

# An Assessment of Students' and Health Professionals' Abilities to Site Stomas Accurately on Human Cadavers

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## Introduction

- A stoma is a surgically constructed opening created to treat disease or damage in a patient (See Figure 1).
- Accurate placement of the stoma results in better function/fewer complications. If not sited correctly they can result in a number of problems often requiring corrective surgery to re-site or re-fashion the stoma. Thus, it is crucial that an experienced and educated healthcare professional should accurately site stomas before surgery.
- This study aimed to use cadavers to simulate stoma siting and compare the accuracy of healthcare professionals and students to locate stomas appropriately.

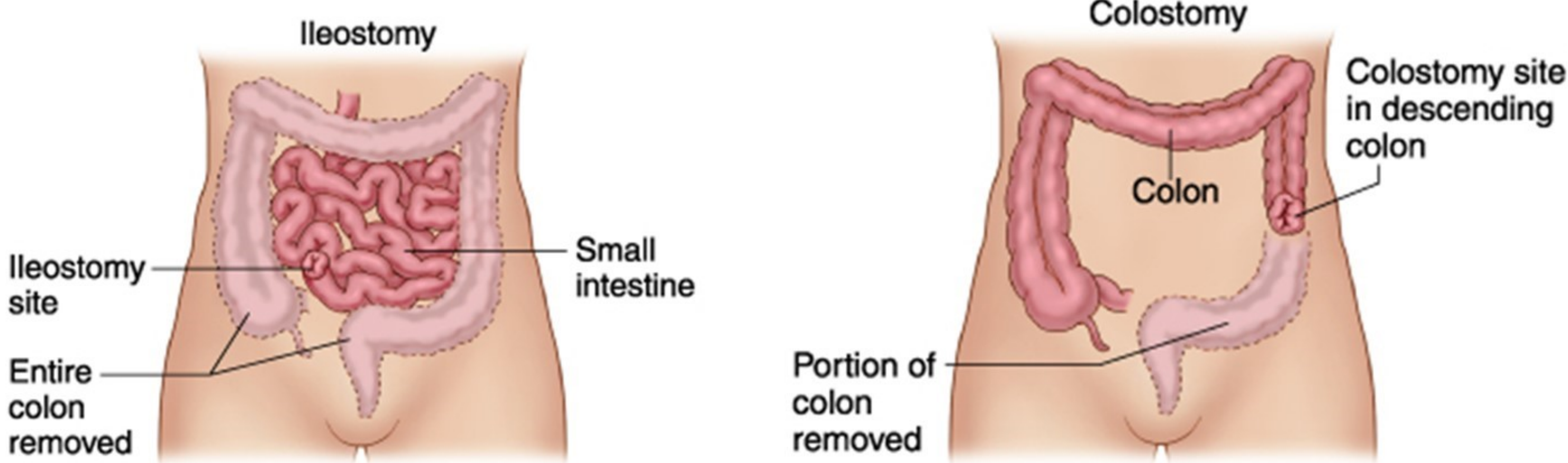
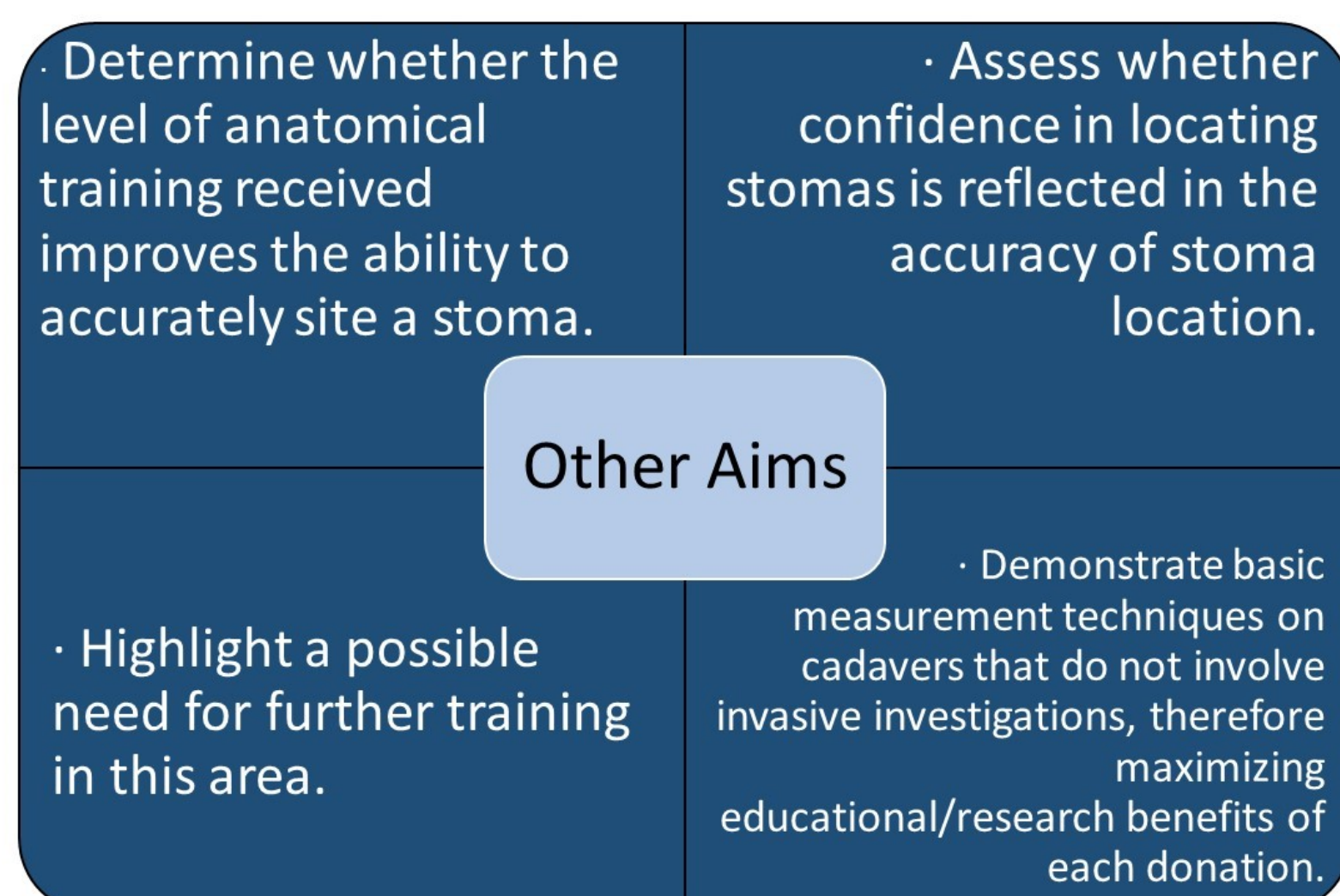


