

The LATITUDE 1 Study

An international, prospective cohort study on lower transverse incisional / interparietal hernia

Study Protocol v1.5

November 2026

Latitude
Lower Abdominal Transverse Incisional Hernia Study

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Introduction

Hernias following lower transverse incisions are rarely considered, difficult to identify and may be an underappreciated cause of chronic pelvic pain. A classic example of a lower transverse incision, largely used in c-sections, was introduced by Pfannenstiel, later modified by Joel-Cohen (1972) and Michael Stark (1995). The lower abdominal transverse incision has been adopted as the standard incision for C-sections, gynaecological and other procedures, including for extraction sites for minimally invasive approaches (laparoscopic and robotic). Alongside the increasing rates of C-sections, the growing utilisation of the lower transverse incisions across multiple surgical specialities is an important consideration for hernias that may arise as a consequence.

The burden of lower abdominal transverse incision related hernia remains unquantified. There are 140 million births annually and at least 20% (29.4 million) are c-sections. The prevalence of hernias subsequent to lower transverse incisions is inconsistent; however, it is typically estimated to be between 0% and 5%. Given these figures, up to 1.47 million females per year may then be affected by a resultant hernia. This makes it an important problem to study as it may be an under-recognised cause of significant abdominal pain and symptoms in young females.

The literature reports only a few isolated cases and small series. Our experience suggests that C-section–related hernias might be more common than reported. We have identified several cases and developed a classification system (the *Zanellato Classification*, below and appendix B), which has led to a rapid growth in the detection of these hernias as shown in the graph below (Figure 1).

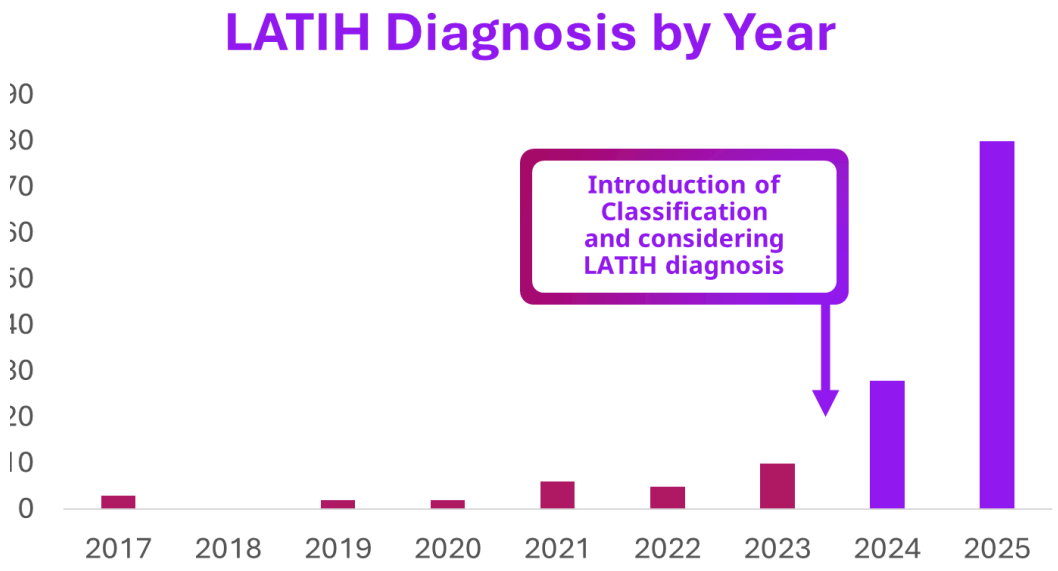

Figure 1 - Increasing rates of LATI-H reported in single centre since introduction of reporting classification and definitions

The LATITUDE project aims to address these issues and provide an accurate estimate of the burden of lower abdominal transverse incisional / interparietal hernias (LATI-H) and to identify how many of these may be symptomatic. This will allow us to understand how many patients are affected by this and to raise awareness and improve management for patients who are affected by pain or other symptoms caused by these hernias.

