

# The Association of Renal Technologists

## Technologist Training Scheme Syllabus

### Part B practical competences

This section is aimed at developing the trainee's practical competence of working on dialysis machines and other auxiliary equipment. In the process they need to develop their understanding of the main components and sub-systems of this equipment. A key aspect of this section is building up experience and it is expected that this will require a minimum of 2 years' experience with each type of equipment. The range of equipment and the various subsystems that must be covered can change over time as new equipment and technologies are introduced.

An up to date list of what is to be covered will be maintained and published by the ART.

The trainee must produce a log book of their work experience along with a description of the subsystems they have worked on.

Both the activity detailed in the log book and the trainee's competence in performing them must be supported by statements from a senior technician authorised by the A.R. T. Training panel

This section deals the practical competencies that must be achieved by the trainee in order to successfully complete the training scheme. The activity involved must be recorded in the trainee logbook and witnessed by an ART authorised verifier. The verifier must also witness that the trainee demonstrates all of the relevant professional standards of section 7 in every competence that they verify. At agreed stages of completion the trainee will submit their logbook to the regional ART assessor for validation and feedback.

Appendix A contains the details of competencies that must be completed, detailing both the range of activities and the minimum number of logbook entries for each particular type of activity. (This appendix will be periodically reviewed and updated by the ART in order to adapt to changes in technology.)

Appendix A activities can be grouped into eight different categories

1. Installation and commissioning of equipment
2. Setting up and using equipment
3. Diagnosing problems in equipment use
4. 4.1 Service and maintenance procedures  
4.2 Calibration procedures
5. Fault finding and repair
6. Documentation
7. Consumable evaluation
8. User training
9. Water quality assurance

In the process of completing the logbook and documenting the activities the trainee must also ensure that the outcomes of Appendix B are achieved.

#### **Guidance on completing the Log book.**

The log book does not have to follow the order and structure of the above outcomes or appendix A. Although the log book itself should be logically structured. E.g. you often undertake tasks that begin with fault diagnoses, followed by a repair and calibration, which you then have to create a job report for. This activity obviously encompasses several tasks and achieves several different outcomes

For this reason your log book needs to be page and paragraphed numbered and you will need to complete a matrix identifying exactly where each of the tasks and outcomes have been achieved. The assessor will use the matrix and only look in the specific location that you have identified to assess your evidence. Non-specific referencing will not be accepted e.g. if your evidence is fragmented over several pages for one outcome or task it may not be accepted. Your log book needs to be concise and well-structured and organised with the key criteria in mind.

Appendix A specifies a range of specific tasks that you must complete as well as the equipment and subsystems that you must work on. You are required to describe the operating principles of each subsystem and have the option to do this in several different sections of the log book e.g. Records

on maintenance, calibration or repair. You only need to describe the specified subsystems (as well as any alternative systems where specified) once in the log book.

You should make use of photos of your activity as well as equipment records etc. to evidence your activity.

#### General Guidance on Part B

As this section is concerned predominantly with practical competence it is unlikely that it could be achieved without successful completion of manufacturers training courses.

Trainees should also make use of any formal user training either from the manufacturer or from clinical staff where they are based

It is also not likely to be able to complete this section without extensive involvement in service and repair on equipment which covers the criteria in appendix A. However if there are some aspects that you are concerned with please discuss this with your regional assessor to see what options are available. In some circumstances simulated faults (as commonly used on training courses) may be sanctioned by the assessor. However this would be limited as the log book should consist predominantly of experience in a real work environment.

#### Appendix A

##### 1 Installation and commissioning

###### Range of equipment

1. Dialysis Machines
2. Portable RO

###### Range of activity

- i. Acceptance testing
- ii. Site assessment
- iii. Installation
- iv. Configuration
- v. Testing

## 2a & 8. Setting up and using equipment and user training

(Some of this content integrates with section 2.3 of part A of the training scheme).

