

Appendix IV

Intraoperative Cell Salvage Competency Assessment Workbook

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Introduction

This training framework for intraoperative cell salvage (ICS) autotransfusionists has been developed on behalf of the National Blood Authority (NBA). It has been reviewed by the NBA intraoperative cell salvage guidance writing group and has been adapted for the Australian health care setting from the UK Cell Salvage Action Group document.

To help address training concerns and the lack of competency assessments for autotransfusionists in this specialist field, this workbook has been developed in consultation with cell salvage “champions” and other national groups with patient blood management, blood safety and conservation as an essential part of their remit.

The competencies have been split into 5 sections to allow assessment to be tailored to the responsibilities of the individual learner.

Each section is then further divided into “Knowledge and Understanding” and “Performance Criteria”. Learners must complete all indicators for both Knowledge and Understanding and for Performance Criteria within a section in order to be signed off as competent for that section.

Section 1	General (To be completed by <u>all</u> learners)
Section 2	Prepare equipment for intra-operative blood salvage collection
Section 3	Operate equipment for intra-operative blood salvage collection
Section 4	Prepare equipment for processing intra-operative salvaged blood
Section 5	Operate and monitor equipment for processing intra-operative salvaged blood and complete salvaged blood processing

It is essential that all staff involved in the operation of ICS machines are trained to the level at which they are expected to operate. **Training should include both theory and practice.**

Autotransfusionists need to develop a broad understanding of the appropriate use of ICS including the contra-indications and implications of administration and reinfusion of salvaged blood. A theoretical course covering all aspects of intraoperative cell salvage (e.g. Australasian Board of Cardiovascular Perfusion autotransfusion course) should be completed. It is also recommended that along with theoretical training, practical training in a non-clinical environment should also be completed (e.g. Manufacturer provided intraoperative cell salvage courses).

NOTE: This workbook is provided as an example only. Individual hospitals may use this workbook in its current form or adapt its contents to suit their own circumstances.

Hospitals involved in training staff in the use of intraoperative cell salvage should adopt the following principles:

- Identify a key trainer/s (it is suggested that these people should have a recognised teaching and assessing qualification)
- Theory training and assessment of knowledge should be completed prior to undertaking practical training
- Staff should be allowed dedicated time for practical training which can be delivered by manufacturer and/or "in-house" trainers. ("In-house" training should be carried out by key trainers)
- "In-house" trainers should assess competency (it is suggested that "in-house" trainers have completed this workbook and that they hold a teaching and assessing qualification)
- Certificates of competence should be issued by the Organisation
- Documented training records should be kept by the Organisation and the learner.

Procedural documents/policies should be available to staff giving clear guidance on:

- Indications and contraindications
- Who can operate the machines and levels of independent operation
- How to operate the equipment
- Warnings regarding contamination of the surgical field
- Rules on labelling, expiry date and time of salvaged blood
- Reinfusion of salvaged red cells
- Recognising and reporting serious adverse events.

Maintaining competency

The Organisation should have a policy that clearly states the number of procedures a person should undertake in a designated period of time to maintain their competency. This policy should also include how often competency assessments should be performed. Where more than one type of ICS equipment is in use, the theory sections need only be completed once, however, the "Performance Criteria" sections should be completed for each type of device in use.

Learners should have a theory update and if necessary technical training when moving clinical speciality to ensure differences in practice have been covered.

It is envisaged that this workbook could be used to provide evidence of the knowledge and skills acquired by the learner with regards to ICS. It can also be used to identify any gaps between the skills and knowledge needed to do the job, and the current skills and knowledge of the individual member of staff.

Audit

It is recommended that Organisations should undertake periodic audit to verify that the principles outlined above are being adopted. It is suggested that a designated person is made responsible for this activity.

Pages from this workbook can be reproduced as required by the learner/trainer/supervisor and are available on the [NBA website](#).

We would welcome feedback on the content of this workbook.

Record of Assessors Initials

All assessors should record their details on this sheet.

	Initials	Full Name (PRINT)	Job title	Signature	e-mail address	Telephone number
1						
2						
3						
4						
5						
6						
7						

Confirmation of Required Pre-assessment Training

This page **must** be completed prior to competency assessment. Candidates should not be competency assessed before they have completed the pre-assessment training requirements.

