Centre for Sustainable Delivery

NHS SCOTLAND

Green Healthcare Scotland
National Green Theatres Programme - Reusable Laparoscopic Ports
Action for Adoption

Reusable Laparoscopic Ports

July 2026

1. About

This information is intended to raise awareness of this carbon-saving initiative. While there is no formal requirement to report on this initiative through Green Healthcare Scotland, NHS Boards and local teams are encouraged to consider how they may adopt this action locally, ensuring alignment with relevant initiatives and national workstreams.

2. Background

2.1 Laparoscopic surgery, commonly referred to as keyhole surgery, is widely performed and often preferred to traditional open surgery as it provides the benefit of avoiding large open wounds or incisions and thereby decreasing blood loss, pain, and discomfort.

2.2 Postoperative hospital stays are usually shorter and the return to normal activities for patients is usually quicker following laparoscopic surgery than open surgery.

2.3 A reusable laparoscopic port project commenced in June 2023 and a Task and Finish Group was established, chaired by Vivienne Gough, Consultant General and Upper Gastrointestinal surgeon with NHS Greater Glasgow & Clyde. The project aimed to trial the use of reusable laparoscopic ports in several NHS Boards to evaluate functionality and user acceptability of these products. The reusable laparoscopic port project built on an existing opportunity to reduce reliance on single-use products by transitioning to high-quality reusable alternatives.

2.4 Initial project engagement included eight hospital sites and 4 suppliers. Due to operational constraints, 1 supplier and 1 hospital site were unable to commence the trial.

2.5 The Task and Finish Group developed and agreed an evaluation methodology requiring each product to be used a minimum of 10 times within each specialty at each participating site. Product evaluations were undertaken either by all departmental clinicians or by a minimum of 3 clinicians representing the department. Details of the evaluation form and results can be found under Appendix 1.

2.6 A total of 70 procedures were completed using reusable laparoscopic ports across 7 hospitals spanning 4 NHS Boards.

2.7 The most commonly performed procedures using the reusable ports were:

- Lap Cholecystectomy (25)
- Lap Nephrectomy (14)
- Lap Bilateral Salpingo Oopherectomy (4)
- Lap Cholecystectomy + IOC (4)
- Lap Inguinal Hernia Repair (3)

2.8 Of the procedures undertaken, supplier 1's reusable ports were used most frequently, accounting for 36 cases. Supplier 2's ports were used in 19 cases, while supplier 3's ports were used in 15 cases. Across the cohort, around 80% of surgeons considered the ports to be clinically acceptable. It is noteworthy, however, that 1 brand demonstrated significantly lower acceptability, with a score of 47%. Overall, the ports performed well within the context of this trial, while recruitment numbers were limited due to practical and logistical challenges in identifying and enrolling suitable cases.

2.9 The Task and Finish Group concluded that the trial provided proof of concept that reusable ports were clinically appropriate and acceptable for use.

2.10 It is recommended that individual NHS Boards explore the reintroduction of reusable instruments, given the potential for both long-term cost savings, reduction in environmental impact and increased resilience within the system.

2.11 NHS Boards can use the trial process for future considerations of alternative products. A guide outlining the necessary steps to take prior to trial/implementation of product, device and/or instrument can be found in within Appendix 2.

Potential Carbon Savings

3.1 A 2021 study looking at the environmental impact and whole life cycle financial cost of hybrid instruments versus single use equivalents in laparoscopic cholecystectomy concluded that: "adoption of hybrid laparoscopic instruments could play an important role in meeting carbon reduction targets for surgery and also save money".[1]

3.2 The study evaluated laparoscopic clip appliers, scissors, and ports (5mm and 10mm). Analysis of the ports demonstrated a 73% reduction in carbon emissions when using hybrid reusable instruments compared with single-use equivalents (933g CO_2e vs 3,495g CO_2e per procedure for 4 ports). The authors noted that the largest contributors to the carbon footprint of hybrid instruments were the single-use components and the decontamination process.[1]

3.3 In terms of cost benefits, the study concluded that the cost of hybrid compared to single-use ports was 58% lower (GBP £59 vs £102).[1]

3.4 For NHS Scotland the total spend from October 2022 – September 2023 was around £938,233 for single use trocars and £26,606 for reposable trocars.[2]

3.5 Recent data for 2025, provided by Public Services Delivery Scotland, reports that the total spend for single use items was £1,174,424.[3]

3.6 Using the 2021 study, if the move towards reducing the number of single use items proceeds, the carbon and cost savings may be significant.

Identified Risks and Issues

4.1 Risks and Issues for the laparoscopic port trial have been split into 2 categories: operational and clinical.

4.2 Operationally the risks and issues surrounding the laparoscopic port trial were:

- Lengthy lead-in times from initial contact with supplier and commencing use of the port
- Supplier availability to provide training and attendance at procedures
- Port kit availability – only 1 kit being available per supplier

4.3 Clinically the risk and issues surrounding the laparoscopic port trial (qualitative feedback provided by clinicians in the evaluation forms) were:

Supplier 1

- The need to make several adjustments during use
- Difficulties with insertion, particularly relating to grip and the amount of force required
- Leaks occurring around the ports
- Concerns that suitability may vary depending on the type of procedure being carried out

Supplier 2

- Some users reported issues with leaks, while other users reported no issues with leaks

Supplier 3

- Difficulties securing the ports in place
- Challenges when transitioning instruments through the ports
- Issues with grip and the force required when using instruments
- Feedback that the ports were inferior to those currently being used
- Reports of leaks

4.4 While it is recognised that surgeons have individual preferences and that no single product will be suitable for all cases or all operators, no safety concerns were identified in relation to the use of these ports. There remains considerable scope for their wider adoption across an expanded range of procedures.

