SUSQI PROJECT REPORT

Making every venepuncture count

Start date of Project: May 2025
Date of Report: October 2025

Team Members:

- Connie Burton, Phlebotomy and specimen reception manager
- Maria Viera, Phlebotomy Team Leader
- Abbi-Rose Sherwood, Phlebotomy Team Leader
- Sally Bowie, Phlebotomy Team Leader
- James Freeburn, Facilities Project Lead
- Simon Preston, Chief Resident Doctor

Background:

Repetitive blood testing in clinically stable patients on general medical wards has been increasingly recognised as a source of avoidable harm. Frequent phlebotomy can lead to hospital-acquired anemia, increase the likelihood of red blood cell transfusions, and contribute to longer hospital stays—even in the absence of active bleeding (1). Although this study was conducted in a Canadian intensive care setting, its findings highlight the broader risks associated with excessive blood draws, which are also relevant to general inpatient care.

In the UK and internationally, initiatives such as Choosing Wisely have identified routine daily laboratory testing in stable patients as low-value care. A U.S.-based article published in JAMA Internal Medicine (2) found that laboratory testing, while accounting for less than 5% of hospital budgets, influences up to 70% of clinical decisions and can drive unnecessary downstream investigations and procedures. This overuse not only affects patients but also contributes to healthcare waste, environmental burden, and increased staff workload. Previous studies suggest that, depending on the definition used, 30–70% of all laboratory tests may be considered potentially inappropriate (3)

Evidence from practice change initiatives, such as those reported in the BMJ (4), shows that reducing unnecessary testing can be done safely, without increasing readmission rates, missed diagnoses, or mortality, while improving patient satisfaction and reducing costs. A previous SusQI project undertaken in South Warwickshire University NHS Foundation Trust, projected annual savings of £18,444 and 937 kgCO2e per year, equivalent to driving 2,767.57 miles in an average car, from a 10% reduction in blood testing in just six care of the elderly wards (5).

It had been noted by several of the Phlebotomy team that inpatients at Hampshire Hospitals were complaining to them of being bled multiple times in a day, or for multiple consecutive days. During informal discussions it was noted that on several occasions doctors or ward based clinicians had taken

an urgent blood test minutes before a member of the phlebotomy turned up to take routine bloods. As part of a corporate responsibility and sustainability apprenticeship, the facilities project lead was made aware and contacted the Phlebotomy management team and chief resident doctor to discuss the issue. It was noted a project was already underway at senior level to work with the resident doctors, some consultants and the Phlebotomy and specimen reception manager to raise awareness of low value testing and to try and reduce unnecessary routine and repeat testing. It was decided the 2 projects could be run separately, but would be monitored to ensure they worked in union and not affected each other's data gathering. This project, making every venepuncture count (MEVeC), would focus on reducing additional venepuncture, where opportunities were missed to take the blood samples at one time, with secondary objectives to support with other sustainable outcomes. The other project would continue under the consultant and senior direction, and would focus on the review of requested samples and raising awareness with requesting staff of low value tests and repeat testing.

Specific Aims:

- To reduce the instances of unnecessary venepuncture by ensuring all outstanding routine and urgent sample tubes are taken when taking any blood or when first cannulating a patient.
- To raise awareness of the triple bottom line impact of additional venepuncture as well as the benefit to all of making every venepuncture count.
- To identify and explore other opportunities for improvements that support the triple bottom line.

Methods:

Initially, the Facilities Project Lead arranged for discussion around the issue of repeat bleeds, and the project team was formed to discuss the aims and methodology for the project.

In discussion with the chief resident doctor it was noted that the doctors and some ward based staff used a different part of the ICE blood sample system to print labels and usually this was done after the bloods were taken. In doing so only the one test would be taken, and others outstanding would remain on the phlebotomy round list to be taken later in the morning.

In taking blood samples twice, the cost, time, risk and inconvenience and discomfort to the patient is doubled. Additionally the risk to the patient in terms of damage to veins, bruising and skin tears from dressings is more than doubled.

It was also noted early on that raising awareness amongst the clinicians and doctors, to check the ICE for other outstanding bloods could reduce the need for a second bleed. It was also noted that clinicians and doctors could also take bloods when first cannulating a patient, further reducing the need for additional venepuncture. The phlebotomy team at Winchester site were already gathering some data.

A process review highlighted a potential circular benefit, where, by having ward clinicians and doctors check and take all outstanding blood samples, phlebotomists were freed up to take additional bloods, thereby freeing up time for clinicians and doctors. In addition, other potential benefits were identified in all three of the triple bottom line areas (Fig. 1)

