

Monklands Hospital
Renal Unit
(Lanarkshire)

Clinical Standards Board for Scotland
(now part of NHS Quality Improvement Scotland)
Local Report on service provision for

Adult Renal Services

Renal failure is becoming increasingly common in Scotland. The condition and its treatment impacts greatly on a patient's life and work. Although no cure exists for renal failure, there is much that can be done to improve outcomes and quality of life for patients.

The Clinical Standards Board for Scotland (CSBS) Adult Renal Services Project Group focused on care provided in renal units for adults throughout Scotland. It developed 14 standards relating to the main areas of care for adults with renal failure. There was a particular focus on chronic renal failure, as this represents the vast majority of the workload in renal units. This report presents the findings from the CSBS peer review of performance against the standards.

This report was undertaken by CSBS in late 2002, and has been prepared and published by NHS Quality Improvement Scotland (NHS QIS). CSBS work was incorporated into NHS QIS on 1 January 2003.

© NHS QIS 2003

ISBN for Adult Renal Services Local Reports (10 volumes) and Adult Renal Services National Overview: 1-84404-116-6

ISBN 1-84404-120-4

First published March 2003

Copies of the *Clinical Standards for Adult Renal Services* (published by CSBS) are also available from NHS Quality Improvement Scotland (NHS QIS).

NHS QIS consents to the photocopying, electronic reproduction by 'uploading' or 'downloading' from the website, retransmission, or other copying of the findings contained in this report, for the purpose of implementation in NHSScotland.

NHS Quality Improvement Scotland
Elliott House
8-10 Hillside Crescent
Edinburgh
EH7 5EA

Copies of this report, and other documents produced by NHS QIS (and CSBS), are available in print format and on the NHS QIS website.

www.nhshealthquality.org

Contents

1	Setting the Scene	5
1.1	How the Standards were Developed	5
1.2	How the Review Process Works	6
2	Summary of Findings	10
2.1	Overview of Local Service Provision	10
2.2	Summary of Findings Against the Standards	14
3	Detailed Findings Against the Standards	20
Appendix 1 Glossary of Abbreviations		35
Appendix 2 Review Team Members		36
Appendix 3 Adult Renal Services Project Group		37
Appendix 4 Timetable of Visits		39

The Clinical Standards Board for Scotland (CSBS) was established as a Special Health Board in April 1999, with the remit to develop and run a quality assurance process for clinical services provided by NHSScotland. The ultimate objective of the work of CSBS is to improve the quality of clinical care provided across Scotland.

About this Report

CSBS published *Clinical Standards for Adult Renal Services* in February 2002. These standards are being used to assess the quality of services provided by NHSScotland nationwide in hospital settings.

This report presents the findings from the CSBS peer review to **Monklands Hospital Renal Unit** managed by **Lanarkshire Acute Hospitals NHS Trust**. This review visit took place on **10 July 2002** and details of the visit, including membership of the review team, can be found in Appendix 2.

1.1 How the Standards were Developed

In May 2001, CSBS established the Adult Renal Services Project Group under the chairmanship of Dr Brian Junor, Consultant Nephrologist, Western Infirmary, North Glasgow University Hospitals NHS Trust. Membership of the Adult Renal Services Project Group includes both healthcare professionals and members of the public (see Appendix 3).

The Adult Renal Services Project Group oversees the CSBS quality assurance process of:

- developing standards;
- reviewing performance against the standards throughout Scotland, using self-assessment and external peer review; and
- reporting the findings from the review.

When developing the adult renal services standards, CSBS consulted widely throughout Scotland. The views of health service staff, patients, carers and the public were sought, and all the relevant evidence available at the time was taken into account. Draft standards were also piloted at two renal units, at Dumfries & Galloway Royal Infirmary, Dumfries, and the Western Infirmary, Glasgow.

1.2 How the Review Process Works

The CSBS review process has two key parts: local self-assessment followed by external peer review. First, each relevant Trust¹ assesses its own performance against the standards. An external peer review team then further assesses performance, both by considering the self-assessment data and visiting the renal unit to validate this information and discuss related issues. The review process is described in more detail below (see also the flow chart on page 8).

Self-Assessment by the Trust

On receiving the standards, each Trust responsible for the management of a main renal unit assesses its own performance using a framework produced by CSBS. This framework includes guidance about the type of evidence (eg guidelines, audit reports) required to allow a proper assessment of performance against the standards to be made.

The Trust submits the data it has collected for this self-assessment exercise to CSBS before the on-site visit, and it is this information that constitutes the main source of written evidence considered by the external peer review team.

External Peer Review

An external peer review team then visits the renal unit and speaks with local stakeholders (eg staff, patients, carers) about the services provided. Review teams are multidisciplinary, and include both healthcare professionals and members of the public. Training is provided for all CSBS reviewers. Each review team is led by an experienced reviewer, who is responsible for guiding the team in their work and ensuring that team members are in agreement about the assessment reached.

The composition of each team varies, and members have no connection with the Trust they are reviewing. This promotes the sharing of good practice, and ensures that each review team assesses performance against the standards rather than make comparisons between one Trust and another.

¹ For simplicity, the term 'Trust' is used throughout this document to refer to all the NHS organisations included in this national review. Further details on the renal units in Scotland are provided in Section 2.

At the start of the on-site visit, the review team meets key personnel responsible for the service under review. Reviewers then speak with local stakeholders about the services provided, including support group representatives and patients who had been selected randomly using the Scottish Renal Registry database. After these meetings, the team assesses performance against the standards, based on the information gathered during both the self-assessment exercise and the on-site visit.

The visit concludes with the team providing feedback on its findings to the Trust. This includes specific examples of local initiatives drawn to the attention of the review team (recognising that other such examples may exist), together with an indication of any particular challenges facing the Trust.

