ASSOCIATION OF RENAL TECHNOLOGISTS

Training Scheme

September 2008

ART Training Scheme

Contents

September 2008

ASSOCIATION OF RENAL TECHNOLOGISTS
TRAINING SCHEME OUTLINE

Aims. The aim of the scheme is to provide a tool to progress a Renal Technologist who possesses the basic "underpinning" knowledge gained from working in a Renal Unit (i.e. H.N.C. level) up to the position of possessing the necessary skills and knowledge to achieve Registration as a Renal Technologist able to deliver the full range of support functions to a Renal service.

1. The training scheme will be overseen by an ART Training Committee made up of senior registered renal technologists who will sit at three month intervals to make decisions regarding the scheme:

- To consider applications by Renal Technical Departments who intend to register a trainee on the scheme.
- To decide if a trainee is ready to present for examination
- To examine trainees and to determine if an ART Certificate of Competence should be issued.

The committee will consist of 10 members, a panel will consist of 3 members.

2. A senior registered renal technologist will be appointed as the scheme registrar by the ART executive. The registrar will not be part of the panel but will attend panel meetings as appropriate.

3. Renal Technical Departments with suitable trainee candidates will complete the **Scheme Application Form** and submit it to the scheme registrar with details of how the scheme fees are to be paid.

4. The Training Panel will judge the suitability of the application. It is expected that candidates will have as a minimum an HNC in a relevant subject or equivalent experience. In particular the panel will consider the proposals for how the training is to be given and the capabilities of the department to deliver the training. If there are any doubts on these aspects, the panel will contact the department to discuss improvements or alternatives. If the Technical Department making the application is not satisfied with the response of the initial panel an appeal may be lodged to be heard by an alternative panel.

5. On receipt of a successful application the registrar will:

- Register the candidate on the scheme
- Formally notify the department
- Make available copies of the training curriculum to the department complete with details of the required underpinning knowledge and recommended list of training materials
- Send blank templates of the training log documents

6. Assuming the candidate has the appropriate entry qualifications, the training programme is expected to take a further two years. Depending on prior qualifications and experience, it may be possible for the candidate to present for examination earlier. The department will be required to submit to the panel, justifications for early presentation if it is deemed appropriate. The panel will make a judgement of the circumstances as appropriate.
The minimum period before a candidate presents for examination will be one year.

7. Bi-annually the candidate will submit evidence of progress to the Training Committee. This will not be part of the examination process but will help ensure the training programme is being followed. If there are doubts about the progress a member of the panel will contact the training supervisor to discuss any problems and any alterations to the original proposals which are deemed appropriate. In extreme circumstances a candidate could be removed from the programme.

8. At the appropriate time the candidate will present to the panel for examination. The examination will consist of three elements:

- Examination of the training log and portfolio to ensure the syllabus has been covered.
- A written examination.
- An interview with two members of the panel to discuss the candidate's knowledge and prior experience and learning. Discussion of the projects may be an appropriate part of this interview.

9. If satisfied with the competence of the candidate, the panel will instruct the registrar to issue an ART Certificate of Competence. The registrar will satisfy himself that all elements of the scheme have been carried out, record these elements with dates, and issue the certificate. If the registrar believes the documentation is incomplete he should refer back to the whole panel for clarification before a certificate is issued.

10. Candidates who feel they have been unfairly treated may appeal, with evidence, to the registrar and the case will be reviewed by three members of the training panel, none who will have been party to the original examination original.

Criteria for Registering a Trainee on the ART Training Scheme

Guidance Notes

The senior management should support training in both principle and practice.

This commitment to support the training should be confirmed in writing. Support will take the form of:

- **Financial Support**
  An understanding of the financial implications of providing training must be accepted and funding commitment must be made.

- **Resources support**
  A commitment to ensure adequate facilities are made available for both trainee and trainer must be made.

- **Provision of adequate time for all staff participating in the training process**.
  This is often a problem when trying to run a service on already overstretched resources but its importance cannot be underestimated

Financial Support
Where possible all costs associated with training should be identified and provision agreed prior to the training starting.

This may involve:

- Course fees
- Additional courses or meetings
- Overnight accommodation
- Travel costs
- Subsistence allowances
- Training materials
- External training

Resources
The ability to cover all aspects of the whole training, where necessary, the cooperation of other Renal Units may be required to provide training in aspects which may not be covered at the local centre.

Access to appropriate desk space, internet access, library facilities, training material etc is essential if the training is to be successful.

