CAI
SALUS DUM VIGILAMUS
College of Anaesthesiologists of Ireland

Healthcare Pricing Office

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive
Clinical Strategy and Programmes Division

Anaesthesia
National Clinical Programme for Anaesthesiology

National Clinical Programme for Anaesthesia

National Audit of Emergency Readmission following day case procedures for 2018

May 2023

Introduction

Emergency readmission following a surgical procedure is now recognised as a measure of quality of care and of morbidity. In the UK National Health Service, avoidable emergency readmissions, regardless of the acuity or reason for the original admission, are not remunerated, leaving the local Hospital Trust to foot the bill (1). In Ireland the Health Service Executive (HSE) has set a target of less than 3% for emergency readmission within 30 days following surgical procedures (2), but there is a paucity of information on emergency readmission following day case surgery with an anaesthetic. The Royal College of Anaesthetists suggests an emergency readmission rate of 0.5% within 48 hours of discharge is acceptable following day case surgery with an anaesthetic (3) with one UK study giving a figure of 0.9% for emergency readmission within 28 days of discharge (4).

Since 2017 NCPA/HPO Annual Reports include data on the number of patients who had a day case procedure with an anaesthetic (5) and the Healthcare Pricing Office (HPO) has the capacity to identify any of these patients who subsequently required emergency readmission but only when the emergency readmission was to the same hospital where the original day case procedure was carried out. Not all hospitals that carry out day case procedures are in a position to readmit patients who get into difficulty following discharge, so these patients of necessity must be treated in a different hospital. However, they cannot be identified by the HPO as emergency readmissions because there is no National Health Identifier so the same patient will have a different medical record number (MRN) in a different hospital. Such cases would be lost to any audit. Despite this drawback, however we believe that data from the remaining hospitals would be very instructive and informative and could help to improve the practice of day case surgery and anaesthesia nationally.

Methods

A review of the national HIPE file for 2018 by the HPO identified 49 hospitals where a total of 75,272 day case procedures involving an anaesthetic had been carried out. Based on this review a further, more detailed examination of 37 hospitals was undertaken so as to identify any episodes of emergency readmission to these hospitals within two post-operative days of discharge.

A specific set of search instructions was then provided by the HPO to individual HIPE offices in these 37 hospitals to allow them to search their local hospital HIPE file for any patient who had a day case procedure involving an anaesthetic and, following discharge, was readmitted as an emergency to that hospital within 2 post-operative days of discharge.

At the same time a senior member of the anaesthesiology department in each of the 37 hospitals was contacted by one of the audit coordinators (JC) and invited to take part in the audit: 36 were in a position to do so (Appendix A). A contact anaesthesiologist was then identified in each department and the audit protocol and data collection sheets (Appendix B & C) were forwarded to them.

The audit is based on data retrieved from the case notes of patients who were readmitted as emergencies to the same hospital where they had had their original day case procedure.

A total of 75,272 day case procedures with an anaesthetic were carried out in 49 hospitals in 2018 (Figure 1).Out of this total, 61,904 (82.2%) were carried out in the 36 hospitals audited and these 36 hospitals represent 75% of all hospitals carrying out day case procedures with an anaesthetic.

Following searches by 36 local HIPE offices, 31 found cases of emergency readmission of day case patients and 5 found none. From the sub-group of 31 hospitals, a total of 122 data collection sheets were returned to the audit coordinators.

