

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

## Adult Renal Services

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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.

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

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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 **Glasgow Royal Infirmary Renal Unit** managed by **North Glasgow University Hospitals NHS Trust**. This review visit took place on **26 June 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.

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## 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 Trust<sup>1</sup> 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.

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<sup>1</sup> 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.

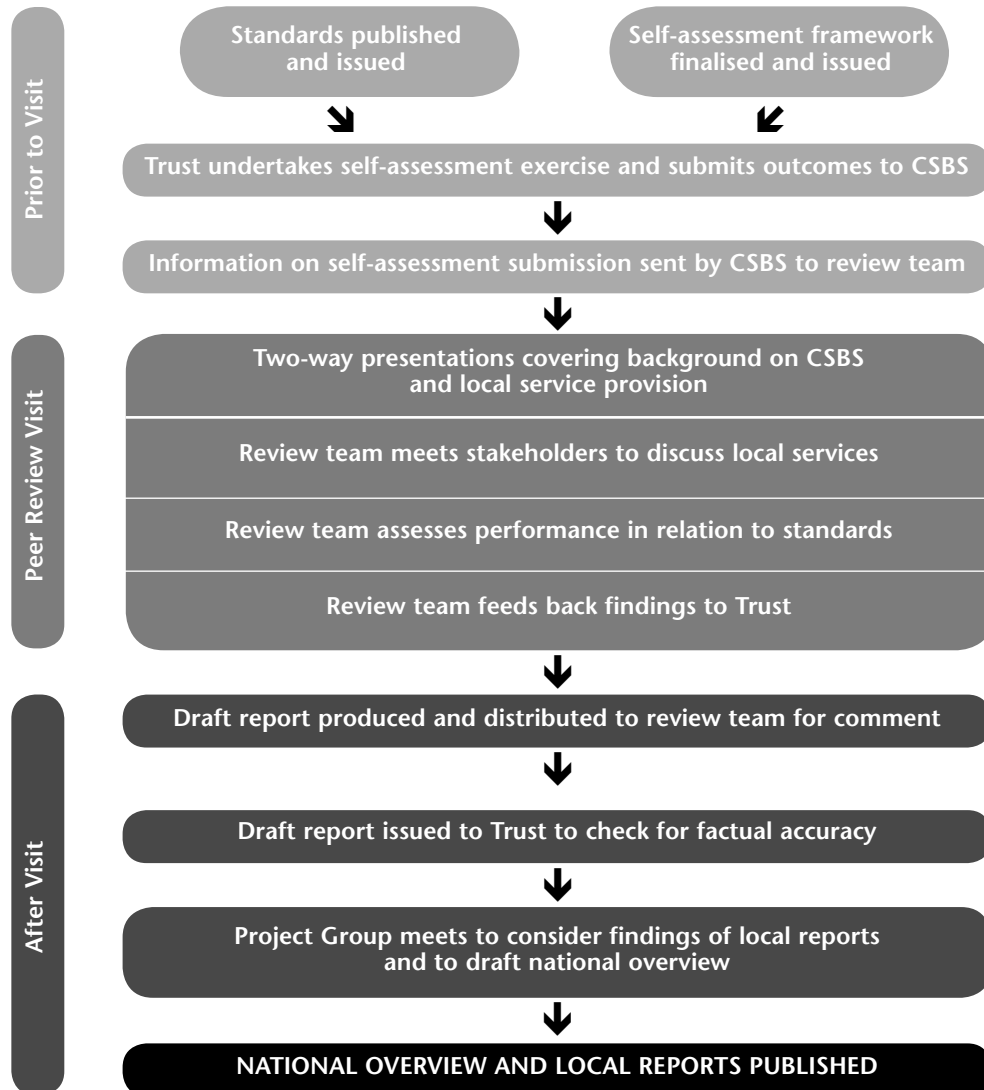
### **Assessment Categories**

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

Greater Glasgow is a compact and densely populated urban region situated in west-central Scotland and has a population of around 911,200. 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

Greater Glasgow 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 Greater Glasgow.

Clinical services are provided through four Trusts, Greater Glasgow Primary Care NHS Trust, North Glasgow University Hospitals NHS Trust, South Glasgow University Hospitals NHS Trust, and the Yorkhill 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 Greater Glasgow NHS Board: [www.show.scot.nhs.uk/gghb](http://www.show.scot.nhs.uk/gghb).

