



*National Institute for
Clinical Excellence*

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**Guidance on
home compared
with hospital
haemodialysis
for patients with
end-stage
renal failure**

Technology Appraisal No. 48

Guidance on home compared with hospital haemodialysis for patients with end-stage renal failure

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Copies of this guidance can be obtained from the NHS Response Line by telephoning 0870 1555 455 and quoting ref: N0160. A patient version of this document can be obtained by quoting ref: N0162. A bi-lingual patient leaflet is also available, ref: N0163.

Distribution of guidance

This document has been circulated to the following:

- PCT Chief Executives
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- Local Health Group General Managers
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- NHS Clinical Governance Support Team
- Chief Medical, Nursing Officers and Pharmaceutical Officers in England and Wales
- Medical Director & Head of NHS Quality – Welsh Assembly Government
- Representative bodies for health services, professional organisations and statutory bodies, Royal Colleges

This guidance is written in the following context:

This guidance represents the view of the Institute which was arrived at after careful consideration of the available evidence. Health professionals are expected to take it fully into account when exercising their clinical judgement. This guidance does not, however, override the individual responsibility of health professionals to make appropriate decisions in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

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Guidance on home compared with hospital haemodialysis for patients with end-stage renal failure

This section (Section 1) constitutes the Institute's guidance on home compared with hospital haemodialysis for patients with end-stage renal failure. The remainder of the document is structured in the following way:

- 2 Clinical need and practice
- 3 The technology
- 4 Evidence and interpretation
- 5 Further research
- 6 Resource impact for the NHS
- 7 Implementation and audit
- 8 Related guidance
9. Review of guidance

- Appendix A: Appraisal Committee
Appendix B: Sources of evidence
Appendix C: Information for patients
Appendix D: Detail and criteria for audit

A bi-lingual summary is available from our website at www.nice.org.uk or by telephoning 0870 1555 455 and quoting the reference number N0161.

Mae crynodeb ar gael yn Gymraeg ac yn Saesneg ar ein gwefan yn www.nice.org.uk neu drwy ffonio 0870 1555 455 gan ddyfynnu cyfeirnod N0161.

1. Guidance

This document provides guidance on the location in which haemodialysis is carried out; it does not address the wider issues of frequency of dialysis sessions and how haemodialysis compares with other forms of renal replacement therapy. These recommendations are applicable only to those patients who, after detailed assessment of all their treatment options, have been defined as being suitable for haemodialysis.

- 1.1 It is recommended that all suitable patients should be offered the choice between home haemodialysis or haemodialysis in a hospital/satellite unit.
- 1.2 In general, patients suitable for home haemodialysis will be those who:
 - have the ability and motivation to learn to carry out the process and the commitment to maintain treatment
 - are stable on dialysis
 - are free of complications and significant concomitant disease that would render home haemodialysis unsuitable or unsafe
 - have good functioning vascular access
 - have a carer who has (or carers who have) also made an informed decision to assist with the haemodialysis unless the individual is able to manage on his or her own
 - have suitable space and facilities or an area that could be adapted within their home environment.
- 1.3 A full assessment of the patient's clinical needs, social circumstances and home environment is necessary to determine his or her suitability for home haemodialysis. In order to make an informed choice about the location of haemodialysis that is most suitable for their particular circumstances, patients and all potential carers should be fully informed regarding what is involved in the different options, and the potential impact on their lives and those of their households should be discussed. All potential carer(s) should be given the opportunity to express their views independently of the patient. An opportunity to review the decision to proceed or continue with home haemodialysis should be available in the event of any change in circumstances.
- 1.4 Patients currently treated in hospital who are potentially suitable for home haemodialysis on clinical grounds, but who have not previously been offered a choice, should be reassessed and informed about their dialysis options.
- 1.5 Patients performing haemodialysis at home and their carers will require initial training and an accessible and responsive support service. The support service should offer the possibility of respite hospital/satellite unit dialysis as required.

