

Renal care

**Health Building Note 07-02:
Main renal unit**



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Renal care

**Health Building Note 07-02:
Main renal unit**

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Preface

About Health Building Notes

Health Building Notes give “best practice” guidance on the design and planning of new healthcare buildings and on the adaptation/extension of existing facilities.

They provide information to support the briefing and design processes for individual projects in the NHS building programme.

Restructuring of the Health Building Note suite

Healthcare delivery is constantly changing, and so too are the boundaries between primary, secondary and tertiary care. The focus now is on delivering healthcare closer to people’s homes.

The traditional division of Health Building Notes into discrete books of information based on hospital departments is therefore no longer appropriate.

Instead, the new Health Building Note framework (shown below) is based on the patient’s experience across the spectrum of care from home to healthcare setting and back, using the national service frameworks (NSFs) as a model. This structure better reflects current policy and service delivery.

New Health Building Note structure

The Health Building Notes have been organised into a suite of 17 core subjects.

Care-group-based Health Building Notes will provide information about a specific care group or pathway but will cross-refer to Health Building Notes on **generic (clinical) activities** or **support systems** as appropriate.

Core subjects will be subdivided into specific topics and classified by a two-digit suffix (-01, -02 etc), and may be further subdivided into Supplements A, B etc.

All Health Building Notes are supported by the overarching Health Building Note 00 in which the key areas of design and building are dealt with.

Example

The Health Building Note on accommodation for adult in-patients will be represented as follows:

“Health Building Note 04-01: Adult in-patient facilities”

The supplement to Health Building Note 04-01 on isolation facilities will be represented as follows:

“Health Building Note 04-01: Supplement A – Isolation facilities in acute settings”

New Health Building Note number and series title	Type of Health Building Note
Health Building Note 00 – Core elements	Support-system-based
Health Building Note 01 – Cardiac care	Care-group-based
Health Building Note 02 – Cancer care	Care-group-based
Health Building Note 03 – Mental health	Care-group-based
Health Building Note 04 – In-patient care	Generic-activity-based
Health Building Note 05 – Older people	Care-group-based
Health Building Note 06 – Diagnostics	Generic-activity-based
Health Building Note 07 – Renal care	Care-group-based
Health Building Note 08 – Long-term conditions/long-stay care	Care-group-based
Health Building Note 09 – Children, young people and maternity services	Care-group-based
Health Building Note 10 – Surgery	Generic-activity-based
Health Building Note 11 – Community care	Generic-activity-based
Health Building Note 12 – Out-patient care	Generic-activity-based
Health Building Note 13 – Decontamination	Support-system-based
Health Building Note 14 – Medicines management	Support-system-based
Health Building Note 15 – Emergency care	Care-group-based
Health Building Note 16 – Pathology	Support-system-based

Other resources in the DH Estates and Facilities knowledge series

Health Technical Memoranda

Health Technical Memoranda give comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology used in the delivery of healthcare (for example medical gas pipeline systems, and ventilation systems).

They are applicable to new and existing sites, and are for use at various stages during the inception, design, construction, refurbishment and maintenance of a building.

All Health Building Notes should be read in conjunction with the relevant parts of the Health Technical Memorandum series.

Health Technical Memorandum Building Component series

All Health Building Notes refer to Health Technical Memorandum Building Component documents for specifications and design guidance on building components for healthcare buildings. All Health Building Notes should therefore be read in conjunction with the relevant parts of the Health Technical Memorandum Building Component series.

Activity DataBase (ADB)

The Activity DataBase (ADB) data and software assists project teams with the briefing and design of the healthcare environment. Data is based on guidance given in the Health Building Notes, Health Technical Memoranda and Health Technical Memorandum Building Component series.

1. Room data sheets provide an activity-based approach to building design and include data on personnel, planning relationships, environmental considerations, design character, space requirements and graphical layouts.

2. Schedules of equipment/components are included for each room, which may be grouped into ergonomically arranged assemblies.
3. Schedules of equipment can also be obtained at department and project level.
4. Fully loaded drawings may be produced from the database.
5. Reference data is supplied with ADB that may be adapted and modified to suit the users' project-specific needs.