Time
One of the largest components to any training programme is the time required by not only by the trainee but those delivering the training. The time required to prepare, to participate in, and write up the training should not be underestimated.

Training

An experienced Renal Technologist should monitor the training. Ideally this technologist would not be involved in the delivery of the training.

A member of staff should be identified to act as a training supervisor.

A formal training plan should be devised for each trainee detailing what is to be covered and approximate timescales as to when this will be done

A training portfolio should be kept. The portfolio should include

- Contents page
- Copy of training plan
- The logbook of Technical Training Experience
- Copy of any supervisor reports
- Any Supporting Evidence. This will be include notes on any knowledge based information given to the trainee in the workplace to supplement or support any knowledge based information being delivered through a for a formal educational route.
- Case studies
- Any certificates relating to any supplemental training
- Any additional training/supporting evidence information

Where it is appropriate referencing to other documents is encouraged to remove duplication of information. Photocopied general information should not be kept in the portfolio; a separate folder could be created if necessary.

Training Scheme Logbook

The purpose of this document is to provide a structured way of recording that the candidate undertaking the ART Training Scheme has performed to a satisfactory level the various activities and tasks required of them and can demonstrate, by way of evidence, that these tasks have been performed under the supervision of their appointed supervisor/tutor.

The Log Book is a series of pages, each dedicated to sections of the syllabus where workshop practice can illustrate knowledge and understanding of various topics. On completion of a task a departmental supervisor should sign at the bottom of the sheet to indicate satisfactory completion of that task. It is anticipated that several sheets, covering different tasks, may be completed for each section to illustrate complete understanding of the topic covered.

When completing the workshop tasks, reference should be made to the appropriate section in the syllabus which will indicate the areas of understanding which are being pursued.

The logbook will be a key document examined by the ART panel when judging the candidate's knowledge and understanding of the subjects involved.

Topics in Green will also be taught as part of a first module at University.
Topics in ***Blue*** will also be taught as part of a second module at University.
Topics in **Black** will only be covered as a workshop subject.

Evidence of Workshop Training

Section 2.1, 2.2, 2.4, 2.5, 2.8.	*2a. Describe a practical activity involving water treatment*
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding these elements of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 2.3, 2.6, 2.9, 2.10, 2.11	*2b. Describe a practical activity involved with achieving Water Quality Standards*
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 4.2, 4.13	4a. Describe an activity related to the blood monitor control and associated safety features
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 4.3, 4.13	4b. Describe an activity related to the heparin control and delivery system.
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 4.4, 4.13	4c. Describe an activity related to the fluid monitor control and associated safety features
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 4.5	4d. Describe an activity related to the haemodialysis machine operation of alarm conditions and the corrective measures
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 4.6, 4.7, 4.12, 4.13, 4.14	4e. Describe an activity related to conductivity control, monitoring and measurement
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 4.8, 4.13	4f. Describe an activity related to temperature control and measurement.
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 4.9, 4.13	4g. Describe an activity related to ultra-filtration control systems
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 4.10	4h. Describe an activity related to cleaning, disinfecting and decontamination processes used on haemodialysis equipment
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 4.11	4i. Describe an activity related to the extra-corporeal blood circuit
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by candidate ……Date …../…../……

Evidence of Workshop Training

Section 4.16	**4j. Describe the activities involved with Electrical Safety testing of equipment.**
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 5.1 (If applicable)	**5a. Describe an activity involving peripheral medical equipment such as infusion devices, temperature monitoring devices and blood pressure monitoring devices**
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 5.2	**5b. Describe an activity involving the commissioning and introduction of new equipment.**
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 5.3,	**5c. Describe an activity involving Planned Preventative Maintenance**
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 5.4	**5d. Describe an activity which involves repairing dialysis equipment.**
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 5.5	**5e. Describe an activity which involves repairing water purification equipment**
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 5.6	**5f. Describe an activity involving record keeping**
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

Section 7.1, 7.2	7a. Describe precautions taken regarding the transmission of Blood Borne Viruses or other infections whilst working on equipment
How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

Evidence of Workshop Training

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Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

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Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

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How was the activity performed?	
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How was the activity performed?	
Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

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Evidence of Workshop Training

Section 4.9, 4.13	4g. Describe an activity related to ultra-filtration control systems
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Why is there a need to perform this activity?	
What equipment was used	
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Evidence of Workshop Training

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Why is there a need to perform this activity?	
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Evidence of Workshop Training

Section 5.3,	**5c. Describe an activity involving Planned Preventative Maintenance**
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Evidence of Workshop Training

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Evidence of Workshop Training

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Further discussion of principles regarding this element of renal technology.	

