SUSQI PROJECT REPORT
Abscess Incision & Drainage

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Background:

Abscess drainage and wound debridement are two of the most frequent emergency surgical procedures performed at Northampton General Hospital (NGH). Around 300 operations were performed in 2023 alone. Abscess drainage is often performed under general anesthesia (GA) but may be done under local anesthetic (LA). We decided to review the current pathway of patients having abscess drainage under the care of general surgery, in addition to reviewing the instruments used in theatre for both operations.

Anecdotal evidence suggested that there were some abscesses being drained in theatre under GA; which may have been more suitable for a procedure under LA (given their size and location). We estimate that between 20-30% of patients having abscess drainage under GA could have had the procedure performed under LA. This presents a potential opportunity cost; as this patient's condition could have been managed sooner, without the risk of general anesthesia and without associated costs of going to theatre. There is only one emergency theater at NGH so if the number of minor cases, such as abscess drainage, can be reduced; then that provides more time to complete major cases. There are also substantial equipment and medication requirements for GA cases. There are numerous single use disposable items (often made of plastic) used for GA in addition to anesthetic gasses – all of which have an environmental and financial impact.

Another consideration were the instruments used in theatre to perform a simple abscess drainage or wound debridement. Formerly for these procedures a Minor Operations Set (MOS) would be used. This theatre tray contains around 30 metal reuseable instruments which would be sent for steralisation in house following the procedure. The majority of the instruments on the MOS would not be required in a simple case. Again presenting and opportunity to form a new Minor

Abscess/Debridement Set (MADS) with only the essential instruments for this procedure. This would reduce demand within sterile services, in addition to extending the life of the instruments which were no longer sent for unnecessary sterilisation. Furthermore, it will reduce the time take to count instruments before and after a procedure, increasing time efficiency.

Specific Aims:

1: Form a Minor Abscess/Debridement Set (MADS) to reduce steralisation of unused equipment.
2: Create an abscess drainage pathway to ensure clinicians consider local anesthetic drainage and offer it to appropriate patients.

Methods:

1: Minor Abscess/Debridement Set
An online questionnaire was created using the Jotform platform (Appendix A). It collected basic demographic information, such as grade of completing clinician (senior house officer/core surgical trainee, registrar or consultant) and specialty (general, vascular or urological surgery). It then listed the instruments on the MOS and allowed clinicians to select the frequency with which they would use them when performing a simple abscess drainage or wound debridement (always, often, rarely or never). Within the questionnaire there was a link to a document with images of the instruments and a brief description of their intended use (Appendix B).

This questionnaire was sent to members of the general, vascular and urological surgical teams and remained open for 4 weeks. 23 responses were collected (Appendix C). The most frequently used instruments were deduced, and they formed the basis of the MADS. This was then approved by our project supervisor. Some of the instrument selections were altered slightly to ensure that it made operative sense. For example, there is little point having a needle holder to suture without having the correct forceps to hold the needle.

Once the instruments which were to form the MADS had been decided, we approached sterile services to create the tray. It was at this point that the theatre management staff expressed their disappointment with not being involved in the process. We subsequently engaged with them in discussion and expressed the logic behind the project. This was certainly a beneficial exercise as it enabled us to identify other theatre sets which were no longer in used, that could provide spare instruments for the MADS. It was also important to ensure that they were involved in forming the MADS as ultimately they would be handling the instruments pre & post procedure.

Once agreement was reached with the theatre management staff, they assisted us in submitting the forms to remove the unused theatre set from circulation and to form the MADS. Once the MADS has been created by sterile services, the managers will be well positioned to inform the other theatre staff of its availability. Helping to ensure its adoption and longevity of use.

2: Abscess drainage pathway
Review of the literature was undertaken to form the basis of our abscess drainage pathway. This revealed that there was little documented regarding when GA drainage would be preferable over

LA, in addition to there being little consensus regarding cavity irrigation nor wound packing (1). There are little to no guidelines available about the management of cutaneous abscesses also. This is surprising considering it rank within in the top 10 most common surgical procedures within the UK, and is the second most common minor surgical procedure (2). Subsequently our pathway is adapted from the short guideline produced by Medcins Sans Frontieres (3) taking into account our local situation and senior clinician preferences.