Type of Training	Date Completed	Candidate's signature (sign and date)	Assessor's signature (sign and date)
Theory (delivered through at least one of the following methods) Face to Face Learn Cell Salvage			
Practical (classroom) Set up of the ICS equipment in a non-clinical setting			
Practical (clinical) Supervised clinical training (recommended minimum of 10 cases 2 of which should be "emergency" cases)			

Supervised Clinical Training Record

A minimum of 10 supervised clinical cases should be completed by the candidate prior to competency assessment. Details of these cases should be entered into the table below.

Case	Date	Operation	Machine Type	Comments & supervisor's signature
1				
2				
3				
4				
5				
6				
7				
8				
Emergency 1				
Emergency 2				

Assessment Plan

This page should be completed at the end of the candidate's assessment and kept with the department's training records as evidence of staff competency.

Enter Candidate's Name: _____ has undergone assessment and has demonstrated competency in carrying out the following tasks:

	Pre-assessment Agreement			Competency Assessment	
	Proposed Date of Assessment (or N/A)	Training Lead's Signature	Trainee's Signature	Completed on (date)	Assessor's signature
General (Everyone)					
Prepare equipment for intraoperative blood salvage collection					
Operate equipment for intraoperative blood salvage collection					
Prepare equipment for processing intraoperative salvaged blood					

Operate and monitor equipment for processing intraoperative salvaged blood and complete the salvaged blood processing						
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ICS Competency Assessment

Section 1 General								
Knowledge and Understanding	Assessment Method							
The trainee demonstrated knowledge and understanding of:	DO	S	EW	PL	WQ	OQ	Assessor's Initials	Date
National guidance (NBA ICS guidance), organisational policies and protocols related to the Intraoperative Cell Salvage (ICS) process.								
Their responsibilities and accountability in relation to the ICS process.								
The importance of working within their own scope of practice and competence, in relation to the ICS process.								
Infection prevention and control in relation to the ICS process and the potential consequences of poor practice.								
The rationale behind the use of autologous blood transfusion.								
The dangers of re-using equipment designed for single use only.								
The applications of ICS in relation to patients who refuse allogeneic blood on religious or other grounds.								

The importance of recording all information, clearly and precisely in the appropriate documentation.										
The importance of immediately reporting any issues which are outside your own sphere of competence without delay to the relevant member of staff.										
DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	Q Written Questions			OQ Oral Questions			

Section 1 General											
Performance Criteria				Assessment Method							
The trainee demonstrated, in a clinical setting, that they could:				DO	S	EW	PL	WQ	OQ	Assessor's Initials	Date
Apply standard precautions for infection control and other necessary health and safety measures.											

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions			OQ Oral Questions			
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Section 2

Prepare equipment for intra-operative blood salvage collection

Knowledge and Understanding	Assessment Method						Assessor's Initials	Date
	DO	S	EW	PL	WQ	OQ		
The trainee demonstrated knowledge and understanding of:								
The role of the suction equipment in relation to Intraoperative Cell Salvage (ICS).								
The purpose of the collection set equipment.								
The rationale behind setting an appropriate vacuum level.								
The need for an appropriate anticoagulant and its correct preparation.								
The reason for setting up the collection equipment.								
The rationale for expiry time on the set up equipment.								
The role of the individual in preparing equipment for ICS and how this relates to other members of the theatre team.								
The importance of reporting all information to the relevant member of staff.								
How to recognise hazards, errors and malfunctions of equipment and the appropriate action to take.								

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions	OQ Oral Questions
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Section 2

Prepare equipment for intra-operative blood salvage collection

Performance Criteria	Assessment Method							
The trainee demonstrated, in a clinical setting, that they could:	DO	S	EW	PL	WQ	OQ	Assessor's Initials	Date
Ensure all members of the theatre team are aware that intra-operative cell salvage is planned.								
Select and set up collection equipment correctly following manufacturer's instructions:								
a. ensuring the correct equipment is safe to use								
b. using aseptic technique								
c. prepare the anticoagulant in accordance with national guidelines and local policy								
Inform the relevant member of staff that the collection equipment is fully prepared as necessary.								