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Evidence of Workshop Training

Section 5.6	**5f. Describe an activity involving record keeping**
How was the activity performed?	
Why is there a need to perform this activity?	
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Further discussion of principles regarding this element of renal technology.	

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Why is there a need to perform this activity?	
What equipment was used	
Further discussion of principles regarding this element of renal technology.	

Sheet ….. of ….. Signed by supervisor ……Date …../…../…..

ART Training Scheme

Resource and Book List.
(Updated – 26th April 2007 at 14:45)

Renal Replacement Therapy: An Introduction for Renal Technicians. (ART)
R.C. James

Replacement of Renal Function by Dialysis 5th Edition (Kluwer Academic)
Edited by Horl, Korch, Lindsay, Ronco, Winchester

Genesis of the Artificial Kidney (Baxter)
P.T. McBride

Understanding Membranes and Dialysers (Pabst Science Publishers)
Uhlenbush-Korwer, Bonnie-Schorn, Grassman, Vienken

Handbook of Dialysis, 4th Edition (Lippincott, Williams and Wilkins)
Daugirdas j, Blake P, Ing T.

Principles and Practice of Dialysis 4th Edition (Lippincott, Williams and Wilkins)
Henrich

Composition and Management of Haemodialysis Fluids (Pabst Science Publishers)
A. Grassman et al

Transport Phenomena in Biological Systems
Truskey, Yuan, Katz
ISBN: - 0130422045

Introduction to Bioengineering
Berger, Goldsmith, Lewis
ISBN: - 019856516X

Biomaterials Science
Ratner, Hoffman, Schoen, Lemons
ISBN: - 0125824637

Mechanics of Fluids
Massey
ISBN: - 0412342804

Biomedical Engineering Principles
Ritter, Reisman, Michniak
ISBN: - 0824796160

Introduction to Biomedical Engineering
Enderle, Blanchard, Bronzino
ISBN: - 0122386604

Basic Transport Phenomena in Biomedical Engineering
Fournier
ISBN: - 1560327081

Water Quality in Haemodialysis (Pabst Science Publishers)
E. Bonne-Schorn et al

Water Supply (Arnold)
A.C. Twort; D.D. Ratnayaka and M.J. Brandt

Water Technology (Butterworth Heinemann)
N.F. Gray

Water Treatment Monograph (EDTNA/ARCA)
Edited by F. Lopot

Basic Water Treatment
by C. Binnie, M. Kimber, George Smethurst
ISBN: 9780854049899
Publisher: The Royal Society of Chemistry
2003

Water Treatment Made Simple For Operators
Sarai, Darshan Singh
ISBN: 0471740020
John Wiley and Sons
2005

Water Treatment and Pathogen Control Process Efficiency in Achieving Safe Drinking Water
Le Chevallier, M.W.; Kwok-Keung, Au
ISBN : 1843390698
IWA Publishing
2004

Water Treatment Principles and Design, 2nd Revised edition
Montgomery, James M.
ISBN: 0471110183
John Wiley & Sons
2005

Pure Water Handbook (Osmonics)
Download free as PDF file from the internet

New Clinical Applications Nephrology Haemodialysis (Kluwer Academic)
Edited by G.R.D. Catto

Renal Nursing (Bailliere Tindall)
Edited by N. Thomas

Principles of Anatomy and Physiology (J. Wiley and Sons)
G.J. Tortora and S.R. Grabowski

History of the Treatment of Renal Failure by Dialysis (OUP, Oxford, 2002)
J.S. Cameron

Useful Journals

Dialysis & Transplantation

Journal of Renal Care

Nephrology Dialysis Transplantation

Useful Web Sites

www.renalweb.com

www.nephronline.com

www.nephronline.org

www.edtnaerca.org

HDCN (annual fee)
http://www.hdcn.com/ch/water

Other

Training CDs from Elizabeth Lindley

Association of Renal Technologists
Training Scheme
Application Form

First Names:	Surname:
Title Mr ☐ Mrs ☐ Miss ☐ Ms ☐ Other ☐	Date of Birth
Home Address	Work Address
County	County
Post Code	Post Code
Telephone	Telephone
Fax	Fax
E-mail	E-mail
Current Post	Grade
Date started in current post	ART Membership Number
Supervisor	Title
Training Supervisor (if different to above)	Title V.R.C.T. No.