It was important to quantify the amount of abscess drainage procedures performed under GA & LA, in addition to wound debridement procedures. The procedure codes used for Hospital Episode Statistics (HES) data were gathered (Appendix D) and a search was ran by the hospital informatics team. We obtained the number of procedures performed from 01/01/2023 – 31/12/2023 (Appendix D). This will enable us to compare if our pathway has had any significant impact on increasing the number of cases performed under LA.

There was some initial resistance from a few of the consultants within the General Surgery department. An important point was made with regard to patient satisfaction for those undergoing LA drainage, as it can be an uncomfortable procedure. We emphasised the importance of stating this to the patient before the procedure; and that effective consenting should entail a discussion regarding both options, LA and GA. We subsequently decided to create a short patient satisfaction survey for those undergoing LA drainage to monitor if they were happy with the procedure. This will also consider other factors such as the stress of having a GA, costs of additional transportation or childcare and impact of time off work.

The new pathway (Appendix E) has been approved by the consultant lead for the project and the next steps will be to present this to the rest of the department. This will provide an opportunity to explain the logic behind this to colleagues and to respond to any concerns or questions raised. We have planned to do this at the Surgical Audit Day 7th February 2025 and will rediscuss it at the departmental Morbidity & Mortality meeting in March 2025.

The most challenging step will be to ensure that the General Surgical department is on board, particularly the registrar and consultants. The consultants will need to approve the new pathway and support it's enactment. However, the registrars will be the people reviewing the patients in the emergency department or urgent care and making independent decisions as to how to treat. It is far easier to bring a patient back the following day for an operation under GA, than to gather the equipment for abscess drainage and perform it yourself during a busy on-call shift. We must present this as an opportunity for teaching, where the on-call Senior House Officer (SHO) can learn how to do this procedure under LA and be taught how to do it independently. It is also a possibility that the theatre SHO may be able to support the on-call team by performing these cases when there are no major cases in the emergency theatre.

Once implemented, we will survey the patients undergoing LA management of their abscesses and review their outcomes. Data from the hospital informatics team can be obtained and the impact calculated.

Measurement:

Patient outcomes:

1: Minor abscess/debridement set

2: LA abscess drainage pathway

The evidence base supports that procedures undertaken under GA or LA have comparable clinical outcomes. We have attempted to reduce risks through including indications for size in the guidance and can monitor any issues via morbidity reporting and patient satisfaction questionnaires.

Environmental sustainability:

The use of the MADS can be assessed through sterile services data. The frequency within which this tray is used can be reviewed. It is anticipated that the MADS will be 1/3rd the size of the MOS. Instantly providing a space saving within the machine for steralisation, meaning fewer cycles will be required. At NGH we use a BMM Weston porous load steraliser (model No V9489 Type P328) to clean surgical instruments, using pressurised steam at a temperature of 134-137 °C. It consumes 480L of water per cycle, producing 38kg of steam (4). The manufacturer has been contacted regarding the energy consumption of the system to see if a rough estimation of the energy consumption can be made.

A hybrid methodology has been used to estimate the greenhouse gas (GHG) emissions associated with an abscess drainage procedure under GA versus an abscess drainage procedure under LA. For both procedures, GHG emissions associated with PPE, pharmaceuticals, procedure consumables, and post-procedure dressings were included. Additionally, for the GA procedure, anesthetic gas was included as well as patient travel as an additional trip per patient is required.

For the GHG emissions associated with the pharmaceuticals (excluding the GA anesthetic gas) and dressings, an Environmentally Extended Input Output Analysis (EEIOA) was undertaken. Individual drug costs per patient were provided by the project team and multiplied by the relevant sector conversion factor taken from the 2021 UK Government database by SIC code (5).

