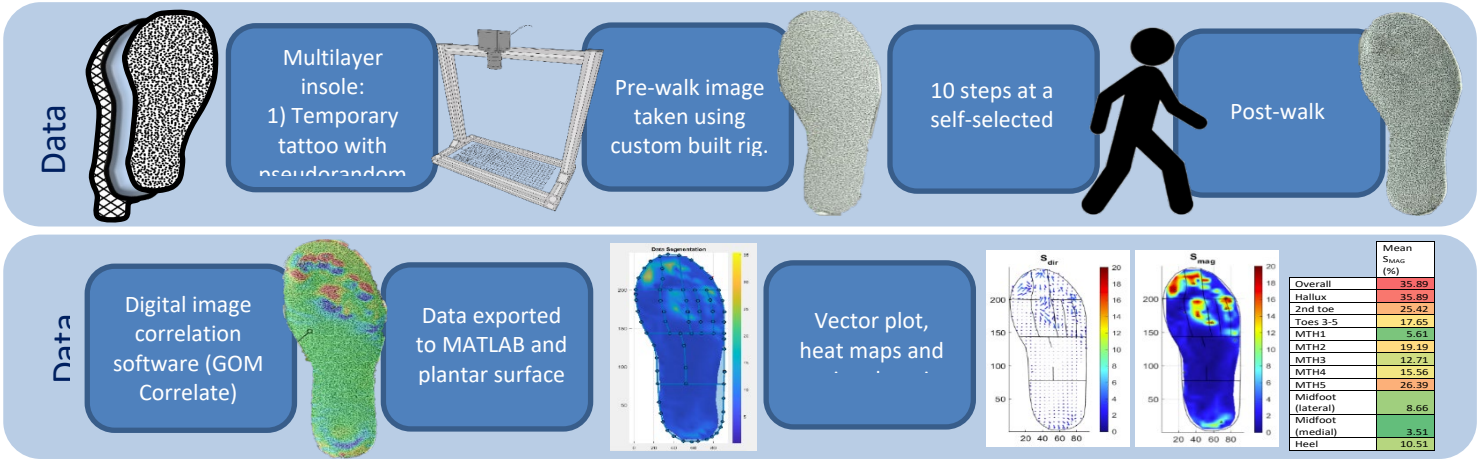
Introduction:
Currently there are no devices able to measure in-shoe plantar strain, induced by peak plantar pressure (PPP) and plantar shear stress (PSS), fundamental precursors of diabetic foot ulcers. STAMPS is a novel system using digital image correlation to measure plantar strain sustained by a deformable insole during gait (Figure 1).

Methods:
A preliminary study of healthy adult participants (no foot pathology) was performed. Participants walked 20 steps with the STAMPS insole, and 10m with the Novel Pedar® plantar pressure measurement insole as a gold-standard comparator, both within standardised shoes. All measurements were repeated thrice. Outcomes of interest were global and regional values for peak strain (SMAG) and PPP.

Results:
In eighteen participants, median peak SMAG and PPP were 31.2% and 410.6kPa respectively. The hallux and heel regions sustained the highest SMAG (27.2% and 16.5% respectively) and PPP (344.8kPa and 279.3kPa respectively). SMAG was strongly correlated with PPP ($r = 0.68$, $p < 0.0001$). Peak SMAG and PPP occurred within the same region in 61.1% participants.

Conclusion:
This study has shown the efficacy of the first in-shoe system to measure plantar strain, strongly correlating to a gold-standard PPP measurement system. It shows potential for in-shoe measurements to inform ulcer risk.



VO49

A survey of surgical site infection prevention practice in UK vascular surgery

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Several international guidelines on SSI prevention have been published in recent years. This study aimed to assess the current practice of SSI prevention among UK vascular surgeons.

An online survey was developed using the current SSI prevention guidelines and piloted in a tertiary vascular centre before being distributed to the members of VSGBI. The survey contained 15 question domains across pre, peri and postoperative phases to establish current SSI prevention practice. The survey was open for responses over one month.

A total of 109 respondents from 47 UK hospitals completed the survey. The median reported SSI rate was 7% (IQR; 5-10%). Lower limb arterial and major limb amputation were highlighted as the highest risk procedures of SSI (92% and 75% respectively). When reviewing surgical wounds, empirical criteria is used alone to diagnose SSI by over half (52%) of respondents. Most use alcoholic skin site preparation (78%) but aqueous based surgical hand suspension (79%). Formal wound surveillance was not undertaken by 74% of respondents.

There is little agreement in current guidelines on the best practice to prevent SSI. Clinical practice additionally shows little consensus on prevention measures used. Well-designed, high-quality trials are needed to provide evidence based recommendations in this field.

VO50

Provision of care for time in critical lower limb ischaemia against the Provision of Services (POVS 2021) guidance

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The Vascular Society (POVS 21 guidelines) set the following benchmark for the care of patients with time for critical lower limb ischaemia. They must have had: a consultant review <14 hours, imaging <24 hours and treatment <5 days.

We wished to compare ourselves with this standard.

All patients with critical lower limb ischaemia were identified between Jul – Dec 2021 and the time of critical assessment, imaging and intervention in their journey were recorded.
Of the 30 patients identified in this time period only 18 patients had complete set of data for all domains. 67% of patients were seen by a consultant within 14 hours, 68% had their initial imaging within 24 hours and 66% of patients were revascularized within 5 days. However, only 33% met the criteria for all 3 timepoints.

The importance of accurate documentation (mainly due to recording of consultant reviews) was noted. However, more capacity is needed in terms of access to cross sectional imaging and Angio/Hybrid suite if we are to improve the outcomes for our patients.

VO51

17 years experience of surgical management of Thoracic Outlet Syndrome at a District General Hospital

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Introduction
This study evaluates the outcomes of patients who underwent First Rib Resection (FRR) for Thoracic Outlet Syndrome (TOS) during a period of 17 years at a single District General Hospital (DGH).

Methods
Retrospective review of patient notes of individuals treated with FRR from August 2004 through to August 2021.

Results
A total of 62 FRR were performed on 51 individual patients. Indications for FRR included 42 neurogenic TOS (68%), 6 venous TOS (10%) and 14 arterial TOS (23%). 34 patients (64%) were female and the mean age at time of surgery was 39 years old (range 27 to 64 years). 11 patients (21%) underwent bilateral FRR and 7 cases of cervical ribs were observed. Outcomes after surgery were positive across all subtypes of TOS. Based on the Derkash's classification; 52 (84%) reported excellent/good, 8 (13%) reported fair and 2 (3%) reported poor resolution of symptoms at 6 month follow up. Complications included pneumothorax 4 (9%), 2 (4%) wound infections, 2 (4%) seromas, 1 (2%) haemothorax, 3 (5%) phrenic nerve complications and 1 (2%) chronic pain.

Conclusion
FRR for TOS can be performed safely and effectively in a DGH environment with excellent patient clinical outcomes.

VO52

Training Effective Surgical Teams (TEST): Initial development and validation of a novel surgical feedback framework prototype

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Background:
The complexity of vascular procedures necessitates excellent team-working for their success. Feedback is key to team-training and sportspeople have sophisticated methods of team feedback. A novel surgical feedback framework was designed based on these and validated.

Method:
Framework design & validation was multimodal: a qualitative interview schedule was distributed to elite sportspeople and a systematic thematic analysis of 16 responses conducted. The Training Effective Surgical Teams (TEST) framework was based on themes extracted.
Validation was conducted at a single tertiary vascular centre. A trained observer facilitated TEST feedback with trainers after operations. 2 self-reported questionnaires assessed TEST validity, usefulness and feasibility. Quantitative methodologies were used for face (FV) (Criteria Impact Scores (CIS)), content (CV) and linguistic validities (LV) (Content Validity Ratios (CVRs)).

Results:
TEST contained 5 learning domains (LDs): technicity, physical ability, tactical awareness, mentality, leadership skills.
TEST was validated over 50 operations. 93% of participants agreed that TEST was feasible (CIS= 3.98). All LDs achieved CV (CVR ≥0.57). All criteria achieved FV (CIS ≥2.0). LV was achieved (CVR ≥0.57) for all domains except technicity (CVR= 0.14) and mentality (CVR= 0.29). Participants deemed TEST useful (CIS ≥2.0).

Conclusion:
TEST is valid, feasible and useful to deliver surgical feedback.

Criteria	Number of Participants rating agreeability as 4 or 5 (14)	Mean score	Impact score
Face validity			
Comprehension	11	4.07	3.20
Clarity	10	3.86	2.76
Layout and Style	13	4.29	3.98
Usefulness			
Increasing frequency of feedback	12	4.00	3.43
Analysing a team's performance	9	4.14	2.66
Structuring feedback to the team	9	4.14	2.66
Identifying good teamwork performance	11	4.14	3.26
Identifying poor teamwork performance	9	3.86	2.48
Providing high-quality feedback	8	3.71	2.12
Providing effective feedback	9	3.93	2.53
Improving the quality of teamwork in the OR	11	4.14	3.26

Table. Face validity and Usefulness criteria impact scores (threshold criterion acceptance score ≥2.0).

VO53

Value of Vascular Surgery Collaboration in Complex Urological Cancer Resection: experience of a large tertiary service

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Introduction
POVS 2021 highlights the role of Vascular Surgeons in assisting other specialties, including cancer resection. We have a collaborative practice with several specialties across various conditions. Here we describe our experience providing a tertiary service for planned resections of advanced or challenging Urological cancers.

Methods
Retrospective case series of all planned Urological cancer resections involving both Urology and Vascular surgery between 01/06/2018 and 01/06/2022.

Results
46 males (median age 34, IQR 27.2 – 47) underwent retroperitoneal lymph node dissection for germ-cell cancer. All cases involved template dissection around aorta and IVC; one case required patch repair of the aorta and another had IVC repair.

34 (radical) nephrectomies were carried out (24M:6F, median age 63, IQR 57.2 – 69.8). 19 cases had tumour thrombus into the IVC, 5 of which extended into the right atrium. 6 cases involved Cardiopulmonary bypass.

One patient required reintervention for aortic thromboembolism. There were no perioperative deaths, nor long-term adverse vascular outcomes.

Conclusion
Vascular Surgeons' skillset allows for complex resections to be performed with good outcomes. Our unit has a well-established collaborative partnership with a number of specialties for cancer resection and other indications; it is feasible that more patients would benefit from this approach.

VO54

The Infected Arterial Pseudoaneurysm Secondary to Groin Injecting Drug Use: A 10-year Retrospective Case Series

MacLeod C[1,2], Dow A[1], O'Neill H[1], Flett M[1], Guthrie G[1], Khan F[2], Radley A[2,3], Nagy J[1], Suttie S[1]
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Infected arterial pseudoaneurysms secondary to groin injecting drug use can be managed by ligation and debridement alone, or with arterial reconstruction. Reconstruction during the index operation or admission in a septic surgical field can risk further life-threatening infective and haemorrhagic complications. This study aimed to report our 10-year regional outcomes.

Retrospective data collection between 01/12/2011-31/12/2021. Patients were identified through discharge codes and a prospective vascular operative database. Demographics, admission, operative details and outcomes were extracted from patient records.

There were 119 groin arterial pseudoaneurysms identified in 869 (466 patients) limb-related admissions secondary to injecting drug use. Of these pseudoaneurysm admissions, 118/119 (105 patients) required ligation, mean age 41.5 (36-61) and 92 (77.3%) were male. One admission was initially managed conservatively, later requiring ligation. Synchronous necrotising soft tissue infections (NSTI) were present in 37 (31.4%) ligations. There were 19 (16%) amputations on the index ligation admission: 12 with NSTI (63.2%; 10 transfemoral amputations [TFAs] and two hip disarticulations) and seven non-NSTI pseudoaneurysms (all TFAs). Seven patients developed chronic limb-threatening ischaemia: five required major limb amputation (one transtibial, four TFAs), one a toe amputation and one had no intervention. No arterial reconstructions were performed.

NSTI may influence outcomes following ligation.

VO55

Improving Safety in the Carotid Surgical Pathway: an Healthcare Failure Mode and Effect Analysis

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Introduction: Healthcare failure mode and effect analysis (HFMEA) has been used to prevent harm in surgical patients. This study aimed to analyse the pathway of symptomatic patients undergoing carotid endarterectomy (CEA), using HFMEA, to improve patient safety.

Methods: The CEA pathway of patients presenting with strokes, transient ischaemic attacks or amaurosis fugax was summarised into process steps and failure modes suggested. A multi-disciplinary panel of 13 stakeholders involved in the care of symptomatic patients undergoing CEA risk-assessed each failure mode, obtaining contributory factors. Recommendations to prospectively prevent these failures were suggested.

Results: Sixty-five organisational failures were identified in 51 process steps. Recommendations were suggested in 5 areas: improve patient recognition of stroke symptoms and educate General Practitioners, Emergency Department Physicians and Opticians to recognise subtle neurological symptoms; improve resource allocation allowing centralisation of stroke and vascular services; implement latest technology to improve documentation, streamline care, enhance efficiency and improve patient safety; use protocol-driven, Consultant-led care to standardise practice in a culture of non-hierarchical, multi-disciplinary team-working; and improve communication between healthcare professionals and patients.

Conclusion: Identification of contributory factors to failures in the CEA pathway of symptomatic patients using HFMEA may allow an optimised pathway to be constructed, reducing adverse events.

VO56

Are major lower extremity amputations well recorded in primary care electronic health data in England?

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Introduction
Major lower extremity amputations (MLEA) are well recorded in Hospital Episode Statistics (HES). It is unclear how well they are recorded in primary care databases[1, 2]. This study compared the recording of MLEA events between HES and Clinical Practice Research Datalink (CPRD)[3, 4.]

Methods
MLEA events were ascertained in CPRD and linked HES between 01/01/2010 and 31/12/2019. The number of events and the number of patients with at least one event in each database were compared. Individual events were matched between the two databases using varying event date matching windows.

Results
A CPRD and HES combined total of 23,262 people had at least one MLEA event recorded within the study period. 39.4% (n=9,153) of which had a record in both CPRD and HES; 37.5% (n=8,716) had a record in HES only and 23.4% (n=5,383) had a recorded in CPRD only. Using the widest date match window, 18.6% (n=10,125) of CPRD events found a match in HES and 37.6% (n = 7,874) of events in HES found a match in CPRD.

Conclusion
MLEAs are not well recorded in CPRD due to factors including re-recording; recording type; and amputations performed abroad. Case-ascertainment of MLEA solely using CPRD would not be recommended.

References

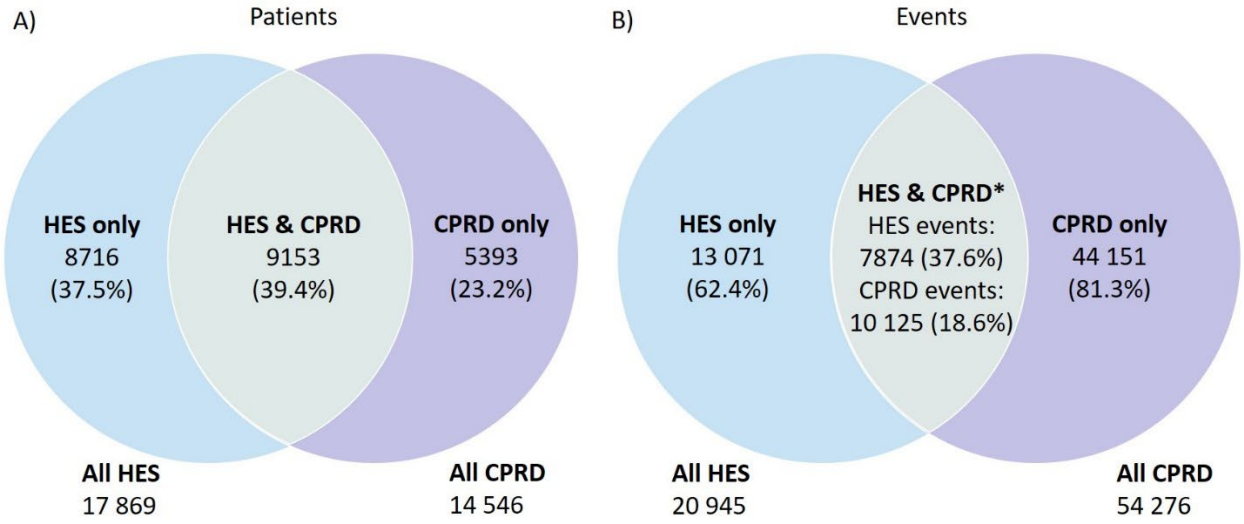
1. Gunn LH, Vamos EP, Majeed A, Normahani P, Jaffer U, Molina G, et al. Associations between attainment of incentivized primary care indicators and incident lower limb amputation among those with type 2 diabetes: a population-based historical cohort study. BMJ open diabetes research & care. 2021;9(1).

2. Meffen A, Houghton JSM, Nickinson ATO, Pepper CJ, Sayers RD, Gray LJ. Understanding variations in reported epidemiology of major lower extremity amputation in the UK: a systematic review. BMJ Open. 2021;11(10):e053599.

3. Wolf A, Dedman D, Campbell J, Booth H, Lunn D, Chapman J, et al. Data resource profile: Clinical Practice Research Datalink (CPRD) Aurum. International Journal of Epidemiology. 2019;48(6):1740-g.

4. NHS-Digital. Hospital Episode Statistics (HES). 2019. [updated 20/03/2019]. Available from: https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics.

Figure 1: Venn diagram of: A) The number(%) of patients with at least one MLEA in HES, CPRD and patients with at least one MLEA in both HES and CPRD. B) The number(%) of events recorded in HES, CPRD and the number of events from each database that are recorded in both. Events were merged with the date window HES admit date to 28 days after HES event date. CPRD – Clinical Practice Research Datalink, HES – Hospital Episode Statistics, MLEA – Major lower extremity amputation. *These differ for each database as there were multiple CPRD events that relate to one HES event.



VO57

A Service Evaluation of the appropriateness of referrals and effectiveness of the Vascular Hot Clinic in a single tertiary centre

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A vascular hot clinic was evaluated for the appropriateness of its referrals and its impact on the time taken to be seen in clinic and receive intervention.

Data were prospectively collected using a bespoke proforma between March 15 – June 9 2021. Statistical analysis was conducted using SPSS® ($p<0.05$).

202 patients attended 33 clinics with 60.9% (n=123) of referrals deemed appropriate. Over half of the inappropriate referrals did not warrant a hot clinic appointment, with 10% considered to be incorrectly referred or triaged. The majority of appointments were new referrals, 35.6% (n=72) were follow-up and 39.6% (n=80) were from primary care. There was no statistically significant association between the source of the referral and its appropriateness. Referrals were considered appropriate where patients had critical limb-threatening ischaemia ($p=0.025$) as their diagnosis and inappropriate in the case of claudication ($p=0.003$). 51.7% (n=75) of all patients were seen within two weeks of referral. 5.0% (n=10) received urgent intervention while 29.7% (n=60) were discharged.

This service evaluation has shown that the hot clinics allowed for a large volume of patients to be urgently assessed and receive the necessary intervention. Future use of the clinic may benefit from referral guidelines for clinicians referring and triaging.

VO58

RUPTURED (Retrospective analysis Undertaken for the Patients Treated for Unexplained Retroperitoneal/ abdominal pain in the Emergency Department)

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Amongst acute abdominal presentations, AAA carries considerable mortality in the elderly. This is supplemented by RCEM guidance on AAA detection offering bedside imaging to individuals with high-risk symptoms over 50 years old presenting with unexplained abdominal, flank, or back pain. The aim of this study was to evaluate the prevalence and mortality rates of AAA in a syndromic high-risk population at a DGH in the UK, and to assess bedside ultrasound scanning rates in A&E.

Retrospective analysis of patients presenting to the A&E from January to June 2021 was performed. Patients over the age of 50 presenting with abdominal, flank, or back pain were included. We further assessed if the presentations indicated for a bedside ultrasound scan.

Of 920 patient meeting inclusion criteria, 361 patients were identified to have an indicated scan. In the syndromic group, the prevalence and 30-day mortality of AAA was 5.5% and 1.1% respectively. Only 6/20 patients with a AAA had been identified on bedside ultrasound with sensitivity of 42.9%.

In conclusion, the detection and bedside scanning rates are in A&E are low. We recommend further multicentric, case-controlled prospective studies to assess the mortality of emergent AAA presentations. Furthermore, improved ultrasound skills can reduce missed diagnoses.

RUPTURED
Retrospective analysis Undertaken for Patients Treated for Unexplained Retroperitoneal / abdominal pain in the Emergency Department

VO59

Female Sex is associated with an Increased Length of Hospital Stay Following Elective Endovascular Repair for Infrarenal Aortic Abdominal Aortic Aneurysms, a Nationwide Study.

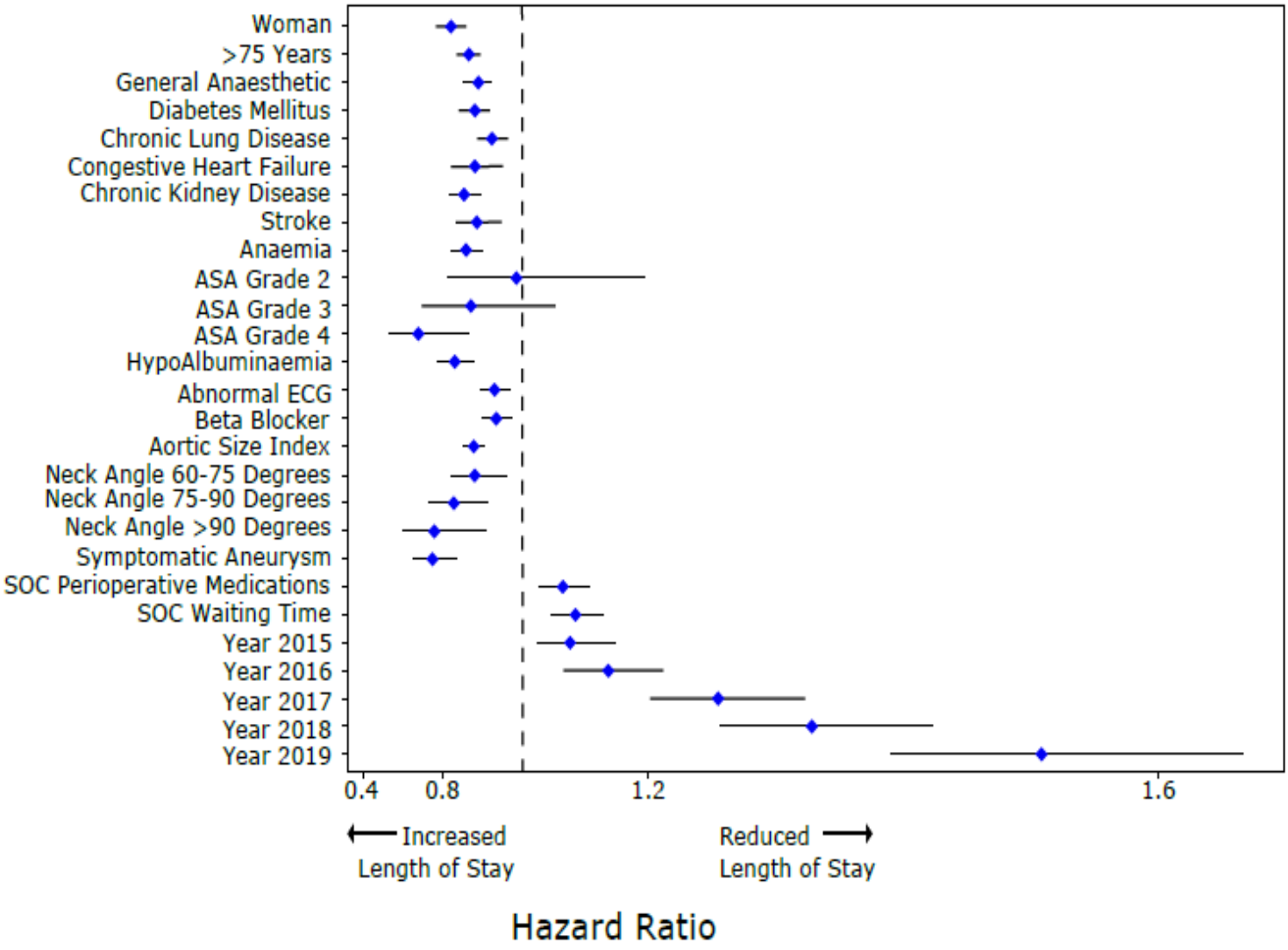
Pouncey A[1], Nicola M[1], Martin G[1], Bicknell C[1], Powell J[1]
[1]*Imperial College London*

Introduction
Length of hospital stay (LOS) for endovascular infra-renal abdominal aortic aneurysm repair (EVAR), is a major driver of cost and reported to be longer for women. This study investigates drivers of LOS and why women stay longer for EVAR.

Methods
Examination of National Vascular Registry elective EVAR patients, 2014-2020. Survival analysis conducted, censoring for in-hospital death. Cox proportional hazard modelling utilised to assess sex-specific difference in LOS adjusting for age, co-morbidity, anaesthetic, year and standard-of-care.

Results
14,050 (12,518 men:1532 women) patients received elective EVAR. LOS was longer for women (restricted-mean 6.55 (standard error (SE)0.59) vs. 4.49 (SE0.12) days, p<0.001). Following multivariable adjustment, early hospital discharge remained less likely for women (Hazard Ratio (HR) 0.81, 95%CI:0.78-0.87). General anaesthetic (HR 0.89 (95%CI:0.86-0.93), age ≥75 years (HR 0.80, 95%CI 0.84-0.90), co-morbidity and anatomical complexity were associated with increased LOS. Treatment within waiting-times and receipt of peri-operative antibiotics/thromboprophylaxis were associated with reduced LOS. Between 2014-2019 LOS reduced for both sexes (restricted-mean change -2.46 vs. -2.18 days; HR 1.54, 95%CI 1.44-1.64).

Conclusion
Women have increased LOS for EVAR, despite adjustment for co-morbidity, standard-of-care and advanced clinical practice. Identification of additional drivers of LOS for women is needed to facilitate fast-track pathways and improve quality-of-care.


Woman
>75 Years
General Anaesthetic
Diabetes Mellitus
Chronic Lung Disease
Congestive Heart Failure
Chronic Kidney Disease
Stroke
Anaemia
ASA Grade 2
ASA Grade 3
ASA Grade 4
HypoAlbuminaemia
Abnormal ECG
Beta Blocker
Aortic Size Index
Neck Angle 60-75 Degrees
Neck Angle 75-90 Degrees
Neck Angle >90 Degrees
Symptomatic Aneurysm
SOC Perioperative Medications
SOC Waiting Time
Year 2015
Year 2016
Year 2017
Year 2018
Year 2019
0.4
0.8
1.2
1.6
Increased Length of Stay
Reduced Length of Stay
Hazard Ratio

VO60

The impact of variation in treatment modality on reintervention rate and survival of men referred from NHS abdominal aortic aneurysm screening programme (NAAASP)

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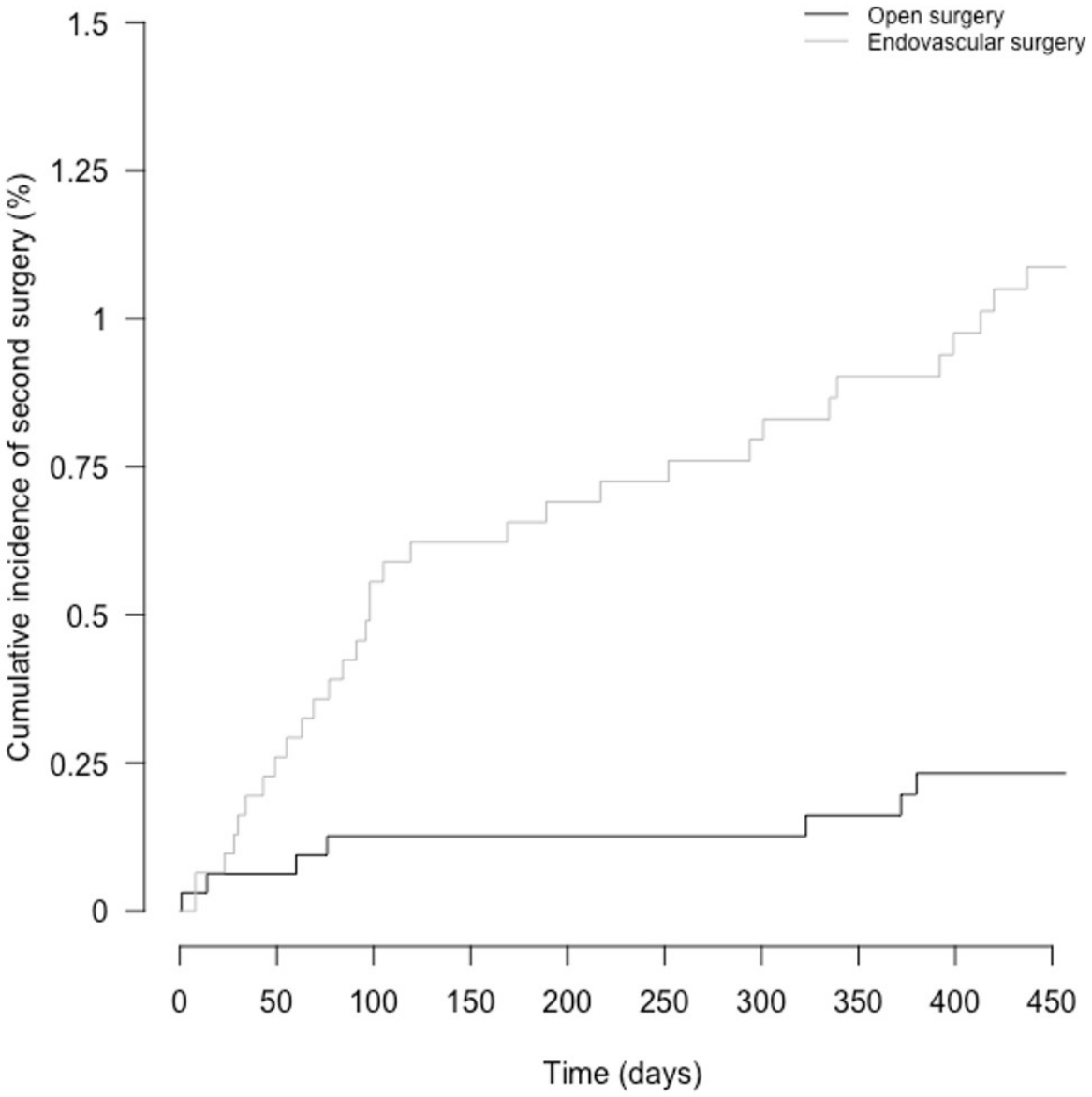
[1]NHS England, [2]Office for Health Improvement and Disparities

Background: NAAASP data suggests wide variation in the proportion of men treated with open repair versus endovascular aneurysm repair (EVAR). This study assessed whether treatment modality impacts reintervention rate and survival.

Methods: Thirteen years of data from NAAASP were analysed using MSExcel and R. Reintervention rate was examined using Cox proportional hazards with time to event (second surgery) compared between groups, adjusting for patient characteristics. All-cause mortality over 15 months following primary surgery was similarly examined.

Results: 6,744 repairs were performed on 6,588 men, with 145 men experiencing multiple AAA surgeries. The overall ratio of EVAR: open surgery was equal. Reintervention rate was five-fold higher for EVAR (hazard ratio [HR]4.87 [95%CI 2.26 – 10.47]) compared to open repair. 161 men died in the 15 months following initial surgery. Those treated with EVAR had a reduction in risk of death for the first 15 months compared to open repair (HR 0.57 [95%CI 0.41 – 0.79]). Risk of death was also significantly associated with emergency surgery, age and deprivation (all $p<0.05$).

Conclusion: Reintervention was five times more likely for EVAR patients compared to open surgery. This risk should be an important consideration when obtaining informed consent for AAA repair.


Open surgery
Endovascular surgery
Cumulative incidence of second surgery (%)
1.5
1.25
1
0.75
0.5
0.25
0
0
50
100
150
200
250
300
350
400
450
Time (days)

VO61

Evaluation of Standard of Care Provided for Infra-renal Abdominal Aortic Aneurysm Repair: An Analysis Stratified by Sex and Repair Type Utilising National Vascular Registry Data.

Pouncey A[1], Nicola M[1], Charles E[1], Martin G[1], Bicknell C[1], Powell J[1]
[1]*Imperial College London*

Background
National guidance standards for infra-renal abdominal aortic aneurysm (IRAAA) repair should facilitate consistent, high-quality care. This study assessed standard-of-care (SOC) provided to men and women in the UK.

Methods
Analysis of elective IRAAA repairs from the National Vascular Registry, 2014-2020. SOC variables - pre-operative assessment (multidisciplinary/anaesthetic review); waiting-times; peri-operative medication (antibiotics/thromboprophylaxis); and cardiovascular risk prevention - defined using AAA-QIP, NICE and ESVS guidance. Analyses stratified by sex and repair-type.

Results
19430 men and 2380 women underwent IRAAA repair: 7667 open and 14143 endovascular. SOC pre-operative assessment was reported in <75% patients, with no sex-specific differences. SOC waiting-times were achieved in <64% and lower for women (open:62.9% vs 48.2%, p<0.001, endovascular:57.9% vs 53.3%, p=0.003). SOC peri-operative medication was low, especially in women (e.g. open:43.2% vs 38.5%, p=0.01). Women more often met SOC cardiovascular risk prevention standards (e.g. open:53.8% vs 55.5%, p =0.001), but less often received secondary prevenative treatment for cardiac disease. Waiting time outside SOC was associated with increased mortality.

Conclusions
All SOC domains were reported as deficient for both sexes. Waiting time targets were not met in the majority of patients. Scrutiny of SOC provision and cardiovascular risk assessment is needed to minimise modifiable risk in this population.

Table 1. Sex-specific differences in standard of care

Abbreviations:, CVD – Cardiovascular Disease, EVAR – Endovascular Aortic Repair, IHD – Ischaemic Heart Disease , IRAAA – Infrarenal Abdominal Aortic Aneurysm, OAR – Open Aortic Repair, p = p value, SD – Standard Deviation.