Previous relevant experience (Including qualifications)

Association of Renal Technologists
Training Scheme
Application Form

RESOURCES

How will the academic portion of the training scheme be delivered? (ie the portions of the training scheme detailed by blue and green colouring)

What resources/personnel are available within the department to support the training?

What resources external to the department will be used to support the training?

Association of Renal Technologists
Training Scheme
Application Form

SIGNATURES

I wish to apply for enrolment to the ART Training Scheme

Signed: (Trainee Applicant) _____ Date: _____

I have discussed this proposal with the applicant and confirm the department will support the applicant both financially and with the appropriate physical resources and time to complete the scheme

Signed: _____ Date: _____

Print Name: _____

Position: _____

FEES

For the duration of the pilot scheme the Association of Renal Technicians will charge no fees for the administration of the Scheme.

All other costs will be the responsibility of the department. This will include the short course fees to Bradford University if this method is chosen to deliver the academic portion of the scheme.

For office use only

Application form reviewed by _____ Date _____

Approved Yes ☐ No ☐ Signed _____

Proposed ART Training Scheme Syllabus

Produced for
The Association of Renal Technologists Education Group

General Information on the Training Scheme Syllabus

The aim of the scheme is to provide a tool to progress a Renal Technologist who possesses the basic "underpinning" knowledge gained from working in a Renal Unit (i.e. H.N.C. level) up to the position of possessing the necessary skills and knowledge to achieve Registration as a Renal Technologist able to deliver the full range of support functions to a Renal service.

The Registered Renal Technologist can be expected to work and contribute as part of a Multi-Disciplined Team within the renal department and provide and take part in a range of services and functions. The range and extent of these services could ultimately be dependant upon which department the technologist is employed by and would include the renal unit; medical physics; EBME / EME etc; estates, clinical engineering etc. Regardless of the employing department the technologist is working for, there will most certainly be a standard or common core of renal related activities and services that the technologist will be expected to provide. This syllabus lists the required knowledge that will allow the newly registered renal technologist to provide this common core of activities and services.

The range of services the renal technologist could be expected to provide could include almost everything from setting-up the haemodialysis machine for patient use; maintaining the stock levels of the consumables; providing an "On Call" support service; teaching staff and patients; repairing and maintaining the dialysis equipment; testing the quality of the water; ordering; working in the community; designing a renal unit and everything else in between. However the common core of services the renal technologist would be expected to provide initially will be a part of the above list.

Nothing can replace the continuous learning acquired through experience over time but this training scheme syllabus endeavours to provide the building blocks to start the process. The syllabus identifies the common knowledge required to achieve the standard to enable the trainee to be eligible for Registration and be entitled to call himself a Renal Technologist following successful completion of the ART Training Scheme. The Training Scheme is outlined in other documents.

The syllabus has been designed with the understanding that the trainee will have previously acquired the appropriate underpinning knowledge required to allow educational progression. This underpinning knowledge has been identified in the second section of the syllabus and is included purely as a reference.

A key factor in this syllabus is the level of knowledge and understanding that is required. To ensure that this is set at an appropriate level for a Renal Technologist, 2 levels of knowledge and understanding have been set.

Level 1, the lower level, is identified by the terminology "Can demonstrate a basic level of knowledge and understanding"; "Can describe the principles"; "Can demonstrate an awareness"; "Can provide an outline and or overview".
Level 2, the higher level, is identified by the terminology "Can demonstrate a detailed level of knowledge and understanding"; "Can explain or describe in detail".

The ART Training Scheme Syllabus

Contents

Colour Key

Topics in Green will be taught as a first module at University.
Topics in *Blue* will be taught as a second module at University.
Topics in **Black** will be taught during placement or whilst the trainee is in post.

Renal Specific Knowledge

Renal Anatomy, Physiology and Pathology

The Renal Technologist must be able to: -

1.1. Demonstrate a basic level of knowledge and understanding of the kidney explaining the principles by which urine is produced.

1.2 . Demonstrate a basic level of knowledge and understanding of the cardiovascular and circulatory systems explaining the movement and control of body water and electrolytes.

1.3. Demonstrate a basic level of knowledge and understanding of the causes and consequences of renal failure and explaining the differences between the Acute and the Chronic renal patient.

1.4. Demonstrate an awareness of and explain at a basic level the terminology associated with renal anatomy and renal failure, such as glomerular filtration, tubular re-absorption and secretion, electrolyte balance, fluid balance, blood pressure regulation, fluid overload etc.