A process based life cycle assessment was used to estimate the GHG emissions associated with the laryngeal mask airway (LMA), anaesthetic face mask, anesthetic circuit, ted stockings, forceps, and scalpel. The analysis included GHG emissions associated with raw material extraction, transport and disposal. Material weights and transport distance were converted into GHG emissions using emission factors taken from the 2024 UK Government Greenhouse Gas Conversion Factors database (6).

Literature review was undertake to derive GHG emissions associated with non-sterile gloves, single use gown, single use apron and single use face masks(7), and sterile gloves(8).

GHG emissions associated with the remaining consumables were taken from previous CSH projects where they had already been estimated using a bottom-up process based approach. The analysis included GHG emissions associated with raw material extraction, transport and disposal. Material weights and transport distance were converted into GHG emissions using emission factors(6).

GHG emissions associated with GA have been calculated using the Association of Anaesthetists anaesthetic gases calculator (9). Anaesthetic practice is highly variable between clinicians in addition to being tailored for each patient and can be viewed as an artistic science. The calculations are based on your average 80kg patient and are listed in Appendix F. Given that an abscess drainage is likely to take around 15 minutes we have assumed that a supraglottic airway (such as I-Gel®) has been used. We have averaged calculated GHG emissions for a spontaneously ventilated and mechanically ventilated case with anaesthesia maintained using Sevoflurane. We assume that anaesthesia lasts 30 minutes. This takes into account induction of anaesthesia, positioning, scrubbing, WHO time out, skin preparation and operating time. The procedural impact is calculated as 2.01kg CO_2e (ventilated - 4.82 and spontaneous – 3.21kg CO_2e /Hr).

GHG emission associated with patient travel was calculated from the average patient journey figures for the Northamptonshire Integrated Care Board from the NHS clinical activity carbon emissions factors for care pathway appraisal document, April 2024 v1.0. This states that the average journey of 6.9 miles (one way) and the emissions were calculated using the CSH travel calculator providing a value of 2.07kg CO_2e.

We can also assume that there is a GHG emission saving by performing LA drainage as opposed to GA due to the patients being admitted to a less energy intensive environment. Theatres are estimated to consume 3-6 times as much energy as a standard ward. This is accounting for theatre water, ventilation, air conditioning and heating requirements (10). This study estimated use at John Radcliffe Hospital, Oxford to be 173 kg CO_2e per case taking into account both direct, indirect emissions and waste disposal (10).

Table 1: GHG emissions associated with abscess drainage under GA and LA.

	GHG emissions per abscess drainage procedure (kg CO_2e)	
	General Anesthetic	Local Anesthetic
Anaesthetic	2.01	0
Pharmaceuticals	3.1	0.82
Procedure consumables	6.83	3.36
Patient travel	8.14	4.07
Total	**20.22**	**8.32**

Economic sustainability:

Costs for patient care were calculated by the Costings & Profitability Team within the hospital. Patients with hospital spells associated with the clinical codes listed in Appendix D were reviewed. For those patients undergoing GA abscess drainage the operative, ward and recovery time could be obtained and subsequent costs calculated. These costs primarily include frontline medical & ancillary staffing, medical equipment & consumables; indirect costs and overheads. They exclude drugs, imaging and pathology costs, which are likely to be negligible in this group. Outliers were excluded, for example those who may have been admitted with another condition but underwent abscess drainage, and an average calculated.

Table 1: Costs associated with abscess drainage under GA and LA.

	Costs (£ per patient)	
	General Anesthetic	Local Anesthetic
Theatre	958	-
Recovery	296	-
Ward	433	339
Total	**1,687**	**339**

Social sustainability:
We require time to implement the changes and to obtain feedback from staff and patients. We are yet to measure the personal and social impact of performing LA abscess drainage as this will be captured in the patient questionnaire following implementation of the change.

Potential impacts have been summarised in the results section.

Results:

Patient outcomes:
We anticipate that patient's health outcomes will largely remain the same; given the lack of statistically significant outcomes of LA compared to GA abscess drainage.

Environmental sustainability:
Performing more LA abscess drainage procedures has a significant environmental impact. There is an estimated 58.9% reduction in CO_2e when compared to GA.

