
# ASA 99 Pilot Audit Project Report

## Part 1

### Audit Results from 6 Departments of Anaesthesiology

September 2019

## Background

The anaesthetic record is an integral part of the patient's case notes and accurate completion of the anaesthetic record sheet every time an anaesthetic is administered is no more than best practice dictates. While anaesthetic record sheets vary considerably between anaesthesiology departments to reflect the range of case complexity and of case load, the concept of a minimum dataset for all anaesthetic record sheets is well established and includes, among other details, the patient's age, gender, ASA score and the urgency of the procedure[1,2.]

Since 2013 the National Clinical Programme for Anaesthesiology (NCPA) in conjunction with the Healthcare Pricing Office (HPO) and the College of Anaesthesiologists of Ireland have published Annual Reports describing the number of general anaesthetics, neuraxial blocks and regional blocks administered in public hospitals in Ireland and captured in HIPE[3].

These reports also include a profile of patient ASA scores and whether the procedure was carried out as an emergency, as indicated on the anaesthetic record sheet. However, the authors have drawn attention to the fact that a significant number of anaesthetic records do not appear to include the patient's ASA score (22% in the 2017 Annual Report) and only 11% of procedures are recorded as emergencies.

The patient's ASA score and the urgency of the procedure are vital pieces of information for the anaesthesiologist and the under recording of these two elements on the anaesthetic record has implications for patient safety and for standards of record keeping.

When HIPE coders are unable to find a patient ASA score or the use of the "e" modifier indicating an emergency procedure on the anaesthetic record, a code ASA 99 is assigned in the HIPE database.

In an attempt to discover the reasons for this under reporting of crucial data as evidenced by the high percentage of ASA 99 scores recorded in HIPE, the NCPA has conducted an ASA 99 pilot audit study in six departments of anaesthesiology.

The principal objective of the project was to determine the reasons for under reporting of this crucial data by examining a sample of anaesthetic records, reviewing the results and discussing these with coders in the local HIPE office.

The results of this ASA 99 pilot audit project are presented in this Report.

Part 1 of the Report sets out the results of the audit for all six departments of anaesthesiology and HIPE.

Parts 2 *a, b, c, d, e* and *f* of the Report sets out the results of the audit for each of the six departments of anaesthesiology and HIPE individually, so that each department and HIPE office only receives their own data.

The full study protocol and data collection sheet are given in Appendix 1and a Preliminary Report is given for the relevant hospital in Appendix 2

1. An anaesthetic minimum dataset and report format , British Journal of Anaesthesia 1994; 73: 256-260
2. https://www.rcoa.ac.uk/document-store/the-good-practice-guide
3. NCPA/HPO Annual Report 2017 available at hse.ie/anaesthesia – publications

# Conduct of the Project

Six departments of anaesthesiology and their local HIPE offices took part in the project.

A sample of anaesthetic records coded ASA 99 by HIPE were examined retrospectively for a three month period in each department.

Three departments examined the final quarter of 2016, two departments examined the first quarter of 2017 and one department examined the first quarter of 2018.

For each participating department the Healthcare Pricing Office (HPO) assisted the HIPE offices in the hospitals with compiling the following:

(a) The number of anaesthetics administered during the audit period.

(b) The number of ASA 99 codes recorded by HIPE during the audit period.

(c) A list of MRN's of patients coded ASA 99 by HIPE during the audit period.

In each department the local audit assessors (consultant and/or registrar) then conducted a review of a sample of approximately 100 patient case notes and anaesthetic records which were coded ASA 99 in HIPE for the audit period.

Data describing patient demographics, the urgency of the procedure, day of the week, time of the procedure and the presence or absence of the clinician signature on the anaesthetic record were collected and recorded on a standardized data collection sheet which included a section for comments. See Appendix 1.

If the audit assessors concluded that an ASA 99 code recorded in HIPE was incorrect, they were encouraged to discuss the case with coders in the local HIPE office and to give a brief account of the reasons for the incorrect code in the comments section of the data collection sheet or communicate directly with the audit coordinator.