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions	OQ Oral Questions
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Section 3

Operate equipment for intra-operative blood salvage collection

Knowledge and Understanding	Assessment Method						Assessor's Initials	Date
	DO	S	EW	PL	WQ	OQ		
The trainee demonstrated knowledge and understanding of:								
The indications and contraindications to the use of Intraoperative Cell Salvage (ICS).								
When and for whom collections for ICS could be started.								
The importance of labelling the collection equipment with unique patient identification.								
The importance of priming the collection equipment with anticoagulant to prevent blood clotting.								
The role of suction equipment in relation to ICS.								
The rationale behind setting an appropriate vacuum level.								
The components of whole blood.								
The functions of red cells in the delivery of oxygen to body tissues.								
The differences between salvaged red cells and whole blood.								
The effects of citrate or heparin anticoagulant on salvaged blood and the appropriate rate/ratio of anticoagulant.								
The possible contents of the collection reservoir during surgery, including potential contaminants.								

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions	OQ Oral Questions
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Section 3

Operate equipment for intra-operative blood salvage collection

Knowledge and Understanding Cont...	Assessment Method							
The trainee demonstrated knowledge and understanding of:	DO	S	EW	PL	WQ	OQ	Assessor's Initials	Date
The importance of immediately reporting sudden, unexpected increases in blood loss to the appropriate member of staff.								
The advantages and risks of swab washing.								
The process of salvaging blood from swabs.								
The rationale for weighing all swabs during ICS.								
How to estimate blood loss during ICS.								
The rationale for and calculation of expiry time of the salvaged blood.								
The role of the individual in collecting salvaged blood and how this relates to other members of the theatre team.								
How to recognise hazards, errors and malfunctions of equipment and the appropriate action to take.								

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions	OQ Oral Questions
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Section 3 Operate equipment for intra-operative blood salvage collection

Performance Criteria	Assessment Method							
The trainee demonstrated, in a clinical setting, that they could:	DO	S	EW	PL	WQ	OQ	Assessor's Initials	Date
Confirm decision to collect blood with the relevant member of staff.								
Accurately label the collection reservoir with patient's details.								
Correctly prime the collection equipment with an appropriate volume of anticoagulant solution following manufacturer's instructions.								
Start the collection using an appropriate vacuum level.								
Deliver or regulate the correct volume of anticoagulant in relation to blood loss.								
Monitor the progress of the procedure and immediately report any problems to the appropriate member of staff.								
Monitor the volume of salvaged blood being collected and immediately report sudden, unexpected increases in the rate of blood loss to the appropriate member of staff.								
Estimate and record the volume of blood collected on completion of the collection procedure.								
Report completion of the collection to the appropriate member of staff.								
Clear and dispose of waste in accordance with local guidelines.								
Complete and sign all relevant documentation.								

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions	OQ Oral Questions
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Section 4

Prepare equipment for processing intra-operative salvage blood

Knowledge and Understanding	Assessment Method							
The trainee demonstrated knowledge and understanding of:	DO	S	EW	PL	Q	OQ	Assessor's Initials	Date
The indications and contraindications of the use of Intraoperative Cell Salvage (ICS).								
Factors to be considered in the decision to set up the processing equipment.								
The types, purpose and functions of the ICS machines used in your work area.								
The purpose of the processing set equipment.								
The rationale for expiry time on the set up equipment.								
The choice of intravenous normal saline 0.9% as the wash fluid.								
The possible contents of the collection reservoir during surgery, including potential contaminants, in relation to the decision to set up to process salvaged blood.								
The advantages or risks of swab washing.								
How to estimate blood loss ICS.								
The rationale for and calculation of expiry time of the salvaged blood.								
The role of the individual in preparing equipment for processing salvaged blood and how this relates to other members of the theatre team.								

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions	OQ Oral Questions
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Section 4 Prepare equipment for processing intra-operative salvage blood

Knowledge and Understanding Cont...	Assessment Method							
The trainee demonstrated knowledge and understanding of:	DO	S	EW	PL	WQ	OQ	Assessor's Initials	Date
The importance of selecting the correct machine programme, where applicable, ready for use.								
How to recognise hazards, errors and malfunctions of equipment and the appropriate action to take.								

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions	OQ Oral Questions
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Section 4

Prepare equipment for processing intra-operative salvage blood

Performance Criteria	Assessment Method							
The trainee demonstrated, in a clinical setting, that they could:	DO	S	EW	PL	WQ	OQ	Assessor's Initials	Date
Check and confirm with the relevant member of staff the suitability of the salvaged blood for processing.								
Maintain strict asepsis at all times.								
Check and confirm that the correct processing equipment is safe to use.								
Load the processing equipment into the machine and connect to the collection equipment.								
Check and confirm that the wash fluid is intravenous normal saline 0.9% before priming the system.								
Set the correct machine programme ready for use.								
Inform the relevant member of staff that processing equipment is fully prepared as necessary.								