- 2.1 End-stage renal failure (ESRF) is the result of progressive disease of the kidneys leading to irreversible loss of function. Patients with ESRF are likely to experience clinical symptoms as a result of the retention of waste products and toxins, and also as a result of anaemia, hypertension, oedema and acidosis. When renal function reaches the point where the kidneys are deemed to be unable to support life in the longer term, renal replacement therapy (RRT) is required.
- 2.2 A number of different options for RRT exist and many patients with ESRF switch between these options at different periods during their disease. Kidney transplantation is the treatment of choice for many patients. However, as over 30% of patients are not suitable for transplantation, and as the supply of donor organs is limited, around half of RRT patients receive either peritoneal dialysis (17% of RRT patients) or haemodialysis (36% of RRT patients).
- 2.3 Haemodialysis can be carried out in hospital, a satellite unit or the patient's home (see Section 3.2). Hospitals and satellite units are the most common sites for treatment, particularly for patients in older age groups. Only 2% of RRT patients currently receive haemodialysis at home. The availability of home dialysis varies widely across England and Wales.
- 2.4 In 2000, an estimated 5350 patients in England and Wales started some form of RRT (derived from an estimated annual rate of 89 per million of the population), and the total number of patients on dialysis increased by 5%. Across different health authorities, the numbers of people receiving dialysis varied from 329 to 693 per million of the population. Afro-Caribbeans and Asians from the Indian subcontinent have a higher incidence of renal failure and are three to four times more likely to be treated for ESRF.
- 2.5 At the end of 2000, the median age of patients starting RRT in the UK was 63 years and the median age of the total population of patients receiving RRT was 54 years. Of dialysis patients, 28% were aged over 65 years and 10% were over 75 years.
- 2.6 Without treatment, ESRF is fatal. With treatment, the 1-year-survival figures for newly diagnosed patients under 65 years and those aged 65 and above are 86% and 66%, respectively. Timely patient referral so that management in the pre-dialysis phase can be optimised, including planning of vascular access, can improve patient outcomes.
- 2.7 The need for long-term dialysis has significant consequences for patients and their households. Major changes to a patient's lifestyle are necessary to accommodate treatment, which may have an impact on his or her ability to work or attend school or college. Patients suffer physical as well as psychological symptoms – lassitude, fatigue and decreased appetite are common.

- 2.8 In general, patients receiving home haemodialysis report better quality of life than those who have haemodialysis in hospital. Home haemodialysis offers a number of potential advantages, for some patients, over hospital dialysis. Patients do not have to travel to hospital or wait for treatment once there. There is also more flexibility at home to tailor the dialysis regimen by changing the timing or length of sessions making it easier for patients to lead a normal life and also to be employed. In recent years there has been interest in changing the dialysis prescription from the standard 4 hours given 3 times per week to alternative prescriptions such as short daily dialysis. These regimens may be easier to follow in the home rather than in the hospital or satellite setting.
- 2.9 By contrast, some home haemodialysis patients and their carers find the responsibility of carrying out the procedure and dealing with any potential problems to be very stressful and they can feel isolated from hospital support staff. Furthermore, home haemodialysis can place a considerable long-term burden on carers both emotionally and financially if they are prevented from working. The presence of dialysis equipment in the house can be a constant reminder to everyone of the patient's illness.

3

The technology

- 3.1 Haemodialysis is a method of removing waste products from the body. The patient is connected to a dialysis machine containing a semi-permeable membrane. The patient's blood is passed into the machine and excess salts and water in the blood pass across the semi-permeable membrane into dialysis fluid. The waste products are retained within the dialysis fluid. A number of different types of haemodialysis machine are currently available. The process can also vary depending on the use of different equipment, dialysis fluids and the frequency and duration of sessions. The most usual haemodialysis prescription is for 4 hours given three times per week.
- 3.2 Haemodialysis can be undertaken in the following settings.
- Hospitals – these are usually specialist units. A renal physician and a team of specialised nursing staff are on call at all times.
 - Satellite units – these centres tend to be in smaller district general hospitals and have a reduced level of medical cover compared with specialist units. Satellite units are always linked to specialist units.
 - Patients' homes – the same equipment and consumables are used in the home as are used for hospital haemodialysis.
- 3.3 Home haemodialysis is associated with the same potential complications as hospital haemodialysis, such as low blood pressure, air embolus or blood loss.

The Appraisal Committee considered evidence from a number of sources (see Appendix B).