There are two renal units located in Glasgow: Glasgow Royal Infirmary and the Western Infirmary. For the purposes of the CSBS peer review programme each renal unit has been reviewed and reported on separately.

This report focuses on Glasgow Royal Infirmary, Glasgow, one of ten renal units treating adults with renal failure across Scotland. It has two satellite units at Stobhill Hospital, Glasgow, and Falkirk & District Royal Infirmary, Falkirk.

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

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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 Inverchilde 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.

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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 North Glasgow University Hospitals NHS Trust for Glasgow Royal Infirmary Renal Unit:

- Patients with suspected renal failure are typically referred to Glasgow Royal Infirmary for renal investigation. For patients requiring renal replacement therapy, dialysis is started at either Glasgow Royal Infirmary or Stobhill Hospital. Patients from Forth Valley are then transferred to the Falkirk & District Royal Infirmary satellite unit. Patients suitable for peritoneal dialysis continue treatment at home where appropriate, attending clinics at Glasgow Royal Infirmary. Transplant patients are typically referred to the transplant unit at the Western Infirmary, with all follow-up being undertaken at the Western Infirmary.

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

- The referral population covered by primary renal services in Glasgow is approximately 1.6 million and includes the populations of NHS Greater Glasgow, NHS Forth Valley and NHS Argyll & Clyde Board areas.
- Renal in-patients are cared for principally in Glasgow (Glasgow Royal Infirmary and the Western Infirmary renal units) while dialysis out-patients typically receive treatment at the satellite units.
- At the time of the visit 323 patients were receiving renal replacement therapy at Glasgow Royal Infirmary Renal Unit. There were 93 new patients during 2001: 74 at Glasgow Royal Infirmary and Stobhill, 19 at Falkirk Royal Infirmary. The number of patients on different forms of renal replacement therapy are as follows:

	Glasgow Royal Infirmery	Stobhill Hospital	Falkirk & District Royal Infirmery
- hospital haemodialysis	92	109	55
- home haemodialysis	-	28	-
- continuous ambulatory			
- peritoneal dialysis (CAPD)	39	-	-

- It is hoped to develop the nephrology out-patient clinics taking place at Falkirk & District Royal Infirmery. There are also plans to develop additional hospital haemodialysis facilities at this site. However, no funding has yet been identified for these developments.
- Glasgow Royal Infirmery Renal Unit is the home haemodialysis centre for the West of Scotland, with Stobhill Hospital Satellite Unit being responsible for the management of patients on home haemodialysis.
- The unit has a highly developed electronic patient record system in place.
- The unit is very committed to medical research, education and audit. The Scottish Renal Registry is also based at Glasgow Royal Infirmery.
- It is recognised that the renal facilities at the Glasgow Royal Infirmery and Stobhill Hospital sites were not designed for this purpose. There are plans in place to refurbish the haemodialysis facilities at Stobhill Hospital.
- There are issues around the limited number of renal in-patient beds at Glasgow Royal Infirmery, resulting in cancelled operations for vascular access surgery. The Trust recognises that this area requires urgent attention and a short-life Working Group, whose remit it is to resolve this issue across the Trust, hopes to emphasise the specific needs of renal services.
- There are issues around access to theatre time for vascular access surgery. It is recognised that the rising demand for dialysis will increase pressure on this service. The Trust reported that the surgical and medical divisions within the Trust are working together on this issue.

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- There is no treatment room at Glasgow Royal Infirmary for the insertion of lines for dialysis.
  - Action is being taken to increase dialysis capacity because of an increase in demand. The West of Scotland Renal Pressures Group has been established to facilitate discussion and planning between NHS Greater Glasgow and surrounding NHS Boards. The group is also considering nurse staffing issues.
  - The Trust has long-term plans to centralise in-patient services in Glasgow, supported by high-quality satellite units.

### **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

The review team commended the high level of achievement of haemodialysis adequacy targets and was impressed with the individualised care provided to patients.

At the Glasgow Royal Infirmary site, adequacy of haemodialysis is initially monitored monthly for all patients. For patients not achieving the target over 4 months, monthly monitoring is continued. However, if patients do achieve the target adequacy over a 4-month period, monitoring is reduced to every 2 months. Monitoring of haemodialysis is monthly at both satellite units.

A comprehensive nurse-led follow-up system is in place for patients not achieving the haemodialysis adequacy target, with action taken documented in nursing notes.