Water Treatment

Municipal Supply

The Renal Technologist must be able to: -

2.1. Demonstrate an awareness of the different sources of water and their properties.

2.2. Demonstrate an awareness of the various water treatment processes performed by the municipal water suppliers.

2.3. Demonstrate a basic knowledge and understanding of the Water Quality Standards.

Dialysis Centres

The Renal Technologist must be able to: -

2.4. Explain in detail "pre-treatment" water treatment systems and the reasons for their use.

2.5. Explain the various Reverse Osmosis systems available.

2.6. Explain the importance of and reasons for the sanitization of the water treatment equipment and the distribution systems.

2.7. Explain the clinical effects of using untreated or poor quality water for dialysis.

2.8. Demonstrate an awareness of the principles and criteria used in the design of a water treatment system for a renal unit.

Water Quality and Testing

The student must be able to: -

2.9 Demonstrate a detailed level of knowledge and understanding of the testing procedures that should be performed including how they should be performed, how often they should be performed and how to interpret and react to the results.

2.10. Outline recommendations to maintain or improve water quality.

2.11. Explain the Terminology associated with Water Treatment such as Ion exchange resin, deionisation, activated charcoal, total bed contact time, agar, endotoxin, biofilm, rigor,

2.12. Explain how the water quality can influence renal replacement therapy.

Principles of Dialysis

The Renal Technologist must be able to: -

3.1. Demonstrate a basic awareness of the history and development of Renal Replacement Therapy, including the evolution of the artificial kidney, the development of dialysis equipment, clinical developments and the development of alternative therapies.

3.2. Describe in detail the principles of fluid and chemical transport i.e. Diffusion, Convection and Filtration.

3.3. Explain alternative dialysis methods of attaining clearance of solutes.

3.4. Describe the role of buffers in dialysis fluid.

3.5. Describe the role of electrolytes in dialysis fluids.

3.6. Explain the reasons that influence the composition of Concentrates.

3.7. Describe methods of access and associated problems.

3.8. Describe the advantages and disadvantages of the different types of sterilisation methods used in the preparation of dialysis consumables.

3.9. Describe possible dialysis complications or adverse reactions

3.10. Demonstrate a basic understanding of the need for anticoagulants and their use during dialysis.

3.11. Explain the Terminology associated with dialysis such as Biocompatibility, shunt, fistula, graft, temporary and permanent line, Dalton, Angstrom, contraflow, pressure gradient, semi-permeable membrane, osmosis,

Renal Technology

The Renal Technologist must be able to: -

4.1. Explain the differences between Single Pass, Regenerative and Re-circulating systems.

4.2. Describe the blood monitor control and associated safety features.

4.3. Explain the heparin delivery and control system.

4.4. Describe the fluid monitor control and associated safety features.

4.5. Explain the haemodialysis machine operation alarm conditions and the corrective measures.

4.6. Describe in detail the methods of conductivity control, monitoring and measurement.

4.7. Describe in detail the mechanical processes involved in the proportioning of concentrate to produce the required dialysate mixture.

4.8. Describe in detail the methods of temperature control and measurement.

4.9. Explain in detail the different ultra-filtration control systems.

4.10. Explain in detail the various cleaning, disinfecting and decontamination processes used on haemodialysis equipment and the reasons for their use.

4.11. Describe and explain the extra-corporeal blood circuit including needle selection, bloodline construction, pressure monitoring, safety systems and dialysis performance assessment systems and demonstrate your knowledge by using the equipment to perform a dialysis treatment.

4.12. Explain the Terminology associated with Renal Technology such as conductivity, ion-selective cell,

4.13. Explain the various “feedback” systems used in dialysis equipment.

4.14. Explain the various analysers used in the renal department and their limitations.

4.15. Explain the various Bio Sensors and Bio Feedback systems in use.

4.16. Describe the need for Electrical Safety testing of equipment and the process involved.

Equipment Management

The Renal Technologist must be able to: -

5.1. Demonstrate a basic understanding of medical equipment such as infusion devices, temperature monitoring devices and blood pressure monitoring devices.

5.2. Demonstrate an understanding of the procedures required when placing new equipment into the clinical environment including acceptance testing, asset management and user training.

5.3. Demonstrate an understanding of the need for and requirements of Planned Preventative Maintenance, servicing and repair programmes including the implications of manpower, time, cost and spare parts.