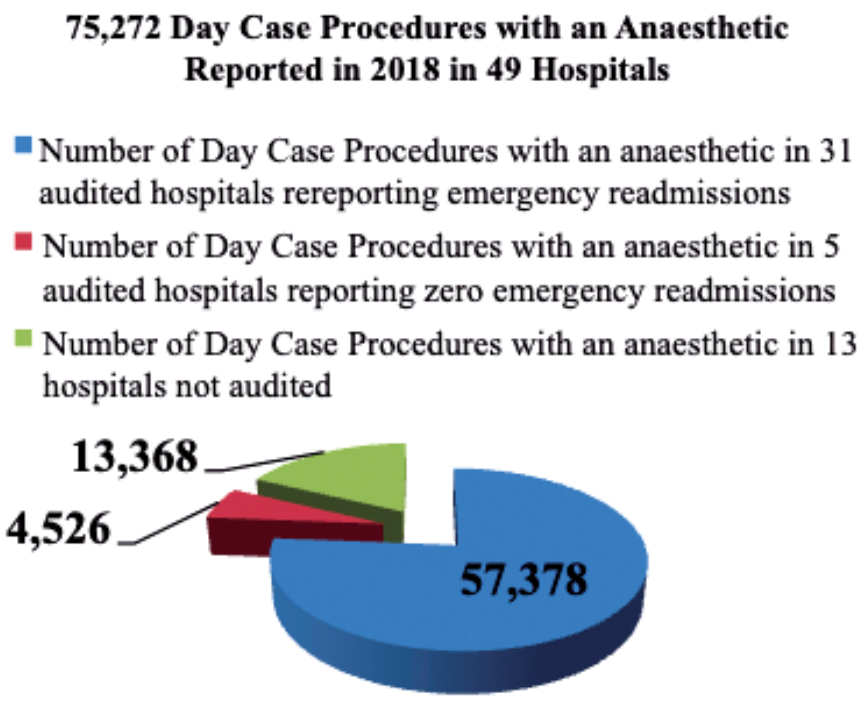
Five of these could not be included in the audit, either because of poor documentation, or the procedures had been conducted with sedation alone, or the procedure had been carried out with local anaesthesia alone, administered by the surgeon with no input from anaesthesiology.

A further seven cases required special consideration before being included in the audit: Five patients had been discharged from a day case facility and readmitted as emergencies to the same hospital campus, and two patients were admitted as emergencies to a Model 4 hospital having had their day case procedure at a Model 2 hospital in the same Hospital Group. Four of these patients were discharged from the day ward and two from the Post Anaesthesia Care Unit (PACU) and proceeded directly to emergency readmission and therefore registered zero time on the post-operative ward and/or for the interval between discharge and emergency readmission. However, as all these cases appear in the HIPE national file as emergency readmissions, the authors believe that they should be included in the audit.

The audit results are therefore based on 117 completed data collection sheets from 31 hospitals.

Fig 1

75,272 Day Case procedures with an anaesthetic reported in 49 hospitals in 2018



Results

Table 1	Patient Profile				Total
Gender					**Total**
Male	55				
Female	62				117
Age (yrs)					
<6	6 – 15	16 – 64	65 – 79	>79	
14	8	78	13	4	117
ASA Patient Score					**Total**
ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	
48	59	9	1	0	117

PATIENT PROFILE (Table 1)

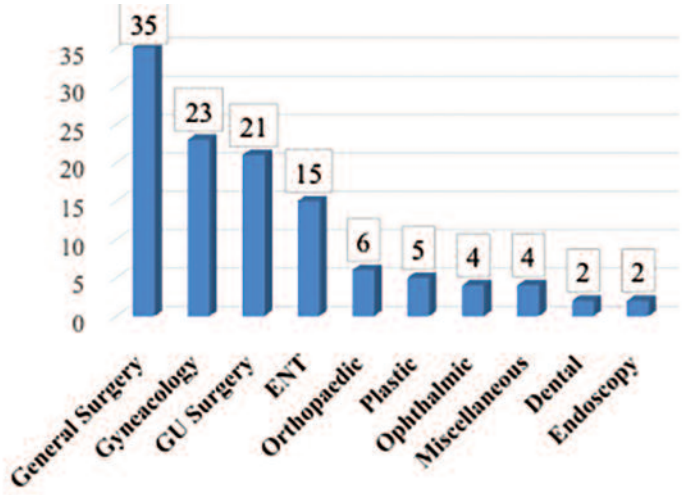
There were 55 male and 62 female patients.
The majority were aged 16 to 64 years.
22 (20%) were less than 16 years of age.
4 were 80 years or older.
41.0% were ASA 1,
50.4% ASA 2,
7.7% ASA 3 and
1.0% ASA 4.