4.1 Clinical effectiveness

- 4.1.1 The systematic review prepared by the Assessment Group identified 27 published studies that met the criteria for inclusion in the effectiveness analysis: four systematic reviews, one randomised crossover trial and 22 comparative observational studies. The overall mean score for the quality of the primary studies was low because of the difficulty in conducting randomised controlled trials in this area. In most studies there was a selection bias, with those patients who were healthiest and most able being selected for home haemodialysis.
- 4.1.2 Of the 23 primary studies identified, the majority were pre-1990 and only two were undertaken in the UK setting. In addition, most studies either did not compare the same duration and frequency of dialysis prescription in the home and hospital settings or did not state the prescription(s) that was compared.
- 4.1.3 The outcomes during haemodialysis considered in the assessment report were: mortality, quality of life, hospitalisation rate, measures of anaemia, erythropoietin use, biochemical indices of renal disease, dialysis adequacy, blood pressure, adverse events, technique failure, access failure, employment and school status. The Assessment Group concluded that, despite the difficulties with the evidence base and with people receiving home haemodialysis being a highly selected group, in general, the outcome results in the studies were more favourable for the groups receiving haemodialysis at home compared with those receiving haemodialysis in a hospital setting.
- 4.1.4 The submissions from the manufacturers also reported a number of published studies in large patient populations comparing patient survival in groups receiving haemodialysis at home with that in groups receiving haemodialysis in hospitals/satellite units. Although there was a clear selection bias in these studies, the reports that tried to take account of confounding factors such as age, sex, race and co-morbidities still found survival benefits for home over hospital haemodialysis. An additional factor that might have contributed to the reported improved outcomes of home-based patients is that some of the patients might have undertaken more frequent dialysis than is the norm in hospital-based settings. The manufacturers concluded that patients selected for home haemodialysis did better than those selected for hospital-based dialysis.

4.2 Cost effectiveness

- 4.2.1 The assessment report identified, from a range of countries, 18 studies that considered costs and outcomes. Virtually all the evidence indicated that the annual cost of home dialysis was less than that of hospital dialysis. The reported costs associated with haemodialysis in a satellite unit varied considerably, depending on staffing and the ability to maximise the use of the dialysis equipment. In general, though, satellite haemodialysis was found to cost more than home haemodialysis. Despite initial higher costs of home haemodialysis due to set-up and training, the payback period for these costs had been estimated on average as 14 months; however, this estimate came from the early 1990s, and the exact cost advantage was difficult to determine because of patient selection bias. Most studies found patient survival to be at least equal or better for home haemodialysis compared with hospital dialysis. Lifetime treatment costs for an identical group of patients will be higher for home haemodialysis if the treatment is beneficial and leads to longer survival.
- 4.2.2 The Assessment Group's model compared the cost effectiveness of home haemodialysis with haemodialysis in hospital and in a satellite unit. Additional analyses looked at increasing the frequency and duration of home haemodialysis compared with the standard frequency of three sessions per week provided in hospital. A subgroup analysis was also provided for adults at high, moderate and low risk of death (defined by age and presence of diabetes).
- 4.2.3 In all the Assessment Group analyses looking at three-times-weekly dialysis, the annual cost of home haemodialysis was always less than haemodialysis in a satellite unit or hospital. The estimated total cost to the NHS per year in the base case of the model was £19,300 for home haemodialysis compared with £21,000 and £22,000 for haemodialysis in a satellite unit and hospital, respectively. This was based on costs for access surgery, equipment, system set-up, buildings, staff, consumables for three sessions per week and costs of dialysis complications. Home haemodialysis was associated with increased costs: an initial training cost; higher equipment costs because the patient is the sole user of the machine; and costs for water treatment and machine maintenance. An average cost of home conversion at £1291 per year over 4 years was also included in the analyses. These increased costs were more than offset by: the costs of medical and nursing staff in hospitals/satellite units; the lower number of

days in hospital resulting from complications arising between dialysis sessions; and the lower cost associated with complications that arise during dialysis.

- 4.2.4 The base case of the Assessment Group model indicated that for younger patients (aged under 50 years) in whom a survival and a quality-of-life benefit was assumed, over a 5-year time horizon, home haemodialysis was cost saving compared with hospital haemodialysis. However, when home haemodialysis was compared with satellite haemodialysis there was a smaller difference in costs and benefits – the incremental cost per quality-adjusted life year for home haemodialysis compared with satellite haemodialysis was £1960 at 5 years. In this analysis, patients on home haemodialysis accrued higher total dialysis costs because of the assumption of a survival advantage at home. If no survival advantage was assumed, then home haemodialysis was cost saving compared with satellite haemodialysis.
- 4.2.5 The Assessment Group indicated that the net financial impact on patients and their households depends on individual circumstances, such as whether the patient and carer are available for work and allowances received. The time commitment for the carer can be substantial.
- 4.2.6 One of the manufacturers submitted a model for consideration. The model focused on the costs and consequences of an ‘ideal integrated care pathway’ and thus did not directly address the question of the cost effectiveness of home versus hospital haemodialysis.

