

# Day-case inguinal hernia repairs: An analysis of same-day discharge rates and reasons for admission

Liberty-Isabelle Todd  
Heather Davis  
Christopher Briggs

Derriford Hospital, University Hospitals Plymouth, UK  
Derriford Hospital, University Hospitals Plymouth, UK  
Derriford Hospital, University Hospitals Plymouth, UK

## Introduction

The British Association of Day Case Surgery (BADs) suggest that 90% of inguinal hernia repairs (IHR) can be completed without an overnight stay in hospital.<sup>1</sup> Between April and September 2022, our performance team reported only 79.0% of IHR's were recorded as day-case. We completed an internal, retrospective audit to ascertain if the number of day-case IHR's could be improved.

## Methods

We examined admission notes for all 31 IHR cases which were not coded as day-case within this time frame. We wanted to determine if a planned admission, or same-day discharge, should have occurred.

## Results

18 cases were admitted in line with BADs unplanned criteria. 2 patients were identified as missed candidates appropriate for planned overnight admission. 1 case had an unidentifiable cause of admission.

10 cases were found to be appropriate day-case surgeries, incorrectly identified by coding. The addition of these cases brings our proportion of elective IHR's above 90%. It was concluded that a lack of clerical staff out of hours meant that day-case patients were not formally discharged on the IT system till the following morning. An evening shift for clerical staff has since been introduced to combat this.

## Summary

Our audit suggests that our department completed >90% of IHR's as day-case surgery, in line with BAD's criteria, despite up to 13% of these cases not being captured appropriately by coding. The main barrier to correct coding is likely to be delayed discharge from the IT system.

---

## Introduction

Inguinal hernia repairs (IHR) are amongst the most commonly performed general surgical operations [1]. It is a relatively simple procedure with low morbidity and mortality rates [2]. The Royal College of Surgeons have identified length of hospital stay to be an important measure of the success of an inguinal hernia repair [1] whereby day case surgery is preferred.

Day case surgery has many advantages; it improves patient throughput [3] [4] and so reduces waiting lists, decreases risk of hospital acquired infection [5] [6] and aligns with patient wishes to spend less time in hospital [7]. In fact, the majority of patients prefer day surgery over inpatient stays with improved health related quality of life scores [8]. The cost savings of day surgery over admission are remarkable [9] [10].

The British Association of Day Case Surgery (BADS) suggest 90% of inguinal hernia repair (IHR) operations, can be completed without the need for an overnight stay in hospital, regardless of method [11].

Pre-operative surgical assessment determines the need for a planned overnight admission or day-case only surgery based on this recommendation.

Patients who are likely to require a planned admission, and therefore considered 'complex' and unsuitable for a day case IHR, include the following: [11] [12].

Factors Contributing to Planned Admission:

1. Technical factors: signs of complication such as incarceration, strangulation, infection, recurrent hernias, and relevant history of previous, complex lower abdominal surgery and radiation therapy.
2. Patient factors: patients with significant co-morbidities, including cardiovascular, respiratory, endocrine, hepatic, renal, gastrointestinal, mental disorders and immune deficiencies.
3. Social factors: IHR in patients without the support of a responsible adult at home for the following 24 hours from discharge and/or with complex social circumstances.

Factors Contributing to Unplanned Admission:

1. Intraoperative complications such as iatrogenic damage and complex intraoperative findings i.e., difficult haemostasis.
2. Poor post-operative recovery such as haematoma, urinary retention and exacerbation of any co-morbidities.

It is worth noting that these criteria are open to interpretation by the assessing surgeon, and therefore opinions on the suitability of day-case surgery for any patient may vary greatly [12]. Despite increasing age or significant comorbidities, day case surgery can be feasible with elective IHR under local anaesthetic [13] [14].

In January 2023, trust data on inguinal hernia repairs performed at Derriford Hospital (Plymouth, Devon) between April 2022 and September 2022 demonstrated that 79.0% of IHR were completed as day-case procedures. This falls short of the BADS recommendation by 11%.