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions	OQ Oral Questions
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Section 5 Operate and monitor equipment for processing intra-operative salvage blood and complete salvaged blood processing

Knowledge and Understanding	Assessment Method							
The trainee demonstrated knowledge and understanding of:	DO	S	EW	PL	WQ	OQ	Assessor's Initials	Date
The indications and contraindications for the use of Intraoperative Cell Salvage (ICS).								
The role of the individual in operating and monitoring equipment for processing salvaged blood, completing salvaged blood processing and how this relates to other members of the theatre team.								
The components of whole blood and the basis of centrifugal separation.								
The functions of red cells in the delivery of oxygen to body tissues.								
The differences between salvaged red cells and whole blood.								
Factors to be considered in the decision to proceed with processing the reservoir contents.								
The types, purpose and function of ICS machines within your work area.								
The rationale behind the choices of machine programme for ICS machines in use in the work area.								
The purpose of the collection equipment and processing equipment.								
The effects of citrate or heparin anticoagulant on salvaged blood and the importance of documenting the amount of anticoagulant used.								

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions	OQ Oral Questions
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Section 5 Operate and monitor equipment for processing intra-operative salvage blood and complete salvaged blood processing

Knowledge and Understanding Cont...	Assessment Method						Assessor's Initials	Date
	DO	S	EW	PL	WQ	OQ		
The trainee demonstrated knowledge and understanding of:								
The possible contents of the collection reservoir during surgery, including potential contaminants.								
The choice of intravenous normotonic wash fluid.								
The importance of using an appropriate wash volume.								
The advantages and risks of swab washing.								
The process of salvaging blood from swabs.								
The rationale for weighing all swabs during ICS.								
How to estimate blood loss during ICS.								
The potential composition of the contents of the re-infusion bag.								
How the re-infusion bag should be labelled.								
The rationale for and calculation of expiry time of the salvaged blood.								
The types of filters used when re-infusing ICS blood and the potential limitations.								
The principles and methods of waste disposal related to the equipment.								
How to recognise hazards, errors and malfunctions of equipment and the appropriate action to take.								

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions	OQ Oral Questions
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Section 5 Operate and monitor equipment for processing intra-operative salvage blood and complete salvaged blood processing

Performance Criteria	Assessment Method							
The trainee demonstrated, in a clinical setting, that they could:	DO	S	EW	PL	WQ	OQ	Assessor's Initials	Date
Confirm decision to process salvaged blood with the relevant member of staff.								
Use intravenous normotonic wash fluid as recommended by the manufacturer.								
Monitor the progress of the processing procedure and report any problems to the appropriate member of staff.								
Correctly record the volume of processed salvaged cells for re-infusion.								
Report completion of the processing procedure to the relevant member of staff.								
Through a safe patient identification process, clearly label salvaged blood re-infusion bags with patient's name, hospital number, date of birth, 'use by' time and the volume of salvaged cells.								
Keep the processed blood with the patient.								
Clear and dispose of waste as appropriate in accordance with local guidelines.								
Complete and sign all relevant documentation.								

DO Direct Observation	S Simulation	EW Expert Witness	PL Prior Learning (evidence required)	WQ Written Questions	OQ Oral Questions
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Reflective Learning Record

Procedure:	Date:	Case Log Number:
Additional Information:		

What have I learnt from this procedure?

How can I apply this to my future work?

What went well?	What could I have done differently?
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Is there anything I didn't understand or need to explore further in order to consolidate my learning?

Signature of Learner.....

Post Competency Assessment Case Log

It is recommended that ICS autotransfusionists maintain an on-going case log following successful completion of the competency assessments. This can be used as part of the evidence of their on-going competency. It is recommended a minimum of 10 cases be completed in a calendar year to maintain sufficient competency. If 10 cases cannot be achieved then it is recommended that the ICS autotransfusionist should be reassessed as to their practical competency by completing the Assessment Plan as outlined above.

Log No.	Date	Operation	Machine type	Collect Only (CO) or Full Processing (FP)	Volume Reinfused	Comments