### Range of equipment

1. Two different models of dialysis machine
2. Portable RO

### Range of activity

- i. HD and HDF treatment modes
- ii. Single needle and double needle configuration
- iii. Set up and priming of a dialysis machine
- iv. Setting parameters for patient treatment
- v. Setting up treatment profiling options
- vi. Accessing treatment data (e.g. BVS/ KT/V)
- vii. Setup or verify automatic heat disinfection parameters
- viii. Carry out full range of disinfection methods

## 2b. Setting up and using equipment (no user training)

### Range of equipment (set up and using equipment only)

1. Pre-treatment
2. RO Unit

### Range of activity

- i. Set up or verify booster pump pressure switch settings
- ii. Set up or verify softener and carbon cylinder head settings
- iii. Set up or verify operating parameters on RO unit

- iv. Set up or verify auto disinfection parameters on RO and any associated plant
- v. Carry out manual disinfection procedure

3 Diagnosing problems in equipment use

Range of equipment

1. Two different models of dialysis machine
2. HD and HDF treatment modes
3. Single and double needle configurations
4. Portable RO

Range of activity

Identifying

- i. User errors - machine setting errors
- ii. User errors -line and consumables set up
- iii. Damaged consumables
- iv. Blood line obstructions
- v. Actual equipment faults

4 - 6 Service maintenance, fault finding and repair, calibrations, job reporting

### Range of equipment

1. Two different models of dialysis machine
2. Portable RO units
3. Water treatment plant

### Range of subsystems covered

#### Dialysis machines

- i. Main water inlet and heating control block.
- ii. Concentrate preparation
- iii. Machine fluid flow regulation
- iv. Patient fluid removal regulation (HD and HDF modes)
- v. Infusate control (HDF)
- vi. Blood Leak protection
- vii. Blood flow control
- viii. Heparin delivery system
- ix. Air detection
- x. Patient connection/ Treatment mode detection

#### Water treatment plant

1. Power distribution panel
2. Pre-treatment
3. RO unit
4. Heat disinfection Unit

### Range of activity

- i. PPM

- ii. Fault diagnosis
- iii. Repair
- iv. Calibration
- v. documentation

7. Consumable evaluation

Range of products

- 1. Dialysers
- 2. Blood lines
- 3. Concentrates

Range of activity

- i. Evaluation – performance quality and biocompatibility
- ii. Alternative selection

9. Water quality assurance

Range of activity

- i. Chlorine and harness testing
- ii. Microbiology and Endotoxin testing
- iii. Water chemistry testing
- iv. Contingency planning for non-complaint results

## Appendix B Competency outcomes

### **A Installation and commissioning of equipment**

O.1.1 The trainee must explain how they have assessed the environment for

- General Health and safety requirements
- Suitability of environment for intended use
- Adequacy of supply services at location

O1.2 The trainee must demonstrate an understanding of the purpose of all of the commissioning activity they describe in their log book.

O.1.3 The trainee must demonstrate an understanding that treatment parameters etc. need to be set for a particular unit or patient.

### **B**

#### **B.1 Setting up and using equipment**

The trainee needs to demonstrate the following to the verifier in order to get this section validated

O.2.1.1 The trainee is competent to set up equipment and is familiar with setting up for routine usage at the centre.

O.2.1.2 The trainee is familiar with common user alerts that occur at the unit and can respond appropriately

O.2.1.3 The trainee is familiar with the operating manuals and can reference them efficiently to set up infrequently used modes and identify uncommon user alerts.

O.2.1.4 The trainee must give examples of common Haemodialysis machine operation alarm conditions and the corrective measures.

O.2.1.5 The trainee demonstrates an awareness of needle selection criteria

#### **B.2 User training**

O.2.2.1 The trainee delivers the user training in a simple clear and consistent manner.

O.2.2.2 The trainee puts the user at ease

O.2.2.3 The trainee invites questions from the user and takes measures to clarify they have understood

O.2.2.4 The trainee adapts their approach to meet the needs of the individual user

## **C Diagnosing problems in equipment use**

This section relates to situations where technicians are called investigate issues in the use of equipment from equipment users.

Important

In units where technicians are required to diagnose problems during treatment there must be clearly established protocols to ensure this is done in a safe and controlled manner.

The trainee should be accompanied by an experienced senior technician who is fully aware of all of the relevant protocols and can intervene if required to ensure that there is no compromise to patient safety. The trainee should verify any proposed actions with the senior technician and nursing staff before initiating them.