Audit coordinators (JC & JS) communicated regularly with the audit assessors during the audit period.

Completed data collection sheets were returned to the audit coordinator who checked the data and compiled,

1. a preliminary report for each individual anaesthesiology department and HIPE office. See Appendix 2
2. a final Report for each individual anaesthesiology department and HIPE office
3. a composite Report based on data from all six anaesthesiology departments.

## Results Overview

| Table 1 | |
|---|---|
| Total number of anaesthetics given in the audit period | **10,621** |
| Total number of anaesthetic records coded ASA 99 in the audit period | **3,283** |
| Total number of anaesthetic records coded ASA 99 reviewed and included in the audit | **479** |
| Percentage of anaesthetic records coded ASA 99 reviewed and included in the audit | **14.6%** |
| Percentage of total anaesthetics given in the audit period coded ASA 99 | **30.9%** |

Table 1 comment

10,621 anaesthetics were administered in the six anaesthesiology departments during the 3 month audit period(s).
3,283 anaesthetic records were coded ASA 99 in HIPE (30.9%)
507 data collection sheets were returned from the six audit assessors.
28 of these could not be used because of missing data.
Data from 479 data collection sheets are therefore included in this audit report, which represents 14.6% of all anaesthetic records coded ASA 99 in HIPE for the 3 month audit period(s).

| Table 2 | |
|---|---|
| Number of Male patients | 215 (44.9%) |
| Median age | 46yrs (20 – 61) |
| Male emergencies | 54 (25.1%) |
| Number of female patients | 264 (55.1%) |
| Median age | 39 (26 – 59) |
| Female emergencies | 105 (39.8%) |

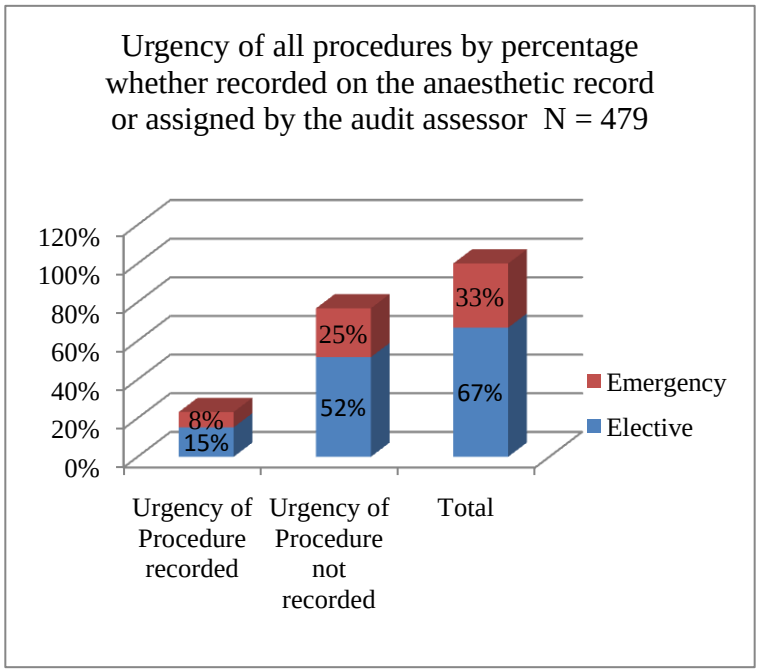
Table 2 Comment

There were 215 anaesthetic records of male patients with a median age of 46yrs.54 of these cases (25.1%) were emergencies.

There were 264 anaesthetic records of female patients with a median age of 39yrs.105 of these cases (39.8%) were emergencies.