For further information please refer to the following DH website: www.adb.dh.gov.uk

How to obtain publications

- To find out about publications that are finalised and currently being published, look under “new publications” on the DH Estates and Facilities Division Knowledge and Information Portal homepage at: www.estatesknowledge.dh.gov.uk. **NOTE that users should also check the Knowledge and Information Portal for latest versions of all publications, including Health Building Notes, and for any amendments to publications.**
- To find out about all DH Estates and Facilities publications, download the publications list from the link on the DH Estates and Facilities Knowledge and Information web page: www.dh.gov.uk/en/Policyandguidance/Organisationpolicy/Estatesandfacilitiesmanagement/DH_4118956
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Note

The new Health Building Notes have been progressively rolled out from spring 2007 onwards.

The sequence of numbering within each subject area does not necessarily indicate the order in which the Health Building Notes are published/printed. However, the overall structure/number format will be maintained as described.

To find out how to access information on published documents, see the “How to obtain publications” section above.

Executive summary

This guidance document is the second in the Health Building Note series on facilities for renal services.

It focuses on the accommodation requirements of a main renal unit. For the purposes of this building note, a main renal unit is defined as an integrated renal patient care centre for dialysis, in-patient care, multifunctional out-patient services, technical services and administration support which:

- is either part of an acute hospital or, if the acute hospital is not on one site, is within the overall campus of an acute hospital; and
- can be used by a defined group of renal patients, based on local renal-disease demographics, who may come from a variety of ethnic and cultural backgrounds and who need a variety of medical therapies to manage their renal disease.

The accommodation described in this document is suitable for providing acute and chronic medical and

support services for adult patients at any stage of renal disease. Where indicated, some of the areas and spaces outlined may be interpreted with flexibility. The aim is that design teams should be able to adapt this guidance to develop and produce a design brief for the range and scale of renal services that are applicable to their own specific projects.

Specifically, this document contains guidance on the planning and design of the following:

- facilities for haemodialysis;
- facilities for peritoneal dialysis training;
- the renal ward;
- renal out-patients;
- maintenance and technical support;
- renal administration services; and
- facilities for home haemodialysis training.

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1 Scope of Health Building Note 07-02

Introduction

- 1.1 This document provides guidance on how the built environment can be designed to improve the experience and outcome of renal patients.
- 1.2 It is a guide to the planning and design of a main renal unit, which comprises facilities for:
 - haemodialysis;
 - teaching peritoneal dialysis;
 - renal in-patients – the renal ward;
 - renal out-patients;
 - the maintenance and repair of haemodialysis machines;
 - the administration of renal services; and
 - training patients who would like to undertake independent haemodialysis in their own homes.
- 1.3 Care has been taken to ensure that the guidance and recommendations for the accommodation described in this Health Building Note are economical and flexible but without jeopardising the standards needed for the high-quality care and treatment of renal patients.
- 1.4 It is most strongly recommended that from the outset, all parties – and especially patients – be involved in a consultation process and that the conclusions of these consultations be included in the written brief.

Range of provision

Inclusions

- 1.5 This Health Building Note provides guidance on accommodation for adults attending a main renal unit for:
 - management of their renal disease as an out-patient, including pre-dialysis education;

- training on how to carry out continuous ambulatory peritoneal dialysis (CAPD) and automated peritoneal dialysis (APD);
- training on how to operate haemodialysis machines for home haemodialysis and associated self-care;
- maintenance haemodialysis; and
- management of their renal disease as an in-patient.

- 1.6 It also provides guidance on the following:

- accommodation for administrative and technical-service support specific to the care of renal patients;
- the relationships between the functional areas of the main renal unit outlined in paragraph 1.2;
- the interdepartmental relationships and adjacencies with other hospital departments and specialties relevant to the work of the functional areas of the main renal unit.

Exclusions

- 1.7 This Health Building Note does not include guidance for accommodation for nephrological services provided by:
 - satellite units which, although on a hospital site, are run separately from the main renal unit; and
 - satellite units not on a hospital site but located within a community.

This is covered in Health Building Note 07-01 – ‘Satellite dialysis unit’.

- 1.8 Accommodation for renal transplantation will be covered in Health Building Note 07-03.
- 1.9 It is assumed that children who need renal services will be treated in paediatric nephrology departments.

2 General service considerations

Introduction

2.1 The function of the main renal unit is to provide a continuum of care for adult patients suffering from renal disease at all points on this continuum except transplantation, which would be offered at a specialist centre that may or may not be co-located.