The majority of the savings are clinical, with the avoidance of theatre, recovery and the ward (pre or post op). Not having GA means no anesthetic gasses, drugs and intra-operative single use monitoring are used. There is also the patient related saving due to there being one less return journey to hospital.

We have had to make assumptions regarding the drugs and gasses used to induce and maintain anesthesia. Anesthetic practice can vary widely due to the clinician's preference in addition to patient variables. If any anaethetic gasses other than sevoflurane were used then there would be an increase in CO_2e, but they are largely being phased out of use.

We have not been able to quantify the environmental impact of creating the MADS as there are numerous variables. As surgical instruments are steralised on site there is no clear cost calculations for steralising each tray. This is partly due to the variable size of theatre trays and equipment sent for steralisation. However, we could assume that given the autoclave has a fixed working area/volume that reducing the size or the theatre tray would increase the space for other instruments to be steralised, resulting in fewer cleaning cycles required. We have also been unable to calculate the extended life given to those instruments which were previously sent for steralisation unnecessarily (i.e. those on the MOS which were not used in minor abscess nor wound debridement operations).

Of those abscess drainage procedures of the torso performed under GA (n=70), we estimate that 20-30% could have been amenable to LA drainage. This would produce a reduced environmental impact between 249.9-333.2kg CO_2e per annum.

Economic sustainability:
LA abscess drainage has a cost saving of £1,348 per case for the hospital. The nature of these savings are cost reduction, service productivity and income generation.

Again, the majority of the savings are due to less use of clinical resources and the avoidance of attending theatre. Theatre is a resource rich environment with many middle-grade and senior clinicians in addition to other theatre support staff. There is much energy consumption in theatres with regard to lighting, monitoring equipment and anaesthetic machines. There are also many consumables used in theatre, the majority of which are not reuseable, further adding to the cost. By removing the need for theatre time there will be an opportunity cost saving.

By comparison the Same Day Emergency Care unit (SDEC), where this procedure would take place if performed under LA, has far fewer staff and is a less resource intensive environment. Although the surgical equipment that would be used is disposable, there is still a significant cost saving.

Through our discussion with the Costings & Profitability Team it became apparent that some cases performed under LA on SDEC were potentially not being coded correctly. Making the team aware that this procedure was being undertaken on the ward provides an opportunity for them to be coded correctly and potentially generate further income for NGH.

Of those abscess drainage procedures of the torso performed under GA (n=70), we estimate that 20-30% could have been amenable to LA drainage. This would produce a financial saving of between £18,900-£28,350 per annum.

Social sustainability:
Patients:
Moving to performing more procedures under LA will have a benefit for patients in several ways. Their condition could be treated on the day of assessment. Reducing the need to return to hospital the following day for a GA procedure. If they had returned for a GA procedure, it is likely that they would have to arrange a lift from a friend/relative or pay for private transport for their return visit. Additionally, there is the financial benefit of not having to take subsequent days off work. One must also consider the stress that is placed upon the patient awaiting an operation under GA; being

starved for an indeterminate amount of time and prolonged waiting times pre-procedure. We hope to capture this data in our LA questionnaire once the pathway is enacted.

Staff:

Although the move to LA drainage may increase the waiting time in the urgent assessment area; the trade off of freeing up emergency theatre and recovery time cannot be ignored. As demonstrated in the costings, it is the emergency theatre and recovery which are the areas associated with the highest costs vs the assessment unit. This will mean that operations for some of the most unwell patients in the hospital may be able to start earlier, and subsequently more operations can be completed during “daylight” hours. It will provide practical training opportunities for junior doctors in LA procedures, in addition to enhancing training for medical students.

Discussion:

There is a clear cost saving and reduced environmental impact of performing abscess drainage under local when compared to general anaestethic. Of course, patient preference in addition to the size and location of the abscess have to be considered when offering the former. The formation of a clear pathway will hopefully encourage clinicians to consider LA and offer it to patients, as opposed to instinctively booking patients direct for GA. Formation of the MADS should reduce the environmental impact and cost of GA abscess drainage with regard to steralisation of the instruments; due to fewer instruments being sent for cleaning and improved life for those instruments removed from the MOS.