## Results Urgency of the procedure & Timing of the procedure

Figure 1

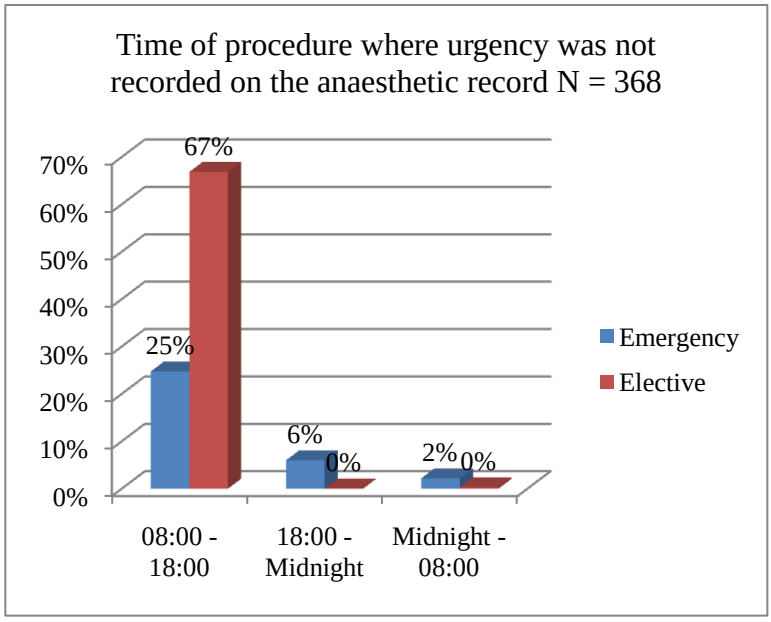



On reviewing individual anaesthetic records, assessors noted whether or not the urgency of the procedure had been recorded. Where the urgency had not been recorded, the assessor reviewed the case notes and then assigned an appropriate urgency in the data collection sheet.

Details of the urgency of all 479 procedures whether recorded on the anaesthetic record or assigned by the audit assessor are given in Figure 1.

77% (368) of anaesthetic records did not record the urgency of the procedure - 23% (111) did.

Figure 2

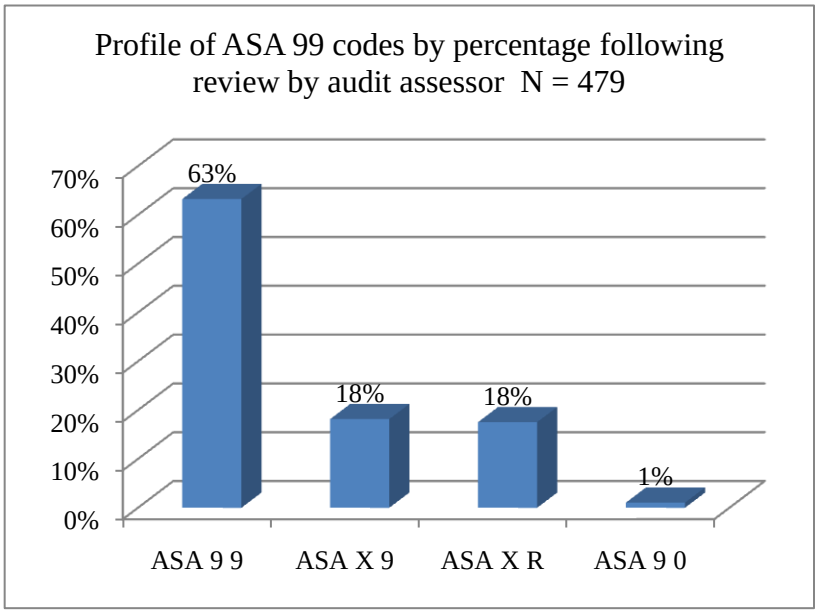



77% (368) of anaesthetic records did not record the urgency of the procedure (ASA 99 = 281, ASA *X*9 = 87). The time at which the procedure was carried out was noted to see if there was an association between out of hours working and failure to record the urgency of the procedure.

92% (337) of these procedures were carried out within normal working hours. Just 8% occurred after 6pm.

## Results Re-coding of HIPE ASA codes & distribution of all ASA codes

Figure 3




ASA *X* above signifies any ASA score (1, 2, 3, 4, or 5). The letter R indicates that the urgency of the procedure was recorded but does not distinguish emergency from elective. The digit 0 indicates the procedure was recorded as an emergency on the anaesthetic record.