	All IRAAA			OAR			EVAR		
	Men	Women	p	Men	Women	p	Men	Women	p
n	19430	2380		6826	841		12604	1539	
Standard of Care n (%)									
Pre-op assessment	14084 (72.5)	1717 (72.1)	0.742	4887 (71.6)	613 (72.9)	0.455	9197 (73.0)	1104 (71.7)	0.319
Within waiting time targets	9279 (59.6)	983 (51.5)	<0.001	3460 (62.9)	327 (48.2)	*<0.001*	5819 (57.9)	656 (53.3)	0.003
Waiting time mean (SD), days	61.59 (62.21)	68.97 (63.64)	<0.001	58.95 (62.16)	76.08 (71.93)	<0.001	63.04 (62.20)	65.03 (58.20)	0.285
CVD prevention	9190 (47.3)	1241 (52.1)	<0.001	3669 (53.8)	467 (55.5)	0.001	5521 (43.8)	774 (50.3)	<0.001
IHD prevention soc|not soc	2902|4424 (39.6)	241|450 (34.9)	0.015	893|1201 (42.7)	76|133 (36.4)	0.08	2009|3223 (38.4)	165|317 (34.2)	0.07
Peri-op medications	8392 (43.2)	977 (41.1)	0.049	2952 (43.2)	324 (38.5)	0.010	5440 (43.2)	653 (42.4)	0.604

VO62

Holistic and tailored strategies for AAA management – an ADAPTive approach

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Introduction
Our unit has followed the NAAASP surveillance protocol; recent work identified this to be inefficient in certain patient cohorts, such as the elderly, frail or very comorbid. We developed an Aortic Advance Decision and Planning Team ("ADAPT") within our AAA pathway, aiming to improve efficiency and appropriateness of ongoing surveillance and to provide advance care planning opportunities.

Methods
Suitable patients on active trust-based AAA surveillance, and those from MDT discussions, were invited onto the ADAPT pathway, including counselling and discussion of AAA management options, with cessation or modification of surveillance and ReSPECT decisions. Here we report the early results.

Results
An initial 72 nonagenarians were identified from 681 active surveillance patients. 8 Aortic-ADAPT clinics so far, between March and July 2022, have reviewed 26 patients from in-house surveillance and 7 from MDT discussions (23 face-to-face appointments and 10 telephone consultations).

Onward imaging requirements reduced from 78 to 27 scans per annum. Initial patient feedback is positive, with notable improvement in patients' knowledge and opportunity to tailor their management.

Conclusion
Our Aortic-ADAPT service offers a platform to review appropriateness of ongoing surveillance and formulate advance decisions. It reduces burden, direct and indirect costs for both patients and the Vascular service.

VO63

Fractured Proximal Nitinol Ring in Fenestrated Anaconda Stent Graft Device

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Introduction:
Fenestrated endovascular stent-grafts have been widely used such as Terumo Aortic Anaconda Aortic Stent Graft System™. This study reports a multi-centre experience of Anaconda Stent Graft proximal ring fracture.

Methods:
A retrospective multi-centre analysis of fenestrated endovascular aortic aneurysm repairs (FEVAR) with the Anaconda Stent Graft from 2010 to 2021, and developed proximal ring fractures in the Freeman Hospital, Newcastle and the Royal Derby Hospital, Derby.

Results:
15 patients (median age 70 years [61-88]) out of 258 (5.8%) who underwent FEVAR with the Anaconda Stent Graft, developed incidental fractures of the proximal sealing ring on routine surveillance. Over 50% of the fractures were detected 1-2 years following implantation. Two-third of the fractures were either fully augmented or fenestrated valley Anaconda designs. Three Fenestrated Anaconda was associated with 60% of detected fractured devices. One patient developed sac expansion associated with stent graft migration and sealing zone dilatation, requiring re-intervention (0.4%). Four cases showed sealing ring wire dislocation to the surrounding tissue/organs.

Conclusion:
Stent fractures highlight the importance of surveillance following aortic endografting. A wider review is required to understand the clinical consequences of stent fracture as well as adverse anatomical prognostic features.

VO64

Indocyanin Green Fluorescence to Evaluate Colonic Perfusion during Open Abdominal Aortic Aneurysm Repair: a Pilot Study

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Introduction:
A devastating complication of open abdominal aortic aneurysm repair (OR) is colonic ischaemia. Indocyanin Green (ICG) dye demonstrates fluorescence at near-infrared frequencies and is utilised in colorectal surgery to determine colonic perfusion. This study aimed to determine whether ICG could be used to interrogate colonic perfusion during OR.

Methods:
All patients undergoing OR in a single centre during a 6-month period were recruited. Patients were excluded for the following criteria: rupture, anaphylaxis, previous colonic resection or clinical concern by the operating team. ICG was given according to protocol and measured using SPY-PHI (Stryker, MI USA). Primary outcome measure was colonic ischaemia and time to maximal fluorescence.

Results:
9 patients fulfilled the inclusion criteria. All were male, with average age 69.2 years. 44.4% had patent inferior mesenteric arteries and re-implantation was performed in 55.5%. Average time to maximal fluorescence was 50 seconds. One patient had poor sigmoid florescence after 3 minutes. Colorectal surgery did not recommend resection. Hartmann's procedure was performed at re-look laparotomy 48 hours later for ischaemic colon. The patient was discharged without further complication.

Conclusion
This study demonstrates safe use of ICG to interrogate colonic perfusion during OR and delayed fluorescence appears to correlate with poor perfusion.

VO65

Branched endovascular repair of thoracoabdominal aortic aneurysms; an 18-year experience.

Patel S[1], Ormesher D[1], Brennan J[1,2], McWilliams R[3], Neequaye S[1,2], Smout J[1,2], Torella F[1,2], Vallabhaneni S[1,2], Fisher R[1,2]

[1]Liverpool Vascular and Endovascular Service, Royal Liverpool University Hospital, [2]Liverpool Cardiovascular Service, Liverpool Heart and Chest Hospital, [3]Department of Interventional Radiology, Royal Liverpool University Hospital

Introduction

Outcomes of branched endovascular aneurysm repair (BEVAR) in the U.K. are seldom reported in detail. Our aim was to report perioperative and medium-term outcomes after BEVAR at a specialist centre.

Methods

Case records and digital imaging reports of patients at our regional centre were retrospectively interrogated. Data were collected regarding baseline demographics, anatomical details, operative information, and outcomes. Analysis was performed using R Studio.

Results

Sixty-eight BEVARs were conducted electively between March 2004 and June 2022 (median age was 72 and 65% were male); 53% of repairs were staged (median time to second stage was 32 days). Spinal drains were used in 64% of cases. Perioperative mortality, spinal cord ischaemia and reintervention rates were 5.9%, 14.7% and 11.8% respectively. Females had higher 90-day mortality than males (13% versus 4%). Median follow-up was 2 years 8 months. Median survival was 3 years 9 months. At 3 years, freedom from graft-related endoleak and freedom from reintervention were 75% and 70% respectively.

Conclusion

Branched endovascular repair of thoracoabdominal aneurysms is associated with significant risk of death and major complications, even in a specialist centre. Overall survival in this cohort is poor, and judicious patient selection is crucial to achieve the best outcomes.

Peri-operative outcomes (Death and major complications)		
	n (/68 cases)	%
Death within 30 days	**4**	**5.9**
Death within 90 days	**5**	**7.4**
Technical Failure (i.e., Repair never completed)	**9**	**13.2**
Spinal Cord Ischaemia (SCI) – total (permanent)	**10 (7)**	**14.7 (10.3)**
SCI – paraparesis total (permanent)	5 (3)	7.4 (4.4)
SCI – paraplegia total (permanent)	5 (4)	7.4 (5.9)
Spinal Haematoma	**2**	**2.9**
TIA or Stroke	**2**	**2.9**
Posterior Reversible Encephalopathy Syndrome	**2**	**2.9**
Type A retrograde dissection	**1**	**1.5**
Myocardial Infarction	**8**	**11.8**
Pneumonia	**13**	**19.1**
Acute Kidney Injury (AKI) – 50% increase in Cr	**18**	**26.5**
AKI requiring Dialysis	3	4.4
GI Ischaemia	**3**	**4.4**
Lower Limb Ischaemia	**1**	**1.5**
Bleeding requiring return to theatre	**1**	**1.5**
Visceral Vessel Complication	**7**	**10.3**
Visceral artery dissection	3	4.4
Loss of patency	1	1.5
Stent dislocation	1	1.5
Stent fracture	1	1.5
Visceral stent-related endoleak	4	5.9
Re-intervention	**8**	**11.8**

VO66

Threshold for isolated iliac artery aneurysm intervention: a systematic review and meta-analysis

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Introduction:
Concern has been expressed at the universal threshold for iliac artery aneurysm intervention. This review aimed to analyse the outcomes of isolated iliac artery aneurysm repair.

Methods:
A systematic search using the following databases of PubMed, Scopus, Embase and Medline via OVID, and the Cochrane Library, were searched to January 2022. The review was in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses, and included studies were quality assessed.

Results:
35 studies were included for analysis, with a total of 1041 patients (86% male, mean age 72.33). Median follow up of 27 months (IQR 18.6). 71% of patients underwent endovascular repair. 10% of patients ruptured having emergent intervention.

Electively, median aneurysm size at operative intervention was 43.5mm (IQR 7.63). Outcomes were stratified for < 40mm and > 40mm, both endoleaks (64%) and short-term mortality (60%) were higher in the < 40mm group ($p < 0.05$).

Conclusion:
The present data suggests that serious consideration should be given to revise the current threshold of iliac artery aneurysm intervention, emphasising that risk of rupture in the literature is very low with aneurysms < 40mm. International registry data analysis is required to justify such proposals.

VO67

Evaluation of abdominal aortic aneurysm surveillance in octogenarians and nonagenarians

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[1]*Lancashire Teaching Hospitals*

Background
Despite an ageing population, there is very limited data on abdominal aortic aneurysm (AAA) surveillance in octogenarians and nonagenarians. We evaluated AAA surveillance and outcomes in our patients, aged 80 years and above, with a first-time diagnosis of AAA.

Methods
A retrospective review of our regional AAA surveillance database. Data collected included patient age, sex, date of scans, initial and latest size of aneurysm, time under surveillance, total number of scans and outcome.

Results
Out of 824 patients, 354 were 80y or above at the time of referral. Median follow up was 40 months (range 5-178m). Forty patients (11.3%) reached threshold while on surveillance but only 6 patients (1.7%) underwent surgical intervention. Throughout the surveillance period only 72 patients (20.3%) were discharged from surveillance, around one quarter of those requested by the patients themselves. 28.2% (100/354) died while on surveillance

Conclusion
There is little evidence to support AAA surveillance in octogenarians with first-time diagnosis of AAA, except in highly selected cases. Surveillance should be individualised depending on patient factors and expected long term survival.

VO68

Evolution of a Combined Endovascular and Laparoscopic Endoleak Repair for Expanding Abdominal Aortic Aneurysms with Persistent Recurrent Endoleaks

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[1]East Suffolk & North Essex NHS Foundation Trust, [2]Mid Essex Hospital Services NHS Trust

Introduction
Poor long-term durability of EVAR increases likelihood of re-intervention, and we are seeing increasing numbers of endoleaks as stents age. When conventional reinterventions (coiling, banding, proximal stenting) fail, patients may be left with expanding large AAA with increased rupture risk. A Combined Endovascular and Laparoscopic Endoleak Repair (CEALER) was developed for high-risk complex patients with recurrent endoleaks.

Methods
We conducted a prospective analysis in 19 patients offered CEALER with expanding AAA (after EVAR). This hybrid approach involved endovascular intervention to reinforce non-IFU sealing zones and extravascular laparoscopic intervention to seal significant endoleaks.

Results
Mean age was 81, with high mean predicted V-POSSUM mortality (12.9%) and morbidity (70.9%). 57.9% had recurrent type-I endoleaks and 100% had type-II endoleaks at referral. After CEALER, aneurysm sac expansion initially ceased in all patients. AAA diameter reduced in 75% (mean 11.2mm), increased in 12.5% (mean 2.5mm) and was unchanged in 12.5%. At mean follow-up (41 months), 70.6% had successful index endoleak closure. 29.4% had index endoleak recurrence, but only 2 patients had increased sac size. 30-day mortality was 10.5%. Only 1 aneurysm-related death occurred during follow-up.

Conclusion
Our results with CEALER are promising and may be a long-term solution in patients with recurrent endoleaks.

VO69

The obesity paradox in patients undergoing elective abdominal aneurysm repair

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[1]*Lancashire Teaching Hospitals*

Background
There is conflicting data on the effect of BMI on survival after aneurysm repair. The obesity paradox has been observed in various disorders, including peripheral arterial disease (PAD). We investigated the effect of BMI on long term survival in patients undergoing elective abdominal aortic aneurysm (AAA) repair.

Methods
Retrospective review of vascular database over a 5-year period of all patients undergoing elective AAA repair. Data collected for patient demographics, Body Mass Index (BMI) and overall survival. Patients were sub-grouped into normal (<25 kg/m2), overweight (25-29.9kg/m2) and obese (30+ kg/m2). Kaplan-Meier analyses performed for each BMI subgroup.

Results
224 patients underwent endovascular repair (EVAR) and 74 open repair (OR) with a mean BMI of (27.7). Two-year mortality was similar between OR, EVAR and overall but after that there is a clear better long-term survival in higher BMI patients undergoing OR (p=0.036), EVAR (p=0.100) and overall (p=0.016).

Conclusion
The 'obesity paradox' appears to exist in patients undergoing elective AAA repair similar to PAD. Lowest BMI and sarcopenia could be contributing factors, but this phenomenon is not yet fully understood. The effect of BMI on long term survival should be considered in patient selection for elective AAA repair.

VO70

End of Life Care and Advance Care Planning for Outpatients with Inoperable Aortic Aneurysms – A Multicentre Cohort Study

Davies H[1], Vleugels M[2], Kwan J[1], Aerden A[2], Wyld L[1], Anthony R[1], Wallace T[1], Fawcett L[1], Khan A[1], Van Den Beuken-Van Everdingen M[2], Schurink G[2], Mees B[2], Scott D[1]
[1]Leeds Teaching Hospitals Trust, [2]Maastricht University Medical Center

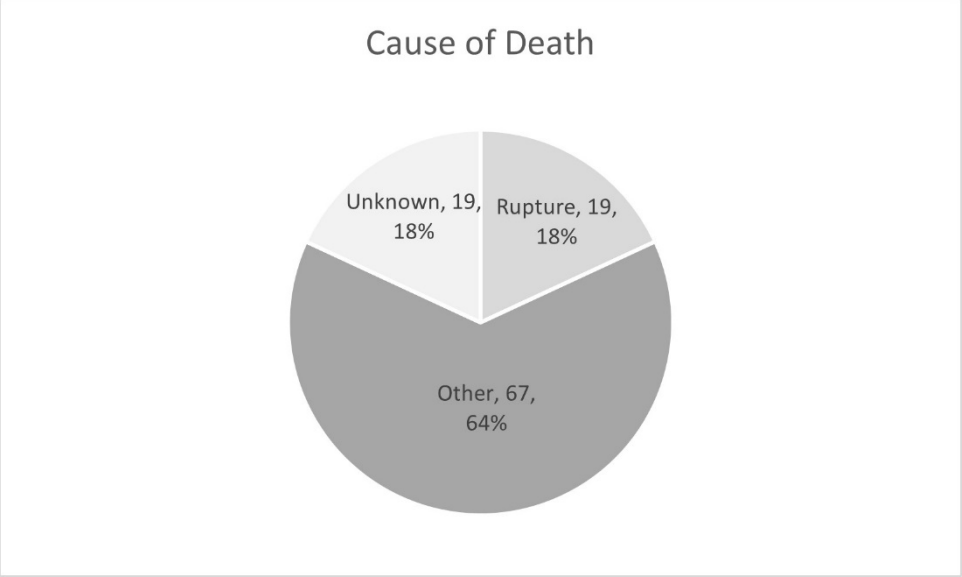
A significant proportion of patients with aortic aneurysms (AA) do not proceed to intervention after reaching treatment threshold diameter. There exist no studies on the end-of-life (EoL) care they receive.

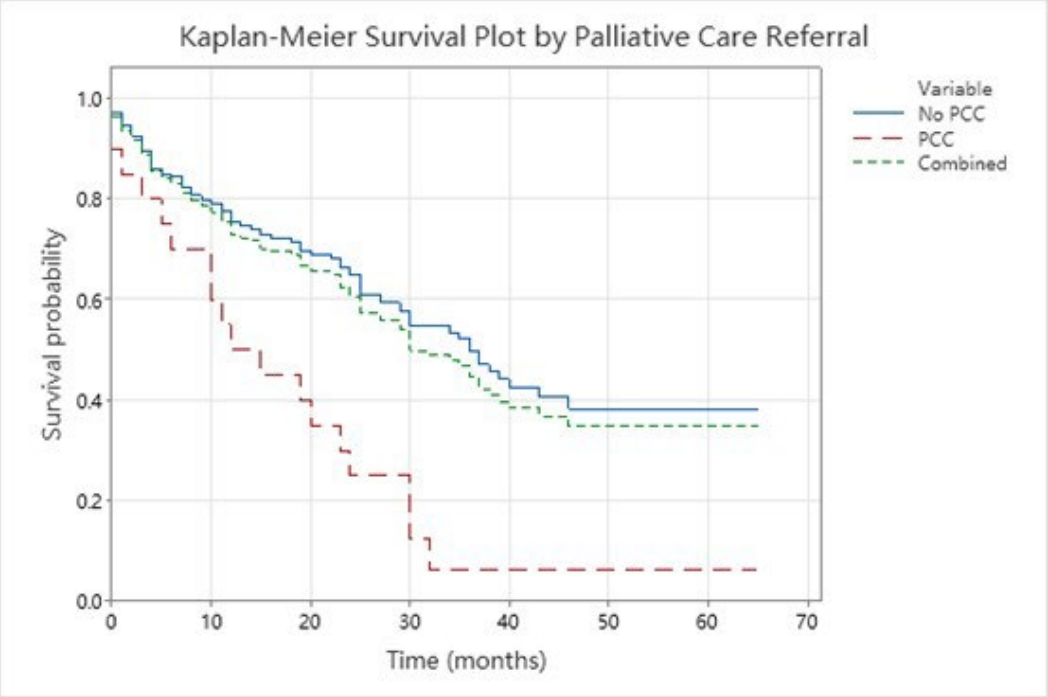
This is a multicentre cohort study of 220 conservatively managed AA patients of 1506 referred to Leeds Vascular Institute and Maastricht University Medical Centre for intervention between 2017 and 2021.

Demographic details, mortality, cause of death, advance care planning (ACP) and palliative care (PC) outcomes were analysed to examine predictors of PC referral and efficacy of palliative care consultation (PCC).

There was a 3-year mortality rate of 55%, a median survival of 364 days and rupture was the reported cause of death in 18% of the decedents. Median follow up was 34 months. Only 8% of patients received PCC, which took place a median of 3.5 days before death. Only 5% of conservatively managed patients had documentation of preferred place of death. Patients with PCC were more likely to have these in place.

Only a small proportion of conservatively treated patients had ACP and this was far below NICE 2019 EoL guidelines, which recommends it for each of these patients. Pathways should be implemented to ensure these patients EoL care.





Palliative care outcomes for 220 conservatively managed AA [diameter > 55m (abdominal) or >60mm (thoracic)] comparison by palliative care referral				
	PCR n=20	**No PCR n=200**	**OR [95%CI]**	***P* Value**
Documentation of preferred place of care and death	7 (35)	12 (6)	8.4 [2.8, 25.1]	<0.001[a]
No documentation	13 (65)	188 (94)		
Documentation of care priorities	9 (45)	41 (21)	3.2 [1.2, 8.2]	0.02[a]
No documentation	11 (55)	159 (80)		
Documentation of family involvement in ACP discussions	8 (40)	26 (13)	4.5 [1.7, 12.0]	<0.001[a]
No documentation	12 (60)	174 (87)		
	PCR (d) n=20	**No PCR (d) n=200**	**Estimation for difference [95%CI]**	***P* Value**
Days in hospital in last 6 months of life (median (IQR))	4.5 (19.5)	3.0 (12.3)	1 [-2, 5]	0.4
Days in ICU in last 30 days of life (median (IQR))	0.0 (0)	0.0 (0)	0.0 [0, 0]	>0.05
	PCR (n) n=20	**No PCR (n) n=200**	**Estimation for difference [95%CI]**	***P* Value**
Number of unplanned hospital admissions in last 6 months of life (median (IQR))	1 (1)	1 (1)	0.0 [0, 0]	0.8

[a] Pearson χ^2 test; PCR, palliative care referral; d, days; n, number; IQR, interquartile range; OR, odds ratio

VO71

A 10-year longitudinal cohort study assessing growth rates for common iliac artery aneurysms in a single tertiary vascular centre.

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[1]Leeds Vascular Institute, Leeds Teaching Hospitals Trust, [2]Leeds Institute for Cardiovascular and Metabolic Medicine

Background
Common iliac artery (CIA) aneurysms beyond 1.8cm in men and 1.5cm in women are considered aneurysmal. This 10-year longitudinal cohort study investigated CIA growth rates at a single tertiary vascular centre in northern England as their natural history is poorly understood.

Methods
Patients diagnosed with an IAA at a single vascular centre between 1st January 2010 and 31st August 2021 were identified from a prospectively collected departmental database. The primary outcome included diameter-based mean aneurysm growth rates. Statistical analysis with SPSS® was performed using chi-squared tests.

Results
Of the 203 patients in this study, 90.6% were men and median (IQR) age at detection was 77 (71-83). CT was most frequently used as the imaging modality for surveillance (66.3%), followed by ultrasound scan (29.8%) and MRA (3.9%). Mean (SD) CIA diameter at rupture was 4.6 (2.4)cm. Growth rate for CIA aneurysms at 2-2.9cm were 0.8mm/year, 3-3.9cm were 3.5mm/year, 4-4.0cm were 9.4mm/year, 5-5.9cm were 2.9mm/year and >6cm were 13.8mm/year.

Conclusion
CIA aneurysms demonstrate a trend towards faster growth as they enlarge and may require more frequent clinical assessments, surveillance and consideration for repair prior to rupture.

CIA diameter, cm	Rate of growth, mean (SD); mm/year
2-2.9	0.8 (10.6)
3-3.9	3.5 (15.1)
4-4.9	9.4 (26.5)
5-5.9	2.9 (4.6)
>6	13.8 (7.9)

Table 1 showing mean rate of growth and median interval surveillance for CIA aneurysms within this cohort.

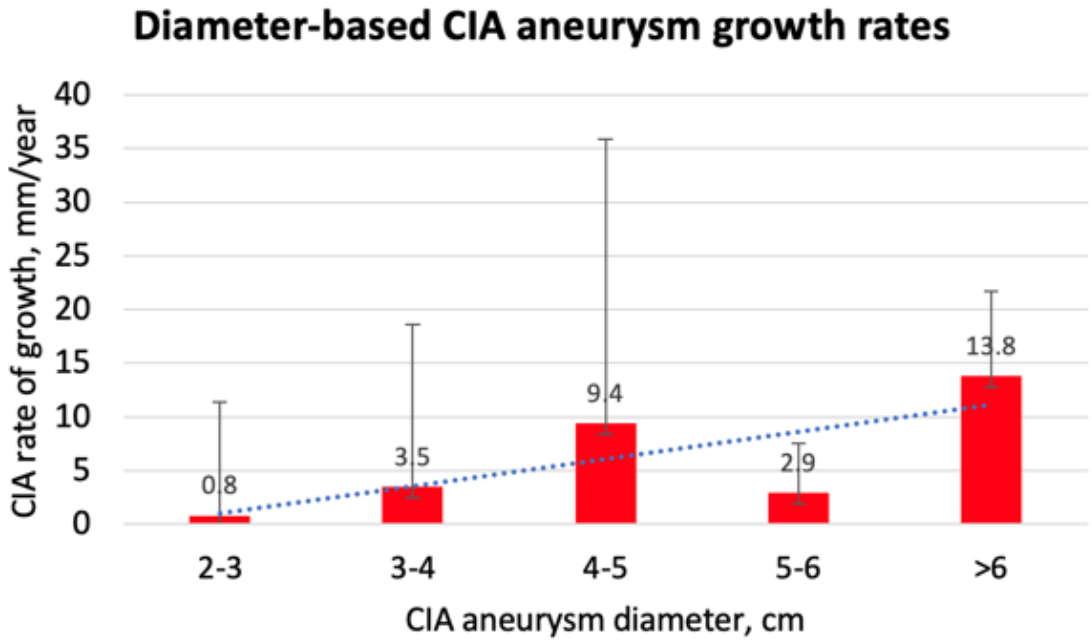

Figure 1 showing CIA aneurysm growth rates

VO72

The impact of abdominal aortic aneurysm surveillance in octogenarians on regional vascular centre

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Background
The number of octogenarians on surveillance for Abdominal Aortic Aneurysm (AAA) across the UK is not known and the impact of that on the vascular centre's workload is not well defined.

Methods
We performed a retrospective review of AAA surveillance database in our regional vascular centre. Data collected included patient age at time of diagnosis, sex, AAA size, time under surveillance, total number of scans, and long-term outcome. Patients were divided into 3 groups, group1 (80-<85y), group2 (85-<90y) and group3 (90+y).

Results
354 patients were identified undergoing 1,564 scans. 217 patients in group1, 122 in group2 and 15 in group3. Median follow up was 40 months (range 5-178m). Around 8% of patients had an aorta <3cm. Although 8.3%, 14.8% and 26.7% of each group reached the threshold respectively, only 2.3%, 0.8% and 0% had intervention. No patient in group1 with AAA <3.5cm and AAA <4cm in group2 at the time of diagnosis proceeded to have an intervention during the surveillance period.

Conclusion
There is a significant waste of resources on AAA surveillance in octogenarians especially in those less than 4cm. There is a need for a nationwide audit to define a "selection criteria" for AAA surveillance in this group.

VO73

Small abdominal aortic aneurysms in the over 85s, a qualitative study of patient perceptions and experience when considering coming off surveillance

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Background
Recently instigated local practice involves contacting all patients aged ≥85 with small AAAs to offer them removal from surveillance. Reasons why patients opt to remain on surveillance, or come off, is unknown.

Methods
All patients aged ≥85 who had a consultation regarding ongoing surveillance of small AAAs, and provided consent, were contacted by a psychologist, who collected data on factors influencing surveillance decision-making.

Results
24 patient (20 male, mean age: 86.9 years) were interviewed. 8 had opted to remain on surveillance.

No age difference was seen with opting-in versus opting-out. Most felt surveillance was important (90.9%), and made them feel safer (72.7%), with rates being lower in those opting out of surveillance compared to those remaining on surveillance.

The majority (72.7%) thought they knew what happened when their aneurysm reached threshold, what happened when a large AAA is not fixed (63.6%) and how major AAA surgery is (59.1%). However, actual knowledge was poor; 56.3% thought that a threshold AAA equated to certain death or rupture, whilst 37.5% thought immediate surgery was required. Most understood surgery was major.

Conclusion
Whilst most patients find surveillance reassuring, knowledge of AAA management at threshold is poor, which may impact continuing surveillance decision making.

VO74

Long term outcomes after superior mesenteric artery angioplasty

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Superior mesenteric artery (SMA) angioplasty is an established therapy for chronic mesenteric ischaemia. This study aims to describe the long-term outcomes of endovascular intervention for chronic superior mesenteric occlusive disease.

Consecutive patients undergoing endovascular treatment of the SMA for mesenteric ischaemia between 2006-2021 were studied. Outcome was assessed in terms of survival, freedom from symptoms and need for reintervention.

Eighteen patients were studied. There were 13 (72%) women and five (18%) men. Mean (SD) age was 65 (11) years. Sixteen (89%) patients were treated electively and two (11%) as an emergency. Post prandial pain and weight loss were the most common symptoms. All procedures were technically successful, but one (6%) patient died after treatment and one patient required an emergency bowel resection. At 1-year follow-up, survival, symptom-free survival and freedom from reintervention were 78%, 56% and 72% respectively. At 3-year follow-up survival, symptom-free survival and freedom from reintervention were 44%, 11% and 44% respectively.

Superior mesenteric artery angioplasty is a useful tool in the elective and emergency management of SMA occlusive disease. However, the majority of patients were dead or required reintervention within 3 years.

VO75

A novel algorithm for pre-operative prediction for the development of post-operative paraplegia after thoracoabdominal aortic aneurysm repair

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Introduction

Paraplegia post-thoracoabdominal aortic aneurysm repair is an unpredictable and devastating complication. Identification of risk factors has proved controversial and predicting operative risk of paraplegia challenging. This paper aimed to identify risk factors in the development of paraplegia and create a novel algorithm to provide more personalised, accurate risk-stratification of this debilitating complication.

Methodology

Patients undergoing thoracoabdominal aortic aneurysm repair were recruited across three high volume units into a prospectively maintained database between October 2016- June 2019 (n=107). AA total of 52 variables were recorded. Risk factor identification was achieved using univariate analysis. Pre-operative predictive algorithm was created using multi-logistic regression.

Results

8 patients were diagnosed with permanent paraplegia. 4 independent risk factors were identified in development of paraplegia namely; pre-operative creatinine, pre-operative patency of the left and right internal iliac and left subclavian arteries. A predictive algorithm incorporated these variables and coverage of aorta using a multi-logistic regression. Area under the receiver-operator curve was found to be 0.93.

Conclusion
This paper has identified risk factors for the development of paraplegia post-TAAA repair and demonstrated patency of each internal iliac as independent factors. We have created a novel algorithm for clinicians to pre-operatively stratify a patient's individual risk of paraplegia.

VO76

Restoration of an abdominal aortic aneurysm screening programme using the mass vaccination sites model-the initial experience.

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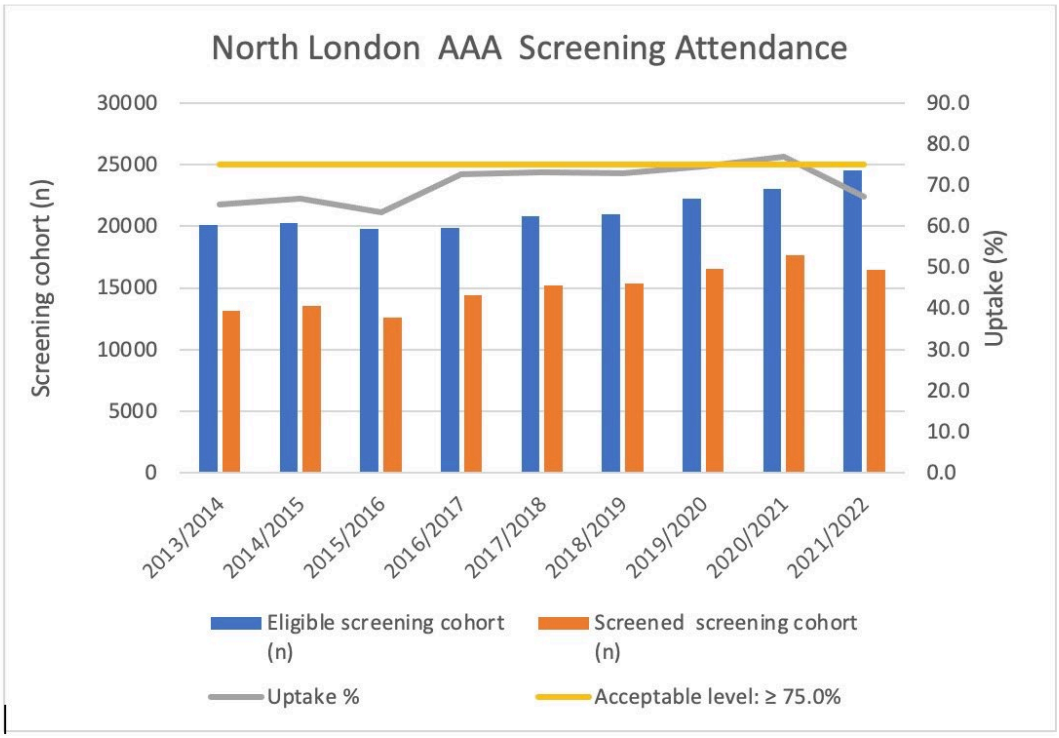
Introduction
March 23 2020 was the start of the first UK lockdown and the temporary closure of the London Abdominal Aortic Aneurysm screening programmes (AAASP). During restoration of services from 2020 to 2022 there was an increasing cohort of men within the screening programme who had not been invited to attend for screening. This resulted in the North and South London AAASP teams developing an initiative to trial mass AAA screening events.

Methodology
The establishment of the UK mass vaccination programme allowed us to use a similar model to deliver AAA screening. These events were undertaken in addition to the routine screening clinics and took place on Saturdays.

The first event was held at Queens Park Rangers football stadium with subsequent events at a health centre, a Church and community centres. The sites were selected in areas with high deprivation and historically low uptake of AAA screening.

Conclusion
Mass AAA screening events have been established and successfully delivered in London to the benefit of men in the screening programme. Staff delivering these events have also commented on their enjoyment in delivering these events within a larger team and in novel sites.



Results

The table below outlines the results of the mass AAA screening events:

Event Site	Invited men	Cancellations	Attended	%
QPR Football Stadium	230	30	95	48%
Killick Street Health Centre	432	82	190	54%
Kinsgate Church Kingston	551	70	241	50%
Kate Fassnidge Community Centre Uxbridge	285	91	217	74%

VO77

The validity of elective abdominal aortic aneurysm (AAA) repair in the elderly

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Background: Trial data confirms that open (OSR) and endovascular repair (EVAR) are effective interventions for treating abdominal aortic aneurysms (AAA), yet recruited patients were <80years, whereas in current practice many treated patients are over 80years. We aimed to establish whether OSR and EVAR outcomes are acceptable in the elderly and if long-term survival warrants elective intervention.

Method: Consecutive patients (2012-2020) undergoing elective AAA intervention in the Thames Valley were prospectively recruited. Demographics, co-morbidity, intervention, and outcome were recorded, and multivariate survival analysis performed.

Results: Of 660 patients (26.5% ≥80yrs) with 5.5yrs (IQR: 3.855) follow-up; patients undergoing EVAR were older (mean 77.98 years [SD: 6.66], p=<0.001) with greater cardiovascular burden (59.7%, p=0.001) compared to OSR (Table1). In octogenarians, 30-day mortality was similar to non-octogenarians: OSR (3.704%, p=0.15); EVAR (1.35%, p=0.32). 3-and 5-year mortality was higher in octogenarians: OSR-5YR (40.91% vs 19.35%, p=0.01); EVAR-5YR (44% vs 30.0%, p=0.005) (Image1). Multivariate analysis confirmed that only age was independently associated with survival, which was very low in patients aged ≥85yrs (39.62% vs 73.38% (<85 years), p<0.001).