The quality of water for dialysis is monitored monthly, and results meet Renal Association targets for microbial count.

It was noted that the percentage of patients achieving the Renal Association standards for pre-dialysis potassium, phosphate and calcium is calculated 2-monthly; patients presenting problems in achieving the targets being monitored monthly.

### Peritoneal Dialysis

Audit data provided by the unit indicated that the standard in relation to peritoneal dialysis adequacy is met. Follow-up for patients not achieving adequacy targets is typically started at consultant clinics. The review team expressed concern that this system could lead to potential delays in initiation of changes to treatment.

While the trend in the rate of peritonitis is variable, the review team commended the efforts made by nursing staff to support patients at risk of peritonitis through the home visit programme.

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## Haemoglobin in Patients on Dialysis

Audit data provided by the unit indicated that while haemoglobin targets are achieved in peritoneal dialysis patients, they are not met for haemodialysis patients. A contributing factor for this was felt to be a delay in implementation of increased erythropoietin (EPO) dose when required. Staff interviews also highlighted a lower target range for haemoglobin and the major co-morbidity of dialysis patients as contributing factors for haemoglobin targets not being met in haemodialysis patients. The review team was encouraged to note that there are plans to review the protocol to facilitate prompt treatment for patients not achieving the target. In addition, the target haemoglobin has been raised.

The review team commended the frequent and regular monitoring of iron status for all patients on dialysis. It was noted that the unit has documented when blood transfusions are given for a number of years. It was reported that plans are in place to use these data to monitor the number of patients receiving blood transfusions in the future.

## Dialysis Access

Audit data provided by the unit indicated that the percentage of patients having permanent dialysis access available at their first dialysis is within the essential limit set by the standard. However, in discussions with staff it was indicated that this percentage is decreasing. Concerns were expressed about a slight deterioration in the service due to the limited number of dedicated theatre sessions for the dialysis patient population, which, if not addressed, will make the standard difficult to meet in the future.

A particular challenge to the Trust is the provision of in-patient beds. Concerns were expressed that patients may not be able to be admitted for vascular access due to a lack of beds, resulting in cancelled operations and an increase in the waiting time for access surgery. The review team noted that this issue impacts on the percentage of patients having permanent access at the first dialysis. While some access procedures may be cancelled at short notice for medical reasons, an appropriate degree of priority is given to urgent vascular access surgery. It was reported that the renal unit is considering ways of reducing the cancellation rate.

The review team noted that the majority of patients have arteriovenous fistulae or vein graft as their permanent haemodialysis access.

## Nutritional Status

The review team commended the comprehensive system of regular dietary assessment, monitoring and review of all patients receiving dialysis or with low creatinine clearance. All patients are assessed at least 6-monthly to identify those at risk of malnutrition. Nutritional goals are set, documented and monitored in accordance with Renal Nutritional Group Standards for all patients identified as 'at risk'. If patients cannot achieve nutritional goals, they are reviewed 2-3-monthly by the dietician.

## Drug Therapy

Protocols are in place for all the areas required and staff demonstrated good awareness of these.

### Example of a local initiative

Drug protocols are continuously available on the Proton database to all members of staff. These protocols are updated regularly.

All in-patient prescriptions are reviewed by the pharmacist, with medical staff routinely reviewing all other patients' prescriptions. Information and advice about drugs is available to healthcare professionals, although it was reported that access to this service is limited due to resource issues. While patients are provided with information about their drugs from medical and nursing staff, there is evidence to suggest that dissemination of this information could be improved.

A challenge to the Trust is the adequate provision of pharmacy staffing for all renal patients. Although there is a designated renal pharmacist, only part-time cover is provided. Concerns were raised that the service is not adequately covered all of the time, particularly during holidays and sick leave.

## Access to Multidisciplinary Team

It was reported that there is good access to most members of the multidisciplinary team. However, the review team noted that there is no designated social worker for renal patients following the end of funding provided by the British Kidney Patients' Association (BKPA). Concerns were expressed about continued funding for the

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occupational therapist. Staff demonstrated good awareness of the services available and referral procedures, with the exception of counselling for patients.

There is no routine multidisciplinary review of dialysis patients involving all the professionals detailed in the standard.

### **Assessment for Transplantation**

There is an effective computerised system in place to ensure prompt assessment of all patients within 3 months of the start of dialysis. All patients are reviewed 6-monthly thereafter for their suitability for transplantation.