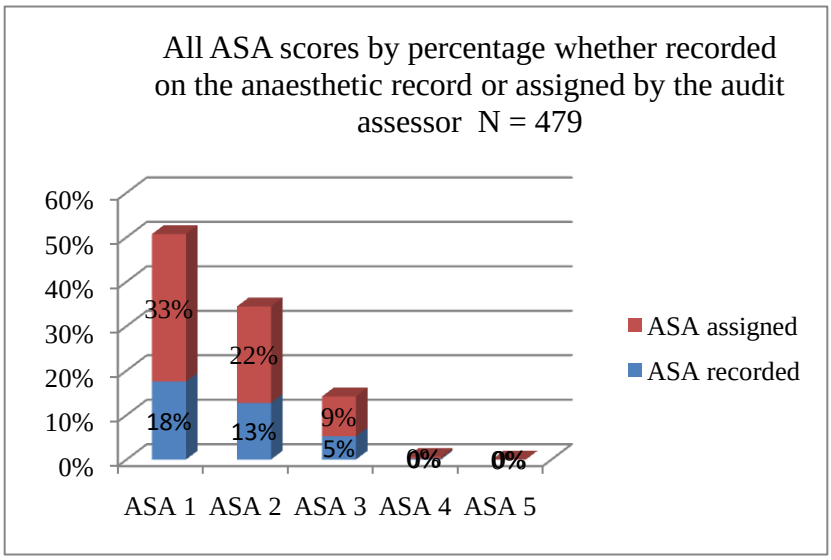
All anaesthetic records reviewed by the audit assessors had already been coded ASA 99 by HIPE coders, that is, neither the ASA score or use of the "e" modifier could be found on the anaesthetic record.

Following review, the assessor either confirmed the ASA 99 code as correct and entered the details in the data collection sheet, or entered an ASA code that indicated what had been recorded on the anaesthetic record.

An ASA 99 code was correct on 63% of anaesthetic records reviewed and incorrect on 37%. A profile of all 479 ASA codes is shown in Figure 3.

For a more detailed account of Figure 3 sees appendix 3.

Figure 4



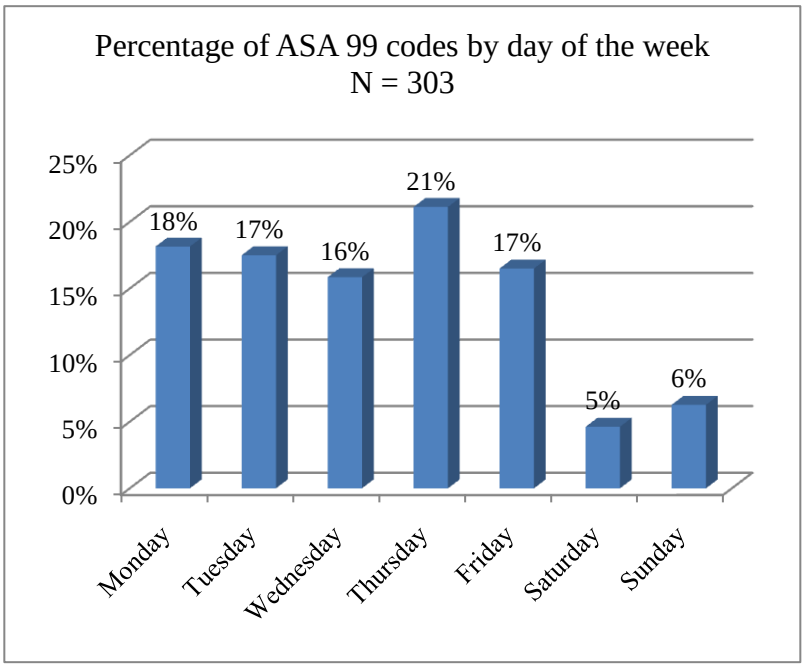

Where an ASA score had not been recorded on the anaesthetic record, the audit assessor assigned the appropriate score in the data collection sheet having reviewed the case notes.

Figure 4 gives all 479 ASA scores and indicates whether they had been recorded on the anaesthetic record or assigned by the audit assessor.

