CONTENTS

Executive Summary 1

1. Introduction 2
2. Aims and Objectives 2
3. Co-ordination and Facilitation 3
4. Renal Units Involved in the Programme 3
5. Standards and Evidence Base 4
6. NW Renal Audit Programme 5
7. Planned Developments 6
8. Completing the Audit Cycle 7
9. Clinical Governance 7
10. Communication 8
11. Patient Involvement 8
12. Audits 9
   12.1 Audit of Peritonitis 2007/2008 9
   12.2 Audit of management of nephrology patients: Stage 5 chronic kidney disease 13
   12.3 The patient perspective audit 20
   12.4 Peritonitis audit 2008/2009 22
   12.5 Audit of haemoglobin and erythropoietin 28
   12.6 Audit of Water Quality 30
   12.7 Audit of dialysis mortality 31
   12.8 Audit of transplant patients 33
   12.9 Bone Chemistry Audit 35

Appendix One  Steering Group Membership

Appendix Two  List of Participating Units
EXECUTIVE SUMMARY

This report sets out the work done within the North West Renal Audit Programme during the years April 2007 to March 2009 and the proposed programme outline for 2009/2010 and beyond.

Six renal hub units and their satellite units are involved in the audit programme; Aintree University Hospital, Arrowe Park Hospital, Manchester Royal Infirmary, Royal Liverpool Hospital, Royal Preston Hospital and Salford Royal Hospital.

The NW Renal Audit Programme runs two concurrent programmes of audit:

- individual audit programme
- ongoing audit programme

2008/2009 has seen changes within the membership and focus of the Steering Group. Due to changes in Renal audit admin staffing levels a number of projects initially outlined for 2008/2009 are still under development:

- Increase our infection surveillance programme with the development of a Vascular Access Haemodialysis Related Bacteraemia Audit, alongside the Peritonitis audit. In the Peritonitis audit, we will adjust the current timescales of April-March, to January-December, and include additional calculations to show ‘infection free months.’

- Include ethnicity data in all audits, to enable us to address patients’ cultural needs.

Work was carried out on audits in 2007/2008 and 2008/2009 as follows:

- Peritonitis Audit - ongoing.
  A review of the past 10 years peritonitis rates found it fluctuated between a minimum of 27 patient months per episode and a maximum of 17 patient months per episode; there have been large variations in the culture negative rate and a significant upward trend over the past four years from 12% to 29%.
- Management of Nephrology Patients: Stage 5 Chronic Kidney Disease
- Vascular Access & Haemodialysis Related Bacteraemia (trial at MRI)
- Management of Anaemia - data collection commenced February 2009
- NW Renal Services – the Patient Perspective - development work
- Water Quality Audit - data collection from autumn 2008
- Dialysis Mortality Audit - development work
- Transplant Audit - development work

In 2009/2010 the main areas of audit development will be:

- Peritonitis Audit - ongoing
- Patient Perspective - data collection, analysis and presentation
- Management of Anaemia - data collection, analysis and presentation
- Dialysis Mortality Audit - data collection
- Transplant Audit - data collection
- Bone Chemistry audit - data collection autumn 2009
- Exit site infections - development work
- Renal take-on rates - development work
- Vascular Access & HD Related Bacteraemia - further development work
1. INTRODUCTION

The North West (NW) Renal Audit Programme is a standards based programme of continuous quality improvement. It was established in 1992 and has been subsequently developed for patients and clinicians based in the NW region. The principal aim of the programme is to continuously improve the quality and effectiveness of renal services in the region.

This report describes the audits that were initiated within the NW Renal Audit Programme between April 2007 and March 2009 and outlines programme development for 2009/2010.

2. AIMS AND OBJECTIVES

The principal aim of the programme is to continuously improve the quality and effectiveness of renal services in the region. To achieve this, the key objectives of the programme are:

- To improve and maintain high standards of clinical care by auditing against national standards, for example the standards published by the UK Renal Association and/or the standards, guidelines and markers of good practice published by the Department of Health.

- To maintain a collaborative multidisciplinary approach to clinical audit by involving dietitians, doctors, nurse specialists, pharmacists and renal technicians as appropriate, in the clinical audit process and in the development of the NW Renal Audit Programme.

- To eliminate inequalities and effect change by benchmarking data collected in a programme of ongoing audit, against data from other regional renal units.

- To improve clinical care in areas not covered by the programme of ongoing audit (referencing the markers of good practice from the National Service Framework Publications and other Department of Health publications) by looking at the feasibility of new audits and including those with strong evidence for resultant improvement in a separate programme of individual audit.

- To make the data collection process in the NW Renal Audit Programme more efficient by developing an audit programme which utilises and complements the work done by the UK Renal Registry.

- To work with the UK Renal Registry, utilising their expertise in data collection and management, to improve poor practice identified by the registry.

- To assist the process of Clinical Governance by maintaining channels of communication with clinicians, managers and patients and by improving awareness and knowledge of clinical audit for renal clinicians in the North West.

- To involve patients in the clinical audit process by inviting them to attend patient forum meetings, and to provide patients with relevant renal audit information via Newsletters and the Renal Audit Website which has recently been redeveloped (www.nwrenalaudit.org).

- To support specialist registrars in their educational development by involving them in regional audits.
3. CO-ORDINATION AND FACILITATION

The programme is directed by the multi-disciplinary NW Renal Audit Steering Group (for membership see Appendix one). The steering group meet quarterly to discuss and agree upon the direction of the Renal Audit Programme and they represent the views of renal clinicians, managers, commissioners and patients situated in the NW Region.

Under the guidance of the steering group, the NW Renal Audit Team centrally co-ordinate and carry out the daily management of the programme. The regional audit team are supported by two Renal Nurse Audit Facilitators who assist in the planning of regional audits, facilitate data collection and assist in the local clinical governance processes of their renal unit.

All audits are centrally co-ordinated by a member of the NW Renal Audit Team under the direction of a Senior Clinician who has specialist knowledge of the audit topic (Consultant Nephrologist, Senior Renal Nurse Specialist or Specialist Registrar in Renal Medicine).

During 2008/2009 the Manchester North and West Chair (Dr Donal O'Donoghue, Consultant Nephrologist, Salford Royal Hospital) and the Manchester South and East Chair (Dr Mike Venning, Consultant Renal Physician, Manchester Royal Infirmary) have taken on alternative commitments which has meant they are unable to continue as the chairs of the North West Renal Audit Steering Group. The steering group meetings were suspended until their positions were filled.

In September 2008, Dr Edmond O’Riordan (Consultant Nephrologist, Salford Royal Hospital) took over the role as the Manchester North and West Chair of the NW Renal Audit Steering Group and Dr Iren Szeki (Consultant Renal Physician, Manchester Royal Infirmary) took over the role as the Manchester South and East Chair of the steering group. Quarterly steering group meetings have now been re-established and the first took place in February 2009.

4. RENAL UNITS INVOLVED IN THE PROGRAMME

All renal units in Lancashire, Manchester and Merseyside are involved in the NW Renal Audit Programme. The participating units are listed in Appendix two.
5. STANDARDS AND EVIDENCE BASE

All audits in the NW Renal Audit Programme are performed against nationally and/or internationally recognised renal standards where they exist. These include

- The Kidney Disease Quality Outcomes Initiative (K/DOQI): Clinical Practice Guidelines for Chronic Kidney Disease

The NW Renal Audit Programme is based upon the following evidence:

- The UK Renal Association:
    - Module 1: Chronic Kidney Disease 10.04.07
    - Module 2: Complications 11.12.07
    - Module 3a: Haemodialysis 26.3.07
    - Module 3b: Peritoneal Dialysis 15.05.07

Related alliance Groups:


In addition each audit undertaken is backed up by a review of published literature.
6. NW RENAL AUDIT PROGRAMME

The NW Renal Audit Programme is based on two separate programmes of work:

- **Ongoing Audit Programme**: This is a standards based programme of prospective ongoing audit. The data collected from this audit programme is used to benchmark the performance of individual units. The regional audit data is also compared to national audit data when it is available.

