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CORRESPONDENCE

# Money, environment and eyelids

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## To the Editor:

In the current economic climate, there is an emphasis for a more cost-efficient National Health Service (NHS). Our department currently utilises non-disposable instruments for oculoplastic minor eyelids procedures and these are sterilised off-site. We have observed some damaged or missing instruments following sterilisation and reprocessing. Disposable surgical instruments are increasingly being used for their reliability, convenience and, possibly, lower infection risks [1, 2]. Due to concern about the cost of changing to disposable instruments, we performed a cost analysis of disposable versus non-disposable instruments for oculoplastic minor operation.

For the cost of non-disposable instruments, we contacted the sterilisation company (Synergy Health Sterilisation UK Ltd, Swindon, UK), the supplier of our non-disposable instruments (Altomed, Tyne and Wear, UK), decontamination and instruments management department and clinical governance department for incidents related to patient safety. The non-disposable instruments cost was calculated from; the initial purchase cost of chalazion sets, oculoplastic sets and other instruments for minor operations, sterilisation cost, repair cost and replacement cost over a 10-year period. The estimated disposable instruments cost for 10 years was obtained from; the quoted purchase price of similar sets of instruments from suppliers of disposable instruments (Blink Medical, Solihull, UK and Malosa Medical, Elland, UK) and the estimated disposal cost from the waste management department.

The overall cost of non-disposable instruments was £174,046 (Table 1). The overall estimated cost of disposable instruments was £450,648 (Table 2). Potentially, an addition of £276,602 would be spent over a 10-year period if disposables were used instead of non-disposables. No serious adverse events related to faulty instruments or any formal complaints were recorded on clinical governance system.

**Table 1** Calculated cost of non-disposable instruments over 10 years.

| Name of instruments | Number of instruments in circulation | Cost of instruments/ sets (in £) | Initial cost (in £) |
|---|---|---|---|
| Oculoplastic tray | 33 | 731 | 24,123 |
| Chalazion tray | 26 | 712 | 18,512 |
| Jewellers bi-polar forcep and lead | 19 | 136 | 2584 |
| Curved artery forcep | 9 | 22 | 198 |
| Straight artery forcep | 4 | 21 | 84 |
| Lacrimal probe (various sizes) | 15 | 15 | 225 |
| Lid retractor | 23 | 25 | 575 |
| Nettleship dilator | 24 | 10 | 240 |
| Vanna's scissor | 8 | 97 | 776 |
| Blade | 4 | 6 | 24 |
| Total initial cost of purchase | | | £47,341 |
| Cost of sterilisation of sets over 10 years | | | £95,669 |
| Cost of sterilisation of individual instruments over 10 years | | | £18,599 |
| Estimated total cost of replacement over 10 years | | | £10,142 |
| Estimated total cost of repair over 10 years | | | £2295 |
| Total non-disposable instruments cost | | | £174,046 |

For oculoplastic minor procedures, we commonly use oculoplastic trays and chalazion trays containing various oculoplastic instruments. We occasionally require additional instruments (listed on the table above) which are not included in the trays. The oculoplastic trays and chalazion trays went through sterilisation process 1019 and 338 times per year, respectively. The costs of sterilisation of a tray and an individual instrument were £7.05 and £1.79, respectively. Overall cost of non-disposable instruments including set trays and other individual instruments was £174,046 over 10 years (prices on the table were rounded to the nearest pound).

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**Table 2** Estimated cost of disposable instruments over 10 years.

| Name of instruments | Number of instruments used | Cost of instruments/ set (in £) | Cost of purchase (in £) |
|---|---|---|---|
| Oculoplastic tray | 10,190 | 27 | 275,130 |
| Chalazion tray | 3380 | 13 | 43,940 |
| Jewellers bi-polar forcep and lead | 5760 | 19 | 109,440 |
| Curved/straight artery forcep | 850 | 5 | 4250 |
| Lacrimal probe (various sizes) | 450 | 4 | 1800 |
| Lid retractor | 580 | 4 | 2320 |
| Nettleship dilator | 2170 | 4 | 8680 |
| Vanna's scissor | 370 | 8 | 2960 |
| Blade | 170 | 1 | 170 |
| Estimated total cost of purchase over 10 years | | | £448,690 |
| Estimated cost of disposal over 10 years | | | £1958 |
| Total disposable instruments cost | | | £450,648 |

The cost of waste container collection and decontamination was £6 per container. The incineration charge for disposable instruments was £450 per tonne. Based on the instruments' weight and volume, we assumed that 12 waste containers were used per year for oculoplastic minor procedures. Overall calculated cost of disposable instruments including set trays and individual instruments was £450,648 over 10 years (prices on the table were rounded to the nearest pound).

Apart from their cost, we wish to highlight the environmental impacts of disposable instruments; they occupy landfill and requiring polluting incineration. Climate change is predicted to be one of the largest global health threats of the 21st century with the carbon footprint of the NHS accounts for 25% of all public sector emissions in the United Kingdom [3]. The majority of medical waste production in hospitals comes from the operating room and mostly consists of disposable surgical supplies. Wormer et al. showed that by converting to utilising reusable products, medical waste can be reduced by ~65% with potential cost saving of $150 million per year for the U.S. healthcare system [4]. Lockington et al. argued that the cost of implementing sustainable carbon neutral healthcare in ophthalmology may not be as cost saving as it appears; reprocessing of non-disposable instruments often results in damaged and unreliable instruments thus compromising patient care [5]. The guaranteed reliability of disposable instruments is invaluable for good delivery of care but some of the risk of damaged reusable instruments can be mitigated by careful quality control and replacement.

Based on their cost and environmental impacts, we recommend the use of non-disposable instruments for oculoplastic minor operation. We believe that emphasis should be placed on staff education to exercise stricter sterilisation, inspection, handling, repair and replacement processes to maintain the reliability of these instruments.

## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

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