A limitation of this project it the assumption that a 20-30% reduction in patients undergoing GA abscess drainage can be obtained. This is based on anecdotal experience. We have no way of accurately checking if the GA cases performed last year were more suitable for LA drainage. We also cannot predict the amount of patients who will present to hospital with an abscess, nor their size or location, over the coming 6 months. These are essentially the factors which determine if an abscess is amenable for LA drainage. Therefore, it is possible that no reduction in GA drainage cases will occur during data collection, if there is an unprecedented increase in patients presenting with large abscesses, for example.

Another limitation is the difficulties experienced with trying to calculate the impact of steralising the MADS as opposed to the MOS. The costings data for steralisation is averaged out to a figure per case and does not take into account the complexity nor number of theatre trays used. Due to the age of our autoclave there is no published information regarding its environmental impact. Subsequently an estimation can only be made based on the reduction in theatre tray size and the increased free space within the autoclave.

Throughout the project there has been questions raised during discussions with the team; which led us to interacting with several departments with which we hadn’t before. Engaging with clinical coding, the cost & profitability team in addition to theatre management have all been useful. They’ve highlighted issues from their own workstream and through discussion we were able to highlight things which they weren’t aware of (e.g. LA abscess drainage coding on SDEC).

We believe this project is very much applicable to all surgical specialties and procedures. Surgery and anaesthsia are resource intensive environments with high CO_2e. Though it may not be possible to perform all operations under LA or a spinal anaesthetic, it certainly should be considered. There has been a move in anaesthesia for totally intravenous anaesthesia (TIVA) which reduces environmental impact by avoiding the use of anaesthetic gases (11). However, this is largely used for cases of an hour or more duration so not applicable for these operations. Nonetheless, any attempts to reduce anaesthetic gas use are valuable as they are estimated to account for 5% for the carbon footprint of all NHS organisations' (12). Revision of surgical instrument sets provides another saving; particularly in equipment heavy theatres such as orthopedics. Reducing the amount of equipment sent for steralisation and potentially producing another saving. To achieve the NHS goal of becoming carbon neutral by 2040, surgical practices will certainly have to be reviewed. This project proposes a method of managing a minor surgical emergency in a resource efficient way.

Conclusions:

The project contributes to a growing body of work regarding greener surgical practice. It provides an insight into how small changes in the management of a common minor surgical emergency can have an impact, particularly if applied regionally or nationally. There have been many changes with regard to anaesthetic practices and the effect of CO_2e of anaesthetic agents, but progress within surgery has been slower.

The key contributors to our success thus far have been forming links with the theatre management team and within sterile services. They have been more than willing to allow us to create the new theatre tray; and assisted us in identifying disused theatre sets. Without this input, it is likely that we would have had to purchase new instruments to create the MADS. Additionally, ongoing input from the theatre team will be invaluable in ensuring the tray is used preferentially for abscess drainage.

We will be incorporating the SDEC abscess pathway into the new SDEC guidelines which are being created. This should ensure some longevity in the project. Additionally, once the pathway has been active and further data collected, we hope to present it at the Greener Surgery Conference next year and will look to publish.

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Appendices

Appendix A

Instruments used for abscess drainage & wound debridement

We are creating an abscess/wound debridement tray for Urology, Vascular and General Surgery in an attempt to reduce cost and improve sustainability. What instruments would you use for a simple abscess drainage or wound debridement?

About you

Grade *

- ○ SHO / Core Trainee
- ○ Registrar
- ○ Consultant

Speciality *

- ○ Urology
- ○ Vascular
- ○ General Surgery

Surgical Instruments

Here is a link to images of the surgical instruments and their intended use, if you are unsure. https://docs.google.com/document/d/1qgMEY1hJidbslxjsBP0z-B4anUCXvEyh_OSI5RA5FGg/edit?usp=sharing

Forceps & Retractors

	Always	Often	Rarely	Never
Sinus forceps	○	○	○	○
Wests self-retractor	○	○	○	○
Bipolar diathermy forceps	○	○	○	○
Adsons diathermy forceps	○	○	○	○