Lower Abdominal Transverse Incisional / Interparietal Hernias

Lower abdominal transverse incisional / interparietal hernias (LATI-H) are a type of hernia where there is a defect in the posterior sheath, arising from a lower abdominal transverse incision, which subsequently causes hernias to form within the lower abdominal wall. The hernias in question do not necessarily breach the anterior fascia of the rectus sheath, making them difficult to detect clinically. Small defects in the abdominal wall are often asymptomatic and cause minimal discomfort, however, in other people they may cause debilitating symptoms. A new classification of these has recently been described by Zanellato *et al.* as shown in table 1 and visually in figure 2[1].

Zanellato Type	Description
1	Lack of posterior layer but no defect between rectus
2	Defect between rectus abdominis with hernia only between rectus
3	Defect between rectus abdominis with herniation between the anterior rectus fascia and muscle unilaterally
4 As for type 3, but bilateral	Defect between rectus abdominis with herniation between the anterior rectus fascia and muscle bilaterally
5	Any grade with a small defect in anterior rectus sheath
6	Lateral damage to spigelian line

Table 1 - Overview of Zanellato classification

Until recently, LATI-H have not been comprehensively described and have not been classified, contributing toward difficulties in recognising what can be symptomatic hernias. Patients may present with pelvic or back pain and even obstruction. In those who are living with these hernias, there is a lack of data describing who has symptoms, the pattern of these and the optimal treatment. LATITUDE 1 aims to address this by describing the incidence and symptomatology of LATI-H.

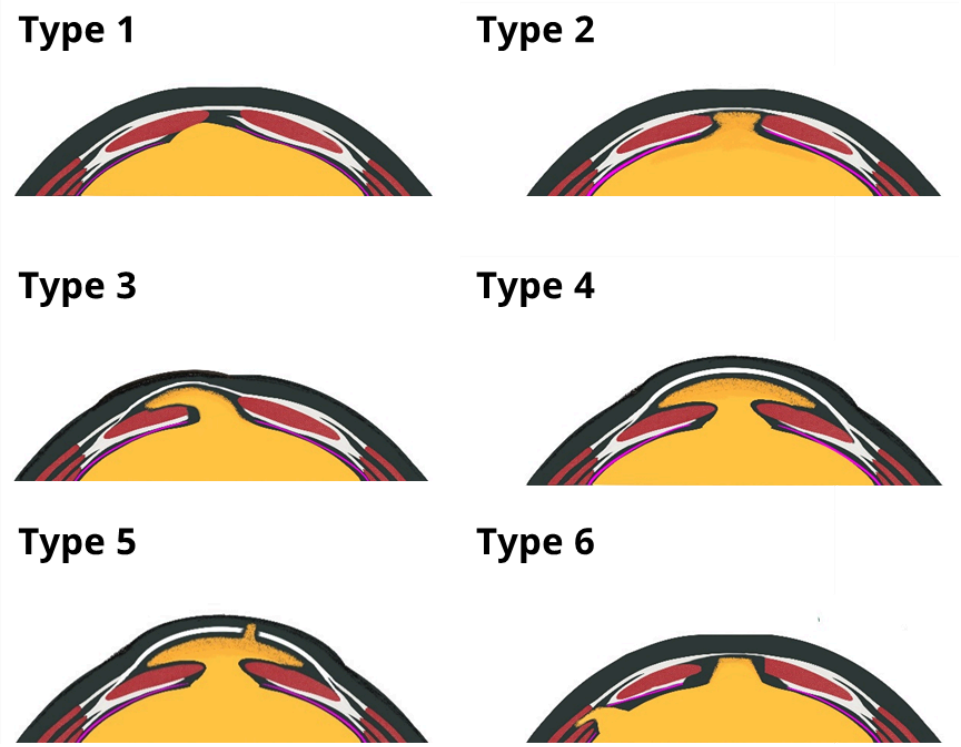

Figure 2 - Zanellato's Classification of 'Lower Abdominal Transverse Incisional / interparietal Hernias (LATI-Hs) Type 1 - Lack of posterior layer but no defect between rectus; Type 2 - Defect between rectus abdominis with hernia only between rectus; Type 3 - Defect between rectus abdominis with herniation between the anterior rectus fascia and muscle unilaterally; Type 4 - As per type 3, but bilateral; Type 5 - Any grade with a small defect in anterior rectus sheath; Type 6 - Lateral damage to spigelian line.