4.3 Consideration of the evidence

- 4.3.1 The Committee reviewed the evidence on both the clinical effectiveness and the cost effectiveness of home versus hospital haemodialysis, having considered evidence from people who have received various forms of renal replacement therapy, those who represent them, and clinical experts, on the nature of the condition. It was also mindful of the need to ensure that its advice took account of the efficient use of NHS resources.
- 4.3.2 The Committee considered that, because of the selection bias of studies and the difficulty of conducting randomised controlled trials to compare home with hospital haemodialysis, there was no robust evidence to support the superior effectiveness of home haemodialysis. However, the Committee recognised that the evidence suggested that home haemodialysis was at least as clinically effective as hospital haemodialysis.

- 4.3.3 The Committee noted that the apparent advantages of home haemodialysis in some studies might also, in part, be related to the occurrence of more frequent dialysis in the home setting. The Committee heard that although there was no definitive study showing that increased frequency of dialysis sessions improved survival, there was evidence of improvement in markers of cardiovascular disease and a reduction in the use of some healthcare resources.
- 4.3.4 The Committee considered carefully the costs included in the Assessment Group's model. The Committee considered that costs may have been underestimated in general. Other estimates based on 1994 Department of Health National Renal Review data found annual costs for home and hospital dialysis were £23,600 and £29,140, respectively. Allowing for inflation, it was thought that present-day costs would be higher still and that the difference between the costs associated with home and hospital haemodialysis was likely to be even greater, in favour of the home setting, than that expressed in the assessment report. It was also noted that satellite unit costs in particular vary widely depending on how units are structured and the type and size of community served.
- 4.3.5 The Committee heard from the experts and patients attending the meeting and in submissions from patients and carers regarding the complexity of social factors that can contribute to the decision about a patient's suitability for home haemodialysis. It was emphasised that informed choice by both patient and carer(s) was essential and that the impact on the patient's household must also be considered carefully. Although the majority of patients had a carer (or carers) at home to assist with dialysis, this was not always the case. Home haemodialysis remained an option in the absence of a carer, but an individual's suitability would depend on the confidence and competence of the patient to carry out the process alone.
- 4.3.6 The Committee accepted that maximising the use of home dialysis for appropriately selected patients might enable hospital and satellite units to better target their resources to those patients for whom home haemodialysis is unsuitable. Expansion of the home haemodialysis service could require initial re-organisation and resources. In addition, haemodialysis at home should not be seen as a single choice for any individual, but as one option in the pathway of care for patients in ESRF.

5

Further research

5.1 There are ongoing studies investigating the effectiveness of more frequent haemodialysis regimens. If more frequent dialysis is demonstrated to improve effectiveness and becomes accepted practice, then further research to look at the applicability of these results for home compared with hospital haemodialysis may be necessary.

6

Resource impact for the NHS

6.1 Approximately 2% of NHS budgets are currently consumed by the treatment of ESRF patients.

6.2 The numbers of patients requiring RRT are predicted to continue rising. Since home haemodialysis is at least as effective as and less costly than hospital or satellite unit haemodialysis, increasing the numbers of patients treated at home would enable more patients to be treated with a smaller increase in budget. In addition, maximising the numbers of patients able to undertake home haemodialysis would enable hospital haemodialysis resources to be used for those patients for whom no other options are available.

6.3 The majority of renal units in England and Wales already provide some level of home haemodialysis service. However, data from the 2001 UK Renal Registry show that there is wide variation between centres in the numbers of patients on home dialysis with a small number of centres having up to 15% of all their dialysis patients receiving home haemodialysis. However, making the assumption that 10% to 15% of dialysis patients, given the choice, would opt for home haemodialysis, expansion of the services to support home haemodialysis will be required.

6.4 A complete service to support home haemodialysis will include an assessment team that ascertains the most appropriate form of treatment from both a clinical and a social perspective, initial training for both patient and carer(s) and ongoing technical and medical support.

6.5 Links between renal units may need to be established so that where a particular unit does not offer its own home haemodialysis service it can refer patients to a neighbouring unit that does provide the service.

7

Implementation and audit

7.1 NHS Trusts currently offering haemodialysis for patients with ESRF and all clinicians involved in the care of these patients should review policies and practices regarding offering home haemodialysis to take account of the guidance set out in Section 1.

7.2 Local guidelines or care pathways on haemodialysis should incorporate the guidance in Section 1.

7.3 To measure compliance locally with the guidance, the following criteria may be used. Further details on suggestions for audit are presented in Appendix D.