5.4. Demonstrate the detailed knowledge required to service and maintain specific dialysis equipment.

5.5. Demonstrate the detailed knowledge required to service and maintain specific water treatment equipment.

5.6. Demonstrate an understanding of and use maintenance management software and spare part management systems.

5.7. Demonstrate an understanding of the requirements of the equipment and the needs of the equipment users.

5.8. Demonstrate an understanding of the procedures required when ordering new equipment such as equipment trials, performance review, assessment and justifications.

5.9. Demonstrate an understanding of the life cycle of the equipment from purchase through to disposal and replacement including asset management.

5.10. Demonstrate an understanding of the application of quality management systems relating to the design and development of medical electrical equipment and systems.

5.11. Demonstrate an understanding of the application of the Medical Device Directive.

5.12. Demonstrate an understanding of C.E. marking of medical electrical equipment and systems, including the routes to compliance.

5.13. Demonstrate an understanding of the application of risk management to medical electrical equipment and systems.

5.14. Demonstrate an ability to discuss and critically evaluate medical electrical equipment and systems design proposals.

Dialysis Techniques

The Renal Technologist must be able to: -

6.1. Describe and explain the function of different types of dialyser and dialyser membrane material with particular reference to middle molecule clearance.

6.2. Explain the Terminology associated with Dialysis Techniques such as Single needle, pH balance, Glucose, Potassium and Sodium homeostasis, high flux, Dalton, Angstrom

6.3. Explain dialysis adequacy and dialysis performance assessment tools and show how they can influence treatment.

6.4. Outline the principle of dialysis performance measurement tools and describe how they work, such as Blood volume monitoring and Urea clearance monitoring.

6.5. Explain dialysis complications and suggest treatment regimes that limit the effects.

6.6. Demonstrate an awareness of the effects on the patient, and on the dialysis unit of different haemodialysis treatment regimes such as twice weekly, three times 4 hour, overnight, long hour, frequent short hour, alternate day and daily haemodialysis treatments.

6.7. Demonstrate an understanding of the importance of dry weight, its calculation and the assessment methods available.

6.8. Explain the Terminology associated with Dialysis Techniques such as low temperature, thermal balance, profiling.

6.9. Demonstrate an understanding of the fistula and other forms of access and be able to explain recirculation and its measurement, blood flow rates, assessment techniques and the impact of stenoses.

Biochemistry, Microbiology and Virology

The student must be able to: -

7.1. Explain the precautions that need to be taken when treating patients with Blood Borne Viruses.

7.2. Outline the precautions the renal technologist must take when working on equipment that has been used to treat a patient with a blood borne virus or infection.

7.3. Explain the Terminology associated with Dialysis Techniques such as Hepatitis, Dialysis dementia

7.4. Explain the potential short and long-term harmful effects on the patient when dialysing with poor quality water, the transfer mechanisms involved and make recommendations to limit such problems.

7.5. Explain the possible causes of microbiological contamination and suggest procedures to limit the problems.

7.6. Explain First Use Syndrome.

The ART Training Scheme Syllabus

Renal Replacement Modalities, Treatment Techniques and Standards

The student must be able to: -

8.1. Explain "OnLine" therapies and factors that influence their use.

8.2. Explain the various renal replacement therapies currently available and the advantages and disadvantages of each therapy.

8.3. Outline the advantages and disadvantages of peritoneal dialysis as compared to haemodialysis.

8.4. Explain the relevance of dietary control and identify situations and conditions that might influence diet.

8.5. Demonstrate a basic knowledge and understanding of the various Standards and Guidelines currently followed in renal units.

8.6. Understand the implications of transplantation

8.7. Explain the terminology such as CAPD, Plasma Exchange, Cadaver, Haemofiltration and Haemodiafiltration, The Renal Association,

Psychological and Social Pressures on Patients - Advisory section only.

The Renal Technologist must understand a patient's perspective of: -

9.1. The Psychological and Social impact on the patient of Renal Replacement Therapy.

9.2. The patient pathway from initial diagnosis to treatment and the associated stress and trauma.

9.3. The potential psychological problems for the patient as a result of a kidney transplant failure.

9.4. Patient problems and patient needs, utilising good communication, interpersonal and listening skills.

9.5. The effects on patients of transmissible diseases, chronic illness, coping mechanisms and associated stress.

9.6. The links between lifestyle, health and disease, health promotion and strategies for delivery to clients

9.7. The effects of disability.

Underpinning Knowledge 1.