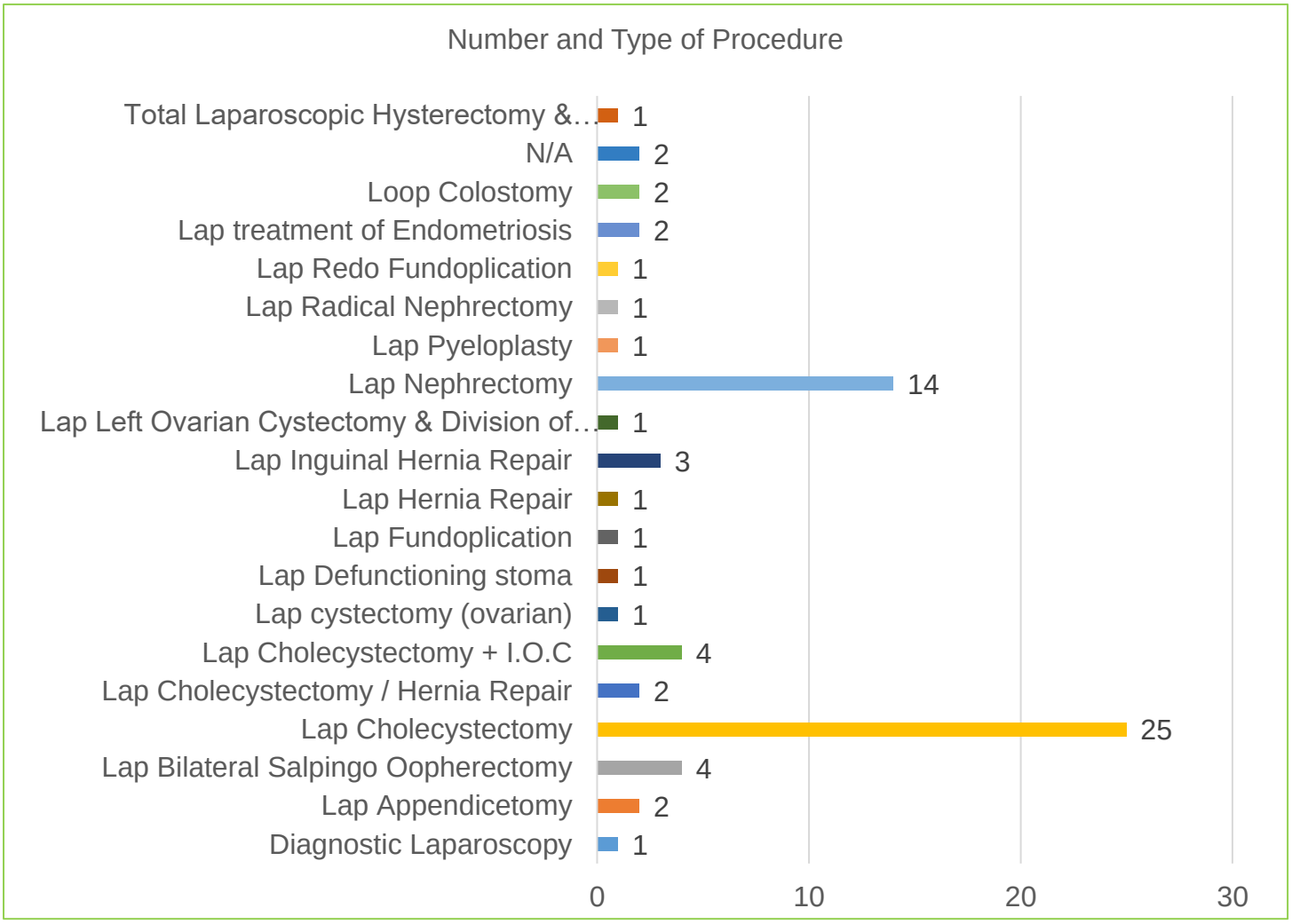
4.5 NHS Boards interested in exploring the use of reusable laparoscopic ports are encouraged to contact Green Healthcare Scotland for information on the suppliers involved in this project.