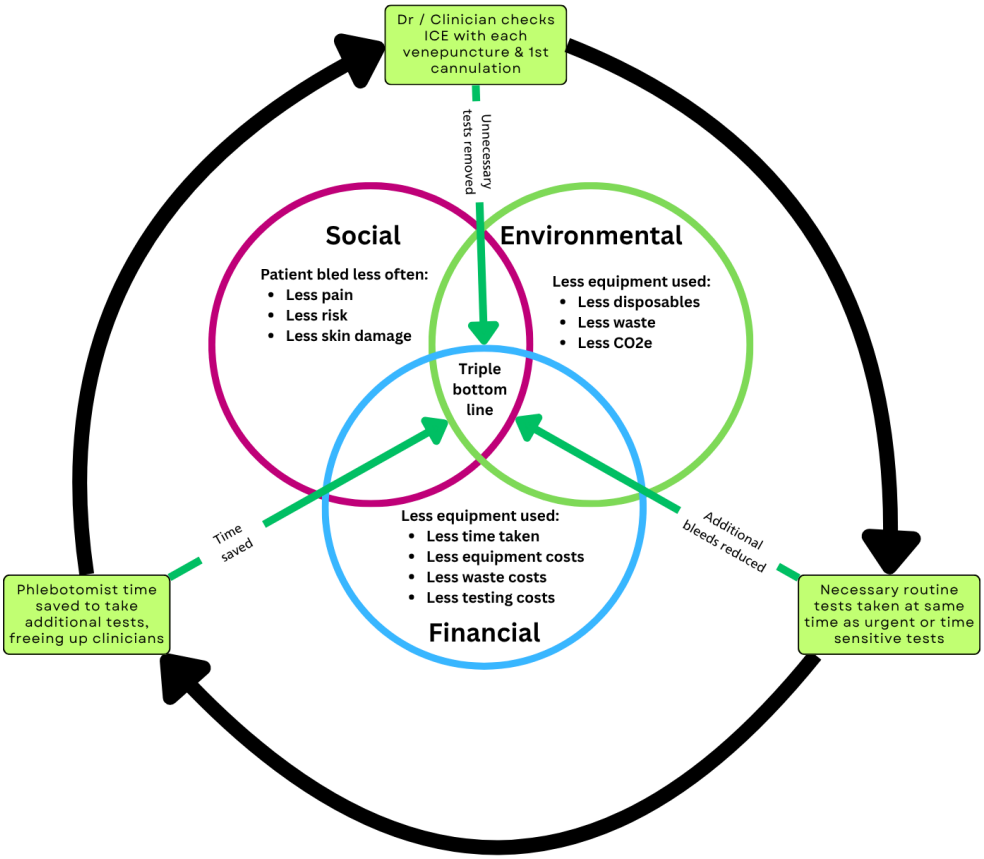

Fig. 1 - Circular benefit and Triple bottom line benefits

To raise awareness of the aims and potential benefits of the project several examples of comms (Fig. 2, 3 and 4 & video link in Appendix 1) were considered and drafted. These were approved by the CNO team and comms as well as the project group. Ahead of the comms roll out, baseline data was gathered in 2 formats, as outlined below and considered.

Due to timing constraints, comms was initially focused on one ward at Winchester (from which the baseline data was collected), before being rolled out to the rest of the trust over an expanded timeframe.

It was noted as part of the methodology discussions that the ICE system does not delete or mark complete on the phlebotomy round list if the sample is taken and label printed via the ICE “honey pot” so duplicate testing could still happen. This led to alterations to the comms messaging to ensure the phlebotomy round was used to take labels where possible, and for the phlebotomy team to be notified where this wasn’t possible. This also led to a discussion around additional tests discarded in the lab (e.g. Vitamin D tests at less than 4 day intervals) and tests that were deemed unnecessary, such as U&Es tests, often taken ahead of radiology appointments, that would be unnecessary if the patient had had a recent (in the last 2 to 3 months) U&Es test already. It was discussed that the Phlebotomy leads would monitor the outpatient department U&Es tests, and ascertain if a pattern, or source for patients attending for U&Es tests (e.g. specific general practice surgeries) could be identified and targeted for communications and future engagements.

It was also noted that, on ICE all blood sample requests were labelled as “routine”, despite 2 week wait and urgent options being available. It was also noted that each test had an optional symbol assigned and that the majority had a £ icon, to try and identify to requesters which tests were expensive, however as most were noted with “£” this made it redundant. It was discussed around the option of having leveled symbology with a “£”, “££” & “£££” option approach to better identify high cost tests and support a reduction in the low value test requests. It was decided that, following the MEVeC project, and following a lab system upgrade (due in October 2025), that the ICE system and process for requesting would be reviewed and that an MDT team would be established to drive additional benefit changes.

Measurement:

Baseline data:

It was decided that, given time constraints and complexities of data collection, data would be gathered by the phlebotomy team leads in several formats:

- Quantitative data would be gathered from ICE system records in 2 formats –
  - Data on patients that had multiple samples taken within a calendar day. This data would show the date and time of all samples being taken and which team collected each sample. This would highlight valid data points, the time between bleeds, and any comments on the bleeds – including when a sample is time bound. This data would be collected on 2 wards for a week each and compared to similar data post project.
  - Data on when a sample set of patients had test and when the tests were reviewed by a clinician, as well as if that patient had any follow up blood test requests added before the sample was reviewed. This data would highlight samples that were not urgent and potentially could have been taken the following day (with another test), cancelled altogether, and where doctors and clinicians are requesting multiple days tests in advance (day-on-day).
- Qualitative data would be gathered from the phlebotomy team around their perception of:
  - How often patients are bled multiple times per day
  - How often patients are bled day-on-day
  - Willingness to support introduction and use of re-usable tourniquets
  - Additional information and comments gathered around ideas and concerns

While data would be gathered in a smaller sample group, comms and therefore benefits would be Trustwide.