Figure 1. Typical locations of an ileostomy and a colostomy.

If these are not sited properly, it may lead to medical complications or poorer quality of life.

## Aims

- Influenced by Macdonald *et al.* (2003), we aimed to investigate the accuracy of siting stomas between specialist stoma nurses compared with trainee surgeons, and additional groups of students and non-clinical academics with an anatomical background. All groups would site stomas under the same conditions unlike the Macdonald *et al.* (2003) study.



## Methods

- Ninety two healthcare professionals, students and non-clinical academics were recruited to determine the best location for a stoma to be sited for an ileostomy and colostomy. Grid lined acetates were used as a quantitative form of measurement on 10 cadavers obtained from the Anatomy facility of the University of Aberdeen.
- Ethical approval for this study had been granted by the CLSM Ethical Review Board.
- Ten A3 acetate sheets were provided for each volunteer to use with each cadaver. Participants were able to palpate cadavers to help their decision. The study investigator placed the acetate grid sheet on the abdomen of the cadaver and the participant marked where they would locate each stoma with an X (see Figure 2).
- To analyse data, investigators measured the x and y coordinates of each stoma located on the acetate sheets.
- The most suitable 'gold standard' location of the stomas was collaboratively agreed between the study supervisors and four consultant colorectal surgeons from Aberdeen Royal Infirmary.