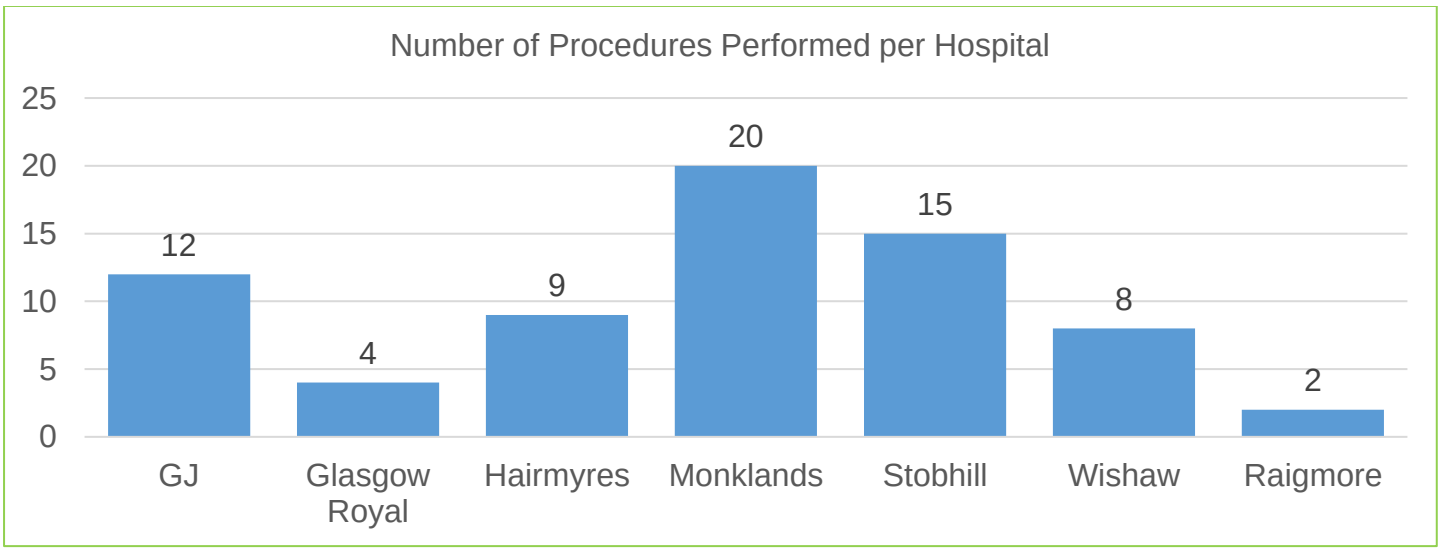
Appendix 1

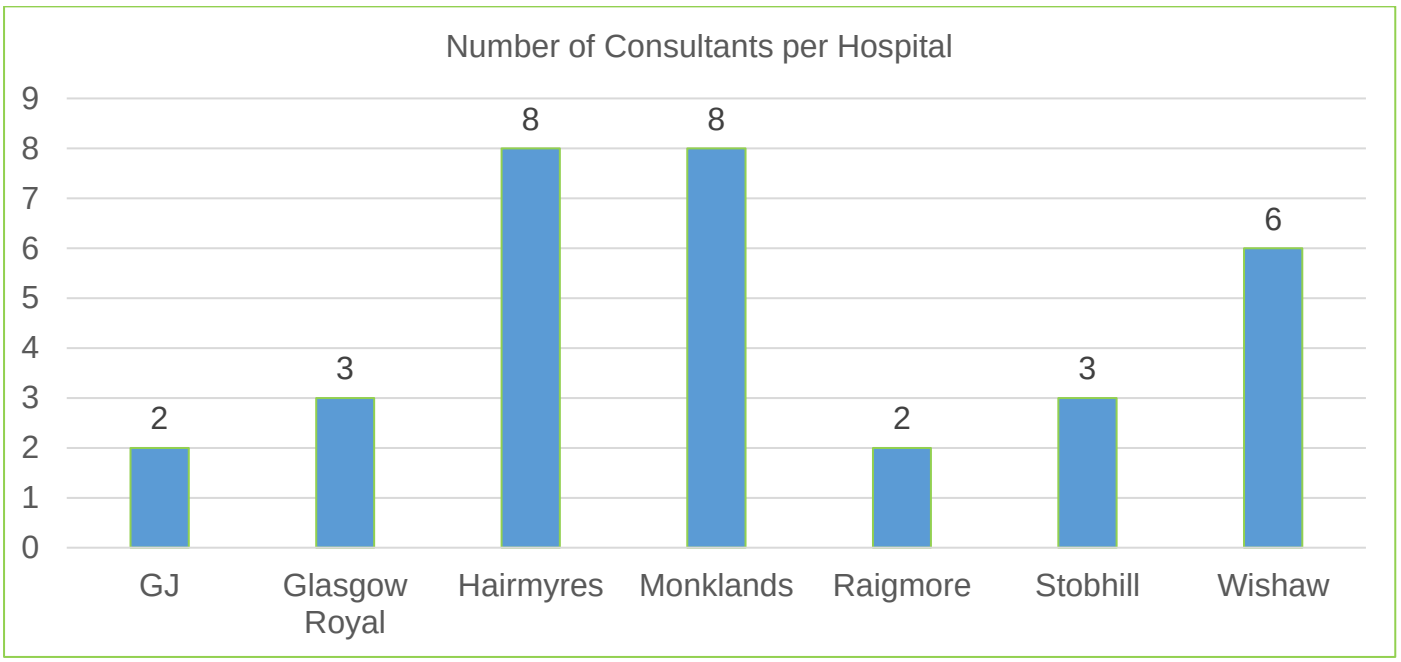
Reusable laparoscopic ports evaluation form:

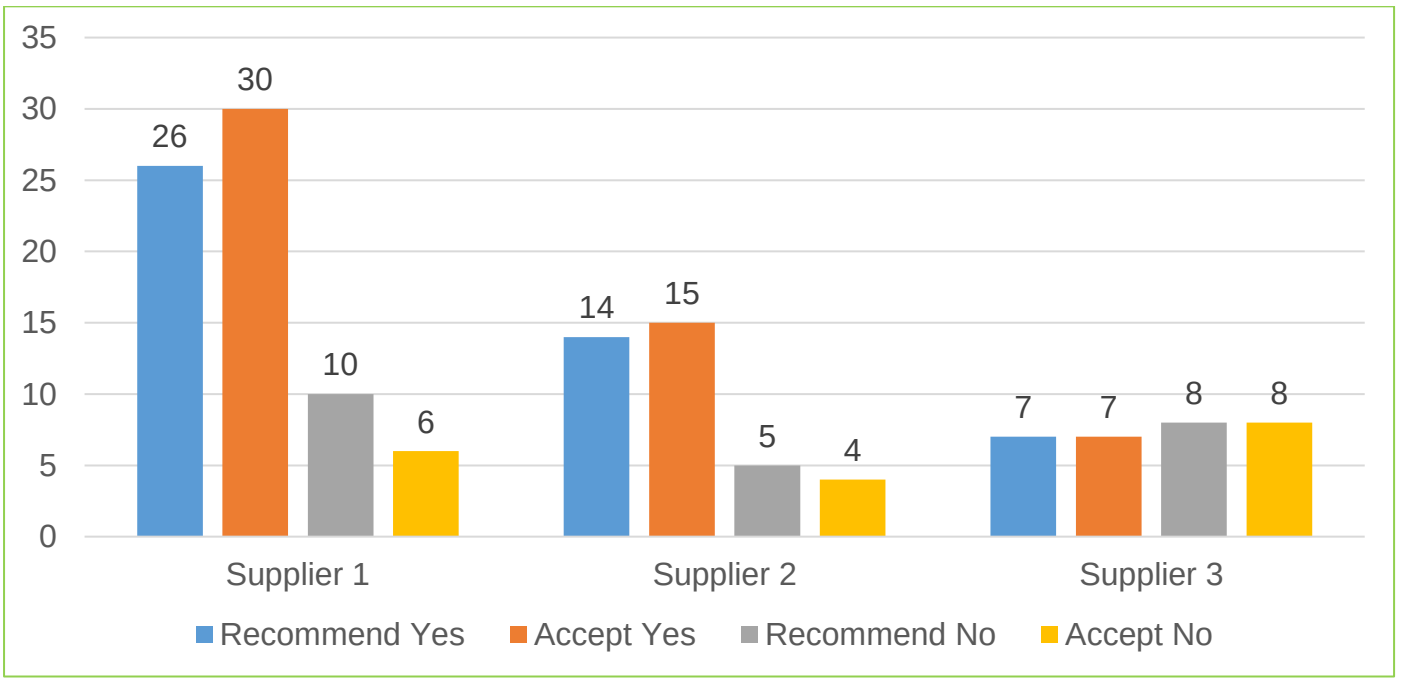
Reusable Laparoscopic Ports Evaluation					
Hospital Site:					
Name:					
Designation/Position:					
Specialty and Theatre No:					
Procedure:					
Date:					
Feedback					
Product name:					
Performance	**Excellent**	**Very Good**	**Good**	**Fair**	**Poor**
Weight and balance of ports	☐	☐	☐	☐	☐
Ergonomics / Profile	☐	☐	☐	☐	☐
Force applied to insert ports	☐	☐	☐	☐	☐
Fixation in abdominal wall	☐	☐	☐	☐	☐
Instrument transition through ports	☐	☐	☐	☐	☐
Performance of ports seals	☐	☐	☐	☐	☐
Overall Performance	☐	☐	☐	☐	☐
Port used	5mm ☐	10mm ☐	12mm ☐		
5 mm seals used	Reusable ☐	Disposable ☐			
10 mm seals used	Reusable ☐	Disposable ☐			
Obturator type:	Blunt Conical ☐	Sharp Conical ☐	Pyramidal ☐	Disposable Separator ☐	
Is this product clinical acceptable?	Yes ☐	No ☐			
Would you be happy to recommend the use of this product?	Yes ☐	No ☐			
Additional Comments:					
Thank you for your time in completing this form					