Patient outcomes:

Patient outcomes will generally be associated with the reduction in number of venepuncture procedures undertaken, and in particular around a reduction in multiple bleeds per day. This will be measured in the baseline (above). This reduction could support better skin care (through reduced dressings and improved awareness of dressing application and removal) and a reduction in more painful and higher risk siting of venepuncture where primary locations have been overused (or use of other alternatives to standard venepuncture), although these benefits can only be implied and not measurable as part of this project.

Out of scope, there could be a patient benefit from use of better, more effective, re-usable tourniquets.

Population outcomes:
As part of the review of unnecessary tests (particularly around U&Es for radiology patients) there will be an implied population benefit around freed up appointments, less travel and less impact to patients, however the data was not available as part of this project and would need to be considered separately, due to the complexities and interrelationships between services.

Additionally, there could be a safety benefit, from a reduced number of venepuncture procedures. InPhase will be reviewed in relation to venepuncture procedures and particularly needlestick injuries to find out if a reduction could be achieved.

Environmental sustainability:
As part of the environmental impact, the process of venepuncture was studied and the time, assets and disposables associated with a process was documented. This data was quantified, with the number that would be reduced had a blood sample been taken with an earlier test, and a purchasing cost (or pay cost based on the phlebotomist hourly rate) and CO2e impact figure sourced from various sources (citations 6, 7, 8 & 9) was applied (Fig. 6). The total CO2e impact per additional bleed was calculated to be 0.406kg CO2e, the equivalent of 0.97 miles driven in an average car.

Item	CO2 - box qty	Qty (box)	CO2 each	KGCO2 / procedure
x1 box of 50 BD vacutainer needles (x1 needle required)	0.0552	1	0.0552	0.03036
x1 box of 50 BD Push-button butterfly needles (x1 needle required)	0.0553	1	0.0553	0.030415
x1 box of 200 Clinell chlorhexidine skin wipes (x1 wipe required)	0.020626	1	0.020626	0.020626
x1 box of 25 pieces Medicare T-band plus tourniquets (x1 torniquet required)	0.0373	1	0.0373	0.0373
x1 packet of 100 pieces/bag Unisurge non-woven swabs (x5 swabs from 1 pack required)	0.2618	100	0.002618	0.01309
x1 pack of 100 yellow top BD SST tubes (x1 tube required)	0.032	1	0.032	0.032
x1 pack of 100 purple top BD EDTA tubes (x1 tube required)	0.034	1	0.034	0.034
x1 pack of 200 nitrile gloves (x2 required)	0.052	1	0.052	0.104
x1 roll of 200 white aprons (x1 required)	0.065	1	0.065	0.0195
x1 box of ?X Aura 1836+ FFP3 masks (x1 mask required)	0.076	1	0.076	0.0038
x1 pack of ?50 blue blood science sample bags (x1 required)	0.052	1	0.052	0.052
x1 bottle of 200 Sani-Cloth disinfectant wipes (?X required)	0.020626	1	0.020626	0.020626
x1 bottle antibacterial soap	0.75	333.3333	0.00225	0.00225
x1 bottle antibacterial hand gel	1.5	333.3333	0.0045	0.0045
x1 water (litres)	0.000366	1	0.000366	0.001281
		Total		0.405748

Fig. 6

The greenhouse gas (GHG) emissions associated with a U&E test have been sourced from McAlister et al 2021, encompassing emissions from test consumables, electricity use, collection tubes, and storage. As the original study was conducted in Australia, the electricity-related emissions have been adjusted to align with the UK context, using the 2025 electricity emission factor from the 2025 DESNZ database.

For patient travel, a generic carbon factor for a patient journey per outpatient appointment was used, as provided by the Greener NHS clinical activity carbon emission factors for care pathways appraisal database.

Economic sustainability:
As described in the environmental sustainability section above, the data was quantified, with the avoided purchasing cost and efficiency from time saved (pay cost) (i.e. full venepuncture procedure,

less the additional tube for the sample and time for the clinician taking the sample). The total cost saving per avoided double bleed was 88p, with a further cost efficiency (avoided wasted time) of £1.09, giving a total benefit of £1.97. The time saving is calculated as 5 minutes saved per procedure (accounting for a 7 minute procedure being saved, but accommodating 2 minutes for the additional check on ICE and to collect additional tubes in the "primary" venepuncture). The cost avoidance is based on purchasing costs provided by WPL, the Trust's procurement subsidiary.

No investment (other than time) has been required for this project, although, as outlined below, may be required for additional projects around reusable tourniquets.