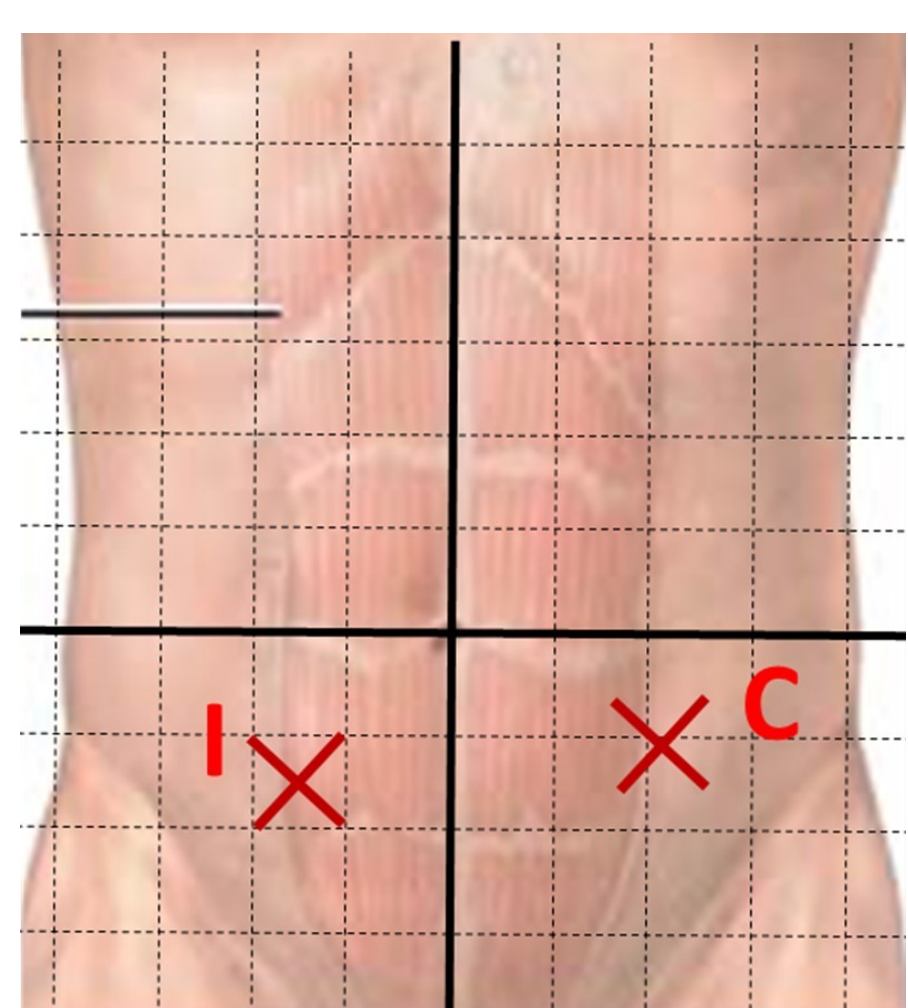


Figure 2 – Representation of an A3 acetate gridline sheet on a cadaver.

The centre of each cross marks the middle of where a participant would site the stoma for an ileostomy (I) and a colostomy (C), respectively.

0, 0 on the XY coordinate system was the umbilicus.

Standard guide marks were used to allow consistent location of the acetate sheets on the cadavers to improve accuracy.

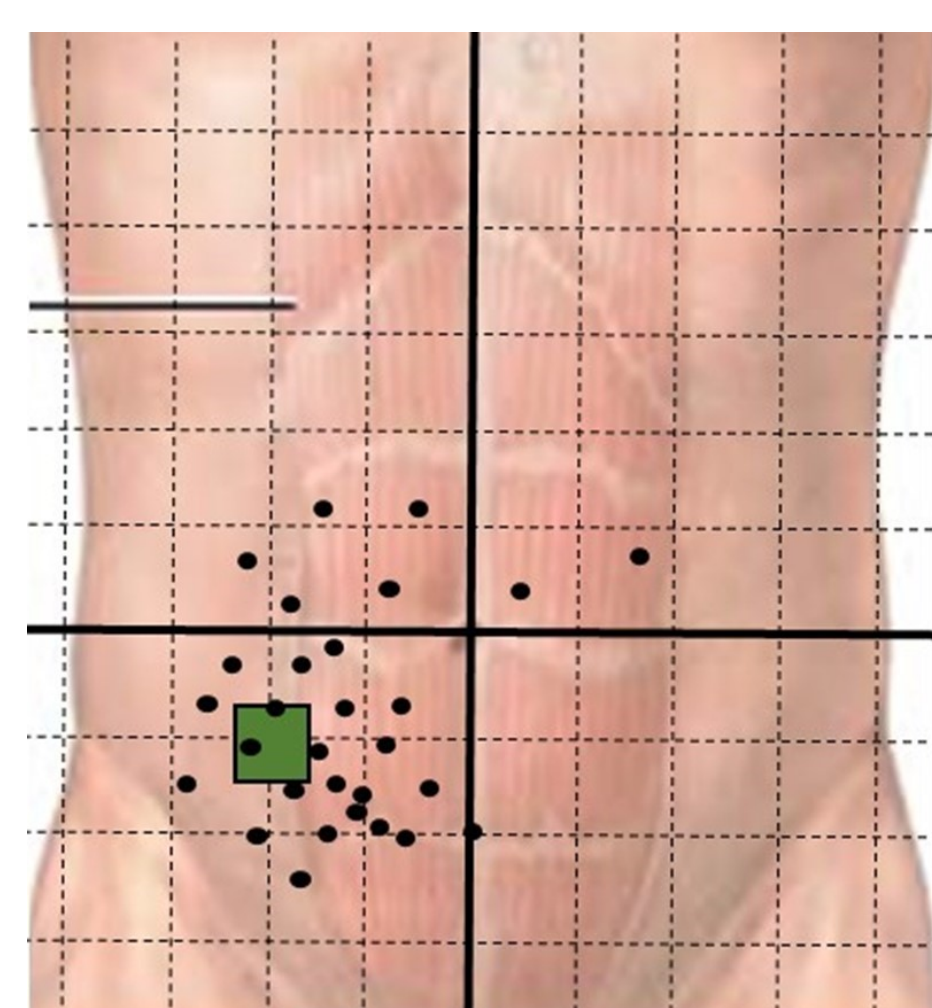


Figure 3 –Example of an A3 acetate gridline sheet on a cadaver with compiled participant stoma location sites for placement of an ileostomy.

'Gold standard' site is marked by green square.

Black dots indicate the variation of where participants would have located the stoma.