Due to the introduction of best-practice tariff systems, our trust may be financially penalised for failure to meet these standards. Reasons for failure for same day discharge were postulated to include poor pre-operative selection for day-case surgery, delayed discharge paperwork being completed, administrative errors (including incorrect coding) and unforeseeable intra or post-operative complications.

## **Methods**

An internal, retrospective audit was conducted of all inguinal hernia repairs between April 2022 and September 2022 which were not coded as a day-case. All inguinal hernia repairs carried out between 1<sup>st</sup> April and 30<sup>th</sup> September 2022, were included. They were identified from the hospital's information patient management system (IPM) using the following codes:

<b>BADS Metric</b>	<b>Primary Procedure Code</b>
Primary repair of inguinal hernia	T202-Primary repair of inguinal hernia using insert of prosthetic material
Primary repair of inguinal hernia	T203-Primary repair of inguinal hernia using sutures
Primary repair of inguinal hernia	T208-Other specified primary repair of inguinal hernia

**Table 1.** Table 1: Procedure code search terms

The resulting case list was then analysed, and patients identified with an inpatient stay of greater than 23 hours were included in our audit.

Data was collected on the following: hospital number, NHS number, sex, age, date of admission/surgery, date of discharge, location of admission, location of discharge, operating specialty, discharge destination, method of referral (via general practice or through the general surgical clinic) and the patient’s registered general practice surgery. Patient identifiers, such as name and date of birth, were excluded.

Planned overnight admissions were identified by review of clinic letters, referral letters and discharge paperwork. Cases without clearly planned overnight admissions were scrutinised further by retrospective note review.

## Results

165 IHR’s were completed in the above timeframe. 130 did not have an inpatient bed booked and were scheduled for day-case, of which 99 cases were day-case compliant.

Therefore, thirty-one patients were admitted overnight. The break-down for the number of cases performed by each general surgical team can be seen here:

<b>General surgical team</b>	<b>Number of cases</b>
Hepatobiliary and Pancreatic	19
Oesophageal and Gastric	8
Colorectal	4

**Table 2.** Table 2: Number of inguinal hernias performed by the different general surgical specialities

Of the 31 cases, 12 had a documented reason for a registered overnight stay in their discharge paperwork. Of these 12, 2 had a successful same day discharge but were identified incorrectly as an overnight stay by coding. 2 cases were identified as being unsuitable day-case candidates due to long standing patient factors such as co-morbidity. These were missed at time of booking.

8 cases fell into BAD’s unplanned exclusion criteria for suitable same day discharge, as follows;

- Extensive procedure with complex intraoperative findings: 2
- Post-operative urinary retention: 2
- Post-operative confusion: 2
- Unwell post-operatively: 2

Of the remaining 19 cases, 1 had no available notes for this elective admission and was excluded from results.

7 were incorrectly identified as an overnight admission; patients had been documented as home

same day by the nursing staff but not discharged on the system.

1 was identified in pre-operative surgery assessment as a suitable candidate for planned overnight admission due to severe respiratory disease, and thus excluded.

1 was admitted due to an unexpected change in home circumstances.

9 fell into BADS' criteria for unplanned post-operative complications. These were as follows;

- Difficulty managing post-operative pain: 1
- Post-operative leg numbness: 1
- Slow post-operative airway recovery: 1
- Unwell post-operatively: 3
- Extensive intra-operative procedure: 2
- Arrived late in the evening to recovery: 1

In total:

<b>Reason for cases being coded as an overnight admission</b>	<b>Number of cases</b>
Same day discharge, identified incorrectly by coding	<b>10</b>
Overnight admission due to unplanned changes in circumstances making patients unsafe to go home same day (in line with BAD's criteria)	<b>18</b>
Overnight admission due to reasons which could have been planned- potentially unsuitable day candidates	<b>2</b>
Unable to determine cause for overnight stay	<b>1</b>
<b>Total</b>	<b>31</b>

**Table 3.** *Table 3: Breakdown of cases coded as overnight admissions*



Figure 1. Figure 1: Flow-chart of results

## Discussion

Day-case surgery is becoming an increasingly more utilised resource internationally [15]. It is often cited as resulting in high levels of patient satisfaction, as well as quicker mobilisation post-operatively [16]. For many trusts, there is also a strong financial incentive for improving patient flow through the hospital [17].