ADMISSION CATEGORIES (Figure 2)

The data collection questionnaire did not ask for the name of the specialty under which the patient was admitted for the day case procedure but this was obvious from the procedure name, which was recorded on the data sheet. The only decision made by the audit coordinators in this regard was to include circumcision in the GU Surgery category.
The top four admission categories were General Surgery 29.9%, Gynaecology 19.7%, GU Surgery 17.9% and ENT 12.8%.
There were four non-surgical cases: one each in Radiology, Paediatric Medicine, Pain Medicine and Cardiology, which are grouped together under the heading Miscellaneous.

Fig 2

Number of Day Case Admission by Admission Category

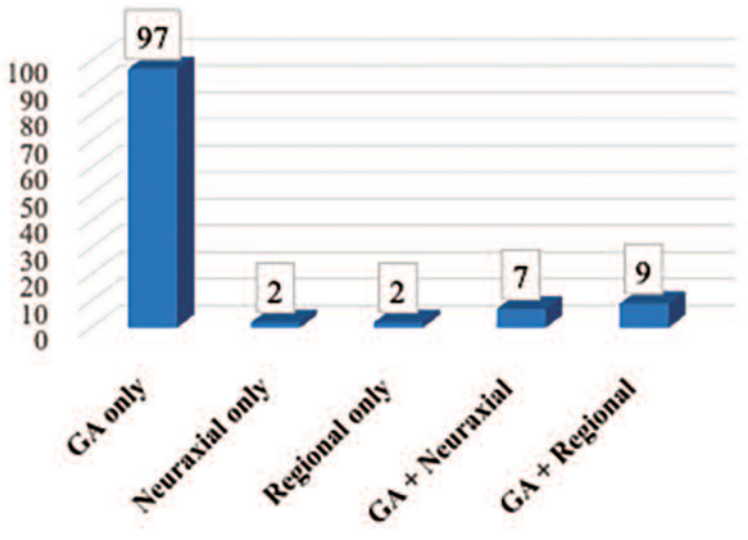


ANAESTHESIA PROFILE (Figure 3)

97 patients (82.9%) received a General Anaesthetic (GA) alone.
16 patients received a GA in combination with either a neuraxial block or a regional block.

Fig 3

Anaesthesia profile



The majority (11) of these patients were children aged less than 10 years having GU surgical procedures such as circumcision, orchidopexy or hypospadias repair.

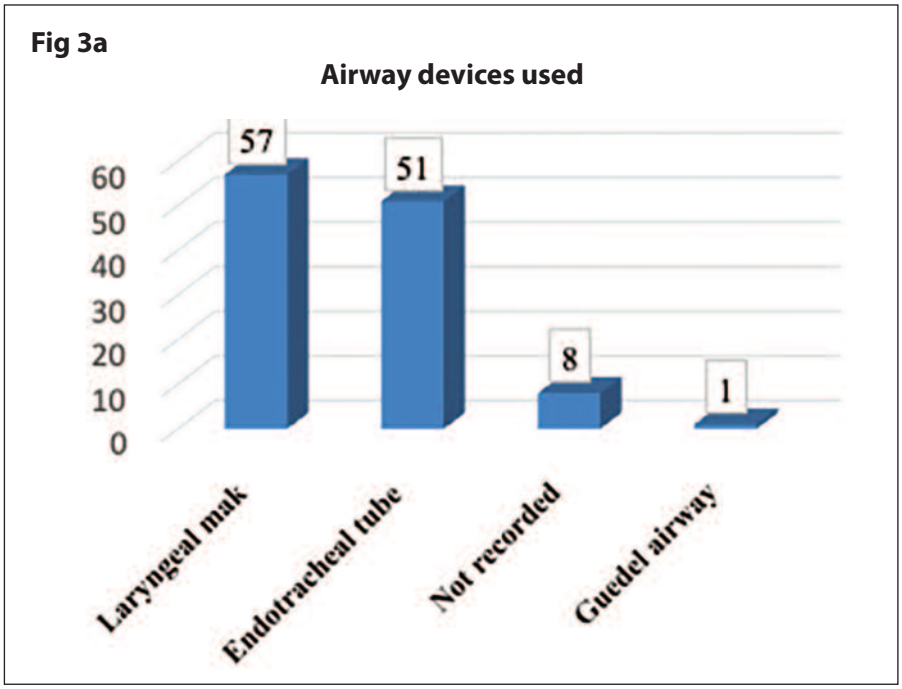
Two patients received neuraxial block only, for inguinal hernia repair, and two patients having ophthalmic procedures received a regional block only.