2.2 Patients attending a main renal unit might arrive there through:

- referral from primary care;
- referral from non-renal secondary care;
- referral from renal secondary care;
- referral from acute services (A&E departments);
- self-referral by established renal patients.

2.3 Patients attending a main renal unit may be:

- of any adult age;
- ambulant, in a wheelchair, or arrive on a stretcher/trolley;
- physically disabled and/or sensorily impaired;
- acutely or chronically ill through renal disease alone or through renal disease in combination with other renal-related or non-renal-related pathologies and co-morbidities;
- low-dependency maintenance haemodialysis patients for whom the main renal unit is their most convenient dialysis facility (see also paragraph 2.4);
- transplant recipients who attend the unit as in-patients and out-patients after surgery.

2.4 Established renal patients on maintenance haemodialysis who need a lower level of nursing and medical care than a main renal unit would provide can ideally be cared for in a satellite unit separate from the main renal unit. However, geographical location may suggest that the main renal unit is the most suitable centre for care, as maintenance haemodialysis patients attend the unit three times per week.

Other roles of a main renal unit

2.5 In addition to giving guidance on the provision of dialysis facilities (that is, both haemodialysis and peritoneal dialysis) within the main renal unit, this Health Building Note also provides guidance on the provision of:

- a renal ward for the care of acutely and chronically ill renal patients;
- an out-patients facility;
- an administration facility; and
- a technical-services area.

2.6 Although some or all of the above may also be linked to a renal transplant facility, this is a specialised facility which will be dealt with separately in Health Building Note 07-03.

Organisation and patient flow

2.7 Patients will arrive at the main renal unit by a variety of routes and for a number of reasons.

2.8 Patients may attend the main renal unit for haemodialysis or peritoneal dialysis treatment because:

- it is the dialysis unit nearest to their home (here, the level of dependency on medical supervision by such patients may be relatively low);
- their medical needs are such that they have to dialyse in the main renal unit (these patients are likely to be less well);
- they are an in-patient on the renal ward; or
- they are an established renal patient who is an in-patient on a non-renal ward.

2.9 Patients may attend a renal ward because:

- they are acutely ill and need urgent dialysis;
- they are undergoing investigation for suspected renal disease;

- they have established renal disease and are attending hospital for a renal-related reason or procedure; or
 - they have established renal disease and are attending hospital for a non-renal-related reason or procedure.
- 2.10 Patients may attend a renal out-patient clinic because:
- they have suspected non-established renal disease;
 - they have pre-established (pre-dialysis/low clearance) renal disease;
 - they have established renal disease;
 - they need access to palliative care services; or
 - they have had a renal transplant.
- 2.11 Patients may have to deal with renal administration directly to arrange:
- transport to and from the main renal unit when attending for haemodialysis;
 - social-services support;
 - out-patient and other clinic appointments;
 - temporary dialysis away from home;
 - delivery of services to home patients.
- 2.12 Patients (and their carers/assistants) may attend the main renal unit for home haemodialysis training to learn how to undertake independent haemodialysis in their own homes.
- 2.13 Patients attending a main renal unit are unlikely to have much direct contact with technical support, although they may have direct contact with individual technicians. The exception to this is where the patient is practising home haemodialysis or home APD (automated peritoneal dialysis) using a machine to facilitate the peritoneal dialysis fluid exchanges.
- 2.14 It is recognised that most patients attending the main renal unit will tend to be more dependent than those attending a satellite dialysis unit, and that this will be reflected in the planning and design of the main renal unit.
- 2.15 Nevertheless, all renal patients, regardless of the level of their dependency and of which area of the main renal unit they are attending, should be able to enjoy a welcoming, calming and attractive environment.

Factors affecting the size of a main renal unit

Demand

- 2.16 In its November 2002 report, the Renal Association set a minimum annual acceptance rate of 100 per million population (pmp). The UK Renal Registry's Ninth Annual Report states that, for 2005, the acceptance rate for adults in the UK was 108 pmp.
- 2.17 According to Roderick et al (2005), there has been a rise in the number of people given renal replacement therapy (RRT) in England. This rise is likely to continue. The prevalence of RRT at the end of 2005 was estimated to be 694 pmp. With the addition of the number of children undergoing RRT, this gives a total prevalence of 706 pmp. By 2010, it is estimated that the prevalence will be between 900 and 1000 pmp.
- 2.18 Even if the acceptance rate remains constant, the numbers of patients receiving treatment will continue to rise, and it will be some time before this equals the number of places available at any given point in time. This point can be referred to as the "steady state". An increase in the acceptance rate along the lines recommended by the Renal Association (2002) will lead to a sharper increase in the number of patients on dialysis. Recent studies suggest – and Roderick et al (2002) have concluded – that steady state in the UK may not be achieved for another ten to 20 years.