One comprehensive literature review from 2018 suggested that day-case IHR's are, for most, as safe as those performed with an overnight admission [18]. Arguably, the attributes which make a patient unsuitable for overnight admission were not explicitly stated in this review, however, further research does suggest that the correct use of day-case surgery can lead to a greater number of cases being completed. As a result, this is likely to ease waiting lists, improve bed numbers and reduce workload burden for staff [17]. This is crucial during a time of NHS staffing crisis and reduced funding.

This audit has identified 10 elective IHR cases which were misidentified as a failed same-day discharge, who did not require an overnight stay. Consequently, with the addition of these cases, the trust meets compliance with the BADS' guidelines, with a 92% rate of day-case IHRs during this time period.

These 10 cases which were incorrectly identified as an overnight stay were discussed with the responsible discharge team. It was concluded that a lack of clerical staff from the late afternoon onwards meant that day-case patients were not formally discharged on the IT system till the following morning.

We have recognised that the largest barrier to correct and accurate coding is delay to a patient's formal discharge from the admitting IT system, due to a lack of clerical staff out of hours. Across our hospital, inaccurate bed numbers may prove problematic in terms of appropriate staffing, arranging admissions from the emergency department and managing hospital resources.

2 cases were missed as appropriate planned overnight stays, as per the BAD's criteria for planned admission. For these patients however, the type of admission for elective surgery (day-case vs overnight), was not explicitly stated in the pre-operative clinic letter. This may pose an issue when the surgeon who reviews the patient in pre-operative clinic is not the operating surgeon. To ensure continuity, and that appropriate overnight beds are booked, explicitly stating the type of elective admission is important for admin staff and patients. In some trusts, trials of same-day pre-operative assessment, IHR and same-day discharge have taken place, with the intention of increasing the number of day-cases completed [19]. This is a potential future solution to issues such as the above, but do pose financial and logistical challenges.

18 cases were admitted for an overnight stay due to appropriate, unplanned changes to circumstances and intra-operative/post-operative complications (approximately 60%). A large prospective study of 1000 IHRs within a district general hospital over a 7-year period, with similar aims as our own audit, demonstrated that an average of 10.8% of patients had an unexpected overnight stay [20]. They concluded that patient age, procedure duration and the time of day the operation occurred were compounding factors in this figure [20]. Our higher proportion of unexpected overnight stays could be reasoned by our significantly smaller sample size, possibly higher levels of complexity and co-morbidity seen within our tertiary surgical centre and a different patient demographic. Better understanding of why our patients may have an unexpected overnight stay has been identified as a potential area for further investigation.

Recommendations for change:

1. Completion of same-day discharge paperwork to allow correct coding for the length of admission.
2. Ensuring nursing or clerical staff can correctly carry out IT discharges out of hours in order to allow for real-time, accurate bed numbers across the hospital.

3. Explicit statement in all pre-operative clinic letters (surgical or anaesthetic) as to whether overnight admission will need to be planned *or not*.
4. Making BAD's criteria for appropriate day-case IHR candidates widely available and easily accessible to all surgical staff involved in this decision-making.

#### Barriers to change:

1. The completion of same-day discharge paperwork is not always possible due to staff shortages and high workload.
2. The decision for planned admission is multifactorial, subjective and may not always be straight-forward to determine in clinic prior to anaesthetic input.

## Summary

Our audit suggests that between April 2022 and September 2022, Derriford Hospital's general surgery department completed >90% of IHRs as day-case surgery, in line with BAD's recommendations and criteria, despite up to 13% of these cases not being captured appropriately by coding. The main barrier to correct coding is likely to be delayed completion of discharge from the IT systems.

