# University Hospitals Birmingham MHS

**NHS Foundation Trust** 

Standard Operating Procedure (SOP) for Renal Technicians to Monitor the Water Treatment Equipment, to Ensure the Continued Safe Delivery of Treated Water for Renal Replacement Therapy in Critical Care

CATEGORY:	Standard Operating Procedure
CLASSIFICATION:	Clinical
PURPOSE	This SOP provides guidance for the monitoring of water treatment equipment by renal technicians, to ensure the continued safe delivery of treated water for renal replacement therapy in Critical Care
Controlled Document Number:	929
Version Number:	1
Controlled Document Sponsor:	Associate Director of Nursing, Division B
	Divisional Director, Division B
Controlled Document Lead:	Renal Technician Manager
Approved By:	Divisional Director, Division B
	Associate Director of Nursing, Division B
	Clinical Service Lead Renal
	Clinical Service Lead Critical Care
	Group Manager, Renal
	Matron, Critical Care
On:	May 2016
Review Date:	April 2019
Distribution:	
Essential Reading for:	All Renal technicians.
Information for:	All clinical staff involved in the care of patient receiving renal replacement therapy in Critical Care.

Page 1 of 10

Standard Operating Procedure (SOP) for Renal Technicians to Monitor the Water Treatment Equipment, to Ensure the Continued Safe Delivery of Treated Water for Renal Replacement Therapy in Critical Care Issued: 05/2016

## Contents

Paragraph		Page
1	Introduction	3
2	Weekly validation	4
3	Critical Care Bi-annual filter replacement programme	5
4	References	6
5	Approval/sign off	7
Appendix 1	Criteria for Competence	8

Page **2** of **10** 

## 1. Introduction

- 1.1 Patients within the Trust's Critical Care Unit may require renal replacement therapy as part of their clinical treatment. The renal replacement therapy provided in Critical Care includes haemodialysis, continuous veno-venous haemofiltration and haemodiafiltration. In order to provide this renal replacement therapy, raw water is used.
- 1.2 Raw water requires specialist pre-treatment to make it suitable and safe for use within renal replacement treatments. The types and length of treatments commonly performed within the critical care units could mean that patients can potentially be exposed to hundreds of litres of permeate water over the course of their treatment.
- 1.3 As it would be impractical to fully implement the Renal Association Standards (2012) within the critical care setting due to the length and type of treatments performed, the renal technical team have put in place an increased level of incoming water pre-treatment and a stringent program of checks and measurements aimed at reducing the likelihood of chlorine breakthrough to a minimum.
- 1.4 For the purpose of this document the term "water treatment system" will be deemed to mean all equipment installed on the transport trolley including filters, reverse osmosis unit and tubing and fittings.
- 1.5 Paragraph 2 identifies:
  - the requirement for routine weekly testing and checking of chlorine levels within the critical care unit setting.
  - actions to be taken should these routine tests indicate increased levels of chlorine.
- 1.6 Paragraph 3:
  - describes the bi-annual carbon filter exchange programme.
- 1.7 Appendix 1 contains competencies for the monitoring of water treatment equipment within Critical Care. These must be completed by suitable trained renal technicians, undertaking this practice, assessed by a practitioner, who is already competent in the monitoring of water treatment equipment within Critical Care.

#### Page **3** of **10**

Standard Operating Procedure (SOP) for Renal Technicians to Monitor the Water Treatment Equipment, to Ensure the Continued Safe Delivery of Treated Water for Renal Replacement Therapy in Critical Care Issued: 05/2016

(Note: monitoring of the chlorine dioxide dosing systems on the incoming water supplies is the responsibility of the Trust's Private Finance Initiative (PFI) partners hard Facilities Management (FM) provider).