Note

The national average number of hospital haemodialysis patients per million catchment population reported for the previous year by the UK Renal Registry should be regarded as the minimum capacity for haemodialysis in each geographically based renal service. Alternatively, up-to-date regional data may be used. For example, the national average provision for 312 hospital haemodialysis patients (78 stations) per million catchment population in Scotland at the end of 2005 may be regarded as a minimum haemodialysis capacity in all regions in 2006. The level of hospital haemodialysis provision will need to be higher in areas with a high ethnic and/or elderly population and will need to increase nationwide over the next ten years (the Renal Association's (2007) 'Clinical practice guidelines for haemodialysis' (www.renal.org/guidelines/module3a.html) – note that these guidelines are to be reviewed in 2009).

2.19 The main drivers for the rise in the number of patients receiving treatment are identified by Roderick et al (2002) as the following:

- the increased incidence of established renal failure in older people (in 1982 the acceptance rate was 20 pmp, whereas in 2000 it was 90 pmp);
- some ethnic minority groups have a higher prevalence of conditions, especially Type 2 diabetes mellitus and hypertension, which can cause established renal failure;
- more people with diabetes are being identified as having established renal disease (acceptance of diabetic patients with associated end-stage renal failure increased from 2% in the early 1980s to 16% in 2000).

2.20 Other reported drivers include the following:

- although the number of satellite units is increasing and there is a shift towards more patients dialysing in satellites, those patients who dialyse in a main renal unit's haemodialysis facility are becoming increasingly dependent. This is because newer established-renal-failure patients are coming from more dependent patient groups, such as older people, and from cultures where self-care of disease is less common;
- there is an increased need to accommodate patients whose dependency is such that they could be dialysed in a satellite unit, but for whom the dialysis facility at the main renal unit is their nearest dialysis facility.

2.21 The current shortage of suitable donor organs is limiting the use of renal transplantation as a treatment. Thus, demand for maintenance haemodialysis is likely to continue increasing.

2.22 Peritoneal dialysis, which was favoured in the 1980s, is now less popular and is recognised to be largely unsuitable for older people with co-morbid disease (see also the Kidney Alliance report, 2001). While being the preferred choice of treatment for many patients, there is a decrease in the adequacy of dialysis over time. The percentage of dialysis patients on haemodialysis has continued to increase. At the end of 2005, haemodialysis patients accounted for 78% of all dialysis patients.

2.23 Diabetes is the leading cause of chronic renal failure, and its prevalence is increasing worldwide. The International Diabetes Federation and the

World Health Organisation (WHO) predict an increase in numbers of people with diabetes from 175 million to 333 million by 2025. The majority of this increase will be in Type 2 diabetes. If survival rates in Type 2 diabetes improve while associated nephropathy progresses, the number of people with diabetes who will need dialysis will increase. (The size and projected increase in the numbers of people with diabetes is the context for the National Service Framework (NSF) for Diabetes, which is a marker of excellence for care and service provision.)

2.24 Thus, haemodialysis and other renal services are under considerable pressure in some areas, and it is recommended that commissioners carry out needs assessments to estimate how many patients will need treatment over the coming years. This will enable them, together with clinicians working in this area, to plan what services will be needed and the most appropriate configuration of those services, taking account of local priorities. Since 2004, the UK Renal Registry has been conducting annual national surveys on the provision of renal replacement therapy in the UK. It has collected data on incident and prevalent patients, the number of renal units and dialysis stations being utilised, and the facilities available in terms of the number of medical and some non-medical personnel involved (see www.renalreg.com). PCTs and NHS trusts can use this data, local demographic information and international comparative data to support planning and to identify in local development plans the priorities for access, choice and equity. Future demand for RRT will vary in different areas according to the age, ethnic composition and levels of deprivation in their populations. See also:

- the 'National Service Framework for Renal Services – part one: dialysis and transplantation' (www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4070359); and
- the UK Renal Registry's Ninth Annual Report 2006 (www.renalreg.com/Report%202006/).