Patients referred to the Western Infirmary, Glasgow for transplantation are seen by both a nephrologist and a surgeon, with decisions regarding the patients' assessment being communicated in writing to all relevant parties. However, the review team did not have sufficient evidence to assess whether patients on the waiting list are advised of the outcome of their annual review at the Western Infirmary.

The review team found that Type 1 diabetic patients with renal failure are not routinely considered for combined pancreas and kidney transplantation, and identified this as a challenge for the Trust.

### **Out-patients**

Audit data provided by the Trust indicated that the essential limits for time between referral and appointment, as detailed in this standard, are not met for new patients being seen following referral. However, all urgent cases are seen within 2 weeks of referral.

It is recognised that there are delays in sending out clinic letters to the GP. An overstretched secretarial service was highlighted as a contributing factor for this.

Changes in medication are communicated to the GP via the patient using a computer printout at Glasgow Royal Infirmary and Falkirk & District Royal Infirmary, and a written note at Stobhill Hospital, Glasgow. However, concerns were expressed over the system used to document and communicate changes in medication or discontinued drugs to the GP. It was felt that there is a potential for error due to GPs receiving incomplete or unclear instructions with regard to medicines.

### Provision of Patient Information

A wide variety of patient information is available in different formats. There is comprehensive provision of this information to patients, with good documentation of what has been provided to individuals and when.

There is a dedicated pre-dialysis clinic, at which treatment options may be discussed with patients. However, the review team received conflicting information as to whether all treatment options are routinely discussed with all patients. When treatment options are discussed, the review team concluded that both patients, and carers where appropriate, are involved in decisions about treatment and changes in treatment.

### Transportation for Haemodialysis

Although the review team commended the results of the audit data provided by the unit in relation to this standard, it was noted these results were not in line with staff or patient perception of transportation for haemodialysis.

#### Example of a local initiative

The review team commended the use of cars for patients on the twilight dialysis shift. These cars are driven by ambulance drivers.

A challenge to the Trust is the provision of comfortable areas for patients to wait for hospital transportation. The current facilities in some areas were considered to be inadequate.

### Audit: Information/Data Collection

The review team commended the good links that exist between the unit and the Scottish Renal Registry, which is based in the same hospital. Computerised systems are in place to ensure the continuous collection of the Scottish Renal Registry core data set. The unit also takes part in comparative audits of dialysis and transplantation through the Scottish Renal Registry.

### 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).

##### Glasgow Royal Infirmary Renal Unit

##### 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 demonstrated that this criterion is met. The review team commended the high level of achievement of adequacy targets, and the individualised care provided to patients. At Glasgow Royal Infirmary, adequacy is initially monitored monthly for all patients. If a patient meets the target adequacy over a 4-month period, monitoring is reduced to 2-monthly. Patients who do not meet the target over 4 months continue to be monitored monthly. Adequacy is monitored monthly at Stobhill Hospital, Glasgow, and Falkirk & District Royal Infirmary satellite units.  
**Met**

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 in nursing notes. A comprehensive nurse-led system is in place to ensure appropriate action is taken for patients not meeting the target. Staff demonstrated good awareness of the local follow-up protocol.  
**Met**

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

**STATUS:** All haemodialysis patients are offered and receive dialysis thrice-weekly.  
**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 monthly and meets Renal Association targets for microbial count.  
**Met**

The review team was pleased to note that endotoxin count is also measured at the Falkirk and District Royal Infirmary Satellite Unit.

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 review team confirmed that the percentage of patients achieving the Renal Association standards for pre-dialysis potassium, phosphate and calcium is calculated 2-monthly at Glasgow Royal Infirmary and monthly at Stobhill Hospital and Falkirk & District Royal Infirmary. For patients at Glasgow Royal Infirmary who do not achieve the targets, results are monitored monthly.  
**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.