- **Individual Audit Programme**: This is a programme of prospective and retrospective audit that is carried out to improve clinical care in areas not covered by the ongoing audit programme.

Work was carried out on the following regional audits in the period April 2007 to March 2009:

- Management of Nephrology Patients: Stage 5 Chronic Kidney Disease
- Vascular Access & Haemodialysis Related Bacteraemia
- Anaemia Audit
- NW Renal Services – the Patient Perspective
- Water Quality
- Peritonitis Audit
- Transplant Audit (five year)
- Outcomes Audit (five year)
- Bone Chemistry

Local audit work carried out on a trial basis at MRI

- Vascular access
- Pre-dialysis clinic audit - patient questionnaire

Future audits under development

- Using Study of Implementation of Renal Standards (SIRS) data in relation to quality of life
- Exit site infections
- Further development work on vascular access
- Further development work on haemodialysis related bacteraemia
- Development work for a series of audits relating to cardiovascular risk
7. PLANNED DEVELOPMENTS

A number of the developments outlined for 2008/2009 were not achieved due to staffing and other issues. These developments will be readdressed in 2009/2010.

- To include ethnicity data in all audits, to enable us to address patients’ cultural needs: This information is being collected for all audits undertaken. Currently, the ethnicity data is being analysed and reported for individual audits.

- To further involve the expanding Units of Arrowe Park and Aintree into the NW Renal Audit Programme: In 2007 – 2008 peritonitis data from Arrowe Park was included in the Peritonitis audit for the first time. Both units were also involved in the development of the Management of Nephrology: CKD stage 5 audit and data submitted from Arrowe Park for this audit. Clinical representatives from both units are now part of the steering group.

- To improve the infection surveillance programme with the Vascular Access and Haemodialysis Related Bacteraemia Audit and the Peritonitis Audit.

- The timescale covered for reporting and presentation of Peritonitis data is being changed from April-March to January-December. Additional calculations to show ‘infection free months.’ will be included in the data analysis.

- To address the issue of Exit Site Infections and the associated difficulties with classification.

- Re-address the Study of Implementation of Renal Standards (SIRS) database, which made up part of Dr Anu Trehan’s MD project, in terms of assessing quality of life/outcomes.
8. COMPLETING THE AUDIT CYCLE

The audit cycle for the NW Renal Audit Programme is based on four stages

- Validation of the data: Data and data analysis is verified by the clinicians at each unit to ensure that it is correct. The audit facilitator discusses any queries regarding the data and/or analysis and resolves any problems relating to the data or the analysis of the data with the clinicians involved.

- Discussion of results: Completed audit data is presented to the steering group. The results are discussed and regional recommendations are proposed by the steering group. When appropriate, regional guidelines are also developed.

- Agreement of recommendations/guidelines: Completed audits are presented to local clinical governance groups. Clinicians and managers at each unit can then discuss the results achieved locally and the recommendations/guidelines proposed by the NW Renal Audit Steering Group. The local clinical governance groups can then agree to implement the recommendations/guidelines or they may decide to develop their own and inform the Steering Group of their local recommendations/guidelines.

- Implementation of change: Change is implemented by putting the recommendations/guidelines into practice. To assist this process an individual audit report with the recommendations/guidelines that are to be implemented at every unit is produced for completed audits. This is circulated to all units involved in the audit.

9. CLINICAL GOVERNANCE

The audit programme supports the clinical governance needs of the renal units as follows:

- The co-chairs of the steering group are responsible for ensuring that the clinical governance committees of the hub units they represent are informed of the regional audit recommendations and guidelines agreed by the steering group.

- Audits that have been reviewed by the steering group are presented at local clinical governance committee meetings.

- The annual report is circulated to the renal medicine clinical governance committee of every participating renal unit.

- The renal nurse audit facilitators inform their local clinical team about the audit recommendations/guidelines agreed by their unit.
10. COMMUNICATION

Communication is essential for the success of the NW Renal Audit programme and plays a key role in the implementation of change. Several channels of communication have been developed.

- The NW Renal Audit Presentation Meeting: Completed audits and the agreed recommendations/guidelines are presented at the NW Renal Audit Presentation Meeting. Clinical renal staff, managers, public health specialists and patients are invited to attend.

- The meetings give staff and patients an opportunity to observe how their unit and the region compare against the Renal Association standard. It also provides an opportunity to openly discuss the results from the completed audits and when benchmarked data shows that individual unit results fall below the regional average, performance and practice are discussed to exchange ideas that could explain and improve poor performance.

- The NW Renal Audit Website: The website (www.nwrenalaudit.org) has been live since May 2005 and has recently been redeveloped.

- The NW Renal Audit Newsletter: This newsletter is produced twice a year and provides details of audits and events currently taking place. It is distributed to all the renal units and satellite units and a copy is placed on the NW Renal Audit Website. Copies are also sent to all the Kidney Patient Associations in the North West Region.

11. PATIENT INVOLVEMENT

The Renal Audit Patient Group, established in April 2004, consists of patients and carers and members of the steering group. The group meets twice a year and it gives patients and carers an opportunity to put forward their views on the renal services they have received, the service they would like to receive and quality issues in relation to these services. Through these discussions patients and carers can support the steering group and help to improve aspects of the renal service that are important to them.

To ensure good communication between the steering group and the NW Renal Audit Patient Group, a representative from the patient group is invited to attend the steering group meetings.

Steps have been made to encourage participation from patients within the region (as part of patient questionnaire) and a large number of patients have expressed an interest in this forum.
## 12. AUDITS

### 12.1 AUDIT OF PERITONITIS - 2007/2008

| Audit Leads: | **NURSE SPECIALIST:** Sister Helen Hurst, Manchester Royal Infirmary.  
**AUDIT FACILITATOR:** Nicola Reid |
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Type of audit:</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>
| Aims and objectives: | • To measure achievement of the Renal Association standards for peritonitis  
• To benchmark peritonitis rates regionally |
| Proposed health benefits: | • To increase patient survival  
• To reduce catheter loss  
• To reduce use of antibiotics |
| Standards: | Renal Association Clinical Practice Guidelines (fourth edition)  
Website: [www.renal.org](http://www.renal.org)  
Module: Peritoneal Dialysis  
Guideline 5.1 - Peritoneal Dialysis: Infectious complications |
The recommended minimum standards:

- Peritonitis rates of less than 1 episode per 18 months
- A primary cure rate of ≥ 80%
- A culture negative rate of < 20%

<table>
<thead>
<tr>
<th>Patients:</th>
<th>Data were obtained from patients who were in a PD programme and who had an episode of peritonitis between 1st April 2007 and 31st March 2008.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Six PD programmes in provided data for the regional audit:</td>
</tr>
<tr>
<td></td>
<td>- MRI - Manchester Royal Infirmary: Central Manchester and Manchester Children’s University Hospitals NHS Trust</td>
</tr>
<tr>
<td></td>
<td>- RLH - Royal Liverpool University Hospital: Royal Liverpool &amp; Broadgreen University Hospitals NHS Trust:</td>
</tr>
<tr>
<td></td>
<td>- RPH - Royal Preston Hospital: Lancashire Teaching Hospitals NHS Trust</td>
</tr>
<tr>
<td></td>
<td>- SRH - Salford Royal Hospital: Salford Royal Hospitals NHS Trust</td>
</tr>
<tr>
<td></td>
<td>- FGH - Furness General Hospital: University Hospitals of Morecambe Bay NHS Trust</td>
</tr>
<tr>
<td></td>
<td>- APH - Arrowe Park Hospital: Wirral Hospitals NHS Trust</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data</th>
<th>- Demographic statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Date of the episode</td>
</tr>
<tr>
<td></td>
<td>- Peritonitis classification</td>
</tr>
<tr>
<td></td>
<td>- Organisms cultured</td>
</tr>
<tr>
<td></td>
<td>- Details about the system used</td>
</tr>
<tr>
<td></td>
<td>- Exit site infection data</td>
</tr>
<tr>
<td></td>
<td>- In-patient episodes</td>
</tr>
<tr>
<td></td>
<td>- Hospital admissions</td>
</tr>
<tr>
<td></td>
<td>- Response to treatment</td>
</tr>
<tr>
<td></td>
<td>The data were used to calculate patient months per episode, the culture negative rate and the initial cure rate of peritonitis.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methods</th>
<th>- CAPD nurses collected the data from nursing records and patient notes onto a standardised data collection sheet.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Data were collated and analysed by the regional renal audit facilitator.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health disciplines involved</th>
<th>- CAPD nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Physicians</td>
</tr>
</tbody>
</table>
RESULTS:

**Standard one: Peritonitis rates of less than 1 episode per 18 months**

Three out of six units and the region as a whole met the Renal Association standard for peritonitis rates in 2007/2008 as shown in figure 10.1.1 below.

![Figure 10.1.1 Peritonitis rates for PD units in the North West Region](image)

N.B. Units above the red line are achieving the standard

**Standard two: A primary cure rate of > 80%**

No units met the Renal Association standard for the primary cure rate in 2007/2008 as shown in figure 10.1.2 below.

![Figure 10.1.2 Primary cure rate for PD units in the North West Region](image)

N.B. Units above the red line are achieving the standard
**Standard three: A negative culture rate of < 20%**

One of the six units met the Renal Association standard for the culture negative rate in 2007/2008 as shown in figure 10.1.3 below.

![Culture negative rate for PD units in the North West Region](image)

**Figure 10.1.3 Culture negative rate for PD units in the North West Region**

**N.B.** Units below the red line are achieving the standard

**CONCLUSIONS:**

- Three out of the six renal units and the Region as a whole achieved the Renal Association Standard for a peritonitis rate of less than 1 episode per 18 patient months.
- No renal units achieved the Renal Association Standard for a primary cure rate greater than or equal to 80%.
- One out of the six units achieved the Renal Association Standard for a culture negative rate of less than 20%. The Region as a whole failed to reach this standard.

**RECOMMENDATIONS:**

- Compare locally devised treatment protocols.
- Conduct further analyses to calculate the primary cure rates associated with individual organisms identified in this audit.

**TIMESCALE:**

- Data Collection: April 2007 – March 2008
- Data Analysis: May 2008 - June 2008
- Presentation to Steering Group September 2008
- Presentation Meeting November 2008
- Presentation to Clinical Governance teams To be agreed

NURSE SPECIALISTS: Sister Susan Heatley, Manchester Royal Infirmary.
Sister Nora Kerigan, Royal Preston Hospital.
Sister Hilary Robinson, Salford Royal Hospital.

AUDIT FACILITATOR: Nicola Reid

TYPE OF AUDIT: Individual

AIMS AND OBJECTIVES:
- To measure achievement of the Renal Association standards for the complications of Stage 5 Chronic Kidney Disease
- To assess and compare drug therapy for management and the correction of anaemia and bone chemistry in this group of patients
- To record the incidence of parathyroidectomy
- To compare plans for dialysis treatment/conservative management
- To assess and compare transplant status in all units
- To review patient education and dietetic advice

PROPOSED HEALTH BENEFITS:
- Reduce progression of chronic kidney disease
- Reduce complications of chronic kidney disease
- Timely preparation for renal replacement therapy

EVIDENCE BASE:

STANDARDS:

Renal Association Clinical Practice Guidelines November 2007 (fourth edition)
Website: www.renal.org
Module: Complications
Section 2: Mineral bone disease

- Serum calcium

There isn’t a Renal Association standard for CKD stage 5 but there are standards for CKD stage 4 patients and CKD patients with End Stage Renal Failure (ESRF).

CKD stage 1 – 4: in range quoted by local laboratory
CKD ESRF: in range quoted by local laboratory and ideally in range 2.2 – 2.5mmol/L

- Serum phosphate
There isn’t a Renal Association standard for CKD stage 5 but there are standards for CKD stage 4 patients and CKD patients with ESRF.

CKD stage 3 – 4: in range 0.9 – 1.5mmol/L  
CKD ESRF: in range 1.1 – 1.8mmol/L

- Calcium x phosphate
  
  < 4.8 mmol/L² and ideally < 4.2 mmol/L²

- Serum iPTH
  
  Within x (2 – 4) the top of the normal range

Renal Association Clinical Practice Guidelines November 2007 (fourth edition)  
Website:  www.renal.org

**Module: Complications**  
**Section 3: Anaemia**  
**Guideline 3.7 C-HB: Target haemoglobin**

- Serum haemoglobin
  
Management of anaemia should be considered in people with anaemia of chronic kidney disease when their haemoglobin (Hb) level is less than or equal to 11 g/dl.

Renal Association Clinical Practice Guidelines November 2007 (fourth edition)  
Website:  www.renal.org

**Module: Chronic Kidney disease**  
**Section 3: Preparation for dialysis**  
**Guideline 3.1 CKD: Preparation for dialysis**

- Modality Choice / Transplant work up / Education / Dietetic assessment
  
Patients with CKD stage 5 should be followed up at a clinic that is able to provide counselling regarding treatment modalities and transplantation as well as dietary education and comprehensive management of anaemia, from at least 6 months prior to the onset of established renal failure (Good practice).

All patients should, where possible, be adequately prepared for renal replacement therapy and this should include receiving information and education about PD treatment, delivered by an experienced member of the MDT.

Patients should undergo fistula creation between 6 and 12 months before haemodialysis is expected to start to allow time for adequate maturation of the fistula or time for any revision procedures needed.

The timing of PD catheter insertion, where possible should be planned to accommodate patient convenience, commencement of training between 10 days and 6 weeks and before RRT is essential to enable correction of early catheter-related problems without the need for temporary haemodialysis.
Kidney transplantation should be considered the renal replacement therapy of choice for most patients with CKD stage 5. Patients with progressive deterioration in renal function suitable for transplantation should be placed on the national transplant list within six months of their anticipated dialysis start date. Pre-emptive transplantation should be the treatment of choice for all suitable patients whenever a living donor is available.

National Institute of Clinical Excellence
Website: www.nice.org.uk

Topic: Blood and immune system
Title: Anaemia management in people with chronic kidney disease (CKD)

• Serum haemoglobin

Within range 10.5 – 12.5 g/dl

PATIENTS:
The inclusion criteria for the audit were

• Stage 5 Chronic Kidney Disease i.e. eGFR < 15 mL/min/1.73m²
• Patients attending a pre-dialysis, low clearance or general nephrology clinic in the week commencing 19th November.

Six trusts in the North West Region have a renal unit and five of these trusts took part in the audit.

• Central Manchester and Manchester Children’s University Hospitals NHS Trust: Manchester Royal Infirmary - MRI
• Royal Liverpool & Broadgreen University Hospitals NHS Trust: Royal Liverpool University Hospital - RLH
• Lancashire Teaching Hospitals NHS Trust: Royal Preston Hospital - RPH
• Salford Royal Hospitals NHS Trust: Salford Royal Hospital - SRH
• Wirral Hospitals NHS Trust: Arrowe Park Hospital - APH

Aintree Hospitals NHS Trust have a renal unit based in Aintree Hospital but the pre-dialysis nursing team decided that they would not take part in the audit because their pre-dialysis nursing service was undergoing a process of change at the time of the audit.