The Renal Technologist should be able to: -

General Anatomy and Physiology
Outline the basic structure, function and location of the major organs and systems in the body including the nervous system, cardiovascular system, renal system, respiratory system, gastrointestinal system and reproductive system and have a basic understanding of cell processes and metabolism.

Mathematics, Statistics and Information Technology
Demonstrate an appropriate use of mathematical functions to solve work related problems.
Demonstrate an appropriate use of statistical methods to analyse results and present information.
Demonstrate an appropriate use of current Information Technology systems and software.

Physics, Chemistry and Biology Principles
Demonstrate an appropriate level of understanding of the basic scientific principles, common to all sciences and should be able to apply these principles, where applicable and when required, in the workplace, e.g. when working with chemicals.

Electronics and Electrical Engineering Principles
Demonstrate an understanding of AC and DC power systems, analogue and digital circuits and both high and low power systems.
Demonstrate fault find techniques and identify faulty components.
Demonstrate an understanding of power supplies, motors, generators and more power demanding systems.

Mechanics and Mechanical Engineering Principles
Demonstrate an ability to perform basic operations correctly and safely such as wiring an electric plug, soldering components and completing basic plumbing techniques.
Demonstrate an understanding of hydraulics, fluidics, flow, pressure, temperature measurement and control systems.
Demonstrate an understanding of general workshop practices and be able to use workshop tools and machinery safely and in accordance with accepted workshop practice.

Study skills
Demonstrate an ability to use all of the available resources and develop the skills necessary to produce evidence based reports and research.

NHS
Understand in outline the NHS including it's history, development, organisation, structure and funding.

Underpinning Knowledge 2.

The Renal Technologist should be able to: -

Laboratory Methodology and Research
Demonstrate the use of good scientific procedures for accurate and repeatable experiments and test procedures.
Demonstrate the use of a scientific approach to the resolution of clinical and technical problems along with the ability to record data and produce accurate reliable reports.
Demonstrate a basic understanding of the procedures required when participating in research.
Demonstrate the effective use of mathematics, statistics and basic computer skills within the field of research.

Clinical Engineering
Demonstrate an understanding of basic electronic and signal processing systems, calibration and quality assurance principles, the effect of temperature on the human body, electrical safety standards, hygiene and general safety in the medical environment.
Demonstrate an understanding of mechanical systems such as pumps, vacuums, and scales, flow control and measurement devices and systems, pressure control and monitoring devices and systems, temperature monitoring devices and systems, fluid proportioning and mixing systems and degassing systems.
Demonstrate an understanding of the basic principles and technology of transducers.
Demonstrate an understanding of how equipment is used at the patient / user interface and how the equipment measures, records and transfers data.

Teaching and Presentation Skills
Demonstrate their ability to teach and educate staff, junior staff and eventual equipment users, the correct procedures to adopt when using the equipment and general information about the equipment and treatment.
Demonstrate their ability to put together a presentation to inform and educate, convince or prove a hypothesis to a peer group.

Health, Safety and Risk
Assess risk in the work place and recommend corrective procedures.
Demonstrate an understanding of all Health and Safety recommendations and appreciate how they impact into the working environment.
Demonstrate an understanding of Data protection, confidentiality of information, infection control and the ethics.

ART Training Scheme
Guidance to Completion of Logbook

The logbook is the key document which provides evidence that workplace learning has been achieved. The trainee should use this as an opportunity to impress the ART overseer of his understanding. During the training period the trainee should consider that every task he/she performs is an opportunity to complete a logbook page.

Each section of the syllabus included in workplace practice must be covered at least once and for many activities there should be numerous entries for each section. The section checklist should be completed as an index of the completion of the log to ensure each section is well covered.

The activities detailed at the top of each page may cover more than one section of the syllabus. The section number that the trainee is focussed on should be highlighted in someway, eg. Circled, formatted bold or other section numbers which do not apply could be deleted.

How was the activity performed? This box in the logbook should include a brief description of the activity. The amount of detail is up to the trainee who should remain aware that it is an opportunity to impress the overseer with their knowledge. For this reason some detail should be included. For example: replacement of a component – a brief description of carrying out this task would be appropriate. To just state the component was replaced may not be sufficient. Guidance should be sought from the relevant overseer if there is doubt.

Why was there a need to perform this activity? Again, this is an opportunity to demonstrate knowledge. In the previous example of replacing a component, it may be enough to state that it was faulty, but some discussion of the nature of the fault and why it was decided to change the component would be more useful.