Results:

Patient outcomes:

Initial data was collected on 2 wards, one at Winchester and one at Basingstoke, both of 28 beds. Given rollout of comms had been expanded, the post project data was collected over a longer period on the sample ward at Winchester. The data was collected over a longer timeframe to give a more consistent dataset and baseline data (below) has been factored up to match the number of patients / patient days as the post project data, making both sets directly comparable.

Baseline data showed patients were bled twice (double bleeds) in the same day on 20 occasions and three times (Triple bleeds) in the same day on 3 occasions. Based on 56 patients on the 2 wards over 7 days, 5% of the patients were bled twice in a day, and 1% were bled 3 times.

Post project data showed only 2 double bleeds and no triple bleeds on the trial ward for the whole of September, equating to 0.2% and 0% of patients undergoing double and triple bleeds respectively. This is a reduction of 78.6% of double bleeds and effectively 100% reduction in triple bleeds.

In practice, based on the baseline data, this would roughly equate to a reduction from 56 to 2 multiple bleeds per month on the ward. By scaling this across the Trust, assuming 1000 in patients per day (roughly 550 at Basingstoke, 420 at Winchester and 30 at Andover), this would equate to around 1929 avoided multiple daily bleeds per month. This means each year the Trust could avoid bleeding patients twice or more in the same day 23,143 times.

The data set collected post project had improved significantly and was then too small to ascertain if a change in the time between bleeds was noticeable. However, it was noted:

- The average time between tests was 4 hours and 42 minutes, however, in 4 instances, the tests were within 1 hour of each other and 7 were within 2 hours or each other. This equates Trustwide to around 3,724 instances each year where a patient is bled twice within an hour (over 10 times per day).
- This data however, does not show the number of times a patient was cannulated and had a venepuncture procedure, so the figure is potentially under that of the true situation.
- This data also does not include tests that could be clinically unnecessary or low value and would fall under the other ongoing project outlined above.

Based on a rough estimate of 100,360 routine in patient venepuncture procedures per year (calculated at 140 requests/weekday RHCH and 190/weekday BNHH, with 70 at each site on weekend days), and on the assumption above of 23,143 additional bleeds per year, this puts additional test at 23.1% of all

tests, meaning that potentially nearly a quarter of all inpatient venepuncture processes at the Trust could have been avoided, but still produced the same number of test results.

The data above was fairly consistent with that of the staff feedback data. The feedback data was gathered from 21 phlebotomists (7 at Basingstoke, 14 at Winchester) and focused on their perception of how often the patients they were noticing or being told by patients that the patient had been bled twice, and also, how often the patients had been bled the previous day (day on day routine testing).

The data above was also supported by that of the phlebotomist survey. Based on an average of 25 patients seen per day by a phlebotomist, and applying an even weighting to each phlebotomist (i.e. as if each phlebotomist works the same number of shifts), the baseline data (Fig. 5) shows that, of the 525 patients that in theory would be seen, the phlebotomist feedback is that around 36 would be bled twice or more, giving a figure of 6.9% (0.9% difference over the sample data above – 5% double 1% triple). This close figure strengthens the sample data and supports the assumption around the number of double bleeds (in this case the figure would be 25,185 per year across the Trust).

Fig. 5

The feedback data also shows a significant number of patients (41%) are believed to be bled on multiple consecutive days.

Following the comms roll out, the phlebotomist team were asked to complete the survey again and, despite a delayed roll out, initial feedback has shown good perceived improvement in a reduction of the number of additional daily bleeds.

How often do patients comment they have already been bled that day?	Multi-bleeds (baseline)			Multi-bleeds (post project)		
	Survey feedback outcome	Share	Patients bled more than once per day*	Survey feedback outcome	Share	Patients bled more than once per day*
More than 5 times daily	2	10%	12.5	1	9%	8.6
3-5 times daily	3	14%	12	0	0%	0
1 - 2 times daily	7	33%	10.5	1	9%	0
A couple of times weekly	4	19%	1	5	45%	1.7
Weekly	1	5%	0.25	1	9%	0.3
Rarely	3	14%	0.00	3	27%	0
Never	1	5%	0.00	0	0%	0
Total	21		36.25	8		10.7
*Based on an average of 25 patients per phlebotomist and even number of phlebotomy shifts per Phlebotomists.				Improvement		71%

The above shows a perceived improvement from 6.9% all patients to 5.3% of all patients. If this data is applied across the Trust (100,360 phlebotomy requests) this could be a reduction of 1582 double bleeds. This is a significant difference from the quantifiable data taken from ICE, however there is likely to be a delay between the change taking place, and there being a significant enough change to be noticed by the phlebotomists, which would explain a slight reduction in staff feedback, compared to the immediacy of ward data findings.