DATA:
• Referral data
• Current data
• Drug prescribing
• Transplant work-up
• Planned treatment
• Education

METHODS:
• Pre-dialysis nurses collected the data from nursing records and patient notes onto a standardised data collection sheet.
• Data were collated and analysed by the regional renal audit facilitator.
HEALTH DISCIPLINES INVOLVED:

- CAPD nurses
- Dietitians
- Pharmacists
- Physicians

RESULTS:

**RA standard for corrected calcium:** Within range quoted by local laboratory

Regionally, 75% of the patients in the audit met the RA standard for corrected calcium as shown in figure 10.2.1 below. Most of the remaining patients were below the standard (24%). A very small proportion was above the standard (1%). Proportionally, APH had the greatest level of achievement (100%) and RPH the lowest (63%).

![Diagram showing proportion of patients meeting the RA standard for corrected calcium](image)

**Figure 10.2.1 Proportion of patients meeting the RA standard for corrected calcium**

**RA standard for serum phosphate:** within range 1.1 – 1.8mmol/L

Regionally, 65% of the patients in the audit met the RA standard for serum phosphate as shown in figure 10.2.2 below. 14% were below the standard and 21% were above the standard. Proportionally, RLH had the greatest level of achievement (92%) and MRI the lowest (60%).
**RA standard for calcium phosphate product:** $< 4.8 \text{ mmol}^2/L^2$

Regionally, 94% of the patients in the audit met the RA standard for calcium phosphate product and 6% were above the standard as shown in figure 10.2.3 below. RLH, RPH and SRH all had the greatest level of achievement (100%) and APH the lowest (72%).

**Figure 10.2.3 Proportion of patients meeting the RA standard for calcium phosphate product**
RA standard for serum iPTH: within x (2 – 4) the top of the normal range

Regionally, 28% of the patients in the audit met the RA standard for serum iPTH as shown in figure 10.2.4 below. 25% were below the standard and 47% were above the standard. Proportionally, MRI had the greatest level of achievement (38%) and RLH the lowest (15%).

![Figure 10.2.4 Proportion of patients meeting the RA standard for calcium phosphate product](image)

NICE standard for anaemia: within range 10.5 – 12.5 g/dl

Regionally, 60% of the patients in the audit met the RA standard for serum haemoglobin as shown in figure 10.2.5 below. Proportionally, RLH had the greatest level of achievement (65%) and APH the lowest (42%).

![Figure 10.2.5 Proportion of patients meeting the NICE standard for anaemia](image)
CONCLUSIONS:

• **RA standard for corrected calcium**

Regionally 75% of the patients in the audit met the standard. Proportionally, APH had the greatest level of achievement (100%) and RPH the lowest (63%).

• **RA standard for serum phosphate**

65% of the patients in the audit met the standard. Proportionally, RLH had the greatest level of achievement (92%) and MRI the lowest (60%).

• **RA standard for calcium phosphate product**

94% of the patients in the audit met the standard. RLH, RPH and SRH all had the greatest level of achievement (100%) and APH the lowest (72%).

• **RA standard for serum iPTH**

28% of the patients in the audit met the standard. Proportionally, MRI had the greatest level of achievement (38%) and RLH the lowest (15%).

• **RA standard for serum haemoglobin**

60% of the patients in the audit met the standard. Proportionally, RLH had the greatest level of achievement (65%) and APH the lowest (42%).

RECOMMENDATIONS:

• Review drug therapy for patients with a high haemoglobin.
• Build evidence base to support management choices.
• Discuss and learn more about decision making and coaching techniques.

TIMESCALE:

• Agree Audit Plan: January 2008 - February 2008
• Data Collection: November 2007 – March 2008
• Data Analysis: April 2008 – May 2008
• Presentation to Steering Group: June 2008
• Presentation Meeting: 1st July 2009
• Presentation to Clinical Governance teams: To be agreed
12.3  NW RENAL SERVICES – THE PATIENT PERSPECTIVE

The patient perspective audit was developed, working closely with the Renal Audit Patient Group during the 2007/2008 and 2008/2009 period. The questionnaire was distributed to patients in August 2009. Analysis will take place in autumn 2009, reporting and presentation of the audit will take place in 2010.

AUDIT LEAD:  Initially Dr Mike Venning, Consultant Physician & Nephrologist, MRI, now Dr Iren Szeki.

AUDIT FACILITATORS:  Nicola Reid, Regional Renal Audit Co-ordinator
Rasheeda Kholwadia, Renal Audit Facilitator

TYPE OF AUDIT:  Individual

AIMS AND OBJECTIVES:

• To improve the patient experience
• To improve clinical management of blood tests
• To improve medicines management
• To improve communication between patients and clinicians
• To provide better information

PROPOSED HEALTH BENEFITS:

• Improved holistic care of the patient
• Better management of clinical complications of CKD

EVIDENCE BASE:


STANDARDS:

• Department of Health: Standards For Better Health 21st July 2004 Developmental Standards

D8 Health care organisations continuously improve the patient experience, based on the feedback of patients, carers and relatives.

D9 Patients, service users and where appropriate, carers receive timely and suitable information, when they need and want it, on treatment, care, services, prevention and health promotion and are

a) encouraged to express their preferences; and
b) supported to make choices and shared decisions about their own health care.

PATIENTS:

The inclusion criteria for the audit are
• Patients enrolled onto a dialysis programme

Six trusts in the North West Region will be invited to take part in the audit.

• Central Manchester and Manchester Children’s University Hospitals NHS Trust: Manchester Royal Infirmary - MRI
• Royal Liverpool & Broadgreen University Hospitals NHS Trust: Royal Liverpool University Hospital - RLH
• Lancashire Teaching Hospitals NHS Trust: Royal Preston Hospital - RPH
• Salford Royal Hospitals NHS Trust: Salford Royal Hospital - SRH
• Wirral Hospitals NHS Trust: Arrowe Park Hospital - APH
• University Hospital Aintree

DATA:
• Transport
• Cleanliness
• Food
• Communication
• Information
• Holidays
• Emotional support
• Specific requirements
• Overall experiences
• Concerns
• Improvements in dialysis care

METHODS:

• Three separate patient questionnaires developed by the North West Renal Audit Patient Group are to be given to unit haemodialysis patients, home haemodialysis patients and CAPD patients.

  1 Unit haemodialysis questionnaire
  2 Home haemodialysis questionnaire
  3 CAPD questionnaire

HEALTH DISCIPLINES INVOLVED:

• Nursing
• Dietetics
• Pharmacy
• Physicians
• Social Workers

TIMESCALE:

• Agree Audit Plan: January 2008 - February 2008
• Data Collection: August/September 2009
• Data Analysis: October/November 2009
• Presentation to Steering Group: February 2010
• Presentation to Clinical Governance teams: To be agreed
12.4 PERITONITIS AUDIT 2008/2009

NURSE SPECIALIST: Sister Helen Hurst, Manchester Royal Infirmary.

AUDIT FACILITATOR: Nicola Reid

TYPE OF AUDIT: Ongoing

AIMS AND OBJECTIVES:

- To measure achievement of the Renal Association standards for peritonitis
- To benchmark peritonitis rates regionally

PROPOSED HEALTH BENEFITS:

- To increase patient survival
- To reduce catheter loss
- To reduce use of anti-biotics

EVIDENCE BASE:


STANDARDS:

Renal Association Clinical Practice Guidelines (fourth edition)
Website: [www.renal.org](http://www.renal.org)
Module: Peritoneal Dialysis
Guideline 5.1 - Peritoneal Dialysis: Infectious complications

The recommended minimum standards:

- Peritonitis rates of less than 1 episode per 18 months
- A primary cure rate of > 80%
- A culture negative rate of < 20%
PATIENTS:

Data were obtained from patients who were in a programme of peritoneal dialysis in the North West Region and who had an episode of peritonitis between 1st April 2008 and 31st March 2009.