AIRWAY DEVICES USED (Figure 3a)

The laryngeal mask airway was the most frequently used airway device closely followed by the endotracheal tube.

No information was given on the type of airway used in 8 patients. A Guedel airway was used on just one occasion.

Fig 3a



TIME INTERVALS (Figure 4)

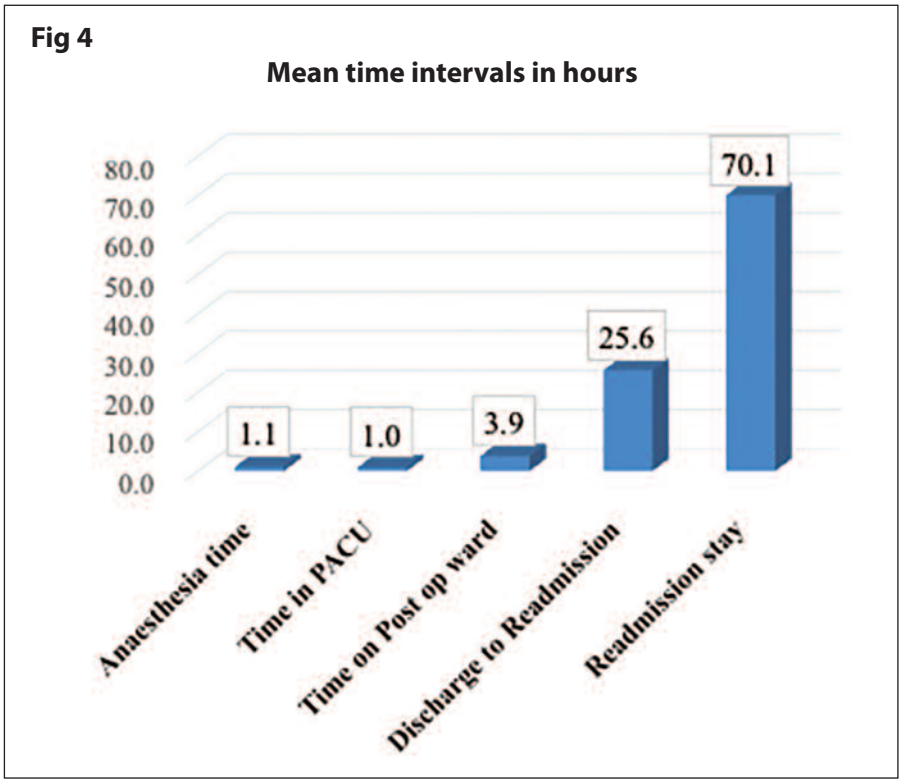
The mean anaesthesia time, i.e. the time from induction of anaesthesia to arrival in the PACU, was 1.1 hrs (range 0.2 – 3.3hrs).

The mean times spent in the PACU and the post-operative ward were 1.0 hrs (range 0.2 – 5.3 hrs) and 3.9 hrs (range 0.0 – 10.0) * respectively while the mean duration from hospital discharge to emergency readmission was 25.6 hrs (range 0.0 – 54.6 hrs)**.

Following emergency readmission patients remained in hospital for a mean of 2.9 days (range 0.14 – 32.9 days).