ASA I accounted for 51% of all scores, ASA 2 for 34%, ASA 3 for 14%, and ASA 4 for 0.6%. There were no ASA 5 scores.

## Results ASA 99 codes by the day of the week & time of day

Figure 5

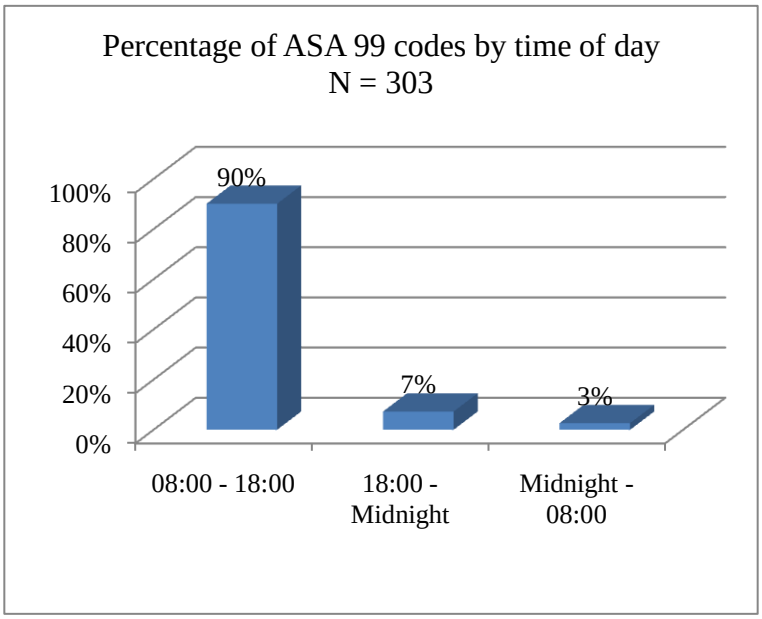



303 anaesthetic record sheets did not record an ASA score or the urgency of the procedure and were correctly coded ASA 99. Figure 5 describes the day of the week on which the procedure was carried out.

Cases were distributed fairly evenly over the days of the week, with a small peak of 21% on Thursday.

The smallest number of cases, 11 %, occurred at the weekend.

Figure 6



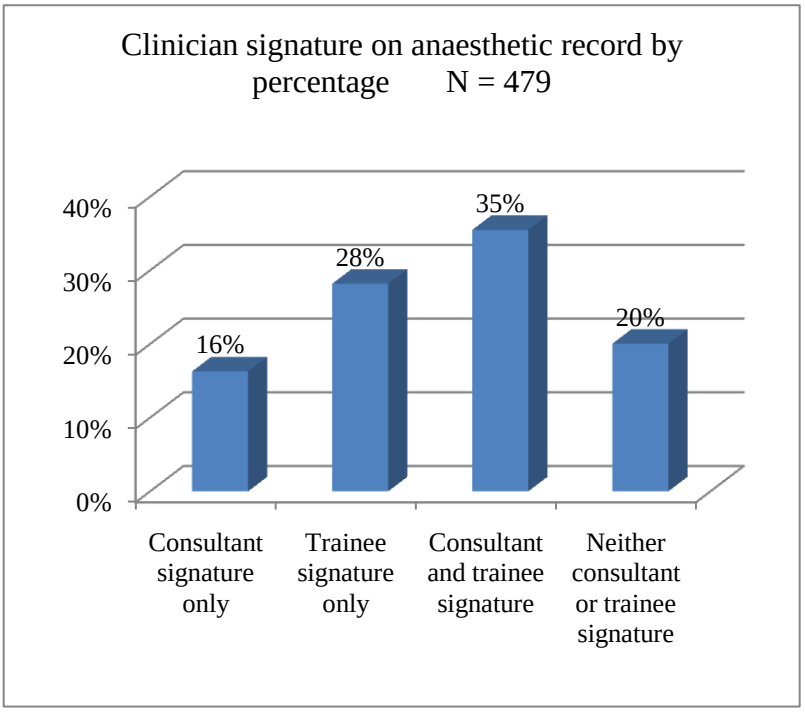

The time at which procedures with an ASA 99 code were carried out was also noted.