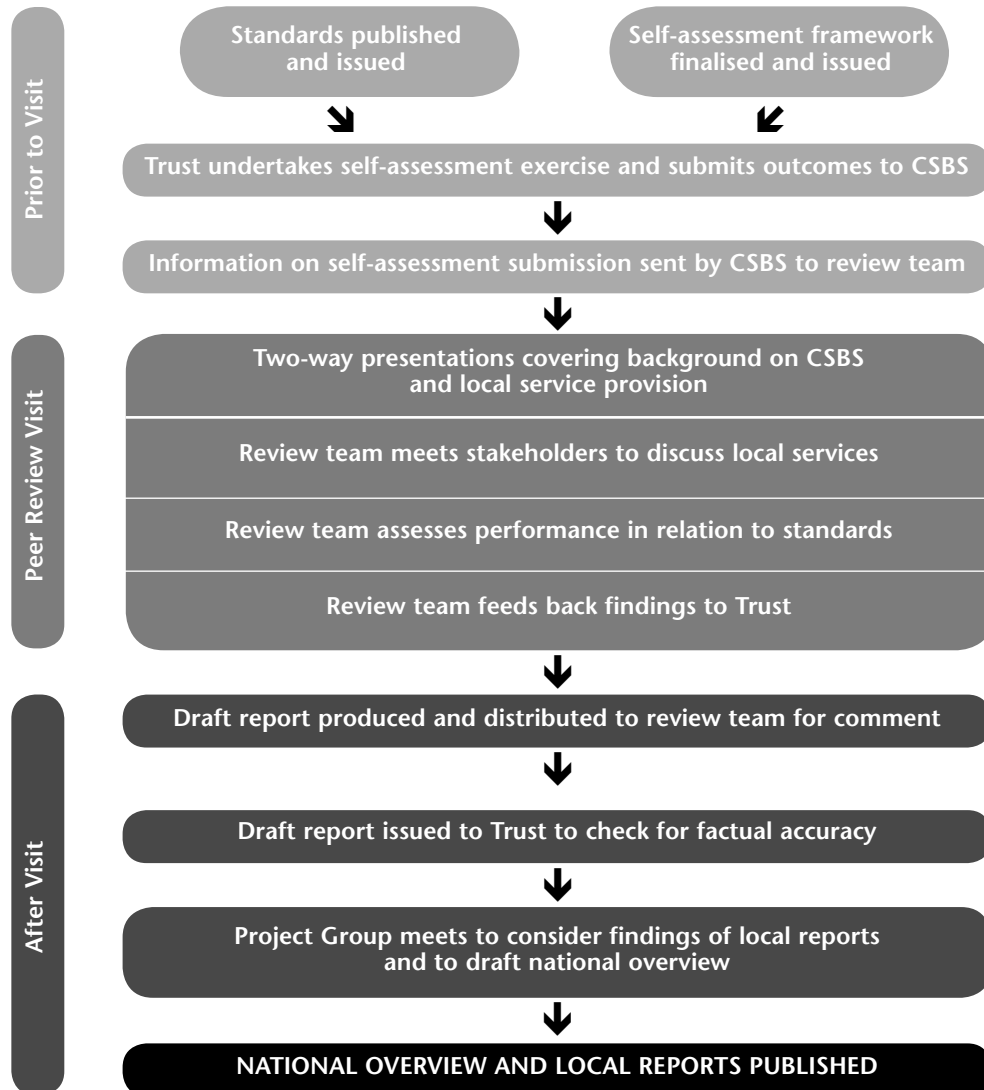
Assessment Categories

Each review team assesses performance using the categories 'met', 'not met' and 'not met (insufficient evidence)', as detailed below:

- **'Met'** applies where the evidence demonstrates the standard and/or criterion is being attained.
- **'Not met'** applies where the evidence demonstrates the standard and/or criterion is not being attained.
- **'Not met (insufficient evidence)'** applies where no evidence is available for the review team, or where the evidence available is insufficient to allow an assessment to be made.

A final category **'not applicable'** is used where a standard and/or criterion does not apply to the Trust under review.

The CSBS review process at a glance:



1.3 Reports

After the review visit, the project officer drafted a local report detailing the findings of the review team. This draft report was sent to the review team for comment, and then to the Trust to check for factual accuracy.

Following completion of the national review cycle, the Adult Renal Services Project Group reconvened to examine review findings and make recommendations to CSBS. The Adult Renal Services Project Group was then responsible for overseeing the production of a national overview of service provision across Scotland in relation to the standards. This document includes both a summary of the findings (highlighting examples of local initiatives and challenges for the service) and recommendations for improvement.

The aim of this review is to report whether the services provided by NHSScotland, both nationally and locally, met the agreed standards, and not to review the work of individual healthcare professionals. In achieving this aim, variations in practice (and potentially quality) within a service will be encountered. In such cases, variations will be reported.

Please note — all reports published by CSBS (now part of NHS QIS) are available on the NHS QIS website.

2 Summary of Findings

2.1 Overview of Local Service Provision

Lanarkshire is situated in central Scotland and has a population of around 562,000. The majority of the population live in urban areas, of which Cumbernauld, Hamilton and Motherwell are the largest in the region. The proportion of older people in the population is below the national average, whereas levels of illness and deprivation are relatively high.

Local NHS System and Services

Lanarkshire NHS Board is responsible for improving the health of the local population and for the delivery of the healthcare required. It provides strategic leadership and has overall responsibility for the efficient, effective and accountable performance of the NHS in Lanarkshire.

Clinical services are provided through two Trusts, Lanarkshire Acute Hospitals NHS Trust and Lanarkshire Primary Care NHS Trust. The Trusts are accountable for the clinical services they provide, through the framework of clinical governance.

Further information about the local NHS system can be accessed via the website of NHS Lanarkshire: www.show.scot.nhs.uk/nhslanarkshire.

Monklands Hospital Renal Unit, Airdrie, is one of ten renal units treating adults with renal failure across Scotland.

A main renal unit is the centre of renal expertise for a particular geographical area and manages the provision of renal services within that area. Both out-patient and in-patient renal services are offered, as well as specialist services. In some areas the main renal unit is supported by one or more renal satellite unit. A renal satellite unit is a haemodialysis facility which is linked to a main unit, and is not autonomous for medical decisions. They are largely nurse-led and typically provide a more accessible haemodialysis service to chronic renal patients in general good health, and not requiring the services and care of a main renal unit.

The ten renal units, to which patients in Scotland may be referred on the basis of clinical need (and location), are based at:

- Aberdeen Royal Infirmary
(including three satellite units at Chalmers Hospital, Banff, Dr Gray's Hospital, Elgin, and Peterhead Community Hospital)
- Dumfries & Galloway Royal Infirmary, Dumfries
- Crosshouse Hospital, Kilmarnock
- Glasgow Royal Infirmary
(including two satellite units at Falkirk & District Royal Infirmary and Stobhill Hospital, Glasgow)
- Monklands Hospital, Airdrie
- Ninewells Hospital, Dundee
- Queen Margaret Hospital, Dunfermline
(including one satellite unit at Victoria Hospital, Kirkcaldy)
- Raigmore Hospital, Inverness
- Royal Infirmary of Edinburgh
(including two satellite units at the Western General Hospital, Edinburgh, and Borders General Hospital, Melrose)
- Western Infirmary, Glasgow
(including an annex at Gartnavel General Hospital, Glasgow, and a satellite unit at Inverclyde Royal Hospital, Greenock)

There is also a small renal unit at Gilbert Bain Hospital, Lerwick, Shetland. This operates as an autonomous unit, but due to the small number of patients involved, has not been visited as a part of this review process. However, patients are referred to Aberdeen Royal Infirmary for renal transplant, and for complex acute renal failure.