Roles, Responsibilities and Authorship

Study Management Group

Name	Affiliation
Artur Zanellato	Royal Infirmary of Edinburgh / University of Edinburgh
Tom Drake	University of Edinburgh
Leo Brown	Royal Infirmary of Edinburgh / University of Edinburgh
Ellen Gardner	Dumfries and Galloway Royal Infirmary
Ellen Small	Royal Infirmary of Edinburgh
James Lucocq	Royal Infirmary of Edinburgh
Kajal Joshi	Dr Gray's Hospital, Elgin
Israa Hussein	Royal Infirmary of Edinburgh
Jenna Volpert	Royal Hospital for Children and Young People, Edinburgh

Authorship

Publication(s) will be authored under one main group name ('LATITIUDE 1 Collaborators') on the authorship by-line underneath the title, recognising all contributor efforts. All collaborator names will then be listed at the end of primary publications. Secondary publications are encouraged. These may focus on a geographic area, risk factor, or a patient subgroup. The inclusion of collaborators on secondary publications is decided on a study-by-study basis.

Wherever possible, manuscripts will be published as fully open access. This authorship model has been successful in previous collaborative projects.

Methods

LATITUDE 1 is a prospective, multicentre, cohort study of patients undergoing laparoscopy for any cause. The cohort study will involve a structured intraoperative assessment of the abdominal wall and combine this with capturing data on previous surgical interventions and symptoms. LATITUDE 1 is an audit and requires no changes to current clinical care.

Primary Aim

The primary aim of the LATITUDE 1 study is to audit the findings of laparoscopic procedures performed for any reason. Performing a diagnostic laparoscopy to identify any abnormalities is a key step in any laparoscopic procedure after induction of pneumoperitoneum. Any findings should be carefully documented on an operation note after and recorded where possible with photographic records[2].

Objectives

The primary objective is to identify the number of patients who have an incisional / interparietal hernia present at time of laparoscopy (the prevalence of incisional / interparietal hernia).

The secondary objectives are as follows:

- To identify the proportion of patients with incisional / interparietal hernia who have symptoms associated with these findings
- Explore risk factors which may contribute toward formation of incisional / interparietal hernias arising from lower abdominal transverse incisions (LATI-H)
- Explore signs and experienced symptoms of patients with LATI-H to allow other clinicians in future to identify LATI-H in future

Project Timeline

The study will run during 2026 and 2027. At each centre the study period will be split into smaller 4-week periods. For each period ‘mini-teams’ of up to five PubMed citable co-authors can be included to collect data. There is the possibility of extending the study period for 1 additional month on a case-by-case basis, considering that the ethical review process might take different times in each country (only for countries requiring research ethics approval). Patients will not require follow-up, unless an intervention on the hernia is performed at the discretion of the responsible clinician.

Study Population

Mini-teams of up to five collaborators per 4-week data collection period will prospectively collect data over a continuous period at each participating centre. This will be on consecutive patients undergoing laparoscopy for any reason, with follow-up to 30 postoperative days for people if there is intervention on the hernia. Centres can have as many collection periods as needed.

Potentially eligible patients can be identified and screened for eligibility from a variety sources including; daily review of elective theatre lists, daily review of handover sheets and ward lists, upcoming planned theatre lists / booking offices and weekly discussions with other teams involved in planning operations i.e. radiology department or MDT meetings.

Centre Eligibility

- LATITUDE 1 is open to any hospital globally that performs laparoscopic surgery without restriction

- Investigators at each centre who are performing laparoscopic surgery should undertake a short online training module on identification and classification of LATI-H.

Patient Inclusion criteria

Data should be collected for consecutive eligible patients operated at your centre during the data collection period. Eligible patients would be those who meet the following criteria:

- Adults aged 18 years and over;
- Undergoing a laparoscopic, laparoscopic assisted or robotic procedure where it is possible to visualise the lower anterior abdominal wall and pelvis;
- Procedure performed in the presence of a consultant, trainee, allied health professional or medical student who has completed the online LATITUDE 1 outcome assessment module.