Future developments

Resurgence of home haemodialysis

2.25 The benefits to patients of carrying out haemodialysis in the home include not having to travel to the dialysis facility in a main renal unit (or

satellite) and their having more choice about when the dialysis is carried out, so that there may be less disruption to their normal lives. On the other hand, some patients and their carers find it a strain having the responsibility of carrying out the procedure (which can be time-consuming) and of dealing with any problems which might arise during the procedure.

- 2.26 Home haemodialysis lends itself to the carrying out of daily haemodialysis, which (preliminary experience suggests) may confer clinical benefit to patients on maintenance haemodialysis (see also paragraph 2.29).
- 2.27 Although the percentage of haemodialysis patients opting for home haemodialysis has fallen over the past decade, some renal units are again actively encouraging patients to consider this option to maximise both patient choice and potential clinical benefit as recommended by NICE (see next paragraph).
- 2.28 Home haemodialysis has been the subject of a NICE appraisal, which recommends that it be available as an option for all suitable patients (National Institute of Clinical Excellence (2002), 'Guidance on home compared with hospital haemodialysis for patients with end-stage renal failure').

Potential for offering daily haemodialysis as an option

- 2.29 If the purported advantages of daily haemodialysis are confirmed, the proportion of patients on home haemodialysis may increase, as may the number of shifts offered by the dialysis facility in a main renal unit.

Shift patterns

- 2.30 Shift patterns will be determined by both local needs and the function of each area of the main renal unit in which the staff are working. For example, the renal ward would normally run medical and nursing cover on a 24-hour, seven-days-a-week basis, whereas the dialysis facility might run only a two-shift/day pattern with a differing workforce skill mix.
- 2.31 Patient demand for further dialysis shifts, including twilight shifts, might need to be accommodated if the main renal unit serves a predominantly urban population where patient preference and local transport links for both patients and staff make this provision feasible.
- 2.32 Such twilight shifts might also need to be accommodated if many low-dependency patients (who would normally be cared for in a satellite unit) are using the main renal unit haemodialysis facility for their convenience and are able to work full-time.
- 2.33 Main renal units may provide "temporary dialysis away from home" or "holiday" dialysis facilities for non-local dialysis patients, and this would have to be taken into account when shift patterns were being planned.
- 2.34 Patient choice is a key consideration when planning to accommodate issues outlined in paragraphs 2.30–2.33, and should be sought through consultation and included in the written design brief.
- 2.35 Whatever the current and predicted future for renal services in a locality, this guidance recommends that neither the main renal unit nor any of its component parts be so large that patients and staff risk losing the one-to-one interaction which is so important to the care of renal patients in particular.

- 3.3 Project teams must also bear in mind that many patients will use the haemodialysis facility of the main renal unit as their “satellite dialysis unit”. Such patients need treatment at least three times a week, every week; project teams should therefore consider transport links and other patient access issues when deciding where to locate the main renal unit. Teams should also consider the ease with which consumables and other equipment may be moved into and out of the facility.
- 3.4 Patients with renal disease, especially those undergoing dialysis, regularly attend hospital and/or are under regular specialist follow-up. Ideally there should be a dedicated entrance to the main renal unit, as this would both make life easier for a group of patients who already have much disruption to their lives and would help prevent overcrowding of the main hospital entrance, especially at shift-changeover times.
- 3.5 Therefore, the main renal unit should be located on the fringe of an acute hospital, as this would make it easier to achieve the objectives outlined in [paragraphs 3.1–3.4](#).
- 3.6 Consideration must also be given to the main renal unit’s adjacency to other general hospital departments (see [Figure 1](#)). The departments with which the main renal unit will have the closest relationships are:
- radiology;
 - cardiology;
 - critical care areas (see Health Building Note 57 – ‘Facilities for critical care’);
 - vascular surgery;
 - urology;
 - the transplant unit.
- 3.7 Contaminated waste disposal is a particular problem with both the haemodialysis facility and the renal ward; thus, project teams need to bear in mind the main renal unit’s adjacency to the hospital’s contaminated waste infrastructure.
- 3.8 Many patients attending a main renal unit are likely to be less ambulant than other patients in the acute hospital; project teams should therefore also consider the unit’s adjacency and links to general hospital portering services.
- 3.9 For the same reasons given in [paragraph 3.8](#), project teams should consider:

- outside transport links when deciding the location of the main renal unit;
- automatic door access to and from the main access points to the unit and its communal areas.