There are seven PD programmes in the North West Region, managed from seven different trusts:

- **AH** Aintree Hospital: Aintree Hospitals NHS Trust
- **MRI** Manchester Royal Infirmary: Central Manchester and Manchester Children’s University Hospitals NHS Trust
- **RLH** Royal Liverpool University Hospital: Royal Liverpool & Broadgreen University Hospitals NHS Trust
- **RPH** Royal Preston Hospital: Lancashire Teaching Hospitals NHS Trust
- **SRH** Salford Royal Hospital: Salford Royal Hospitals NHS Trust
- **FGH** Furness General Hospital: University Hospitals of Morecambe Bay NHS Trust
- **APH** Arrowe Park Hospital: Wirral Hospitals NHS Trust

All seven programmes provided data for the regional audit.

DATA:

- Demographic statistics
- Date of the episode
- Peritonitis classification
- Organisms cultured
- Details about the system used
- Exit site infection data
- In-patient episodes
- Hospital admissions
- Response to treatment

The data were used to calculate patient months per episode, the culture negative rate and the initial cure rate of peritonitis.

METHODS:

- CAPD nurses collected the data from nursing records and patient notes onto a standardised data collection sheet.
- Data were collated and analysed by the regional renal audit facilitator.

HEALTH DISCIPLINES INVOLVED:

- CAPD nurses
- Physicians
RESULTS:

**Standard one:** Peritonitis rates of less than 1 episode per 18 months

Five out of seven units met the Renal Association standard for peritonitis rates in 2008/2009 as shown in figure 10.1.1 below.

![Figure 10.1.1 Peritonitis rates for PD units in the North West Region](image)

**N.B.** Units above the red line are achieving the standard

The Renal Association Standard for peritonitis rates has been met regionally in 8 of the last 10 years as shown in figure 10.1.2 below.

![Figure 10.1.2 Variation in regional peritonitis rate over the past 10 years](image)

**N.B.** Standard is achieved regionally when the result is above the red line
**Standard two:** A primary cure rate of $\geq 80\%$

Three out of seven units met the Renal Association standard for the primary cure rate in 2008/2009 as shown in figure 10.1.3 below.

![Figure 10.1.3 Primary cure rate for PD units in the North West Region](image)

N.B. Units above the red line are achieving the standard

The Renal Association Standard for primary cure rate has been met once regionally in the last 10 years as shown in figure 10.1.4 below.

![Figure 10.1.4 Variation in regional primary cure rate over the past 10 years](image)

N.B. Standard is achieved regionally when the result is above the red line
Standard three: A negative culture rate of < 20%

Two out of seven units met the Renal Association standard for the culture negative rate in 2008/2009 as shown in figure 10.1.5 below.

![Figure 10.1.5 Culture negative rate for PD units in the North West Region](image)

**N.B.** Units below the red line are achieving the standard.

The Renal Association Standard for the culture negative rate has been regionally met in 5 of the last 10 years as shown in figure 10.1.6 below.

![Figure 10.1.6 Variation in regional culture negative rate over the past 10 years](image)

**N.B.** Standard is achieved regionally when the result is below the red line.
CONCLUSIONS
Five out of the seven renal units and the Region as a whole achieved the Renal Association Standard for a peritonitis rate of less than 1 episode per 18 patient months.

Three out of the seven renal units achieved the Renal Association Standard for a primary cure rate greater than or equal to 80%. The Region as a whole failed to reach this standard.

Two out of the seven units achieved the Renal Association Standard for a culture negative rate of less than 20%. The Region as a whole failed to reach this standard.

DISCUSSION
Over the past 10 years peritonitis rates have fluctuated between a minimum of 27 patient months per episode and a maximum of 17 patient months per episode. Similarly, there have been large variations in the culture negative rate over the past 10 years and a significant upward trend over the past four years from 12% to 29%. With appropriate action the peritonitis rate and the culture negative rate could be improved significantly. There has been less variation in the primary cure rate over the past ten years and so improvements in this area could be more difficult.

RECOMMENDATIONS
• Specialist PD nurses representing all the regional units should meet to discuss the peritonitis data and review literature in this area. The outcome of the meeting should be the identification of locally feasible actions which could improve peritonitis rates and primary cure rates across the region.

• A small group of specialist PD nurses and microbiologists should meet to review the culture negative rate and the primary cure rates associated with individual organisms identified in this audit.

• Following these two meetings a regional action plan will be devised to improve peritonitis standards.

TIMESCALE
• Data Collection: April 2008 – March 2009
• Data Analysis: May 2008 - June 2008
• Presentation to Steering Group
• Presentation Meeting July 2008
• Presentation to Clinical Governance teams To be agreed

ACTIONS
Proposed date for specialist PD nurse meeting: to be advised
Proposed date for PD nurse and microbiologist meeting: to be advised
Proposed dates for presentation at local clinical governance meetings: are to be advised.

PLEASE NOTE:
During the course of analysing data it has become apparent that there is variation in the region as to the method of calculation of peritonitis rates. These variations are being investigated and therefore the results given are subject to change.
12.5 AUDIT OF HAEMOGLOBIN AND ERYTHROPOIETIN

The anaemia audit was developed during the 2008/2009 period. Data collection commenced in February 2009. Analysis and presentation of the audit took place in July 2009. A report will be produced in 2009/2010. It is the NW Renal Audit group’s intention that this audit be carried out on a two yearly basis.

<table>
<thead>
<tr>
<th>AUDIT OF HAEMOGLOBIN AND ERYTHROPOIETIN PROJECT PLANNING GUIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Audit Leads:</strong></td>
</tr>
<tr>
<td>▪ Sue Perrin</td>
</tr>
<tr>
<td>Anaemia Co-ordinator - Manchester Royal Infirmary</td>
</tr>
<tr>
<td>▪ Rita Murray</td>
</tr>
<tr>
<td>Anaemia Co-ordinator - Royal Liverpool Hospital</td>
</tr>
<tr>
<td>▪ Debbie Farrow</td>
</tr>
<tr>
<td>Anaemia Co-ordinator - Royal Preston Hospital</td>
</tr>
<tr>
<td>▪ Representative(s) from Salford Royal Hospital</td>
</tr>
<tr>
<td><strong>Specialist registrar:</strong></td>
</tr>
<tr>
<td>Dr Asad Ullah</td>
</tr>
<tr>
<td>Specialist Registrar - Aintree Hospital</td>
</tr>
<tr>
<td><strong>Audit facilitator:</strong></td>
</tr>
<tr>
<td>Tracey Powell</td>
</tr>
<tr>
<td>Regional Renal Audit Co-ordinator</td>
</tr>
<tr>
<td><strong>Type of audit:</strong></td>
</tr>
<tr>
<td>Bi-annual</td>
</tr>
<tr>
<td><strong>REASONS FOR CHOICE</strong></td>
</tr>
<tr>
<td><strong>Aims &amp; objectives:</strong></td>
</tr>
<tr>
<td>▪ To measure achievement of the Renal Association and NICE guideline for haemoglobin</td>
</tr>
<tr>
<td>▪ To determine the extent of Erythropoietin (Epo) therapy in the region</td>
</tr>
<tr>
<td>▪ To benchmark haemoglobin levels regionally and nationally (using data from the UK Renal Registry)</td>
</tr>
<tr>
<td>▪ To review cardiovascular risk</td>
</tr>
<tr>
<td><strong>Proposed health benefits:</strong></td>
</tr>
<tr>
<td>▪ To reduce morbidity</td>
</tr>
<tr>
<td>▪ To reduce cardiovascular risk</td>
</tr>
<tr>
<td>▪ To reduce blood transfusion (hence viral transmission and transplant recipient sensitisation)</td>
</tr>
<tr>
<td>▪ To reduce iron overload</td>
</tr>
<tr>
<td><strong>Evidence base:</strong></td>
</tr>
<tr>
<td><strong>Priority:</strong></td>
</tr>
<tr>
<td>▪ National</td>
</tr>
<tr>
<td>▪ Regional</td>
</tr>
<tr>
<td><strong>METHODOLOGY</strong></td>
</tr>
<tr>
<td><strong>Guidelines:</strong></td>
</tr>
<tr>
<td>▪ Regional Association Clinical Practice Guideline†</td>
</tr>
</tbody>
</table>

