

ORIGINAL ARTICLES

Cost Savings and Quality Improvement - Single-Use Suture Instruments?

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Abstract

Aim

To determine if the instruments found in single-use suture kits are of satisfactory quality when compared with re-useable instruments and to determine the cost implications of changing to these kits.

Methods

Audit of established practice, followed by trial of new suture kits and their introduction to the department. The new practice was then audited. A cost analysis was conducted.

Results

The audit showed numerous problems with the traditional suture kits (instruments were breaking or no longer suitable for suturing wounds). A trial of single-use instruments demonstrated them to be high quality and provided new instruments each time.

A repeat audit at one year post-introduction demonstrated no identifiable problem with the new suture kits. The subjective impression of staff was of an improvement compared to the old kits.

Costs of sterilising suture instruments were determined and it was found that single use suture kits were cost effective. Assuming an average usage of 150 kits per month, at £4.45 each cost for sterilisation, and a total cost of £3.05 each for a single-use suture kit plus dressing pack per patient, this yielded a projected cost saving of £2520.00 per annum.

The actual cost saving was £1981.00 that year. The shortfall was due to overestimation of average usage.

Conclusion - Single use instruments would appear to be safe and cost effective in the emergency department setting.

Introduction

Wound closure is a core skill of the emergency medicine doctor. Despite the increasing use of tissue adhesive, suturing remains a commonly used method of wound closure. Basic suturing techniques are well established.¹ The instruments available to allow suturing of wounds have however, evolved in recent years.

Recent concerns over prion-mediated disease has driven the development and introduction of disposable instruments for a variety of surgical procedures (e.g. tonsillectomy).^{2,3,4} Companies producing such instruments have widened their range to produce surgical instruments for use in other fields. For emergency

departments, single-use suture kits have been developed which are for single use and discarded after use via the sharps disposal route.

In Aberdeen Royal Infirmary Emergency Department, the equipment used for the suturing of wounds came in a "casualty incision pack" which was designed for a variety of tasks including some operative procedures in theatre. This contained basic instruments:

needle holder
scissors
toothed and non toothed forceps

In addition the pack contained swabs and sterile drapes, a collection of various types of retractors and probes, artery clamps and a tourniquet. This array of instruments was felt not to be necessary for the majority of procedures being undertaken in the emergency department.

The aim of this study was to identify if these kits could be introduced safely to routine practice and evaluate if they were cost effective.

Methods

An audit of current practice of suturing was performed within the emergency department of Aberdeen Royal Infirmary. Following a short evaluation of the new single-use suture kits, they were introduced to the department. Their use was reassessed at one year.

A simultaneous cost analysis of the new versus old suture kits was performed. Data from the first audit allowed a projected cost to be calculated using the average usage of kits which was provided from the hospital Central Sterile Supplies Department (CSSD). This process was repeated at the second assessment to provide an actual cost of change.

Results

Audit

The initial audit revealed that there were numerous problems arising with the use of the suture kits in use in the department. These packs contained standard surgical instruments which were re-sterilised after use. The kits were assessed using the following criteria and graded in each using the scale shown:

- general packaging
- ease of use
- feel of instruments
- confidence in using them/overall impression
- problems/comments

Scale: Very Poor; Poor; Adequate; Good; Very Good

The main findings of this audit are shown in Figure 1. In light of this, we chose to trial a single-use suture pack. (Figure 2)

These packs contained basic instruments required for suturing as outlined above and the instruments were made from stainless steel. A simple dressing pack, to provide a sterile field drape, swabs, and galipot for cleaning solutions was added.

During the trial phase, the kits were assessed by the same criteria as above, with an initial twelve packs trialed. The pack was felt to be fit for purpose and none of the problems found with the re-usable instruments were identified. However, some problems were identified with the needle holders. (Table I)

Table I Trial Results

Advantages	Disadvantages
Simple pack with no confusing/unnecessary instruments	Fine needle holder struggles with 6/0 suture needles
Good quality needle holder	Standard needle holder struggles with 4/0 suture needles and smaller
Scissors are sharp every time	
Forceps meet at the tips	
Confidence in safety to patients	

Following this positive result, fine and standard suture kits were introduced in the department. Traditional fine needle holders were made available for 6/0 suture procedures.