## Results

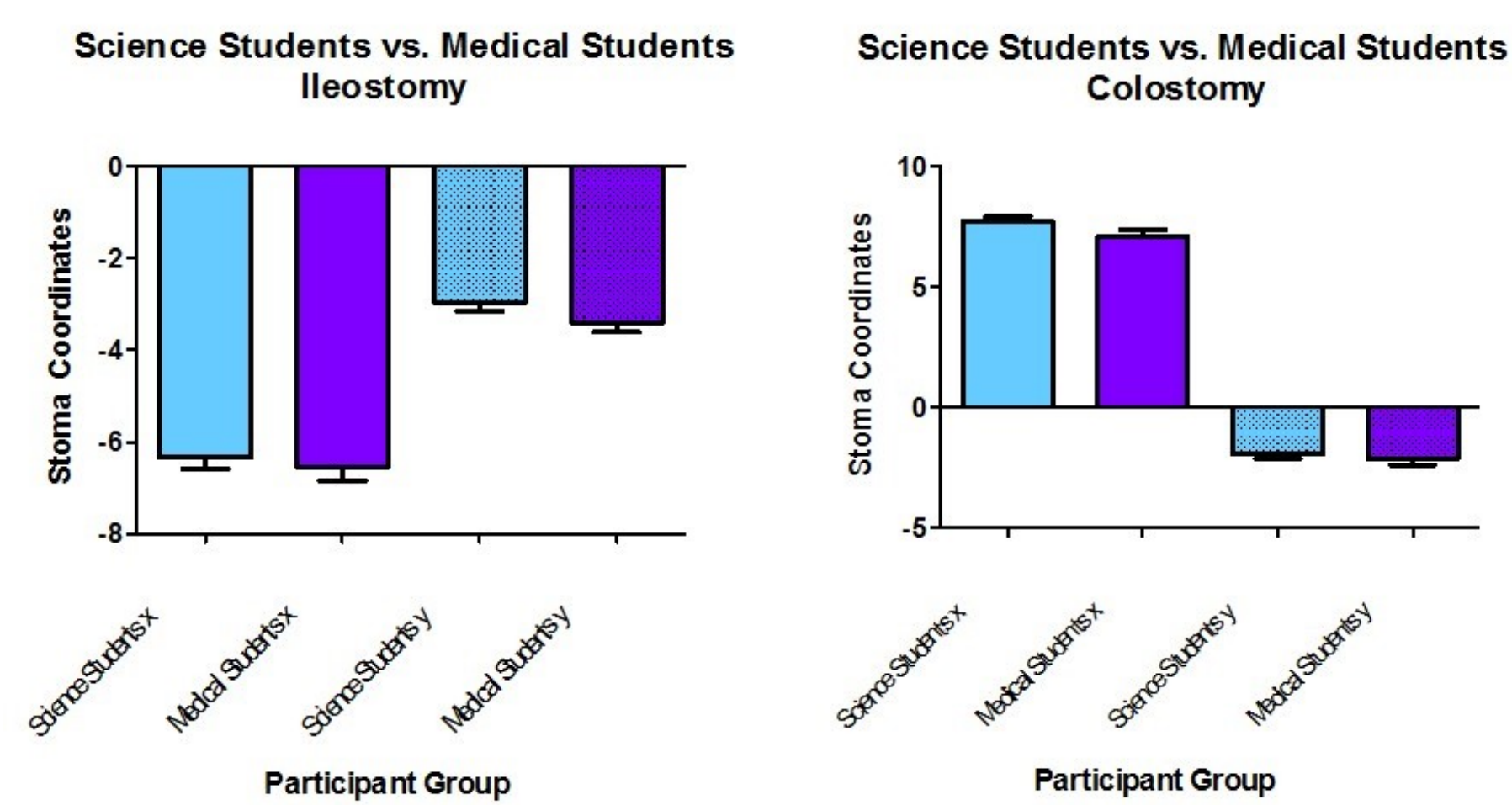


Figure 4 - x, y coordinates for siting an ileostomy and a colostomy between all Science (Anatomy and Physiology) (n=380) and Medical students (n=280).

There was no significant difference between the x and y coordinates for siting both an ileostomy and a colostomy.