### Glasgow Royal Infirmary Renal Unit

#### 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/1.73m<sup>2</sup> 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. The review team commended the systems in place for monitoring peritoneal dialysis adequacy 6-monthly. Results are gathered using a computerised database, facilitating regular monitoring of results.  
**Met**

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 recorded in the clinical history record, with appropriate action taken. Changes to treatment are typically instigated when patients attend their next consultant clinic. The review team expressed concern that this practice could lead to potential delays in the implementation of changes to treatment.  
**Met**

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 the percentage of patients achieving the Renal Association standards for potassium, phosphate and calcium is calculated every 6-12 weeks.  
**Met**

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

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

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

**STATUS:** Audit data provided by the unit demonstrated that this criterion is met by a small margin. The review team commended the efforts of nursing staff to support patients at risk of peritonitis on home visits. It was reported that good links exist between the unit and primary care.  
**Met**

## 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.

Glasgow Royal Infirmary Renal Unit

### 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 whilst this criterion is met for peritoneal dialysis patients, it is not met for haemodialysis patients. The review team concluded that a contributing factor for this is a delay in the implementation of increased erythropoietin (EPO) dose when required. Staff interviews also highlighted a lower target haemoglobin range and the major co-morbidity of dialysis patients as major contributing factors for this criterion not being met in haemodialysis patients. The review team was pleased to note that the protocol for the management of EPO is being reviewed. The target range for haemoglobin has also been increased from 10-12g/dl to 10.5-12.5g/dl in an attempt to facilitate patients achieving the target.

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 nursing notes by the named nurse, with appropriate action being taken.

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

**STATUS:**  
**Met**

Iron status is monitored monthly for hospital haemodialysis patients and 2-3-monthly for patients dialysing at home.

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

**STATUS:**  
**Not met**

Blood transfusions are documented on the Proton computer system at Glasgow Royal Infirmary and Falkirk & District Royal Infirmary; manual records are kept at Stobhill Hospital. Staff interviews confirmed that while the number of patients receiving blood transfusions is not currently monitored, plans are in place to enable monitoring of this information in the future. The review team also noted that the unit has a policy of restricting the number of blood transfusions where possible, and actively avoiding transfusion for all patients on the transplant list.

## Standard 4 - Clinical Management/Treatment 4: Dialysis Access

All people requiring dialysis have timely surgery for access.

### Glasgow Royal Infirmary Renal Unit

#### 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:** Audit data provided by the unit demonstrated that this criterion is met.  
**Met** However, the review team expressed concern that the percentage of patients having permanent access at the first dialysis appears to be decreasing. A contributing factor for this was felt to be a lack of dedicated theatre time. Staff interviews also highlighted an issue with in-patient beds, which can result in beds not being available on admission for patients requiring dialysis access, and therefore cancelled operations.

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

**STATUS:** Reasons for patients not having permanent access available at their first dialysis  
**Met** are documented in nursing notes and highlighted at weekly meetings.

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

**STATUS:** The review team confirmed that there are not adequate dedicated theatre  
**Not met** sessions for the patient population. There is currently one dedicated theatre session per week, with renal patients having access to theatre lists on 2 further days. It was noted that plans are in place to offer some increased capacity for renal patients from August 2002, when another consultant will take up post. It was reported that there are occasions when vascular access surgery may be cancelled at short notice. A shortage of theatre sessions and in-patient beds was identified as a contributing factor for this. It was also noted that while some cancellations are also due to medical reasons, an appropriate degree of priority is given to urgent vascular access surgery.

#### Desirable Criteria

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

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

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

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

### Glasgow Royal Infirmary Renal Unit

#### Essential Criteria

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

**STATUS:** All patients are assessed at least 6-monthly to identify those at risk of malnutrition. While methods of assessment vary across the sites, all are recognised methods of assessment.  
**Met**

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

**STATUS:** The review team confirmed that all patients identified as at risk have nutritional goals set, documented and monitored in accordance with Renal Nutritional Group Standards. It was reported that dietetic staff have inadequate access to the computer system at Stobhill Hospital, Glasgow, where nutritional goals are recorded. However, the review team was pleased to note the planned refurbishment to the renal unit at this site, which it is hoped will address the issue of computer access. Refurbishment is planned to begin in August 2002.  
**Met**

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

**STATUS:** Reasons why patients identified as at risk do not achieve nutritional goals are documented by the dietician. Patients are reviewed every 8-12 weeks by the dietician with appropriate action taken.  
**Met**

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

**STATUS:** There is a designated dietician with a recognised postgraduate qualification and/or renal experience in each of the three sites.  
**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:** Staff interviews confirmed that baseline anthropometry is documented for all patients at the beginning of dietetic treatment at Glasgow Royal Infirmary and Falkirk & District Royal Infirmary. Plans are in place to expand this to pre-dialysis patients. However, the review team was unable to clarify whether anthropometry is carried out and documented for all patients at the start of dietetic treatment at Stobhill Hospital.  
**Not met (insufficient evidence)**