- **Four patients went directly from the post-operative ward to emergency readmission*
- ***Two patients went directly from the PACU to emergency readmission*

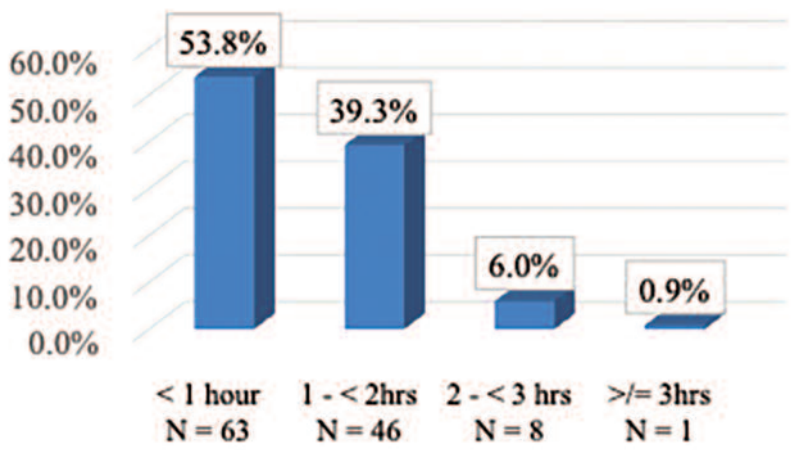
Fig 4



ANAESTHESIA TIMES (Figure 4a)

Over 50% of patients arrived in the PACU less than one hour after induction of anaesthesia and over 90% in less than two hours. One patient arrived in PACU 3 hours and 15 minutes after induction of anaesthesia.

Fig 4a



REASONS FOR EMERGENCY READMISSION (Table 2)

The majority of patients, 71, presented for emergency readmission because of pain or bleeding at the operative site (there was one wound dehiscence) or pain and discomfort in an area which had been examined or operated upon endoscopically, e.g. abdominal pain following laparoscopy, cystoscopy or hysteroscopy.

Table 2
***Presenting complaint at emergency readmission**

	Number	%
Wound and operative site related problems	71	60%
PONV	22	19%
Pyrexia	18	15%
Various system disturbances		
GU, Cardiovascular, Respiratory, CNS, Ophthalmic	29	24.8%
Other	7	6.0%
Anaesthetic	3	2.6%
Social	1	0.9%

**These are not mutually exclusive*

Table 2A
Wound problems requiring emergency readmission

Symptom	Number of patients	%
Pain only	34	48%
Bleeding only	24	34%
Pain and Bleeding	12	17%
Wound dehiscence	1	1%
Total	**71**	**100%**

Of 34 patients whose presenting complaint at emergency readmission was pain, (but not bleeding) 16 had undergone laparoscopic procedures including 10 laparoscopic cholecystectomies. A further 4 patients had undergone GU or gynaecological endoscopy procedures e.g. hysteroscopy or cystoscopy.

Of 24 patients whose presenting complaint was bleeding (but not pain), 6 had undergone circumcision and 5 tonsillectomy/ adenoidectomy. Only two of these patients had undergone an endoscopic procedure, both hysteroscopy.

29 patients presented with various system disturbances: 8 with urinary retention, 7 with cardiovascular problems including dysrhythmias, hypotension, and one with myocardial infarction requiring emergency stenting, 7 with respiratory problems including stridor, aspiration pneumonia and upper respiratory tract infection. One patient in the >79 age category required CPAP and Airvo: 5 patients presented with central nervous system (CNS) disturbance including stroke, cerebral infarct, syncope, paraesthesia, speech disturbance and migraine and 2 patients suffered a dropped lens following ophthalmic surgery.

22 patients presented with post-operative nausea and vomiting (PONV) and 18 presented with pyrexia. All but six of these patients also had at least one of the presenting complaints given in Table 2 - of the six that did not, four had either pyrexia or PONV and two had both.

7 patients were readmitted for a variety of "Other" complaints: 2 with anxiety, one each with a dislodged suction drain, tonsillitis unrelated to surgery, fractured lower limb in a child following a fall at home – (this patient's day case procedure was pinning of a fracture of the opposite lower limb), a definite allergic reaction, and psychosomatic limb pain unrelated to the site of surgery.