At the beginning of this section in the log book:

O.3.1 The trainee must describe the protocols in place at their unit

O.3.2 The trainee must describe the initial assessment/checklist that they use to determine that it is safe in each case to continue treatment while diagnosing the fault. They should also state any circumstances that would have lead them to request immediate discontinuation of treatment.

O.3.3 The trainee must describe treatment parameters that can be adjusted to assist their diagnosis and the involvement required from nursing staff in this process. They should also highlight potential hazards from adjusting treatment parameters.

O.3.4. For each event logged the trainees must:

- a) Describe the mode of operation of the dialysis machine and the expected behaviour of the machine. (For subsequent faults in the same operating mode the trainee can refer back to a previous log entry).
- b) Describe the observed behaviour

- c) Explain step by step how they diagnosed the fault.
- d) Describe the corrective action

## **D Service maintenance, fault finding and repair, and calibrations**

O.4.1.1 In completing this section the trainee must describe the operation of all of the subsystems referenced in section D this can be integrated in the descriptions of calibrations, repairs, servicing etc. on each of the subsystems. Note this need only be done once for each subsystem.

O.4.1.2 For the dialysis machine the trainee should first present an overview of the systems it is made up of incorporating

- a. Description of the blood monitor control and associated safety features.
- b. Description of the heparin delivery and control system.
- c. Description of the fluid monitor control and associated safety features.

### **D.1 Service and maintenance procedures**

At the beginning of this section the trainee should describe,

O.4.2.1 The requirements for routine service and maintenance in terms of verification procedures and preventative measures.

O.4.2.2 The risks of introducing faults during maintenance activities and therefore the important of post service verification and safety checks.

O.4.2.3 The various sources that set the maintenance procedures and intervals and. (Sections 5 and 6 of Part A have some relevance to this outcome).

O.4.2.4 The implications of compliance/non-compliance with 0.3.3 with regard to liability in equipment use

For each activity

O.4.2.5 The trainee should describe the purpose of the action being taken

O.4.2.6 Describe undesirable outcomes that could be caused by mistakes in carrying out each procedure

### **D.2 Calibration procedures**

O.4.3.1 The trainee must demonstrate their understanding of the need for calibrated reference instruments and traceability.

O.4.3.2 The trainee must demonstrate their understanding of the need to ensure calibrations are performed under the specified operating and environmental parameters.

O.4.3.3 The trainee must give examples of when calibrations may need to be carried out in addition to routine maintenance.

O.4.3.4 Describe undesirable outcomes that could be caused by mistakes in calibration.

### **D.3 Fault finding and repair**

O.4.4.1 The trainee should clearly identify the fault symptoms

O.4.4.2 The trainee should identify anomalies and describe their fault finding procedures step by step (including any actions that were unsuccessful in diagnosing the fault).

O.4.4.3 The trainee should clearly describe the remedial action that they took and any post-repair calibrations, verifications or tests carried out.

### **D.4 Documentation**

These outcomes have links to section 4 of Part A. The trainee should include examples of service sheets and job reports safety tests etc. completed after service or repair.

The trainee should annotate these to show

O.4.5.1 Clear description of fault reported

O.4.5.2 Clear identification of the fault that was found

O.4.5.3 Clear description of remedial action

O.4.5.4 Lists of parts used and asset ID for test/ reference instruments used

O.4.5.5 Completed service sheets where appropriate

### **E Water quality assurance**

This topic is comprehensively covered in Part A section 3. The log book entries just require evidence of actually carrying out the range of activities specified in appendix A

O.5.1 The trainee must produce work records to evidence their activity of the tasks specified in appendix A and which are consistent with the requirements stated in Part A section 3

**F Consumable evaluation**

Some of these outcomes have links with Section 2.2.8 of part A.

O.6.1 The trainee needs to demonstrate an understanding of the key parameters of dialysers, blood lines and other consumables in relation to selecting appropriate or alternative products for a particular patient's requirements.

O.6.2 The Trainee need to demonstrate an understanding of biocompatibility in relation to materials and manufacturing methods used.