Exclusion criteria

- All open procedures or where a laparoscopic approach was intended but pneumoperitoneum could not be established to examine the anterior abdominal wall;
- Patients already included in the study or returning to theatre - each individual patient should only be included in the study once
- Patients who have already undergone extensive abdominal wall repair or LATI-H hernia repair prior to laparoscopy.

Audit Standard

Performing a thorough laparoscopy to identify any abnormalities is a key step in any laparoscopic procedure (including, but not limited, cholecystectomy, appendicectomy, diagnostic lap for endometriosis or gynaecological disease such as ovarian cyst or tuboloovarian abscess, stage laparoscopy for cancer, fundoplications, laparoscopy hernia

repair, etc) induction of pneumoperitoneum. Including this in operation note documentation is also an essential part of good medical practice. Therefore we will use the two following audit standards or guidelines:

- Procedure notes from JCST/ISCP (Joint Committee on Surgical Training / Intercollegiate Surgical Curriculum Programme) on performing laparoscopy and establishing pneumoperitoneum

- Royal College of Surgeons of England Good Surgical Practice point 1.3. “Ensure that there are clear (preferably typed) operative notes for every procedure” which includes operative findings[2]

Outcome Measures

Precise definitions can be found in Appendix A or the REDCap case report form.

Primary outcome measure

- Compliance with audit standards described above, including operative findings of LATI-H

Secondary outcome measures

1. Prevalence of LATI-H in people who have undergone caesarean section or other lower abdominal transverse incisions (see definitions in Appendix B);
2. Symptoms arising from LATI-H including chronic pain;
3. Number of previous investigations and healthcare utilisation (number of clinic appointments, procedures, investigations, emergency department visits) for people with symptoms attributable to LATI-H;
4. Surgeon decision to intervene when LATI-H identified and subsequent outcomes following this procedure (pain, recurrence, readmission, complications).

5. Review of the operation notes from previous procedures (usually c-section, but not limited to) which used LATI (lower abdominal transversal incision) in order to identify the closure or not of peritoneum.

Outcome Standardisation

LATITUDE project leads at each centre are encouraged to hold local meetings with their teams to brief them on the protocol, and to feedback any local issues or questions raised. All LATITUDE collaborators should complete the online training package prior to prospective data collection in order to ensure findings can be accurately captured and to standardise outcome assessment. As part of this online training, collaborators will be provided with examples of diagnostic laparoscopy findings and asked to grade them as part of the online training assessment. Collaborators must get at least 90% in the end of module assessment to pass.

Data Variables

Data will be collected on audit standards, outcomes and confounding factors for risk-adjusted analyses. These include age, sex, body mass index, American Society of Anaesthesiologists (ASA) grade, relevant comorbidities, CCI Charlson index, and smoking status, symptoms, parity, previous operations including those utilising lower transverse abdominal incisions.

Variables including date of c-section or lower transverse abdominal incision (and details on closure where available), date of referral, date of starting symptoms, date of imaging, date of previous procedures that did not identify the hernia previous to the diagnosis and other intraoperative findings. Where a lower transverse abdominal incisional / interparietal hernia is identified and the operating surgeon has decided to repair or reduce / take it down, we will capture data on the contents of the hernia, hernia repair technique used, mesh or not, type of mesh, subsequent symptoms and post operative complications of any repair.

Without appropriately adjusting for risk factors, it is likely that any findings would be biased and unable to be appropriately analysed on a national scale. A full list of required data fields is available in Appendix A, and on the REDCap database.

Follow-Up

Follow-up should be performed in line with current routine practice within each hospital setting. No additional visits are required as part of LATITUDE and no change to clinical practice should be made.

Quality Assurance

This protocol was written with guidance from an expert cross-speciality advisory group.

Project team structure

At each centre, this study can be delivered and disseminated by teams of medical students, junior doctors, trainees and/or consultants. Each team should include at least one qualified doctor to provide additional local support for participating medical students. There is a maximum team size per 4 week collection period of 5 people, at least 3 of whom should not be consultant surgeons.