Opening hours/shifts

- 3.10 Flexibility to accommodate patient choice is likely to be key to the opening hours and shift patterns of the dialysis facilities within main renal units in the future. Most are likely to operate at least a two-shift system. Running a third shift in the evenings may appeal to some patients, for example those in full-time employment, and such twilight shifts are more feasible in main renal units than in satellite units, because medical cover within the former is more readily available. Twilight shifts are likely also to maximise unit economics, as more patients can be treated without having to increase the number of treatment stations.

Planning and design

- 3.11 As mentioned in [paragraph 3.2](#), ideally all functional areas of the renal unit should be located together. But this guidance recognises that this may not be feasible for a variety of local reasons, and therefore recommends that the priority for adjacencies be arrived at through consultation among all parties, including patients, and that the conclusions of these consultations be included in the written design brief.
- 3.12 The unit should be attractively and sensitively designed. It is recommended that patients be consulted about the design, and that any agreed suggestions be included in the written design brief (see also [paragraphs 3.40–3.45](#)).

Access to the main renal unit

- 3.13 As the main renal unit uses a considerable amount of consumables and needs to dispose of large volumes of clinical and non-clinical waste daily (possibly more than any other department), it should ideally be situated on the ground floor or have adequate facilities for clinical and non-clinical waste disposal.

Entrance

- 3.14 It should have a separate, dedicated entrance for patients and their escorts/carers and staff (see [paragraphs 10.88–10.90](#) on security systems).

- 3.15 This entrance should be wide enough to allow access by disabled patients in wheelchairs or using walking aids, and should be able to comfortably accommodate a peak of patient/staff flows at dialysis-shift and working-shift changeovers.
- 3.16 There also needs to be access to the hospital, large enough to permit patients to come to the unit on a bed. This link needs to be a covered “corridor”.
- 3.17 There should also be an entrance to the ward and administration area which allows medical staff access without their having to go through patient waiting areas, such as those in out-patients or the haemodialysis area.
- 3.18 Patients attending the main renal unit are likely to arrive at the unit by a variety of means: public transport; taxi; ambulance; own transport; and carers’ transport. To facilitate patient access, therefore, the entrance to the main renal unit should, where possible, be located near public transport routes.
- 3.19 It is also important to provide dropping-off points for ambulances, taxis and carers’ transport. The dropping-off point for ambulances should be large enough to accommodate several ambulances, as the ambulance staff may have to leave their vehicles there while taking patients to their destination within the main renal unit.
- 3.20 The entrance to the unit should be covered so that patients transferring from a vehicle into the unit are not exposed to the weather. Other facilities provided should include:
- nappy changing and baby/infant feeding facilities;
 - buggy/pushchair parking;
 - public telephones;
 - refreshment facilities.

Car parking

- 3.21 Car-parking spaces should be provided immediately adjacent to the unit and as near to the entrance of the dialysis area as possible. It is recommended that there is at least one dedicated parking space for every three dialysis stations.
- 3.22 Project teams should bear in mind that, as the age of dialysis patients is likely to increase, thought should be given to future needs for disabled car-parking spaces.
- 3.23 Project teams should also take into account the need to accommodate parking for disabled employees. Local practices might also require there to be nearby dedicated parking for community-based staff, such as technicians for home haemodialysis and home-visiting nursing staff, who may have to carry heavy or bulky supplies or equipment between the main renal unit and their vehicles. For further guidance on car-parking, see Health Technical Memorandum 07-03 – ‘Transport management and car-parking’.

Support services

- 3.24 Both the renal ward and the haemodialysis area will need large volumes of clinical and non-clinical supplies to be delivered and off-loaded routinely. There will also be large volumes of clinical waste and non-clinical waste that will need to be removed daily. Bulk supplies and clinical waste should not be taken through patient waiting or treatment areas; separate entrances for these should be designed into the building (see also Health Facilities Note 30 – ‘Infection control in the built environment’).
- 3.25 Access to storage facilities, technical support facilities, workshops and the plantroom must be considered, and adequate provision must be made.
- 3.26 It would be ideal for the entrances mentioned in paragraphs 3.24 and 3.25 to be at the rear of the main renal unit and away from patient/staff entrances.