Phlebotomist feedback survey findings	Day on day bleeds (baseline)			Day on day bleeds (post project comms)		
	Survey feedback outcome	Share	Patients bled multiple consecutive days*	Survey feedback outcome	Share	Patients bled multiple consecutive days*
More than 15 times daily	9	43%	135	2	18%	30
10 - 15 times daily	5	24%	60	1	9%	12
5 - 10 times daily	2	10%	16	0	0%	0
1 - 5 times daily	1	5%	3	4	36%	12
A couple of times weekly	3	14%	1.5	3	27%	1.5
Weekly	1	5%	0.25	1	9%	0.25
Total	21		216	11		56

In addition to the daily bleeds, the feedback from the phlebotomy team showed a perceived improvement on day-on-day requests from 41% baseline to 20%. This improvement would suggest a greater awareness from clinicians around the impact of over requesting blood samples has on patients and the triple bottom line, although several factors may be impacting this perception. It should be noted that the sample size for the feedback was limited (21 baseline and 11 post project).

This data will go towards supporting the case for the other project mentioned above around repeat routine and low value testing. This data was also supported by data gathered from the Winchester lead phlebotomist, who had looked into a patient that had been bled on 2 bank holidays, and noted that on every day since the patient's admission, 23 consecutive days to date, the patient had been bled at least once for “routine” tests. Many of these tests had also not been reviewed since the results had been published by the lab.

Following these initial findings, a ward at Winchester was audited and 20 venepuncture procedures analysed. The data showed that, of the 20 blood samples, the average time between the sample being taken and the sample results being reviewed was 25 hours, with 3 tests (15%) not reviewed within 48 hours. Lab turn around time varies by test, but results are usually posted within 6 hours. Within the sample data, 25% of patients (5 total) had another sample requested for the following day, and 10% of patients had 3 or more days of tests requested before initial results were returned. In each of these cases subsequent testing was for the same purpose. Testing for different reasons have not been included.

If these findings were expanded across the Trust, based on the 100,360 predicted phlebotomy requests, 15,054 tests are likely not reviewed within 48 hours of being taken, and 25,090 are likely to have additional tests requested before results are reviewed, of which 10,030 will have 3 or more days’ worth of requests made before initial results are reviewed.

The tissue viability team was approached around the patient outcome in regard to the condition of patients skin and incidents of skin damage from dressings and regular venepuncture, however it was indicated that small skin tears and vein damage would not usually be reported to the team so was unlikely to generate data of significant value.

It was hoped additionally that the phlebotomy team might be able to provide data around the number of test requests that were unfulfilled by the team each day (and handed back to the ward staff to carry out), which could highlight any reduction in the number of tests ordered and the number of tests the ward staff are taking (particularly routine tests that are taken with early morning urgent tests). Unfortunately this data wasn’t available at time of the project.

In addition, a reduction in unnecessary additional procedures would reduce risk around infections and complications as described above. Unfortunately, data around infections and HAI’s in particular would be unlikely to be significantly impacted enough to show any changes, particularly given the timing of the project and the seasonal increase in general infections which is usually increasing at the time of the project.

Additionally, HHFT employs around 676 resident doctors, and given above findings and further anecdotal evidence, it could be possible for each to review low value and repeat tests and make some cancellations. If each Dr cancelled just one test per week this would be 31,096 less tests requested (assuming 6 weeks annual leave and no sickness), meaning a fair reduction in tests required, although the actual figure is not quantifiable, given many of the patients would still require venepuncture for other tests.

Population outcomes:
While difficult to quantify, by having less procedures, there has been a reduction of potential infection opportunities, which may have led to wider benefits, as well as a reduction in potential needlestick injury, as described above.

In the 12 months leading to the project (October 2024 - October 25) there were 52 reported needlestick incidents at the Trust (reported using the InPhase system), of which 21 were directly attributable to blood tests. Of the remaining 31, some were attributable to PICC and cannulation, some of which in themselves may have been necessary due to repeated venepuncture on the patients causing damage to usable veins. Based on the above assumption of around 23.1% of venepunctures being "additional", this could result in over 5 less needlesticks each year, with additional benefit from reduced testing and care costs, liability costs, pay costs (from sickness absence and time spent managing the incident and reporting) and improved staff well being, although the scope of quantifying these benefits would be out of scope of this project.

Environmental sustainability:
Based on the baseline and post project data, as noted in the patient outcomes, there was a noted reduction in additional bleeds of between 23,143 (based on scaling of reduction figure) and 23,340 (based on scaling of baseline and post project separately). This discrepancy is due to 0 triple bleeds being observed so not scaled. Given triple bleed figures are more accurately quantified on the latter dataset, this figure has been used. Based on a potential reduction of 23,340 additional bleeds, the Trust could have a perceivable benefit of a reduction of 8,977 kgCO2e (based on carbon foot printing data Fig 6.). This equates to a distance of 21,544 miles driven in an average car, roughly the equivalent of driving from John O'Groats to Land's End and back, 13 times over.

In regards benefit from indirect cancelations of low value tests (from clinicians noticing on review of ICE), a reduction of 1 test tube request per resident doctor, per week, could reduce GHG emissions by 1026 kgCO2e (saving on just the tube), roughly equivalent to driving 2461 miles in an average car (around the distance to drive to Oslo in Norway, and back, via France, Belgium, Holland, Germany, Denmark and Sweden). This reduction is increased to 12617 kgCO2e less if no venepuncture if required, although in most cases the former is more likely, due to other tests still being required. This equates to around 30,281 miles driven, roughly equivalent to the distance around the circumference of the earth and then from John O'Groats to Athens and back.