- 7.3.1 A patient who needs haemodialysis or one who is currently on haemodialysis in a hospital or satellite centre, and who is potentially suitable for home haemodialysis on clinical grounds, but has not previously been offered that choice, is assessed for suitability for home haemodialysis.
- 7.3.2 A patient selected for or currently receiving haemodialysis in a hospital or satellite unit is offered the option of home haemodialysis when the following are present. The patient:
- has the ability and motivation to learn to carry out the process
 - has the commitment to maintain treatment
 - is stable on dialysis
 - is free of complications and significant concomitant disease that would render home haemodialysis unsuitable or unsafe
 - has good functioning vascular access
 - has a carer who has (or carers who have) also made an informed decision to assist with the haemodialysis unless the individual is able to manage on his or her own
 - has suitable space and facilities or an area that could be adapted within the home environment.
- 7.3.3 The patient and all potential carers make an informed choice as to the most suitable location for treatment.
- 7.3.4 An initial training programme is provided for both the patient and his or her carer(s).
- 7.3.5 The patient on home haemodialysis and his or her carers have an accessible and responsive support service.
- 7.3.6 The patient on home haemodialysis has an opportunity to review the decision to proceed or continue with home haemodialysis in the event of any change in circumstances.

8

Related guidance

- 8.1 There is no related guidance for this technology.

- 9.1 The review date for a technology appraisal refers to the month and year in which the Guidance Executive will consider any new evidence on the technology, in the form of an updated Assessment Report, and decide whether the technology should be referred to the Appraisal Committee for review.
- 9.2 It is proposed that the guidance on this technology is reviewed in August 2005.

Andrew Dillon
Chief Executive

September 2002

Appendix A

Appraisal Committee members

NOTE The Appraisal Committee is a standing advisory committee of the Institute. Its members are appointed for a 3-year term. A list of the Committee members appears below. The Appraisal Committee meets twice a month other than in December, when there are no meetings. The Committee membership is split into two branches, with the Chairman, Vice-chairman and a number of other members attending meetings of both branches. Each branch considers its own list of technologies and topics are not moved between the branches.

Committee members are asked to declare any interests in the technology to be appraised. If there is a conflict of interest, the member is excluded from participating further in that appraisal.

The minutes of each Appraisal Committee meeting, which include the names of the members who attended and their declaration of interests, are posted on the NICE website.

Dr Jane Adam

Radiologist, St George's Hospital,
London

Professor R L Akehurst

Dean, School of Health Related
Research, Sheffield University

Dr Sunil Angris

General Practitioner, Waterhouses
Medical Practice

**Professor David Barnett
(Chairman)**

Professor of Clinical Pharmacology,
University of Leicester

Dr Sheila Bird

MRC Biostatistics Unit, Cambridge

Professor Carol Black

Consultant Physician, Royal Free
Hospital & UCL, London

Professor John Brazier

Health Economist, University of
Sheffield

Professor Martin Buxton

Director of Health Economics Research
Group, Brunel University

Professor Mike Campbell

Statistician, Institute of General
Practice & Primary Care, Sheffield

Dr Karl Claxton

Health Economist, University of York

Professor Sarah Cowley

Professor of Community Practice
Development, Kings College, London

Professor Jack Dowie

Health Economist, London School of
Hygiene & Tropical Medicine, London

Mr Chris Evennett

Chief Executive, Mid-Hampshire
Primary Care Trust

Dr Paul Ewings

Statistician, Taunton & Somerset NHS
Trust

Professor Terry Feest

Clinical Director and Consultant
Nephrologist, Richard Bright Renal
Unit, and Chairman of the UK Renal
Registry

Professor Gary A Ford

Professor of Pharmacology of Old Age/
Consultant Physician, Wolfson Unit of
Clinical Pharmacology, University of
Newcastle

Mrs Sue Gallagher
Chief Executive, Merton, Sutton and
Wandsworth Health Authority

Dr Trevor Gibbs
Head, Global Clinical Safety &
Pharmacovigilance, GlaxoSmithKline

Sally Gooch
Director of Nursing, Mid-Essex
Hospital Services Trust

Mr John Goulston
Director of Finance, The Royal Free
Hampstead NHS Trust

Professor Trisha Greenhalgh
Professor of Primary Health Care,
University College London

Miss Linda Hands
Consultant Vascular Surgeon, John
Radcliffe Hospital, Oxford

Professor Philip Home
Professor of Diabetes Medicine,
University of Newcastle

Dr Terry John
General Practitioner, The Firs, London

Dr Diane Ketley
Research into Practice Programme
Leader, NHS Modernisation Agency