There are three transplant centres in Scotland to which patients suitable for transplant may be referred. These are based at:

- Aberdeen Royal Infirmary
- Royal Infirmary of Edinburgh
- Western Infirmary, Glasgow

The following information was submitted by Lanarkshire Acute Hospitals NHS Trust:

- At the time of the visit there were 155 patients receiving renal replacement therapy. There were 68 patients who started haemodialysis during 2001 including seven transfers from peritoneal dialysis, nine transfers from Glasgow and two failed transplants. In addition there were 17 new peritoneal dialysis patients, including two failed transplants. The number of patients on different forms of renal replacement therapy are as follows:

- hospital haemodialysis	120
- continuous ambulatory peritoneal dialysis (CAPD)	22
- automated peritoneal dialysis (APD)	13

Patients with suspected renal failure are referred to Monklands Hospital, Airdrie, for renal investigation. For patients requiring renal replacement therapy, dialysis is started at Monklands Hospital, with treatment continued at home where appropriate. Transplant patients are typically referred to the transplant unit at the Western Infirmary, Glasgow. Follow-up of transplant patients is undertaken at the Western Infirmary, Glasgow, although plans are being made for follow-up to be undertaken at Monklands Hospital.

From the introductory sessions at the start of the visit, the following points regarding service provision were noted:

- In 1999 a new renal unit was opened at Monklands Hospital comprising 25 in-patient beds, 30 haemodialysis stations and a peritoneal dialysis training area. Due to the continued increase in numbers of haemodialysis patients, five in-patient beds have since been closed in order to accommodate five additional haemodialysis stations. An area for an out-patient department was subsequently created within the renal unit.

- In the 2 years prior to the visit, new patient referrals to Monklands Hospital Renal Unit have doubled. Since the opening of the new renal unit the peritoneal dialysis patient population has remained stable. However, the haemodialysis patient population has risen significantly. Projections suggest that the chronic haemodialysis patient population will increase to over 180 patients within the next 10 years.
- There are plans to restructure out-patient clinics in order to reduce out-patient department waiting times and facilitate better use of staff resources.
- A business case has been submitted for a further five haemodialysis stations, a senior house officer and additional nursing staff to accommodate the rise in the number of patients receiving haemodialysis. It was noted that funding for unused automated peritoneal dialysis (APD) is currently being used to fund excess haemodialysis capacity. A further business plan, which was being prepared at the time of the review visit, highlights the need for an additional consultant nephrologist and secretarial staff.
- While there is an electronic database in use (eMed), this is not compatible with the electronic databases used at the Scottish Renal Registry or the Western Infirmary Transplant Unit, Glasgow. Data must therefore be transferred manually from eMed to the appropriate external system. It is recognised that this process is labour-intensive.
- It is recognised that the provision of dialysis access is currently inadequate for the patient population. Peritoneal dialysis access is currently undertaken on an ad hoc basis by surgeons from North Glasgow University Hospitals NHS Trust in order to meet the requirements of dialysis access surgery. However, it is hoped that Lanarkshire will be able to take over responsibility for this in the future, with an additional post for vascular surgeon at Hairmyres Hospital due to be advertised shortly after the review visit. However, it was reported that additional staffing would still be required to meet demand.
- It is hoped to establish a 12-station satellite unit at either Wishaw General Hospital or Hairmyres Hospital, East Kilbride, in the future, which would better serve those haemodialysis patients living in the south of the region with regards to travelling distance and time. However, it is recognised that this will require a business case to be submitted and consultation to be undertaken.

-
- There is a dedicated renal transport service, which is jointly funded by NHS Lanarkshire, Lanarkshire Acute Hospitals NHS Trust and the Scottish Ambulance Service. A dedicated staff member from the unit schedules patient pick-up and collection in liaison with the Scottish Ambulance Service. Lease cars are used to transport patients, with dedicated drivers being provided by the Scottish Ambulance Service. Monitoring of transportation times by the unit has demonstrated an improvement in average journey times since the establishment of this service.

Scottish Renal Registry

There is clearly a commitment to, and an awareness of, the importance and value of data collection and audit for renal services in Scotland. The Scottish Renal Registry has played a significant role in the development of audit in renal services. It was established in 1991 by the Scottish Renal Association, as a computer-based registry for patients receiving renal replacement therapy for end stage renal disease in Scotland. Once a system of computerised data collection was operational, the Scottish Renal Registry moved into comparative audit between renal units.

The Registry is now able to audit many of the standards developed by the UK Renal Association. This has resulted in renal units across Scotland sending data to the Scottish Renal Registry for the purposes of national audit. In addition to the results of national audits being published in the Registry's Annual Report, all renal units are provided with the national results and their individual unit's results.

2.2 Summary of Findings Against the Standards

A summary of the findings from the review, including examples of local initiatives drawn to the attention of the review team, is presented in this section. A detailed description of performance against the standards/criteria is included in Section 3.

Haemodialysis

Audit data provided by the unit indicated that the haemodialysis adequacy target is met for patients who have been on haemodialysis for more than 3 months. There is a comprehensive system of review of patients who do not achieve the target adequacy.

The review team commended the regular monitoring of water quality for dialysis, and noted that endotoxin count is measured in addition to microbial count.

Peritoneal Dialysis

Audit data provided by the unit indicated that the peritoneal dialysis adequacy target is met for patients who have been on peritoneal dialysis for more than 8 weeks. A comprehensive system of regular review of patients facilitates early detection of problems in achieving dialysis adequacy and episodes of peritonitis. The review team commended the low rate of peritonitis achieved by the unit.

Haemoglobin in Patients on Dialysis

Audit data provided by the unit indicated that whilst the haemoglobin targets are achieved in peritoneal dialysis patients, they are not achieved in haemodialysis patients. A major contributing factor for this is the high rate of infection resulting from the use of permanent catheters or temporary lines. This can cause a lack of response to erythropoietin (EPO) treatment to correct haemoglobin levels. A comprehensive system of nurse-led review is in place for patients failing to meet haemoglobin targets.

The review team was concerned to note that the high rate of infection, resulting from the use of permanent catheters or temporary lines, also contributes to the need to carry out a higher than average number of blood transfusions. The use of permanent catheters and temporary lines relates to issues around access to theatre and surgery space for patients requiring vascular access surgery.

Dialysis Access

Audit data provided by the unit indicated that the essential limits for dialysis access detailed in this standard are not met. The review team was concerned to note the low percentage of patients having permanent access available at their first dialysis session. In addition, permanent access for peritoneal dialysis patients is undertaken on an ad hoc basis by visiting surgeons from outwith the Trust, resulting in many of these patients requiring temporary lines for haemodialysis until they receive access surgery for peritoneal dialysis.

A major challenge for the Trust is to provide adequate theatre time and theatre space for patients requiring vascular access surgery, as well as an adequate number of surgical staff to meet the demand for dialysis access. It was noted that, despite an increase in the dialysis population, the number of sessions for dialysis access has not increased since 1994.

