

APPENDIX 2 NRLS database analysis results

Methodology

Database search

Inclusion criteria for the search were all cases with evidence of nasogastric tube misplacement at any site outside the stomach entered into the National Reporting and Learning System (NRLS) database from the date of inception in October 2003 to 28th February 2009. Exclusion criteria were all paediatric cases as the safety guideline was applicable only to adults.

Case selection and Analysis

The narratives from the initial NRLS dataset were further examined to identify cases of nasogastric tube misplacement in any site outside the stomach. Two independent reviewers classified the adverse event reports according to whether or not current NPSA safety alert guidelines were followed prior to enteral feed being commenced. This was only possible for those reports that included sufficient information in the narratives. For reports that described tube feed or medication being administered via incorrectly placed nasogastric tubes, the reason for this was identified and classified.

The classification of the failure to correctly identify a misplaced tube originated from process mapping based on the existing and proposed safety guidelines.

Results

The number of incidents found from the NRLS database using the predefined search terms was a total of 2368 adverse event reports. Further examination of these reports yielded a total of 104 cases with documented feeding tube misplacement. The outcomes of tube misplacement in terms of patient harm are summarised in Table A1. In 29 reports there was too little information to support further analysis of the checking procedure employed to identify tube misplacement. Of the 75 narratives which allowed for further analysis, 11 reports described the wrong location of NG tube being discovered prior to feed or medication administration. These 11 cases included 5 incidents of tube misplacement identified by a tube aspirate pH > 5.5 followed by chest radiography and 6 incidents identified by chest radiography alone. For the remaining 64 cases in which the correct test was not used to locate the nasogastric tube or the results were incorrect, analysis of the reasons for failing to identify tube placement prior to tube use was performed and the results detailed in Table A2.

Table A1. Patient harm resulting from feeding tube misplacement – NRLS database

Effect on patient	No. of cases
Death	6
Severe harm	15
Moderate harm	23
Low harm	17
No harm	43

Table A2 (Table 3 in the main text). Mode of failure to identify tube misplacement

Type of failure	No. of cases
pH test correctly carried out but invalid (pH <5.5 but tube not in stomach)	10
pH test wrongly interpreted (thought OK if pH = 6)	1
Aspiration used as checking procedure; unclear whether pH tested	5
Bubble or Whoosh test used as only checking procedure	2
CXR incorrectly interpreted	25
Correct test indicated tube in stomach but tube moved prior to starting feed	4
No action taken to assess tube placement	12
CXR done but not checked prior to feeding	2
Other (misinterpretation of CXR report) (CT scan misreported)(direct vision and no further checks)	3
Total	64

Chest radiographs were misinterpreted by the junior House Officer in 4 cases and the Senior House Officer in 6 cases, while it was not clear what level of doctor misread the radiograph in 14 cases. The chest radiograph from the wrong date was reviewed in 2 cases of tube misplacement.