Conclusion: Short-term OSR and EVAR outcomes for elderly patients are acceptable, yet very poor 5-year survival questions the benefit of elective intervention, especially for patients aged ≥85yrs

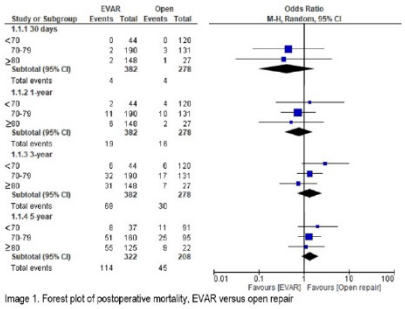

Image 1. Forest plot of postoperative mortality, EVAR versus open repair

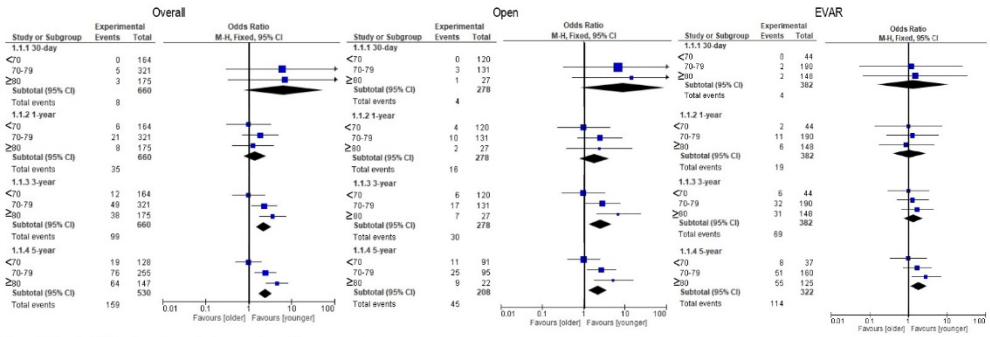

Image1.2 Forest plot of postoperative mortality, comparing older versus younger age group.

	Overall (n=660)	OSR (n=278)	EVAR (n=382)	P value	Octogenarian (n=175)	Non-octogenarian (n=485)	P value
Male (%)	602 (91.2)	254 (91.37)	348 (91.10)	0.33	150 (85.71)	452 (93.20)	0.001365*
Mean Age (SD)	75.3 (7.39)	71.56 (6.72)	77.98 (6.66)	< 0.001*	84.32 (3.00)	72.01 (5.59)	<0.001*
<70 (%)	164 (24.85)	120 (43.17)	44 (11.52)	< 0.001*	0 (0)	164 (33.81)	NA
70-79 (%)	321 (48.64)	131 (47.12)	190 (49.74)	0.253	0 (0)	321 (66.19)	NA
≥80 (%)	175 (26.52)	27 (9.71)	148 (38.74)	< 0.001*	175 (100)	0 (0)	NA
Risk factors (%)							
Hypertension	322/515 (64.47)	139/222 (62.61)	183/293 (62.46)	0.48	88/130 (67.69)	234/385 (60.78)	0.08
Diabetes	85/515 (16.50)	31/222 (13.96)	54/293 (18.43)	0.09	20/130 (15.38)	65/385 (16.88)	0.35
Prior CVD	274/515 (53.20)	99/222 (44.59)	175/293 (59.72)	<0.001*	74/130 (56.92)	200/385 (51.95)	0.16
Prior IHD	251/515 (38.03)	92/222 (41.44)	159/293 (54.27)	0.0039*	67/130 (51.54)	184/385 (47.79)	0.23
Prior stroke	29/515 (5.63)	11/222 (4.95)	18/293 (6.14)	0.28	6/130 (4.62)	23/385 (5.97)	0.28
CKD	52/515 (10.10)	18/222 (8.11)	34/293 (11.60)	0.10	17/130 (13.08)	35/385 (9.09)	0.10
Overweight	320/439 (72.89)	143/192 (64.41)	177/247 (71.66)	0.26	75/116 (64.66)	245/323 (75.85)	0.009984*
BMI (mean; SD)	27.9 (6.01)	28.23 (7.72)	28.24 (6.72)	0.99	26.84 (5.15)	28.74 (7.70)	0.052
Smoker	423/642 (67.29)	187/274 (68.25)	236/268 (88.06)	< 0.001*	99/169 (59.58)	324/473 (68.50)	0.009781*
Current Smoking	126/642 (19.63)	69/274 (25.18)	57/268 (21.27)	0.14	12/169 (7.10)	114/473 (24.10)	<0.001
Ex-smoker	297/642 (46.26)	118/274 (43.07)	179/268 (66.79)	< 0.001*	87/169 (51.48)	210/473 (44.40)	0.057
Anti-hypertensive	397/604 (65.73)	163/261 (62.45)	234/343 (68.22)	0.07	109/157 (69.43)	288/447 (64.4)	0.13
Anti-platelet	402/604 (66.56)	167/261 (63.98)	235/343 (68.51)	0.12	100/157 (63.69)	302/447 (71.59)	0.19
Anticoagulant	156/604 (25.83)	54/261 (20.69)	102/343 (29.74)	0.06	50/157 (31.85)	106/447 (23.71)	0.02259*
Statin	461/604 (76.32)	195/261 (74.71)	266/343 (77.55)	0.21	111/157 (70.70)	350/447 (78.30)	0.027*
Operation (%)							
OSR	278 (42.12)	278 (100)	0 (0)	NA	27 (15.43)	251 (51.75)	<0.001*
EVAR	382 (57.88)	0 (0)	382 (100)	NA	148 (84.57)	235 (48.45)	<0.001*
ASA ≥3	459/638 (71.94)	182/271 (67.16)	277/367 (75.48)	0.11	129/166 (77.71)	330/472 (69.92)	0.02725*
Size of AAA (mm) (SD)	63.0 (10.87)	63.54 (12.28)	62.61 (9.72)	0.14	64.474 (11.6)	62.47 (10.56)	0.073
Elective	636 (96.36)	267/278 (96.04)	369/382 (96.59)	0.36	143 (81.71)	470 (96.91)	<0.001*
Neck diameter (mm) (SD)	46.15 67.39)	NA	46.41 (67.76)	NA	53.52 (76.74)	41.22 (60.04)	0.062
Neck length (mm) (SD)	32.53 (30.89)	NA	32.81 30.95)	NA	31.82 (29.99)	33.01 (31.56)	1.33
Local anaesthesia	35/639 (5.48)	0 (0)	35/367 (9.54)	NA	17/167 (10.18)	18/472 (3.81)	<0.001*
Regional anaesthesia	55/639 (8.61)	1/272 (0.37)	54/367 (14.71)	< 0.001*	20/167 (11.98)	35/472 (7.42)	0.03546*
General anaesthesia	547/639 (85.60)	138/272 (50.74)	276/367 (75.20)	< 0.001*	129/167 (76.05)	418/472 (88.56)	<0.001*
Previous aortic procedure	9/657 (1.37)	1/276 (0.36)	8/381 (2.10)	0.30	4/175 (2.29)	5/482 (1.04)	0.11
Outcome (%)							
Return to theatre	24/525 (4.57)	7/190 (3.68)	17/335 (5.07)	0.23	9/148 (6.08)	15/377 (3.98)	0.15
30-day readmission	17/439 (3.87)	6/142 (4.23)	11/204 (5.39)	0.31	9/100 (9.00)	8/246 (3.25)	0.012*
30-day mortality	9/660 (1.36)	5/278 (1.80)	4/382 (1.05)	0.21	3/175 (1.71)	5/485 (1.03)	0.23
Cardiovascular death	84/278 (30.22)	27/77 (35.06)	57/201 (28.36)	0.14	27/99 (27.27)	57/179 (31.84)	0.21
Procedure-related death	32/278 (11.51)	10/77 (12.99)	22/201 (10.95)	0.31	7/99 (7.07)	25/179 (13.97)	0.04226*
Median survival (year; SE)	8.85 (0.39)	NA	7.633 (0.33)	NA	4.52 (2.39)	5.68 (2.51)	<0.001*
1-year survival	625/660 (94.70)	262/278 (94.24)	363/382 (95.03)	0.33	167/175 (95.43)	458/485 (94.43)	0.31
3-year survival	561/660 (85.00)	248/278 (89.21)	313/382 (81.94)	0.00979 *	137/175 (78.29)	424/485 (87.42)	0.001855*
5-year survival	371/530 (70.00)	163/208 (78.37)	208/322 (64.60)	<0.001*	83/147 (56.46)	288/383 (75.20)	<0.001*
Days of hospitalisation (Mean; SD)	6.20 (9.28)	8.20 (6.54)	4.78 (10.58)	< 0.001*	6.37 (12.29)	6.134 (7.90)	1.55
Days of stay under intensive care (Mean, SD)	1.21 (3.03)	2.16 (4.15)	0.378 (0.79)	< 0.001*	0.68 (1.89)	1.39 (3.30)	0.0146*

Table 1. Baseline patient characteristics. CVD=cardiovascular disease; IHD: ischaemic heart disease; CKD: chronic kidney disease; ORS=open surgical; EVAR=endovascular aneurysm repair

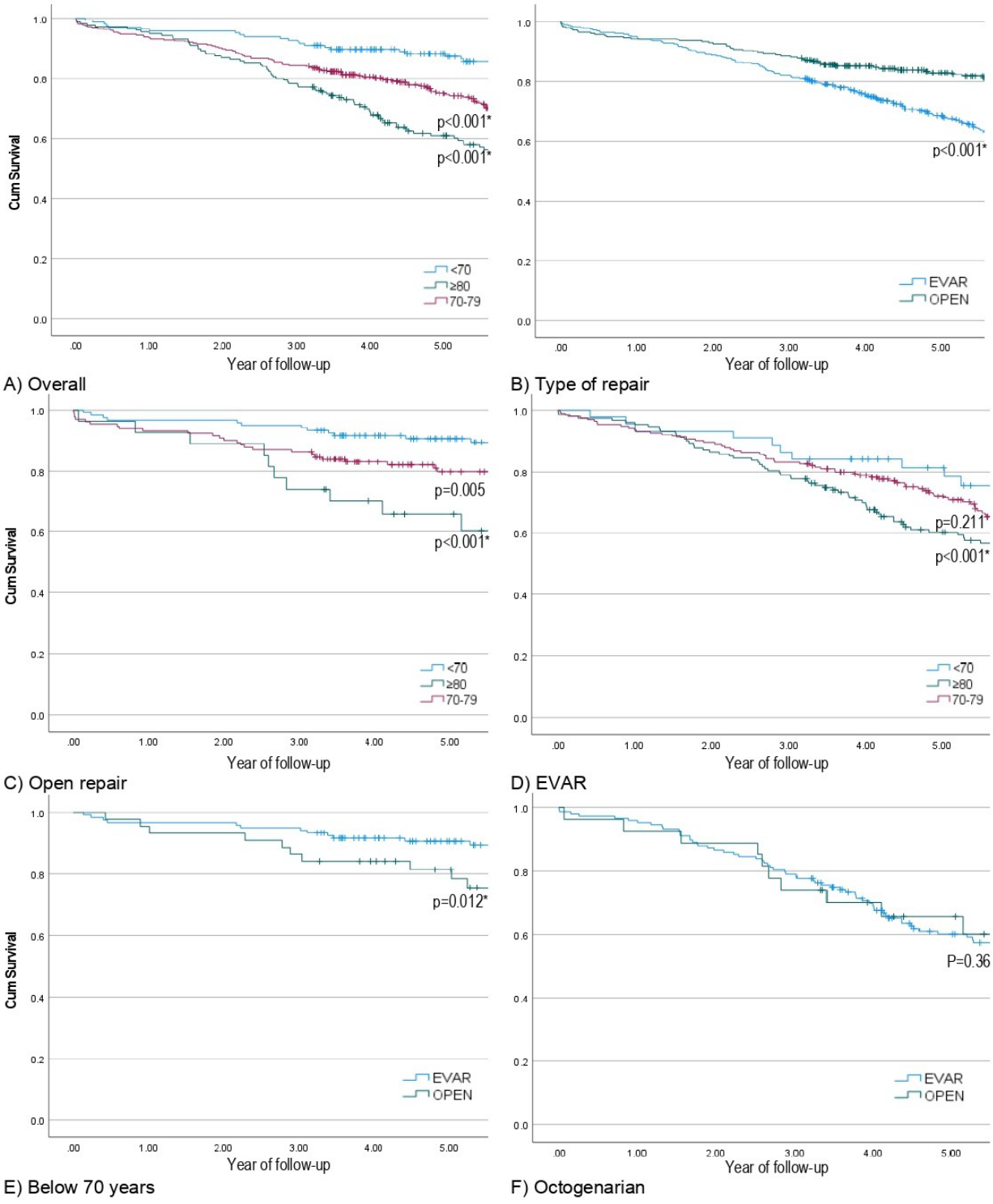

Figure 1. Kaplan Meier survival analysis of post-aortic repair patients in A) overall, B) by type of repair, C) post-open repair, D) post-EVAR, E) octogenarians, F). 5-year survival log-rank pairwise comparison made with reference to patients aged <70 years (Figure A, C, D).

VO78

The evidence for shared decision making and use of decision support tools for patients facing elective AAA repair

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Introduction
The importance of shared decision making (SDM) is highlighted in both the European Society for Vascular Surgery 2019 and the National Institute for Health and Care Excellence (NICE) 2020 abdominal aortic aneurysms (AAA) guidelines. The aim was to summarise the current evidence for SDM, including the use of decision support tools (DSTs), in facilitating SDM for patients with AAA.

Methods
This scoping review was undertaken aligning with PRISMA guidelines. Qualitative synthesis of articles reporting on SDM in those with intact AAA was performed.

Results
Fifteen articles (1,344 AAA participants, mean age 62-74 years) reported on SDM (Table 1). Although 58% - 95% patients preferred SDM (3 studies), objective ratings of SDM were consistently <50% (3 studies). Three randomised-controlled trials assessed the use of DSTs, which included digital material and illustrated or text-only cards. DSTs improved knowledge and agreement between patient-preference and procedure received but did not significantly improve observer-rated measures of SDM. Available on-line DSTs require advanced patient reading skills. DSTs increase the proportion of patients choosing conservative management (21.4% versus 28.8%).

Conclusion
Most AAA-patients desire SDM, but this is not commonly applied. DSTs improve patient knowledge to facilitate SDM. Further research is needed to provide optimal DSTs.

Table 1: Overview of study aims, methodology, and key findings

First author	*Aims*	*Methodology*	*Patient - centred outcome measure*	*Conclusions*
Anderson et al.	Examine sources of information regarding AAA repair	Survey administered prior to clinic consultation	N/A	52% had not talked to their primary care physician about their options for AAA repair, 50% reported that their view of the different surgical options had not been influenced by anyone 41% did not receive any information about OSR 37% did not receive any information about EVAR 10 – 11% used internet as main source of information
Corriere et al.	Examine patient's desired role in treatment choice and information sources for those undergoing vascular procedures	Survey administered whilst on waiting list	Patient satisfaction at time of survey	95% preferred discussion of all treatments being considered vs single recommended treatment† 95% preferred choosing together with the provider† 75% stated opportunity to ask questions† 50% indicated that they were offered a treatment choice† 85% had adequate information† 95% satisfied with their understanding (entire cohort)
de Mik et al.	Classify importance of complications of AAA repair	Survey administered pre or post AAA repair	N/A	Ranking of important complications: 1 Below ankle amputation following ALI 2 Rupture 3 Stroke 4 Renal failure 5 Type 1 Endoleak requiring surgery
de Mik et al.	Development of decision support tools and their use in SDM	Focus groups and commissioned decision support tools	Patient satisfaction at time of survey	92% agreed the decision aid would help them decide 92% would recommend the consultation cards. 100% found the decision aids and consultation cards to be helpful 71% would recommend the decision cards. Patients and vascular surgeons had different preference for information giving
Eid et al.	Determine the effect of a decision aid on agreement between patient preference and repair type received	Cluster randomised controlled trial of decision aid versus standard care	Proportion patients who had agreement between their preference and their repair type Secondary outcome included decision satisfaction	Patients exposed to a decision aid were more likely to receive their preferred AAA repair type* 95% in agreement with preference in decision aid group 86% in agreement with preference in the control group Decision aids reduced pre-consultation uncertainty in patient preference Decisions aids did not lead to improved decision satisfaction
Govender et al.	To determine the proportional contributions of pain, impulsivity, perception of the benefits of surgery, patients' perception of peri-operative risk and predicted peri-operative risk on the acceptance of peri-operative risk for vascular procedures	Survey administered whilst on waiting list	Acceptance of risk at time of survey	Moderate association between predicted peri-operative risk and the patients' perception of peri-operative risk (r = 0.33) Patients' perception of the benefits of was the only predictor of peri-operative risk acceptance** Pain and impulsivity not correlated with peri-operative risk acceptance
Jones et al.	Examine factors influencing patients with AAA preference for OSR or EVAR	Survey administered during first clinic consultation	N/A	9 themes as main factor influencing patient preference identified Early outcomes of EVAR were the main reason for preferring EVAR Long term concerns were more commonly secondary factors Older age more importance on short term outcomes. Lack of information was a significant factor in treatment preference i.e., lack of knowledge of alternative

Jones et al.	Examine factors influencing patients with AAA preference for OSR or EVAR	Survey administered during first clinic consultation	N/A	Sources of information before decision aid were from vascular surgeons in half the patients Although most patients preferred EVAR, the non-retired patients were twice as likely as retired patents to prefer open repair
Knops et al.	In those with AAA, evaluate whether decision aids lead to a reduction in decisional conflict regarding their treatment options	Survey administered at 1, 4 and 10 months	Decisional conflict scores at 1 month, Aneurysm knowledge questionnaire at 1 month, Patient satisfaction at 1 month	Decisional conflict scores, satisfaction level, quality of life and patient anxiety levels did not differ between the decision aid and control group at 1 month Patients in the decision aid group had a higher aneurysm-related knowledge at 1 month*
Knops et al.	Examine the quality of provision of information to patients regarding AAA repair	Qualitative assessment of consultation recordings	N/A	86% were informed about the proposed clinician-recommended treatment option 46% were informed of alternative treatment option 18% of consultations explored patient preference in those at threshold with respect to surgical repair or surveillance frequency 82% received information on complications 100% of those at threshold for repair given prognosis
Robertson et al.	In those with AAA, to determine the patient's perspective for optimal surveillance intervals utilising a decision aid	Survey and patient interviews after use of decision aid	N/A	78% stated that the decision aid helped them to make an informed choice
Santema et al.	Explore patients' decision-making preferences and to investigate patients' perception of SDM in vascular surgery	Survey at the time of consultation and qualitative assessment of consultation recordings	CPS, IPAS, SDM-Q-9, CollaboRATE outcome measures	58% preferred a shared role in decision-making 55% of patient's preferred role disagreed with what they had experienced 31% preferred a more active role in the decision-making process than they had experienced 46–94% of patients indicated that patients should receive all information about possible risks
Santema et al.	To assess the quality and degree of SDM behaviour in vascular surgery for pre-operative consultations	Survey at the time of consultation and qualitative assessment of consultation recordings	SDM-Q-9, SDM-Q-Doc, OPTION-12 outcome measures	Median SDM-Q-9 score among the patients was 93% Mean total OPTION score was 31% Duration of the consultation was found to be significantly associated with the OP TION score*
Stubenrouch et al.	Evaluate effectiveness of decision support tools on the level of SDM among vascular surgeons and their patients	Survey prior to and after consultation and qualitative assessment of consultation recordings	OPTION-5, SDM-Q-9, SDM-Q-Doc, CollaboRATE, CPS, DCS, SF-12 outcome measures	DSTs did not significantly improve OPTION-5 scores for AAA patients DSTs did not significantly improve SDM-Q-9 or DCS for AAA patients DSTs led to increase in number of AAA patients choosing non-surgical treatment choices increased with 21.4% to 28.8% DSTs led to a significantly higher level of aneurysm-related knowledge, mean increase 40%*
Ubbink et al.	In those with AAA, evaluate the use of decision aids in SDM for treatment options	Survey at the time of use - non-clinical	N/A	Decision aid was found to be understandable and leave patients 'feeling better informed' (extracted from focus groups)

AAA: Abdominal aortic aneurysm
ALI: Acute limb ischaemia
CPS: Control Preferences Scale
DCS: Decisional Conflict Scale
DST: Decision support tool
EVAR: Endovascular aneurysm repair
OPTION-12: Observing Patient Involvement -12 assessment
OSR: open surgical repair
SDM: Shared decision making
SDM-Q-9: Shared Decision Making 9-point Questionnaire
SDM-Q-Doc: Shared Decision-Making Questionnaire-Physician version
SF-12: 12-item Short Form Survey
T1EL: Type 1 endoleak
T2EL: Type 2 endoleak

*comparison associated with p-value <0.05
**comparison associated with p-value <0.005

†: AAA subgroup of mixed cohort

VO80

The effect of obesity on cardiopulmonary exercise testing parameters in patients undergoing abdominal aneurysm repair

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Background
There is no good evidence of the effect of obesity on Cardiopulmonary Exercise Testing (CPET) variables in patients undergoing abdominal aortic aneurysm (AAA) repair. We studied this effect in our regional vascular unit.

Methods
Retrospective review of vascular database over a 5-year period of all patients undergoing elective AAA repair. Data collected for patient demographics, CPET parameters, Body Mass Index (BMI) and overall survival. Patients were sub-grouped into normal (<25 kg/m2), Overweight (25-29.9kg/m2) and Obese (30+ kg/m2).

Results
224 patients underwent endovascular repair (EVAR) and 74 open repairs (OR). Both groups had a mean BMI of (27.7). The ventilatory equivalents (VE) were higher in the EVAR group. This was mainly driven by higher VE in the normal-weight EVARs and not in the obese (p=0.01). However, the negative effect of weight on anaerobic threshold (AT) was only significant in the obese group.

Conclusion
There is evidence of "conscious" selection bias towards EVAR in patients with respiratory compromise. Higher VEs are well tolerated in normal weight patients but more strict criteria are applied in the overweight and obese patients. Systemic effect on AT is only significant in the obese patients. Those findings would help the decision making in complex AAA patients.

VO81

Early and Long-Term Outcomes in Treatment of Type Non-A Non-B Aortic Dissection in a single centre

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Introduction:
To report a single centre experience in treatment of type non-A-non-B dissection.

Methods:
Retrospective observational study over a 6-year period on non-A-non-B AAD patients evaluating morbidities, mortality, reintervention and FL thrombosis achieved with best medical (BMT)/interventional treatment.

Results:
Out of 514 AAS(n311,60.5% type A AAD;n164,31.9% type B AAD;n19,3.7% IMH/PAU and n3,0.6% iatrogenic dissection),n17(3.3%) patients presented with a non-A-non-B AAD(n13, 76.5% men, mean age 64yo,range 41-87).Nine patients(52.9%) were successfully medically treated but 8(47.1%) needed an emergent/urgent operation(FET). Indications for intervention were impending aortic rupture/retrograde extension(n4,25.5%),malperfusion (n2,11.8%),uncontrolled pain/blood pressure(n2,11.8%).A significantly larger initial diameter of zone 3-4(mean 43.23vs33.01 mm,p<.005) and 5-6(mean 35.04vs29.51mm,p.046)was detected in patients undergoing intervention versus BMT.At a median follow-up of 263(range 3-1019)days, survival rate was 94.1%;17.6% of patients underwent an aortic reintervention; the rate of aortic-related death was 5.8%.CTA showed FL thrombosis in 85.7% of surgical vs 50% of BMT patients.

Conclusion:
In treatment of non-A-non-B aortic dissection, the outcomes relay critically upon selection criteria for surgery/BMT. Even if the number of patients is too small to draw any definitive conclusion, an enlarged initial diameter of DTA seems to be related to need for both early and late intervention and surgery to FL thrombosis in the vast majority of patients.

VO82

A single-centre retrospective hypothesis-generating study investigating Computed Tomography-based body composition metrics in a cohort of aortic aneurysm patients.

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INTRODUCTION
Sarcopaenia and adipose distribution have been associated with poorer postoperative outcomes, but their importance in abdominal aortic aneurysms (AAA) remains unknown. This study explored the patterns of Computed Tomography-based body composition (CTBC) metrics in AAA patients, and their associations with outcomes.

METHODS
We included 265 patients who received open or endovascular AAA repair from 2015 to 2020 at a single institution. Cross-sectional surface areas of skeletal muscle (SMI), intramuscular (IMAT), visceral (VAT), and subcutaneous (SAT) adipose tissues at the L3 vertebral level were obtained from preoperative CT scans. Sarcopaenia was defined as SMI ≤38.5cm2 in women and ≤52.4cm2 in men. Outcomes included hospital length of stay, postoperative complications, and peri-operative mortality (in hospital or within 30 days).

RESULTS:
Sarcopaenic patients had less total adipose tissue ($p<0.001$), lower VAT/SAT ratios ($p=0.011$), and higher IMAT/SMI ratios ($p=0.002$). Lower SMI was associated with peri-operative mortality ($p=0.011$). Peri-operative mortality was higher among female patients ($p=0.027$), who had higher IMAT ($p=0.017$) and IMAT/SMI ratios ($p<0.001$), and lower VAT/SAT ratios ($p<0.001$) compared to male patients.

CONCLUSIONS
Sarcopaenia is often accompanied by high IMAT and low VAT and is associated with peri-operative mortality. CTBC differences between men and women may contribute to different mortality rates.

	Sarcopaenic (n=203)	Non–sarcopaenic (n=62)	*P*–value	Male (n=228)	Female (n=37)	*P*–value
Age at operation (years)	76 (70 – 82)	70.065 ± 8.573	<0.001	74 (68 – 80)	77.4 ± 8.88	0.028
Sarcopaenic	–	–	–	175	28	0.837
Male sex	175/203	53/62	0.837	–	–	–
BMI (kg/m²)	25.280 (22.885 – 27.787)	31.318 (28.775 – 33.840)	<0.001	26.510 (24.293 – 30.093)	22.430 (19.830 – 30.748)	0.007
Smoker	156	56	0.019	118	24	0.157
Hypertension	137	47	0.270	163	21	0.084
COPD	45	15	0.731	48	12	0.140
Ischaemic heart disease	64	25	0.220	82	7	0.059
Type 2 diabetes mellitus	31	8	0.830	36	3	0.317
Chronic kidney disease	26	11	0.402	32	5	1.000
Length of stay (days)	7.00 (4.00 – 12.00)	7.50 (4.00 – 9.25)	0.920	7.00 (4.00 – 12.00)	7.00 (3.00 – 11.00)	0.348
Complications	88	24	0.559	95	17	0.720
Perioperative mortality	17	2	0.260	13	6	0.034
SMI (cm²/m²)	–	–	–	45.118 (40.519 – 51.633)	34.468 ± 6.648	0.063
IMAT (cm²/m²)	5.641 (3.765 – 8.460)	5.467 (3.871 – 8.747)	0.832	5.262 (3.749 – 7.843)	6.956 (5.197 – 10.311)	0.017
VAT (cm²/m²)	48.210 (26.437 – 72.693)	80.386 (59.638 – 101.643)	<0.001	59.507 (38.661 – 81.273)	26.418 (18.262 – 55.692)	<0.001
SAT (cm²/m²)	43.963 (32.814 – 61.927)	63.380 (50.559 – 85.526)	<0.001	48.751 (35.384 – 66.645)	66.945 ± 40.380	0.106
IMATI:SMI ratio	0.130 (0.090 – 0.212)	0.103 (0.067 – 0.156	0.002	0.118 (0.783 – 0.179)	0.208 (0.132 – 0.323)	<0.001
VAT:SAT ratio	1.007 (0.579 – 1.461)	1.249 (0.857 – 1.592)	0.011	1.167 (0.787 – 1.578)	0.472 (0.286 – 0.657)	<0.001
TAT (cm²/m²)	99.845 (69.883 – 133.160)	149.716 (123.055 – 181.583)	<0.001	115.030 (80.560 – 148.120)	100.605± 59.139	0.073
VAT:TAT ratio	0.487 ± 0.150	0.537 ± 0.131	0.020	0.526 ± 0.131	0.321 ± 0.112	0.205

Table 1: Demographic data of 265 patients with abdominal aortic aneurysms, divided by sarcopaenia status and sex. Sarcopaenia is defined as SMI ≤38.5cm² in women and ≤52.4cm² in men. Perioperative mortality is defined as any death in hospital or within 30 days postoperatively. Discrete data is analysed using a Fishers exact test. Continuous data is analysed by independent–samples T–test when parametric, or Mann–Whitney U test when nonparametric. BMI, body mass index. COPD, chronic obstructive pulmonary disease. SMI, skeletal muscle index. IMAT, intramuscular adipose tissue. VAT, visceral adipose tissue. SAT, subcutaneous adipose tissue. TAT, total adipose tissue which is the sum of VAT and SAT.

VO83

Aortic sodium [18F]fluoride uptake following endovascular aneurysm repair

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Background: Sodium [^{18}F]fluoride is a positron emission tomography radiotracer. Increased aortic sodium [^{18}F]fluoride uptake is associated with a higher rate of abdominal aortic aneurysm expansion and adverse clinical events. In this study, we compare sodium [^{18}F]fluoride uptake in patients with an abdominal aortic aneurysm before and after endovascular aneurysm repair (EVAR).

Methods: Ten patients with an abdominal aortic aneurysm underwent a sodium [^{18}F]fluoride positron emission tomography and computed tomography (PET-CT). EVAR was performed at size treatment-threshold. Repeat sodium [^{18}F]fluoride PET-CT was performed. Regional aortic radiotracer uptake was assessed by measuring aortic microcalcification activity (AMA): a summary measure of mean sodium [^{18}F]fluoride uptake.

Results: Patients were predominantly elderly (76 [67 to 85] years) men (90%) with mean aortic diameter of 56 [55 to 61] mm at time of EVAR. Median time from EVAR to repeat scan was 2,140 [412 to 2,610] days. Pre-EVAR AMA was higher in abdominal rather than thoracic aorta ($p<0.001$). Following EVAR, radiotracer uptake was reduced in suprarenal (ΔAMA 0.62,$p=0.018$), neck (ΔAMA 0.72,$p=0.005$) and aneurysm body (ΔAMA 0.69,$p=0.006$) but not in the thoracic aorta (ΔAMA 0.11,$p=0.091$).

Conclusions: EVAR is associated with a reduction in aortic microcalcification activity that is most prominent in stented regions of the aorta.

VO84

Assessment of available information on the world wide web (WWW) for patients with abdominal aortic aneurysms (AAA)

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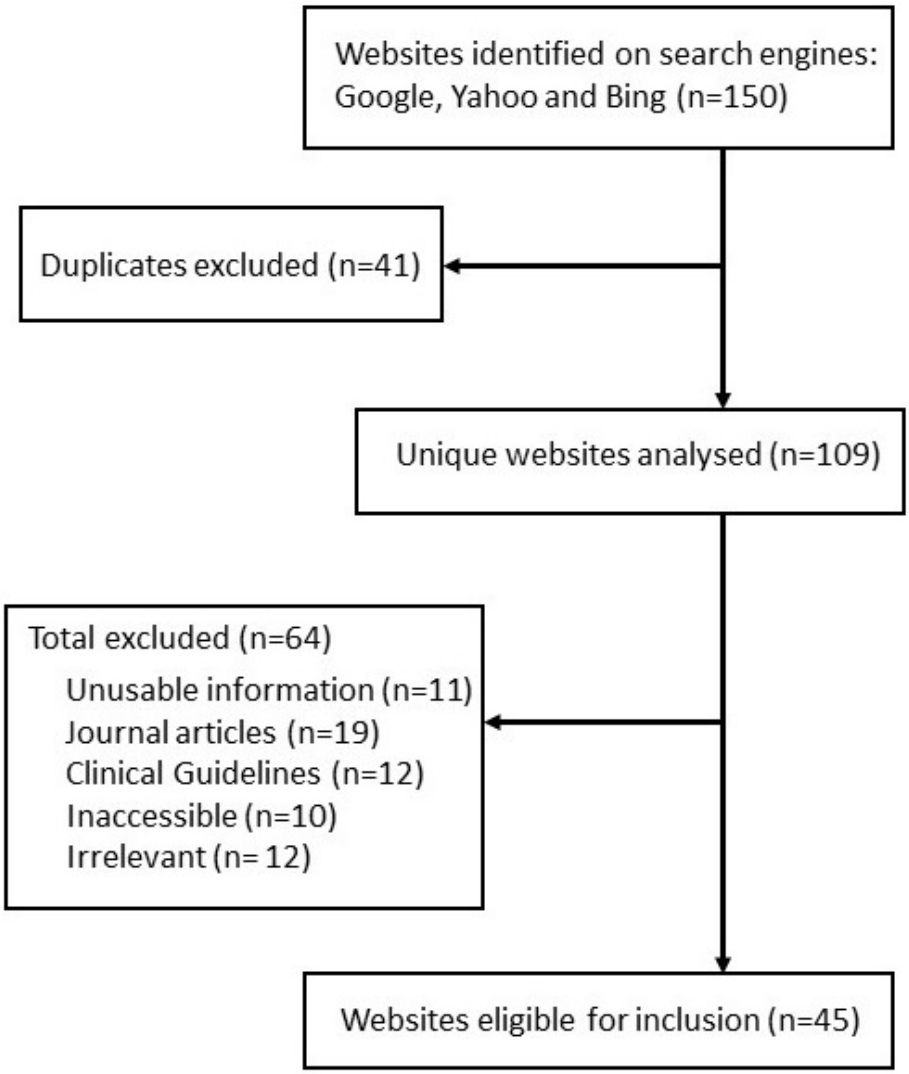
Introduction
To determine current quality and readability of online patient information for AAA and assess whether this has improved since our 2012 analysis.

Methods
The three most popular search engines by market shares (Google, Yahoo! and Bing) were interrogated for the term "abdominal aortic aneurysm". The first 50 results for each search engine were assessed for quality (independently assessed by two authors using the University of Michigan Consumer Health Web Site Evaluation Checklist), readability (Flesch Reading Ease score) and content (custom-designed tool). Health on the Net status (HoN) was recorded.

Results
45 unique websites were analysed. Compared to 2012, median FRE [IQR] increased from 39[29-47] to 56.4[50.4-62.75]. Median Michigan score [IQR] improved from 36[25-56] to 38.5[32-43.5]. Interobserver agreement was good (ICC 0.899). HoN certified websites increased from 15% to 29% with higher median Michigan score ($p<0.001$) and no significant difference in FRE ($p=0.576$). Higher content-specific scores were associated with higher median Michigan score ($p<0.05$) but no significant differences in FRE.

Conclusions
Despite an increase in median FRE and Michigan scores, the current average online information on AAA continues to be of 'weak' quality and 'difficult' readability. Healthcare providers should consider producing their own information material to avoid misguided healthcare decisions.


Websites identified on search engines: Google, Yahoo and Bing (n=150)
Duplicates excluded (n=41)
Unique websites analysed (n=109)
Total excluded (n=64)
Unusable information (n=11)
Journal articles (n=19)
Clinical Guidelines (n=12)
Inaccessible (n=10)
Irrelevant (n= 12)
Websites eligible for inclusion (n=45)

VO85

Wall stiffness determined by nanoindentation varies significantly in abdominal aortic aneurysm (AAA) patients, and is independent of maximum diameter.

