

Reducing the risk of retained throat packs after surgery

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Supporting information

Acknowledgement

The National Patient Safety Agency (NPSA) would like to thank the below contributors for their help in producing this guidance:

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Introduction

Throat packs are used in patients undergoing certain surgical procedures under general anaesthesia to:

- absorb any blood, other bodily or external fluids or other material that may seep into the back of the patient's throat and enter the oesophagus or lungs during surgery in the mouth (oral surgery)
- to seal the area around the tracheal tube during provision of general anaesthesia and the surgical procedure, and thus prevent leakage of gases
- stabilise the tracheal tube or a supraglottic airway device and thus prevent its displacement during the surgical procedure.

Throat packs have been used in surgery for over 150 years and are traditionally made of woven gauze or other soft fabrics. Currently, materials such as polyurethane foam are also being used.

Throat packs are removed either after the surgical procedure while the patient is still in the operating theatre or when the patient is in the recovery room or the intensive care unit (ICU). Leaving a throat pack *in situ* is associated with a high risk of obstruction of the patient's airway.¹

The problem of retention of throat packs was recognised as early as 1858, when John Snow, a leading protagonist in the development of anaesthesia, wrote 'I never allow a cork or any such substance being put into a patient's mouth when insensible unless it is well tied to a string, lest it be swallowed'.² Although some express disbelief that such a problem can occur, others still witness it. As a Clinical Director told the National Patient Safety Agency (NPSA): 'I have heard of many occasions

when a throat pack has been forgotten or very nearly forgotten' (personal communication, M Nel, 2007).

Collecting and analysing the evidence for the risk of retention of throat packs

A working party was drawn from the Royal College of Anaesthetists (RCoA), the Association of Anaesthetists of Great Britain and Ireland (AAGBI), the Association for Peri-operative Practice, (AfPP), the College of Operating Department Practitioners (CODP), and the NPSA. The working party gathered information and data on throat pack retention by:

- conducting a literature search;
- reviewing incidents of throat pack retention reported to the NPSA;
- requesting the NHS Litigation Authority (NHSLA) for reports of litigation involving throat pack retention;
- requesting professional medical defence organisations for details of any instances of reported throat pack retention;
- calling professional bodies for reports of and methods to minimise throat pack retention.

Findings

Published literature

Use of throat packs is more common in the UK than in the USA (personal communication, J Davies, 2007). The literature search revealed several case reports and letters and a few randomised trials on the topic of throat packs.

A large proportion of the reports on throat packs focused on their role in the etiology of sore throats in the post-operative period,³⁻⁵ rather than on their retention. One randomised controlled trial that looked at the usefulness of throat packs in preventing postoperative nausea and vomiting (PONV) also looked at the incidence of sore throats caused by throat packs. The authors found that the throat packs did not reduce the incidence of PONV but increased the incidence of postoperative sore throat, and they called into question the use of throat packs at all.⁶

The few reports of retention of throat packs⁶⁻¹² have highlighted both the problems that increase the risk of this patient safety incident and methods to prevent it happening.

In 1977, in a letter to the editor of the *BMJ*,⁶ the late author referred to the death of a child from a retained throat pack, and stated that those who use 'this useful but dangerous technique must establish a foolproof system' to ensure its timely removal. 'Responsibility for the removal of the pack devolves on the person who inserted it, but all who are present must see it removed... This is particularly important... when there is a change of anaesthetist.' Najjar and Kimpson⁷ also drew attention to information being lost during lengthy surgical procedures in which there is a changeover of operating staff.

Crawford described leaving a length of the pack hanging outside the mouth as a reminder.⁶ Najjar and Kimpson⁸ suggested that this practice may cause a problem as there was a risk of operative instruments getting caught in the throat pack's fabric,

and recommended attaching a suture to the pack, and placing the suture in a prominent place to act as a reminder. Other authors have suggested suturing the pack to the artificial airway device,^{6,8,11} putting a label on the patient's forehead,^{6,7,11} the airway¹⁰ or on the anaesthetic machine,¹² and marking the pack with radio-opaque material.¹¹ It has been stated that the overall responsibility lies with the anaesthetist.^{6,10}

More recently in 2008 in the UK, Blackburn and Knepil carried out a national survey on oral surgical practices with regard to retention of throat packs.¹³ The results of the survey showed:

- nine per cent of respondents did not use throat packs, and only 39 per cent always used them;
- the anaesthetist usually placed (82 per cent), but less frequently removed (34 per cent), the throat pack;
- most respondents used 'bandage' rolls (78 per cent), and a few used Raytex™ swabs (18 per cent);
- 22 per cent of respondents were aware of incidents involving retention of throat packs in the previous five years;
- 29 per cent used the method of 'swab count' to ensure removal of the throat pack.