Nutritional Status

The review team commended the dietetic service provided to renal patients. Comprehensive dietetic assessments are undertaken on a regular basis for all patients. Nutritional goals are set, documented and monitored in accordance with Renal Nutritional Group Standards for those identified as at risk. Baseline anthropometry is carried out and documented for all patients at the beginning of dietetic treatment and annually thereafter.

Drug Therapy

There are protocols for the management of anaemia and treatment of peritonitis, which are regularly reviewed and updated. However, the review team was concerned to note that there is currently no protocol for immunisation for hepatitis B. Although a business case has been prepared for immunisation for hepatitis B, it was noted that this had not been submitted at the time of the visit. The review team noted that staff remain undecided as to which regimen and agent should be used for immunisation, and whether all patients should be immunised or only patients who are new to the unit.

The renal pharmacist reviews in-patient prescriptions, with review of all other patients' prescriptions being undertaken by medical and nursing staff. Information and advice about the use of drugs in chronic renal failure and dialysis patients is available to both healthcare professionals and renal patients. The renal dieticians and palliative care nurse also provide advice and information as required.

Access to Multidisciplinary Team

It was reported that there is typically quick and easy access to most members of the multidisciplinary team. Concerns were raised about the future funding of the post of occupational therapist. There are weekly multidisciplinary meetings to review dialysis patients, patients who are unsuitable for dialysis, and patients from low clearance and general nephrology clinics. These meetings are attended by the occupational therapist and social worker, in addition to medical and nursing staff, renal dieticians and pharmacist.

Example of a local initiative

The review team commended the provision of palliative care support for renal patients. A dialysis nurse, who has been trained in palliative care, provides four sessions per week. Funding for this service is provided by the British Kidney Patients' Association.

Assessment for Transplantation

A system is in place to ensure that all patients are assessed for transplantation within 3 months of starting dialysis; suitable patients are then referred to the Western Infirmary Transplant Unit, Glasgow. The review team noted that there is no formal annual review of dialysis patients' suitability for transplantation. However, a business case has been compiled for extra nursing staff and clinical time in order to facilitate formal annual assessment.

Decisions regarding the patient's assessment at the Transplant Centre are communicated to the patient in writing. However, it was noted that patients on the waiting list for transplantation are informed only if there is a change in their transplant status following informal annual review.

Out-patients

The review team was concerned to note the significant waiting times for non-urgent referrals to the renal unit. A major contributing factor is a lack of medical staff. However, the review team was encouraged to learn that changes to the structure of clinics are being investigated, which it is hoped will facilitate a reduction in waiting times.

It was highlighted that the unit is currently without its full quota of secretarial staff, and this was felt to be a contributing factor for delays in clinic letters being sent to the GP. However, it was noted that changes in patients' medication are communicated to the GP promptly using a written note via the patient, in addition to a formal clinic letter.

Provision of Patient Information

The review team commended the comprehensive pre-dialysis information which is provided to patients on an individual basis. Good communication exists between staff and patients and their carers with regards to the discussion of treatment options and changes in treatment. All relevant members of the multidisciplinary team are involved in these discussions.

The review team noted the recent appointment of a designated pre-dialysis nurse specialist, which will further facilitate the pre-dialysis work of the renal unit.

Transportation for Haemodialysis

The review team commended the results of the audit provided by the unit in relation to this standard.

Example of a local initiative

The review team commended the dedicated renal transportation system which is in place. Jointly funded by NHS Lanarkshire, Lanarkshire Acute Hospitals NHS Trust and the Scottish Ambulance Service, the service is operated by the latter in liaison with the renal unit. Dedicated drivers have been trained specifically in the needs of renal patients, and transport the same patients to their dialysis sessions, facilitating good relationships between drivers and patients. A dedicated staff member from the renal unit works with the Scottish Ambulance Service to schedule the pick-up and collection of patients. Implementation of the system has resulted in a reduction in the waiting time for transportation to and from dialysis.

It was noted that, as Monklands Hospital Renal Unit is located in the north of Lanarkshire, patients from the south of the region have longer travelling times to and from dialysis. Consideration is being given to the development of a renal satellite unit at either Wishaw General Hospital or Hairmyres Hospital, East Kilbride, which would reduce the travelling time for this group of patients.

Audit: Information/Data Collection

The review team identified issues around the collection of data for audit. Whilst a computerised information system, eMed, is in place, it was noted that this does not provide an electronic link to either the Scottish Renal Registry or the Western Infirmary Transplant Unit, Glasgow. This results in data being manually transferred across to these external systems.

It was noted that the unit takes part in comparative audits of dialysis and transplantation through the Scottish Renal Registry.

The review team was encouraged to note that, at the time of the visit, the unit was in the process of establishing a system of audit in liaison with the Trust Audit Department to monitor the type and time of access surgery.

3 Detailed Findings Against the Standards

Standard 1 - Clinical Management/Treatment 1: Haemodialysis

All people on haemodialysis achieve the Renal Association targets set for adequacy. There is regular audit of haemodialysis adequacy (see Standard 14).

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: The target for haemodialysis adequacy is a Urea Reduction Ratio not less than 65% or stable Kt/V not less than 1.2 (dialysis and residual renal function) for thrice-weekly dialysis. This is achieved in a minimum of 85% of patients. Where Kt/V is measured, the method used to calculate is documented.

STATUS: Audit data provided by the unit on the day of the visit demonstrated that this criterion is met in all patients who have been on dialysis for more than 3 months.
Met

The calculation for Kt/V is not used.

2: Reasons for patients not achieving the target haemodialysis adequacy are documented and appropriate action taken.

STATUS: Reasons for patients not achieving the target haemodialysis adequacy are documented on continuation sheets which are kept in the office of the consultant in charge of haemodialysis. Vascular access and dialysis prescription are reviewed monthly to determine the appropriate action to be taken for patients not meeting the target. Changes made to patients' prescriptions are recorded in the nursing notes. Patients are informed of their urea reduction ration (URR) results and any changes to their dialysis prescription.
Met

3: Haemodialysis is offered thrice-weekly unless there are specific circumstances.

STATUS: All haemodialysis patients are offered and receive thrice-weekly dialysis.
Met

4: Quality of water for dialysis and/or dialysis fluid is monitored monthly and meets Renal Association targets for microbial count.

STATUS: The quality of water for dialysis is monitored weekly from the central water treatment plant and Renal Association targets for microbial count are met. In addition to this, individual machines are monitored 3-monthly. The review team noted that endotoxin count is measured in addition to microbial count.
Met

5: The percentage of patients achieving the Renal Association Standards for pre-dialysis potassium, phosphate, and calcium is calculated at a minimum of 3-monthly intervals.