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	Always	Often	Rarely	Never
Mcindoe non-toothed forceps	○	○	○	○
Lanes toothed forceps	○	○	○	○
Debakey dissecting forceps	○	○	○	○
Adsons non-toothed forceps	○	○	○	○
Adsons toothed forceps	○	○	○	○
Spencer Wells artery forceps	○	○	○	○
Allis tissue forceps	○	○	○	○
Langenbeck (small)	○	○	○	○
Kilner Catspaw retractor	○	○	○	○

Clamps & Scissors

	Always	Often	Rarely	Never
Rampley - sponge holders	○	○	○	○
Mosquito straight	○	○	○	○
Mosquito curved	○	○	○	○
Mayo scissor - straight	○	○	○	○
Mcindoe scissors	○	○	○	○
Curved kilner scissors	○	○	○	○

Other items

	Always	Often	Rarely	Never
Needleholder	○	○	○	○
Mcdonald dissector	○	○	○	○
Brodie director	○	○	○	○
Curette	○	○	○	○
Probe	○	○	○	○

Submit

Appendix B

Forceps & Retractors

Sinus forceps		Extraction of foreign bodies from sinus cavities, however it may also be used for puncturing and drainage of eruptions, and abscess drainage
Wests self-retractor		A finger ring retractor with a cam ratchet lock and 3x4 sharp interlocking teeth.
Bipolar diathermy forceps		Are used during electrosurgery for coagulating tissue by means of an electric current.

Adsons diathermy forceps		Are used during electrosurgery for coagulating tissue by means of an electric current.
Mcindoe non-toothed forces		Used for fine surgical procedures to hold delicate or superficial tissues. Also used to tie sutures at the end of the procedure and hold dressings.
Lanes toothed forceps		Non-ratcheted thumb forceps used for holding tough tissue such as fascia and cartilage. This product is straight with serrated jaws and heavy 1x2 teeth
Debakey dissecting forceps	 	Atraumatic tissue forceps used to avoid tissue damage during manipulation

Adsons non-toothed forceps		Used for fine surgical procedures to hold delicate or superficial tissues
Adsons toothed forceps		A surgical instrument for holding delicate tissues. Tissue forceps with a wide and serrated thumb grasp area and narrow tips with 1 tooth on one tip and 2 on the other.
Spencer Wells artery forceps		These forceps are primarily designed to control bleeding during surgical procedures by clamping off blood vessels. They can also be used for temporary occlusion, assisting in suturing, and tissue grasping.
Allis tissue forceps		The Allis tissue Forcep is a surgical instrument with sharp teeth, used to hold or grasp heavy tissue.

Langenbeck (small)		Commonly used within surgical procedures to separate the edges of an incision. They can also be used to hold back tissue or organs.
Kilner Catspaw retractor		Retractor with a double-ended design for retracting surface tissue. Surgeons frequently use it in cosmetic surgery, as well as small bone and joint procedures.

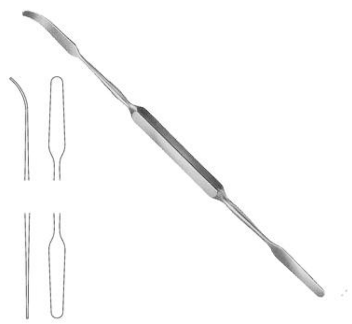
Clamps & Scissors

Rampley - sponge holders		Commonly used to hold a swab, which can be used to clean and prep the skin.

Mosquito straight		Designed for clamping blood vessels or other small tissues to control bleeding during surgery or to provide a secure grip.
Mosquito curved		Designed for clamping blood vessels or other small tissues to control bleeding during surgery or to provide a secure grip. Curved design provides extra protection to the encompassing structure.
Mayo scissor - straight		Designed for cutting body tissues near the surface of a wound in addition to cutting sutures.
Mcindoe scissors		For meticulous dissection of soft tissue.

Curved kilner scissors		For meticulous dissection of soft tissue.