Patients with CKD should achieve a haemoglobin between 10.5-
<table>
<thead>
<tr>
<th>Guidelines:</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ European Best Practice Guidelines</td>
</tr>
<tr>
<td>▪ KDOQI</td>
</tr>
<tr>
<td>Patients:</td>
</tr>
<tr>
<td>▪ All patients enrolled in a dialysis programme in the North West Region on 1st February 2009 and who have been in the programme for at least three months will be included in the audit.</td>
</tr>
<tr>
<td>Methods:</td>
</tr>
<tr>
<td>▪ Data will be collected prospectively from computer systems, anaemia co-ordinator records and patient notes onto a standardised data collection sheet or an excel spreadsheet.</td>
</tr>
<tr>
<td>▪ Data collected will include haemoglobin, ferritin, Epo therapy, type of Epo, iron therapy, type of iron therapy and current mode of dialysis. BP, PTH and Tsat % if available.</td>
</tr>
<tr>
<td>▪ Data will be collated and analysed by the regional audit facilitator.</td>
</tr>
<tr>
<td>Health disciplines involved:</td>
</tr>
<tr>
<td>▪ Anaemia co-ordinators</td>
</tr>
<tr>
<td>▪ Nurses</td>
</tr>
<tr>
<td>▪ Physicians</td>
</tr>
<tr>
<td>Timescale:</td>
</tr>
<tr>
<td>▪ Data collection: February - May 2009</td>
</tr>
<tr>
<td>▪ Data analysis: June 2009</td>
</tr>
<tr>
<td>▪ Presentation of results: July 2009</td>
</tr>
<tr>
<td>▪ Reporting of results: Autumn 2009</td>
</tr>
<tr>
<td>ACTION</td>
</tr>
<tr>
<td>Persons responsible for monitoring change:</td>
</tr>
<tr>
<td>▪ Sue Perrin</td>
</tr>
<tr>
<td>Anaemia Co-ordinator - Manchester Royal Infirmary</td>
</tr>
<tr>
<td>▪ Rita Murray</td>
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<tr>
<td>Anaemia Co-ordinator - Royal Liverpool Hospital</td>
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<tr>
<td>▪ Debbie Farrow</td>
</tr>
<tr>
<td>Anaemia Co-ordinator - Royal Preston Hospital</td>
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<tr>
<td>▪ Representative(s) for Salford Royal Hospital</td>
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</tbody>
</table>
12.6 AUDIT OF WATER QUALITY

The water quality audit was developed, during the 2008/2009 period. Water quality data is being collected for the period October 2008 to September 2009. Analysis and reporting of the audit will take place in December 2009 with presentation at the January 2010 meeting.

<table>
<thead>
<tr>
<th>NORTH WEST REGION RENAL AUDIT PROGRAMME</th>
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<tbody>
<tr>
<td>WATER QUALITY</td>
</tr>
<tr>
<td>PROJECT PLANNING GUIDE</td>
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<table>
<thead>
<tr>
<th>AUDIT PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit Leads:</td>
</tr>
<tr>
<td>▪ Dr S. Mitra</td>
</tr>
<tr>
<td>Consultant Nephrologist</td>
</tr>
<tr>
<td>Manchester Royal Infirmary</td>
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<table>
<thead>
<tr>
<th>Specialist registrar:</th>
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<tbody>
<tr>
<td>Specialist Registrar in Renal Medicine</td>
</tr>
<tr>
<td>Manchester Royal Infirmary</td>
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<table>
<thead>
<tr>
<th>Audit facilitator:</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Rasheeda Kholwadia</td>
</tr>
<tr>
<td>Regional Renal Audit facilitator</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>REASONS FOR CHOICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aims &amp; objectives:</td>
</tr>
<tr>
<td>▪ To assess the quality of water used in dialysis</td>
</tr>
<tr>
<td>▪ To assess if concentrates meet the required standards</td>
</tr>
<tr>
<td>▪ To record any incidence that may be related to water quality</td>
</tr>
<tr>
<td>▪ To assess local guidelines meet requirements.</td>
</tr>
<tr>
<td>▪ To assess the disinfection programme works effectively.</td>
</tr>
<tr>
<td>▪ To establish if the water used to produce dialysis fluid has appropriate chemical and microbiological purity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proposed health benefits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ To reduce the risk of pyrogenic reactions</td>
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<table>
<thead>
<tr>
<th>National / Regional priority:</th>
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<tbody>
<tr>
<td>▪ National priority</td>
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<tr>
<td>▪ Regional priority</td>
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<table>
<thead>
<tr>
<th>METHODOLOGY</th>
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<tbody>
<tr>
<td>Standards:</td>
</tr>
<tr>
<td>Regional Association Recommended</td>
</tr>
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<table>
<thead>
<tr>
<th>Guidelines:</th>
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</thead>
<tbody>
<tr>
<td>▪ Regional guidelines developed from previous audit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methods:</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Data will be collected retrospectively.</td>
</tr>
<tr>
<td>▪ Data will be collected from each unit and the water companies.</td>
</tr>
<tr>
<td>▪ Data will be collected using a sampling program, where different methods are used to test each contaminant.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health disciplines involved:</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Renal technicians</td>
</tr>
<tr>
<td>▪ Physicians</td>
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<tr>
<th>Timescale:</th>
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<tbody>
<tr>
<td>▪ Data collection start: Winter 2008/2009</td>
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<tr>
<td>▪ Review date</td>
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<tr>
<th>ACTION</th>
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<tbody>
<tr>
<td>Proposed date for audit presentation:</td>
</tr>
<tr>
<td>▪ July 2010</td>
</tr>
</tbody>
</table>
12.7 AUDIT OF OUTCOMES

The audit is led by Iren Szeki, Consultant at MRI and Co-chair of the Steering group. It is a prospective audit (data collection at MRI commenced in January 2009). Historically, and currently, reporting to the Renal Registry of co-morbidity data has been poor in the NW Region. Data collection for this audit will commence within the region in 2009/2010. The audit will run for a period of five years with interim reports at 1 year, and 3 years.

| NORTH WEST REGION RENAL AUDIT PROGRAMME |
| PROJECT PLANNING GUIDE |
| DIALYSIS MORTALITY AUDIT (FIVE YEAR STUDY) |

| AUDIT PROJECT: | Clinical Lead: Dr Iren Szeki  
Consultant Nephrologist, Manchester Royal Infirmary |
| Audit leads: | Angela Cooper - Arrowe Park Hospital  
Dr Sana Tahir - Aintree Hospital  
tba - Salford Royal Hospital  
tba - Royal Liverpool Hospital  
Ajay Dhaygude - Royal Preston Hospital  
Iren Szeki - Manchester Royal Infirmary |
| Audit Facilitator: | Tracey Powell  
Regional Renal Co-ordinator |
| Type of audit: | Individual |

| REASONS FOR CHOICE |
| Aims and objectives: | Audit goals  
Compare take on rate for each unit in terms of age, ethnicity and comorbidity at start of RRT  
Quantify regional patient survival and record cause of death |
| Proposed health benefits: | Equity of dialysis for patients of different social status, sex, ethnicity and co-morbidity. |
| Evidence base: | Renal Registry publishes survival on dialysis according to age at start of RRT. |
| Priority: | Regional |

| METHODOLOGY |
| Standards: | It is recommended that survival analysis must at least take account of age, gender, diabetes and co-morbidity.  
Outcomes will be compared to published national data from the Renal Registry. |
| Guidelines: | To be developed |
| Patients: | All new renal dialysis patients who survive > 3 months. |
| Methods: | Data will be collected prospectively from computer systems, and patient notes onto a standardised data collection sheet (excel format).  
Data will be collated and analysed by a member of the NW Renal Audit Team. |
<p>| Health disciplines involved: | nurses |</p>
<table>
<thead>
<tr>
<th align="left">Physicians</th>
</tr>
</thead>
</table>

**Timescale:**
- This audit is prospective and will run for a five year period.
- July 2009 - June 2014

**ACTION**

**Proposed date for audit presentation:**
- Interim presentation July 2011
12.8 AUDIT OF TRANSPLANT PATIENTS

The audit is led by Ed O’Riordan, Co-chair of the Steering group. It is a prospective audit and data collection will commence from 1st July 2009. It will run for a period of five years with interim reports at 1 year, and 3 years.