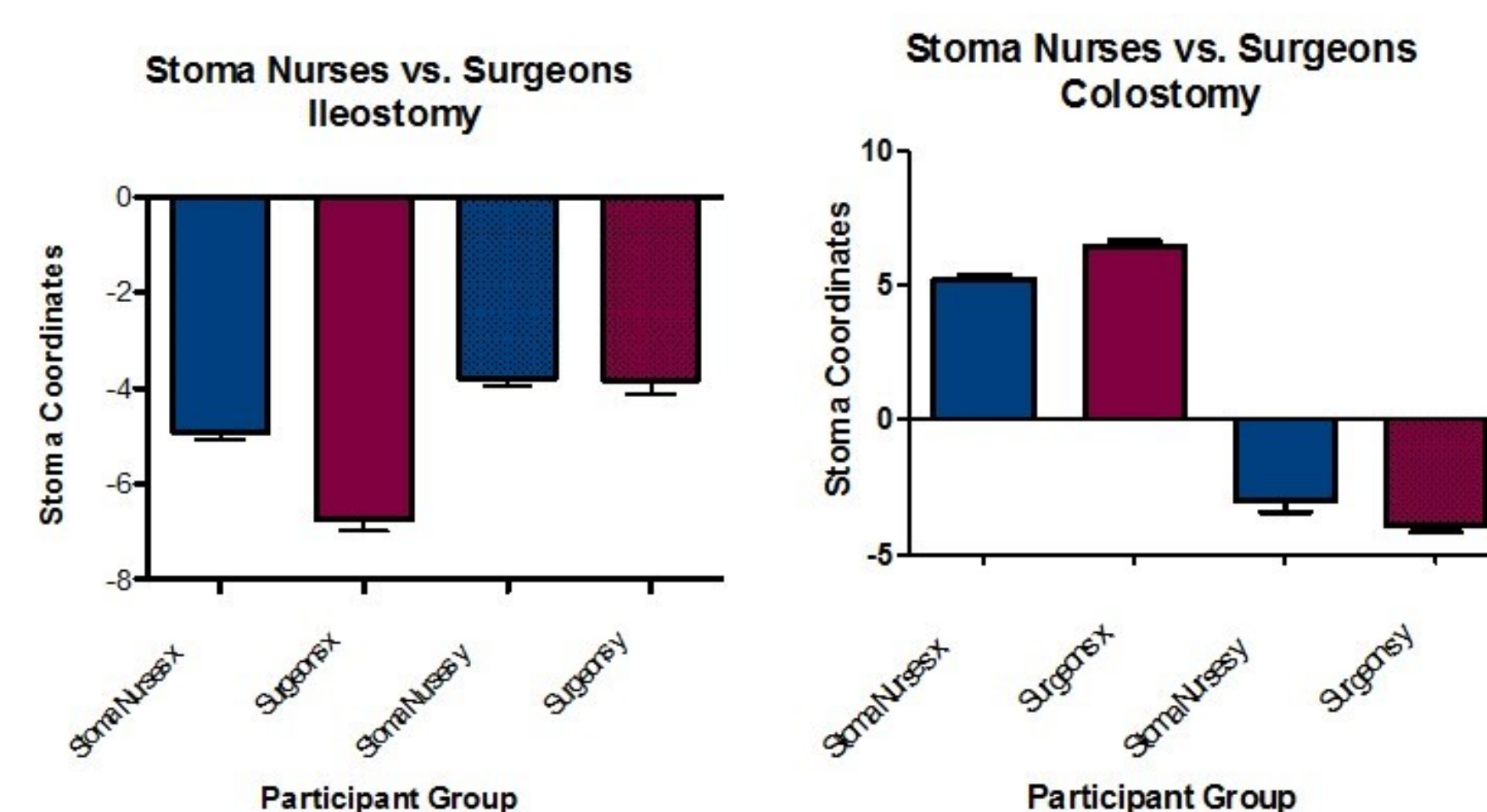


Figure 5 - x, y coordinates for siting an ileostomy and a colostomy between stoma nurses (n=30) and trainee surgeons (n=40).

There was a significant difference between the x coordinates for siting an ileostomy (<0.001) and colostomy (<0.05), but there was no significant difference for the y coordinates.