One year following implementation reassessment using the same criteria was performed. The criteria were graded as before. In general, the new kits were found to perform well. (Table II)

Fig 2 Instrapac™ single-use suture kit



Fig 1 Problems with the Casualty Incision Packs

- Too many instruments
- Blunt scissors
- Forceps did not always meet at the tips
- Often oversized needle holder

Table II Reassessment

Criteria	Response
Packaging	Good
Ease of use	Good
Feel of Instruments	Adequate to Very Good
Confidence/ Overall Impression	Good
Comments	Poor needle holding of smaller needle sizes Fine forceps hold is variable Feel better than old sterilisable instruments

Cost Analysis

The cost for sterilising the traditional suture packs was identified as £4.45 per pack. The single-use packs cost £2.56 per pack. The cost of the dressing pack (£0.49 each) was added giving a total cost of £3.05 per patient. Using these figures, and assuming an average usage of 150 kits/month, a projected cost saving of £2520 was calculated. (Table III)

Table III Projected savings calculation

Total Cost of sterilising Casualty Incision Pack	£4.45ea
Cost of INSTRAPAC™ suture kit	£2.56ea
Cost of Sterile Dressing pack	£0.49ea
Total cost per patient	£3.05
Saving to Department per patient	£1.40
Total Saving per year	@150 packs/ month £2520.00

During the study period an average of 118 packs was used each month. This resulted in an actual saving of £1981.50. (Table IV)

Table IV Actual Costs and Savings

<i>Number of Standard Suture Kits used</i>		617
<i>Number of Fine suture Kits used</i>		798
<i>Total</i>		<u>1415</u>
<i>Cost of Single-use Suture Kits</i>	<i>@ £2.56 ea</i>	£3622.40
<i>Cost of Dressings Packs</i>	<i>@ £0.49 ea</i>	£693.35
<i>[A] Total cost of Single-use Method</i>		£4315.75
<i>[B] Cost for equivalent Casuality Incision Packs</i>	<i>@ £4.45 ea</i>	£6296.75
<i>Saving to Department</i>	<i>[B] [A]</i>	<u>£1981.00</u>

The cost for using supplemental fine needle holders is not considered in these figures. The cost for sterilisation of these was £0.60 each. If these had been required for each case where fine instruments were used, the overall saving would have been reduced to £1502.20.

Discussion

The use of single-use suture kits within an emergency department is desirable due to the nature of the patient group (e.g. high levels of intravenous drug misusers, etc). These kits remove the need to worry about the risk of cross infection from sources resistant to standard sterilisation techniques. Wear and tear on traditional instruments in such a high volume area is removed by using disposable kits.

However, the use of single-use instruments does raise waste disposal issues. In Scotland, the centralisation of sterilisation services and the introduction of tighter controls on decontamination processes has been recommended.^{5, 6} The use of single-use instruments is also recommended where possible.^{7, 8}

Single-use instruments are disposed of in “sharps bins” which are decontaminated by two methods. The first method is by shredding, then heat treating to remove the risk of contamination. The resultant waste is disposed of in landfill sites. The second method of decontamination is by incineration. This eliminates the risk of spreading prion diseases but the resultant waste is also disposed of in landfill sites. The shredding, heat treatment and landfill route of disposal is employed in NHS Grampian as the number of instruments used is relatively small.

This study addresses two main issues. The first is; are single-use kits suitable and safe, i.e. are they adequate for

wound closure?

The audit indicated the kits to be of a high standard and no significant problems were reported. Subjectively, they were felt to be superior to the old instruments and eliminated wear and tear issues. Confidence in using the instruments was high. Overall, they were fit for purpose. We accept there is potential for observer bias in this study, given the results are completely reliant on subjectivity. Secondly; was introducing single use kits cost effective?

With current sterilisation costs, changing to single-use kits produced an overall saving of departmental resources. These savings may be reproducible in other emergency departments. To determine whether this may be the case, in May 2004 33 hospitals were contacted and asked whether they had trialled and/or were using single use suture kits. Over half were still using reusable instruments for suturing, with only 30% using single use kits. (Table V)

Table V Phone survey

<i>Table V: Phone survey</i>	
<i>Questions</i>	<i>Results (%)</i>
<i>Using Single use kits</i>	30.3
<i>Using Re-usable kits</i>	54.5
<i>Using combination of both single use and re-usable</i>	15.2

Therefore, potential exists for significant savings to be made within emergency departments by introducing single use kits.

Conclusion

This study has subjectively shown that single use suture kits may be introduced safely into routine practice. It has also demonstrated that their introduction is likely to result in cost savings. We would recommend their introduction in Emergency Departments for routine use.

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