Based on the above assumptions of 23,340 less venepuncture procedures, there would also be an additional benefit of reducing water consumption used in hand washing by 81,690 litres (based on 3.5 litres observed per wash). This itself would support an additional GHG reduction of 24.3 kgCO2e (10).

Economic sustainability:
As per environmental outcomes, taking a potential reduction in additional testing of 23,340 tests the below financial benefits may be realised.

From the baseline data 26 additional tests over the 2 week-long audits were noted, compared to 2 over the month following the change, giving an approximate monthly reduction of 54 additional tests. This figure gives a cost avoidance of £47.16 and cost efficiency of £58.77, giving a total financial benefit of £105.93 (per ward, per month).

The below table shows potential financial benefit if the comms are as successful on other wards as they were on the trial ward.

	Baseline	Post project	Difference
Double bleeds	18622	869	-17753
Triple bleeds	2793	0	-2793
Total additional tests	24209	869	-23340
Cost additional bleeds	£ 21,255	£ 763	-£ 20,492
Pay costs (total)	*£ 37,084*	*£ 1,331*	*-£ 35,753*
Pay costs (efficiency)	£ 26,488.88	£ 950.88	-£ 25,538
Total cost of additional bleeds	£ 47,692	£ 1,714	-£ 46,030
CO2e	9823	846	-8977
Miles	23575	2031	-21544
Expanding the baseline data to match the post project timeframe (28 pts & 840 patient days) thereby making the datasets directly comparable. Pay cost efficiency is 5/7 due to 2 minutes per 7 being added to another procedure to avoid the additional bleed.			

For future note in communications, 1 test per ward per day, could be enough to reduce additional bleeds by around 15,000 procedures and have the potential to save the Trust £13,170, with an additional cost efficiency of £16,413 per year.

In regards benefit from indirect cancelations of low value tests (from clinicians noticing on review of ICE), a reduction of 1 test tube per resident doctor per week could save £3,109 annually (saving on just the tube), raising to £61,325 (of which £27,301 is cost avoidance) if no venepuncture if required. In neither of these findings were lab or disposal costs included.

There would also be a reduction in waste disposal costs, although more difficult to quantify.

From a reduction of 23,340 additional venepunctures, the Trust could benefit from a reduction of 27, 22 litre sharpsmart containers with associated £286.17 disposal cost reduction. There would also be a reduction in the amount of PPE and other infectious / offensive waste, although this was not quantifiable with the data available at the time of the report.

As mentioned above in pt. outcomes, if each resident were to cancel 1 test per week, this would reduce testing by 31,096 tubes, itself a saving of around £3,109, not including saved lab costs. If these

tests could result in a cancelled venepuncture procedure, or one that could be delayed and combined, this could mean a cost avoidance of around £27,301.48 and (pay) cost efficiency of £34,024.21, giving a total benefit of £61,325.69.

Social sustainability:
By reducing the number of additional tests, the workload applied to the phlebotomy team would be reduced, giving the team more time to complete each appointment and to (previously often not possible) return to patients who were not picked up on the first round, meaning a more practiced staff member could take the bloods, reducing the negative impact of venepuncture on the patient.

There would also be a patient satisfaction benefit, from fewer venepunctures and this would in turn have a positive impact on the staff wellbeing, through more positive interactions with the patients.

In the 21 days following the comms campaign, 35 staff watched the MEVeC video from the QR code banners, which may contribute to raised awareness and project engagement.

Discussion:
During early team discussions several other avenues for sustainable improvements were discussed and have been explored, although not fully implemented. These included:

- Potential for reusable tourniquets, with a potential project looking at a small trail in the phlebotomy outpatient department. This project is ongoing although engagement with infection control and procurement are raising concerns over the safety of reusable tourniquets in general. Further research and engagement with existing users (Trusts) and the IPC sustainability exemplar Trust (Great Western Hospitals) is ongoing to gather data around the safe use and potential PDSA trial and SOPs required to facilitate agreement to trial from the IPC and procurement teams. From the Phlebotomists survey feedback, 69% of staff were open to the use of reusable tourniquets prior to any comms to their benefit.
- Potential engagement with radiology and local GPs raise awareness of the low value of duplicate U&E testing where the patient has already had the test in the previous 4 months (TBC).
- Potential linking or coordinating communication strategies with the ongoing project with doctors and consultants where low value and repeat routine blood test requests are reviewed and cancelled (or not ordered) except where there is a definite clinical need. Additional comms will begin, with specific comms placed in Doctor's mess rooms, on call rooms and other places frequented by the resident doctor teams.
- Potential reduction in PPE (aprons in outpatient setting). A discussion around this has been agreed and the IPC team are supportive of a reduction in PPE in an outpatient setting.
- Changes to the ICE system have been discussed and, following implementation of a new lab IT system in October 2025, will be quantified and reviewed inline with SUSQI, process mapping tolls, to ascertain problem areas, and try to amend the system so it can be adapted to better highlight repeat and regular tests, ensure tests cancelled are canceled easily and off each teams page, and to provide routine reports for Doctor supervisor teams on the number of tests requested, the cost, and the average time between results being available, being checked, and reordered.
    - One of the key barriers observed was that the phlebotomy team and clinicians print

labels off (and carry out tasks) on a different aspect of the ICE system, which doesn't link to the other. This is believed to have caused conflict between the teams and lead to inefficiencies, for example where a test has been cancelled by a doctor, this isn't always updated on the phlebotomist round list, leading to the sample being taken unnecessarily.