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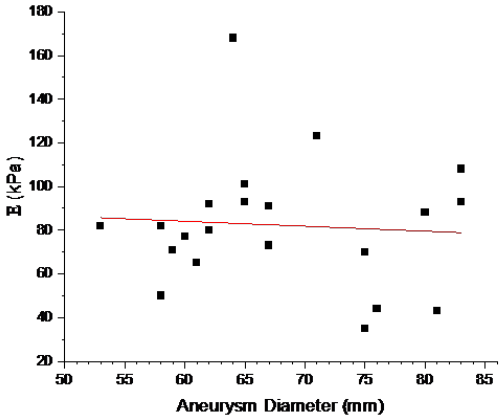
Introduction: Sole use of the diameter threshold to plan aneurysm repair risks rupture during surveillance in higher-risk cases, and unnecessary repair of others. Defects in aortic extracellular matrix have been implicated in aneurysm growth and rupture, and dictate the measured material properties. We used nanoindentation, a high-resolution technique capable of measuring material properties non-destructively, on explanted aortic tissue with the aim of identifying high-risk cases.

Methods: Anterior aortic wall tissue was harvested from 21 patients (86% male) undergoing repair of degenerative AAA (median maximum diameter 63mm). Specimens were subdivided to facilitate testing throughout aneurysm length. Micromechanical properties were probed using nanoindentation on cross-sections of wall tissue to determine the elastic modulus (E). 137 samples were tested (1406 indentations). We also quantified collagen, elastin and glycosaminoglycan (GAG) concentration for each sample.

Main Results: E of aortic wall tissue demonstrated a high intra- and inter-subject variability ($P<0.0001$). Collagen (Pearson's $r=0.5$) and GAG ($r=0.4$) levels increased with maximum aneurysm diameter. Neither elastin levels ($r=-0.03$) nor E ($r=0.1$) (Figure 1) correlated with maximum diameter.

Conclusion: Patients with degenerative AAA demonstrate a high and significant variability in micromechanical stiffness. This is independent of the aneurysm diameter, and may be important in identifying high risk cases.



VO86

Unfavourable anatomical measurements of aortic neck demonstrate a cumulative increased risk of proximal endograft failure in Infrarenal endovascular Aneurysm repair (EVAR)

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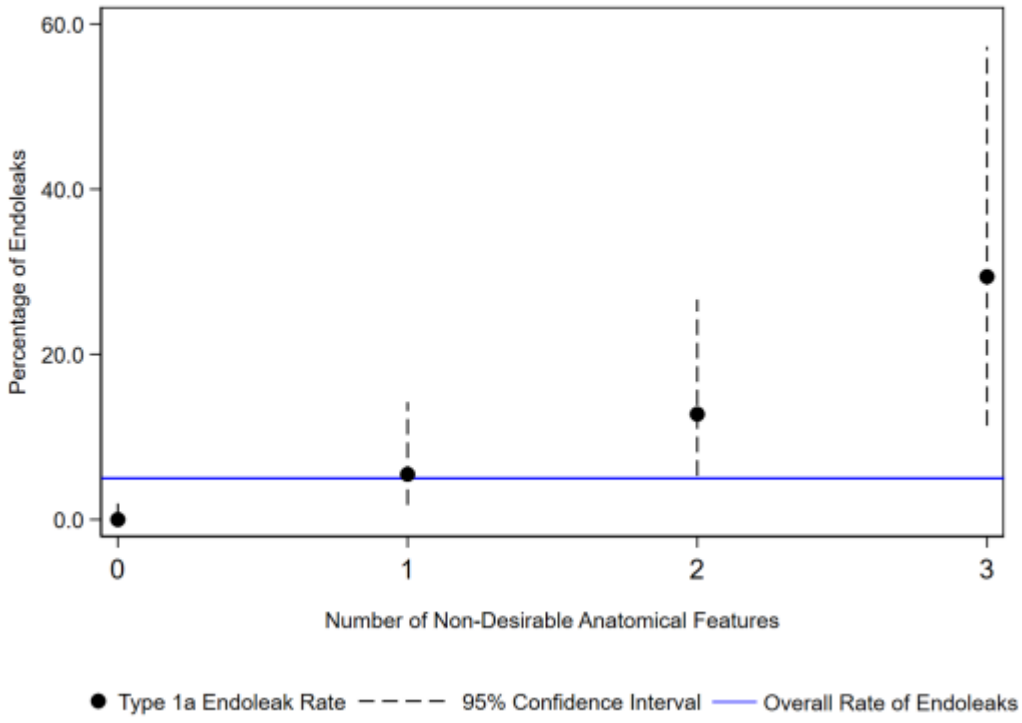
Introduction
Proximal endograft failure (Type 1a endoleak-T1aE) after infrarenal EVAR is associated with hostile aneurysm neck-morphology. We investigated the relationship between aneurysm anatomy, utilisation of neck and T1aE.

Methods
Anonymised data from medical records at our Vascular Network was extracted for all patients receiving EVAR between 01/09/2009-31/12/2019. T1aE rates at any time during follow-up were compared using Fisher's exact-tests for; pre-operative neck length, diameter, angulation, shape and post-operative neck-coverage, categorised by Instructions for Use (IFU) recommendations.

Results
From 300 operations; T1aE occurred in 15 (5%) patients. Median follow-up was 36 months (range 12-120 months). In all measurements, a higher proportion of patients with non-recommended anatomy developed T1aE, compared to those without (all; $p<0.001$).
The proportion of endoleaks increased with increasing numbers of non-desirable anatomical features ($p<0.001$); Figure 1. All patients with T1aE had ≥1 non-desirable characteristic.
There was a strong correlation between neck length and neck coverage (correlation=0.88). This was independent of stent-graft make and the presence/absence of suprarenal-fixation.

Conclusion
All adverse measurements were associated with increased risk of T1aE. In patients with ≥1 hostile anatomical measurement, the cumulative higher risk of proximal endograft failure should be considered. This supports the mantra of strict adherence to the IFU.

Figure 1:- The percentage of endoleaks with non-desirable anatomy



VO87

Chronic Kidney Disease and Statin Therapy affect long-term outcomes following open Juxtarenal Abdominal Aortic Aneurysm repair

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Open repair remains the treatment of choice for Juxtarenal abdominal aortic aneurysms (JAAA) due to its long-term durability.

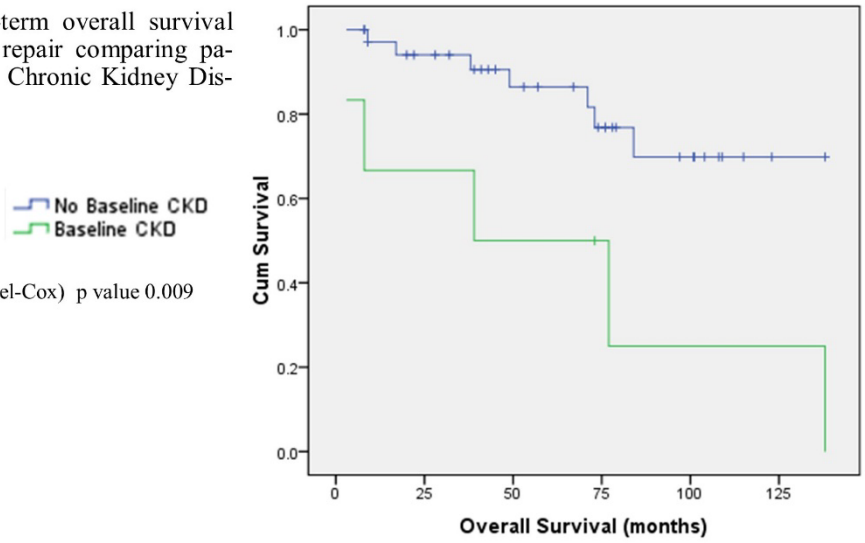
All patients who underwent open JAAA repair from 2011 to 2022 were studied. Patient demographics, risk factors, aneurysm characteristics, procedure details and long-term outcomes were analysed. Kaplan-Meier survival analysis was performed. Predictors were determined using the log-rank test and Cox regression analysis.

Seventy-seven patients were included with a mean age of 73 years (range 52-84), 81.8%(63/77) were men, 18.2%(14/77) had baseline chronic kidney disease (CKD), 39.0%(30/77) were emergency admissions, 29.9%(23/77) had suprarenal clamp and 48.1%(37/77) developed Acute Kidney Injury (AKI) post-operatively. On post-30-day survival analysis, baseline CKD (p=0.009) and postoperative AKI (p=0.001) were associated with poor overall long-term survival in elective cases. Application of suprarenal clamp did not impact long-term survival in either elective (p=0.307) or emergency cases (p=0.141). There was no difference in long-term survival between elective and emergency cases once they survive 30 days (p=0.131). Preoperative statin improved overall long-term major adverse cardiovascular event (MACE) free survival (p=0.012).

Baseline CKD predicts poor long-term outcomes and should be considered during patient selection. The importance of statin therapy is further emphasised in this group of patients.

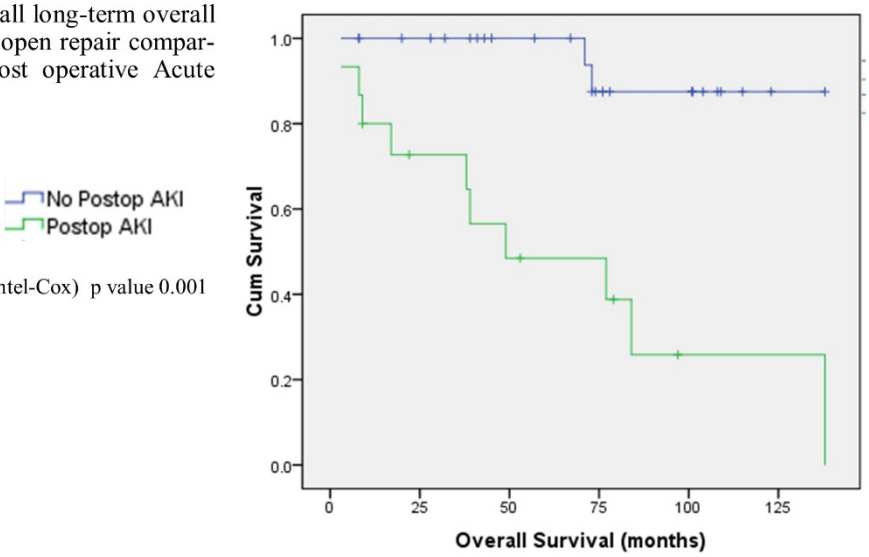
Long term survival analysis				
Elective open JAAA repair (n = 47)				
	Median Survival (months)	1 year survival (%)	3-year survival (%)	5-year survival (%)
Overall Survival	138.0 (95% CI 61.2 - 214.8)	82	80	71
MACE free survival	86.0 (95% CI 73.7 - 98.3)	80	75	69
Emergency open JAAA repair (n = 30)				
	Median Survival (months)	1 year survival (%)	3-year survival (%)	5-year survival (%)
Overall Survival	22.0 (95% CI 0.0 - 80.2)	52	44	37
MACE free survival	14.0 (95% CI 0.0 - 43.1)	52	37	30

1. Kaplan-Meier plot for long-term overall survival following elective JAAA open repair comparing patients with and without baseline Chronic Kidney Disease (CKD)



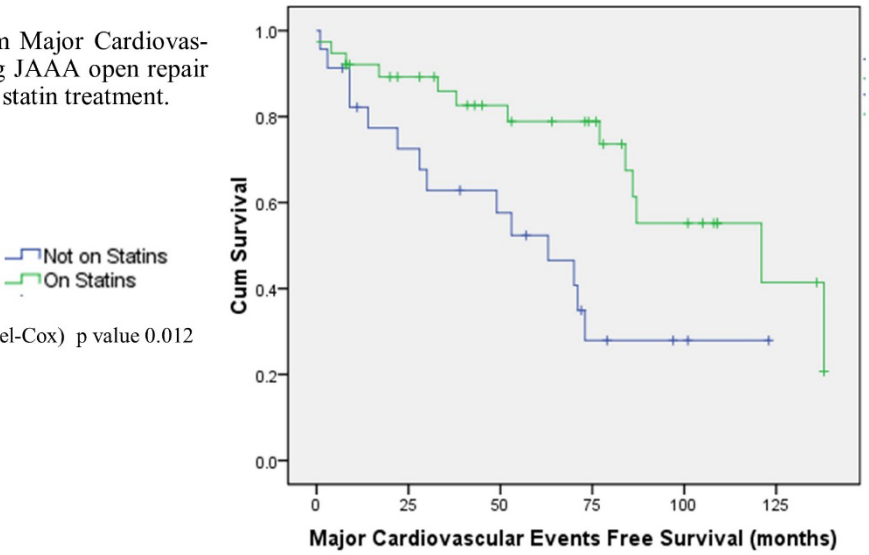
Log Rank (Mantel-Cox) p value 0.009

2. Kaplan-Meier plot for post overall long-term overall survival following elective JAAA open repair comparing patients with and without post operative Acute Kidney Injury (Postop AKI)



Log Rank (Mantel-Cox) p value 0.001

3. Kaplan-Meier plot for long-term Major Cardiovascular Event Free survival following JAAA open repair comparing patients on and not on a statin treatment.



Log Rank (Mantel-Cox) p value 0.012

VO88

Endovenous laser ablation (EVLA) versus conventional surgery for superficial venous incompetence (SVI): Ten-year outcomes from the HELP-1 trial

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Introduction
Despite higher rates of clinical recurrence following surgery compared with EVLA, quality of life (QoL) has been shown to be similar up to 5 years. This study reports clinical and technical outcomes of EVLA versus surgery at 10 years.

Methods
280 adults with unilateral great saphenous vein (GSV) reflux (C2s-C5) were randomised equally to EVLA or surgery. Outcomes included clinical recurrence, disease specific QoL (Aberdeen Varicose Vein Questionnaire-AVVQ) and generic QoL (EQ-5D & SF-36).

Results
At 10 years clinical recurrence was similar between groups, 39/104 (37.5%) following EVLA vs 36/83 (43.4%) following surgery (p=0.416). EVLA was associated with lower (better) AVVQ (Med (IQR) 3.63 (0–7.86) vs 6.94 (1.63–13.22), p<0.001) and higher (better) EQ5D (1 (0.88–1.00) vs 0.88 (0.80-1.00), p=0.008). SF-36 favoured EVLA across multiple domains including “bodily pain” (84 (57-100) vs 62 (41-84), p<0.001) and “vitality” (75 (55-80) vs 60 (45-75), p<0.001).

Conclusion
EVLA offers superior 10 year outcomes in terms of quality of life with similar rates of clinical recurrence.

VO89

Cardiac function and exercise tolerance in patients with deep venous outflow obstruction

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Aims
Chronic venous outflow obstruction (CVO) develops in up to half of patients after iliocaval thrombosis and may impair venous return, limiting stroke volume during exercise. This study aimed to evaluate cardiac function and exercise tolerance pre- and post iliocaval stenting.

Methods
Patients with CVO and age/gender matched controls underwent cardiopulmonary-exercise testing and exercise cardiac MRI (ExCMR) using an MR-compatible supine cycle-ergometer. Tests were repeated 6-8 weeks post- intervention.

Results
Fourteen patients (10 males 4 females, age 43.5± 14.24) and 10 controls (7 males 3 females, age 44+/-13.5) were included. Peak VO2 was impaired in patients (17.9mL/min/kg, 66% predicted) compared with controls (30.65ml/ml/kg, 100% predicted, $p<0.0001$). ExCMR demonstrated insufficient increase in stroke volume in patients from rest to exercise (0.8% vs 16.5% in controls, $p<0.01$), and lower cardiac-index at peak exercise (5.5L/min/m2 vs 8.6L/min/m2, $p<0.05$). Seven patients repeated testing after stenting of the IVC and iliofemoral veins. Peak VO2 improved by 29% ($p<0.002$) . Patients were able to increase stroke volume significantly from rest to exercise post-stenting (15% increase, $p<0.01$), leading to improvement in cardiac index (5.5L/min/m2 to 7.1L/min/m2 , $p<0.05$).

Conclusion
Stenting of the IVC and iliofemoral veins can significantly improve cardiac function and exercise tolerance.

VO90

A 10-year, real-world, evaluation of the epidemiology, management and natural history of CVD.

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Introduction
Evidence suggests that Chronic Venous Disease (CVD) patients receive suboptimal care. This impacts individual and population-level health. Trends in epidemiology, management, and progression of CVD were evaluated using electronic healthcare records.

Methods
Observational, nested case-control studies were performed on databases (CPRD/HES/WSIC) between 2008-2018. Adults with CVD diagnostic codes were matched to age/gender/comorbidity controls from a ~30 million population denominator. Time series analyses evaluated annual period prevalence and incidence rates. Associated factors, clinical progression and healthcare resource utilisation were analysed using descriptive, statistical and unsupervised machine learning methods.

Results
CVD annual period prevalence was 5-6%; symptomatic varicose veins (VV) was 2%, and venous ulceration (VLU) was 0.65%. VV incidence remained consistent (~300/100,000 person-years) whilst VLU slightly decreased. Primary care compression/referrals increased whilst secondary care endovenous/surgical procedures declined, with longer waiting times (median, 96 days). Significant seasonal and regional variations exist. Clinical progression occurs in 12% of CVD. 28% of VLU patients experience ulcer recurrence. CVD is associated with advanced age, obesity, deprivation, frailty, higher direct/indirect care costs, and female gender; ulcer progression is associated with males.

Conclusion
This work outlines the population burden of CVD and identifies areas of suboptimal care. Both are required to plan and improve service provision.

VO91

Development of an international standard set of outcome measures for patients with venous thromboembolism: an International Consortium for Health Outcomes Measurement (ICHOM) consensus recommendation

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Background:
To support the shift towards value-based health care in venous thromboembolism (VTE), an international working group of clinical VTE experts, researchers, and patient representatives from 15 countries aimed to develop a standardised minimum set of patient-centred outcomes for benchmarking VTE care delivery in supporting clinical decision-making, facilitating quality improvement and research.

Methods:
Using an online-modified Delphi process, international patient focus groups, and systematic publication searches, outcomes considered important to patients and health professionals were selected and relevant measurement instruments were evaluated. Measures were appraised for their feasibility in routine practice (ie, brevity, free availability, validation, and language translation) and psychometric performance (ie, validity, reliability, and sensitivity to change).

Results:
We identified 83 possible outcomes and 42 relevant measurement instruments. Following a three-round Delphi study, patient-centred outcomes for VTE were selected and categorised into (i) patient-reported outcomes, (ii) long-term consequences of disease, (iii) disease-specific complications and (iv) treatment-related complications. The standard set contains a selection of outcome domains, their definitions, measurement tools, and case-mix variables as well as predefined time points for measurement.

Conclusions:
Implementation of a minimum standard set of patient-centred outcomes for VTE could help institutions monitor, compare and improve the quality and delivery of VTE care.

VO92

Validity, reliability and responsiveness of the Wound-QoL questionnaire in patients with venous leg ulcers

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Introduction: Venous leg ulcers(VLU) have a significant impact on patients' quality of life(QoL). This study aims to assess the validity, reliability and responsiveness of the Wound-QoL questionnaire in patients with VLU.

Methods: Patients attending a nurse-led VLU clinic were asked to complete the Wound-QoL, EuroQoL(EQ-5D-3L), and a visual analogue scale(VAS) measuring wound pain at baseline. Cronbach's α was used to assess internal consistency, while Spearman's rank correlation was used to assess item selectivity and convergent validity. Responsiveness to change was examined by calculating the area under the receiver operating characteristic curves(AUROC).

Results: 62 patients were included. Wound-QoL showed good internal consistency, with high Cronbach's alpha in all the subscales(>0.86) and in the global scale(0.96). The item selectivity for the global score ranged from r= 0.59 to r= 0.87. Significant correlations were found with respect to convergent validity, between Wound-QoL and EQ-5D(r= -0.747, p<0.001),EQ-VAS score (r= -0.329, p= 0.024), pain VAS(r= 0.511, p<0.001), and wound size (r= 0.333, p= 0.047). The AUROC of the global score in discriminating between patients with active vs healed ulcers was 0.816.

Conclusion: The Wound-QoL is a reliable, valid and responsive tool for the longitudinal assessment of QoL in patients with VLU.

VO93

Impact of the NHS Evidence Based Intervention Programme on access to NICE recommended Varicose Vein Treatment

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Background
A previous study demonstrated widespread non-compliance of Clinical Commissioning Group (CCG) policies with NICE guidelines leading to geographic variation in access to varicose vein treatment. The Evidence Based Intervention (EBI) programme aimed to improve care quality. This study assesses the impact of EBI.

Methods
CCG policies were obtained before and after EBI and categorised by two independent reviewers into levels of compliance with NICE CG168 (green/amber/red). Hospital episode statistics were compared with the NICE commissioning model predictions.

Results
The number of green policies fell from 33.5%(64) to 28.8%(55) in 2019, amber policies increased from 55.5%(106) to 62.3%(119) and red policies remained static (8.9% (17) vs. 8.4%(16)). Over this period 7.3%(14) changed their policy to become fully compliant, but 33.0%(63) changed their policy to become less compliant. Common deviations were to restrict based on clinical severity 51.8%(99) or delay for conservative management 22.5%(43). Nationally the proportion of interventions performed fell from 43.6% to 37.5% of predicted levels, with an estimated loss in net health benefit of £174.6million.

Conclusion
The EBI programme is not associated with improvement in commissioning policy or unwarranted variation, with most patients remaining unable to access NICE recommended treatment in England prior to the SARS Cov-2 pandemic.

VO93

Management of lower limb superficial venous thrombosis using prophylactic and therapeutic doses of tinzaparin; is it effective in reducing treatment time?

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Background
There is a controversy regarding the management of superficial venous thrombosis (SVT). Different studies like the CALISTO trial and the SURPRISE trial recommend different management pathways.

This study aims evaluating the effectiveness of our protocol.

Methods
Prospective observational study of patients presenting with lower limb SVT confirmed by duplex ultrasonography (DUS). Patients with SVT in the Great Saphenous Vein (GSV) above the knee or Small Saphenous Vein receive weight adjusted therapeutic dose tinzaparin (WATT) for 14 days, while those with SVT in the GSV below the knee receive weight adjusted prophylactic dose Tinzaparin (WAPT) for 7 days. Follow-up DUS is performed at 14 days and treatment is stopped if SVT is stationary. Treatment continues with repeated weekly DUS for progressive SVT.

Results
Between March 2020 – 2021, 127 patients presented with SVT, 80 patients fulfilled the inclusion criteria. The median duration of treatment for all patients was 14 days. The average duration of treatment for patients on WAPT was 17.6 days, while for those on WATT was 19.6 days.

Conclusions
Using WATT and WAPT accordingly with DUS follow-up is cost effective and has led to a significant reduction in days of treatment in comparison to published protocols.

VO94

Restricted access to Varicose Vein Interventions: Is commissioning the whole story?

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Background
This study aims to explore the association between commissioning policy and the number of patients receiving intervention for varicose veins (VV).

Methods
In 2019 CCG policies were assessed by two independent reviewers for compliance with NICE CG168. CCG policies were categorised into levels of compliance (green/amber/red). Hospital episode statistics for CCG VV interventions were compared with the NICE commissioning model predictions.

Results
55 CCGs (29.0%) had a compliant policy (green), 119(62.3%) had amber policies and 16(8.4%) had red policies. The median (range) number of interventions (per 100,000 population) performed in 2019 in green CCGs was 76(5-173), representing 61.3% of predicted intervention rate. In amber CCGs the intervention rate was 48(6-128) (43.6% predicted) and 30(2-101) (31.0% predicted) in red CCGs. A compliant policy was associated with a higher intervention rate ($p<0.001$). Overlap was significant e.g. some red CCGs had higher intervention rates than some green. CCG policy compliance was only associated with 17% of the observed variation in intervention rate ($R2=0.168$, $p<0.001$).

Conclusion
There is huge geographical variation in VV intervention rates and there are significantly less patients receiving treatment than predicted. The association between published policy and intervention is modest and there are likely to be other factors responsible.

VO96

Is there Evidence that Bariatric Surgery Improves Lower Limb Venous Disease? A Literature Search.

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Introduction: Obesity has been identified as a risk factor for venous disease, an increasingly significant problem in Western healthcare systems. We aimed to establish whether published data correlates weight loss with improvement in venous disease.

Method: A literature search of PUBMED, OVID, CPRD, Cochrane online library was performed using search terms: Bariatric surgery (BS), obesity, venous insufficiency (VI), venous disease (VD), venous leg ulcer (VLU).

Results: The search criteria yielded 4 publications measuring VD, VLU or VI as an outcome following weight loss or BS. One retrospective nested cohort study compared the incidence of VD in 2959 BS patients with 2959 obese controls, finding greater incidence of VD post-surgery ($p<.001$). Another 123-patient cohort study found significant improvement in VLU healing rates ($p<.001$) and venous flow velocities ($p<.001$) following BS, compared to controls. A prospective cohort study of 10 patients measured venous haemodynamics pre- and post sleeve gastrectomy, finding improvement in venous flow ($p=0.04$), 12 months post-operatively. A study evaluating Venous Clinical Severity Scores, found an improved score in 28 patient post BS ($p=<0.05$).

Conclusions: There is sparse and conflicting evidence examining the relationship between weight loss, VD and VLU. Further clarification may change treatment thresholds in obese patients with VD.

VO97

Determining the relationships between venous reflux patterns, clinical severity, and health-related quality of life

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Introduction
The relationship between different reflux patterns in the VEIN-TERM classification system, health-related quality of life (HRQoL) and clinical severity is poorly understood.

Methods
507 chronic venous disease patients (CEAP C1:n=3,C2:n=247,C3:n=62,C4:n=137,C5:n=31,C6:n=27) and 105 asymptomatic controls (CEAP C0:n=73,C1:n=31,C2:n=1) underwent duplex ultrasound. Individuals were classified into seven groups: no reflux, superficial axial, deep axial, combined axial, superficial segmental, deep segmental, and combined segmental reflux. HRQoL according to the Aberdeen Varicose Vein Questionnaire (AVVQ) and EuroQol-5D-3-level (EQ-5D-3L) scores, and clinical severity according to the Venous Clinical Severity Score (VCSS) were compared between groups by two-tailed Kruskal-Wallis tests with pairwise comparisons at the 5% significance level.

Results
All reflux types were associated with significantly greater VCSS than no reflux ($p<0.001$). Superficial axial and combined axial reflux were associated with significantly greater VCSS than superficial segmental reflux ($p<0.001$, $p=0.042$ respectively). All reflux types were associated with significantly worse AVVQ and EQ-5D-3L scores than no reflux ($p<0.03$). However, there were no significant differences in both HRQoL scores between all reflux types.

Conclusion
Across all clinical CEAP classes, superficial axial and combined axial reflux were associated with the greatest clinical severity. However, all reflux patterns adversely impact HRQoL; thus, all reflux patients may benefit from treatment.

VO98

Efficacy and safety of sirolimus therapy in Klippel-Trenaunay syndrome: a systematic review

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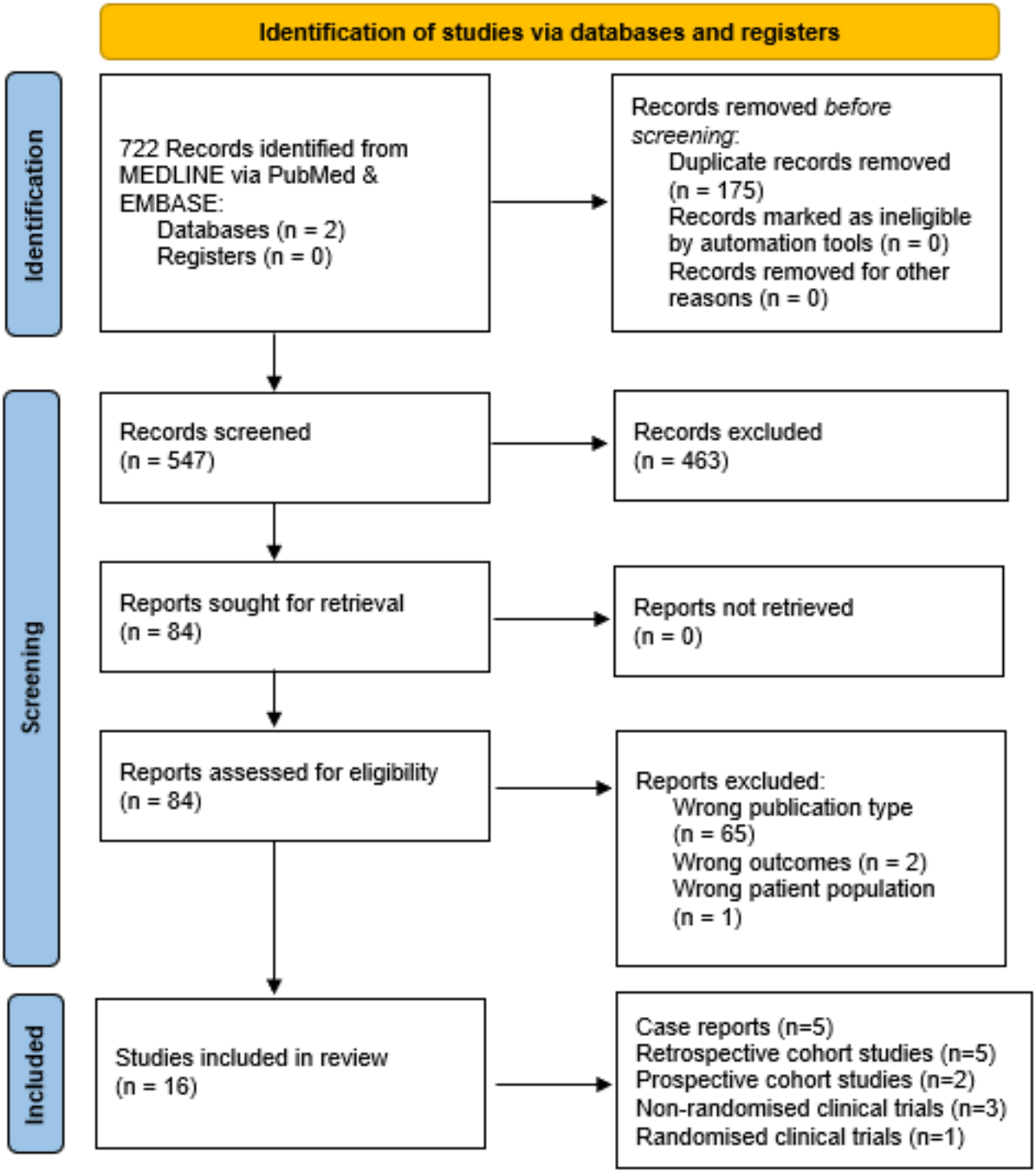
Background:
Sirolimus is emerging as a repurposed targeted therapy for Klippel-Trenaunay syndrome (KTS) refractory to conventional treatments. We aimed to evaluate the efficacy and safety of sirolimus in KTS.

Methods:
A systematic review of the literature was undertaken according to PRISMA guidelines. MEDLINE and EMBASE were searched on 22/03/2022 for articles containing synonymous terms for “sirolimus” and “KTS”. Additional articles were identified from reference screening.

Results:
16 articles were included; (n=45) KTS patients were treated with sirolimus (median age: 13 years; IQR: 7.5-21 years; 52.4% female). Target serum sirolimus levels ranged from 1-20 ng/ml.
After treatment (mean duration 12 months), 96.4% (n=27/28) reported clinical improvements in bleeding, limb hypertrophy and/or infection. 65.6% (n=21/32) reported a radiological reduction in lesion size. 100% (n=16/16) reported improved coagulopathy markers (D-dimer, Fibrinogen, platelet-count). 75.0% (n=27/36) reported improved quality of life/pain reduction.
The commonest adverse event was oral mucositis. 15.6% (n=7/45) KTS patients had to stop sirolimus due to side effects. 6 studies reported a relapse of symptoms after stopping sirolimus and symptomatic improvement with resumption. No sirolimus-related deaths were reported.

Conclusion:
In a limited number of lower-evidence level studies, sirolimus therapy demonstrates clinical, radiological and haematological efficacy in KTS but several side-effects are observed.


Identification of studies via databases and registers
Identification
722 Records identified from MEDLINE via PubMed & EMBASE:
Databases (n = 2)
Registers (n = 0)
Records removed *before screening*:
Duplicate records removed (n = 175)
Records marked as ineligible by automation tools (n = 0)
Records removed for other reasons (n = 0)
Screening
Records screened (n = 547)
Records excluded (n = 463)
Reports sought for retrieval (n = 84)
Reports not retrieved (n = 0)
Reports assessed for eligibility (n = 84)
Reports excluded:
Wrong publication type (n = 65)
Wrong outcomes (n = 2)
Wrong patient population (n = 1)
Included
Studies included in review (n = 16)
Case reports (n=5)
Retrospective cohort studies (n=5)
Prospective cohort studies (n=2)
Non-randomised clinical trials (n=3)
Randomised clinical trials (n=1)

Study Authors	Year	Country	Study design	Study population	Number of KTS patients	Age(s) of KTS patients	Target serum sirolimus levels (ng/ml)	Concurrent Immunosuppresant prophylaxis	No. reporting clinical improvem	No. reporting radiological	No. reporting haematological	No. reporting improved	Stopped therapy due to side effects	Most common side effect reported
Boscolo et al.	2015	USA, Belgium	Prospective cohort study with additional in vitro and murine study (single centre)	Venous malformations refractory to standard care	1	14 years	10 - 15	No/None reported	1	1	1	1	0	Headache
Vlahovic et al.	2015	Serbia	Case report	KTS	1	10 years 4 months	5 - 15	No/None reported	1	1	1	1	0	Hyperlipidaemia
Bessis et al.	2016	France	Case report	KTS	1	13 months	10	Co-trimoxazole	1	1	1	NA	1	Nil
Hammer et al.	2018	Belgium	Prospective Phase II non-randomised crossover trial (single centre)	Venous/Lymphatic/complex slow-flow malformations refractory to standard care	2	14, 30 years	10 - 15	No/None reported	2	1	2	2	0	Headache
Parker et al.	2018	UK, USA, France	Prospective non-randomised clinical trial (Open label multi-centre non-randomised clinical trial with 26 weeks of run in (observation phase) and 26 weeks of sirolimus therapy)	PROS	8	6, 6, 11 ,13, 16, 19, 23, 26 years	2 - 6	No/None reported	NA	8	NA	0	4	Infection
Mack et al.	2019	USA	Retrospective cohort study (single centre)	Slow flow vascular malformations with a significant venous component (at risk of LIC)	8	Individual ages not reported	5 - 15	Co-trimoxazole	8	3	8	8	0	Mucositis
Sandbank et al	2019	Israel	Retrospective cohort study (multicentre)	Complicated vascular anomalies	5	Individual ages not reported	5 - 12	No/None reported	4	NA	NA	NA	0	Elevated liver enzymes
Youssef et al.	2019	Egypt	Prospective cohort study (single centre)	Complex vascular malformations refractory to previous therapies	3	17 years, 8 years, 7 years	10 - 15	No/None reported	3	NA	NA	3	0	Nil
Nozawa et al.	2020	Japan	Retrospective cohort study (multicentre study aimed to characterise the immunological effects of sirolimus in patient with vascular anomalies)	Vascular anomalies	1	Individual ages not reported	5 - 15	Co-trimoxazole	NA	NA	1	NA	0	Infection
Fortich et al.	2021	USA	Case report	KTS	1	35 years	1.0 - 6.7	No/None reported	1	NA	NA	NA	0	Nil
Harbers et al.	2021	Netherlands	Retrospective cohort study (single centre)	Slow-flow vascular malformations experiencing severe pain/functional impairment refractory to previous treatments	2	6 years, 30 years	4 - 10	Co-trimoxazole	2	0	NA	2	2	Aphthous stomatitis
Ji et al.	2021	China	Prospective non-randomised clinical trial (multicentre)	Children (0-14) with complex vascular anomalies	7	Individual ages not reported	10 - 15	Co-trimoxazole	NA	5	NA	6	0	Mucositis
Maruani et al.	2021	France	Prospective Phase II Randomised Clinical Trial (multicentre randomised clinical trial where patients where randomised to either 4 or 8 months observation period prior to starting sirolimus)	Children (6-18) with complex slow flow vascular malformations extending to underlying tissues	1	Individual ages not reported	4 - 12	No/None reported	1	0	NA	1	NA	Oral ulcer
Tole et al.	2021	Canada	Retrospective cohort study (single centre)	Children (0-18) with vascular tumours & malformations	2	8 years 9 months, 11 years 10 months	5 - 15	No/None reported	2	NA	2	2	NA	Hypertriglyceridaemia
Yuan et al.	2021	USA	Case report	KTS	1	43 years	3 - 20	No/None reported	NA	1	NA	1	0	Not reported
Kuo et al.	2022	Taiwan	Case report	KTS	1	20 days	10 - 15	No/None reported	1	NA	NA	NA	0	Raised GGT

A = Not reported

	n/total	%
Total number	45	100
Female patients	11/21	52.4
Improved clinical	27/28	96.4
Improved lesion size on MRI	21/32	65.6
Improved haematological markers	16/16	100
Improved	27/36	75
Stopped sirolimus due to side effects	7/45	15.6

VO99

Circulating Proteins as Diagnostic Biomarkers in Chronic Venous Disease: A Systematic Review

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Introduction: Chronic venous disease (CVD) clinical manifestations arise from cellular and molecular changes secondary to venous hypertension, but these pre-clinical datasets are heterogenous and have had limited translational impact. This review aims to explore the existing literature on protein biomarkers in primary CVD, characterising their associations to CVD stage and alterations when compared to controls.