Data completeness

Following data collection, only data sets with >95% data completeness will be accepted for pooled national analysis. To emphasise the importance of data completeness to collaborators, data collection periods with >5% missing data points will be excluded from the study and collaborators from those periods withdrawn from the published list of citable collaborators.

Validation

This collaborative methodology has been widely validated across multiple datasets, both nationally in the UK and Ireland and internationally, demonstrating high levels of case ascertainment (typically greater than 90 to 95%) and data accuracy (greater than 96 to 98%). Data validation and cross validation will be automatically performed to detect inaccurate data entry.

Data Governance

Data will be collected and stored online through a secure server running the Research Electronic Data Capture (REDCap) web application allowing safe anonymised data storage by collaborators.

The service is managed by the REDCap system hosted at the University of Edinburgh, United Kingdom. The security of the study database system is governed by the policies of the University of Edinburgh. Data management and data security within REDCap will abide by the requirements of the General Data Protection Regulations (GDPR) and any subsequent amendments. Collaborators will be given secure REDCap project server login details, allowing secure data storage on the REDCap system. No patient data will be uploaded or stored on the REDCap database without prior local permissions. All data should be handled in accordance with local data governance policies, and all paper copies of any data should be destroyed as confidential waste within the centre once uploaded to REDCap. Data collected during LATITUDE study can be used for future analyses at the Study Management Group's discretion.

Statistical Analysis and Sample Size

We anticipate the LATITUDE project will include more than 50 centres globally. No surgeon, hospital or LATITUDE project country-specific comparisons will be performed. Further secondary analyses may be performed at the Study Management Group's discretion.

Sample Size Calculation

As this is a clinical audit, a formal sample size calculation is not required. However, as this is a prospective study, we have included an exploration of the expected statistical power. We estimate there is a 5% rate of LATI-H in people who have undergone caesarean section and a 1% rate in those who have not. Based on this, we will need to include at least 209 people who have undergone caesarean section and 836 who have not (where power = 0.90 and alpha = 0.05).

Statistical Analysis

Initially, data will be reported using descriptive analyses. Comparisons between groups will be undertaken using appropriate parametric and non-parametric analyses. Multilevel logistic regression multivariable models will be constructed to account for case mix when undertaking analysis of factors influencing LATI-H. Prespecified subgroup analyses will be made by previous history of lower abdominal transverse incisions whilst accounting for other risk factors including age, parity, number of previous lower abdominal transverse incisions and other clinically plausible risk factors. Selection of variables for inclusion in models will be done by entering the most clinically plausible and relevant risk factors and minimisation of the Akaike information criterion (AIC). Effect estimates will be presented as odds ratios (OR) alongside their corresponding 95% confidence intervals. Identification of hospital or surgeon-specific performance will not be reported. Following analysis, results will be fed back to

participants at the centre level, but no other centres will be identifiable. Statistical significance will be taken at the level of $P<0.05$.

Local Project Registration

At any centre, if the option is available, this project may be registered as clinical audit or service evaluation. Alternatively, it may be necessary to obtain formal ethical approval. It is the responsibility of the local mini team at each site to ensure that the study is registered appropriately, according to local regulations.



LATITUDE 1 should be registered in the UK and Ireland as a clinical audit. When registering LATITUDE 1 project as a clinical audit you can emphasise that:

- LATITUDE 1project is a national audit and all data collected will measure current practice.
- No changes to normal patient pathways/ treatment will be made.
- All LATITUDE 1project data will be collected and stored online through a secure server running the Research Electronic Data Capture (REDCap) web application.

REDCap allows collaborators to enter and store data in a secure system. Collaborators will be given secure REDCap project server login details, allowing secure data storage on the REDCap database. Collaborators in the UK should seek their trust's Caldicott Guardian's permission to submit data to the REDCap system. No data should be uploaded to REDCap prior to written approval from the Caldicott Guardian. No patient identifiable information (e.g. NHS numbers) should be uploaded or stored on the REDCap database without explicit

permission from the trust's Caldicott Guardian. All data should be handled in accordance with national and local data governance policies.