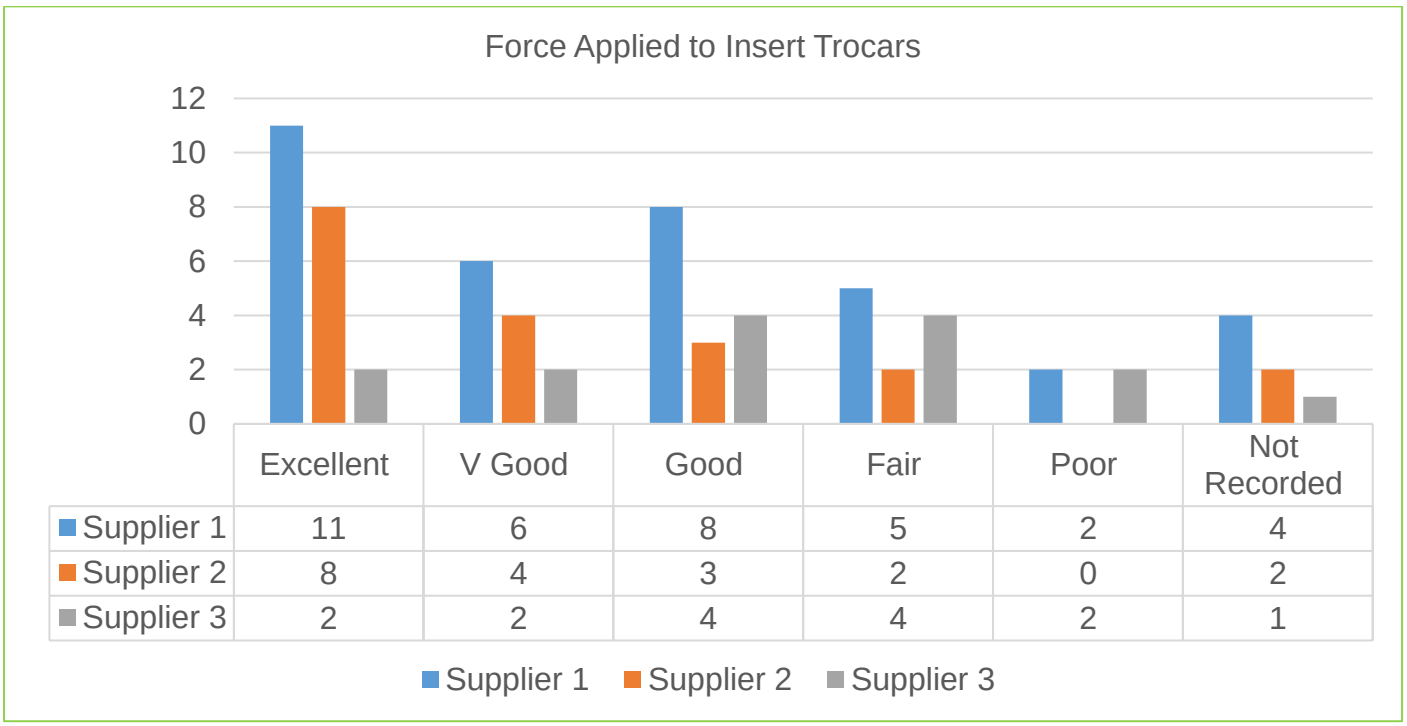
Results of laparoscopic ports trials:

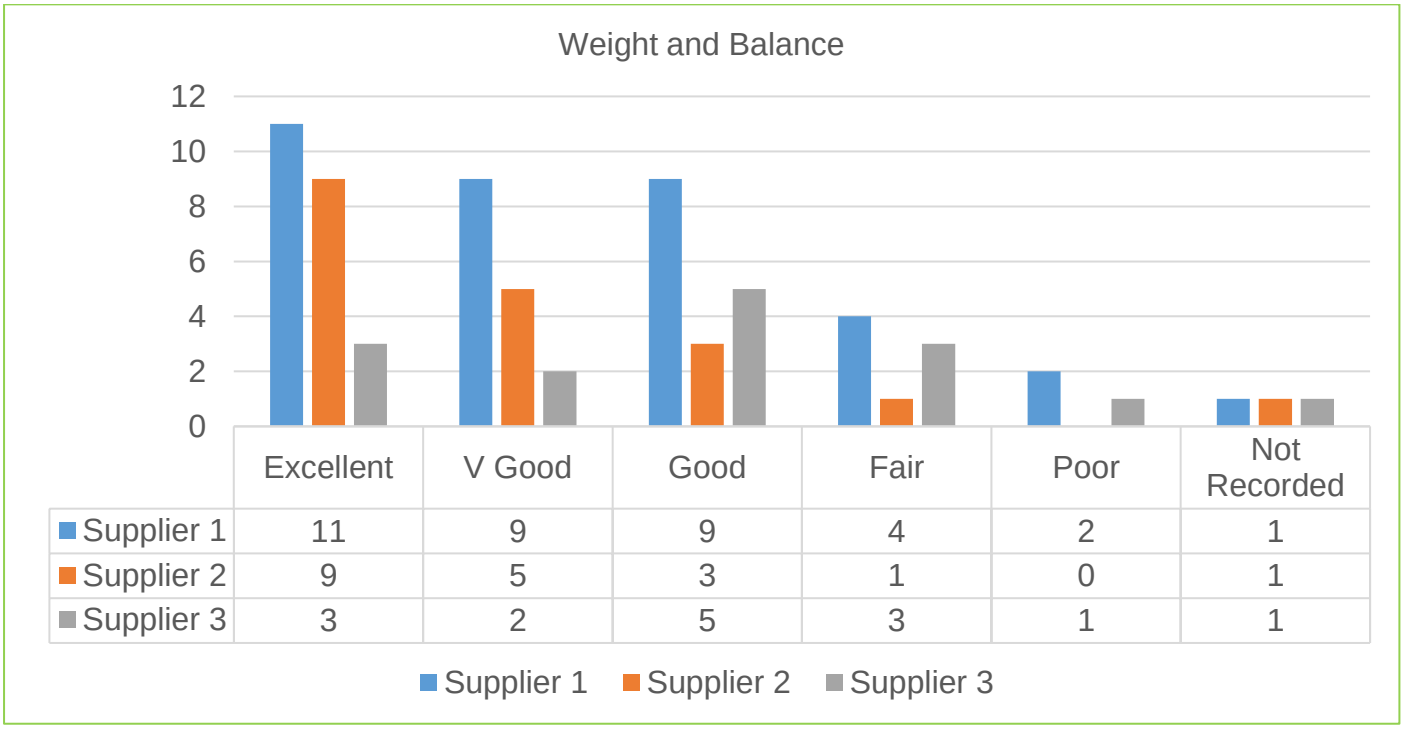


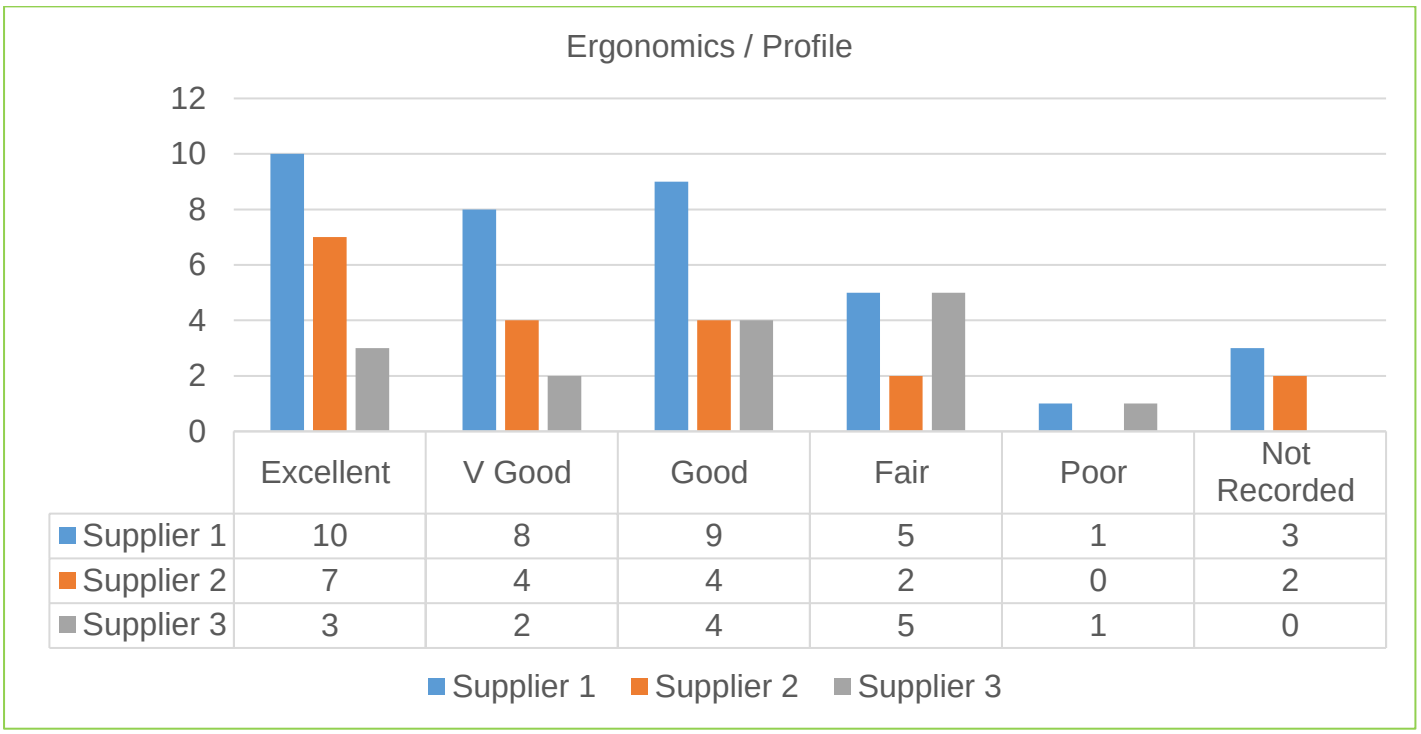



Number of Consultants per Hospital
9
8
7
6
5
4
3
2
1
0
2
3
8
8
2
3
6
GJ
Glasgow Royal
Hairmyres
Monklands
Raigmore
Stobhill
Wishaw