## References

1. Associations of Surgeons of Great Britain and Ireland, British Hernia Society. Commissioning guide: Groin hernia Commissioning guide 2013 Groin hernia. 2013;(September 2012).
2. Nilsson H, Stylianidis G, Haapamäki M, Nilsson E, Nordin P. Mortality after groin hernia surgery. *Ann Surg* [Internet]. 2007 Apr;245(4):656-60. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17414617>
3. Dr Gregory Warren, Dr Jonathan Carter, Dr Alexandra Humphreys DMS. The benefits of a dedicated Day Surgery Unit. *J One-Day Surg*. 2020;
4. K Fehrmann, CM Matthews MS. Day surgery in different guises: a comparison of outcomes. *J One-Day Surg*. 2009;
5. Weber DJ, Rutala WA, Miller MB, Huslage K, Sickbert-Bennett E. Role of hospital surfaces in the transmission of emerging health care-associated pathogens: norovirus, *Clostridium difficile*, and *Acinetobacter* species. *Am J Infect Control* [Internet]. 2010 Jun;38(5 Suppl 1):S25-33. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/20569853>
6. Tess BH, Glenister HM, Rodrigues LC, Wagner MB. Incidence of hospital-acquired infection and length of hospital stay. *Eur J Clin Microbiol Infect Dis* [Internet]. 1993 Feb;12(2):81-6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/8500486>
7. Gnanalingham K. Day case hernia repair under local versus general anaesthesia: patient preferences. *Ambul Surg* [Internet]. 1998 Oct;6(4):227-9. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0966653298000365>
8. Suhonen RA, Iivonen MK, Välimäki Prof. MA. Day-case surgery patients' health-related quality of life. *Int J Nurs Pract*. 2007;13(2):121-9.
9. Castoro C, Bertinato L, Baccaglioni U, Drace CA, Mckee M. Policy Brief Day Surgery: Making it Happen International Association for Ambulatory Surgery. 2007;
10. Appleby J. Day case surgery: a good news story for the NHS. *BMJ* [Internet]. 2015 Jul 29;h4060. Available from: <https://www.bmj.com/lookup/doi/10.1136/bmj.h4060>
11. Raza M, Kler A, Hamouda A. Causes of failed discharges in day case Laparoscopic Inguinal Hernia Repair: Is there room for improvement? *J One-Day Surg* [Internet]. 2018;28(4):21-8. Available from: <https://bads.co.uk/for-members/journal-of-one-day-surgery-jods/?id=1337#collapse5>
12. HerniaSurge Group. International guidelines for groin hernia management. *Hernia* [Internet]. 2018 Feb;22(1):1-165. Available from:

- <http://www.ncbi.nlm.nih.gov/pubmed/29330835>
13. Kurzer M, Kark A, Hussain ST. Day-case inguinal hernia repair in the elderly: a surgical priority. *Hernia* [Internet]. 2009 Apr;13(2):131-6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19034602>
  14. Sanjay P, Jones P, Woodward A. Inguinal hernia repair: are ASA grades 3 and 4 patients suitable for day case hernia repair? *Hernia* [Internet]. 2006 Aug;10(4):299-302. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16583150>
  15. Pollard BJ, Elliott RA, Moore EW. Anaesthetic agents in adult day case surgery. *Eur J Anaesthesiol* [Internet]. 2003 Jan;20(1):1-9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/12553381>
  16. McCloy O, McCutcheon K. The day surgery experience from the perspective of service users. *Br J Nurs* [Internet]. 2016 Jul 14;25(13):736-9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27409781>
  17. Appleby J. Day case surgery: a good news story for the NHS. *BMJ* [Internet]. 2015 Jul 29;351:h4060. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26223680>
  18. Scarfe A, Duncan J, Ma N, Cameron A, Rankin D, Karatassas A, et al. Day case hernia repair: weak evidence or practice gap? *ANZ J Surg* [Internet]. 2018 Jun;88(6):547-53. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29573102>
  19. Putnis S, Merville-Tugg R, Atkinson S. "One-stop" inguinal hernia surgery--day-case referral, diagnosis and treatment. *Ann R Coll Surg Engl* [Internet]. 2004 Nov;86(6):425-7. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/15527579>
  20. Solodkyy A, Feretis M, Fedotovs A, Di Franco F, Gergely S, Harris AM. Elective "True Day Case" Laparoscopic Inguinal Hernia Repair in a District General Hospital: Lessons Learned from 1000 Consecutive Cases. *Minim Invasive Surg* [Internet]. 2018;2018:7123754. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29971162>