Outside of the UK, individual study investigators are responsible for ensuring the correct audit, ethical or departmental approval has been achieved prior to commencing data collection (this can be registered as an audit or service evaluation, if appropriate). Centres will not be allowed to upload patients' data onto REDCap until they have successful registration of the study.

Authorship Attribution

In accordance with National Research Collaborative (NRC) authorship guidelines, all research outputs from the LATITUDE project will be listed under a single corporate authorship. All collaborators will be listed as PubMed-citable collaborators in accordance with the responsibilities defined below (so long as the minimum requirements for authorship are met) :

- *Writing Group Central Management Team* - responsible for the overall scientific content, data analysis and preparation of research manuscripts.
- *Steering Committee* - responsible for protocol design, project coordination and data handling.
- *Statistical Analysis Team* - responsible for the statistical analysis plan and quality assurance of data analysis
- *National Leads* - responsible for national coordination of the study, acting as a link between mini-teams / hospital leads and the steering committee.
- *Local (Hospital) Leads* - responsible for site governance registration and coordinating handover between local collaborator teams. Local Leads should be prospectively identified by Regional Leads (although remain an optional role) and these are recommended to be the

junior doctor or a senior medical student within the mini-team and only one person can fulfil this role.

- *Local Collaborators (Data Collectors)* - responsible for data collection per specialty group over a specific 4-week period at a particular centre. This should ideally be formed by consultant surgeons and consist of a team of up to 5 people.

Requirements for authorship on LATITUDE project outputs include:

- Active engagement with dissemination of LATITUDE project activities in their own country.
- Effective and responsive communication with the steering committee and with local collaborators throughout their time as Regional Leads.

Minimum requirements for authorship on LATITUDE project outputs include:

- Primary person responsible in obtaining local approvals for conduct of LATITUDE project audit (e.g. registration of the audit, seeking Caldicott guardian permission to upload data to REDCap, submit the protocol to Ethics Commission where applicable).
- Active involvement in a mini-team during a data collection period at the centre which meets the criteria for inclusion within the LATITUDE project dataset.
- Co-ordination of handover between all local collaborator teams at the centre, and involvement in local dissemination of LATITUDE project.
- Presentation of local results at their centre from the LATITUDE project (or otherwise arranges another collaborator to present on their behalf).
- Compliance with local audit approval processes and data governance policies.
- Active involvement in data collection over at least one data collection period at a centre which meets the criteria for inclusion within the LATITUDE project dataset (below). While assistance with other teams is encouraged, collaborator status will only be assessed

based on successful completion of the allocated period. Collaboration with the regional / local lead to ensure that the audit results are reported back to the audit office / clinical teams.

Criteria for centre inclusion within LATITUDE project:

- Obtain all appropriate local approvals for conduct of the LATITUDE 1 audit.
- Successful completion of at least one data collection period at the centre (with a minimum of one eligible patient per period included). Individual data collection periods will only be included when:
  - >95% data completeness has been achieved.
  - All data for the period has been uploaded within the specified deadlines.

Please note if these criteria are not met, then the contributing mini-team and/or the centre may be removed from the dataset and authorship list (please get in contact as soon as potential issues arise so we can support as many centres to be included as possible).

Data Privacy

Patient identifiable information will not be collected in this study (i.e. names or dates of birth). All data for analysis at the University of Edinburgh will be anonymised. All data collected about participants will be identified using only a unique LATITUDE study number. This number will be automatically allocated via REDCap once a new patient record is created in the LATITUDE REDCap database[3]. Any correspondence between the LATITUDE study office and hospital sites will use the LATITUDE study number only. The linkage between REDCap study ID and participants will be maintained in strict confidence at participating sites. This data will not be submitted to the LATITUDE study office and will not be sent outside of the participating site. Confidentiality of all participant's data will be maintained and there will be no disclosure of information by which participants may be identified to any third party other than those directly involved in the treatment of the participant

References

1. Zanellato, A., Tulloh, B. 2025. C-Section Hernia. In: Kudsi, O.Y., Dietz, U.A., Fortelny, R., Beldi, G., Wiegering, A. (eds) *Robotic Hernia Surgery.* Springer, Berlin, Heidelberg.