90% of these procedures took place between 08:00hrs and 18:00hrs

3% took place between midnight and 08:00hrs.

## Results Clinician signature on the anaesthetic record

Figure 7




Audit assessors examined the anaesthetic records to identify the signature of the clinician who had given the anaesthetic and/or the clinician in overall charge of the case.

35% of anaesthetic records had both consultant and trainee signatures but in 20% of cases no signature of the clinician(s) responsible for the anaesthetic could be found

## Principal findings and discussion

1 64% of anaesthetic records examined did not have a patient ASA score and 77% did not record the urgency of the procedure.

2. Multiple non uniform anaesthetic record sheets in the same department was the commonest reason for under recording of the ASA score and urgency of the procedure by anaesthesiologists and for the incorrect ASA 99 coding in HIPE.

3. 20% of anaesthetic records had neither a consultant or trainee anaesthesiologist signature.

4. 90% of cases coded ASA 99 occurred between 08:00hrs and 18:00hrs

5 ASA 99 codes were distributed evenly over the days of the week. There was a small peak of 22% on Thursdays. Only 11% of cases occurred at the weekend (Saturday/Sunday).

6. The male to female patient ratio was 4:5. 33% of cases were emergencies.

When interpreting the results of this study it important to remember that it is a pilot study conducted in 6 hospitals of varying size and workloads. Although the duration of the study (3 months) was the same for each hospital, the timing was not.

Nevertheless, the results are very informative and shed considerable light on why ASA 99 codes are recorded so frequently in HIPE.

Overall 15% of the 3,283 ASA 99 codes for the study period were examined but the percentage varies considerably between anaesthesiology departments ranging from 6% to 88%. This variation is indicative of the wide range of workloads between the six departments and consequently the number of ASA 99 codes. Four departments reviewed over 90 anaesthetic records each. Another department reviewed 66 records representing 88% of all ASA 99 codes for the study period.

All the anaesthetic records reviewed in the study had been coded ASA 99 by HIPE. However audit assessors discovered an ASA score on 36% of these and an urgency of procedure on 23%. Information gleaned from the comments section of the data collection sheets and from discussions between audit assessors and HIPE coders identify the presence of multiple non uniform anaesthetic records, including electronic records, in the same department, as the main source of these errors. Anaesthetic records used for recording epidurals given for pain relief in the labour ward serve as a good example. All labour wards use the National Maternity Healthcare Record (NMHCR) which includes an anaesthetic record. However this anaesthetic record does not have a patient ASA score tick box or prompt so this information is frequently omitted by the anaesthesiologist. Matters are further complicated by the fact that some anaesthesiology departments do not use the anaesthetic record contained in the NMHCR, but have their own separate anaesthetic record, which the HIPE coders may be unaware of.

The lack of a of a consultant or trainee anaesthesiologist signature on 20% of anaesthetic records examined is a significant finding but it must be acknowledged that two departments account for the majority of these with no anaesthesiologist signature in over 50% of cases in each. While the signature of the anaesthesiologist who conducted the pre anaesthesia assessment was present on some of these records, the signature of the anaesthesiologist who administered the anaesthetic was not.

The vast majority of cases coded to ASA 99, including emergencies, were conducted within normal working hours, i.e. 08:00hrs to 18:00hrs, and with the possible exception of Thursday, were distributed evenly throughout the week. There does not appear to be any connection between failure to record an ASA score and the urgency of the procedure and the timing of the case. That so few emergency cases occurred "out of hours" is striking but it must be remembered that these data come from a sample of a sub group of cases coded ASA 99 in a three month period.

The male to female ratio of 4:5 is consistent with the figures in previous NCPA/HPO Annual Reports.