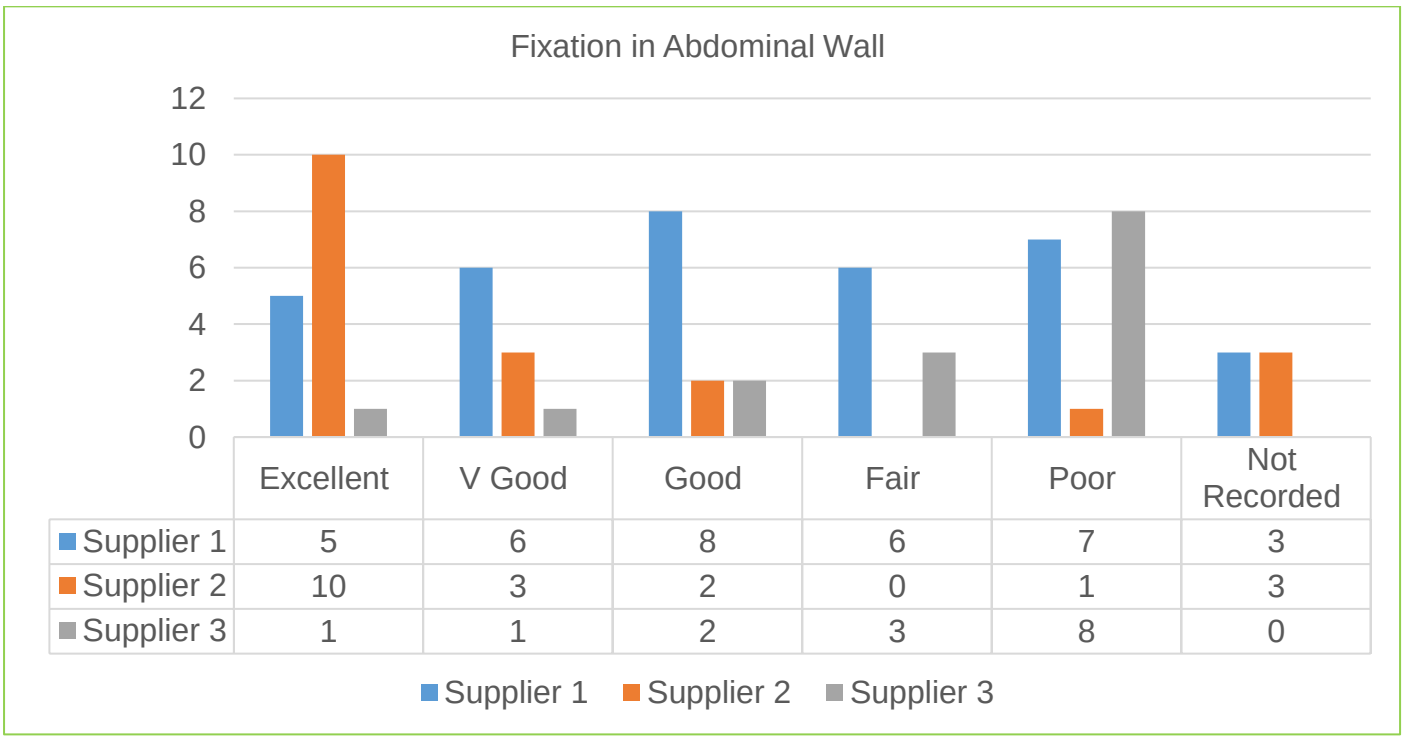

35
30
25
20
15
10
5
0
26
30
10
6
14
15
5
4
7
7
8
8
Supplier 1
Supplier 2
Supplier 3
Recommend Yes
Accept Yes
Recommend No
Accept No


Force Applied to Insert Trocars
12
10
8
6
4
2
0
Excellent
V Good
Good
Fair
Poor
Not Recorded
Supplier 1
11
6
8
5
2
4
Supplier 2
8
4
3
2
0
2
Supplier 3
2
2
4
4
2
1
Supplier 1
Supplier 2
Supplier 3

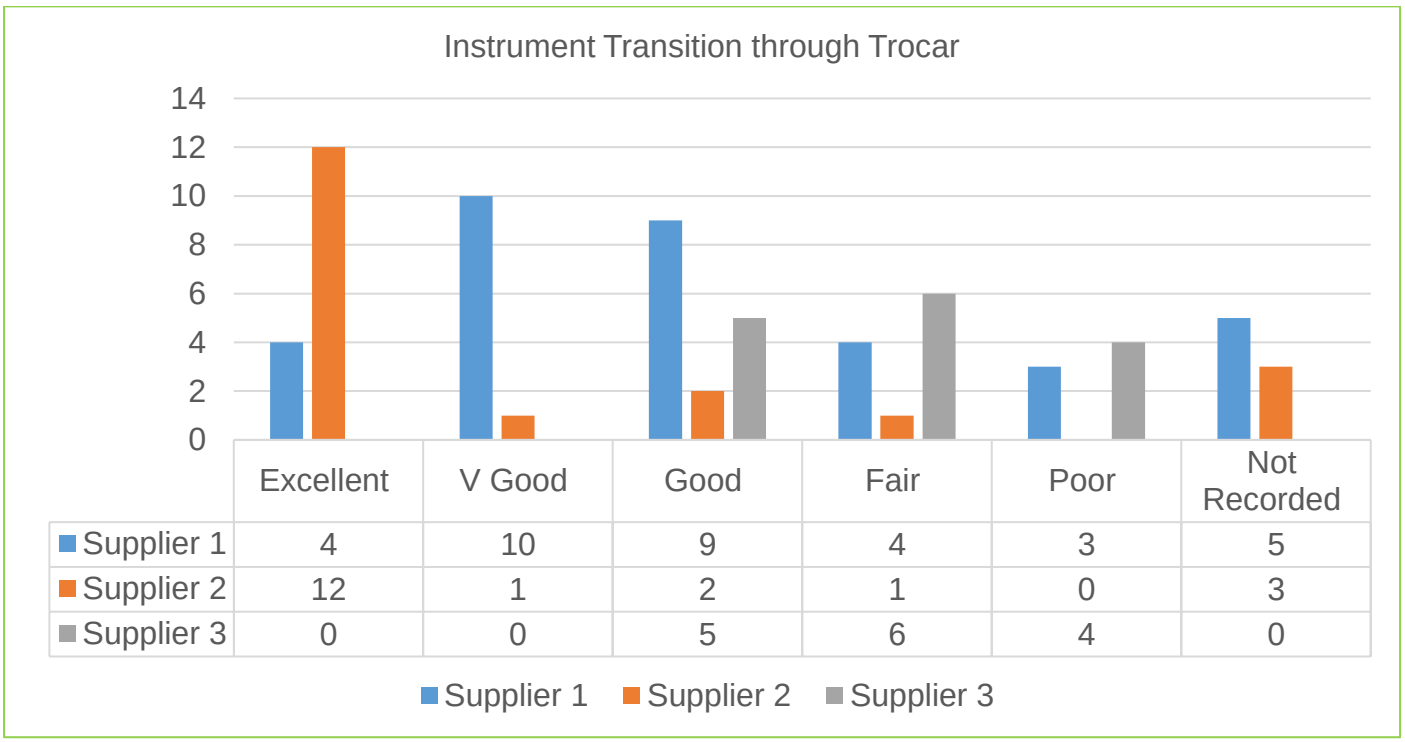

Weight and Balance
12
10
8
6
4
2
0
Excellent
V Good
Good
Fair
Poor
Not Recorded
Supplier 1
11
9
9
4
2
1
Supplier 2
9
5
3
1
0
1
Supplier 3
3
2
5
3
1
1
Supplier 1
Supplier 2
Supplier 3