The following reasons were given for retention of the throat pack:

- surgeon stating that the pack had been removed when it clearly had not been removed (5);
- 'change' of anaesthetist during the operation (5);
- throat pack 'forgotten' by the whole surgical team (4);
- anaesthetist unfamiliar with head and neck surgery (3);
- additional packs placed during the procedure (2);
- unexpectedly rapid recovery(2).

The authors of the survey proposed that all organisations should have a policy in place on use of throat packs. They suggested that the policy should include the following:

- the reasons for use of throat packs, as agreed by the surgeon and anaesthetist for each patient;
- clear, written procedures to avoid retention, which should include stating that ensuring removal was the responsibility of the person who inserted the pack and inclusion of the pack in the 'swab count'.

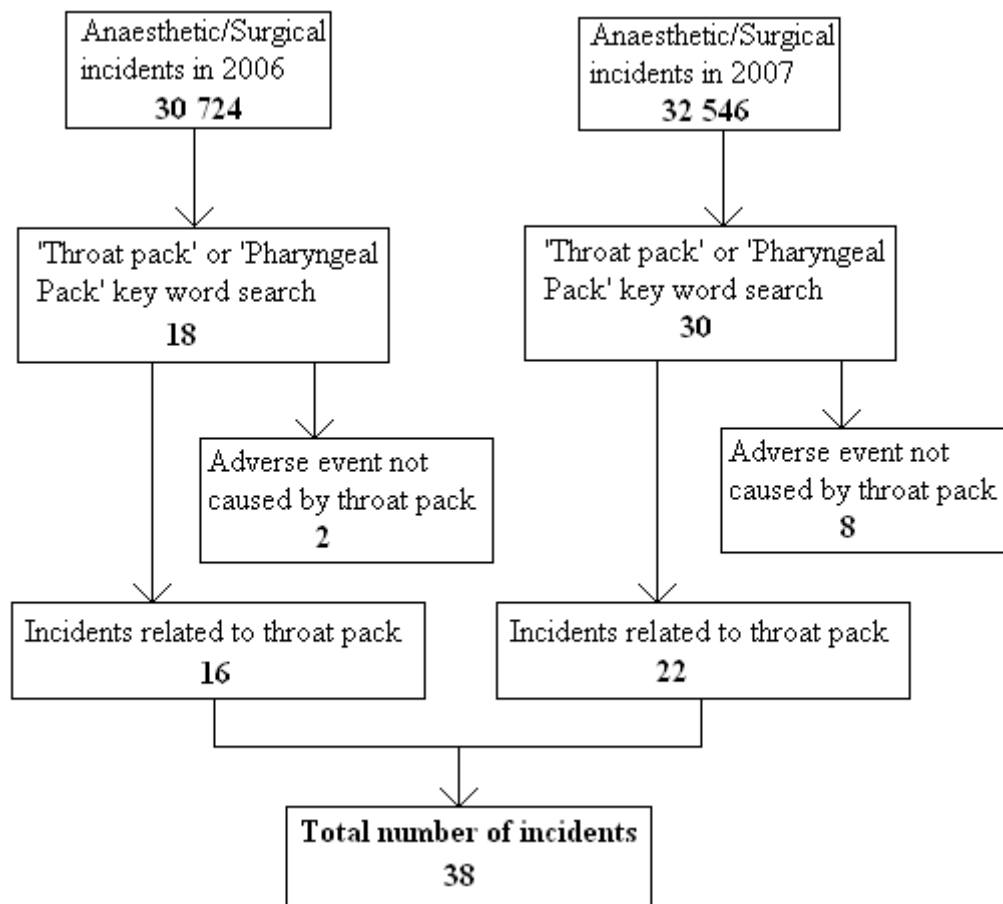
NPSA data (with thanks to C J Cassidy, Royal Lancaster Infirmary)

The NPSA provided details of anonymised patient safety incidents related to anaesthesia and surgical care, and which were reported from the acute general care setting (anaesthesia and surgical specialities) for the 24-month period from 1 January 2006 to 31 December 2007. The data were made available in Excel spreadsheets.