Methods: A systematic review was reported according to the PRISMA guidelines. MEDLINE and Embase databases were searched up to 20th November 2021. Study selection and data extraction was performed by three reviewers independently.

Results: 49 studies were identified. Seven studies used untargeted while 42 used targeted approaches to identify biomarkers. Heterogeneity was identified in sampling sites, sample types, and analysis methods. Circulating proteins involved in extracellular matrix remodelling (e.g. MMP-1/2/8/9), cytokines (e.g. IL-6), chemokines (e.g. RANTES), and growth factors (e.g. VEGF) were found to be more consistently dysregulated in CVD patients, but with weak correlation to disease severity.

Conclusion: This study has systematically reviewed the evidence on circulating protein phenotypes associated with CVD. Certain proteins including RANTES, IL-6, VEGF, and MMPs (MMP-1/2/8/9) have been identified as potential translatable biomarkers after further characterisation in vivo.

VO100

A systematic review of biomarkers in chronic venous disease and their effects on wound healing

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BACKGROUND: Chronic venous disease (CVeD) is a common vascular pathology of great socioeconomic burden. Several studies have been carried out to understand the pathophysiology of venous leg ulcers to allow for an effective therapy. The aim of the review was to elicit predominant biomarkers and their effects on wound healing.

METHODS: We undertook a systematic review as per PRISMA protocol of all randomised human control studies written in English, using PUBMED, EMBASE and OVID Databases within the last ten years.

RESULTS: Out of 23 articles in the original search, 5 articles fit the selection criteria, and a further 8 articles were found via reference screening. 3 articles thought to be suitable were unavailable. 10 original articles were included in this review, involving a total of 458 patients. Studies thus far have highlighted inflammatory markers e.g., IL1, IL6, IL8, IL10, TNF-alpha, VEGF, as well as proteolytic biomarkers e.g., MMP1, MMP2, MMP3, MMP8, MMP9, MMP13, TIMP1, TIMP2, in various phases of wound healing.

CONCLUSION: Further research is needed in a larger population study to investigate if these biomarkers can be good prognostic indicators for wound healing in local and systemic environment, using old and novel therapies in the management of CVeD.

VO101

EKOS thrombolysis for the management of ilio-femoral DVT at district hospital/Cumberland infirmary

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[1]Badreldin Mohamed, [2]Salma Babikir, [3]t.Barakat, [4]R.Eifell, [5]M.CUSSO, [6]l.Navaro, [7]Nor adliana, [8]T.ojimba

Venous-thromboembolism is common vascular disease affecting lower limbs composed of (DVT) (2/3 of VTE) and 1/3 is PE. The goal of management of DVT is to prevent PE, recurrence or PTS .Anticoagulation was the cornerstone of DVT management to prevent PE or recurrent DVT.

Results: 21 patients had thrombolysis for illiofemoral DVT over 7years in Cumberland infirmary (16Females, 5 Males). Median age 20-89 years. Number of Sessions; 1 session:4 Patients, 2 session :11 patients 3 sessions:5 patients 4 sesseions:1 patients. Success rate 80%/More :85.7%(18 patients). Stents placement %. Out come; Improvement of symptoms in 85.7%(18 patients) leg ulcer healed in 9.52% (two patients). complications: Leg swelling 28.6% (6 patients) All are short terms resolved with three weeks and one long standing leg swelling. Post procedure leg pain is in 19.04% (4 patients). ongoing issues were in9.52% and were persistent leg ulcer and PTS in each. One patient had recurrence . two patients had bleeding at puncture site 9.52%No patient had PE/ intracranial bleeding.

Conclusion: CDT improve the quality of life by preventing valvular damage and reducing long-term sequela of PTS.
CDT also reduces risk of recurrent DVT/PE more than anticoagulation alone . No records of Sever post-procedure bleeding

Abstract Posters

BP1

BP1 - A case study project to explore physiotherapists' experiences of using removable rigid dressings with patients post transtibial amputation in the United Kingdom

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Background: Clinical guidelines advise the use of removable rigid dressings (RRDs) with patients post transtibial amputation,1,2,3 however in practice, RRDs are not widely used. 4 Little is known about the experiences of physiotherapists using RRDs with patients.

Aim: To explore the experiences of physiotherapists who have used or are using removable rigid dressings with patients post transtibial amputation.

Methodology and Methods: A relativist ontological stance, constructivist epistemological approach and a case study methodology were employed. Virtual semistructured interviews with ten participants. Analysis: Thematic coding used to analyse data, resulting in three key themes: Application of RRDs; RRD design; and Education and training related to the use of RRDs.

Conclusions: To ensure RRDs are used most effectively, the design and education and training provided needs to be considered to ensure as many of the positive effects are achieved, while minimising negative effects

BP2

BP2 - Physical activity participation among community re-integrated army veterans following lower limb amputation in Sri Lanka

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Lower limb amputation (LLA) associated secondary disabilities related to reduced physical activity (PA) levels. However, PA participation among LLA population in Sri Lanka is unknown.
A comparative cross-sectional study was conducted. Level of PA was assessed for community re-integrated army veterans with LLA (group 1, n=85) using the International Physical Activity Questionnaire. PA was defined as metabolic equivalent of task (MET)-minutes/week and computed for walking, moderate-intensity, and vigorous-intensity activities. Level of PA was classified as either very active, sufficiently active, or sedentary. This assessment was repeated with a group of age and sex matched healthy individuals (group 2, n=85).
Group 1 participants had undergone amputation > ten years ago (Mean±SD: 21.7±5.9). Total PA score was significantly lower in group 1 (Median (IQR): 1913.6 (515.8-3506.9)) compared to group 2 (Median (IQR): 4857.3 (1008.4-8296.1)) ($p<0.05$). PA participation in walking and vigorous-intensity activities were significantly lower in group 1 compared to group 2 ($p<0.05$). Thirty-four (40%) in the group 1 were classified as “sedentary” compared to 10 (11.8%) in group 2 ($p<0.05$).
PA participation is insufficient in majority of the veterans with LLA, and lower compared to healthy counterparts. Veterans mostly engaged in moderate-intensity and domestic and garden related physical activities.

BP3

BP3 - Exploring outcome measurement following lower limb amputation from a clinical practice perspective: a narrative review

Ostler C[1], Scott H[1], Sedki I[1], Kheng S[1], Donovan-Hall M[1], Dickinson A[1], Metcalf C[1]
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Background: Outcome measurement is essential to understand the impact of clinical interventions and the performance of services. Despite national and professional body encouragement, and successful examples of system level outcome measurement within some health care settings, many barriers still exist preventing outcome measurement from becoming embedded in clinical practice.

Objectives: To explore the status of outcome measurement in prosthetic rehabilitation, as applied in clinical practice, with a view to identifying areas of future work aimed at making outcome measurement in prosthetic rehabilitation a meaningful and useful reality.
Study Design: Narrative review

Methods: A literature search of four databases was undertaken, following the PRISMA principals appropriate to narrative reviews, and using the search terms outcome, measure*, tool, scale, instrument, prosthe*, amput* and limb loss. A total of 1116 papers were identified. Following screening 35 papers, focusing on four main themes, were included in the review.
Results: The four themes were 1) What outcome domains should be measured? 2) How can these outcome domains be measured? 3) What are the barriers to outcome measurement? and 4) What examples of routine outcome measurement currently exist in prosthetic practice?

Conclusions: Successful outcome measurement in clinical practice is multifaceted. Understanding and embedding value at every step is key to success. Addressing the questions of `why', `what' and `how' we measure outcome may move us closer to a consensus. Routine outcome measurement at the clinical level should ensure data collection is valuable to clinical practice, makes use of IT solutions and has all important organisational buy in.

BP4

BP4 -An update and review of the MSc in Amputation Prosthetic Rehabilitation': how are we doing and plans for the future

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[1]University Of Southampton, [2]Portsmouth Enablement Centre, UK, [3]University of Southampton

The 'MSc Amputation and Prosthetic Use Programme' has now been running for six year and was developed in response to a call from BACPAR to develop a range of 'Continued Professional Development' (CPD) opportunities within the field of 'amputation rehabilitation'. We therefore worked in partnership and developed a range of CPD offerings, ranging from a single CPD module through to a full MSc, with two potential exit awards of Postgraduate Certificate and Postgraduate Diploma. We are now in the process of revalidating the programme and continue to see this as a joint venture with shared ownership. The aim here is to therefore provide a summary of the programme and a platform for feedback and questions from the wider BACPAR membership.

This will include:
Overview of the two specific amputation modules that provide current and specialist knowledge relating to all areas of amputation rehabilitation practice
Discuss the current structure of the modules and feedback on the four-day teaching blocks that run from Thursday to Sunday
Present figures and graphs of the student numbers and professional backgrounds that have completed the module
Provide a summary of anonymous student reflections and future plans
Provide an opportunity to ask questions and a feedback box

BP5

BP5 - Exploring an integrated therapy approach in meeting standards pre and during covid

Wilkins H

The start of Covid-19 in March 2020 brought significant changes to healthcare, including staffing levels and service provision. However, it is currently unknown whether this altered local service provision for vascular patients following lower limb amputation.
The full study is a BACPAR documentation audit on an integrated Occupational Therapy and Physiotherapy team for patients following lower limb amputation in a regional vascular hub, where BACPAR guidelines underpin a significant amount of the ward work. It will look at the impact of Covid-19 on meeting therapy standards with this patient group, and also explore integrated OT/PT working.
The poster will aim to outline the first part of the project proposal, including the background and methodology.

BP6

BP6 - What is the role for physiotherapy in post-thrombotic syndrome?

Waring H

Post-thrombotic syndrome (PTS) is a complication of deep venous thrombosis, occurring in 20-50% of patients [1]. A common predictor of PTS is the site of the initial deep venous thrombosis [2]. Conservative management techniques, such as compression and exercise, have been cited for the treatment of post-thrombotic syndrome [3], as well as surgical techniques. The way exercise affects the calf pump within venous insufficiency is well defined in the literature, however there is less evidence when looking specifically into post-thrombotic syndrome.

A literature review was carried out to review the evidence for exercising with PTS across five databases; MEDLINE, CINAHL, Google Scholar, AMED, EMBASE. Across all databases, four papers were available to review. Two looked into the effects of exercise training on PTS [4, 5], one studied the changes in intravenous pressures when exercising [6], the final paper assessed the effect of early physical activity on the development of PTS [7].

The results showed improvements in patient's symptom burden and quality of life, although sample sizes were small across the board and participants were not UK based. This suggests there may be a role for physiotherapy, but more research is needed particularly within a UK cohort.

References

1. Kahn, S. R. (2010) The post-thrombotic syndrome, Hematology, 2010 (1), pp. 216-220. DOI: 10.1182/asheducation-2010.1.216.
2. Kahn SR, Shrier I, Julian JA, et al. Determinants and time course of the postthrombotic syndrome after acute deep venous thrombosis. Ann Intern Med. 2008;149:698–707
3. Schleimer K, Barbati ME, Gombert A, Wienert V, Grommes J, Jalaie H. The Treatment of Post-Thrombotic Syndrome. Dtsch Arztebl Int. 2016 Dec 16;113(50):863-870. doi: 10.3238/arztebl.2016.0863. PMID: 28098065; PMCID: PMC5273589.
4. Kahn, S. R., Shrier, I., Shapiro, S., Houweling, A. H., Hirsch, A. M., Reid, R. D., Kearon, C., Rabhi, K., Rodger, M. A., Kovacs, M. J., Anderson, D. R., Wells, P. S., Kahn, S. R., Shrier, I., Shapiro, S., Houweling, A. H., Hirsch, A. M., Reid, R. D., Kearon, C. and Rabhi, K. (2011) Six-month exercise training program to treat post-thrombotic syndrome: A randomized controlled two-centre trial, CMAJ: Canadian Medical Association Journal, 183 (1), pp. 37-44. DOI: 10.1503/cmaj.100248.
5. Gürdal Karakelle, S., Ipek, Y., Tulin, O. and Alpagut, İ U. (2021) The efficiency of exercise training in patients with venous insufficiency: A double blinded, randomized controlled trial, *Phlebology,* 36 (6), pp. 440-449. DOI: 10.1177/0268355520985759.
6. Kurstjens, R. L. M., de Wolf, M. A. F, Konijn, H. W., Toonder, I. M., Nelemans, P. J., de Graaf, R. and Wittens, C. H. A. (2016) Intravenous pressure changes in patients with postthrombotic deep venous obstruction: Results using a treadmill stress test, Journal of Thrombosis and Haemostasis, 14 (6), pp. 1163-1170. DOI: 10.1111/jth.13333.
7. Shrier, I., Kahn, S. R. and Steele, R. J. (2009) Effect of early physical activity on long-term outcome after venous thrombosis, Clinical Journal of Sport Medicine, 19 (6), pp. 487-493. DOI: 10.1097/JSM.0b013e3181bd11a3.

BP7

BP7 - Our experience of the short term effects of MPKs at Swansea ALAC

Carter L

There is limited research on the short term benefits of MPK. As a centre we are able to prescribe a set number of MPKs per year under our new MPK policy (Rheo XC, C-leg 4, Plie 3 and Orion 3). The MPK policy in Wales states that outcome measures must be recorded for each patient on their current prescription (baseline) and repeated after 4 weeks of trialling an MPK (as well as after 6months and a year). We are have just completed the first year of our MPK service and thought it would be interesting to average out our results to see if there are any trends/patterns.
Method: The outcome measures recorded at baseline and post 4 week MPK trial were: number of stumbles and falls, ABC, RNLI, PEQ, TUAG, L-test, 6min indoor walking test and 2min outdoor walking test. All outcome measures pre and post-trial were averaged to allow easy comparison. Video footage of the patient walking on the flat, up and down stairs and up and down a ramp. We also collected patient impact statements at 4 weeks to record verbal feedback from the patients.
Results: No. of stumbles and falls both decreased. ABC score improved. RNLI score improved. PEQ scores improved in every category. TUAG time decreased. L-test time decreased. 6min walking test distance increased. 2min walking test distance increased. Gait and technique/effort on stairs and ramps also improved. A word cloud was created from the patient impact statements with the strongest themes being ‘confidence’, ‘stability’, ‘easier’, ‘less back pain’ and ‘stairs foot over foot’.

P1

P1 - Predicting Necrotising Soft Tissue Infections in People Who Inject Drugs: The Development of a Novel Clinical Predictive Nomogram in a Retrospective Cohort with Internal Validation

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Diagnosis of necrotising soft tissue infections (NSTI) can be challenging. Early identification and debridement are key for improved outcomes. People who inject drugs (PWID) are high-risk for NSTI. Scoring systems can facilitate recognition, however none have been validated in PWID. Prior work highlighted the poor performance of the Laboratory Risk Indicator for Necrotising Fasciitis (LRINEC) in PWID. This study aimed to develop a clinical predictive nomogram to aid diagnosis.

All lower limb infections secondary to injecting drug use were extracted from a retrospective database (01/12/2011-31/12/2020) and dichotomised by NSTI and non-NSTI. Global and best-fit logistic regression models were built to estimate the odds of having NSTI. Model covariates were age, gender and blood results.

There were 557 lower limb infection admissions (378 patients), with 124 (22.3%; 111 patients) NSTI. Vascular surgery ultimately managed 116 (93.5%) NSTI. The nomogram model found age ($p=0.04$), c-reactive protein ($p<0.001$) and non-linear albumin ($p=0.015$) to be significant predictors of NSTI. The NSTI prediction model had a calibration of 0.949 and C-index of 0.794, compared to an area under the curve of 0.697 (95% confidence interval=0.615-0.778) for LRINEC ≥6 in this PWID cohort.

Early diagnosis of NSTI in PWID may be enhanced through this predictive nomogram.

P2

P2 - Mirror Therapy for the Management of Phantom Limb Pain: A Single-Centre Experience

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Introduction
Phantom limb pain (PLP) can have devastating consequences, affecting up to 90% of amputees. PLP is associated with analgesia dependence and impaired quality of life. Mirror therapy (MT) is a novel treatment that has been applied in other pain syndromes. We prospectively evaluated MT in the management of PLP.

Methods
Prospective study of patients recruited between 2008–2020 who underwent unilateral major limb amputation but had a healthy contralateral limb. Participants were invited to attend weekly MT sessions. Pain in the seven days prior to each MT session was scored on a visual analogue scale (VAS -0-10mm) and the short form McGill pain questionnaire (SFMPQ).

Results
98 patients (68M: 30F) ages 17-89 years were recruited over 12 years. 44% patients had amputations due to peripheral vascular disease. Over an average of 2.5 sessions, the final treatment score on the VAS scale was 2.6 (SD ±3.0) with a reduction of 4.5 points on VAS score. As a comparison using the SFMQ scoring system, the average final treatment score was 3.2 (±5.0) with 91% overall improvement.

Conclusion
MT is a very powerful and effective intervention for PLP. It is an exciting addition to the armoury of vascular surgeons in PLP management.

P3

P3 - Ankle Doppler acceleration index for cuffless, accurate and precise estimation of ankle brachial pressure index and diagnosis of PAD independent of diabetes

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[1]Department of Clinical and Experimental Medicine, University of Surrey, [2]Surrey and Sussex Healthcare NHS Trust, East Surrey Hospital, [3]Brighton and Sussex University Hospitals NHS Trust, [4]Department of Mathematics, University of Surrey, [5]St George's University Hospitals NHS Foundation Trust

Introduction: Ankle brachial pressure index (ABPI) is the first-line test to diagnose peripheral artery disease (PAD). Its adoption in clinical practice is poor and the validity e.g. in diabetes is limited. We hypothesized that ABPI can be accurately estimated based on cuffless Doppler wave forms.

Methods: Retrospective analysis of standard ABPI and handheld Doppler waveform characteristics. Prospective analysis of ABPI and angle-corrected Doppler acceleration index (AccI) with testing of performance to diagnose PAD with ultrasound and CT-angiography reference standards.

Results: AccI from handheld Doppler was significantly logarithmically associated with ABPI ($y=0.27\ln(x)+0.31$, $p<0.001$, $R2=0.67$, $n=100$) and estimated ABPI (eABPI) based on AccI closely resembled ABPI ($r=0.81$, $p<0.001$, average deviation -0.01±0.13 [SD], $n=100$). AccI from angle-corrected Doppler in patients without media sclerosis improved ABPI prediction ($y=0.3*\ln[0.038*x+1]$, $R2=0.94$, $p<0.0001$, average deviation -0.01±0.08, $n=100$). In a population including diabetes CLI and media sclerosis ($n=148$), ROC-analysis of (angle-corrected) eABPI performed better than ABPI to diagnose PAD defined by ultrasound (area=0.96, $p<0.001$; sensitivity: 94%, specificity: 95%, $n=117$) and CT (area=0.93, $p<0.001$, sensitivity: 87%, specificity: 100%, $n=111$) at <=0.9 cut-off independent of diabetes ($p=0.408$).

Conclusion: ABPI can be estimated based on AccI without compression and performs better than standard ABPI to diagnose PAD independent of diabetes.

P4

P4 - Implementation of the SHOUT protocol in the post-operative management of Carotid Endarterectomy (CEA) Surgery

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Introduction: SHOUT is an early warning protocol to identify haematoma development following anterior neck surgery[1]. We review the effect of introducing this following CEA.

Methods: A retrospective analysis of the investigations and outcomes following CEA between 2018- 2022 at our UK vascular unit were reviewed.

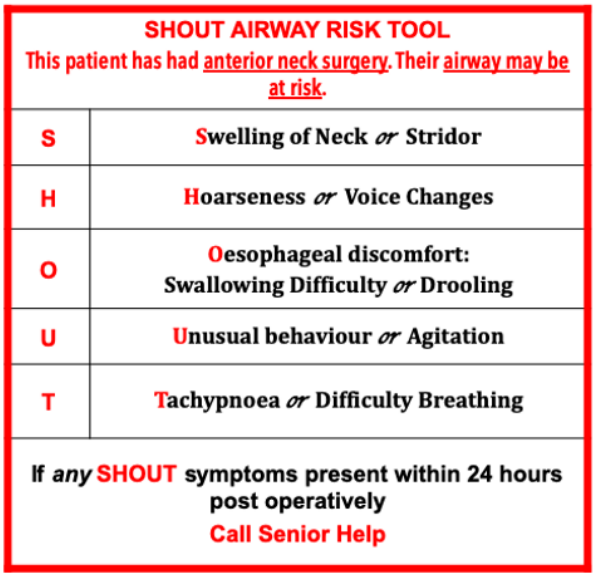
Results: A total of 216 patients underwent CEA. 100 patients pre-SHOUT (Group A), 112 patients post-SHOUT (Group B).
In Group A, 9 (9%) required re-imaging for urgent neurological symptoms, 2 of them had new stroke findings and were managed conservatively. 3 patients underwent urgent surgical re-intervention; 2 returned to theatre without imaging due to significant haematoma.

In Group B, 11 (9.8%) required re-imaging, 3 had new stroke findings and were managed conservatively, while only one patient (0.89%) needed surgical re-intervention for haematoma evacuation.

Conclusion: Although no significant difference was noted between the groups, the SHOUT protocol aids all members of the post-operative team to recognise early impending complications that require intervention. This provides more time to formulate and execute the appropriate management plan.

References:

1. DOI: https//doi.org/10.1016/j.bja.2018.02.048



SHOUT AIRWAY RISK TOOL This patient has had anterior neck surgery. Their airway may be at risk.	
S	Swelling of Neck *or* Stridor
H	Hoarseness *or* Voice Changes
O	Oesophageal discomfort: Swallowing Difficulty *or* Drooling
U	Unusual behaviour *or* Agitation
T	Tachypnoea *or* Difficulty Breathing
If *any* SHOUT symptoms present within 24 hours post operatively Call Senior Help	

P5

P5 - Eligibility of COmmoN FEmoral artery atheroSclerotic diSease for endovascular treatment – the CONFESS study.

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Introduction: This observational study aimed to describe the morphology and composition of CFA lesions treated with CFAE and report the proportion that would be considered amenable to endovascular treatment since, after the advances in endovascular technologies, this amount is still unknown.

Methods: Patients who underwent CFAE from January 2014 to December 2018 in two NHS tertiary hospitals were included. Data relating to patient's characteristics as well as anatomical and morphological characteristics of the CFA atherosclerotic lesions were collected, which included plaque analysis using 3D reconstruction of pre-operative CTA. Lesions were considered suitable for endovascular treatment if presented with patent inflow, at least one patent outflow vessel (SFA or PFA) and CFA not occluded.

Results: A total of 829 CFAs in 737 consecutive patients who underwent CFAE were included (mean age 71±10 years; 526 males, 71%); 451 (62%) presented with CLTI. Overall, 35% of CFAs had a localised lesion and 376 (45%) target vessels did not feature severe calcium load with a patent CFA, PFA and proximal SFA and therefore would have been eligible.

Conclusion: A significant proportion of patients with atherosclerotic CFA lesions who undergo surgery could potentially be candidates for endovascular treatment.

P6

P6 - Different Endovascular MOdalities of Treatment for Isolated Atherosclerotic POPlitealArtery Lesions (EMO-POP registry)

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Background: Mid term results following treatment of isolated popliteal lesions are limited. We report mid-term outcomes following endovascular treatment of isolated atherosclerotic popliteal artery lesions.

Methods: A multicentre (15 hospitals, 5 countries) retrospective cohort study was performed on 651 consecutive patients treated for isolated popliteal using six techniques.

Results: PTA:286pts drug coated balloon : 98pts, COF stents: 84pts, high-COF stents:76pts, atherectomy alone:17pts and directional atherectomy with DCB :90pts Primary outcomes measures were primary and secondary patency, and freedom from clinically-driven target lesion revascularization. Median follow-up 20 was 26 months (range: 6-42). Actuarial rate for all patients at 26 months (per outcome measure) was: primary patency, 73.9%; secondary patency, 88%; F-CDTLR, 76.5%. Whencomparing PTA vs. all other treatments in an adjusted regression, F-CDTLR was 75.2% for PTA vs. 76.5% for all other treatments, HR: 1.06, 95% CI: 0.75-1.48, P=.46 (adjusted
regression); secondary patency was also not statistically different (85.7% for PTA vs. 88%, p=0.20). In an adjusted Kaplan Meier analysis, estimated primary patency was inferior for PTA in pairwise comparisons vs. other treatments (<.001 vs. atherectomy; .002 vs. DAART; .002 vs. low-COF stenting).

Conclusions: Treatment of isolated popliteal lesions is safe and associated with acceptable patency and CD-TLR in the mid-term.

P7

P7 - The road to recovery?- Functional outcomes after major limb amputation

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Introduction
Most patients want to become a Limb User (LU) after major limb amputation (MLA). Our study aims to look at factors affecting functional outcomes in patients undergoing MLA.

Methods
Retrospective database of patients from hospital records 01/04/2019-01/04/2022.

Results
Data for 81 patients with MLA. 41%(33/81) went to rehabilitation, 48%(39/81) home and 10%(9/81) died during index admission. Multivariate analysis showed that patients over 70 years were significantly more likely to go to rehabilitation OR (95% CI) 3.758(1.374-10.28)(P=0.01) and those on dialysis significantly less likely OR (95% CI) 0.193(0.039-0.966)(p=0.045). The level of amputation did not affect discharge to rehabilitation.
51%(41/81) became a LU and 49%(40/81) were Non Limb Users (NLU).
NLU patients had a significantly higher American Society of Anesthesiologists grade (ASA) (p=0.031) and use of dialysis than LU (OR (95%CI) 27.34(2.605-286.9)(p=0.006). Diabetes and COVID did not affect outcome.
There was a low rate of long term wound complications at 2%(2/81).
On multivariate analysis, patients with Through Knee amputation had an OR (95% CI) of being a NLU of 9.424(1.205-73.73)(p=0.033) and Above Knee of 5.642(1.635-19.47)(p=0.006) compared to those with a Below Knee Amputation.

Conclusion
Patients with dialysis, higher ASA and higher level amputations are less likely to become limb users.

P8

P8 - Does modified Rankin Score (mRS) matter? The impact of stroke severity on carotid artery endarterectomy (CEA) outcomes.

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Carotid artery endarterectomy (CEA) is recommended to reduce stroke risk in patients following non-disabling ischaemic stroke (modified Rankin Score mRS<3). We reviewed CEA outcomes in patients after more devastating strokes (mRS>3).

Data was collected from 1021 CEA cases over fifteen years. Patient demographics, co-morbidities and post operative outcomes were compared between preoperative mRS<3 (Group 1) and mRS>3 (Group 2). Statistical significance was determined by $p<0.05$.

Ninety-one (9%) patients were mRS>3. There was no significant difference between age, gender, and operated side. Group 2 had significantly higher rates of diabetes, atrial fibrillation, renal failure, heart disease, frailty, and higher ASA score. There was no significant difference in time to surgery, or anaesthetic type. Group 2 spent longer in High Dependency and had longer hospital stays. Return to theatre, and post operative cardiac and respiratory events were similar. Group 2 had a higher incidence of post-operative confusion and fewer patients returned to their home on discharge. Incidence of perioperative stroke, nerve injuries, mortality and readmission rates were not significant at 30 days post-operation between the two groups.

Patients with a higher mRS have more pre-operative co-morbidities but short-term perioperative complication rate is not significantly different. Patient selection should be undertaken with care.

P9

P9 - Systematic Review of the current status of Smart technologies and Artificial Intelligence (AI) applications in the detection and early diagnosis of diabetes related foot disease

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Introduction: Diabetes is the most common cause of non-traumatic limb amputation, with diabetic foot ulcers preceding > 80% of amputations in diabetic patients. Outcomes in diabetes foot disease can be modified by screening and/or early detection. Smart technologies and AI applications can potentially aid with screening, diagnosis, early intervention, and surveillance in patients at risk of diabetes-related foot disease.

Methods: Systematic Search using Medline, PubMed (January2000-March2022) of studies including humans, > 18 years old, Type I/ II DM with history of diabetes-related foot disease, smart wearables, or other technologies (smart home devices and mobile applications). 254 articles identified, 181 articles screened, 27 articles analysed. Assessment of methodological quality was performed using the QUADAS-2 tool.

Results: This review yielded small-sized validity studies with large heterogeneity which mainly investigated 'smart' wearables and home devices measuring plantar temperature, pressure and offloading, and mobile applications focusing on wound imaging for early diagnosis and monitoring.

Conclusion: Most of the technologies that are validated focus on monitoring and prevention. Large-scale controlled studies are lacking to confirm the impact of these technologies on diabetic foot outcomes. The leveraging AI generated care algorithms through machine learning from the data gathered from these technologies is still in its infancy.