2. Royal College of Surgeons of England. *Good Surgical Practice.* 2014. London, England.

3. PA Harris, R Taylor, BL Minor, V Elliott, M Fernandez, L O'Neal, L McLeod, G Delacqua, F Delacqua, J Kirby, SN Duda, REDCap Consortium, The REDCap consortium: Building an international community of software partners, J Biomed Inform. 2019 May 9 [doi: 10.1016/j.jbi.2019.103208]

Appendix A – Case Report Form / Data Dictionary

	Required Definition	gested Source of Data
Patient characteristics		
JDE Record ID	natically generated by REDCap	p
l	**uired Definition**	**gested Source of Data**
birth	ex (Female / Male)	l letters / notes
t	us myocardial infarction ured in centimetres (cm); within 1 year of index procedure mic heart disease	
t	ured in kilograms (Kg) within 3 months of index procedure heral vascular disease stive cardiac failure (NYHA I / II / III / IV)	
ng status	covascular disease nt, Previous (stopped smoking <6 weeks), Previous (stopped smoking 6 weeks – 1 year), ntia Previous (stopped smoking >1 year), Never smoked	
us abdominal or pelvic surgery	us TIA / stroke any open abdominal or pelvic procedure / Yes – Laparoscopic or robotic surgery only / No	
us pregnancy	ulcer disease nt currently pregnant, Yes – currently pregnant, No - never	tcharts tcharts
erm health conditions	tes Mellitus	l letters / notes
ail previous pregnancies singleton?	o – twins, No – triplets, No – other (free text) ver disease	l letters / notes sions clerking
to ≥ 38 weeks	ate / severe liver disease (cirrhosis) er of children born (whole integer) without metastases	al letters al letters
ity carried to ≥ 26 weeks	noma / leukaemia er of pregnancies (whole integer) natological disease	
er of previous caesarean sections	mmatory Bowel Disease er of caesarean sections (whole integer) tatic cancer	
of caesarean sections	ic Kidney Disease ting fields with date MM/YYYY s thromboembolism	
	ctive tissue disorder gers, directors and senior officials hyalgia sional occupations ic pain syndrome ate professional occupations	
patient has cardiac failure, what is the NYHA classification?	III / IV (available at https://www.heartonline.org.au/media/DRL/ istrative and secretarial occupations _New_York_Heart_Association_(NYHA)_classification.pdf)	l letters / notes l letters / notes
ation classification	trades occupations , leisure and other service occupations	sions clerking l letters / notes
of chronic kidney disease	IIIA / IIIB / IV / V and customer service occupations	sions clerking
y of diabetes mellitus	ss, plant and machine operatives al labour (i.e. security, factory, construction, groundwork, other physical trades) ype 1 / Yes - Type II (diet controlled, tablet controlled, insulin controlled)	atory systems l letters / notes sions clerking

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nosuppression (non-cancer)	s – oral steroids, Yes – oral DMARDs (Azathioprine, methotrexate), Yes – biologics	charts
cancer and/or cancer treatment	es - curative intent / Yes - palliative intent / Yes - end of life	

l	Required Definition	gested Source of Data
Abdominal / pelvic pain symptoms		
he patient have any of the following symptoms?	**ll which apply or select 'none'** pain orse on exercise or lifting abdominal pain back pain / lump in the lower abdomen re / heaviness a / vomiting obstruction symptoms* tic concerns around the lower abdomen ng le bowel syndrome lty conceiving (requiring fertility treatments) dyspareunia (free text)	l letters / notes sions clerking al letters tems tion notes
ng has the pelvic pain been present for?	on in months	
he patient menstruate?	o – Post-menopausal, No – Perimenopausal, No – Hysterectomy, No – On contraceptive pill / injection or device, No – Hormone or endocrine for amenorrhoea	
e symptoms cyclical in nature?	o	
e patient ever had a diagnosis of endometriosis or pelvic inflammatory disease	ndometriosis, Yes – Pelvic inflammatory disease, No - Neither	
any of these symptoms be attributable to incisional hernia?	o	
e patient been referred or assessed for these symptoms?	as been seen in clinic by a pelvic pain specialist (gynaecologist or chronic pain service), Yes – awaiting appointment, Yes – but referral declined, No – never referred	