- In addition, certain tests (particularly high cost) carry their own SOPs or standards in the Trust Labs. Tests such as vitamin D tests are, in some conditions, discarded by the lab without testing, if a recent test (believed to be within 4 days) has been done already, due to the perceived low value of testing frequently. This was discussed as a cost pressure, in a wasted test, but also highlighted as an opportunity, whereby a list of such restrictions, and additional low value repeat tests, could be documented by consultants and senior clinicians, and, where these are requested by resident doctors, the phlebotomy could hand these tests back to the ward staff to undertake, thereby ensuring the low value test is reviewed and cancelled if not required (if required the ward staff will justify the requirement to re-test or repeat the test).

Time and long-term absence for key team members were barriers to the project, as were unforeseen changes in the background, which had significant impact to the subsequent gathering of data, post project. Additionally, barriers were observed due to a lack of availability for senior clinicians, consultants, etc. to engage in the process.

It was discussed that following successful gathering of additional data, this project would be presented to the senior team involved in the other project (around reducing testing) to ensure the findings can be used to support further clinical engagement and future reductions in low value and repeat testing, as well as keeping awareness of checking on ICE high.

Conclusions:

The MEVeC project was a simple and all but nil cost project that has, raised awareness of the impact of multiple daily bleeds to the patient, as well as realizing patient financial and environmental impacts.

Likely Trustwide benefits:

- 23,340 less venepuncture procedures carried out the same day as another on the same patient, leading to greater patient satisfaction and comfort.
- £20,492 cost avoidance, and £25,528 cost efficiency from reduction in additional bleeds.
- £286.17 sharp wasteage disposal cost reduction
- Unquantifiable lab cost reduction and efficiencies.
- 8,977kgCO2e reduction from reduced additional testing – equivalent of 21,544 miles driven in an average car.
- 81,690 litres water saved from reduction in venepuncture associated hand hygiene.
- 5 less needle stick injuries per year

Additional potential benefits:

- Potential to promote a reduction in low value testing of £3,109 from tubes and potentially up to a total financial benefit of £61,325.69

- Reduction in risk, infection and skin damage from unnecessary additional venepuncture, as well as reduction in alternative siting of venepuncture or procedures where veins are no longer viable due to over-bleeding.

Further data gathering, and engagement is required, along with the widening of scope to include or complement the other linked projects. The project itself will continue to be reviewed and developed as part of a PDSA, and it is hoped, with engagement, small scale trials of intensive changes and eduction can begin on specific wards, to promote best practice and develop a more collaborative approach, making the best use of the ICE digital system.

References and Resources

1) Thavendiranathan, P., Bagai, A., Ebidia, A., Detsky, A. S., & Choudhry, N. K. (2005). Do blood tests cause anemia in hospitalized patients? The effect of diagnostic phlebotomy on hemoglobin and hematocrit levels. *Journal of General Internal Medicine, 20*(6), 520–524. https://doi.org/10.1111/j.1525-1497.2005.0094.x
2) Kale, M. S., Bishop, T. F., Federman, A. D., & Keyhani, S. (2017). Top 5 lists top $5 billion: The potential savings of the Choosing Wisely campaign. *JAMA Internal Medicine, 177*(5), 757–758. https://doi.org/10.1001/jamainternmed.2017.5152
3) Kip, M.M.A., Oonk, M.L.J., Levin, MD. *et al.* Preventing overuse of laboratory diagnostics: a case study into diagnosing anaemia in Dutch general practice. *BMC Med Inform Decis Mak* 20, 178 (2020). https://doi.org/10.1186/s12911-020-01198-8
4) Moynihan, R., Albarqouni, L., Doust, J., Dunn, A., Jones, M., & Glasziou, P. (2022). Reducing unnecessary tests and treatments in healthcare: Evidence and practice. *BMJ, 379*, e070698. https://doi.org/10.1136/bmj-2022-070698
5) SusQI case Study - Reducing routine blood testing in Frailty and Care of the Elderly Wards | Sustainable Healthcare Networks Hub
6) Spoyalo K, Lalande A, Rizan C, Park S, Simons J, Dawe P, et al. Patient, hospital and environmental costs of unnecessary bloodwork: capturing the triple bottom line of inappropriate care in general surgery patients. BMJ Open Quality. 2023;12:e002316. https://doi.org/10.1136/bmjoq-2023-002316
7) Rizan C, Reed M, Bhutta MF. Environmental impact of personal protective equipment distributed for use by health and social care services in England in the first six months of the COVID-19 pandemic. J R Soc Med. 2021 May;114(5):250-263. doi: 10.1177/01410768211001583. Epub 2021 Mar 16. PMID: 33726611; PMCID: PMC8150566. https://pubmed.ncbi.nlm.nih.gov/33726611/
8) Greater Glasgow & Clyde NHS (2023) The Environmental Impact of Single-use Verses Reusable Tourniquets at Greater Glasgow & Clyde NHS. The Centre for Sustainable Healthcare https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fnetworks.sustainablehealthcare.org.uk%2Fsites%2Fdefault%2Ffiles%2F2024-05%2FGGC%2520Tourniquet%2520LCA%2520Report%2520%25281%2529.docx&wdOrigin=BROWSELINK
9) Centre For Sustainable Healthcare, ICU project (unpublished)
10) Ask Leo | Ethical and green living | The Guardian