## 2. Weekly Validation

- 2.1 Within the critical care setting the incoming water pre-treatment validation checks must be performed on a weekly basis by a suitable trained renal technician. In addition, they must also be performed when there are changes to the local operating conditions (as identified by the estates department) or when directly requested by the renal technical manager, Clinical Service Lead (CSL), Matron for the Critical Care Unit or the Water Safety Group chair.
- 2.2 The single patient water treatment system currently utilised within the critical care units consists of three elements;
  - Incoming water particle filter nominal rating 5 micron.
  - Twin big blue carbon block filters with a nominal rating of 1 micron.
  - Single patient reverse osmosis (RO) unit.
- 2.3 To ensure the integrity and correct functioning of the carbon filtration set, the output of the filter system MUST be tested on a <u>weekly</u> basis.
  - This test must be performed using a calibrated chlorine measurement instrument; currently the Palintest Chlorosense unit is used within the renal technical department.
  - Prior to any test being performed, the renal technician is responsible for ensuring that the test unit and test sensor calibration codes are identical, under no circumstances must any test be performed with an incorrectly calibrated tester.
  - All tests must be performed following the operating guidelines for the test equipment in use.
  - All sample test results MUST immediately be recorded on the "ITU Chlorine" record sheet and signed by the performing renal technician.

#### Page **4** of **10**

Standard Operating Procedure (SOP) for Renal Technicians to Monitor the Water Treatment Equipment, to Ensure the Continued Safe Delivery of Treated Water for Renal Replacement Therapy in Critical Care Issued: 05/2016

- 2.4 If the Total Chlorine level is measured as above 0.1ppmm or there are any other operating/performance concerns (such as an unexpected result or concern that the test equipment is not functioning correctly):
  - The equipment must be immediately retested; another sample must be taken by another member of the renal technical team and documented on the record sheet.
  - The Renal Technical Manager must be made aware.
- 2.5 If the re-tested Total Chlorine level is measured again as above 0.1ppmm or there is not another renal technician available to re-test the equipment:
  - The water treatment system MUST be removed from use immediately.
  - The Renal Technical Manager, his deputy and the Matron for Critical Care must be informed.
  - Further investigative checks must be made to fully establish reasons for the test result failure.
  - All works carried out MUST be fully documented on the relevant service report sheet.

#### 3. Critical Care Bi-annual filter replacement programme

- 3.1 To reduce the possibility of chlorine or sediment break through, the cartridge carbon and rolled felt filters will be replaced on a biannual basis or where test results show that performance is deteriorating and has reached the upper safe limit, by the renal technical team, regardless of their measured operational effectiveness.
- 3.2 When installing new filters it is essential to:
  - Lubricate the top and bottom "O" rings with silicon lubricant.
  - Flush the output to drain for 20 minutes.
  - Perform a residual chlorine test. This test is aimed to confirm both the correct performance of the new carbon filters and as a final check for correct seating of the internal "O" rings. It is imperative that any failure (reading above 0.1ppm) or unexplained readings at this stage

#### Page 5 of 10

Standard Operating Procedure (SOP) for Renal Technicians to Monitor the Water Treatment Equipment, to Ensure the Continued Safe Delivery of Treated Water for Renal Replacement Therapy in Critical Care Issued: 05/2016

MUST in first instance be reported to the renal technical manager and the filter set remain out of service until the issues are identified and proper operation confirmed and documented.

- Complete an electronic service report on completion of the installation and file it in the relevant folder within the electronic Renal Folder.
- 4. References

Renal Association and Association of Renal Technologists (2012) Guideline on water treatment facilities, dialysis water and dialysis fluid quality for haemodialysis and related therapies http://www.renal.org/guidelines/clinical-practice-guidelinescommittee#stha 2012sh.alOszLez.dpbs [accessed 01/05/15]

Page 6 of 10

## 5. SOP reviewed by:

Paul Simpson Liz Simpson Helen Gyves Mav Manji Renal Technician Manager Matron, Established Renal Failure Matron, Critical Care Consultant, Critical Care and Anaesthesia

SOP submitted to and approved by:			
	C		
Divisional Medical Director,	Division B		
Date: .	21-1-16		
	1 MI		
Associate Director of Nursin	g, Division B. Muthel		
Date:	15/5/16		
Clinical Service Lead, Renal			
Date: .	24 March 2016		
Group Manager, Renal	<u>IG</u>		
Date:	22 / 02 / 16		