<table>
<thead>
<tr>
<th>NORTH WEST REGION RENAL AUDIT PROGRAMME</th>
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<tbody>
<tr>
<td>PROJECT PLANNING GUIDE</td>
</tr>
<tr>
<td>TRANSPLANT AUDIT (5 YEAR)</td>
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</table>

<table>
<thead>
<tr>
<th>AUDIT PROJECT:</th>
<th></th>
</tr>
</thead>
</table>
| Clinical Leads: | ▪ Dr Ed O’Riordan  
Consultant Nephrologist - Salford Royal Hospital |
| Audit leads: | ▪ Jane Redshaw  
Salford Royal Hospital  
▪ Durga Kanigicherla  
Manchester Royal Infirmary  
▪ Fiona Biggins  
Royal Preston Hospital  
▪ Jane Smith  
Royal Liverpool Hospital |
| Audit Facilitator: | Tracey Powell  
NW Region Renal Audit Co-ordinator |
| Type of audit: | Individual |

**REASONS FOR CHOICE**

**Background**
- Kidney transplants remain a precious resource with demand for organs outstripping supply
- Patients often have concerns about transplant care away from the transplant centre
- Little guidance is available for transplant follow-up and the evidence base remains scanty

**Aims and Objectives:**
- Audit goals
  - How successful is transplant follow-up in non transplant centre?
    - Is graft survival similar in different centres
    - Is patient survival similar in different centres
  - Do patients have a similar co-morbidity from different centres
  - Core renal transplant management
    - Deteriorating renal function
    - Tapering of immunosuppression
  - Cause of death, DM, tumours

**Proposed health benefits:**
- Reassure patients that the quality of post transplant care is high throughout the region. Quantify regional kidney survival which is currently unknown and which would be useful information for patients and health professionals in making informed choices in patient care

**Evidence base:**
- World wide and UK data available for overall patient and allograft survival

**Priority:**
- High-transplant is preferred modality for renal replacement therapy

**METHODOLOGY**
- Standards: (1) UK Guidelines for *living donor* kidney transplantation
  - Standard: Recipient survival should be 95% at 1 year and 90% at 5 years
Standard: Graft survival should be 90% at 1 year and 80% at 5 years. BTS recommend that patients aged 15-50 no diabetic should have minimum patient survival (first graft) 1 year 95% and 5 year 85% and graft survival 1 year 85% and 5 year 68%.

Guidelines:
- Factors identified by (1) above to measure transplant outcome
- Organ and patient survival
- Incidence and timing of acute rejection episodes
- Incidence of tumours
- Incidence of chronic transplant nephropathy
- Quality of life measurements
- European best practice guidelines also recommend very similar goals to those outlined above.

Patients:
- All transplant patients in the NW region who have survived at least 3 months.

Methods:
- Data will be collected prospectively from computer systems, Transplant Coordinators records and patient notes onto a standardised data collection sheet (excel format).
- Data will be collated and analysed by a member of the NW Renal Audit Team.

Health disciplines involved:
- Nurses, Physicians

Timescale:
- This audit is prospective and will run for a five year period. Interim reports will be produced at 2 year and 4 and 5 years.
- Start date: 1st July 2009
- End Date: 30th June 2014

ACTION
- Proposed date for audit presentation: Interim presentations at July 2011 and July 2014.
12.9 Bone Chemistry Audit

This audit was developed during the 2008/2009 period. Due to staffing and other considerations the audit was postponed until autumn 2009. It is the intention of the group that this audit will take place on a 2 yearly basis, alternating with the anaemia audit.

<table>
<thead>
<tr>
<th>NORTH WEST RENAL AUDIT PROGRAMME</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANAGEMENT OF MINERAL BONE DISEASE IN DIALYSIS PATIENTS</td>
</tr>
<tr>
<td>PROJECT PLANNING GUIDE</td>
</tr>
</tbody>
</table>

**AUDIT PROJECT:**
- Consultant / Steering Group lead: tba
- Audit leads:  
  - Dr Helen Eddington  
    Specialist Registrar in Renal Medicine  
    Salford Royal Hospital NHS Foundation Trust  
  - Nora Kerigan  
    Specialist Nurse  
    Royal Preston Hospital
- Audit facilitator:  
  - Tracey Powell  
    Regional Renal Audit Co-ordinator

**REASONS FOR CHOICE**

**Aims & objectives:**

**For whole dialysis population**
- To measure achievement of the Renal Association standards and compliance with the KDOQI guidelines for calcium, phosphate, calcium phosphate product and serum PTH.
- To assess compliance with the K/DOQI guideline for calcium load.
- To compare prescribing practice for phosphate binders and vitamin D
- To measure the incidence of parathyroidectomy
- To quantify the use of cinacalcet for the treatment of patients with secondary hyperparathyroidism
- To compare the commercial machines and assays used by the hospital laboratories for the measurements above.

NB Helen Eddington plans to assess the variability of commercial intact PTH assay measurements across the region as a separate research project.

**For 10% sample of dialysis population**
- To note the systems used to track drug information and assess the accuracy of these systems.
- To quantify use of IV Vitamin D
- To assess calcium load
- To compare dietetic contact between the units

**Proposed health benefits:**
- To reduce the risk of renal bone disease
- To reduce the risk of hyperparathyroidism

**Evidence base:**
- Block GA, Klassen PS, Lazarus JM, Ofsthun N, Lowrie EG, Chertow GM. Mineral metabolism, mortality and morbidity in maintenance

- London GM; Guerin AP; Marchais SJ; Metivier F; Pannier B; Adda H. Arterial media calcification in end-stage renal disease: impact on all-cause and cardiovascular mortality. Nephrol Dial Transplant 2003 Sep; 18(9):1731-40.
- Zitterman A. Vitamin D in preventive medicine: are we ignoring the evidence? Br J Nutr 2003; 89: 552-572.

**METHODOLOGY**

**Standards:**

- Regional Association Clinical Practice Guidelines' Phosphate
  Serum phosphate should be maintained between 1.1 and 1.8mmol/l

- Calcium
  Serum calcium, adjusted for albumin concentration should be maintained within the normal reference range for the laboratory used and ideally between 2.2 and 2.5 mmol/L

  Serum calcium phosphate product
The serum albumin corrected calcium phosphate product should be kept below 4.8 mmol/L\(^2\) and ideally below 4.2 mmol/L\(^2\).

Serum parathyroid hormone
The target range for parathyroid hormone measured using an intact PTH assay should be between 2 and 4 times the upper limit of normal for the intact PTH assay used. The same target range should apply when using the whole molecule PTH assay.