Other items

Needleholder		Designed to hold a suturing needle.
Mcdonald dissector		to tease soft tissues away from major structures, as well as being used as a lever to hold tissues away from the bone

Brodie director		Can be used as a probe or cutting guide. It has a double-ended profile, a furrowed shank, and a spoon end.
Curette		Designed for scraping or debriding tissue.
Probe		A slender, flexible rod used in surgery to explore or guide tissue and other objects in hard-to-see areas, such as wounds or cavities

Appendix C

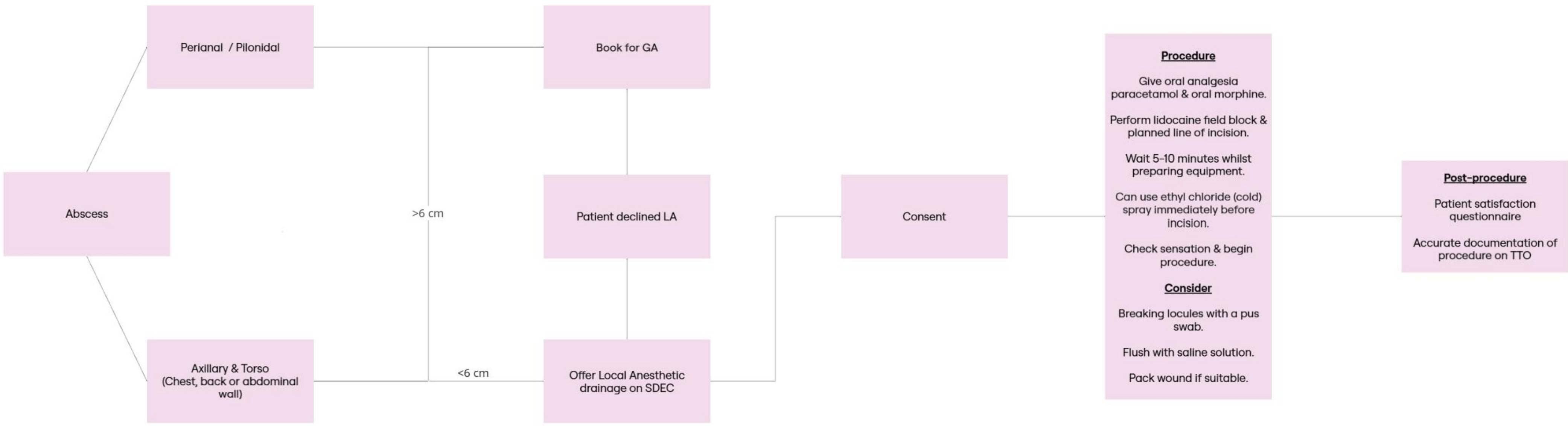
	Grade		Speciality		Forceps & Retractors >> Sinus forceps	Forceps & Retractors >> Wests self-retractor	Forceps & Retractors >> Bipolar diathermy forceps	Forceps & Retractors >> Adsons diathermy forceps	Forceps & Retractors >> Mcindoe non-toothed forceps	Forceps & Retractors >> Lanes toothed forceps	Forceps & Retractors >> Debakey dissecting forceps	Forceps & Retractors >> Adsons non-toothed forceps	Forceps & Retractors >> Adsons toothed forceps	Forceps & Retractors >> Spencer Wells artery forceps	Forceps & Retractors >> Allis tissue forceps	Forceps & Retractors >> Langenbeck (small)	Forceps & Retractors >> Kilner Catspaw retractor	Clamps & Scissors >> Rampley - sponge holders	Clamps & Scissors >> Mosquito straight	Clamps & Scissors >> Mosquito curved	Clamps & Scissors >> Mayo scissor - straight	Clamps & Scissors >> Mcindoe scissors	Clamps & Scissors >> Curved kilner scissors	Other items >> Needleholder	Other items >> Mcdonald dissector	Other items >> Brodie director	Other items >> Curette	Other items >> Probe
SHO/CT	5	Gen surg	17	Never	12	15	7	13	8	6	5	9	7	7	8	10	13	13	11	8	6	7	14	9	14	15	3	9
SpR	11	Vascular	4	Rarely	5	5	7	6	6	2	3	5	5	10	10	4	7	4	6	6	3	4	3	1	4	4	5	6
Cons	7	Urology	2	Often	4	2	6	2	6	8	5	3	6	1	4	2	2	1	1	5	7	7	1	3	3	3	3	4
				Always	2	1	3	2	3	7	10	6	5	5	1	7	1	5	5	4	7	5	5	10	2	1	12	4
				Sum (often + always)	6	3	9	4	9	15	15	9	11	6	5	9	3	6	6	9	14	12	6	13	5	4	15	8

