

The need for Intra-operative cell salvage training to reduce the use of Allogeneic 'bank' Blood during Surgery. Is the routine adoption of a competency-based assessment in Intra-operative cell salvage required?

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Citation

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Abstract

We performed a survey of all specialist registrars and their equivalents in the Imperial (North West Thames) region to assess their experience of and training in Intra-operative red cell salvage (ICS) and asked whether they would be confident to use ICS unsupervised for emergency out of hours work. 85% of respondents said that they would not be confident to set up or use ICS unsupervised. Allogeneic blood transfusion is expensive, associated with uncommon but potentially severe adverse consequences and of limited availability. Intra-operative red cell salvage (ICS) is a well-tried, cost effective method of reducing the use of allogeneic blood. Many organisations including the UK Blood Transfusion and Tissue Transplantation Service (www.transfusionguidelines.org) and the Association of Anaesthetists of Great Britain and Ireland have advocated the use of ICS for all suitable cases [1]. An operating department assistant (ODA) or anaesthetic nurse, with the appropriate experience, may set up the equipment but it will have to be supervised and used by an anaesthetist or, in a cardiac theatre, a Perfusionist. Anaesthetists with appropriate training and experience are therefore necessary if use of ICS is to be maximised.

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METHODS

A questionnaire (see Appendix) was sent by email to all Specialist Registrars in the Imperial School of Anaesthesia (North West Thames) region. A range of questions were asked to gauge the training and experience Registrars had received with ICS. Questions were asked regarding the

familiarity with any guidelines on ICS use, the number and type of cases in which ICS had been used in the past 6 months (surgical speciality and whether elective or emergency cases) and whether or not they had received training (either formal or informal) on using a cell salvage device. We also asked the trainees if they would be confident at setting up and operating a cell salvage device themselves.

RESULTS

Questionnaires were sent by email to 150 Specialist Registrars (SPR 1-5 / ST 3-7) and Clinical Fellows in the Imperial region and 108 (72%) were completed and returned. ICS devices are available in all the main District General and Teaching Hospitals in the region.

53 Registrars (49%) surveyed were in years 3-5 of Specialist Registrar training (ST 5-7) and 8 were clinical fellows [see fig. 1]. 63.2% of those surveyed were not familiar with any guidelines on ICS use [see fig.2]. 75.2% of Registrars had been involved in cases using ICS only 3 times or less in the past 6 months with 35% not having used ICS at all during

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this period [fig. 3]. Just under 41% of Registrars had never received any training, formal or informal, on the use and set up of a cell saver device. Only 6.5% reported having received formal training [see fig.4]. Most commonly Anaesthetists delivered ICS training but ODA and Perfusionists also made a significant contribution [fig.5]. The use of ICS was most commonly experienced in Vascular, Cardiothoracic and Obstetric surgery [fig.6]. 85% of Registrars had never set up a cell saver device themselves and were not confident at doing so and operating it.

DISCUSSION

Due to risks of infection, immunomodulation, transfusion reactions and the increasing expense of allogeneic 'bank' blood, transfusion of autologous blood should be used in all appropriate circumstances. The Blood Conservation Strategy Report (2004) recommended the introduction of ICS as routine for all surgery where blood loss is expected to exceed 1 litre. It is estimated that this could result in saving approximately 160 000 units of blood per annum [2].

The Royal College of Anaesthetists has also advocated the use of cell salvage in emergency surgery. Their compendium of audit recipes suggests that in emergency surgery where blood loss exceeds 1 litre, the administration of cell saved blood should approach 100%. In procedures where predicted blood loss is greater than 1 litre, but actual blood loss is less than one litre, a reservoir for collection of blood for cell salvage should be used in most (if not all) cases, even though subsequent processing of blood may not be deemed necessary [3]. The British Committee for Standards in Haematology Blood Transfusion Task Force has also issued guidelines for cell salvage. It recommends that a designated member of the Consultant staff should be responsible for supervision and training of staff involved in cell salvage procedures [4].