An emergency rate of 33% is higher than the figure in previous NCPA/HPO Annual Reports and is much closer to that reported in the NAP 5 Report [4]

Notwithstanding the caution that must be exercised when interpreting the results of this pilot study, two clear positives have emerged. Firstly, the study has raised awareness of the importance of a high standard of anaesthatic record keeping and it has identified some of the current deficits. Secondly, the positive interactions that have occurred between departments of anaesthesiology and their local HIPE offices during the conduct of the audit have laid the foundations for a much closer working relationship between clinicians and HIPE personnel which will improve standards of record keeping and of data recording.

The commitment of the local HIPE offices to this project has been crucial and the HPO has now introduced an "edit alert" to all HIPE databases which alerts the HIPE coder every time an ASA 99 code is entered. This new tool will allow the audit project to continue in more hospitals with information immediately available to the audit assessors so that coding errors and failures to record ASA scores and urgency of procedures on anaesthetic records can be seen and corrected immediately.

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4. Who operates when, where and on whom? A survey of anaesthetic-surgical activity in Ireland Anaesthesia 2014: 69: 961 – 8

Appendix 1

## NCPA/HPO ASA 99 Pilot study Protocol

Individual anaesthetic departments and HIPE offices will be invited to take part in a pilot study which will be a collaborative effort between the anaesthetic department, the local HIPE office and the Healthcare Pricing Office (HPO). To begin with the HPO will provide a report describing the total number of general anaesthetics, neuraxial blocks and region blocks administered in the participating hospital for a study period of three months.

The HPO will also provide a list of cases for the study period where HIPE recorded the patients' ASA status as ASA 99, that is, no indication of the patients' ASA status or the urgency of the procedure (emergency/elective) could be found by HIPE coders on the anaesthetic record sheet. This list will be sent from the HPO to the HIPE office of the participating hospital for review at chart level. The percent of ASA 99 cases for the study period can be calculated and compared with the national figure which is given in the NCPA/HPO Annual report. The list of ASA 99 cases will allow the relevant anaesthetic record sheets to be recovered from the patients' hospital records for review.

These ASA 99 anaesthetic record sheets will then be examined jointly by the hospital's anaesthetic department and the local HIPE office to try to discover why HIPE could not identify the patient ASA status or the urgency of the procedure. A standard data collection sheet (see Appendix 2) will be used for this part of the audit. The number of anaesthetic record sheets with an ASA 99 coding will vary from hospital to hospital and could be large, but details from a subset of about 100 cases should be sufficient to allow us to draw meaningful conclusions. A standard report format will be used to describe the results.

While the outcome of the audit in any particular hospital will be for internal use only, any general conclusions which might be applicable to other hospitals will be publicised to promote data quality improvement across the system.

## NCPA/HPO ASA 99 Pilot study data collection sheet

Name of Hospital _____

Patient MRN _____

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1. Does the patient anaesthetic record sheet clearly indicate

   (a) Patient ASA score? _____Yes/No

   (b) Urgency of procedure (elective or Emergency) ?_____Yes/No

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2. Age of Patient (yrs) _____
3. Gender _____
4. Patient ASA score (auditors assessment if not given on anaesthetic record)_____
5. Urgency of Procedure (auditors assessment if not given on anaesthetic record)._____
6. Date of procedure_____
7. Time of procedure (24hr clock) _____
8. Signature on anaesthetic record sheet consultant? ----------Yes/No

   Trainee?----------Yes/No

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Comments:

Appendix 2

NCPA/HPO ASA Pilot Audit study Preliminary Report

Audit Results from 6 Departments of Anaesthesiology

| | Number | Percent |
|---|---|---|
| Male Patient Records | 215 | 44.9% |
| Female Patient Records | 264 | 55.1% |
| Total Patient Records | 479 | 100% |
| | | |
| Emergency Cases | 159 | 33.2% |
| Elective Cases | 320 | 66.8% |
| | | |
| Actual ASA | | |
| ASA 1 | 243 | 50.7% |
| ASA 2 | 165 | 34.4% |
| ASA 3 | 68 | 14.2% |
| ASA 4 | 3 | 0.6% |
| ASA 5 | 0 | 0.0% |
| | | |
| ASA 99 code (correct HIPE code) | 303 | 63.3% |
| Urgency of procedure not recorded | 368 | 76.8% |
| | | |
| Consultant signature only | 78 | 16.3% |
| Trainee signature only | 135 | 28.2% |
| Neither Consultant or Trainee signature | 96 | 20.0% |
| Both Consultant and Trainee signature | 170 | 35.5% |
| | | |
| ASA 99 codes by day of the week | | |
| Monday | 55 | 18.2% |
| Tuesday | 53 | 17.5% |
| Wednesday | 48 | 15.8% |
| Thursday | 64 | 21.1% |
| Friday | 50 | 16.5% |
| Saturday | 14 | 4.6% |
| Sunday | 19 | 6.3% |
| | | |
| All procedures by time of day | | |
| 08:00 - 18:00 | 432 | 90.2% |
| 18:00 - Midnight | 35 | 7.3% |
| Midnight - 08:00 | 12 | 2.5% |

Appendix 3

The ASA score and the emergency modifier "e" are the two elements that make up the ASA code.

The digit in the first position after the letters ASA indicates the patient ASA score, 1, 2, 3, 4, or 5, while the digit 0 in the second position indicates that the "e" modifier was used, indicating an emergency.
Example: *ASA 30 indicates that a patient ASA score of 3 was recorded on the anaesthetic record and the "e" modifier was used, indicating an emergency procedure.*

If no patient ASA score was recorded on the anaesthetic record, the digit 9 is used in the first position and if the "e" modifier was not used, the digit 9 is also used, in the second position.
Example: *ASA 99 indicates that the patient ASA score was not recorded on the anaesthetic record and the "e" modifier was not used.*

The digit 9 in the second position does not distinguish between an emergency procedure where the anaesthetists omitted to use the "e" modifier, and an elective procedure, even if the elective nature of the procedure is clearly recorded on the anaesthetic record. However, the audit assessors were able to make this distinction by examining patient case notes and anaesthetic records. Figure 3 in the Report displays the results of that examination and the table below gives a more detailed account.

If the letter *X* indicates any ASA score, 1, 2, 3, 4, or 5, and the letter R indicates that the urgency of the procedure was recorded on the anaesthetic record, there are 4 possible combinations for the ASA code.

| ASA Score | Urgency of procedure |
|---|---|
| (1).Not recorded (9) | not recorded (9) - could be emergency or elective |
| (2). Recorded (*X*) | not recorded (9) - could be emergency or elective |
| (3). Recorded (*X*) | recorded (R) - could be emergency or elective |
| (4). Not recorded (9) | recorded (R) - could be emergency or elective |

Applying the actual figures from the audit gives the following table on which Figure 3 in the Report is based.

| | | Emergency | | Elective | | | |
|---|---|---|---|---|---|---|---|
| (1). | *ASA 99* | 99 | + | 182 | = | 281(59%) | *(+22=63%) |
| (2). | *ASA X*9 | 22 | + | 65 | = | 87 (18%) | |
| (3). | *ASA XR* | 33 | + | 51 | = | 84 (18%) | |
| (4). | *ASA 9R* | 5 | + | 22 | = | 27 (6%) | *(-22=1%) |
| | | 159 (33%) | + | 320 (67%) | = | 479 (100%) | |

*One final point – (4).above, *ASA9R*, includes 22 elective cases for which the correct HIPE code is ASA 99 so in figure 3 in the Report these have been taken from the last column and added to the first column. As the *ASA9R* now only contains recorded emergencies, the correct code is ASA 90.

## Acknowledgements

The NCPA acknowledges the support and expertise of the following people and the institutions they represent in preparing this report.

Six Departments of Anaesthesiology and local HIPE offices that took part in this Pilot Audit Project

| | |
|---|---|
| Healthcare Pricing Office | Ms Jacqui Curley |
| | Ms Deirdre Murphy |
| | Ms Laura Metcalfe |
| | Mr. Brian McCarthy |
| College of Anaesthesiologists of Ireland | Dr Brian Kinirons, President |
| | Mr. Martin McCormack, CEO |
| NCPA Working Group Members | Ms Una Quill, NCPA Programme Manager |
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