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l	Required Definition	gested Source of Data
	Abdominal / pelvic pain symptoms	
igation findings	Normal scan - no cause for symptoms identified / Endometriosis / Pelvic Inflammatory Disease / Rectal Prolapse / Vaginal or Uterine prolapse / Adenomyosis / Ovarian cyst / Hernia / Free fluid	ogy systems l letters / notes
the patient received imaging studies or a diagnostic laparoscopy for these symptoms?	**ll which apply or select 'none'** ound scan etic Resonance Scan uted Tomography Scan ostic or Therapeutic Laparoscopy	ogy systems l letters / notes

l	Required Definition	gested Source of Data
	Surgical history	
us abdominal or pelvic operations	er (integer)	
ny of these procedures been open or converted to open from laparoscopic / robotic, or required an extraction port?	s	
us operation details	ion / Hysterectomy / Appendicectomy / Hernia repair / Cholecystectomy / Colorectal resection / Bariatric surgery / Bariatric surgery / Liver resection / Pancreatic resection / Oophorectomy–salpingo-oophorectomy / Laparotomy (other) / Laparoscopy (other) / Other (free-text)	tems
f the last operation	M-YYYY	l letters / notes
n types for previous open procedures	e, Paramedian, Gridiron, Kocher, McBurney, Lanz, Chevron/Rooftop, Mercedes-Benz, Transverse, Rutherford Morison, Pfannenstiel, Joel–Cohen	thetic charts tion notes
f the last caesarean section	YYY	
n types for previous caesarean sections	enstiel / Joel–Cohen / Transverse (other) / Midline / Oblique / Other / Not applicable (laparoscopy only)	

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e details for previous caesarean sections or lower transverse incision	e of anterior fascia but posterior fascia layer (transversalis or peritoneum) not closed, Closure of anterior fascia and closure of posterior fascia layer (transversalis or peritoneum), Bulk closure of anterior fascia but posterior fascia layer (transversalis or peritoneum), Not documented, Other (free-text)	
er of defects	er (integer)	

l	Required Definition	gested Source of Data
	Intraoperative details and laparoscopy findings	
o skin time	M:SS DD-MM-YYYY	l letters / notes
f end of operation	M:SS DD-MM-YYYY	tems l letters / notes
rade	III / IV / V	thetic charts tion notes
tion for laparoscopy / laparoscopic surgery	ICD-10 codes	e logbooks
perative findings on laparoscopy/ laparoscopic surgery	– normal laparoscopy, Hernia / lower third abdominal wall adhesions identified, Other non-hernia pathology	l letters / notes
defect size	t x Width (estimated cm)	tion notes
type	Transverse Incisional (LATI), Incisional ventral, Umbilical, Paraumbilical, Other incisional, Port-site hernia, Inguinal	
contents	Sac, Adhesions, Omentum, Mesentery, Small bowel, Large bowel, Uterus, Fallopian tube, Ovary, Bladder, Other (free-text)	
ions present	s – film, Yes – dense	
ato's classification of hernia	, Type 2, Type 3, Type 4, Type 5, Type 6	tion notes
e hernia / adhesions require mobilisation or taking down from abdominal wall	s – blunt dissection, Yes – sharp dissection	perative findings nt stickers
hy abdominal wall repair or other reduction performed?	s- Reduction only, Yes - Suture repair, Yes – Component separation	
f mesh	etic – non-absorbable, Synthetic – absorbable, Biological, Hybrid	
placement	, Inlay / interposition, Retrorectus, preperitoneal, intraperitoneal	

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l	Required Definition	gested Source of Data
30-day outcomes		
ostoperative complications within 30-days?	s	l letters / notes t information systems rge summaries tion notes
rvention	s – outside of theatre, Yes – return to theatre	
lity within 30-days	s – in-hospital, Yes – out of hospital	
lications with Clavien-Dindo Grade	t of complications and Clavien-Dindo grading	
f death / discharge	M-YYYY	

Appendix B – LATI-H Classification