STATUS: The percentage of patients achieving the Renal Association standards for pre-dialysis potassium, phosphate and calcium is calculated 3-monthly. These data are entered into eMed, the computerised renal database system, and used to calculate Renal Association standards. The review team noted that this procedure was implemented 6 months prior to the visit.
Met

Standard 2 - Clinical Management/Treatment 2: Peritoneal Dialysis

All people on peritoneal dialysis achieve the Renal Association targets set for adequacy. There is regular audit of peritoneal dialysis adequacy (see Standard 14). There is safe and effective management in place for prevention of peritonitis.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: The target for peritoneal dialysis adequacy is a total weekly creatinine clearance (dialysis and residual renal function) not less than 50 l/week/1.73m² and/or weekly urea Kt/V exceeds 1.7 by 8 weeks after beginning peritoneal dialysis. This is maintained in a minimum of 85% of patients.

STATUS: Audit data provided by the unit demonstrated that this criterion is met. All
Met patients on peritoneal dialysis have adequacy measured within 3 weeks of beginning treatment; thereafter there is a system of regular monitoring.

2: Reasons for patients not achieving the target peritoneal dialysis adequacy are documented, and appropriate action taken.

STATUS: Reasons for patients not achieving the target peritoneal dialysis adequacy are
Met documented in the peritoneal dialysis clearance file, with appropriate action being taken. Patients are followed up monthly by nurses and 2-monthly by consultants. If required, more frequent consultant follow-up is undertaken. This system facilitates early detection of problems with dialysis adequacy.

3: The percentage of patients achieving the Renal Association Standards for potassium, phosphate and calcium is calculated at a minimum of 3-monthly intervals.

STATUS: The review team confirmed that, as of January 2002, the percentage of patients
Met achieving the Renal Association Standards for potassium, phosphate and calcium is calculated on a 3-monthly basis.

4: The use of disconnect systems is standard unless contra-indicated.

STATUS: The use of disconnect systems is standard for all patients.
Met

5: Peritonitis rates are not more than one episode/18 patient-months.

STATUS: The review team commended the low rate of peritonitis. Frequent monitoring
Met facilitates early detection of peritonitis. It was noted that the unit operates a policy of treating peritonitis at home.

Standard 3 - Clinical Management/Treatment 3: Haemoglobin in Patients on Dialysis

All people on haemodialysis or peritoneal dialysis achieve targets set for haemoglobin levels after 3 months of dialysis. Transfusion is avoided wherever possible.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: The target is a haemoglobin concentration not less than 10g/dl (haematocrit is not less than 30%) after 3 months of dialysis. This is achieved in a minimum of 85% of patients.

STATUS:
Not met

Audit data provided by the unit demonstrated that this criterion is met for peritoneal dialysis patients. However, it is not met for haemodialysis patients. A major contributing factor for this is the high use of permanent catheters and temporary lines which can result in high infection rates. This in turn can cause a lack of response to erythropoietin (EPO) treatment. Staff interviews confirmed that this issue arises from limited access to theatre and surgery space for patients requiring vascular dialysis access surgery. It was noted that Trust management are aware of this issue.

2: Reasons for patients not achieving the target haemoglobin are documented, and appropriate action taken.

STATUS:
Met

Reasons for patients not achieving the target haemoglobin are documented in the URR and haemoglobin file. This is kept in the office of the consultant in charge of haemodialysis, along with the management of anaemia protocol. Staff interviews confirmed that this file and the protocol are available at the monthly meetings. It was noted that the protocol is nurse-led and action is taken to correct haemoglobin levels following reference to this protocol. Patients with persistent problems in reaching the target are reviewed by medical staff.

3: Iron status is monitored at a minimum of 6-month intervals.

STATUS:
Met

The review team confirmed that iron status is monitored 2-monthly.

4: The number of patients receiving blood transfusions is monitored.

STATUS:
Met

The review team confirmed that the number of patients receiving blood transfusions is monitored. Whilst the number of patients receiving transfusions appeared to be high, staff interviews confirmed that transfusion is typically only carried out in patients who are unwell, due to the high infection rates caused by permanent catheters and temporary lines.

Standard 4 - Clinical Management/Treatment 4: Dialysis Access

All people requiring dialysis have timely surgery for access.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: Permanent access is available at the first dialysis in a minimum of 60% of patients who present at the renal service more than 3 months before requiring dialysis.

STATUS:
Not met

Audit data provided by the unit demonstrated that while this criterion is met for peritoneal dialysis patients, it is not met for haemodialysis patients. Concerns were raised about the low percentage of haemodialysis patients having permanent access available at the first dialysis. A major contributing factor for this is the lack of theatre time and theatre space for renal patients requiring vascular access surgery. It was noted that, despite an increase in the dialysis population, theatre time has not increased since 1994. Concerns were also raised about the lack of surgical staff to meet demand, although the review team was encouraged to note that consideration is being given to the appointment of a vascular surgeon to aid the provision of vascular access.

Staff interviews confirmed that permanent access for peritoneal dialysis patients is undertaken on an ad hoc basis by visiting surgeons from outwith the Trust. As a result, many of these patients initially require temporary lines for haemodialysis until they receive access surgery for peritoneal dialysis.

2: Reasons for patients not having permanent access available at their first dialysis are documented.

STATUS:
Not met

Staff interviews confirmed that reasons for patients not having permanent access available at their first dialysis are not documented. However, the review team noted that this issue is under review.

3: There are adequate dedicated theatre sessions (Reference Guideline: one weekly theatre session per 120 patients (approximately) on dialysis – National Service Standard 3).

STATUS:
Not met

There are inadequate dedicated theatre sessions for the patient population. It was noted that there are two sessions per month for the creation of vascular dialysis access and this has been the case since 1994.

Desirable Criteria

4: A minimum of 70% of patients have arteriovenous fistulae or vein graft as their permanent haemodialysis access.

STATUS:
Not met

Audit data provided by the unit demonstrated that this criterion is not met.

5: Permanent catheters are used as haemodialysis access in a maximum of 20% of patients.

STATUS:
Not met

Audit data provided by the unit demonstrated that this criterion is not met.

Standard 5 - Clinical Management/Treatment 5: Nutritional Status

All patients receiving dialysis or with low creatinine clearance have nutritional status regularly assessed, evaluated and documented.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: All patients are assessed at least 6-monthly to identify those at risk of malnutrition.

STATUS: Staff interviews confirmed that patients are assessed at least 6-monthly to identify those at risk of malnutrition.
Met

2: Patients identified as at risk have nutritional goals set, documented and monitored in accordance with Renal Nutritional Group Standards.

STATUS: Patients identified as at risk have nutritional goals set and monitored in accordance with Renal Nutritional Group Standards. These goals are documented on dietetic record cards. They are also recorded on the computerised database as time permits. Major changes to nutritional goals are also documented in medical notes.
Met

3: Reasons why patients identified as at risk do not achieve nutritional goals are documented, and appropriate action taken.