Further Discussions: This box is key to demonstrating the knowledge of the trainee. The local supervisor has the opportunity to discuss issues related to the activity with the trainee who can then further elaborate on paper. The trainee should be encouraged to research the issues around and add any findings to the discussion. References should be formally quoted when this information is gathered and, where the information is not immediately to hand for the overseer, the trainee should be encouraged to copy portions of relevant documents to support the discussion. This material should be retained in the portfolio of work that the trainee is expected to maintain. Where standards are applicable these should be quoted and discussed.
On occasion the same discussion may be appropriate for two or more sheets. In this case it is permissible to cross reference rather than repeat. Both cross referencing and further discussion might be in order.

Once the trainee is content that the logbook page will need no further adjustments, it should be signed by the local supervisor. The date should match the date the activity was performed and correspond to an entry in the section checklist.

During the period of training, the logbook should be discussed with ART overseer who will help ensure the correct level of detail is used.

The local supervisor should ensure that the use of the logbook is not just used as a record but that completion is a meaningful learning experience to increase the knowledge of the trainee.

February 2011

ART Training Scheme
Guidance to Documents in the Portfolio

There is no formal format to the contents of the portfolio. It should include items which the trainee considers useful in demonstrating a level of knowledge. Good examples of this could be documents which have been referenced in the logbook and are not immediately to hand to share with the ART overseer. Other items could relate to project work that the trainee has carried out or things that the trainee has found interesting and enhance the learning experience.

Relevant standards (eg. Water Quality) could be included where used in discussion in the logbook

Copies of training certificates should be included. These must include evidence of the completion of the academic portion of the scheme (currently delivered only at Bradford University) and could also be evidence of manufacturers' training courses.

Other examples could be related training sessions delivered within the local hospital environment or external courses: (eg. Electrical Safety, conferences etc.)

As with the logbook, the key purpose of the portfolio is to impress the ART Examining Panel that the trainee has adequate knowledge and understanding of Renal Technology to be awarded the ART Certificate. Whereas the logbook is prescriptive by nature, the portfolio is an opportunity to add in other interesting material which is not defined in the logbook. This may be included elsewhere in the syllabus or may be items entirely of the trainee's own (relevant) interest.

ART Training Scheme Documents

Title Page

1. Contents
2. Outline
3. Application Guidance
4. Log Book
5. Book List
6. Application Form
7. Section Checklist
8. Syllabus
9. Guidance to completion of logbook
10. Guidance to documents in the portfolio

Renal Technology Short Course Application Form

Please return this completed form by email to J.Williamson7@bradford.ac.uk
(Julie Williamson, EDT3, University of Bradford, Bradford BD7 1DP)

Applicant Information

(please complete the details of the applicant, not a sponsor or supervisor)

Title (Dr/Mr/Mrs etc.): _____
First Name: _____
Family Name: _____
Job Title: _____
Date of Birth: _____
Home Address (1): _____
Home Address (2): _____
City: _____
County: _____
Postcode: _____
Country: _____
Telephone: _____
Fax: _____
Email Address: _____

Registration Fees

Please do not include payment at this time - payment will be required at the enrolment stage. Fees include all technical sessions, online literature and support. Accommodation is *not* included, but we can offer recommendations if required. As a higher education course, these fees are VAT exempt.

Renal Technology 1 ENG3057M: 23-25th October 2013	**£750.00***	☐
Renal Technology 2 ENG3092M: scheduled for 3 days in Feb/March 2014	**£750.00***	☐

**please tick to indicate which course(s) you are applying for*

Funding - please tick to indicate who will be paying the registration fees

☐ Self: fees to be paid by applicant

☐ Grant: fees to be paid from NHS block grant by prior arrangement (confirmation required)

☐ Employer: fees to be paid by applicant's organisation*

**if your employer will be paying your registration fees, please identify who should be invoiced*

For Attention Of: _____
Sponsor Address (1): _____
Sponsor Address (2): _____

Enrolment

Successful applicants will be sent an email asking them to enrol online, sent from "The Hub" (please check any spam filters). On enrolment you will be made an associate student of the University of Bradford and be given a student card that grants you access to University facilities. Until you complete the online enrolment process you will be unable to access the course materials, examinations and results.

Please advise if you have any special requirements, such as access.

_____

_____

Signature _____ Date _____

For Administrative Use Only

☐ NHS sponsored application (S2091) ☐ Payment by applicant/employer (C6274)