In the past ICS has not been routinely adopted in Obstetrics because of concerns regarding the possibility of amniotic fluid embolism. The advent of leukocyte depletion filters has rapidly changed practice and NICE has issued guidelines on ICS use in obstetrics [5]. Theoretical Concerns over amniotic fluid embolism have not been borne out in clinical practice and Teig et al showed in a survey of UK cell salvage use in obstetrics that compared with safety concerns, a lack of training was the biggest barrier in preventing cell salvage use [6]. Encouragingly, 41.2% of Registrars in our survey had experienced the use of ICS in obstetrics [fig.6].

Figure 1

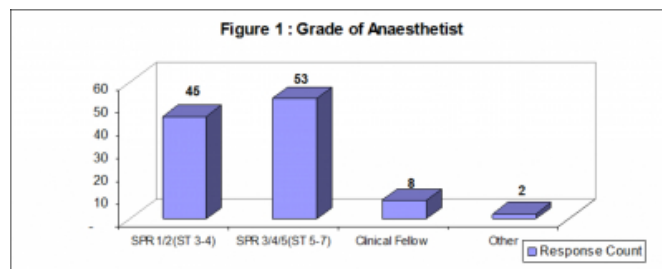


Figure 2

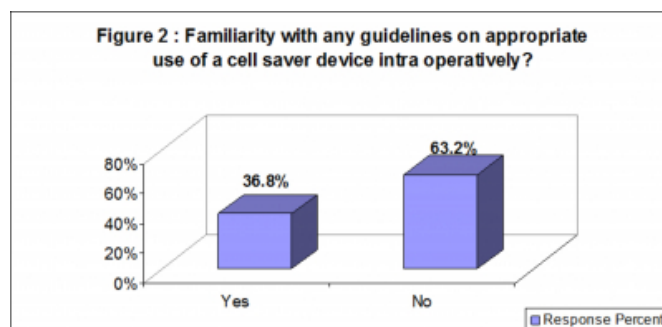


Figure 3

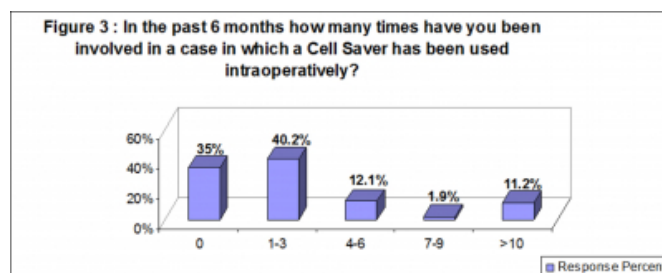
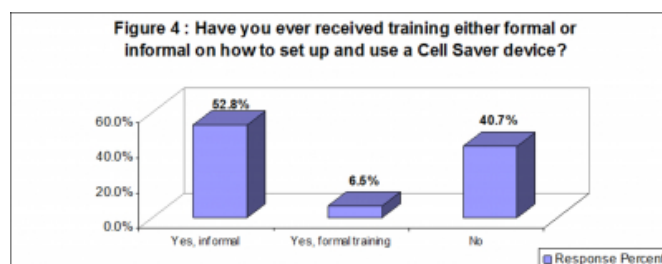


Figure 4



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Figure 5

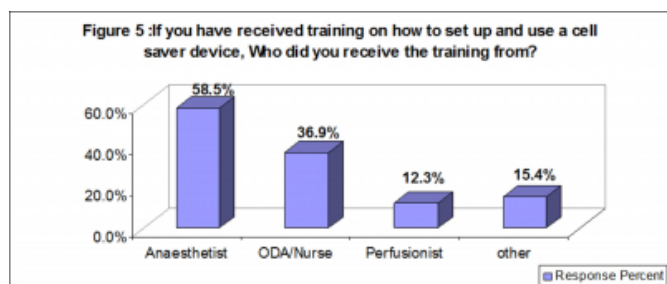
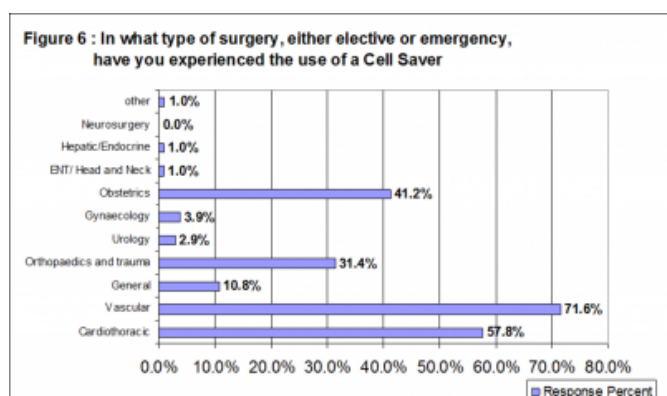