Appendix D

1) S47.2 Drainage of lesion of skin NEC performed on SDEC under General Surgery	87
2) The following codes as emergency cases in main theatres under General Surgery	
S47.2 Drainage of lesion of skin NEC	70
B33.1 Drainage of lesion of breast	9
H58.1 Drainage of ischiorectal abscess	2
H58.2 Drainage of perianal abscess	41
H58.3 Drainage of perirectal abscess	0
H60.3 Drainage of pilonidal sinus	29
3) The following codes as emergency cases in main theatres under Vascular Surgery	
Debridement lower limb S57.1 + specific site code depending on site	13
Debridement of foot S57.1 + Z50.5	21
Debridement of toe S57.1 + Z50.6	4
Drainage foot/toe/lower limb abscess S47.2 + Z50.5 (foot) or Z50.6 (toe)	3

Appendix E

SDEC Abscess Drainage Pathway



Appendix F

Anaesthetic assumptions & calculations

Patient

80kg patient
Tidal volumes - 5-7ml/kg = **400ml**
Respiratory rate **12** -16
Minute Volume = TV x RR = 400ml x 12 = **6000ml/min**
Oxygen consumption by a patient 2-7ml/kg/min = **400ml/min**

Sevoflurane percentage will be roughly between 2-3 throughout the procedure, aiming for a minimum alveolar concentration (MAC) of 1 - 1.3.

Supraglottic airway mechanically ventilated

Pre oxygenation with 15L/min of O2 for 2 minutes.
IV induction

Then change rotometers to:
O2 - 1.5L/min
Air 1.5L/min
Sevoflurane at 2.5%

FGF 3 litres per minute throughout the procedure.

Supraglottic airway spontaneously ventilated

Pre oxygenation with 15L/min of O2 for 2 minutes.
IV induction

Then change rotometers to:
O2 - 1L/min
Air - 1L/min
Sevoflurane at 2.5%

FGF 2 litres per minute throughout the procedure.

Critical success factors

Please select one or two of the below factors that you believe were most essential to ensure the success of your project changes.

People	Process	Resources	Context
☐ Patient involvement and/or appropriate information for patients - to raise awareness and understanding of intervention X Staff engagement ☐ MDT / Cross-department communication ☐ Skills and capability of staff ☐ Team/service agreement that there is a problem and changes are suitable to trial (Knowledge and understanding of the issue) X Support from senior organisational or system leaders	☐ clear guidance / evidence / policy to support the intervention. ☐ Incentivisation of the strategy – e.g., QOF in general practice X systematic and coordinated approach ☐ clear, measurable targets ☐ long-term strategy for sustaining and embedding change developed in planning phase ☐ integrating the intervention into the natural workflow, team functions, technology systems, and incentive structures of the team/service/organisation	☐ Dedicated time ☐ QI training / information resources and organisation process / support ☐ Infrastructure capable of providing teams with information, data and equipment needed ☐ Research / evidence of change successfully implemented elsewhere ☐ Financial investment	☐ aims aligned with wider service, organisational or system goals. ☐ Links to patient benefits / clinical outcomes ☐ Links to staff benefits ☐ 'Permission' given through the organisational context, capacity and positive change culture.

This template is adapted from SQUIRE 2.0 reporting guidelines.

Template References

- SQUIRE | SQUIRE 2.0 Guidelines (squire-statement.org)
- Home | Sustainable Quality Improvement (susqi.org)