A search of the location of the incidents was limited to anaesthetics, operating theatre, day care services, high dependency unit (HDU), intensive care unit, radiology and recovery. The following key words were used to search for relevant incidents: 'throat pack'; 'pharyngeal pack' and 'throat swab'. The free text for each incident was then analysed to identify those reports in which the throat pack was responsible for, or contributed to, the patient safety incident.

A total of 63,270 anaesthetic/surgical incidents occurred in the time period stated above (Figure 1). Key word filtering returned 48 incidents but analysis of the free text excluded ten of these (in eight cases it was not clear if the throat pack had caused the incident and in two the throat pack prevented a more serious outcome), leaving 38 incidents related to throat packs (<0.6 per cent).

Figure 1: Incidents identified by search strategy



The mean (range) age of the 25 affected patients whose ages were included in the reports was 36 (13–100) years.

Of the 38 incidents, 20 were described as resulting in ‘no harm,’ and 17 as resulting in ‘low harm’. One incident that led to a ‘crash call’ and involved re-intubation was considered to result in ‘moderate’ harm.

The types of harm that occurred during insertion/removal of the throat pack were:

- injury to the tongue or frenulum (two lacerations required suturing) (4);
- dental damage (9) (although for most incidents the reporter was uncertain about the exact cause of the damage, and throat pack insertion was considered being a possibility);
- removal of part of the uvula (1).

The remaining 24 incidents (63%) were related to pack retention, and are summarised in Table 1.

Table 1: Reports relating to throat pack (TP) retention

Number of reports	
1-10	TP left <i>in situ</i> at end of procedure. No further details.
11	TP not removed at the end of operation resulting in airway obstruction when patient was turned supine.
12	TP left <i>in situ</i> , no record of use documented.
13	Retained TP caused airway obstruction and pulmonary oedema; admission to HDU required.
14	String attached to TP cut off because the surgeon did not like it. In ward patient couldn't swallow and was returned to the anaesthetic room where TP was found <i>in situ</i> .
15	After using two TPs during the procedure only one was removed: after return to ward repeated search to find TP undertaken. Later transpired TP had been removed by recovery room staff.
16	TP could not be identified at end of operation. Patient coughed it out in recovery.
17	TP inserted with an extra piece of gauze attached to it and this only noted after its removal.
18	Patient with laryngeal mask airway 'desaturated' and required tracheal intubation. TP already <i>in situ</i> significantly impeded intubation.
19	TP inserted by anaesthetist at start of operation removed by surgeon who inserted swabs which were not included in swab count, nor removed at the end of the operation. Anaesthetic staff unaware of their insertion.
20	At handover to recovery staff TP stated to have been removed; later found <i>in situ</i> by recovery staff.
21	TP found <i>in situ</i> on return to ward. No record in theatre documentation.
22	In recovery room patient developed upper airway obstruction and coughed out TP.
23	Patient developed respiratory obstruction. Returned to anaesthetic room and TP found <i>in situ</i> .
24	Patient became distressed in recovery room, anaesthetist asked to return, and 'crash call' made. TP found <i>in situ</i> and patient's trachea re-intubated.

The NPSA analysis showed that reporters rarely felt that retained throat packs resulted in serious harm but recognised the importance of obvious reminders, because for 20 of the incidents shown in Table 1 the reason why the throat pack was not removed was that it had been forgotten. In five incidents, the cause of the problem was incorrect or unconventional use – using multiple packs, using loose swabs instead of or in addition to throat packs, or cutting the tape attached to the throat pack. Had the advice given in 1977⁷ been followed, all of the incidents reported to the NPSA may have been prevented.