PRISMA flow diagram

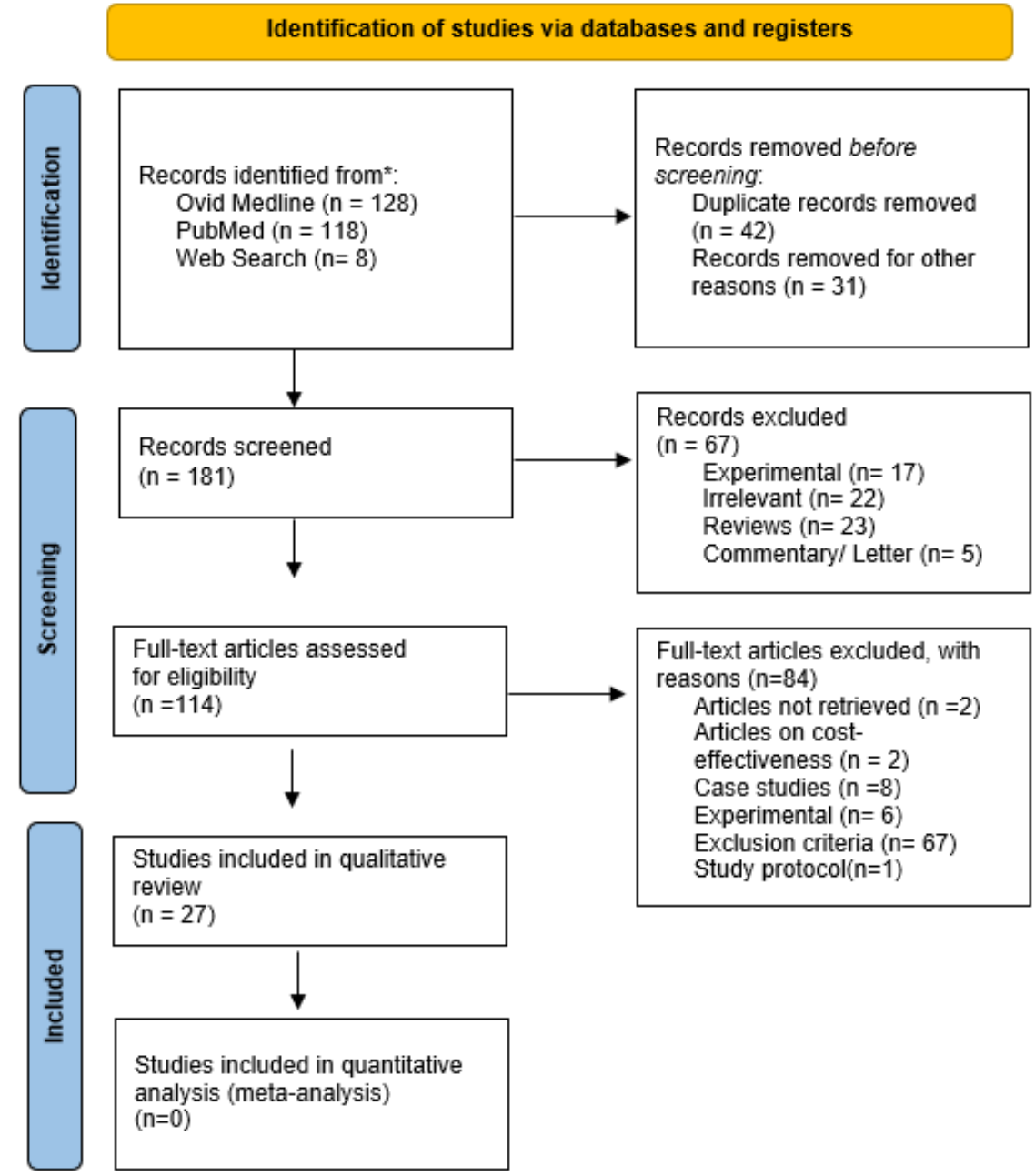

Figure1 – PRISMA flow Diagram

Study/ Authors	Type of Smart Technology	Index Test	Reference Standard	Usability
Reyzelman et al, 2022	Siren Socks wireless temperature monitoring device (Siren Diabetic Socks, Neurofabric, Siren Care Inc, San Francisco, CA)	Plantar Temperature	Standard Mercury thermometer (Temperature Difference of 2.2 ◦C)	Prediction /Early Detection
González J.T. et al, 2021	Smart Sock	Plantar Temperature	Thermal Camera FLIR E60bx; (Temperature Difference of 2.2 ◦C)	Monitoring
Beach et al, 2021	custom 3D wearable sensor insole system (based on Podimetrics SmartMat) (Frykberg et al) (17)	Plantar Temperature	Standard Mercury Thermometer (Temperature Difference of 2.2 ◦C)	Monitoring
Arts L et al, 2020	ThermoScale KT11 'smart' home device	Plantar Temperature	Standard Mercury Thermometer (Temperature Difference of 2.2 ◦C)	Screening/ Monitoring
Moulaei et al, 2020	Smart Shoe + Smartphone App	Plantar Temperature /Pressure/ Humidity	Standard Thermometer / Pressure not specified	Monitoring
Lavery et al, 2019	Smart mat (Podimetrics Remote Temperature Monitoring System)	Plantar Temperature	Ambient Temperature difference of 10.5C	Monitoring/ Prognosis
Reyzelman et al, 2018	Siren Socks (Siren Care) temperature monitoring device	Plantar Temperature	Stand- alone sensor temperature, °C	Diagnosis/ Early Detection
Rescio et al, 2019	3D foot Smart Insole	Plantar Temperature/ Pressure	Infrared Thermometer/ Piezoelectric	Monitoring
Najafi et al, 2017	SmartSox	Plantar Temperature /Pressure	FSCAN/Fluke; Ti25 (IR Thermal Camera)	Prediction/ Risk Assessment
Frykberg et al, 2017	SmartMat (Wireless thermometric foot mat)	Plantar Temperature	Stand- alone sensor temperature, (Temperature difference of 2.2 ◦C)	Early Diagnosis
Park et al, 2022	SmartBoot (Smart removable offloading Boot) + Smartwatch Mobile App	Plantar Pressure/ Offloading	Sensoria Core microelectronics; tri-axial accelerometer and gyroscope; R/S N/S	Monitoring/ Treatment
Du et al, 2021	Offloading Wearable	Offloading / Gait & Balance	LEGSys and BalanSens wearable sensor systems; N/S pressure	Monitoring/ Adherence to Treatment
Chatwin et al, 2021	SurroSense Rx Smart Insole	Plantar Pressure	Pressure sensors (Plantar Pressure exceeding capillary perfusion pressure > 35mmHg)	Monitoring
Abbot et al, 2019	SurroSense Rx Smart Insole	Plantar Pressure/ Offloading	Pressure Sensors (plantar pressure exceeding capillary perfusion pressure (>35 mm Hg))	Screening /Early Detection

Najafi et al, 2017	SurroSense Rx Smart Insole + Smartwatch app	Plantar Pressure/ Offloading	Pressure Sensors (threshold >35-50 mmHg for >15 minutes)	Monitoring /Adherence
Chan et al, 2022	CARE4WOUNDS(C4W) system + mobile app	Wound Imaging	Traditional Manual wound measurements (Length/Width/Surface Area)	Early Diagnosis/ Monitoring
Marques et al, 2021	PedCare Hybrid App	MHealth App - N/A	Standard Diabetic Foot Care; N/A	Monitoring/ Self-care
Ferreira et al, 2019	Diabetic Foot Guidance System (SOPeD)	MHealth App- N/A	Standard Diabetic Foot Care; N/A	Monitoring /Self-care
Fraiwan et al, 2018	FLIR ONE mobile thermal camera + Smartphone app	Wound imaging/ Thermal Image Acquisition	Thermal Camera FLIR (Temperature difference of 2.2 ◦C)	Prediction/ Early Detection
Wang et al, 2017	Swift Wound app/FLIR1 infrared camera	Wound imaging/ Thermal Image Acquisition	Traditional Manual wound measurements (Length/Width/ Surface Area)/ Thermal Camera FLIR	Early Diagnosis
Yap et al, 2018	FootSnap Application	Wound imaging/ MHealth App – N/A	Standard Diabetic Foot Care; N/A	Monitoring/ Self-care
Kanazawa et al, 2016	Smartphone based FLIR ONE Infrared Thermal Camera	Wound Imaging/ Thermal Image Acquisition	Thermal Camera FLIR (Temperature difference Pressure Ulcers PU ±2ºC, Diabetic Ulcers ±6 ºC)	Monitoring
Wang et al, 2015	Smart-phone wound Assessment App	Wound imaging/ MHealth -N/A	N/S	Monitoring/ Self-care
Hazenberg et al, 2012	Smart home device- photographic foot imaging device	Wound Imaging	Standard Diabetic Foot Care; N/A	Monitoring
Ladyzynski et al, 2011	Home Foot Scanning Device + TeleDiaFoS	Wound Imaging	Traditional Manual Wound Area (Ruler); computer-aided planimetry	Monitoring
Foltynski et al, 2011	Home Foot Scanning device (Patient Module) + TeleDiaFoS	Wound Imaging	Traditional Manual Wound Area	Monitoring/ Surveillance
Bus et al, 2010	Smart Home Photographic foot imaging device	Wound Imaging	Standard Wound Assessment by diabetic foot specialist; N/S	Monitoring

Table 1- Summary of studies investigating smart-wearables and smart- home devices

Key- Not specified N/S; Reference Standard R/S; Not Applicable N/A

P10

P10 - The impact of specialist chronic limb-threatening ischaemia (CLTI) outpatient clinics on limb-salvage outcomes; a systematic review and meta-analysis

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Introduction
New 'deliberately-challenging' standards of care for CLTI include rapid-access clinics. However, evidence is from single-centre data only. This meta-analysis aims to determine the impact of specialist outpatient CLTI clinics on patient outcomes, in comparison to inpatient management.

Methods:
The review was registered on PROSPERO. Diabetic foot clinic studies were excluded. The primary outcome was major amputation at 12 months. Secondary outcomes included mortality and amputation-free survival. Results were blindly and independently assessed twice, with a third reviewer arbitrating. 2 or more studies were required for meta-analysis.

Results
2625 articles were screened and reduced to 3 studies with a total of 930 patients.
Outpatients were half as likely to undergo major amputation compared to inpatients [9.6% vs 22.0%, OR 0.46 (95%CI 0.29–0.73, p=0.001, I2 = 0%)], although there was no significant survival benefit [11.8% vs. 23.7%, OR 0.28 (95%CI 0.04–2.18), p=0.22, I2 = 86%].

Amputation-free survival was significantly higher in outpatients compared to inpatients [20.4% VS. 44.7%, OR 2.95 (95%CI 1.23–7.04, p=0.02, I2 = 77%)], but heterogeneity was significant.

Conclusion
Specialist outpatient CLTI pathways can provide favourable limb-salvage outcomes in comparison to inpatient admission, but require further evaluation and optimisation.

P11

P11 - Outcomes of tibial vessel angioplasty for critical limb ischemia.

Fisher J[1], Ross J[1], Paravastu S[1], Hickson G[1], Cooper D[1], Ramnarine R[1], Chana M[1]
[1]*Gloucestershire Hospitals NHS Foundation Trust*

Background:
Patients with critical limb ischemia (CLI) quite often have significant tibial vessel disease. We assessed outcomes of tibial vessel angioplasty performed for CLI.

Methods:
Retrospective analysis of a prospectively collected database of all consecutive tibial angioplasty procedures performed over 2 years in a vascular network. Data collected includes demographics, indications, procedural details. Technical success and symptomatic improvement were the primary outcomes. Wound healing rate, complications and limb loss were the secondary outcomes.

Results:
126 tibial angioplasty procedures were performed in 114 patients. Median age was 76.5 years (30-94), of whom 75% were male. 62% suffered with diabetes and 25% had CKD; 20% were active smokers and 27% ex-smokers.
Technical success was achieved in 78% of cases. Mortality at 30-days was 3% and at 1-year was 20%. Symptomatic improvement was noted in 46% of patients. Significant improvement in symptoms within a month after angioplasty was experienced by 32.5% of patients. Although no significant improvement in symptoms, there was no deterioration in 21% of cases. 19% underwent major amputation.

Conclusions:
In this contemporaneous data tibial angioplasty helped to achieve 46% wound healing rate at 6 months and averted amputation in over 80% cases.

P12

P12 - Smoking cessation in Vascular patients: Whose responsibility is it?

Zyada A[1], Tripathi K[1], Yap Kannan R[1], SIVAPRAGASAM S[1], Enaya A[1], WAGSTAFF S[1], TURICCKI E[1], TANNER L[1], AU H[1]

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The NHS National Smokefree Helpline is a free service available to the public, to aid smoking cessation. We aimed to assess awareness and usefulness of this helpline, amongst vascular patients. An online Google form was used to gather data. Non- smokers were not recruited. This is an interim report of an ongoing prospective study. 79 patients were recruited (Median age: 64; M:F = 56:23). 38% patients (n=30) had never heard of the helpline. Of the patients who did (n=49), three quarters of patients had not used it (n=37). Of those who used the helpline, 50% stopped and 33.3% relapsed. The commonest reason for not using the helpline was 'wanting to quit smoking by themselves' (38%), followed by 'thought unlikely to be helpful' (19%). Introduction to the helpline was by GPs (51%), non-healthcare sources (36.7%), Vascular (2%) and other services (4%). This study shows that the helpline is effective when used. No patients had any major issues with it. The use of this helpline is not optimal, and neither is its uptake. Smoking cessation can be improved by a proactive approach of encouraging patients to use this helpline.

Table 1: data analysis

Smoking status	Number	Percentage
Current smoker	41	51.89873
Ex-smoker	38	48.10127
Total	79	100
Ratio	1.078947	
Age		
Range	33-89	
Median	64	
Gender	**Number**	**Percentage**
M	56	70.88608
F	23	29.11392
Total	79	100
Ratio	2.434783	
Setting	**Number**	**Percentage**
IP	5	6.329114
OP F2F	66	83.5443
OP tele	8	10.12658
Total	79	100
Awareness	**Number**	**Percentage**
Yes	49	62.02532
No	30	37.97468
Total	79	100
The patients who were aware	**Number**	**Percentage**
Used the service	12	24.4
Did not use the service	37	75.6
Total	49	100
Outcome of using the service	**Number**	**Percentage**
Stopped	6	50
Did not stop	2	16.66667
Relapsed	4	33.33333
Total	12	100
Source of information	**Number**	**Percentage**
GP	25	51.02041
Other specialist	4	8.163265
vascular specialist	2	4.081633
Non health care	18	36.73469
Total	49	100
Reasons for not using the service	**Number**	**Percentage**
Wanted to stop smoking by themselves	14	38
Did not think it will be helpful	7	19
Other reasons	16	43
Total	37	100

P13

P13 - Comparison between 2DUS and t3DUS for the assessment of the lower limb arteries

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The current haemodynamic criteria for assessing lower limb arteries relies on the peak systolic velocity to calculate the ratios for estimating the stenosis. However, there is a percentage of 30% (50% – 80%) that allows the vascular scientist to use their own opinion on estimating the grade of stenosis. This study aims to narrow the 30% down and break it into 5% for more precise treatment options.

Method:
50 participants with different SFA grades of stenosis were assessed using 2D ultrasound. The current 2D criteria was used to define the grade of stenosis, followed by t3DUS, which provided stenosis percentage.

Results:
Correlation between velocity ratio and degree of stenosis measured using t3DUS shows a strong positive correlation between velocity ratio and degree of stenosis measured using t3DUS (correlation value (r) = 0.99, p<0.001, Figure 1). Table 1 shows the criteria to define lower limb arterial stenosis measured using t3DUS.

Conclusion:
t3DUS demonstrated the ability to provide a precise grade of stenosis. Where unavailable, the new ratios out of this study can be used. This would significantly help the vascular surgeon with the best treatment plan with the right intervention tools size and for the follow-up scans in recurrent interventional decisions.

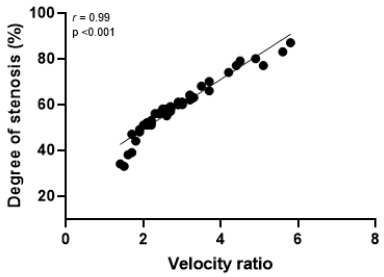

Figure 1 Demonstrates the degree of stenosis in correlation with velocity ratios.

Stenosis (%)	Velocity Ratios
<50	<2
50-54	2-2.4
55-59	2.5-2.9
60-64	3-3.4
65-69	3.5-3.9
70-74	4-4.4
75-79	4.5-4.9
>80	>5

Table 1 Grading of lower limbs arterial stenosis measured using t3DUS.

P14

P14 - COVID-19 associated temporal and demographic trends in diabetes mellitus related major lower-limb amputations within Sussex 2019-2021

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Introduction
Major lower-limb amputations secondary to diabetes mellitus (DM) are a preventable outcome. This study aimed to evaluate the impact of the COVID-19 pandemic on incidence of DM-related major lower-limb amputations.

Methods
Data on all diabetic patients from Sussex receiving major lower-limb amputations at the arterial hub for the regional vascular network between March 1st, 2019, and March 1st, 2021 was included. Patients were classified into pre-COVID-19 and COVID-19 cohorts based on amputation date. Patients receiving major lower-limb amputations for non-diabetic causes and previous amputation revisions were excluded.

Results
A total of 89 amputations were included. 17(19%) were female, and 72(81%) were male. Mean age at time of amputation pre-COVID-19 was 70(±11), and 63(±10) during COVID-19. Amputation rates were pre-COVID-19 5 per 10,000(CI 4-7), and 4 per 10,000(CI 3-6) during COVID-19. Incidence rate ratio between the two periods was 0.87(CI 0.57-1.32). Median index of multiple deprivation decile pre-COVID-19 was the 6th decile, and during COVID-19 was the 5th decile. Incidence rates across clinical commissioning group areas were equally dispersed.

Conclusion
Decreased incidence rates of DM-related major lower-limb amputations were demonstrated during the pandemic. COVID-19 related demographic trends showed a disproportionate impact on younger, more deprived diabetic patients.

P15

P15 - Medical Optimisation in Chronic Life-Threatening Ischaemia in a Single Centre

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Best practice guidance from the PAD QIF states that "first line management for people with PAD is cardiovascular risk factor modification". Achieving guideline suggested targets for CV risk modification may reduce poor outcomes.

Methods

A retrospective study of CLTI patients (2019&2020). Data was collected at baseline on lipid lowering therapy and antithrombotic therapy (ATT). Lipid levels were collected to 1y. A composite 1y cardiovascular / limb focused outcome was used.

Results

We analysed a total of 250 patient with CLTI (69% men, median age 71). Fewer patients were prescribed no ATT at 1 year (19% to 5% p<0.001). Overall, median LDL-C remained at 1.7mmol/L at baseline and at 1y. At 1y, fewer people were statin naïve (23% vs 9% p<0.001) with an increase in prescription of high intensity statins (55% to 69% p<0.001). Targets for lipid reduction are shown in table 1. The composite outcome was reached in 7% of patients at 1y with an increase in patients with diabetes (p=0.016). LDL-C level / statin use or ATT use did not predict outcome at 1y.

Conclusion

Few patients reached an LDL-C of 1.0mmol/L. There is still need for aggressive lipid lowering with ezetimibe and statin up-titration.

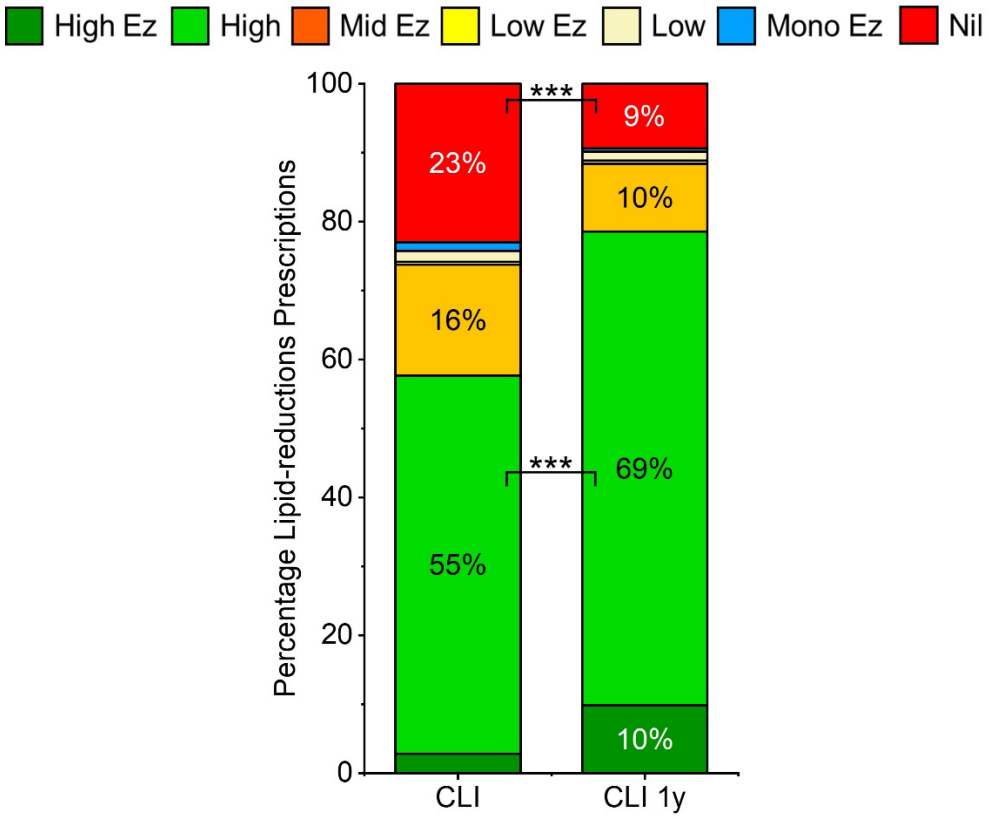
Targets achieved at baseline and at one year follow up (FU) for CLI cohort

One year targets no. /n (%)	Baseline	One Year	P-Value
UK NICE ≤1.8 mmol/L LDL-C	117/200 (58.5)	77/124 (62.1)	0.56
Of those above NICE target % optimised*	3/83 (3.6)	3/47 (6.4)	0.67
ESC/EAS ≤1.4 mmol/L LDL-C	66/200 (33.3)	50/124 (40.3)	0.19
Of those above ESC target % optimised*	4/134 (3.0)	8/74 (10.8)	0.03
ESC dyslipidaemia ≤1.0 mmol/L	34/200 (17.0)	23/124 (18.5)	0.76
UK NICE 40% LDL-C reduction	N/A	5/110 (4.5)	N/A
ESC/ESVS/ACC/AHA 50% LDL-C reduction	N/A	5/110 (4.5)	N/A
Incliseran >2.6mmol/L	27/200 (13.5)	20/124 (16.1)	0.52
PSCK9i >3.5 mmol/L	7/200 (3.5)	6/124 (4.8)	0.57
Prescription targets			
Ezetimibe	11/250 (4.4)	24/223 (10.8)	0.01
High intensity statin**	142/250 (56.8)	177/223 (79.4)	<0.001
Maximum statin	83/250 (33.2)	132/223 (59.2)	<0.001
Maximum statin + ezetimibe	5/250 (2.0)	21/223 (9.4)	<0.001

optimised= Maximum intensity statin (Atorvastatin 80mg or Rosuvastatin 40mg) plus ezetimibe 10mg

****High intensity = Atorvastatin 20mg+ or Rosuvastatin 10mg+. P-value Fisher's Test.***

Table 1.



*Statin (High/Mid/Low) and ezetimibe (Ez) prescriptions across the overall cohort, and clinics at baseline and at one year follow up (FU). CLI on the left. Fisher's exact test. NS= not significant p>0.05. ***= p<0.001, **= p<0.01, *=p<0.05.*

P16

P16 - MIND THE GAP: Peripheral arterial disease knowledge comparison between healthcare professionals and non-healthcare professionals

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Background: Peripheral arterial disease (PAD) is a vascular condition affecting 200 million people around the world. Although the consequences of the condition parallel those of cardiovascular conditions disease burden remains high. The aim of the research is to investigate whether there is a gap in PAD knowledge between healthcare professionals and non-healthcare professionals.

Methods: A survey was created by utilising available Illness Perception Questionnaires online. The survey was shared on various social platforms via a Google Form and results were collected throughout May 2022.

Results: Of the 260 participants surveyed, the majority were female, from a non-healthcare profession and over the age of 65. There was general low awareness of PAD, with an obvious disparity in illness perception between the two profession groups. Non-healthcare professionals were more likely to believe PAD was a condition of the heart and mistake the consequences of the disease if left untreated.

Conclusion: There is room for improvement in educational campaigns to close the gap in knowledge on PAD between healthcare professionals and non-healthcare professionals. Such initiatives have the potential to decrease incidence of PAD, and thus reduce the disease burden both personally to the individual and financially to the NHS.

P17

P17 - Reproducibility of pulse wave velocity and augmentation index in healthy individuals

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Introduction:
Pulse wave velocity (PWV) and augmentation index (Alx), measures of arterial stiffness and function, are important cardiovascular disease risk factors. The present study evaluated the reproducibility of PWV and Alx.

Methods:
Forty healthy subjects (age 33±11 years, 17 females) underwent resting PWV and Alx assessments using tonometer-cuff method and brachial-occlusion (SphygmoCor Xcel, AtCor Medical, AU). Measurements were performed in triplicate and repeated one week apart. Reproducibility was assessed using intraclass correlation coefficient (ICC). Inter-operator reliability was performed on ten participants. The relationship between average PWV and Alx was determined using Pearson's coefficient of correlation.

Results:
On the same day, PWV and Alx showed excellent reproducibility (i.e. PWV: ICC=0.96, 95% CI 0.92-0.98, p=<0.01; Alx: ICC=0.90, 95% CI 0.83-0.94, p=<0.01). Inter-operator reliability was excellent (PWV: ICC=0.98, 95% CI 0.93-1.00, p<0.01; Alx: ICC=0.91 95% CI 0.64-0.98, p=<0.01). One week apart, PWV and Alx showed high reproducibility (i.e., PWV: ICC=0.77, 95% CI 0.61-0.87, p=<0.01; Alx=0.87, 95% CI 0.75-0.93, p=<0.01). The relationship between PWV and Alx was significant (r=0.50, p<0.01).

Conclusion:
Pulse wave velocity and augmentation index demonstrate excellent reproducibility in healthy individuals. As a simple, non-invasive, patient- and user-friendly tool, arterial stiffness should be integrated into the assessment of cardiovascular risk profile.

P18

P18 - Hybrid vs conventional surgical approach in the management of common femoral artery disease

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Introduction
Hybrid approach is increasingly utilised in the management of peripheral arterial disease. This study assessed the outcomes of Hybrid revascularisation (HR) compared to common femoral endarterectomy (CFEA).

Methods
Retrospective analysis of consecutive patients undergoing CFEA and HR between 2017-2021. Primary outcomes included mortality, limb salvage, reintervention rates and surgical site infections (SSI). Secondary outcomes included length of surgery and stay.
Normality testing was undertaken using Kolmogorov-Smirnov test/ Q-Q plot. Student's unpaired t-test and chi squared analysis were used for continuous and categorical data respectively (SPSS v27).

Results
166 consecutive patients were included; 79 underwent CFEA and 87 HR. There were no significant differences in age, sex and indication for surgery. 19%(n=15) of CFEA patients required further reintervention compared to 11%(n=10) of HR patients ($p<0.01$). There were no significant differences in major amputation rates(8% vs 7%), one-year mortality(10% vs 8%) or SSI(15% vs 16%) respectively for CFEA versus HR.
HR procedures lasted on average 297 minutes compared to 218 minutes for CFEA ($p<0.01$). Length of stay was comparable.

Conclusions
Whenever feasible HR should be performed as it is associated with lower re-intervention rates. Despite longer operative time SSI outcomes and length of stay with HR are comparable to CFEA alone.

P19

P19 - Does chronic kidney disease and dialysis affect outcomes in diabetic patients requiring major limb amputation? - a single centre 4 year case series.

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Introduction
Both diabetic foot disease and major limb amputation have poor outcomes in patients with Chronic Kidney Disease. Our aim was to assess outcomes in diabetic patients with renal impairment undergoing major limb amputation over a 4 year period.

Methods
Single centre retrospective data collection from hospital systems 01/1/2018-31/12/2021.

Results
69 diabetic patients underwent major limb amputation. 39% (27/69) had normal renal function (NRF), 33% (23/69) Chronic Kidney Disease (not on dialysis) (CKD) and 28% (19/69) were on dialysis. Dialysis patients were significantly younger with a significantly lower HBA1C than the CKD group.
There was no significant difference in previous minor amputations, major amputations and revascularisations. There was no significant difference in mortality rates between different levels of amputation (Above Knee vs. Through Knee vs Below Knee).
Dialysis had a Hazards ratio of 2.602(1.018-6.653)(p=0.046) for mortality compared to NRF. Dialysis patients had lower survival rates at all time points analysed with only 68.4%, 45.6%, 39.1% and 26.1% survival at 6 months, 1 year, 2 years ad 4 years respectively.

Conclusion
Survival of diabetic dialysis patients undergoing major limb amputation was poor despite them being younger with lower HBA1C and care should be taken when planning and counseling this group.

P20

P20 - Reliability of Tomographic 3D Ultrasound in Measuring Carotid Plaque Volume.

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Background:
Tomographic 3D ultrasound(t3DUS)is a promising imaging technique for quantifying carotid plaque by measuring the degree of stenosis and plaque volume (PV).Carotid plaque volume(CPV)could add benefit in predicting plaque vulnerability.Therefore, we aimed to assess the reproducibility and accuracy of t3DUS for measuring CPV in patients undergoing carotid endarterectomy.

Methods:
t3DUS was used to obtain CPV from 25 patients before surgery.CPV from the endarterectomy specimen was then measured using a validated water displacement method as a reference standard.Intraclass correlation coefficient(ICC) and Bland-Altman plot were used to establish bias and limit of agreement between carotid plaque volume measurements.

Results:
Intra-operator agreement of t3DUS CPV measurements was excellent with an ICC value of 0.95 (95% confidence interval(CI) 0.91 – 0.97, p <0.001)Bias in measurements was 0.004±0.07 cm3 (95% limit of agreement (LoA) -0.14 – 0.15).There was an excellent agreement between t3DUS and gold standard in measuring CPV with an ICC value of 0.98 (95% CI 0.93–0.99, p <0.001)Bias in measurements was 0.07±0.08 cm3 (95% limit of agreement (LoA)-0.08–0.23)

Conclusion:
t3DUS is a reproducible imaging method and showed excellent agreement with reference standards in measuring CPV.Further studies investigating the reliability of t3DUS in assessing plaque morphological characteristics and the ability of CPV to predict plaque vulnerability are warranted.

P21

P21 - Current levels of involvement of vascular surgeons and orthopaedic surgeons in the acute surgical management of diabetic foot infections, and in multidisciplinary diabetic foot clinics: results of a UK survey.

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Introduction: Vascular surgeons commonly manage acute diabetic foot infections, while orthopaedic surgeons correct deformities. However, services seem to vary, and increased orthopaedic sub-specialisation has been suggested. This study investigated current UK practice.

Methods: Email questionnaires to Society Members, then targeted approaches.

Results: We aimed for information from the localities of 61 UK Arterial Centres, and received informative responses from 46 (75%). They described diabetic foot clinics daily (9%); or once (48%), twice (17%) or thrice (18%) weekly - attended regularly by vascular surgeons. Orthopaedic surgeons attend clinics substantially less often and are normally involved in initial management, and urgent treatment of sepsis, in only 22% and 14% localities, respectively. Operations for acute foot sepsis may be done by vascular in 98% localities and by orthopaedics in 17%. The latter are orthopaedic foot specialists in all localities but two. We will present the range of foot procedures undertaken by vascular and orthopaedics. Major amputations are done by vascular in 98% localities and by orthopaedics in only 8%. All deformity correction procedures are performed by orthopaedics.

Conclusion: A collaborative approach to diabetic foot care is vital. Services need to develop such that patients receive optimal care by the most appropriate specialists.

P22

P22 - Analysis of changes to vascular surgery outpatient attendances subsequent to the Covid-19 lockdown

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Objectives
To analyse vascular outpatient alterations after the first Covid-19 lockdown.

Design Comparative study.

Method
We analysed records of a single consultant before and after the coronavirus lockdown.
Volume, type, frequency and medium of OPA interaction were assessed from a prospectively maintained anonymised database.

Results
800 OPAs (Northamptonshire, 26/04/2021 -27/04/2022) were compared with the immediate previous cohort of 1024 OPAs (Bedfordshire, 01/06/2019- 31/05/2020).
Virtual consultations increased from 21.7% to 50.1%. DNA rates doubled from 2.6% to 5.4%. A greater proportion of patients are seen less frequently in the post Covid era; half the individuals had one or two total OPAs and the other half had more than two in 2020-21; 75% individuals were seen at only 1-2 OPAs in 2021-22.
OPAs for CLTI increased from 10.2% to 22.8% and DFU-without-PAD from 3.2% to 5.4%. Non-CLTI PAD appointments remained static (26.5% vs. 25.8%), as did OPAs for AAA (11% vs 10.8%). Venous OPAs decreased from 19.3% to 6.6% and carotid encounters from 4.9% to 2.4% over the two periods.

Conclusion
The conduct and composition of vascular outpatient attendances has altered during the COVID-19 pandemic. Further research to understand the impact of these changes upon patient satisfaction and clinical outcomes is worthwhile.

P23

P23 - Metabonomic analysis of interstitial fluid obtained by microdialysis in tourniquet induced lower limb ischaemia - a novel biofluid for assessing tissue health?

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Background: Stratification of ischaemic damage in limb ischaemia is clinically challenging, and presently doesn't include biochemical assessment of tissue viability. Microdialysis is a minimally-invasive sampling technique used to obtain interstitial fluid (ISF). The metabolic profile of ISF in lower limb muscle was explored using metabonomic analysis (a systems biology approach permitting the study of cellular metabolism in biofluids).

Methods: A microdialysis catheter (M-Dialysis, Stockholm) was inserted into the gastrocnemius muscle of eight healthy volunteers. ISF was obtained at baseline, during tourniquet-induced ischaemia, and tourniquet release (reperfusion), alongside paired plasma samples (venapuncture). Samples were analysed using three Liquid Chromatography Mass Spectrometry assays.

Results:
ISF contains substantially different metabolites from plasma, with only 15-25% of metabolites present in both biofluids. Mixed-effects linear regression modelling identified significant changes ($p < 0.05$) in metabolites associated with the tricarboxylic acid cycle, carnitine synthesis and purine metabolism within the ISF during ischaemia and reperfusion phases, compared to baseline.

Conclusion: The analysis of ISF in limb ischaemia may add insight into the metabolic pathways occurring directly in the ischaemic muscle bed and with fewer systemic confounders than in plasma. An objective chemical assessment of tissue health has potential to transform assessment of limb ischaemia, and mandates further study.

P24

P24 - Lower Limb Sarcopenia on Magnetic Resonance Imaging in patients with Diabetes Mellitus – a Systematic Review

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Introduction:
Sarcopenia is defined by low measures of muscle quantity/quality, muscle strength and physical performance and is associated with frailty and mortality. Individuals with diabetes mellitus (DM) undergo sarcopenia at accelerated rates causing structural changes culminating in limb loss. Early, accurate detection may be of prognostic value.

Aims:
To systematically review the available literature on MRI and sarcopenia in lower limbs (LL) in DM. Method: A literature review was conducted in accordance with PRISMA guidelines.Embase and Medline databases were searched with Ovid interface, as well as Pubmed and Cochrane.The MeSH terms “sarcopenia” OR “sarcopaenia” AND “diabetes mellitus” AND “magnetic resonance imaging” were employed in the search string.Articles were reviewed by two independent reviewers.

Results:
660 studies were screened.9 studies were included in the study assessing the muscle atrophy component of sarcopenia in the lower limbs of DM patients. There is evidence of early sarcopenic changes in the LL on MRI in patients with diabetic polyneuropathy;There is good inter- and intra rater-reliability.

Conclusion:
MRI has merit in assessing skeletal muscle volume and fat infiltration of muscle.Further research is needed to evaluate its role in grading/risk stratification of patients with diabetes and the evolution of sarcopenia in the context of peripheral arterial disease.

STUDY	YEAR	LOCATION	NUMBER OF PATIENTS	STUDY DESIGN	MEDIAN AGE/AGE RANGE	M:F RATIO	MUSCLES REVIEWED	FINDINGS
ANDERSEN ET AL	1997	Denmark	-	Case Control	32	NOS	Ankle dorsi and plantarflexors Knee extensors and flexors *	FHL cross sectional area reduced in DPN (p<0.001); Muscle volume reduced by 32% (P<0.005); 43% Atrophy mid lower leg (P<0.002) and 65% distally (p<0.002)
BUS ET AL	2002	USA	-	Case Control	16	12:04	Intrinsic Foot muscles**	Volume significantly reduced in patients with DPN (P<0.02)
ANDERSEN ET AL	2004	Denmark	-	Case Control	46	32:14	Intrinsic Foot muscles**	Volume reduced by 73% in DPN (P<0.001) Interossei most affected
GREENMAN ET AL	2005	USA	-	Case Control	31	22:09	Foot Muscles NOS	Small muscle atrophy present before clinical manifestation of DPN (p <0.001)
ANDREASSEN ET AL	2009	Denmark	26 (T1DM)	Cross sectional	55-61	16:08	Ankle dorsi and plantar flexors Knee extensors and flexors *	Annual loss of muscle volume loss higher in DPN > Non-DPN > Control (p<0.01). Average 3% muscle volume loss annually in DM patients (P<0.01)
ALIZAI ET AL	2012	USA	62 (26 with DM)	Case Control	-	62F only	Lower Limb Compartments***	Correlation between clinical grading and fat fraction values (P<0.0001) Higher Goutallier grades in DM than non-DM. Intra and interrater correlation 0.83 and 0.81
CHEUY ET AL	2013	USA	19 (12 with DM)	Case Control	53-57	9M:10F	Forefoot, Midfoot, Hindfoot NOS	ICC >0.95 ; No differences in the reliability values between the two groups using different MR sequences
PRITCHARD ET AL	2015	Canada	59 (29 with DM)	Cross sectional	70	59F only	Soleus, Gastrocnemius	IMAT higher in DM (p= .002) but reduced to 13% vs 11 in non-DM when adjusted for confounding factors (p= 0.515). ICC 0.99 for IntraMAT 0.98 for InterMAT
MOORE ET AL	2016	Canada	17 (5 with DPN	Case Control	65	5:04	Tibialis Anterior	Lower MTR and proportion of contractile tissue 8% lower. Longer T2 relaxation time. P<0.05

P25

P25 - Service evaluation of the vascular hot clinic – assessment of the provision of intervention for carotid disease, critical limb threatening ischaemia and venous leg ulcers

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This service evaluation aimed to assess how a newly introduced hot clinic facilitated the provision of intervention for carotid disease, critical limb-threatening ischaemia (CLTI), venous leg ulcers (VLU) as recommended by national guidelines.