STATUS: Reasons for patients not achieving nutritional goals are recorded in medical notes and on dietetic record cards. Appropriate action is taken with reference to the local protocol. Dietary advice and support are also provided to patients by the renal dietitians.
Met

4: There is a designated dietician with a recognised postgraduate qualification and/or renal experience.

STATUS: There are two designated dieticians with experience in renal dietetics.
Met

Desirable Criteria

5: Baseline anthropometry is documented for all patients at the beginning of dietetic treatment by an individual trained in the technique.

STATUS: Baseline anthropometry is carried out and documented for all patients at the beginning of dietetic treatment and annually thereafter. It is carried out by individuals trained in the technique.
Met

Standard 6 - Clinical Management/Treatment 6: Drug Therapy

All people with chronic renal failure or on renal replacement therapy receive appropriate drug therapy and advice on their medicines.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1.1: There are protocols for: Management of anaemia; Treatment of peritonitis; Immunisation for Hepatitis B.

STATUS:
Not met

There are protocols for the management of anaemia and treatment of peritonitis, which are regularly reviewed and updated. However, there is currently no protocol for immunisation for hepatitis B and staff interviews confirmed that patients are not immunised for hepatitis B. Although a business case has been prepared for immunisation for hepatitis B, it was noted that this had not been submitted at the time of the review visit. However, there is some indecision among staff as to which regimen and agent should be used for immunisation, and whether all patients should be immunised or only patients who are new to the unit.

1.2: In addition, for transplant units there are protocols for: Immunosuppressive regimens; Cytomegalovirus and pneumocystis infection prophylaxis; Renal vein thrombosis prophylaxis; Management of delayed graft function.

STATUS:
Not applicable

Monklands Hospital is not a transplant unit, and all transplant follow-up is undertaken at the Western Infirmary, Glasgow.

2: All patients' prescriptions are reviewed to ensure their drug therapy is appropriate for their circumstances.

STATUS:
Met

In-patient prescriptions are reviewed on a daily basis by the renal pharmacist. All haemodialysis patients' prescriptions are reviewed by medical and nursing staff, with input from the renal dietician and palliative care nurse as required. Peritoneal dialysis patients' prescriptions are reviewed by medical staff at the weekly peritoneal dialysis clinic and monthly peritoneal dialysis review meeting.

3: Information and advice about the use of drugs in chronic renal failure or in dialysis patients is available to healthcare professionals and renal patients.

STATUS:
Met

Information and advice about the use of drugs in chronic renal failure or in dialysis patients is available to healthcare professionals from the renal pharmacist, who attends ward rounds. Additional information is provided on request, and there is access to the renal pharmacist at other times. The renal dieticians provide advice and education to nursing staff on phosphate binders.

Information and advice is provided to patients by medical and nursing staff. The renal dieticians, along with nursing staff, also provide information and advice to patients on phosphate binders.

4: There is a designated pharmacist with a recognised postgraduate qualification and/or renal experience.

STATUS:
Met

There is a designated renal pharmacist with recognised postgraduate qualifications and renal experience.

Standard 7 - Clinical Management/Treatment 7: Access to Multidisciplinary Team

All people with end stage renal failure have access to a multidisciplinary team.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

- 1: In addition to the regular medical and nursing staff, patients are referred to the following services when required: physiotherapy; pharmacy; dietetics; occupational therapy; designated social worker with a recognised postgraduate qualification and/or renal experience; primary healthcare team; community hospitals (where applicable); transplant co-ordinator/ liaison nurse; counselling service; clinical psychology; liaison psychiatry.

STATUS:

Met

Patients are quickly referred to the relevant services when required. Staff interviews confirmed that any member of the renal team may refer patients. It was reported that there are difficulties around referral to psychiatric services due to the arrangement of the service into geographical zones. Concerns were also raised about the continued funding of the occupational therapist, whose post is currently funded by the Kidney Patients' Association.

The review team commended the provision of palliative care support for renal patients, which is provided by a dialysis nurse who has palliative care training. The British Kidney Patients' Association provide funding for four palliative care sessions per week.

- 2: Dialysis patients are regularly and confidentially reviewed by a multidisciplinary team including medical and nursing staff, dieticians and pharmacists.

STATUS:

Met

Dialysis patients are reviewed at weekly meetings by a multidisciplinary team. These meetings are also used to review patients who are unsuitable for dialysis, and patients from low clearance and general nephrology clinics. In addition to medical and nursing staff, dietician and pharmacist, the social worker and occupational therapist also attend the meetings. The review team noted that the unit was considering a move towards integrated care pathways to help facilitate comprehensive and seamless patient care. There is adequate private space for confidential discussions with patients.

Standard 8 - Transplantation 1: Assessment for Transplantation

All dialysis patients are assessed for suitability of transplantation within three months of starting dialysis.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: All patients are assessed for transplantation within 3 months of starting dialysis and those suitable are referred to a Transplant Centre.

STATUS: A system is in place to ensure that all patients are assessed for transplantation within 3 months of starting dialysis. Those suitable are referred to the Western Infirmary Transplant Unit, Glasgow.
Met

2: Patients referred are seen by a nephrologist and surgeon from the Transplant Centre.

STATUS: Patients referred are seen by a nephrologist and surgeon from the Western Infirmary Transplant Unit.
Met

3: Decisions regarding the patient's assessment at the Transplant Centre are communicated in writing, to the patient, the GP and, where appropriate, the carer.

STATUS: Decisions regarding the patient's assessment at the Transplant Centre are communicated to the patient by letter from the Western Infirmary Transplant Unit. Staff interviews highlighted that Monklands Hospital Renal Unit is typically informed of these decisions after the patient.
Met

4: All patients on dialysis are reviewed annually for their suitability for transplantation.

STATUS: There is no formal annual review of patients on dialysis for their suitability for transplantation. A business case has been prepared for two additional nurses and extra clinical time in order to fund a link between the Proton database at the Western Infirmary, Glasgow, and the eMed database at Monklands Hospital. This is in order to facilitate formal annual review. It was noted that this report had not been submitted at the time of the visit.
Not met

5: All patients on the waiting list are informed of the outcome of their annual review either orally or in writing.

STATUS: All patients on the waiting list are informed orally of any change in their transplant status. However, the review team confirmed that patients are not currently informed of the outcome of their informal annual review if there is no change.
Not met

6: The percentage of dialysis patients on the waiting list for transplantation is monitored and reviewed annually.

STATUS: The percentage of dialysis patients on the waiting list for transplantation is monitored. Annual monitoring was implemented at the beginning of 2002.
Met

7: The unit takes part in the Renal Donor Sharing Scheme operated by UK Transplant.

STATUS: Monklands Hospital Renal Unit takes part in the Renal Donor Sharing Scheme operated by UK Transplant.
Met

8: Type 1 diabetic patients with renal failure are considered for combined pancreas and kidney transplant.