Analyses such as this are limited by the quality of reporting. Reporting is voluntary, and in this case, the 38 incidents identified are unlikely to form the complete picture. However, the reporters made extensive use of the free text field to give a fairly good

idea of what happened. The significance of the event is obviously perceived differently by different reporters; in the case of throat pack retention, it is likely that many would feel that a routine day case procedure that resulted in HDU admission would not represent 'no harm'.

NHSLA data

From the NHSLA data, a single incident was retrieved, of a retained throat pack during surgery for cleft lip that resulted in respiratory distress and alleged brain damage.

Data from professional indemnity organisations

Two of the three UK-based professional indemnity organisations that were contacted had no records of reports of retained throat packs. The third organisation declined to provide data for reasons of confidentiality.

In 2007, the Australian organisation United Medical Protection reported three cases of retention of throat packs,¹⁴ all occurring during a 12-month period. In one of the incidents a tracheostomy was performed before the cause was discovered. Reasons for the incidents occurring included breach of protocol, fatigue, diversion of attention and forgetting a throat pack had been placed.

Data from calls to professional bodies

The working party received 45 responses from professional bodies (RCOA 19, CODP 17, AfPP 6, RCN 3).

Few cases of retention were reported but free text entries included examples of failure to deal with the problem as well as good practice, as illustrated by the following vignettes:

'Three cases in one year... no corporate solution'

'no formal policy... no problems in 10 years'

'an ODP's efforts being "overridden by the anaesthetist"'

'the anaesthetist cuts the [protruding] tape'

'four cases in one hospital... distressing patient response. Incident forms filled in – options discussed... but nobody bothered to change practice... nothing has changed, we are still waiting for another similar incident (sadly)'

'do you really need a throat pack? In most cases I suggest "no"'

'two incidents, don't know if they were reported, happened twice to the same anaesthetist, no harm arising from the incidents, packs were still in place in recovery room and discovered when patients had difficulty breathing'

Methods of preventing retention of throat packs

Table 2 lists the methods to prevent retention of throat packs that have/are being used as reported by professional bodies. One respondent submitted a policy on throat packs that included the simultaneous use of more than one method (personal communication, N Fauvel, Chelsea and Westminster Hospital, 2007).

The most common methods are:

- putting a label on the patient's head;
- recording use of the throat pack on the swab board;
- tying the throat pack to the airway device.

Table 2: Methods to avoid retention of throat packs

Method	Numbers reported in use
Putting a label on the patient's head	16
Recording use on the swab board	16
Tying the throat pack to the airway device	16
Allowing the throat pack to protrude outside the oral cavity	13
Putting a label on the airway device	5
Conducting a formal verbal check	5
Documenting the placement/removal of a pack in the care plan	4
Documenting the placement/removal of a pack in the anaesthesia chart	4
Putting a label on the anaesthetic machine	2

Risk assessment of procedures in use to minimise the risk

As is clear from the above evidence-gathering exercise, several methods are in used in the UK to manage the risk of throat pack retention after surgery. However, these methods have not been subjected to a critical analysis.

The working party therefore conducted a risk assessment of the reported methods for minimising the risk of retention of throat packs. It identified certain actions that need to be taken within each method to maximise the prevention of this patient safety incident. For a summary list of these actions see Appendix 1.

The working party recommendations are intended for inclusion in local policies regarding prevention of this patient safety incident.

Summary recommendations

- *At least two* of listed procedures, one from each column, should be used because no single method is risk free.
- Other procedures that are already in use locally should be subjected to risk assessment. If the method is found to be safe, it may be selected as one of the chosen local procedures.
- The working party does not endorse labelling of the anaesthetic machine, because it is not specific to individual patients, and the label remains in the operating theatre after the patient has left the theatre with or without the throat pack *in situ*.