Data was prospectively collected using a fit-for-purpose proforma between March 15 – June 9, 2021. Additional information were retrospectively gathered.

202 patients attended 33 clinics over the study period, with no data available from 4 clinics (approx. 28 patients). 9 patients were lost to follow-up and excluded from long-term outcomes including time from clinic to intervention, but not from the overall analysis. 50% (n=6) received intervention for carotid disease within 2 weeks from referral, and 83% (n=5) of patients received intervention within 5 days from when seen in clinic. 57.6% (n=19) of patients diagnosed with CLTI received intervention within 14 days, and 47.6% (n=9) with VLU were discharged (~5% of all referrals).

This service evaluation demonstrates the versatility of changing acute vascular services in response to unforeseen pressures in addition to providing a baseline for the performance of the hot clinic. Low adherence to standards could have been due to pandemic-related pressures on NHS services. Reinstation of routine clinics and operating theatres may assist with this.

P26

P26 - The Carbon Footprint of the Operating Theatre

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Climate change is the largest challenge facing public health, and currently healthcare generates eight percent of greenhouse gases. This study will investigate what can be done in the operating theatre to reduce emissions.

Retrospective analysis of vascular operations over a month for the number of general anaesthetics (GA) and type of agent administered took place using electronic records. Staff were questioned on waste disposal before and after an educational update, and the current methods of waste processing at the Trust were investigated.

Twenty-two patients received a GA; 18 cases used sevoflurane, two cases used desflurane and two anaesthetic records were unavailable. Staff scores on the waste disposal questions improved following in-person training. The Trust was found to use high temperature incineration for all clinical waste.

The findings suggest a move away from the use of harmful anaesthetic gas, but further work is needed for its eradication. The results from the study's second cycle support the use of in-person training to update and refresh waste disposal methods, hopefully resulting in a reduction of misclassified materials. Furthermore, by introducing new waste streams for clinical waste that use alternative treatments to high temperature incineration, large savings can be made environmentally and financially.

P27

P27 - A review of cases from a dedicated paediatric vascular surgery clinic

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Background:
The experience of paediatric vascular cases in UK is limited due to their rarity and variations in practice. We looked at types of cases presenting to a dedicated paediatric vascular clinic.

Methods:
Medical records of children seen in the paediatric vascular clinic at a tertiary referral service between 2016 and 2022 were reviewed. These patients were either seen for the first time in that clinic or had their appointments as a follow up after inpatient review or intervention while being under paediatric team care in the local children hospital.

Results:
55 patients (33 males) were seen aged between 4 months and 16 years (mean 9.5 years). Common presentations were limb length discrepancy secondary to iatrogenic arterial occlusion, follow up following bypass for trauma, lower limb swelling or discolouration and varicose veins. Operative procedures included lower limb bypass, stent removal, ligation of aneurysms and varicose vein surgery.

Conclusion:
Paediatric vascular conditions are uncommon and therefore most vascular surgeons will have little exposure to such cases. Intervention is needed for traumatic or iatrogenic arterial injury. National registry is required for these rare cases to gain prospective data that can help build up more evidence for educational purposes and to establish guidelines.

P28

P28 - Clinical effects of tourniquet use for major lower limb amputation: a multi-centre cohort study

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Background: Tourniquet use in major lower limb amputation is an area of contention; their use may reduce blood loss and thereby improve patient outcomes, but they may deleteriously impact wound healing rates.

Methods: Patients undergoing amputation (trans-tibial or higher) between 1/1/2016-31/12/2020 at two hospitals were identified. The use of a tourniquet was noted. Haemoglobin drop, blood transfusion rates, revision rates, surgical site infection rates and mortality were noted.

Results: 472 patients underwent amputation, of which 124 had a tourniquet applied. Haemoglobin drop was lower in the tourniquet group compared to the non-tourniquet group (13g/L vs. 20g/L; p=<0.001). Blood transfusion requirements (p=0.824), surgical revision rates (p=0.152), infection rates (p=0.655) and mortality (p=0.231) were similar. Multivariable regression demonstrated tourniquet use was independently associated with a reduced haemoglobin drop compared to no tourniquet, but was not associated with wound breakdown, revision surgery or infection. Hypertension, infection and below knee amputation using the skew flap (compared to above knee amputation) were all significant predictors of surgical revision.

Conclusion: Tourniquet use in amputation surgery was associated with a significantly lower fall in postoperative haemoglobin compared to no tourniquet use. Tourniquet use did not impact other patient outcomes or revision rates.

P29

P29 - The Use of Dermal Substitutes for the Management of Diabetic Foot Ulcers in Patients with Critical Limb Ischaemia: A Systematic Review

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Introduction:Diabetic foot ulcers (DFU) are one of the most common complications of diabetes. The use of dermal substitutes in the management of non-healing DFUs in patients with an adequate blood supply is well reported. We wanted to establish the role of these dermal substitutes in patients with DFU and critical limb ischemia (CLI).

Methods:A systematic review was performed in February 2022. All studies including patients with DFUs and evidence of CLI and patient outcomes were included. PRISMA guidelines were adhered to throughout.

Results:Most of the screened studies excluded patients with inadequate peripheral vascular supply. Overall, three studies which met the inclusion criteria were identified. One study found even in cases of 'no option' CLI dermal substitutes significantly improved limb salvage and wound healing. The other two studies demonstrated the role of revascularisation in patients with CLI and showed timely wound healing and the potential for limb salvage in these patients with the use of dermal substitutes.

Conclusion:The evidence for use of dermal substitutes to treat patients with DFUs and concomitant CLI is limited. Further research is needed to evaluate the perfusion targets for these patients, this could have the potential to influence practice and patient outcomes in patients with CLI.

P30

P30 - Patient-reported quality of life factors in wound management by secondary intention: a qualitative exploration

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Background
Chronic, unhealed wounds can have a variety of aetiologies are often managed in the community. There is not enough research currently available on the specific ways that having an unhealed or slowly healing wound can affect the quality of life of the patients they affect. This qualitative exploration of wounds symptomatology aims to understand how unhealed wounds affect the day-to-day lives of the patients that live with them.

Methods
A purposively collected sample of 14 patients and carers attended a focus group session to discuss their experience of living with mixed wounds being managed by secondary intention.

Results
Thematic analysis of the sessions was completed which revealed 4 main domains of symptoms: mental health, lifestyle, physical and service-related. Most patients reported a significant impact on mental health and a fear of loss of bodily integrity.

Conclusion
This focus-group based exploration highlighted key themes within the spectrum of lived symptoms that participants felt were pertinent to their quality of life, and will aid in the development and validation of more sensitive quality of life instruments in wounds research.

P31

P31 - Quiescent Interval Single Shot (QISS) non-contrast Magnetic Resonance Angiography (MRA) – a novel approach to imaging in Peripheral Arterial Disease (PAD)

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Contrast enhanced MRA is an accurate method of imaging in PAD that does not utilize ionizing radiation or iodinated contrast media. However, there are concerns about the risk of nephrogenic systemic fibrosis with the use of gadolinium in patients with advanced chronic kidney disease. Further, there are growing concerns about gadolinium chelates in the brain in patients undergoing multiple examinations in, the cumulative impact of which is unknown. Non-contrast MRA techniques have been described, but are less popular. A novel ECG gated QISS protocol for non-contrast MRA has been described where the signal is acquired during diastole.

48 patients (22 female mean age 75 years) underwent QISS non-contrast MRA beginning June 2018. 32 patients were diabetic and the mean EGFR was 30. All examinations were performed for Critical Limb Threatening Ischaemia (CLTI) and were well tolerated by the patients.

QISS non-contrast MRA was found to have a high degree (>90%) of sensitivity and specificity and was diagnostic in all patients. 14 patients underwent revascularization (open or endovascular). 3 major amputations performed in patients with no revascularization options.

Overall, QISS non-contrast MRA contributed to accurate decision making in the management of all patients.

P32

P32 - Salvage of thrombosed arteriovenous access: is it worth the effort?

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Introduction:
Arteriovenous fistulas and grafts (AVF & AVG) are the preferred access for haemodialysis with thrombosis a persistent problem. Declotting procedures require resource and pose some risk so is access longevity after salvage sufficient to warrant this investment?

Objective:
This study evaluates secondary patency after salvage of thrombosed access.

Methods:
We identified patients who underwent salvage of thrombosed AVF/AVG at a vascular unit between June 2019 and 2021. Demographics, declotting technique and reinterventions were evaluated.

Results:
38 cases were identified (18AVF, 20AVG). Median age 64, IQR 54-70. Prior intervention seen in 26 cases, 17 with intervention within 6 months of thrombosis.

Declotting techniques performed: 12 thrombolysis (7AVF, 5AVG), 14 surgical thrombectomies (5AVF, 9AVG) and 12 endovascular thrombectomies (6AVF, 6AVG). No significant post-procedural complications.

5 procedures were unsuccessful immediately (all AVF cases). 22 of 33 salvaged accesses required further procedures within 1 year.

At 1-year, 19 of 33 salvaged accesses were abandoned (9AVF, 10AVG; 5 patients died). Intervention free patency at 1-year in only 2 of 33 (1AVF, 1AVG).

Conclusions:
Declotting technique is safe but only 42% of salvaged accesses were functional 1-year later and most required reinterventions. These results help inform shared decision making with our patients suffering access thrombosis.

P33

P33 - Should we be modernising our methods of pedal perfusion? A prospective comparison of traditional ABPI and TBPI with BlueDop

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Introduction

Limitations of ankle and toe brachial pressure index (ABPI/TBPI) include pain, unreliable readings in patients with diabetes or renal disease, and practical issues for patients with large ulcers and/or absent digits. "BlueDop" is a specialist probe that estimates ABPI from the doppler waveform without the need for a tourniquet or a patient lying flat. This study assesses the accuracy of BlueDop against traditional ABPI/TBPIs and evaluates patients' and users' experience.

Methods
Patients attending a Vascular clinic undergoing ABPI+/-TBPI and BlueDop measurements were recorded. Patient and user experience were noted.

Results
Sixty-four patients were included. Mean time taken per measurement was 3.24+/-0.63 minutes for ABPI and 3.08+/-0.70 minutes for BlueDop. BlueDop was poorly correlated with ABPI (Pearsons' correlation coefficient=0.392; p=0.071) and TBPI (Pearson's=0.135; p=0.519). 47% of patients and 52% of operators preferred BlueDop over ABPI/TBPI. 87% of treating clinicians perceived BlueDop to be useful/very useful compared to ABPI (78%) and TBPI (67%). 71% of patients and 80% of operators were satisfied or very satisfied with BlueDop, compared to equivalent rates for TBPI (patients-43%, operator-73%) and ABPI (patients-41%, operator-67%).

Conclusion
BlueDop was acceptable to patients and clinicians and slightly faster than ABPI, however, BlueDop measurements were poorly correlated with ABPI/TBPI.

P34

P34 - Barriers in conducting vascular clinical research among medical students in developing countries -a Cross sectional study and literature review

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Introduction
Research is the cornerstone for establishing leading healthcare systems all over the world. The impact of research can influence national and international vascular clinical practice. Our aim was to identify the barriers in conducting research and finding strategies to overcome some of these challenges.

Method:
A cross sectional study conducted between Jan-March 2022 in Gaza, Palestine. A standardized questionnaire was utilised to identify the barriers to conducting research. PRISMA Literature review was performed.

Results:
756 articles were included in formulating the questionnaire. The randomized sample included 140 medical students (CI=95%), it showed 71% of medical students never participated in research nor had any training in it.74% did not think English is a barrier. Chi square was used to identify Significant differences between getting research financial support (p=.001), or the need for training opportunities (p=.001) and participating in research.

Conclusion;
This study showed the need for sustainable collaborative research initiatives. This would enhance research amongst medical students, through collaborating with various international centers of excellence in the UK and creating mentorship programs , to positively impact the quality of research in such developing countries like Palestine. Hence, the idea of international journal club (IJC)- UK was initiated as a result.

Significant findings to improve research in Palestine

	CI 95% Total sample	Number of medical students who identified the barrier	P value
Getting mentor support	140	138	0.01
Getting training in research	140	138	0.001
Getting research opportunities	140	138	0.001.

Table1.

P35

P35 - Results of FEVAR for Juxtarenal AAA in Octogenarians vs non-Octogenarians

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Background:
With an increasing life expectancy of Western populations, more octogenarians are presenting with large AAAs that require intervention. There remains some hesitancy in offering complex AAA repairs in this age group. We aimed to compare the outcome of FEVARs done for juxta-renal AAA in Octogenarians and non-Octogenarians.

Methods:
All consecutive FEVARs done for juxta-renal AAA in a single centre between 2010-2020 were reviewed retrospectively. The primary outcome was 30-day mortality and secondary outcomes included: 2-year mortality, longer-term mortality and post-operative morbidity rates.

Results:
There were 26 Octogenarians with a mean age of 81.8 +/- 0.38 years and 75 non-octogenarians with a mean age of 72.1 +/- 0.55 years. Both groups were similar in background characteristics (AAA size, comorbidities) and the 30-day mortality rates were 0% in Octogenarians vs 2.6% in non-Octogenarians (p=0.400). 2-year mortality and long-term mortality were also statistically non-significant. Both groups had similar post-operative morbidity rates (Cardiac, respiratory complications and spinal cord ischaemia), but renal complications were significantly higher in non-Octogenarians (0% vs 13.3%, p=0.05).

Conclusions:
FEVAR remains an acceptable option in carefully selected octogenarians, and age alone should not prevent consideration of these interventions. Larger registry data may provide more insight in the future.

P36

P36 - Optimising secondary prevention in patients undergoing carotid intervention (CI) – A Single Centre Cohort Study

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Background: Stroke/TIA patients should receive best medical therapy (BMT; antithrombotic therapy (ATT) and lipid lowering therapy (LLT)). This includes high-intensity statins (HIS), aiming for LDL-C <1.8mmol/L. We explored BMT in patients undergoing CI on admission prior to intervention, at discharge, and 1 year post intervention.

Methods: 205 patients underwent CI (01/01/18–31/12/20). Differences between time points were assessed with McNemar test.

Results: There were 137 men (67%), median age 73 (CI: carotid endarterectomy n=175; carotid stent n=30).

Increases in prescription of ATT (50%vs96%, p<0.001), statins (65%vs93%, p<0.001) and HIS (47%vs83%, p<0.001) were observed at discharge compared to pre-intervention but no differences were seen at 1 year. At 1 year, 8 patients were not taking statin therapy, 6 were allergic and 3 prescribed Ezetimibe.

At 1 year, there was significant improvement in median LDL-C (2.4mmol/L, IQR(1.9-3.3)vs.1.6mmol/L, (1.2-2.0), and proportion of patients achieving an LDL-C of <1.8mmol/L (21%vs59%,p=0.003) compared to pre-admission. In patients with LDL-C≥1.8mmol/L, 92% had scope for LLT up-titration.

Conclusion: Patients undergoing carotid intervention receive appropriate BMT whilst in-patient. This led to improved lipid control in a substantial proportion. A minority fail to achieve recommended LDL-C targets. Reasons for this need to be understood to allow for optimal risk reduction.

P37

P37 - Amputations in People Who Inject Drugs (PWID): A 10-year Retrospective Cohort

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People who inject drugs (PWID) are at risk of limb loss secondary to vascular injury and infection. This study aimed to quantify amputation indications in this population.

Retrospective data collection between 01/12/2011-31/12/2021. Patients were identified through discharge codes and a prospective vascular operative database. Demographic, admission and operative details were extracted from patient records.

There were 869 (466 patients) limb-related admissions secondary to injecting drug use with 36 amputations. The mean age of amputation was 40.4 (24-54) years and 26 (72.2%) were male. Indications were: 19 following acute arterial ligation (12 with necrotising soft tissue infections [NSTI]; 17 transfemoral amputations [TFAs], two hip disarticulations); five due to chronic limb-threatening ischaemia (one transtibial [TTA], four TFAs); five after intra-arterial injecting (two TTAs, three TFAs); four due to NSTI (two TFAs, two hip disarticulations) and three due to chronic venous ulceration (three TFAs). All amputations were performed by vascular surgery. Ten patients limb-fitted, mean age 35.9 (24-51) and seven (70%) were male. At follow-up 13/36 (36.1%) patients were dead, mean age 41.4 (26.8-52.2) and 10 (76.9%) were male, six of whom had limb-fitted.

These figures reinforce the poor prognosis in this young population. Not all amputations follow ligation.

P38

P38 - Exploring the patient experience of shared decision making regarding the surgical management of their permanent haemodialysis access in Sydney, Australia.

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Purpose: There is limited research into the patient experience of permanent haemodialysis access in Australia. This study explores the patient experience of a shared decision making for HD access surveillance and management. This aims to inform future care models to improve the delivery of nuanced and patient-centred care.

Methodology: This qualitative study used 12 semi-structured interviews with patients from a HD access clinic in Sydney. Interviews of 40-60 minutes were recorded, transcribed verbatim, and de-identified. Themes were identified and mapped in an iterative process underpinned by content analysis.

Findings: Patients reported a strong hierarchy in the decision making regarding their HD access. They identified as being part of this hierarchy, but often lower compared to the Vascular Surgeon. Most were comfortable with this model, with all recognising the technical skill and trust in their surgeon's care. Trust and an increasing role in decision making were reported to increase over time, as their exposure to HD increased.

Conclusion: HD access management and surveillance requires ongoing shared decision making. Some patients reported that they had an increasing role in decision making over time as their knowledge and trust with the surgeon increases. Utilising this understanding may help to improve models of care.

P39

P39 - Changes in Functional Health status following Open Abdominal Aortic Aneurysm Repair and the role of exercise-based rehabilitation: A Systematic Review

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Introduction:
Physical domains of quality-of-life measures are negatively impacted following abdominal aortic aneurysm (AAA) repair. This is also likely to result in a reduction in objective measures of physical function. These reductions can be targeted via rehabilitation. The aim of this systematic review is to summarise the current evidence quantifying changes in functional status following AAA repair. It also aims to consider the role of exercise-based rehabilitation for these patients.

Methods:
The Medline, EMBASE and Cochrane CENTRAL databases were searched using two separate search strategies. The primary outcomes were changes in objective measures of physical function and changes in these measures following exercise-based rehabilitation.

Results:
No study has quantified changes in physical function following AAA repair. One study has considered exercise-based rehabilitation. This three-arm randomised trial compared two walking-based exercise programmes with routine-care physiotherapy. Functional status was improved in the two walking groups, via changes in 6-minute walking distance and standard metabolic equivalents. These changes were not apparent in the control group. There were no significant differences for length of stay or pulmonary function.

Conclusion:
There is no evidence to quantify the functional decline following AAA repair and limited evidence to support exercise-based rehabilitation. Future research is urgently needed.

P40

P40 - A Systematic Review of the Quality of Life (QOL) Assessment Tools used in Aortic Dissection in the Context of Survivorship

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Introduction: With recent advancements in peri-operative care, patients are living longer with aortic dissection(AD). However, the known impact on their quality of life(QOL) and survivorship is still relatively rudimentary. Our aim therefore was to identify the QOL instruments used in patients with AD and determine alignment to 'survivorship', a construct that focuses on the issues facing patients living with a chronic condition.

Methods: A systematic review was conducted according to PRISMA guidelines searching electronic databases until June 2022 for studies reporting on QOL in AD patients. Study quality was assessed using Agency for Healthcare Research and Quality(ARHQ) methodology checklist.

Results:40 studies were included, encompassing 38 QOL tools. The most common tool utilised was the 36-Item Short-Form Survey(SF-36). Overall, QOL was found to be poor in AD survivors and only 3 qualitative studies were found. All tools demonstrated a poor alignment with the nine survivorship domains. Included studies displayed a moderate to high risk of bias, having small sample sizes and insufficient follow-up.

Conclusion: All identified tools failed to encompass the breadth of survivorship domains, with a lack of studies focusing on the patients' perspective. With no current AD-specific QOL tool, there is an urgent need to address and develop this.

P41

P41 - External validation of UKAmpRisk – (‘Prognostic risk modelling for patients undergoing major lower limb amputation: and analysis of the UK National Vascular Registry’)

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‘Prognostic risk modelling for patients undergoing major lower limb amputation: and analysis of the UK National Vascular Registry’ was published in the European Journal of Vascular and Endovascular Surgery (EJVES) in 2020. The observational study examined risk factors for in-hospital mortality and morbidity following 9549 major lower limb amputations, and generated a risk model with online calculator named UKAmpRisk.

As an exercise in external validation of UKAmpRisk, we designed a local study to see whether the outcomes from the large data-set of the UK National Vascular Registry translated to our busy vascular unit in East Kent.

The UKAmpRisk calculator predicted a mean score of 8.3% mortality for all patients undergoing major lower limb amputation as either an emergency or planned procedure. This compared with the observed mortality of 5.8% (Table 1).

UKAmpRisk appears to overestimate the mortality risk of major lower limb amputation (8.3 vs 5.8%) however, when ascertaining risk, and in the subsequent communication of likelihood of post-operative mortality with patients and their families, an approximation of “5-10% chance of death” is an acceptable and useful metric for surgeons undertaking surgery. We therefore advocate the use of the UKAmpRisk scoring system and have implemented its use in our practice.

		Ambler et al (1/1/14 - 31/12/16)	EKUHFT (1/1/17 - 31/12/20)		
			All patients	In-hospital mortality	Not in-hospital mortality
n		9549	155	9 (5.81%)	146 (94.19%)
Age at operation	Mean	70	68.5	73.4	68.2
Median		69	74	69	
Pre-op creat	Mean	81	135.1	214.4	130.2
Median		80.5	150	80	
Pre-op Alb	Mean	30	23.9	20.7	24.1
Median		23	20	24	
Pre-op WCC	Mean	11.7	12.6	19.8	12.1
Median		11.3	14.8	11.1	
Weight	Mean	75	79.6	76.2	79.8
Median		77	72	77	
Prev procedure on affected limb?	% Yes		74.2	88.9	73.3
Amputation below knee joint?	% Yes	47.3	47.1	44.4	47.3
Mode of admission?	% Unplanned	78.4	65.2	66.7	65.1
ASA Grade	Mean		3.1	3.8	3.1
Median		3	4	3	
Simultaneous bilateral operation?	% Yes	2	1.9	0	2.1
Abnormal ECG?	% Yes	42.9	43.2	11.1	43.8
UKAmpRisk	Mean		8.3	19.7	7.6
Median		6	18.8	5.7	
Inpatient mortality	% Yes	9.1	5.8	100	0
Return to theatre	% Yes	10	13.5	22.2	13
Readmission to higher level of care	% Yes	3.8	28.4	55.6	26.7
Post-op LOS	Mean		19.5		19.8
Median		15.5		15	
Post-op complication?	%Yes		56.8	100	54.1
Cardiac	% Yes	6.6	8.4	22.2	7.5
Respiratory	% Yes	9.7	11.6	33.3	10.3
Stroke	% Yes	<1	0.6	0	0.7
Renal Failure	% Yes	4.3	25.8	55.6	24
Haemorrhage	% Yes	<1	31	11.1	32.2
Limb iscahemia	% Yes	4.4	5.2	11.1	4.8

P42

P42 - Outcome of elective open abdominal aortic aneurysm repair in patients who underwent cardiopulmonary exercise testing (CPET) versus non-physiological assessment

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Introduction:
Cardiopulmonary exercise testing (CPET) is an effective preoperative risk stratification tool providing an objective measure of fitness and functional capacity. There is little evidence on the use of this compared to non-physiological assessment. This study investigates whether CPET preoperatively has value alongside non-physiological testing for patients undergoing elective open abdominal aortic aneurysm (AAA) repair.

Method:
Retrospective data was collected at two vascular centres between 2015-2019 (CPET centre and non-CPET centre) in patients undergoing elective AAA repair. Outcomes measured included: length of stay at intensive care unit (ICU); total hospital length of stay; post-operative complications including need for red blood cell (RBC) transfusion and acute kidney injury (AKI). Statistical analysis was performed using SPSS software.

Results:
There were 38 patients at each centre. The mean duration of stay in ICU and total length of stay was significantly shorter in CPET centre (p=0.05 and p=0.015 respectively; table 1). Mortality, number of patients developing AKI post-op and requiring RBC transfusion were higher in non-CPET group (table 1).

Conclusion:
CPET tested patients have statistically significant lower length of total and ICU stay compared to non-CPET patients. CPET is therefore a useful adjunct in selecting patients for open surgery compared to non-physiological testing.

Table 1: Comparison of outcomes between CPET centre and non-CPET centre

Outcome measured	CPET	non-CPET	P value
ICU length of stay (days±SD)	2.5 ± 2.13	3.68 ± 4.08	0.05
Total length of stay (days±SD)	6.97± 4.13	10.78 ± 9.59	0.015
Mortality (%)	2.63	5.26	0.56
Number of patients developing AKI post-op (%)	13.61	28.95	0.09
Number of patients requiring RBC transfusion post-op (%)	7.89	18.42	0.17

P43

P43 - Molecular mechanisms of action of negative-pressure wound therapy in open surgical wounds: A systematic review

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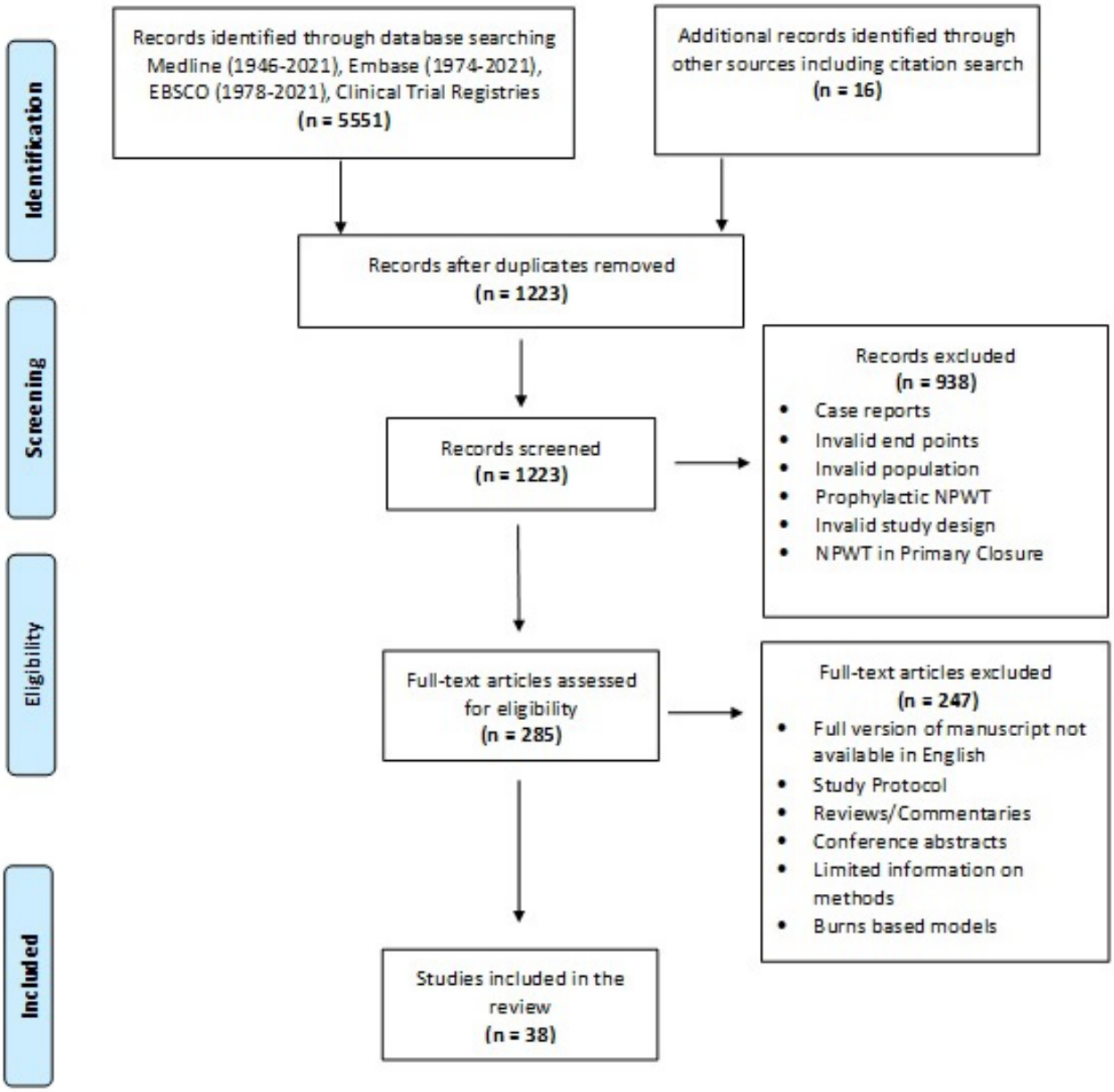
[1]*Hull York Medical School*

Introduction:
Negative pressure wound therapy(NPWT) has significantly advanced wound care and continues to find new applications. Its effects at a molecular level however, remain a subject of debate.

Methods:
Medline, Embase, Cochrane CENTRAL databases and clinical trial registries were searched from inception to December 2021. Clinical studies, animal models or in-vitro studies that quantitatively or semi-quantitatively evaluated the influence of NPWT on growth factors, cytokine or gene-expression in the circulation or wound-bed were included.

Results:
38 studies involving 1096 subjects were included. This included 21 clinical studies, 14 animal models and 3 in-vitro studies. VEGF was elevated in all 9 studies which studied its effects. TNF α was downregulated in 6 out of 7 studies, TGF β was upregulated in 4 out of 4 studies, Fibronectin was upregulated in both studies which evaluated its effects. Equivocal results were obtained across all studies with respect to Interleukins(IL) and Matrix Metalloproteinases(MMP). The effects of NPWT on 43 other biomarkers and 13 gene expressions were studied across all studies.

Conclusion:
NPWT stimulates modulation of numerous local and circulating cytokines and growth factor expressions to promote an anti-inflammatory profile. This is most likely achieved by downregulation of TNFα, upregulation of VEGF, TGF-β and fibronectin.


Identification
Screening
Eligibility
Included
Records identified through database searching Medline (1946-2021), Embase (1974-2021), EBSCO (1978-2021), Clinical Trial Registries (n = 5551)
Additional records identified through other sources including citation search (n = 16)
Records after duplicates removed (n = 1223)
Records screened (n = 1223)
Records excluded (n = 938)
Case reports
Invalid end points
Invalid population
Prophylactic NPWT
Invalid study design
NPWT in Primary Closure
Full-text articles assessed for eligibility (n = 285)
Full-text articles excluded (n = 247)
Full version of manuscript not available in English
Study Protocol
Reviews/Commentaries
Conference abstracts
Limited information on methods
Burns based models
Studies included in the review (n = 38)

P44

P44 - Safety of daycase-based endovascular lower limb revascularisations in patients with peripheral artery disease: systematic review and meta-analysis

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Introduction: Peripheral artery disease (PAD) is a major challenge worldwide and day case based endovascular revascularizations may help to meet the growing demand. We performed a systematic review and meta-analysis to synthesize complication rates of daycase based lower extremity revascularisations in PAD patients.

Methods: Systematic review and meta-analysis.

Results: Out of the 135 studies identified, 28 met the eligibility criteria including 32,035 procedures. The definitions of major complications differed across the studies. Some studies included conversion to overnight stay as a major complication. The pooled overall estimates of reported major and minor complications were 0.7% (95%CI: 0.5%, 1.0%) and 6.2% (95%CI: 4.9%, 7.6%). Due to the different definitions of complications, there was considerable heterogeneity I2= 77% and 97%). Four of the studies reported complications rates of both daycases and in-patient procedures. The risk of complications was numerically but not significantly higher in hospitalized patients (OR 1.3 (95%CI: 0.1, 12.8).

Conclusion: Lower limb angioplasty can be performed safely in PAD patients in a daycase setting. The large heterogeneity of reported complications between studies is likely due to different definitions of minor and major complications highlighting the need for unified classification of complications for peripheral endovascular procedures.

P45

P45 - Technical success and major bleed rate of peripheral arterial thrombolysis for acute limb ischaemia at University Hospitals Coventry and Warwickshire

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Aim: To assess the technical success rate and major bleeding rate of post catheter thrombolysis at a tertiary centre in the West Midlands.

Background: Acute limb ischaemia is the sudden decrease in arterial perfusion of the limb, requiring urgent management. Catheter based thrombolysis reduces the risks of limb loss and death in acute limb ischaemia.

Standards: A technical success rate of post catheter thrombolysis of 80-90% and major bleeding requiring intervention post thrombolysis < 10%, as per the European Society for Vascular Surgery (ESVS) 2020 Guidelines.

Method: Retrospective data collection of patients having lower limb peripheral arterial thrombolysis between March 2019 – March 2022. Data was collected from Soliton database and CRRS hospital records.

Results: 64% (n = 27) of patients had technical success (including full and partially successful thrombolysis), with 17% (n = 7) developing major bleeding requiring blood transfusion. 1 patient developed a subarachnoid haemorrhage, managed conservatively.

Discussion: Determinants for suboptimal success of thrombolysis included unclear diagnosis at referral and failure of staff to understand the referral pathway.

Conclusion: Technical success and major bleeding after thrombolysis did not meet the ESVS guidelines. Tailored education to improve diagnosis and referral for arterial thrombolysis is required.

P46

P46 - Postoperative outcomes are significantly worse among patients undergoing repair of ruptured versus unruptured iliac artery aneurysms: a 10-year retrospective cohort study.

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Background
ESVS guidelines on iliac artery aneurysms (IAA) are predominantly based on small retrospective studies with limited high-quality evidence. This 10-year retrospective cohort study investigates IAA rupture rates and post-operative outcomes at a single vascular centre in northern England.

Methods
Patients with IAAs between 1st January 2010 and 31st August 2021 were identified from a prospectively-collected departmental database. Primary outcomes included rupture rate and size, post-operative complications and 30-day, 1-year and 5-year mortality rates. Statistical analysis with SPSS® was performed.

Results
Of the 203 patients included, 90.6% were men and median (IQR) age at detection was 77 (71-83). IAA were located mainly in the CIA (85.2%). Mean(SD) CIA diameter at rupture was 4.6 (2.4)cm. Post-operative MACE occurred more frequently following ruptured versus unruptured IAA repair (33.3% vs 3.5%, p=.011). Postoperative mortality at 30-days, 1-year and 5-years were higher following repair of ruptured versus unruptured aneurysms (88.9%, 88.9%, 100% vs 1.2%, 10.6%, 36.1% respectively). Kaplan-Meier analysis highlighted superior estimated survival time following endovascular treatment compared to surgical and hybrid approaches.

Conclusion
Postoperative outcomes were significantly worse among patients undergoing emergency repair following rupture compared to elective repair. Survival time was superior following endovascular repair compared to surgical and hybrid repair.