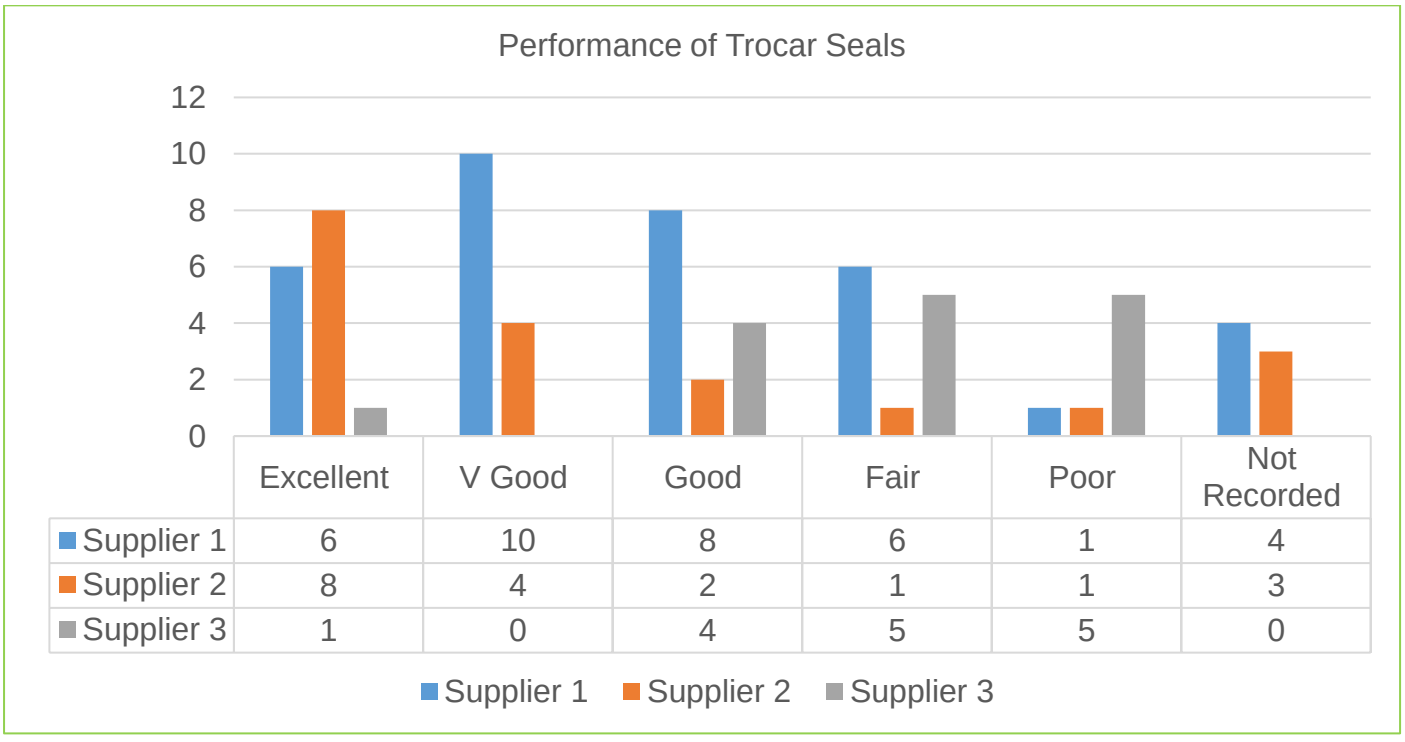
	Excellent	V Good	Good	Fair	Poor	Not Recorded
Supplier 1	10	8	9	5	1	3
Supplier 2	7	4	4	2	0	2
Supplier 3	3	2	4	5	1	0



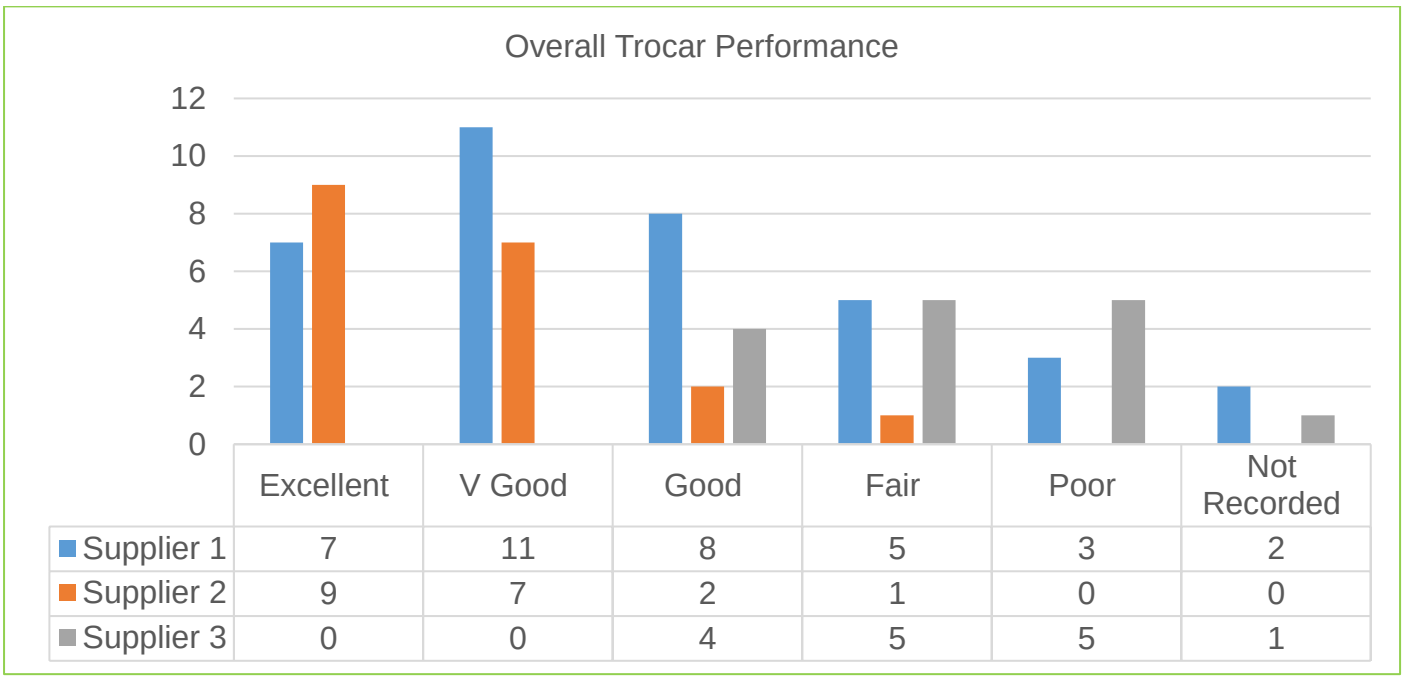
	Excellent	V Good	Good	Fair	Poor	Not Recorded
Supplier 1	5	6	8	6	7	3
Supplier 2	10	3	2	0	1	3
Supplier 3	1	1	2	3	8	0