STATUS:
Met

Patients suitable for transplantation are referred to the Western Infirmary Transplant Unit, Glasgow, where Type 1 diabetic patients with renal failure are considered for combined pancreas and kidney transplant.

Standard 9 - Transplantation 2: Kidney Retrieval

The removal and use of cadaver kidneys for transplantation is carried out to optimise the quality of future renal function.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: Kidneys are retrieved by a transplant surgeon experienced in the procedure.

STATUS: Monklands Hospital is not a transplant unit.
Not applicable

2: Cold storage time is below 24 hours, where possible.

STATUS: Monklands Hospital is not a transplant unit.
Not applicable

3: Reasons for cold storage exceeding 24 hours are documented.

STATUS: Monklands Hospital is not a transplant unit.
Not applicable

4: Documentation of damage to retrieved kidneys is sent with the donor kidney to the transplant unit.

STATUS: Monklands Hospital is not a transplant unit.
Not applicable

5: A minimum of 70% of donor kidneys from people on artificial ventilation, who are confirmed to be dead by brain stem testing, function immediately.

STATUS: Monklands Hospital is not a transplant unit.
Not applicable

6: The percentage of kidneys that never function is no more than 5% for people on artificial ventilation, who are confirmed to be dead by brain stem testing.

STATUS: Monklands Hospital is not a transplant unit.
Not applicable

Standard 10 - Transplantation 3: Survival Rates

Patient and transplant survival rates following kidney transplantation are within acceptable limits.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: Following live related donor kidney transplantation: Patient survival rate is a minimum of 95% at 1 year; Transplant survival rate is a minimum of 93% at 1 year.

STATUS: Monklands Hospital is not a transplant unit.
Not applicable

2: Following first cadaver kidney graft transplantation: Patient survival rate is a minimum of 95% at 1 year and a minimum of 80% at 5 years; Transplant survival rate is a minimum of 85% at 1 year and a minimum of 66% at 5 years.

STATUS: Monklands Hospital is not a transplant unit.
Not applicable

3: Transplant patients are reviewed regularly by a nephrologist or transplant surgeon.

STATUS: All transplant patients are followed up at the Western Infirmary Transplant Unit, Glasgow.
Not applicable

Standard 11 - Patient Focus 1: Out-patients

Waiting times for new patient appointments are within acceptable limits and clinic letters are sent out with minimum delay.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: New patients are offered an appointment to be seen within 1 month of referral.

STATUS:
Not met

Audit data provided by the unit indicated that there is a significant waiting list for non-urgent referrals. Contributing factors include limited clinic time and, in particular, a lack of medical staff. Staff interviews confirmed that possible changes to the structure of clinics are being investigated to increase the amount of available clinical time. It is hoped that this will facilitate a reduction in waiting times.

2: Clinic letters are sent to the GP within 2 weeks of being seen by a nephrologist.

STATUS:
Not met

Audit data provided by the unit demonstrated that this criterion is not met. A contributing factor was felt to be limited secretarial support.

3: Changes in medication are communicated to the GP via the patient using a written note or by updating a drug booklet.

STATUS:
Met

The review team confirmed that changes in medication are communicated to the GP via the patient using a hand-written letter, in addition to a formal clinic letter.

Standard 12 - Patient Focus 2: Provision of Patient Information

All people with chronic renal failure or on renal replacement therapy, and carers where appropriate, are given information to help them make informed choices.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: All people diagnosed with chronic renal failure, and carers where appropriate, are provided with appropriate information materials which are evidence-based, identify treatment options, possible outcomes, risks, possible side-effects, and sources of further information.

STATUS: The review team commended the high standard of pre-dialysis information provided to patients. Pre-dialysis patients attend low clearance clinics, at which information leaflets are provided to ensure patients receive information appropriate to their circumstances.
Met

2: Medical and nursing staff discuss possible treatment options which may include home and hospital dialysis, CAPD and APD, cadaver and live donor transplantation, with patients, and carers where appropriate, at a dedicated appointment or home visit.

STATUS: Medical staff discuss possible treatment options with patients during a dedicated clinic appointment. There is good system in place to ensure provision of pre-dialysis education and a full discussion of treatment options. There is also opportunity for new patients to meet existing patients. The occupational therapist is involved in home visits to assess patients' suitability for peritoneal dialysis or haemodialysis. Feedback from patients indicated that they felt well informed about different treatment options.
Met

The review team commended the desire of the unit to develop its living donor clinic. However, it was noted that the clinic is currently unfunded.

3: Patients, and carers where appropriate, are involved in decisions about treatment and changes in treatment.

STATUS: Both patients, and carers where appropriate, are involved in decisions about treatment and changes in treatment. Discussions involve all relevant members of the multidisciplinary team.
Met

Desirable Criteria

4: There is a designated pre-dialysis nurse specialist.

STATUS: A designated pre-dialysis nurse specialist has recently been appointed and is due to take up post on 1 August 2002.
Met

Standard 13 - Patient Focus 3: Transportation for Haemodialysis

Delays for patients attending for dialysis are minimised through reasonable measures taken by the Trust.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: 50% of all patients using hospital transportation are collected from home within half an hour of their allotted pick-up time, and all are collected within one hour.

STATUS: Audit data provided by the unit demonstrated that this criterion is met. The review team commended the dedicated system of transporting patients to and from dialysis using lease cars and dedicated drivers. The initiative is jointly funded by NHS Lanarkshire, Lanarkshire Acute Hospitals NHS Trust and the Scottish Ambulance Service. The drivers, provided by the Scottish Ambulance Service have received appropriate training, including spending a month at the renal unit. In addition a designated person from the Scottish Ambulance Service spent a month in the renal unit to set up liaison protocols and provide renal unit staff with appropriate training. The review team noted that the transport funding currently only covers 120 patients.
Met

2: 50% of all patients begin dialysis within half an hour of appointment time, and all begin within one hour.

STATUS: Audit data provided by the unit demonstrated that this criterion is not met by a small margin.
Not met

3: 50% of all patients using hospital transportation are collected within half an hour of the end of dialysis, and all are collected within one hour, provided they are clinically fit.

STATUS: Audit data provided by the unit demonstrated that this criterion is met.
Met

4: Reasons for delays of more than an hour are documented.

STATUS: A system for documenting reasons for delays of more than an hour was implemented prior to the review visit. This information is recorded in a log book, which is kept at the dialysis reception desk.
Met

5: Patients who wait for hospital transport do so in comfortable surroundings.

STATUS: It was reported that the area where patients wait for hospital transport has inadequate seating for the number of patients. Feedback from patients also highlighted that the location of the waiting area, next to the front door of the unit, can result in the area being cold and draughty.
Not met

Desirable Criteria

6: Within the constraints of population density and geography, a unit is available within half an hour's travelling time for patients.