3 patients presented with complications related to anaesthesia. 2 had abrasions in the oropharynx following the use of an endotracheal tube and an LMA. One had pain and swelling at the injection site following extravasation of induction agent due to a misplaced intravenous cannula. The extravasation was noted immediately, the faulty cannula was removed, hyaluronidase administered and a new cannula inserted and the day case procedure went ahead uneventfully. Nevertheless the patient required emergency readmission 24 hours after discharge because of pain and swelling at the site of the extravasation.

One patient was readmitted for social reasons.

26 patients (22.2%) required surgical intervention, 22 of these (18.8%) with an anaesthetic.

All patients had a discharge date and time following their emergency readmission. The questionnaire did not ask for information on the discharge destination but remarks in the Comments section of four data sheets indicated that two patients had been discharged to a care/rehabilitation facility having suffered a stroke and an aspiration pneumonia respectively, and two patients had been discharged to Model 4 hospitals for further management, one to a High Dependency Unit (HDU) and one to an Intensive Care Unit (ICU).

DISCUSSION

The emergency readmission rate based on the data presented above is 0.2% (117 emergency readmissions out of a total of 61,904 day cases) which is well below the rate considered acceptable by the Royal College of Anaesthetists. However this figure of 0.2% must be interpreted with considerable caution. The 117 cases identified by the audit are emergency readmissions to the same hospital (or hospital group) where the original day case procedure was performed but we do not know how many patients were readmitted as emergencies to a different hospital.

This deficit may not be as significant as it first appears however because the results of this audit are based on data retrieved from 75% of all hospitals carrying out day case procedures and represents over 80% of all day case procedures carried out for the audit period. Also, there is no obvious reason why the incidence of emergency readmission from hospitals that were not audited might be any greater than that in the 36 hospitals that were audited so an emergency readmission rate of 0.2% might reasonably be applied to all 49 hospitals.

There is no doubt however that the inability to identify patients who required emergency readmission to a hospital other than the one where the original procedure was carried out was a significant impediment to the audit. HIPE does not have a means of identifying a patient who has a procedure in one hospital and is then admitted to another hospital because there is no National Health Identifier. As a consequence the same patient will have a different medical record number (MRN) in a different hospital. For this reason our audit could not identify such patients. The inability to track a patient's progress from one hospital to another further underlines the need for a National Health Identifier.

Despite the weakness of the data, a number of important points have emerged from the audit. The data collection sheet suggested that the reason for emergency readmission could be medical, surgical, anaesthesia or social, and these have been set out in a more expansive way in Table 2. This more expansive approach was taken because it is clear from the details that each readmission event, notwithstanding the small numbers, was highly significant for each individual patient and also added to the work of already stretched hospital emergency services.

The majority of patients, 71, were readmitted due to pain, discomfort or bleeding at the wound or operative site and 16 of these also complained of PONV. Adequate control of both of these post-operative symptoms is necessary if day case surgery is to be successful yet they were the two commonest reasons for readmission. Although 20 of these patients required a surgical intervention the majority were treated conservatively with analgesics, anti-emetics and fluids suggesting that greater emphasis on advice, information and adequate medication at the time of discharge could help to reduce the number requiring emergency readmission.

Of the remaining 46 patients whose presenting complaint at readmission was not wound pain or bleeding, 6 required surgery.

Three patients were readmitted because of problems directly related to the anaesthetic. This is a very small number out of a total of 61,904 anaesthetics but such episodes might reasonably be considered completely avoidable. The same could be said of the single instance of emergency readmission for social reasons.

Conclusion

This limited national audit indicates that the incidence of emergency readmission following a day case procedure with an anaesthetic is low. In theory, a prospective national audit of all emergency admissions could establish the true figure but in reality, such an approach appears impractical. The obvious and most practical solution would be the introduction of a national health identifier.

