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Waist circumference as an estimator of abdominal wall depth

Submission date	**Recruitment status**	[X] Prospectively registered
08/01/2023	No longer recruiting	[X] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
02/02/2023	Completed	[X] Results
Last Edited	**Condition category**	[_] Individual participant data
26/08/2025	Other	

Plain English summary of protocol

Background and study aims
This study seeks to assess whether waist circumference can estimate the abdominal wall depth to a reliable degree of accuracy so as to be incorporated in a nomogram that would categorise suggested Veress needle abdominal insertion depth according to waist circumference range. This would be helpful in guiding initial Veress entry into the abdominal cavity during laparoscopic (keyhole) or robotic surgery where entry is achieved blindly without standardised depth advice. The research question is therefore 'Can waist circumference estimate abdominal wall depth?' Due to the urgent need for safety mechanisms to be incorporated in the conduct of laparoscopic abdominal wall injury, this study attempts to provide some guidance into how deep the Veress needle should be inserted when a Veress needle is being used as the first entry abdominal device and insufflator. The study aims to improve safety in laparoscopic entry where a Veress needle is used by providing insertion depth guidance. It is aimed to reduce the number of failed entries or complicated entries. The traditional Body Mass Index (BMI) will also be taken to see if it makes a better correlation than abdominal girth.

Who can participate
Any adult patient undergoing non-urgent scheduled CT or MRI abdominal imaging

What does the study involve?
The abdominal wall depth will be measured directly from CT or MRI scans of the waist, whilst patient abdominal circumference, weight and height measurements will be physically obtained.

What are the possible benefits and risks of participating?
The possible benefits of participating are that the research team will assess the validity of the relationship between waist circumference and abdominal wall depth for the first time so this can be taken into account whenever patients are subjected to minimally invasive surgery where entry is likely to be initially accomplished through the use of the Veress needle. There is minimal risk to participation, if any, there may be an inconvenience in taking the physical measurements. Weight and height are routinely taken, however, additionally taking the waist circumference is not envisaged to create significant delay.

Where is the study run from?
University Hospitals Bristol and Weston NHS Foundation Trust (UK)

When is the study starting and how long is it expected to run for?
April 2022 to July 2024

Who is funding the study?
This study is part of a PhD project funded by UK Research and Innovation (UKRI) ESPRC Centres for Doctoral Training Digital Health & Care (UK)

Who is the main contact?
Chimwemwe Miti (Principal researcher and PhD student), c.miti@bristol.ac.uk (UK)

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Additional identifiers

Integrated Research Application System (IRAS)
321171

Central Portfolio Management System (CPMS)
55619

Study information

Scientific Title
Investigating whether the abdominal waist circumference or abdominal girth can be employed as an accurate estimate of abdominal wall depth as measured from the base of the umbilicus

Study objectives
Measured waist circumference is a better estimator than Body Mass Index (BMI) of the abdominal wall depth

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 21/07/2023, London - Harrow Research Ethics Committee (Health Research Authority Bristol HRA Centre, Ground Floor, Temple Quay House, 2 The Square, Bristol, BS1 6PN, United Kingdom; +44 (0)2071048289; harrow.rec@hra.nhs.uk), ref: 23/PR/0600

Primary study design
Observational

Study design
Observational cross-sectional study

Study type(s)
Other

Health condition(s) or problem(s) studied
Assessing the correlation between waist circumference and abdominal wall depth

Interventions
For eligible participants undergoing cross-sectional imaging (CT or MRI scans) as part of their routine diagnostic workup, their waist circumference (additional to height and weight which are already routinely collected before any CT or MRI scan) will be measured. The principal investigator who is a PhD student and a medical doctor trained in taking patient physical parameters will measure the waist circumference, height and weight. The measurements of physical parameters are undertaken face-to-face in the imaging department where the patient will be attending their scheduled scan. These data will be analysed mathematically against the abdominal wall depth taken from the base of the umbilicus to the peritoneum and which will be measured directly from an appropriate slice of the cross-sectional image series.

Intervention Type
Other

Primary outcome(s)
1. Abdominal wall depth from the centre of the umbilicus to the peritoneal edge in millimetres (mm) measured using cross-sectional imaging (CT or MRI scans) at one timepoint
2. Waist circumference measured in a complete circle passing through the centre of the umbilicus in millimetres (mm) using a measuring tape at one timepoint
3. Height and weight measured using routine procedures in centimetres (cm) and kilograms (kg), respectively, at one timepoint

Key secondary outcome(s)
Performance of the relationship between waist circumference measurements and abdominal wall depth and measured BMI to estimate abdominal wall depth at a single time point

Completion date
21/07/2024

Eligibility

Key inclusion criteria
1. Adult patients aged 18 years old and over
2. Undergoing routine scheduled cross-sectional imaging that includes their abdomen
3. Mobile patients
4. Able to consent and volunteer their participation in the study

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group

Adult

Lower age limit
18 Years

Sex
All

Total final enrolment
386

Key exclusion criteria
1. Patients with uncorrected abdominal wall hernias or abdominal wall defects
2. Patients undergoing emergency CT scans requested from the emergency department

Date of first enrolment
31/07/2023

Date of final enrolment
24/06/2024

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
University Hospitals Bristol & Weston
Radiology Department
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Marlborough Street
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United Kingdom
BS2 8HW

Sponsor information

Organisation
University Hospitals Bristol and Weston NHS Foundation Trust

Funder(s)

Funder type
Government

Funder Name
UK Research and Innovation

Alternative Name(s)
UKRI

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and /or analysed during the current study will be stored in a publicly available repository. The Research Data Storage Facility, Digital Health Doc (digitaldoc.info) will be the most robust long-term storage facility for my project data so that the data is accessible by designated researchers should I not be present and when the project ends and I leave the University. The type of data stored will be metric measurements of abdominal wall depth, height, weight, waist circumference, and Body Mass Index. Consent from participants was required and obtained. Data anonymization was as per protocol. There are no ethical or legal restrictions foreseen because only measurements being taken will be stored, the scan images will not be stored.

IPD sharing plan summary
Stored in publicly available repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Basic results			26/08/2025	No	No
Participant information sheet	version 1.6	02/07/2021	16/01/2023	No	Yes
Protocol file	version 1.0	31/12/2022	16/01/2023	No	No