Appendix 1: Comms materials

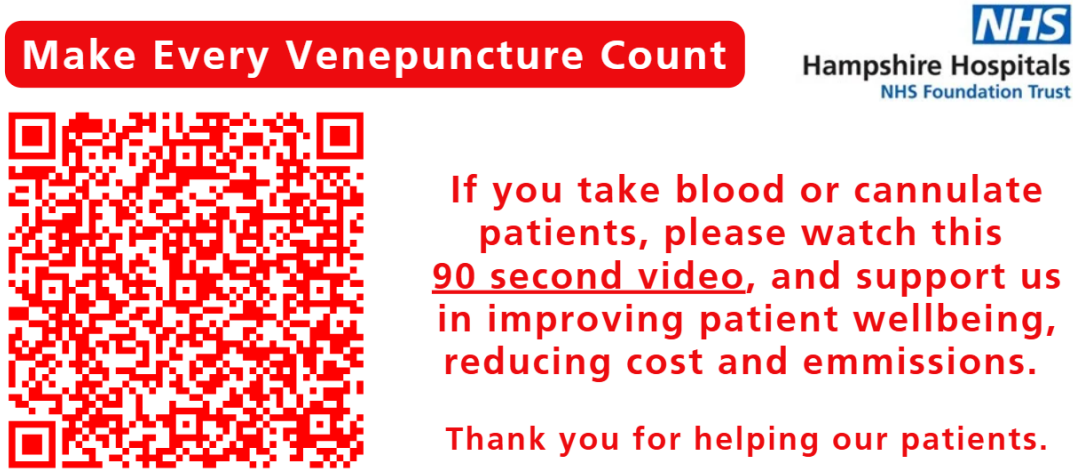

Fig. 2

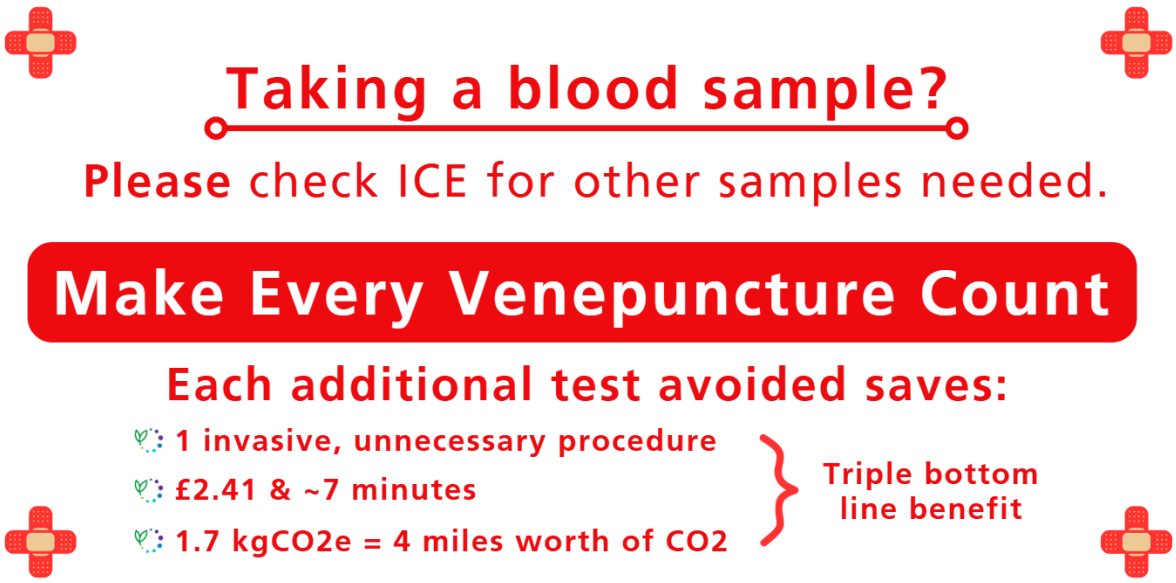

Fig. 3

Fig 4.

Link to comms video:
https://www.canva.com/design/DAGpTB3fPlo/08LlCbAt06urWDbI0zWqag/watch?utm_content=DAGpTB3fPlo&utm_campaign=designshare&utm_medium=link2&utm_source=uniquelinks&utlId=ha32ced5a40