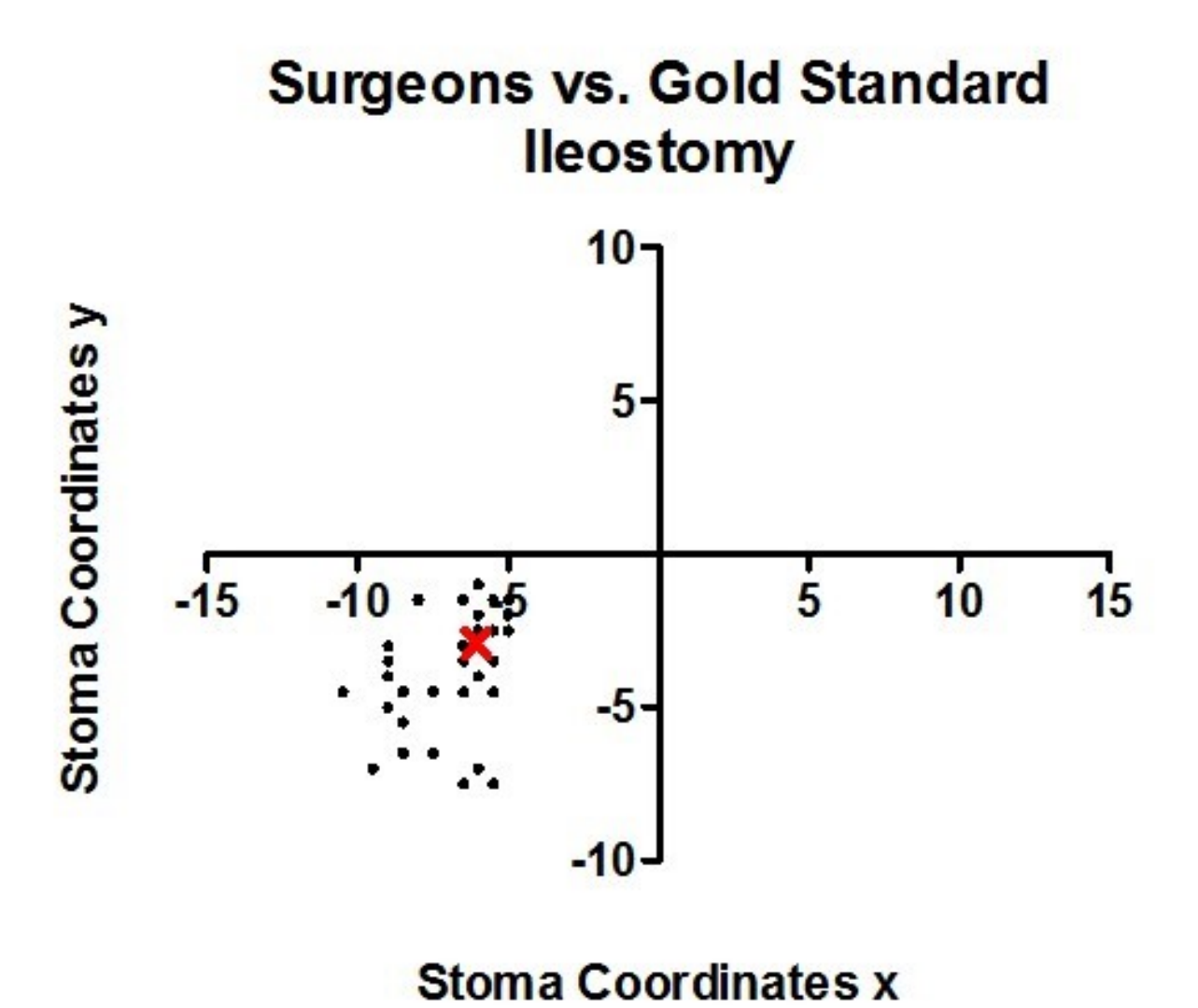
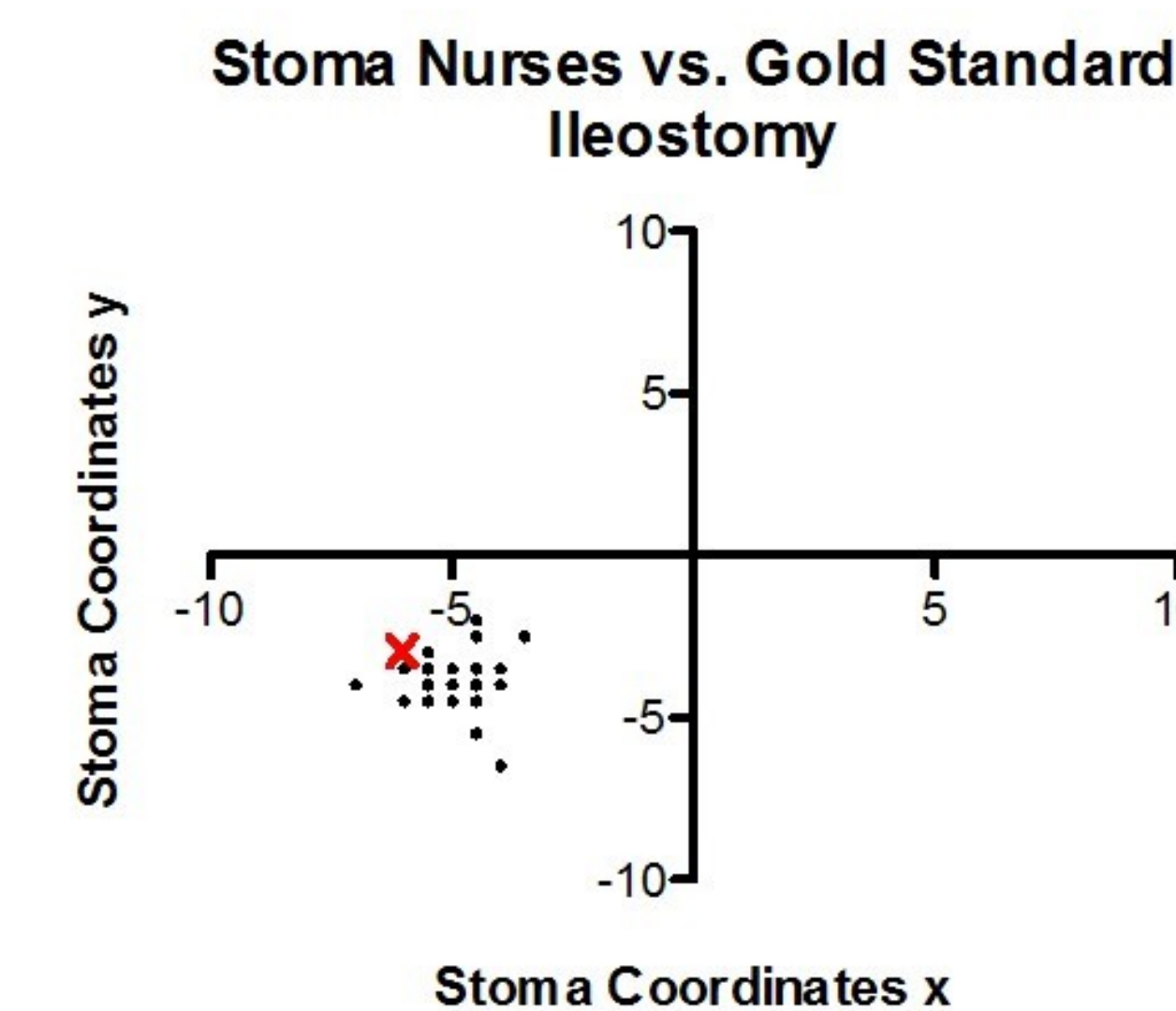