STATUS: The review team concluded that this criterion is not currently met. Whilst it was recognised that geographical constraints create difficulties in providing a unit within half an hour's travelling time for all patients, it was felt that a satellite unit situated in another of the Trust's hospital sites would provide easier access and reduce the travelling time for patients from the south of the region.
Not met

Standard 14 - Audit: Information/Data Collection

There is continuous data collection to facilitate regular national audit through the Scottish Renal Registry.

Monklands Hospital Renal Unit, Lanarkshire

Essential Criteria

1: There are information systems in place for continuous collection of the Scottish Renal Registry core data set to facilitate audit.

STATUS: A computerised information system is in place for the continuous collection of the Scottish Renal Registry core data set to facilitate audit. However, it was noted that there is currently no electronic link with the Scottish Renal Registry resulting in data being manually transferred to the Scottish Renal Registry records. It was acknowledged that this process is labour-intensive.
Met

2: The unit takes part in comparative audits of dialysis and transplantation through the Scottish Renal Registry and, where appropriate, UK Transplant.

STATUS: The unit takes part in comparative audits of dialysis and transplantation through the Scottish Renal Registry.
Met

3: There is data collection of the following, where appropriate, to facilitate regular audit: Haemodialysis adequacy (monthly for hospital dialysis and every 3 months for home dialysis); Peritoneal dialysis adequacy (6-monthly); Haemoglobin levels (monthly for hospital dialysis and every 3 months for peritoneal and home dialysis); Peritonitis (occurrence, investigation, treatment and cause); Type and time of access surgery; Immediate function of cadaver kidneys; Patient and transplant survival rates.

STATUS: The review team confirmed that there is currently no audit of the type and time of access surgery, although it was noted this is currently being established in liaison with the audit department.
Not met

Desirable Criteria

4: There is collection of incidence, management and outcome data on acute renal failure.

STATUS: The review team confirmed that these data have been collected by intensive therapy unit staff in a 3-year programme of the collection of crude data. In addition, the renal unit is involved in the Scottish Renal Registry Audit of dialysis dependent acute renal failure.
Met

Glossary of Abbreviations — Appendix 1

Abbreviation

APD	Automated Peritoneal Dialysis
CAPD	Continuous Ambulatory Peritoneal Dialysis
EPO	Erythropoietin
GP	General Practitioner
HDU	High Dependency Unit
ITU	Intensive Therapy Unit
MRSA	Methicillin Resistant <i>Staphylococcus aureus</i>
SRR	Scottish Renal Registry
URR	Urea Reduction Ratio

2 Appendix — Review Team Members

Details of Review Visit

The review visit to Monklands Hospital, Lanarkshire Acute Hospitals NHS Trust was conducted on 10 July 2002. The review team members for this visit were:

Dr Brian Junor (Team Leader)

Consultant Nephrologist, Western Infirmary, North Glasgow University Hospitals NHS Trust
(Chairman of the Renal Services Project Group)

Ms Susan Christie

Renal Dietician, Lothian University Hospitals NHS Trust

Rev Gillian Morton

Lay Representative, Borders

Mrs Geraldine Ovens

Charge Nurse, Ayrshire & Arran Acute Hospitals NHS Trust

Mr John Prentice

Lay Representative, Greater Glasgow

Dr Caroline Whitworth

Consultant Nephrologist, Lothian University Hospitals NHS Trust

Ms Lindsey Wilson

Clinical Nurse Manager – Renal, Grampian University Hospitals NHS Trust

Clinical Standards Board for Scotland Personnel

Mr Sean Doherty

Review Team Manager, Clinical Standards Board for Scotland

Mrs Fiona Russell (nee Dymitrenko)

Project Officer, Clinical Standards Board for Scotland

Dr Brian Junor (Chairman)

Consultant Nephrologist, Western Infirmary, North Glasgow University Hospitals NHS Trust

Mr Murat Akyol

Consultant Surgeon, Lothian University Hospitals NHS Trust

Mrs Caroline Arnott

Ward Manager, Fife Acute Hospitals NHS Trust

Dr Gordon Baird

General Practitioner, Dumfries & Galloway

Mrs Megan Casserly

Lay Representative, Greater Glasgow

Mrs Rhona Duncan

Renal Dietician, Ayrshire & Arran Acute Hospitals NHS Trust

Mr James Dunleavy

Renal Pharmacist, Lanarkshire Acute Hospitals NHS Trust

Mr Sandy Glass

Lay Representative, Highland

Dr Chris Isles

Consultant Physician, Dumfries & Galloway Acute & Maternity Hospitals NHS Trust

Professor Alison MacLeod

Honorary Consultant Physician/Nephrologist, Grampian University Hospitals NHS Trust

Ms Lesley Logan

Project Manager, National Services Division

Mrs Maureen Perry

Specialist Nephrology Nurse, Tayside University Hospitals NHS Trust

Dr Keith Simpson

Consultant Physician, North Glasgow University Hospitals NHS Trust

The Board member specifically working with the Adult Renal Services Project Group was **Professor John Cromarty**, Trust Chief Pharmacist, Highland Acute Hospitals NHS Trust.

Dr David Steel (Chief Executive), **Mr Sean Doherty** (Review Team Manager), **Ms Rona Smith** (Senior Project Officer), **Mrs Fiona Russell** (nee Dymitrenko; Project Officer) and **Miss Josephine O'Sullivan** (Project Administrator) from the CSBS provided support.

Timetable of Visits — Appendix 4

Organisation Reviewed	Dates
NHS Ayrshire & Arran Crosshouse Hospital, Kilmarnock	2 October 2002
NHS Dumfries & Galloway Dumfries & Galloway Royal Infirmary, Dumfries	23 July 2002
NHS Fife Queen Margaret Hospital, Dunfermline	21 August 2002
NHS Glasgow (North) Glasgow Royal Infirmary Including: Falkirk & District Royal Infirmary (satellite unit) Stobhill Hospital, Glasgow (satellite unit)	26 June 2002
Western Infirmary Including: Gartnavel General Hospital, Glasgow (annex) Inverclyde Royal Hospital, Greenock (satellite unit)	12 June 2002
NHS Grampian Aberdeen Royal Infirmary Including: Dr Gray's Hospital, Elgin (satellite unit) Peterhead Community Hospital (satellite unit) Chalmers Hospital, Banff (satellite unit)	23 October 2002
NHS Highland Raigmore Hospital, Inverness	29 May 2002
NHS Lanarkshire Monklands Hospital, Airdrie	10 July 2002
NHS Lothian Royal Infirmary of Edinburgh Including: Borders General Hospital, Melrose (satellite unit) Western General Hospital, Edinburgh (satellite unit)	19 September 2002
NHS Tayside Ninewells Hospital, Dundee	5 September 2002