<table>
<thead>
<tr>
<th>Guidelines:</th>
<th>K/DOQI Clinical Practice Guidelines for Bone Metabolism and Disease in Chronic Kidney Disease <a href="http://www.kidney.org/professionals/kdoqi/guidelines_bone/index.htm">www.kidney.org/professionals/kdoqi/guidelines_bone/index.htm</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients:</td>
<td>All dialysis patients in the North West Region on 1(^{st}) November 2009.</td>
</tr>
<tr>
<td>Methods:</td>
<td>For whole dialysis population</td>
</tr>
<tr>
<td></td>
<td>For HD and PD patients serum albumin corrected calcium, phosphate and iPTH will be collected from the monthly blood test that includes iPTH measurement in either November, October or September 2009 ensuring calcium, phosphate and iPTH are taken from the same blood test. If no iPTH available in this time frame record most recent corrected calcium and phosphate (HD and PD patients). If iPTH has not been collected with monthly bloods within the time frame above then the iPTH result should be taken from the most recent iPTH measurement taken in the last 6 months. If the results are not available, the patient will be excluded from that part of the analysis. Use of phosphate binders and vitamin D and the prescribed dose, and the source of this information will be recorded. Use of cinacalcet will be recorded. The number of patients who had a parathyroidectomy will be recorded. The machines and assays used by the hospital laboratories to measure the biochemical variables will be recorded.</td>
</tr>
<tr>
<td></td>
<td>For 10% sample of dialysis population</td>
</tr>
<tr>
<td></td>
<td>A 10% sample of dialysis population will be selected by taking every 10(^{th}) patient on a list of patients ordered by hospital number, at each unit. Additional information will be collected on these patients. IV Vitamin D and dialysate used will be recorded from the hospital drug cardex. The hospital systems used to track drug information will be recorded and a GP record of the patients’ drug prescription will be requested. Contact with dietitians will be recorded from dietetic records.</td>
</tr>
<tr>
<td>Health disciplines involved:</td>
<td>Dietitians Nurses Pharmacists Physicians</td>
</tr>
<tr>
<td>Timescale:</td>
<td>Start of data collection: November 2009 Deadline for data collection: 29 January 2010</td>
</tr>
<tr>
<td>ACTION</td>
<td>Proposed date for audit presentation: Presentation Meeting July 2010</td>
</tr>
</tbody>
</table>
## APPENDIX ONE

### MEMBERSHIP OF THE NORTH WEST RENAL AUDIT STEERING GROUP

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrs Ros Adams</td>
<td>Renal Audit Facilitator</td>
<td>Salford Royal Hospital</td>
</tr>
<tr>
<td>Mrs J Alderdice</td>
<td>Team Leader, Renal Dietitians</td>
<td>Manchester Royal Infirmary</td>
</tr>
<tr>
<td>Dr J Alexander</td>
<td>Consultant Renal Physician Mersey Chair</td>
<td>Royal Liverpool Hospital</td>
</tr>
<tr>
<td>Dr A Banerjee</td>
<td>Consultant Renal Physician</td>
<td>Arrowe Park Hospital</td>
</tr>
<tr>
<td>Mr P Campbell</td>
<td>Regional Clinical Audit Projects Coordinator</td>
<td>Bury PCT</td>
</tr>
<tr>
<td>Dr A Dhaygude</td>
<td>Consultant Physician and Nephrologist Lancashire Chair</td>
<td>Royal Preston Hospital</td>
</tr>
<tr>
<td>Dr C Goldsmith</td>
<td>Consultant Renal Physician</td>
<td>University Hospital Aintree</td>
</tr>
<tr>
<td>Sr N Kerigan</td>
<td>Senior Haemodialysis Sister / Renal Hub Audit Facilitator (Lancashire)</td>
<td>Royal Preston Hospital</td>
</tr>
<tr>
<td>Mrs R Kholwadia</td>
<td>Regional Renal Audit Facilitator</td>
<td>Manchester Royal Infirmary</td>
</tr>
<tr>
<td>Sr L Lappin</td>
<td>Senior Peritoneal Dialysis Sister</td>
<td>Salford Royal Hospital</td>
</tr>
<tr>
<td>C/N P Livesley</td>
<td>Senior Peritoneal Dialysis Charge Nurse / Renal Hub Audit Facilitator (Mersey)</td>
<td>Royal Liverpool University Hospital</td>
</tr>
<tr>
<td>Dr E O’Riordan</td>
<td>Consultant Nephrologist North and West Manchester Chair</td>
<td>Salford Royal Hospitals NHS Trust</td>
</tr>
<tr>
<td>Miss T Powell</td>
<td>Regional Renal Audit Co-ordinator</td>
<td>Manchester Royal Infirmary</td>
</tr>
<tr>
<td>Dr N Reid</td>
<td>Regional Renal Audit Co-ordinator</td>
<td>Manchester Royal Infirmary</td>
</tr>
<tr>
<td>Dr D Smithard</td>
<td>Consultant Physician</td>
<td>Rochdale Infirmary</td>
</tr>
<tr>
<td>Dr I Szeki</td>
<td>Consultant Renal Physician South and East Manchester Chair</td>
<td>Manchester Royal Infirmary</td>
</tr>
<tr>
<td>Dr M Venning</td>
<td>Consultant Renal Physician</td>
<td>Manchester Royal Infirmary</td>
</tr>
<tr>
<td>J Winterbottom</td>
<td>Education &amp; Development Practitioner Renal Education Office</td>
<td>Manchester Royal Infirmary</td>
</tr>
<tr>
<td>Sr R Worsman</td>
<td>Renal Satellite Unit Nurse Manager</td>
<td>Westmorland General Hospital</td>
</tr>
</tbody>
</table>
APPENDIX TWO

RENAL UNITS PARTICIPATING IN THE NW RENAL AUDIT PROGRAMME

- Accrington Victoria Community Hospital - East Lancashire Hospitals NHS Trust
- Arrowe Park Hospital – Wirral University Teaching Hospital NHS Trust
- Broad Green Hospital - Royal Liverpool & Broadgreen University Hospitals NHS Trust
- Burnley General Hospital – East Lancashire Hospitals NHS Trust
- Chorley and South Ribble District General Hospital – Lancashire Teaching Hospitals NHS Foundation Trust
- Clatterbridge Hospital - Wirral University Teaching Hospital NHS Trust
- Clifton Hospital – Blackpool, Fylde & Wyre Hospitals NHS Trust
- Countess of Chester Hospital - Countess of Chester Hospital NHS Trust
- Furness General Hospital – University Hospitals of Morecambe Bay NHS Trust
- Macclesfield District General Hospital - East Cheshire NHS Trust
- Manchester Royal Infirmary - Central Manchester and Manchester Children’s University Hospitals NHS Trust
- North Manchester General Hospital – Pennine Acute Hospitals NHS Trust
- Prestwich Hospital – Bolton, Salford and Trafford Mental Health NHS Trust
- Rochdale Infirmary - Pennine Acute Hospitals NHS Trust
- Royal Bolton Hospital – Bolton Hospitals NHS Trust
- Royal Liverpool University Hospital - Royal Liverpool & Broadgreen University Hospitals NHS Trust
- Royal Preston Hospital – Lancashire Teaching Hospitals NHS Foundation Trust
- Salford Royal Hospital - Salford Royal NHS Foundation Trust
- Tameside General Hospital – Tameside and Glossop Acute Services NHS Trust
- University Hospital Aintree – Aintree University Hospitals NHS Foundation Trust
- Warrington Hospital – North Cheshire Hospitals NHS Trust
- Waterloo Day Hospital - Mersey Care NHS Trust
- Westmorland General Hospital - University Hospitals of Morecambe Bay NHS Trust
- Whiston Hospital - St Helens and Knowsley Hospitals NHS Trust
- Wigan Renal Unit – Ashton, Leigh and Wigan PCT
- Wythenshawe Hospital - University Hospitals of South Manchester NHS Foundation Trust