Figure 6 - the x, y coordinates for siting an ileostomy for stoma nurses (n=70) and trainee surgeons (n=80) against the 'gold standard' stoma coordinates (marked by a red cross).

When siting an ileostomy there was also a significant difference (<0.001) in the x coordinates between trainee surgeons and stoma nurses. For the y coordinates, there was a significant difference (<0.05) between trainee surgeons and the 'gold standard', and also a significant difference (<0.01) between stoma nurses and the 'gold standard', for siting an ileostomy.

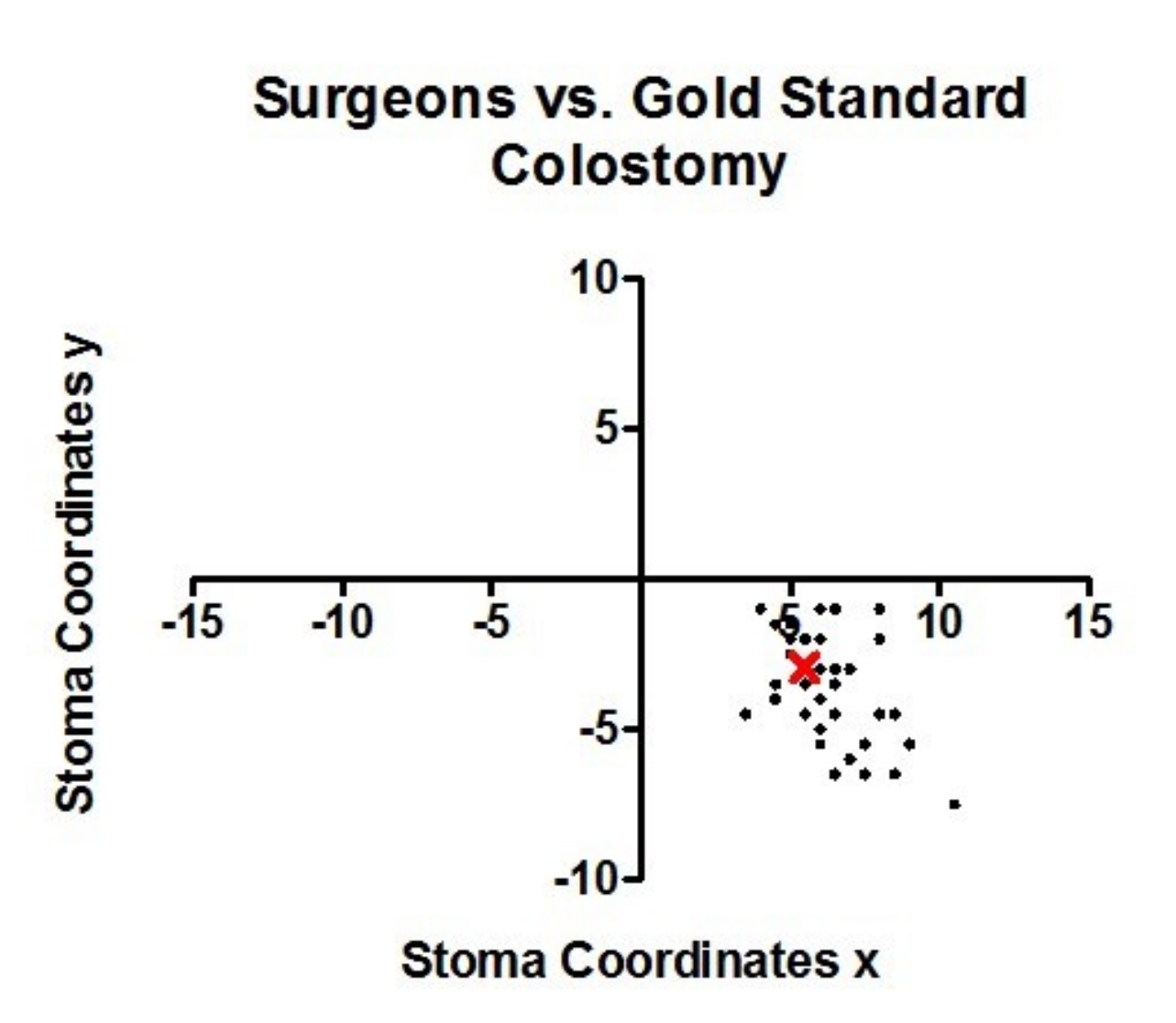
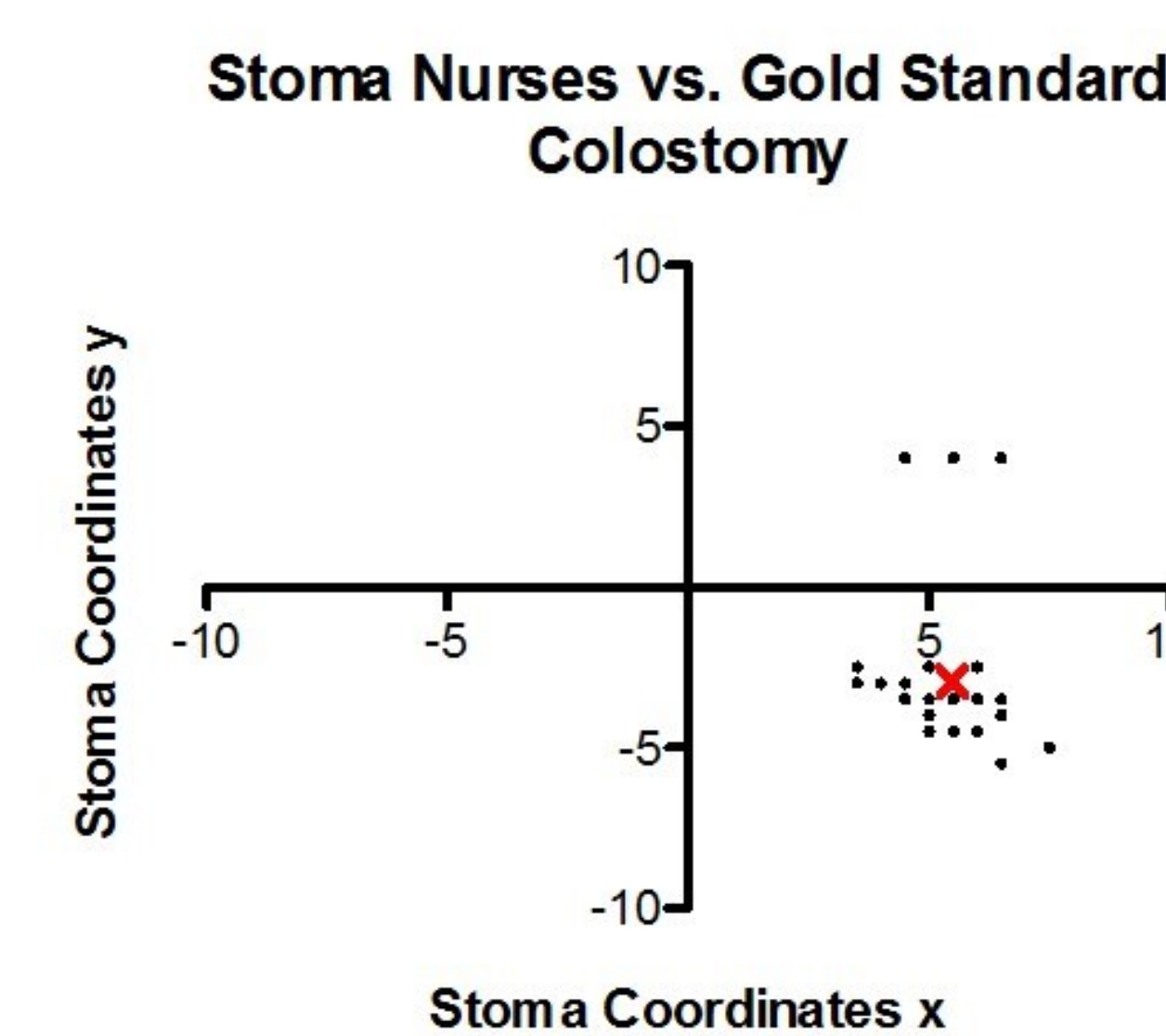


Figure 7 - x, y coordinates for siting a colostomy for stoma nurses (n=70) and trainee surgeons (n=80) against the 'gold standard' stoma coordinates (marked by a red cross).

For siting a colostomy, there was a significant difference (<0.05) in the x and y coordinates between trainee surgeons and the 'gold standard' when siting a colostomy. There was no significant difference in the x and y coordinates between stoma nurses against the 'gold standard'.

## Conclusions

- When siting a stoma under the same conditions, the stoma nurses were closer to the 'gold standard' than the trainee surgeons. Consultants and stoma nurses had the most consistent/clustered results and were the most accurate at siting stomas.
- Anatomical training may improve the ability to site a stoma correctly as Anatomy students were closer to the 'gold standard' results than the Physiology students. It was also demonstrated that Y4 Medical students were closer to 'gold standard' results than Y2 and 3 Medical students.
- No correlation was observed between anatomical training and confidence at siting stomas.
- There is need for increased training in siting stomas due to lack of consistency between groups, in particular, trainee surgeons and stoma nurses. This increase in training could potentially result in fewer stoma complications, therefore, not only having major benefits for future patients but also for the NHS.