Dr Mayur Lakhani
General Practitioner, Highgate Surgery,
Leicester, and Lecturer, University of
Leicester

Ruth Lesirge
Lay Representative; Director, Mental
Health Foundation

Dr George Levvy
Lay Representative; Chief Executive,
Motor Neurone Disease Association

Dr Gill Morgan
CEO, North & East Devon Health
Authority

Professor Miranda Mugford
Health Economist, University of East
Anglia

Mr M Mughal
Consultant Surgeon, Lancashire
Teaching Hospitals NHS Trust

Mr James Partridge
Lay Representative; Chief Executive,
Changing Faces

Siân Richards
General Manager, Cardiff Local Health
Group

Professor Philip Routledge
Professor of Clinical Pharmacology,
University of Wales

Dr Rhiannon Rowsell
Pharmaceutical Physician, AstraZeneca
UK Ltd

Dr Stephen Saltissi
Consultant Cardiologist, Royal
Liverpool University Hospital

**Professor Andrew Stevens
(Vice-Chairman)**
Professor of Public Health, University
of Birmingham

Professor Ray Tallis
Consultant Physician, Hope Hospital,
Salford

Dr Cathryn Thomas
General Practitioner, and Senior
Lecturer, Department of Primary Care
and General Practice, University of
Birmingham

Professor Mary Watkins
Head of Institute of Health Studies,
University of Plymouth

Dr Norman Waugh
Public Health Consultant, University of
Southampton

Appendix B

Sources of evidence considered by the Committee

The following documentation and opinion were made available to the Committee:

- A. Assessment report prepared by:** University of Aberdeen and Grampian University Hospitals NHS Trust: The systematic review of the effectiveness and cost-effectiveness of home versus hospital or satellite unit haemodialysis for people with end-stage renal failure.
- B. Manufacturer/sponsor/Trade submissions:**
- Aksys Ltd
 - Baxter Healthcare Ltd
 - Fresenius Medical Care
 - EUCOMED
- C. Professional/specialist group submissions:**
- Association of Renal Industries
 - Association of Renal Technicians
 - Royal College of Physicians
 - Royal College Nursing
 - DGH Nephrology Society
 - British Renal Society
 - National Kidney Research Fund
 - Department of Health and Welsh Assembly Government
 - Health Technology Board for Scotland
 - Health Economics Research Unit & Health Services Research Unit, University of Aberdeen
- D. Patient/carer group submissions:**
- National Kidney Research Fund
 - National Kidney Federation
 - Welsh Kidney Patients Association
- E. Expert perspective:**
- Dr M Ward, Consultant Physician, Royal Victoria Infirmary, Newcastle-upon-Tyne
 - Mr Gordon Nicholas, Vice Chairman, National Kidney Federation
 - Mr Gareth Murcutt, Dialysis Technical Services Manager, Royal Free Hospital, London
 - Dr Roger Greenwood, Consultant Renal Physician, Lister Hospital, London

Appendix C

Patient information

The use of haemodialysis in the home and in hospital

The patient information in this appendix has been designed to support the production of your own information leaflets. You can download it from our website at www.nice.org.uk where it is available in English and Welsh. If you would like printed copies of the leaflets please ring the NHS Response Line on 0870 1555 455 and quote reference number N0162 for the English patient leaflet and N0163 for the bi-lingual patient leaflet.

What is NICE guidance?

The National Institute for Clinical Excellence (NICE) is part of the NHS. It produces guidance on the use of medicines, medical equipment and clinical procedures for people working in the NHS in England and Wales, and for patients and their carers.

To produce this guidance, NICE looks at how well the medicine, equipment or procedure works and also how well it works in relation to how much it costs. This process is called an appraisal. The appraisal process involves the manufacturer of the medicine or equipment for which guidance is being produced, and the organisations that represent the healthcare professionals, patients and carers who will be affected by the guidance. Each appraisal takes about 12 months to complete.

NICE was asked to look at the available evidence on haemodialysis (a treatment for kidney failure) carried out in the home and in hospital and to provide guidance that would help the NHS decide when haemodialysis should be offered in these locations.

What is kidney failure?

The kidneys are organs in the body that remove waste products and excess water from the blood. Most people have two kidneys. The waste products and excess water taken out of the blood by the kidney are carried down a tube (the 'ureter') that links the kidney to the bladder and then passed out of the body as urine.