## 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.

### Glasgow Royal Infirmary Renal Unit

#### Essential Criteria

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

**STATUS:** Protocols are in place for the management of anaemia, treatment of peritonitis and immunisation for hepatitis B. These are easily accessible by all members of staff using the computerised database, and are updated as required. Staff showed a good awareness of these protocols.  
**Met**

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:** Glasgow Royal Infirmary is not a transplant unit. The follow-up of all transplant patients is undertaken at the Western Infirmary, Glasgow.  
**Not applicable**

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

**STATUS:** In-patient prescriptions are reviewed by the pharmacist. All other patients' prescriptions are reviewed by medical staff. The review team raised concerns about the system for documentation of changes in patients' medication to the GP (see 11.3 for details).  
**Met**

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:** Staff interviews confirmed that information and advice about the use of drugs in chronic renal failure or in dialysis patients is available via the drug information service. However, it was reported that access to this service is limited at times. Advice to patients is provided by medical and nursing staff, although there was evidence to suggest that dissemination of this information could be improved.  
**Met**

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

**STATUS:** There is a designated renal pharmacist who provides part-time cover. However, concerns were raised over the varying level of cover provided across the three sites. It was also noted that no cover is provided for holiday or sick leave.  
**Met**

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

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

### Glasgow Royal Infirmary Renal Unit

#### 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:**  
**Not met**

It was reported that patients are referred to most of these services when required. It was noted that while there is access to a social worker, there is currently no designated social worker for renal patients. This resource was previously funded by the British Kidney Patients' Association (BKPA) for 2 years. The occupational therapist post is currently funded by the BKPA, and there are concerns over continued funding in the future. With the exception of the counselling service, there appeared to be a good awareness among staff as to the services available and referral procedures.

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

**STATUS:**  
**Not met**

The review team confirmed that dialysis patients are not routinely reviewed by a multidisciplinary team. At Glasgow Royal Infirmary and Stobhill Hospital patients are reviewed by medical and nursing staff, with reference to dietetics and pharmacy when required. At Falkirk & District Royal Infirmary there is a nurse-led service and patients are reviewed monthly by nursing staff, the dietician and pharmacist. The consultant covering this satellite unit also performs a weekly clinic to review patients dialysed at this unit.

## Standard 8 - Transplantation 1: Assessment for Transplantation

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

### Glasgow Royal Infirmary Renal Unit

#### 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:** There is a comprehensive computerised system in place to ensure that all patients are assessed for transplantation within 3 months of dialysis.  
**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, Glasgow.  
**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 Western Infirmary Transplant Unit, Glasgow, are communicated by letter to the patient, the GP and, where appropriate, the carer. A copy of the letter is sent to Glasgow Royal Infirmary Renal Unit for reference.  
**Met**

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

**STATUS:** Staff interviews confirmed that all patients on dialysis are reviewed 6-monthly for their suitability for transplantation by a nephrologist.  
**Met**

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

**STATUS:** The information provided in response to this criterion was unclear and therefore the team concluded that this criterion was not assessable given the available evidence.  
**Not met (insufficient evidence)**

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 and reviewed monthly. This information is calculated using the Proton computer system and can be accessed by staff when required.  
**Met**

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

**STATUS:** Glasgow Royal Infirmary 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:** Type 1 diabetic patients with renal failure are considered for combined pancreas and kidney transplant. Those patients who then wish to consider this form of transplant are referred to the Royal Infirmary of Edinburgh Transplant Unit.  
**Met**

## 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.

### Glasgow Royal Infirmary Renal Unit

#### Essential Criteria

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

STATUS: Glasgow Royal Infirmary is not a transplant unit.

**Not applicable**

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

STATUS: Glasgow Royal Infirmary is not a transplant unit.

**Not applicable**

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

STATUS: Glasgow Royal Infirmary 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: Glasgow Royal Infirmary 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: Glasgow Royal Infirmary 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: Glasgow Royal Infirmary 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.

**Glasgow Royal Infirmary Renal Unit****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: Glasgow Royal Infirmary 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: Glasgow Royal Infirmary 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.

### Glasgow Royal Infirmary Renal Unit

#### Essential Criteria

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

**STATUS:** Audit data provided by the unit demonstrated that this criterion is not met.  
**Not met** However, the review team noted that all referrals are prioritised, with urgent cases being seen within 2 weeks of referral.