Table 3: Procedures for reducing the risk of leaving a throat pack *in situ*

Procedures involving visual checks	Procedures involving documented evidence
Putting a label or mark on the patient (The label is an adherent sticker that is put on either the patient's head or, exceptionally, on another visible part of the body. In either situation the label or mark must be removed at same time as the pack is removed)	Formalised, recorded 'two person' check of insertion and removal of a throat pack
Putting a label on the artificial airway device (for example tracheal tube or supraglottic mask airway device)	Recording insertion and removal of throat pack on swab count board
Attaching the throat pack securely to the artificial airway device	
Leaving part of the throat pack protruding externally	

Conclusions

- The clinical risk to patients of unintended retention of a throat pack is potentially high. We do not know the exact frequency of retention of throat packs. 'Under-reporting' to patient safety incident reporting systems is a well-recognised problem. In the present case, we also do not know how many of the incidents provided by the professional organisations were also reported to the NPSA.
- The less common use of throat packs in North America, and the findings of two UK-based studies^{12,13} suggest that the decision to use a throat pack should be clearly justified.
- While overall responsibility for removal rests with the person who inserted the throat pack, having systems in place can prompt removal.
- Measures to prompt removal must cater for those rare occasions when throat packs are deliberately left in place when patients are transferred to a critical care facility.
- Based on the published literature, the responses from professional bodies and the Australian organisation United Medical Protection publication¹⁴ we conclude that there are adequate methods available to minimise the risk of retention, but there has been little national application.
- Local organisations need to ensure that they have a policy for use of throat packs, which should include the NPSA's recommendations and actions related to the methods of preventing throat pack retention.

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Appendix 1

Summary of actions identified in the NPSA risk assessment of methods used to prevent throat pack retention, and recommended for inclusion in local policies

Local policies and procedures must be adapted to include the actions that are specified below for the recommended procedures to prevent throat pack retention.

Note: the method of 'Labelling the anaesthetic machine' has not been included as a recommended procedure due to its high risk ranking.

Procedures involving visual checks

Putting a label or mark on the patient

Putting a label on the patient

- Specify a named person who will be responsible for the application of the label and its removal.
- Select a robust, adherent label that will stay on the patient throughout a range of surgical procedures.
- Clearly write on the label: 'Throat pack' or 'TP'.
- Identify the primary site for fixing the label (for example, the head).
- Identify an alternative site for the label. This decision should be based on local risk assessment.
- Do not remove the label before the throat pack is removed.

Putting a mark on the patient

- Specify who will be responsible for marking the patient and removing the mark, and how and when this should occur.
- Define and differentiate between the mark used for correct site surgery and for insertion of throat packs. The mark for the throat pack may be 'Throat pack' or 'TP', but not an arrow.
- Identify the primary site for the mark (for example the head)
- Specify an alternative site for the mark. This decision should be based on local risk assessment
- Do not remove the mark before the throat pack is removed.

Putting a label on the artificial airway device

- Specify who will be responsible for the application and removal of the label.
- Use a visible, adherent sticker to label the artificial airway device.
- Clearly write on the label: 'Throat pack' or 'TP'.
- Do not remove the label before the throat pack is removed.

Attaching the throat pack securely to the artificial airway device

- Clearly identify the surgical procedures and the types of airway that are suitable for this type of method, and ensure this is communicated to all staff
- The person who has taken the decision to insert a throat pack should be responsible for tying it to the artificial airway device.

Leaving part of the throat pack protruding externally

- Clearly identify the procedures for which this method is suitable, and ensure this is communicated to all staff.
- Clearly identify the available designs of throat packs that can be used for this technique.
- The person who has taken the decision to insert a throat pack should be responsible for ensuring that throat pack is positioned appropriately with one end protruding externally.

Procedures involving documented evidence

Formalised, recorded ‘two person’ check of insertion and removal of a throat pack

- Clearly specify where the throat pack insertion and removal is to be documented
- Define clear roles and responsibilities for who records the throat pack insertion and removal.
- Clearly state that this should be a joint responsibility of two of the team members.
- Clearly state where and when the two-person check should take place.
- Clearly state what should be done if the named second person is not available.

Recording throat pack insertion/removal on the swab board

- Define clear roles and responsibilities for who records the throat pack insertion and removal on the swab board.
- This process should be in accordance with standard local swab count procedures.
- The throat pack record should be clearly visible on the swab board (for example in its own designated area)
- If a throat pack remains *in situ* until extubation (that is, in recovery or in the intensive care unit) this should be communicated in handover, and recorded in the notes.
- The insertion and removal of the throat pack must be recorded in the notes after it has been removed.