Page 7 of 10

Standard Operating Procedure (SOP) for Renal Technicians to Monitor the Water Treatment Equipment, to Ensure the Continued Safe Delivery of Treated Water for Renal Replacement Therapy in Critical Care Issued: 05/2016

(Page 1 of 3)

## UNIVERSITY HOSPITALS BIRMINGHAM NHS FOUNDATION TRUST CRITERIA FOR COMPETENCE

## END COMPETENCE: Monitoring of Water Treatment Equipment in Critical Care

Name of Supervisor (print):

Element of Competence To Be Achieved	Date Achieved	Renal Technician Sign	Supervisor Sign
Be able to identify the need for incoming water pre-treatment			
validation checks.			
Demonstrate knowledge of the single patient water treatment			
systems used in Critical Care.			
Demonstrate competence in use of the chlorine			
measurement instrument, in accordance with the operating			
guidelines.			
Demonstrate how to identify the chlorine measurement			
instrument is correctly calibrated to the test sensors in use,			
and identify actions to take if it is not.			
Demonstrate competence in obtaining a measurement for the			
Total Chlorine Level.			
Identify what levels would be considered satisfactory			
measurements.			
Discuss other potential operating/performance concerns			
which may be identified and necessitate re-testing.			

Page 8 of 10

Standard Operating Procedure (SOP) for Renal Technicians to Monitor the Water Treatment Equipment, to Ensure the Continued Safe Delivery of Treated Water for Renal Replacement Therapy in Critical Care Issued: 05/2016

## Appendix 1

(Page 2 of 3)

Element of Competence To Be Achieved	Date Achieved	Renal Technician Sign	Supervisor Sign
Identify what actions must be taken, if the measurement falls			
outside this range on initial testing and on repeat testing.			
Demonstrate ability to undertake the further investigative			
checks necessary to establish reasons for any test result			
failure.			
Identify who must be informed of a test failure on initial			
testing and on re-testing.			
Identify performance characteristics that would indicate the			
cartridge carbon and rolled felt filters need to be replaced.			
Demonstrate competence in the installation of new filters to			
include:			
<ul> <li>Lubrication of the top and bottom "O" rings</li> </ul>			
<ul> <li>Flushing of the output to drain</li> </ul>			
<ul> <li>Performance of residual chlorine test and action to</li> </ul>			
take if unexplained readings/test failure.			
Completion of electronic service report			
Demonstrate accurate record keeping, including use of:			
<ul> <li>"ITU Chlorine" record sheet</li> </ul>			
<ul> <li>service report sheets</li> </ul>			
electronic service reports			
Demonstrate the ability to practice safe infection prevention			
and control practices, in relation to monitoring, installation			
and removal of the water treatment system.			

## Page **9** of **10**

Standard Operating Procedure (SOP) for Renal Technicians to Monitor the Water Treatment Equipment, to Ensure the Continued Safe Delivery of Treated Water for Renal Replacement Therapy in Critical Care Issued: 05/2016

#### Appendix 1

Element of Competence To Be Achieved	Date Achieved	Renal Technician Sign	Supervisor Sign
Discuss any health and safety issues in relation to this practice			
Demonstrate an understanding of the incident reporting process.			

I have read and understood the Standard Operating Procedure (SOP) for Renal Technicians to Monitor the Water Treatment Equipment, to Ensure the Continued Safe Delivery of Treated Water for Renal Replacement Therapy in Critical Care

Signature of Renal Technician:		Print name:
Date:		
I declare that I have supervised the	his renal technician and have found her/him to be co	mpetent as judged by the above criteria.
Signature of Assessor:		Print name:
Date:		Designation:

A copy of this record should be placed in the renal technician's personal file, a copy must be stored in the clinical area by the line manager and a copy can be retained by the individual for their Professional Portfolio.

#### Page 10 of 10

Standard Operating Procedure (SOP) for Renal Technicians to Monitor the Water Treatment Equipment, to Ensure the Continued Safe Delivery of Treated Water for Renal Replacement Therapy in Critical Care Issued: 05/2016