'Kidney failure' means that the kidneys are not working (or functioning) properly. When kidney failure is very severe it's necessary to replace the kidney function. One way of doing this is to remove waste substances and excess water from the blood artificially, using a process called 'dialysis'. There are two kinds of dialysis – peritoneal dialysis and haemodialysis. Another way of restoring kidney function is kidney transplantation.

This guidance is concerned only with haemodialysis.

What is haemodialysis?

In haemodialysis the blood is filtered to remove waste products outside the body, using a haemodialysis machine, which is often called a 'kidney machine'. Blood flows out of the body down a tube into the machine where the waste products and excess water are removed and the 'clean blood' is returned to the body.

This guidance concerns haemodialysis for patients who have very severe and permanent kidney failure – doctors refer to the condition as ‘end-stage renal failure’ (‘renal’ means related to the kidneys). The haemodialysis has to be carried out regularly – usually it’s carried out 3 times a week and each session of haemodialysis takes about 4 hours.

Where can haemodialysis be carried out?

Most patients have their haemodialysis sessions in a hospital renal unit or in a satellite renal unit – that is, one that is located away from the main hospital renal unit.

But some patients have the option of having a haemodialysis machine in their own home. Home haemodialysis is not suitable for everyone and many patients may prefer to have their treatment at the renal unit. Whether a patient is able to have home haemodialysis will depend on whether he or she is clinically suitable and on other factors such as whether the home has the space and facilities needed for the haemodialysis machine and the other equipment that’s required and, perhaps, whether there’s someone who can help the patient with the dialysis and be available to deal with any emergencies. Alterations to the home, such as changes to the electricity supply or plumbing, may be needed before a haemodialysis machine can be set up. Someone who’s going to carry out haemodialysis at home – and anyone who’s going to help – has to be taught how to use the machine and what to do if problems occur.

The benefits of carrying out haemodialysis in the home rather than in hospital include not having to travel to the renal unit and more choice about when the dialysis is carried out, so there may be less disruption to normal life. On the other hand, some patients and their carers find it a strain to have the responsibility of carrying out the procedure, which can be time consuming, and dealing with any problems.

What has NICE recommended about haemodialysis in the home and in hospital?

The recommendations NICE has made concern **only** where haemodialysis is carried out (that is, in the home or in a renal unit). They do not deal with other issues concerning haemodialysis, such as how often it should be carried out, or how it compares with other ways of treating kidney failure. And these recommendations only apply to individuals who have had a detailed assessment of their treatment options and for whom haemodialysis is considered to be a suitable treatment.

NICE has made the following recommendations.

All patients who are suitable for home haemodialysis should be offered the choice of having haemodialysis in the home or in a renal unit. In general, patients who are suitable for home haemodialysis are those who:

- are able and willing to learn to carry out the procedure and to continue with the treatment
- have remained in a stable condition while on dialysis
- don’t have particular problems associated with of their kidney disease or don’t have other diseases that would make it too difficult or unsafe to carry out haemodialysis at home

- have blood vessels that are suitable for inserting the catheters (tubes) that carry the blood to and from the dialysis machine
- have a carer (or more than one carer) who has decided, after discussing all the issues, to help with the haemodialysis (this doesn't apply to patients who can carry out the haemodialysis on their own)
- have a home that already has enough space and facilities to set up and use the kidney machine, or whose home could be adapted to provide the space and facilities needed.

Before it's decided whether home haemodialysis is a suitable option for an individual, there should be a full assessment of the patient's healthcare needs and social and home circumstances. The team responsible for the patient's care should give the patient, and anyone who might be a carer, full information about what is involved in carrying out haemodialysis in the home or in a renal unit, and what impact it could have on their lives and the life of the rest of the household. Potential carers should be given the chance to tell the doctor what they think on their own, when the patient isn't there.

Patients having haemodialysis in a renal unit who haven't previously been offered the option of having home haemodialysis but who would like to consider the possibility should be reassessed, provided that their clinical condition does not rule out home haemodialysis.

Whenever it's decided to go ahead with home haemodialysis, there should be an opportunity to reconsider the decision later if there's any change in the patient's circumstances.

Patients and their carers should receive training before starting to carry out haemodialysis at home. They also need the support of a team of healthcare professionals they can contact easily and who respond rapidly. Because sometimes patients can't carry out dialysis at home as usual (for example, because the carer is ill or away from home), there should be facilities available for them to have the dialysis in a renal unit when necessary.

What should I do next?