APPENDIX A

36 Hospitals contributing data to the audit with consultant and trainee Anesthesiologists

Hospital	Consultant Anaesthesiologist	Trainee Anaesthesiologist
Bantry General Hospital	Dr Srirangapatna Premnath	
Beaumont Hospital, Dublin	Dr Rory Dwyer	Dr Coilin Collins Smyth
Cavan General Hospital	Dr Jan van Haaster	
Connolly Hospital Blanchardstown	Dr Miriam Carroll	
Coombe Women & Infants University Hospital	Dr Stephen Smith	Dr Barbara Cusack
Cork University Hospital	Dr Dan Mullane	Dr Kirsten Joyce
Galway University Hospitals	Dr Kevin Clarkson	
Letterkenny University Hospital	Dr Kevin Bailey	
Mallow General Hospital	Dr Dan Mullane	
Mater Misericordiae University Hospital	Dr Roisin Ni Muircharthaig	
Mayo University Hospital	Dr Ciara Canavan	
Mercy University Hospital, Cork	Dr Jennifer Whyte	
Midland Regional Hospital; Mullingar	Dr Anne Bergin	Dr Tiarna Morris
Midland Regional Hospital; Portlaoise	Dr Ann Whitford	
Midland Regional Hospital; Tullamore	Dr Gerldine Morris	
Naas General Hospital	Dr Shakil Kazmi	Dr Anthony Thomas
National Maternity Hospital; Holles St; Dublin	Dr Roger McMorrow	Dr Grainne Rooney
Our Lady of Lourdes Hospital; Drogheda	Dr Anwar Maiilk	
Our Lady's Hospital; Navan	Dr Anwar Maiilk	
Portiuncula Hospital; Ballinasloe	Áine ni Chonchubhair	
Rotunda Hospital; Dublin	Dr John Loughrey	
Royal Victoria Eye and Ear Hospital; Dublin	Dr Deirdre McCoy	Dr Shakti Sawh-Connolly
Sligo University Hospital	Dr Jeremy Smith	
South Infirmary Victoria University Hospital	Dr Stephen Mannion	
St. Columcille's Hospital	Dr Michael O'Dwyer	Dr Rachel Horan
St. James' Hospital; Dublin	Dr Jennifer Porter	Dr Aoife Mableson
St. Johns Hospital; Limerick	Dr Catherine Motherway	
St. Luke's General Hospital; Kilkenny	Dr John Cudmore	
St. Vincent's University Hospital	Dr Michael O'Dwyer	Dr Rachel Horan
Tallaght University Hospital	Dr Ellie O'Leary	Dr Medhat Eldereny
Temple Street Children's University Hospital	Dr Thoman Howlett	Dhari Alrashed
UL Hospitals; Ennis Hospital	Dr Catherine Motherway	
University Hospital Kerry	Dr Hymayun Zaheer	
University Hospital Limerick	Dr Catherine Motherway	
University Hospital Waterford	Dr Vida Hamilton	Dr Lauren O'Callaghan
Wexford General Hospital	Dr David Honan	Dr Jean-Franscois Bonnet

APPENDIX B

NCPA/HPO
Day Case Emergency Readmission Audit Data Collection Sheet

Study period January 1st 2018 – December 31st 2018

Hospital Name _____ **Case reference number**_____ **(NOT MRN)**

Patient Gender._____ Age (yrs)._____ (NOT DOB) ASA status._____

Date of Procedure._____ Name of Procedure._____

B

Type of Anaesthetic (please tick appropriate boxes)

GA ☐ plus Neuraxial block ☐ plus Regional block ☐

or Neuraxial ☐ plus Regional block ☐

or Regional block ☐

Airway management ETT ☐ LMA ☐ Guedel ☐ Other ☐

C

Time of (24hr clock)

1. induction of GA _____
   Or
2. commencement of Neuraxial block_____
   Or
3. commencement of Regional block _____

D

Time of (24hr clock)

Arrival in PACU*_____

Discharge from PACU _____

Discharge from hospital _____

**Post Anaesthesia Care Unit*

E

Date of emergency readmission _____ **Time** of emergency readmission_____ (24hr clock)