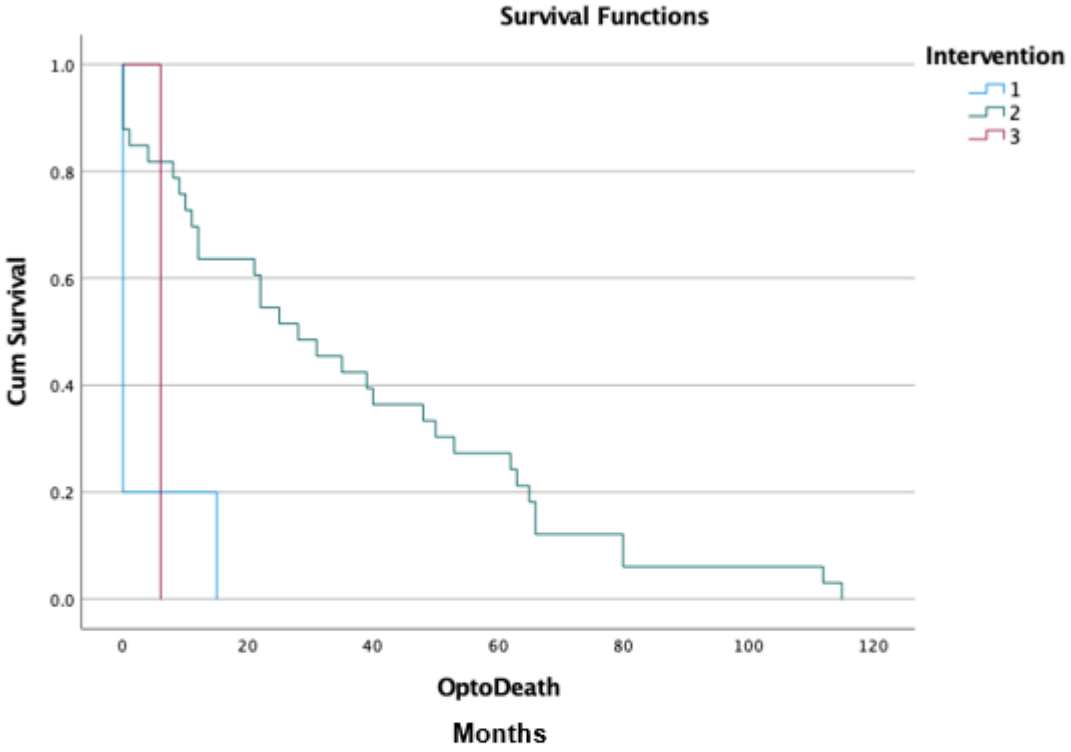
Baseline characteristic	N=203 (%)	Ruptured*		p-value	Treated+		p-value
Sex		Yes (n=16)	No (n=187)		Yes (n=94)	No (n=109)	
Male	184 (90.6)	13 (81.2)	171 (91.4)		91 (96.8)	93 (85.3)	
Female	19 (9.4)	3 (18.8)	16 (8.6)	.177	3 (3.2)	16 (14.7)	.004
Age on detection (median, IQR)	77 (71-83)	76.5 (72.8-84)	78 (71-83)	.779	77 (70-82)	80 (72-85)	.526
Comorbidities							
Hypertension	110 (54.2)	5 (31.3)	13 (7.0)		50 (53.2)	34 (31.2)	
Hyperlipidaemia	87 (42.9)	5 (31.3)	82 (43.9)		44 (46.8)	20 (18.3)	
Diabetes	20 (9.9)	0 (0.0)	21 (11.2)		12 (12.8)	8 (7.3)	
COPD	27 (13.3)	2 (12.5)	23 (12.3)		7 (7.4)	4 (3.7)	
Active/treated cancer	6 (3.0)	3 (18.8)	31 (16.6)		17 (18.1)	9 (8.3)	
CKD	40 (19.7)	3 (18.8)	40 (21.4)		15 (16.0)	6 (5.5)	
Stroke	12 (5.9)	0 (0.0)	14 (7.5)		0 (0.0)	10 (9.2)	
IHD	72 (35.5)	3 (18.8)	72 (38.5)		15 (16.0)	41 (37.6)	
Connective tissue disorder	3 (1.5)	0 (0.0)	3 (1.6)		0 (0.0)	2 (1.8)	
Medications							
Antiplatelets	97 (47.8)	5 (31.3)	92 (49.2)		46 (48.9)	43 (39.4)	
Antihypertensives	97 (47.8)	3 (18.8)	40 (21.4)		40 (42.6)	55 (50.5)	
Anticoagulants	39 (19.2)	5 (31.3)	40 (21.4)		13 (13.8)	23 (21.1)	
Lipid-lowering therapy	113 (55.7)	5 (31.3)	110 (58.8)		52 (55.3)	56 (51.4)	
Side of IAA							
Right	84 (41.4)	7 (43.8)	77 (41.2)		45 (47.9)	39 (35.8)	
Left	38 (18.7)	4 (25.0)	34 (18.2)		23 (24.5)	15 (13.8)	
Bilateral	80 (39.4)	5 (31.2)	76 (40.6)		26 (27.7)	54 (49.5)	
Site of IAA							
CIA	173 (85.2)	13 (81.3)	160 (85.6)		82 (87.2)	91 (83.5)	
IIA	44 (21.7)	4 (25.0)	40 (21.4)		20 (21.3)	24 (22.0)	
EIA	4 (2.0)	0 (0.0)	4 (2.1)		0 (0.0)	4 (3.7)	
Other aneurysms							
Aortic	135 (66.5)	12 (75.0)	123 (65.8)		72 (76.6)	63 (57.8)	
Femoral	8 (3.9)	0 (0.0)	8 (4.3)		3 (3.2)	5 (4.6)	
Popliteal	17 (8.4)	1 (6.3)	15 (8.0)		6 (6.4)	11 (10.1)	
Symptomatic							
No	160 (78.8)	0 (0.0)	164 (87.7)		70 (74.5)	90 (82.6)	
Yes	39 (19.2)	16 (100.0)	23 (12.3)		24 (25.5)	19 (17.4)	.491
Ruptured IAA							
Yes					9 (9.6)	7 (6.4)	
No					85 (90.4)	102 (93.6)	.284
CIA		13 (7.5)					
IIA		3 (6.8)					
Size of ruptured IAA; mean (SD) cm					4.7 (2.3)	3.9 (2.3)	.602
CIA		4.6 (2.4)			4.3 (2.4)	5.0 (2.7)	
IIA		4.6 (3.0)			4.9 (2.7)		
Modality of treatment							
Surgery		4 (44.4)	6 (7.1)	.007	-	-	-
Endovascular		5 (55.6)	77 (90.6)	.014	-	-	-
Hybrid		0 (0.0)	2 (2.4)	.817	-	-	-
Surveillance imaging modality							

USS	54 (29.8)	-	-	-	-	-	-
CT	120 (66.3)	-	-	-	-	-	-
MRA	7 (3.9)	-	-	-	-	-	-
Post-operative complications							
MACE		3 (33.3)	3 (3.5)	.011			
MALE		0 (0.0)	2 (2.4)	.817			
Colonic ischaemia		1 (11.1)	0 (0.0)	.096			
Buttock claudication		0 (0.0)	9 (10.6)	.387			
Post-operative complications SURGICAL							
MACE		1 (25.0)	1 (16.7)				
MALE		0 (0.0)	0 (0.0)				
Buttock claudication		0 (0.0)	0 (0.0)				
Colonic ischaemia		1 (25.0)	0 (0.0)				
Post-operative complications ENDOVASCULAR							
MACE		2 (40.0)	2 (2.7)				
MALE		0 (0.0)	2 (2.7)				
Buttock claudication		0 (0.0)	9 (11.7)				
Age at death (median, IQR)		79 (75-88.5)	83 (76-86)		80 (75-86)	84 (76-87)	-
Mortality following treatment							
30-day post op (n=94)		8 (88.9)	1 (1.2)	<.001	-	-	-
1-year post op (n= 84)		8 (88.9)	9 (10.6)	<.001	-	-	-
5-year post op (n=44)		2 (100.0)	16 (38.1)	<.001	-	-	-

Table 1. Characteristics for all ruptured and treated iliac artery aneurysms in this cohort.

* - Includes all ruptured IAA (treated and untreated)

+ - Includes all treated IAA (ruptured and unruptured)



Intervention	Number of cases	Estimated survival time, months
Surgery	5	3 (0-8.9)
Endovascular	33	36 (5.6-25.1)
Hybrid	1	6 (0-6)

Figure 1. Kaplan-Meier Curve – Survival analysis following surgical (1), endovascular (2) and hybrid (3) IAA repair

P47

P47 - The Role of Vascular Surgery in Managing Perivascular Soft Tissue Sepsis in People Who Inject Drugs, A 10-year Retrospective Cohort

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Complications of injecting drug use can generate a substantial workload. This study aimed to characterise limb-related admissions by specialty for this group.

Retrospective data collection (01/12/2011-31/12/2021). Patients were identified through discharge codes and a prospective vascular operative database. Demographic and admission details were extracted from patient records. Two diagnoses could be recorded.

There were 869 admissions (466 patients; 1-14 admissions/patient): mean age 37.6 (21-61) years and 534 (61.4%) were male. There were 351 (40.4%) initial admissions to vascular, with 450 (51.8%) overall cases following in-patient referral. Throughout the decade, excluding 2012, vascular surgery cared for the most limb-related complications (Figure 1). Vascular surgery managed 247 (72.1%) groin abscesses, 18 (22.5%) other abscesses, 120 (100%) pseudoaneurysms, 131 (92.9%) necrotising soft tissue infections, 35 (26.1%) cellulitis, 50 (28.6%) deep venous thromboses (DVTs), 11 (17.2%) infected DVTs and 76 (45.5%) other pathologies. In 2012 vascular surgery managed three (15.7%) groin abscesses and 17 (88.2%) in 2021. Vascular surgery managed 56% of groin abscesses in the first five years and 77.7% in the latter five.

Are vascular surgeons the last true generalists? If this work is appropriate to be absorbed, vascular surgery must be adequately resourced.

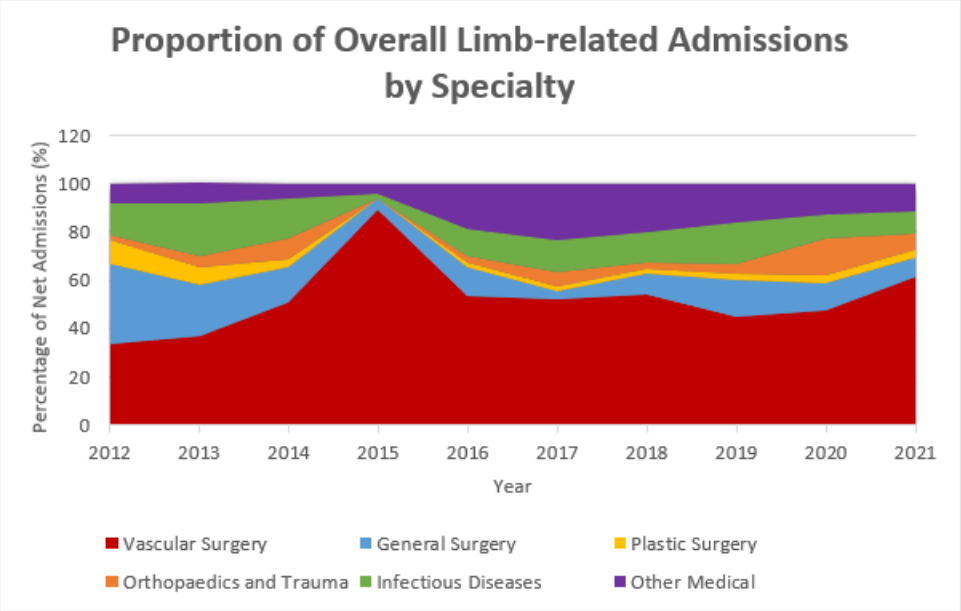

Figure 1. Proportion of overall limb-related admissions by specialty (following in-patient referral)

P48

P48 - The impact of incidental findings on pre-operative CT scans prior to abdominal aortic aneurysm (AAA) repair.

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INTRODUCTION
When patients with AAAs reach threshold diameter they are assessed for surgery. This involves cross-sectional imaging of the aneurysm to aid surgical planning for a potential open surgical or endovascular repair. The aim of this study is to explore the prevalence and impact of incidental findings from these CT scans.

METHODS
All CT scan reports for pre-operative AAA assessments over a four-year period (March 2018 to February 2022) were analysed. Time from referral to surgery for patients with findings requiring further investigation or specialist referral were compared to patients without.

RESULTS
101 CT scans were performed, summary of non-vascular diagnoses are documented in Table 1. 22 patients had findings requiring further workup or specialist referral, 9 of these patients went on to be diagnosed with a malignancy. There was no difference in number of patients going on to have surgery or deemed unfit between those with and without incidental findings. The mean days to surgery was significantly longer in the group requiring further investigation (71 vs 121 days, P=0.007).

CONCLUSION
A high number of incidental findings are generated from CT scanning as part of the surgical workup for AAA surgery causing a significant delay to surgery.

Table 1: Summary of non-vascular findings

TABLE 1: SUMMARY OF FINDINGS	
Non- Vascular diagnosis on CT report	**Number and %**
Diverticular disease	51 (51)
Lung emphysema	46 (46)
Renal Cysts	38 (38)
Lymphadenopathy	23 (23)
Coronary artery calcification	20 (20)
Prostatic enlargement	15 (15)
Gallstones	14 (14)
Liver cysts	13 (13)
Hiatus hernia	11 (11)
Degenerative changes of the spine	10 (10)
Bronchiectasis	10 (10)
Lung granuloma	10 (10)
Bulky Adrenal glands or adrenaloma not requiring investigation	9 (9)
Lung nodules not requiring investigation	8 (8)
Atelectasis	7 (7)
Features suggestive of active infection or inflammation (including lung consolidation, inflammatory stranding or cholecystitis)	7 (7)
Renal cortical scarring or atrophy	6 (6)
Pleural Plaques	5 (5)
Inguinal hernia	4 (4)
Osteopenia	3 (3)
Cardiomegaly	2 (2)
Bladder diverticulae	2 (2)
Retrosternal goitre	2 (2)
Other findings; Fatty Liver, Scoliosis, Diaphragmatic hernia, Atrophic Pancreas, Appendicolith, Bowel wall thickening, Portal vein varicosities, pulmonary artery dilatation, prominent pancreatic duct,	

P49

P49 - Timing and reason for readmission in elective EVAR

Budge J[1], Azhar B[1], Selway W[1], Wafi A[1], Roy I[1], Loftus I[1], Holt P[1]
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Introduction
Understanding readmission after EVAR is important, due to its effect on patients and its fiscal repercussions. Previous research has shown that the majority of readmissions in EVAR are due to surgical site infection. With the prevalence of percutaneous access in contemporary practice, this may have changed.

Methodology
All elective asymptomatic EVAR cases performed at a tertiary vascular centre from 2013 to 2020 were identified using the National Vascular Registry. All cases were screened for readmissions within 30 days of discharge. Where identified, case notes were screened to collect the reason and timing.

Results
A total of 964 EVAR cases were identified with 21 readmissions within 30 days post-discharge. Median readmission was 10 days post-discharge with a bimodal pattern of readmission. These peaks were at day 4 and day 19 respectively, with a skew toward the early peak. 62% of readmission occurred in the first 10 days.

The most common cause of readmission was back pain most of which occurred within the first 5 days post-discharge.

Conclusion
30-day readmission rates in this study follow a bimodal distribution with a skew toward the early peak. This information could allow more targeted readmission reduction programs.

P50

P50 - Factors influencing the perspective of medical students towards pursuing a career in transplant surgery

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Introduction:
Concerns regarding transplant surgery recruitment have been previously reported in the UK and US.

The importance of understanding the reluctance of trainees to choose the specialty has been recognised, but there is a lack of insight into the factors affecting recruitment at the medical school stage.

Methods:
A survey was circulated to medical students across year groups in a UK institution, inquiring about their views on transplant surgery.

Participation was voluntary and incentivised with eligibility to receive a prize.

Results:
208 responses were collected.

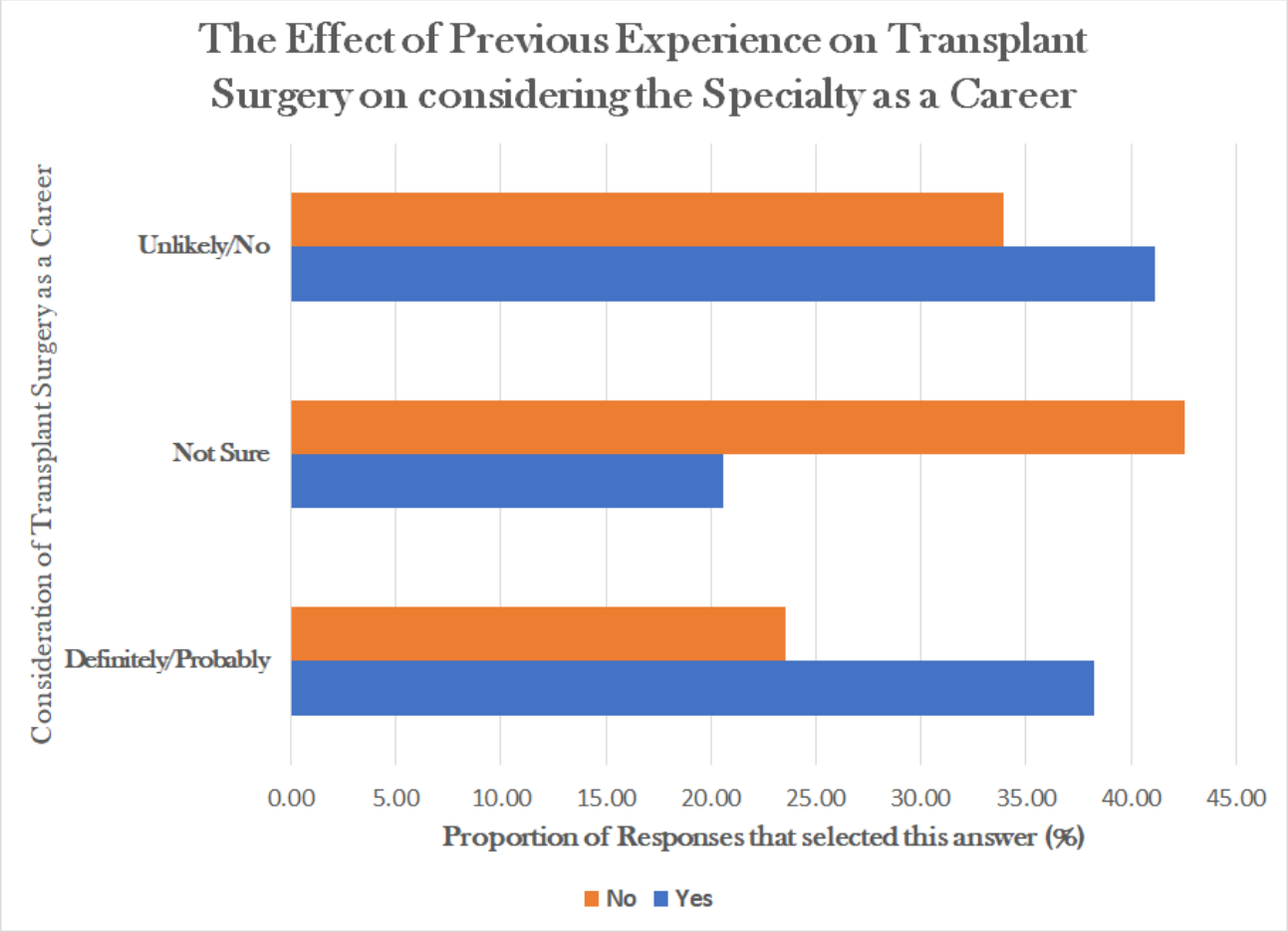
Students with previous transplant surgery experience were significantly less unsure about a career in transplant surgery, and tended to more likely consider it as a career (p=0.04).

The most appealing aspects were its immediate impact (69.7%), variety of cases (38.0%) and the underlying science (34.6%).

The most common detracting factors mentioned, were not knowing enough about the specialty (56.3%) and its work-life balance (31.3%).

Discussion:
Addressing the lack of information regarding transplant surgery is the most important step in shifting the attitudes of medical students.

Exposing them to the specialty via placements is pivotal to recruitment, and these opportunities must leverage the appeal of the specialty's impact, variety, and underlying science to generate interest.


The Effect of Previous Experience on Transplant Surgery on considering the Specialty as a Career
Consideration of Transplant Surgery as a Career
Unlikely/No
Not Sure
Definitely/Probably
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
Proportion of Responses that selected this answer (%)
No
Yes

P51

P51 - The diagnostic test accuracy of remote or virtual follow up for detecting wound infection in surgical wounds

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Background
The Sars-CoV-2 pandemic catalysed integration of digital health models worldwide. This review appraises literature investigating digital methods of identifying SSI post discharge, and summarises effectiveness using diagnostic test accuracy measures.

Methods
Databases were searched for telemedicine and wound infection studies. Titles and abstracts, followed by full texts, were screened by two independent authors and mediated by a third. QUADAS-2 was used to assess methodological quality. The primary outcome was summary sensitivity and specificity.

Results
Of 1400 studies identified by searching, 17 studies were included in meta-analysis. There were 11,437 observations available with a weighted mean age of participants of 47.1 years. Risk of bias was present in all included studies, and there were high applicability concerns in nine studies. The mean sensitivity of all methods of telemedical follow up for detecting SSI was 88% (95% CI 68%-96%) and the mean specificity 97% (95% CI 94%-98%). The overall rate of SSI was 5.6% across studies.

Conclusion
Telemedicine is highly specific for SSI diagnosis, with potential as a screening tool post discharge. However, participants were young, and may under-represent the surgical population. Work is required to maximise engagement with telemedicine in the elderly and digitally naive before widespread adoption can occur.

P52

P52 - Incidence of New Onset Atrial Fibrillation in patients undergoing Carotid Surgery

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Background:
Atrial fibrillation(AF) is a common sustained cardiac arrhythmia, (prevalence 2.5%), with an increased risk of embolic stroke, peripheral embolism and death.

Aims:
To assess the 5 year incidence of new onset AF and stroke following carotid surgery.
Review our current practice of anticoagulation for patients with AF post procedure.

Methods:
We performed a retrospective analysis on 113 patients to look at the incidence of new onset AF following carotid surgery in 2015.

Results:
Out of 113 patients, 10.61% (n=12) had AF at the time of surgery. Of the remaining 101, 10% (n=10) developed new onset AF over the course of the next 5 years and 3 developed a stroke (30%).

Patients with AF at the time of operation,3 patients were already anticoagulated, a further 5 patients were were anticoagulated on discharge with apixaban or warfarin. However 4 patients with AF were discharged only on clopidogrel.

Conclusion:
We found that the incidence of new onset AF post carotid surgery (10%) is significantly high. We recommend that patients undergoing carotid surgery should have regular ECG follow up.
We recommend patients with AF postoperatively should be anticoagulated (NICE guidelines), as in our study 33% were discharged without anticoagulation.

P53

P53 - A single centre audit of antibiotic use and surgical site infection rates in patients undergoing major lower limb amputation at a UK tertiary vascular centre

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Introduction
Major lower limb amputations(MLLA) are high risk for surgical-site infection(SSI), which negatively impacts outcomes. Research has suggested 5-day post-operative antibiotic prophylaxis may reduce SSI rates within this group. We aimed to evaluate these rates and antibiotic use in this cohort, in our vascular unit.

Methods
A single-centre retrospective review of patients who underwent MLLA over a 6-month period(November 2020–April 2021) was performed. Demographics, post-operative outcomes(SSI, return to theatre, length of hospital stay(LoS), 30-day & 1-yr mortality) and inpatient antibiotic use, was collected.

Results
Fifty patients were included (30AKA/1TKA/19BKA). 12 patients(24%) experienced amputation wound complications; the majority(n=8, 16%) due to SSI(4AKA & 4BKA). Although average LoS was higher in those with SSI(30.3 vs. 21.6 days) it was not significant ($p>0.05$). Mortality rate was 14%(n=7) at 30-days, doubled by 1-year(n=15, 30%). 2/3 patients(n=33, 66%) received antibiotics post-operatively. Only 15 patients(30%) were given dedicated post-operative wound antibiotic prophylaxis, including n=7 who received a dedicated 5-day course.

Conclusion
A substantial proportion of patients undergoing MLLA received antibiotics post-operatively at some point during admission, often unrelated to the residuum. Whilst our audit finds no significant differences, we support recent RCT data for post-operative antibiotic prophylaxis but nonetheless demonstrate important real-world factors to consider.

P54

P54 - Non-Invasive optical methods to assess Tissue Perfusion in patients with Peripheral Arterial Disease and Diabetes Mellitus - a Systematic Review

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Introduction: Peripheral Arterial Disease and Diabetes Mellitus continue to increase. Diabetic Foot ulcer (DFU) is a debilitating complication which is burdensome socially, psychologically and economically. It is therefore imperative to be able to continuously monitor local tissue perfusion in high-risk patients for risk stratification, management and prognostication of DFU in a non-invasive, easily accessible and cost effective manner.

Aims: To systematically review the available methods of assessing non-invasive optical tissue perfusion and their use in PAD and DFU, to collate and present details of the technologies, advantages and disadvantages.
Method: A systematic literature review was conducted in accordance with PRISMA guidelines. Embase and Medline databases were searched using Ovid interface, as well as Pubmed and Google Scholar. The articles were reviewed by two independent reviewers.

Results: 625 articles were screened. 26 were included in the final review. The modalities discussed include photoplethysmography, spatial frequency domain imaging, hyperspectral imaging, laser Doppler, laser speckle flowgraphy, near infra-red spectroscopy,thermography and indocyanine green.

Conclusion: Several modalities are available for non-invasive monitoring of tissue perfusion which show promise for use in diabetic foot disease. Further clinical evaluation is required to determine if there is a role for these technologies in widespread clinical use.

P55

P55 - Co-creation of a Digital Health Intervention for people at high risk of developing Diabetic Foot complications

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Introduction
People with diabetes often do not feel empowered to actively engage in their own self-care. Digital health interventions (DHIs) may promote patient engagement but must be relevant. The aim of this study was to identify the most important issues faced by people at risk of diabetic foot complications, with a view to targeting these as part of a future DHI.

Methods
We conducted a literature review followed by semi-structured interviews with patients and healthcare professionals (HCPs). The Corbin-Strauss model, a theoretical framework for managing chronic illness, was applied to help determine patient needs.

Results
Findings from patient (n=19) and HCP (n=7) interviews illustrated the considerable impact of diabetic foot complications on patients' health, daily life, and emotional wellbeing. Thematic analysis revealed four key problem areas; access to simple and personalised information, an interactive daily footcare routine, the ability to ask questions to HCPs and access to wellbeing support. Collecting physiological data and gamifying the digital experience were some participant suggestions that may help improve engagement with a DHI.

Conclusion
Our early co-creation activities have highlighted important patient identified needs that should be addressed in any future digital health intervention.

P56

P56 - The utility of post-operative pre-discharge duplex ultrasound in EVAR

Budge J[1], Selway W[1], Azhar B[1], Wafi A[1], Roy I[1], Loftus I[1], Holt P[1]
[1]*St George's Vascular Insitute*

Introduction
National and international guidance on EVAR does not explicitly advise the need for post-operative pre-discharge imaging. Previous studies have shown post-operative pre-discharge duplex ultrasound (DUS) does identify EVAR complications not seen on completion angiography. These complications however may be self-resolving or managed as a day case.

Methodology
All asymptomatic infrarenal EVAR cases at a tertiary vascular centre between 2010 and 2019 were identified. All completion angiograms, operative notes, and post-operative pre-discharge DUS were screened to identify complications. All in-patient reinterventions were collected.

Results
650 cases were identified, with a 3.5% in-patient reintervention rate. 2.3% were graft related and 1.2% were access related.

7.4% of patients with an abnormal and 3.4% with a normal completion angiogram went on to have an in-patient reintervention. 9.4% of patients with an abnormal and 1.5% with a normal duplex had a reintervention.

141 patients had a normal completion angiogram but an abnormal duplex, with 13 having a re-intervention. 6 of these were graft related and were asymptomatic.

Conclusion
DUS and completion angiography have good discriminatory potential for early post-operative issues in EVAR that require re-interventions. However, many of the asymptomatic complications identified by duplex could be treated as an outpatient or may self-resolve.

P57

P57 - Systematic Review of the results of FEVAR in Octogenarians

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[1]*University Hospitals Sussex*

Objectives:
We aimed to review the literature on the results of complex endovascular AAA repairs (mainly fenestrated endovascular aortic repair (FEVAR)) in Octogenarians to ascertain whether these patients should not beoffered repair based on age alone.

Data Sources:
The study was registered with PROSPERO. A literature search was conducted of the Ovid Medline and EMBASE databases to January 2022.

Review Methods:
The literature search identified 134 potential articles. Following qualitative assessment by two independent appraisers, this was refined to 11 studies according to the PRISMA statement.

Results:
The primary outcome studied was 30-day mortality, which ranged from 0-9% in octogenarians vs 0-5% in non-octogenarians. However, these differences were only found to be statistically significant in two studies. The secondary outcomes included technical success rates, major adverse events, re-intervention rates, length of hospital and ICU stay. No statistically significant differences were found between octogenarians and non-octogenarians. Long term survival was significantly lower for octogenarians in two studies.

Conclusions:
FEVAR remains an acceptable option for complex endovascular aneurysm repairs in carefully selected octogenarians, and age alone should not prevent consideration of these interventions. This review highlights the paucity of data on the outcomes of endovascular repair of complex aneurysms in octogenarians.

P58

P58 - Survival after EVAR in women, outcomes from 17 years of practice in tertiary vascular centre

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Introduction
It is widely appreciated that women are under-represented in most of the seminal abdominal aortic aneurysm (AAA) trials. We also know that outcomes are worse for women following open AAA repair but there is relatively little gender-specific evidence on outcomes after endovascular aneurysm repair (EVAR). This study investigated outcomes of EVAR in women over 17 years in a tertiary vascular centre.

Methods
This was a retrospective observational analysis of a prospectively collected clinical database of women who underwent EVAR in a tertiary centre between June 2002 and 31 August 2019.

Results
109 (12.1%) of all EVARs were performed in women.30-day, 90-day mortality rates were 1.4% and 2.9% respectively with a median (IQR) survival time of 6.5 years (5.4-7.6) after elective repair. 30-day morbidity was 32.8%, with the largest proportion of this caused by respiratory complications, and median length of stay was 2 days. Reintervention rate was 10.0% at 2 years rising to 21.4% at 5 years.

Conclusion
Our local data suggests significant rates of in-hospital morbidity and reintervention following EVAR in women. More than 10% of EVARs were performed in women and this data supports further gender-specific research across all aspects of AAA management.

P59

P59 - Protein Biomarkers in Venous Leg Ulcer Fluid - A Systematic Review

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Introduction
Venous leg ulcers (VLUs) are common and cause significant morbidity and poor quality of life. There is poor understanding of the biology underlying non-healing VLUs. As VLU exudates may reflect the underlying wound microenvironment, this systematic review aims to identify potentially diagnostic and/or prognostic protein biomarkers within VLU fluid/exudates.

Methods
A systematic review was reported according to the PRISMA guidelines. MEDLINE and Embase databases were searched up to 30th April 2022. Additional publications were identified by searching the references of included studies.

Results
42 studies were identified with nine comparing healing and non-healing VLUs. Cytokines (e.g. IL-1a, IL-1ra, IL-6, eotaxin, GM-CSF, PDGF, VEGF), and proteins involved in extracellular matrix (ECM) homeostasis (e.g. MMP-7, MMP-10, MMP-13, TIMP-4) were significantly increased ($p<0.05$) in non-healing compared to healing VLUs. Collagen subunits (PICP and PIIINP) were significantly increased as the VLU healed. Inflammatory proteins (e.g. complement type 6, S100A8, S100A9) and ECM proteins (e.g. fibronectin, lumican) were found to be increased in non-healing VLUs compared to acute surgical wounds.

Conclusion
Altered levels of specific proteins in exudates may be indicative of healing and non-healing VLUs. Further work is essential to elucidate a comprehensive protein phenotype that may help early identification of non-healing VLUs.

P60

P60 - Predictors of lower limb amputation in patients with CLI – Snapshot Audit in the pre-covid & covid time

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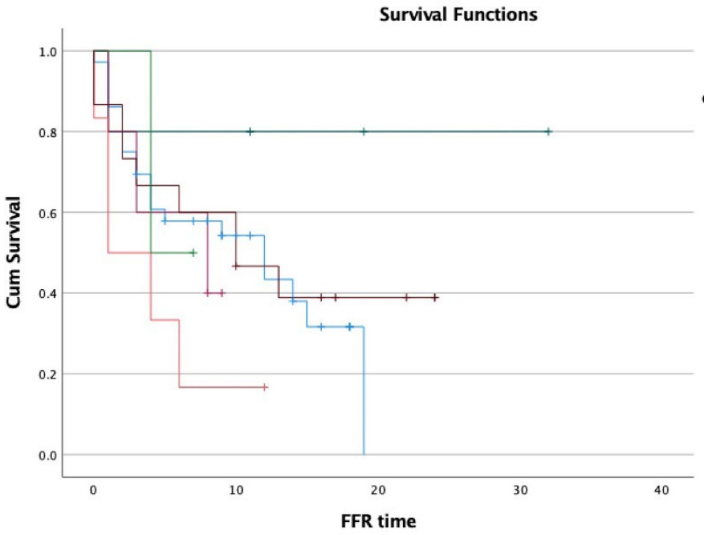
Introduction
Prevention of the main risk factors is crucial to prevent PAD. This includes smoking cessation, lipid modification and management of DM and CAD.

This study aims to enumerate predictors for successful limb salvage/amputation, effect of covid pandemic in outcome and assess post-operative clinical improvement contributing factors.

Methodology
A Retrospective study included patients presented with critical limb ischemia in the pre-covid time February-May 2019 and during first covid wave February-May 2020.

Results
73 patients (76 limbs) (M =58 F=18), with 41 pre-covid and 35 covid limbs and median age of 69 included in this study. 39 limbs treated endovascularly, 16 had bypass, 10 limbs had femoral endarterectomy and 23 limbs had combined surgeries. 7 out of 33 active smokers had major amputations. Poor outcome pointers were poor distal runoff, more than 2 recent interventions, multiple co-morbidities, and use of single instead of dual anti-platelet. No statistical difference noticed between pre-covid and covid periods, with increased number of first presentation unsalvageable limbs in covid time.

Conclusion
Smoking, poor runoff and complex TASC level disease have poor outcome. Double anti-platelet therapy has the best clinical outcome. Our study points towards limiting revascularization attempts early in the disease course considering amputation/conservative approach.


Survival Functions
Cum Survival
1.0
0.8
0.6
0.4
0.2
0.0
0
10
20
30
40
FFR time