	Excellent	V Good	Good	Fair	Poor	Not Recorded
Supplier 1	4	10	9	4	3	5
Supplier 2	12	1	2	1	0	3
Supplier 3	0	0	5	6	4	0



	Excellent	V Good	Good	Fair	Poor	Not Recorded
Supplier 1	6	10	8	6	1	4
Supplier 2	8	4	2	1	1	3
Supplier 3	1	0	4	5	5	0



	Excellent	V Good	Good	Fair	Poor	Not Recorded
Supplier 1	7	11	8	5	3	2
Supplier 2	9	7	2	1	0	0
Supplier 3	0	0	4	5	5	1

Appendix 2

Steps to take prior to trial/implementation of product, device and/or instrument.

1. **Establish key personnel that require to be involved.**

This may include:

- Surgeons
- Theatre staff
- Infection Prevention and Control Team (IPCT)
- Decontamination
- Procurement
- Finance
- Service Managers
- Sustainability Team
- Trial/Implementation Co-ordinator/Project Manager
- Medical Reps

2. **Creation of clinical user group**
   - Key personnel
   - Scheduled meetings to discuss status/progress

3. **Planning of training, competency and clinical engagement**
   - Please see Additional Information, following these steps, for training recommendations.

4. **Agree methodology and evaluation process, include information such as:**
   - Objectives
   - Inclusion/Exclusion
   - Sample size
   - Procedures
   - Training staff
   - Suppliers
   - Decontamination process

5. **Creation of evaluation form to gather data, include information such as:**
   - Hospital
   - Procedure
   - Consultant/Staff
   - Date
   - Instrument/product/device used
   - Performance of instrument/product/device
   - Acceptability – recommend and/or clinically appropriate
   - Adverse events
   - Patient Consent
   - General Feedback

6. **Completion of Application Form to proceed with new product, device and/or instrument (please check local processes or policies).**

Additional Information

Due to variations in port size and design compared with commonly used single-use devices, training is recommended to ensure optimal performance and functionality. Steps to take would be:

- Identify staff groups requiring training (e.g. surgeons, theatre staff, ODPs and decontamination staff).
- Agree training responsibilities and the delivery model (supplier-led training, medical representative support, local training leads and cascade training).
- Ensure staff are trained in the safe assembly, use, troubleshooting, disassembly and handling of the product, device and/or instrument.
- Review local decontamination, sterilisation and storage requirements where applicable.
- Consider supervised first-use cases with supplier representatives or experienced users present, where appropriate, to support safe implementation.
- Engage clinical champions and early adopters to support peer-to-peer learning and feedback.
- Share available evidence, trial data, clinical evaluations and sustainability benefits to support informed decision-making.
- Provide opportunities for staff to evaluate products, raise concerns and contribute to the assessment process.
- Incorporate feedback mechanisms throughout the trial and implementation period to support continuous improvement.
- Establish local competency assessments and training records in line with Board policies.

Acknowledgements

Name/Organisation	Position Statement	Date
8 Hospitals*	Undertook the trials of the reusable laparoscopic ports	Throughout the lifespan of the project June 2023 to May 2026
Task and Finish Group – Reusable Laparoscopic Ports	Provided guidance during initial discussions and development of the project throughout.	
National Procurement	Involved in initial discussions regarding the current products available via the National Framework and provided data on single-use laparoscopic spending.	
Central Decontamination Unit (CDU)	Provided details on capacity, capability, and validation of products in the trial.	
GHS Green Theatres SDG	Reviewed and endorsed the Action for Adoption	June 2026

* The specialties that supported this project were General Surgery, Gynaecology, Colorectal, and Urology. The 8 hospitals involved were:

- Golden Jubilee University National Hospital
- Glasgow Royal Infirmary
- Stobhill Hospital, Glasgow
- Western General Hospital (Edinburgh)
- University Hospital Hairmyres (East Kilbride)
- University Hospital Monklands (Airdrie)
- University Hospital Wishaw
- Raigmore Hospital (Inverness)

Not all of these specialties were participating in all hospitals.

References

1. Rizan, C., Bhutta, M.F. Environmental impact and life cycle financial cost of hybrid (reusable/single-use) instruments versus single-use equivalents in laparoscopic cholecystectomy. Surg Endosc 36, 4067–4078 (2022). Available at https://doi.org/10.1007/s00464-021-08728-z (Accessed April 2026)
2. NSS National Procurement, Buyers Guide, Minimally Invasive Surgical Products, May be available on request.
3. Data provided by Public Services Delivery Scotland. Available at Public Services Delivery Scotland on request.

Contact us

If you have any questions about this action, please contact NHS Green Healthcare Scotland at cfsdghs@nhs.scot.