Figure 6



The administration of blood products intraoperatively is the responsibility of the anaesthetist. Knowledge of guidelines on the use of ICS as well as an appreciation of how a cell salvage device works, along with ability to set up a device and operate it, are key to ensuring ICS is used appropriately. Other members of theatre staff such as the ODA should also have this training but ultimately the responsibility of administering Intraoperative blood products falls with the Anaesthetists and it is the feeling of the authors that Anaesthetists should be trained accordingly.

There is a deficiency in ICS training in London North West Thames with over 40% of Registrars surveyed in the region claiming to have never received training on ICS. Fewer than 7% of Registrars had received formal training. Just over 62% were not familiar with any guidelines on ICS use and almost 85% of Registrars would not be happy at setting up and operating a cell salvage device themselves. These results suggest that current methods of teaching on the use of ICS in the region are not adequate. The UK Cell Salvage Action Group has produced a competency assessment workbook on ICS use endorsed by the Royal College of Anaesthetists. A survey of NHS trusts in 2007 by the UK Cell Salvage Action Group showed only 47% of respondents used competency assessment, as a means of documenting that staff was trained

and competent in ICS [7].

The post that they occupy may affect exposure of the trainee to ICS, with those working in cardiac and vascular surgery more likely to gain experience. However, with 75% of trainees reporting to have been involved in cases using ICS 3 times or fewer in the past 6 months it is clear that an ad hoc approach to training is not working. Clearly, the routine adoption of a competency assessment such as the one proposed by the UK Cell Salvage Action Group in ICS for all Registrars when doing modules in either Cardiac, Vascular or Obstetric Anaesthesia, would greatly enhance the guidelines on appropriate ICS use being followed, particularly in emergency out of hours cases which might be commenced by the trainee. For most anaesthetists, trainees and consultants, ICS is a technique which will only be required on an occasional basis. Techniques that are required intermittently need to be recognised and targeted, with regular reinforcement and assessment, an approach that has been widely adopted with resuscitation skills. Training in ICS is important to ensure we maximise its appropriate use, ensuring potential benefits to patients and preventing unnecessary use of Allogeneic 'bank blood'.

APPENDIX

The need for Intra-operative cell salvage training to reduce the use of Allogeneic 'bank' Blood during Surgery. Is the routine adoption of a competency-based assessment in Intra-operative cell salvage required?

Figure 7

CELL SAVER TRAINING QUESTIONNAIRE

1. What grade of Anaesthetist are you?

SPR 1/2(ST 3-4)

SPR 3/4/5(ST 5-7)

Clinical Fellow

2. Which Hospital do you currently work at?

3. Are you familiar with any guidelines on the appropriate use of a cell saver device intra operatively?

Yes

No

4. In the past 6 months, approximately how many times have you been involved in a case in which a Cell Saver has been used intraoperatively?

0

1-3

4-6

7-9

>10

5. Have you ever received training either formal or informal on how to set up and use a Cell Saver device?

Yes, informal

Yes, formal training

No

6. If you have received training on how to set up and use a cell saver device, who did you receive the training from?

Anaesthetist

ODA/Nurse

Perfusionist

other

Figure 8

7. In what type of surgery, either elective or emergency, have you experienced the use of a Cell Saver device?

<input type="checkbox"/> Cardiothoracic	<input type="checkbox"/> Obstetrics
<input type="checkbox"/> Vascular	<input type="checkbox"/> ENT/ Head and Neck
<input type="checkbox"/> General	<input type="checkbox"/> Hepatic/Endocrine
<input type="checkbox"/> Orthopaedics and trauma	<input type="checkbox"/> Neurosurgery
<input type="checkbox"/> Urology	<input type="checkbox"/> other
<input type="checkbox"/> Gynaecology	

8. Have you ever set up a cell saver device yourself and if not, would you be happy at setting one up and operating it?

No and I would not be confident at setting up the device and operating it myself.

No but I would be confident at setting it up and operating it myself.

Yes

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