Date of discharge from hospital _____ **Time** of discharge from hospital_____ (24hr clock)

APPENDIX B (continued)

NCPA/HPO
Day Case Emergency Readmission Audit Data Collection Sheet

Study period January 1st 2018 – December 31st 2018

Hospital Name _____ **Case reference number**_____ **(NOT MRN)**

PART 2

F

Please give a brief account of the reasons for the emergency readmission including presenting complaint(s), diagnosis and treatment. Reasons for readmission could be Surgical, e.g. bleeding, wound dehiscence, Medical e.g. pneumonia, DVT, Anaesthetic e.g. PONV, inadequate pain relief, Social e.g. inadequate home support, or any combination of these.

Presenting complaint(s):

Diagnosis:

Treatment:

COMMENTS:

APPENDIX C

Protocol for Audit of Emergency Readmission of Day Case Patients within two post-operative days of discharge

The audit project will be a retrospective analysis of data for the calendar year January 1st, 2018 to December 31st 2018. Individual departments of anaesthesiology and local HIPE offices will be invited to take part in the audit and the project will be a collaborative effort between the Healthcare Pricing Office (HPO), the National Clinical Programme for Anaesthesia (NCPA), departments of anaesthesiology and local HIPE offices. The Chairperson of the participating anaesthesiology department will be asked to nominate an audit coordinator, usually a consultant, and an assistant, usually a senior trainee, to conduct the audit in that hospital. The NCPA audit coordinators will liaise closely with the local audit team to ensure that the audit runs smoothly and in a timely manner.

The HPO will provide instructions to the local HIPE offices that will enable it to generate a list of MRN's of patients who were readmitted as an emergency to that hospital within 48 hours of discharge following a day case procedure which included an anaesthetic.
This list of relevant MRN's will allow the local audit team to review the case notes of day case patients who were readmitted as an emergency during the audit period and the information to be collected is set out in the attached data collection sheet.

Part 1 of the data collection sheet seeks information on the patient's age, gender and ASA status, the date and type of procedure carried out and the type of anaesthetic given as well as the duration of the procedure and the date of the emergency readmission. The type of anaesthetic (Part 1, section B) refers to general anaesthesia, neuraxial blocks (epidural, spinal or caudal) and regional blocks or any combination of these, but procedures carried out under infiltration of local anaesthesia alone or with sedation are not included. The duration of the procedure may influence the chances of an emergency readmission and for the purpose of this audit this period is from the start of anaesthesia to the time the patient arrived in the post anaesthesia recovery unit (PACU). We acknowledge that this time period could be further broken down into specific times for the start of anaesthesia, start of surgery, completion of surgery and arrival in PACU but we suspect that only the first and last of these times is consistently recorded on the anaesthesia record and the retrospective nature of this audit does not allow missing times to be recovered.

Part 2 of the data collection sheet seeks information on the reasons for the emergency readmission which may be surgical, medical, anaesthetic, social or a combination of these. The NCPA audit coordinators will be available to discuss and answer any queries that arise with this part of the questionnaire.

Once the list of relevant MRN's has been compiled and total number of case notes to be examined by the participating anaesthesiology department has been determined, a time period for completion of the data collection will be agreed, usually not exceeding six months. Completed data collection sheets will then be returned to and reviewed by the NCPA coordinators and a summary report will be prepared. The details of these summary reports will be exclusive to the individual anaesthesiology department but information which could help to raise standards in clinical practice will be publicised by the NCPA.

The support and advice of the senior coding manager at the local HIPE office will be crucial to the smooth progress of the audit particularly in relation to retrieval of MRN's of relevant patients. The HPO has written a set of instructions which will enable local HIPE offices to search their HIPE database and retrieve MRN's of emergency readmissions following day case procedures. This part of the audit requires time and expertise and can only be carried out by HIPE coders. Good communications between the local audit team and HIPE coders is therefore essential and we would suggest that a formal meeting take place before the audit begins and that regular informal meetings then occur until the audit is completed.

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