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

**STATUS:** Audit data provided by the unit demonstrated that this criterion is not met.  
**Not met** Limited secretarial support was highlighted as a contributing reason for this.

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

**STATUS:** Changes in medication are communicated to the GP via the patient using a computer printout at Glasgow Royal Infirmary and Falkirk and District Royal Infirmary, and a written note at Stobhill Hospital. The review team raised concerns over the documentation and communication of changes in medication or discontinued drugs to the GP. There was evidence to suggest there is a potential for error due to GPs receiving incomplete or unclear instructions with regard to medicines.  
**Met**

## 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.

### Glasgow Royal Infirmary Renal Unit

#### 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:** Met  
 Staff interviews confirmed that nursing staff routinely provide patients diagnosed with chronic renal failure, and carers where appropriate, with a range of verbal and written information. Videos are also shown to patients. Translator services are available when required. The renal unit computer database contains guideline documents and patient information leaflets. Access is also available to relevant websites. Information is provided in an organised and timely way, and reinforced when necessary. Information provided to patients is recorded in nursing notes and on the Proton computer system.

- 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:** Not met (insufficient evidence)  
 The information provided in response to this criterion was unclear and therefore the review team concluded that this criterion was not assessable given the available information.

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

**STATUS:** Met  
 The review team confirmed that where there is discussion about treatment and changes to treatment, patients, and carers where appropriate, are involved in all decisions.

#### Desirable Criteria

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

**STATUS:** Not met  
 There is no designated pre-dialysis nurse specialist.

## Standard 13 - Patient Focus 3: Transportation for Haemodialysis

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

### Glasgow Royal Infirmary Renal Unit

#### 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.  
**Met** However, the review team noted that the results of the survey carried out were not in line with staff or patient perception. It was reported that the car system that is in use for the twilight dialysis shift is excellent.

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 the vast majority of patients begin dialysis with half an hour of appointment time, but not all begin within 1 hour.  
**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 the vast majority of patients using hospital transportation are collected within half an hour of the end of dialysis, and almost all patients are collected within 1 hour.  
**Not met**

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

**STATUS:** Staff interviews confirmed that reasons for delays of more than 1 hour are documented.  
**Met**

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

**STATUS:** It was reported that the surroundings for patients who wait for hospital transportation are not considered to be comfortable at any of the three sites. At Glasgow Royal Infirmary patients typically opt to wait in the corridor. The waiting area at Falkirk & District Royal Infirmary has insufficient space for all patients. The review team was pleased to note that plans are in place to refurbish facilities at Stobhill Hospital.  
**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 they did not have sufficient information to make an assessment of performance against this criterion.  
**Not met (insufficient evidence)**

## Standard 14 - Audit: Information/Data Collection

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

### Glasgow Royal Infirmary Renal Unit

#### Essential Criteria

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

**STATUS:** The review team confirmed that there are well-organised computerised information systems in place for continuous collection of the Scottish Renal Registry core data set.  
**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 review team confirmed that this criterion is met.  
**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 all these data are collected routinely to facilitate regular audit. However, it was noted that home haemodialysis adequacy data are collected 3-6-monthly, which is outwith the essential limits set by the criterion.  
**Not met**

#### Desirable Criteria

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

**STATUS:** The review team confirmed that this criterion is met.  
**Met**

# 1 Appendix — Glossary of Abbreviations

## Abbreviation

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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

## Details of Review Visit

The review visit to Glasgow Royal Infirmary Renal Unit, North Glasgow University Hospitals NHS Trust was conducted on 26 June 2002. The review team members for this visit were:

**Mr Murat Akyol (Team Leader)**

Consultant Surgeon, Lothian University Hospitals NHS Trust

**Mr Jim Dunleavy**

Renal Pharmacist, Lanarkshire Acute Hospitals NHS Trust

**Mrs Marjorie Gaughan**

Specialist in Public Health, NHS Ayrshire & Arran

**Mr Ken Graham**

Consultant Nephrologist, Shetland NHS Board

**Mr William Hoare**

Lay Representative, Tayside

**Mrs Elaine Nicol**

Clinical Nurse Facilitator – Renal Services, Grampian University Hospitals NHS Trust

**Mr Brian Phillips**

Lay Representative, Fife

**Dr Robin Winney**

Consultant Renal Physician, Lothian 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

## 3 Appendix — Adult Renal Services Project Group

**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

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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.

## 4 Appendix — Timetable of Visits

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