You should discuss this guidance with your specialist if you have a kidney problem that might require treatment with haemodialysis or if you are currently having haemodialysis in a renal unit and you are interested in the possibility of having haemodialysis at home.

Will NICE review its guidance?

Yes, NICE will review this guidance in August 2005.

Further information

The NICE website (www.nice.org.uk) has further information on NICE and the full guidance issued to the NHS. The guidance can also be requested from the NHS Response Line by phoning 0870 1555 455 and quoting reference N0160.

If you have access to the Internet and would like to find out more about kidney failure and haemodialysis, please visit the NHS Direct website at www.nhsdirect.nhs.uk. If you would like to speak to NHS Direct, you can call them on 0845 46 47.

Appendix D

Detail on criteria for audit of the use of home haemodialysis for patients with end-stage renal failure

Possible objectives for an audit

An audit on access to and the appropriate use of home haemodialysis could be carried out to ensure that suitable patients who need haemodialysis or who are currently on hospital or satellite haemodialysis are offered the option of home haemodialysis and that the patients and their carers are prepared and supported in the use of this option.

Possible patients to be included in the audit

All new patients who have been selected for haemodialysis and those currently on haemodialysis in a hospital or satellite centre who have not previously been offered the option of home haemodialysis.

Measures that can be used as a basis for audit

The measures that can be used in an audit on home haemodialysis are as follows.

Criterion	Standard
1. The patient is assessed to determine suitability for home haemodialysis.	100% of patients selected for haemodialysis or who are currently haemodialysing in hospital or in a satellite unit.
2. The patient who meets the following is offered the option of home haemodialysis: <ul style="list-style-type: none"> a. has the ability and motivation to learn to carry out the process and the commitment to maintain treatment, and b. is stable on dialysis, and c. is free of complications and significant concomitant disease that would render home haemodialysis unsuitable or unsafe, and d. has good functioning vascular access, and e. has one or more carers who have also made an informed decision to assist with the haemodialysis or the patient is able to manage on his or her own, and f. has suitable space and facilities within the home or an area that could be adapted within the home environment. 	100% of patients who meet 2a–f.
3. The patient and all potential carers make an informed choice as to location of haemodialysis that is most suitable.	100% of patients who are offered home haemodialysis.
4. The patient who opts for home haemodialysis has an initial training programme provided for the patient and carer(s).	100% of patients who choose home haemodialysis.
5. The patient who opts for home haemodialysis and his or her carer(s) have access to a responsive support service.	100% of patients who choose home haemodialysis.
6. The patient who opts for home haemodialysis has an opportunity to review the decision.	100% of patients who choose home haemodialysis.

Exception	Definition of Terms
<p>A. The patient is not suitable for home haemodialysis on clinical grounds.</p> <p>B. The patient does not wish to consider home haemodialysis.</p>	<p>Assessment for home haemodialysis = consideration of the individual's social circumstances and home environment; see criterion 2 for guidance.</p> <p>Clinical grounds for suitability for home haemodialysis = free of complications and significant concomitant disease that would render home haemodialysis unsuitable or unsafe, good functioning vascular access and stable on dialysis.</p>
<p>None</p>	<p>Local teams should agree on what would constitute evidence of 2a for audit purposes.</p> <p>For 2e, clinical teams should enable carers to express their views independently of the patient.</p> <p>Local teams may add other patient circumstances for which the option of home haemodialysis could be offered, such as a patient's personal determination to manage on his or her own at home, to the list in 2.</p>
<p>None</p>	<p>Local teams should agree on what would constitute evidence of informed choice for audit purposes and how to judge if patients and carers are fully informed regarding what is involved in the different options and if the potential impact on their lives and those of their households has been discussed.</p>
<p>None</p>	<p>Local specialists should agree on what constitutes an initial training programme.</p>
<p>None</p>	<p>Local specialists should agree on what constitutes a responsive support service, including the possibility of respite hospital or satellite unit dialysis as required.</p>
<p>None</p>	<p>Local specialists should agree on how reviews will be carried out and recorded for audit purposes.</p>

Calculation of compliance with the measure

Compliance with each measure described in the table is calculated as follows

$$\frac{\text{Number of patients whose care is consistent with the **crit**erion **plus** the number of patients whose care is consistent with any **exception**}{\text{Number of patients to whom the **measure** applies}} \times 100$$

Healthcare practitioners should review the findings of measurement, identify whether practice can be improved, agree on a plan to achieve any desired improvement and repeat the measurement of actual practice to confirm that desired improvement is being achieved.