Signage

- 3.27 There should be on-road and plated signage indicating that the drop-off bay, ambulance bay and delivery bay are for the main renal unit’s exclusive use.
- 3.28 The car-parking spaces should be clearly marked to indicate that they are for the exclusive use of patients visiting the main renal unit. Accordingly, it is recommended that the disabled car-parking bays are also marked to indicate that they are for the exclusive use of disabled renal patients.
- 3.29 There should also be signposting from the main renal unit to the main hospital, and especially those departments within the main hospital which are of particular relevance to renal patients: radiology, cardiology and urology; see ‘Wayfinding’ (Department of Health, 2005).

Privacy and spatial arrangements

- 3.30 Project teams should bear in mind that patient privacy, and staff-to-patient and staff-to-staff confidentiality, can be compromised by open-plan designs within the main renal unit. In some cases, only closed offices will provide the required levels of privacy or confidentiality. A balance therefore needs to be struck between privacy and confidentiality and patient–patient social interaction; blood-borne virus control; the need for staff and patients to be able to observe one another; and the need for staff to be able to hold confidential discussions without being overheard. The ideal balance is likely to be arrived at through local consultations with all parties (including the infection-control team) – and especially patients – with their views being encompassed in a written design brief.
- 3.31 The use of non-fixed partial barriers may offer flexibility in arrangements and give patients a greater sense of personal space, and be suitable for use in the dialysis area and parts of the renal ward. For further guidance, reference should be made to Health Technical Memorandum 56 – ‘Partitions’.
- 3.32 Noise levels can be reduced by the use of acoustic ceiling tiles, flooring materials and partitions (see Health Technical Memorandum 08-01 – ‘Acoustics’ for further guidance).

Infection control

- 3.33 The Public Health Laboratory Service (now subsumed under the Health Protection Agency) set up a working group to assess the risks of cross-infection from blood-borne viruses and how they may best be managed. Project teams should consider the working group’s recommendations: ‘Good practice guidelines for renal dialysis and transplantation units: prevention and control of blood-borne virus infection’ (Department of Health, 2002).
- 3.34 In addition, the Department of Health’s ‘Code of practice for the prevention and control of healthcare-associated infections 2006’ also sets out policies and protocols for (among others) the prevention of occupational exposure to blood-borne viruses. The purpose of this Code is to help healthcare organisations plan and implement ways of preventing and controlling healthcare-associated infections (HCAI). The Code itself does not have statutory force. However, failure to comply with

the Code may lead to breach of the Health Act 2006 and, ultimately, action being taken by the Healthcare Commission (such as improvement notices, special measures, or being reported to the Secretary of State).

- 3.35 See also the standard principles of infection control in ‘Infection control: prevention of healthcare-associated infection in primary and community care’ (NICE, 2003) and guidance on “designing-in” infection control in Health Facilities Note 30 – ‘Infection control in the built environment’ (Department of Health, 2002).

Future expansion

- 3.36 As the demand for renal services is likely to increase with the growing elderly population and medical advances in renal care, consideration should be given to making the facilities flexible enough to increase accommodation and/or provide nocturnal haemodialysis.
- 3.37 Planned expansion should be along the lines of accepted modelling for populations, bearing in mind the possible influence of the National Service Frameworks (NSFs) for coronary heart disease, diabetes and anaemia. These NSFs should lead to improved patient survival and possibly increased incidence through better and more widespread diagnosis of established renal disease. In addition, the NSF for Older People dictates that all should be offered treatment regardless of age.
- 3.38 Expansion may be achieved by developing existing internal spaces or by extending the building in which the main renal unit is housed. As the area most likely to need future expansion will be the dialysis area, consideration should be given to locating this facility adjacent to an external wall to make such expansion easier.

Information technology

- 3.39 The ‘Renal services information implementation strategy’ focuses on supporting the Renal NSF to deliver improved renal care, collecting and making available national comparative data for audit, and providing nationally available data to support planning and identify local priorities (www.dh.gov.uk/en/Policyandguidance/Healthandsocialcare/topics/Renal/RenalInformation/DH_4079734).
- 3.40 The project team should plan for the future and consider allowing:

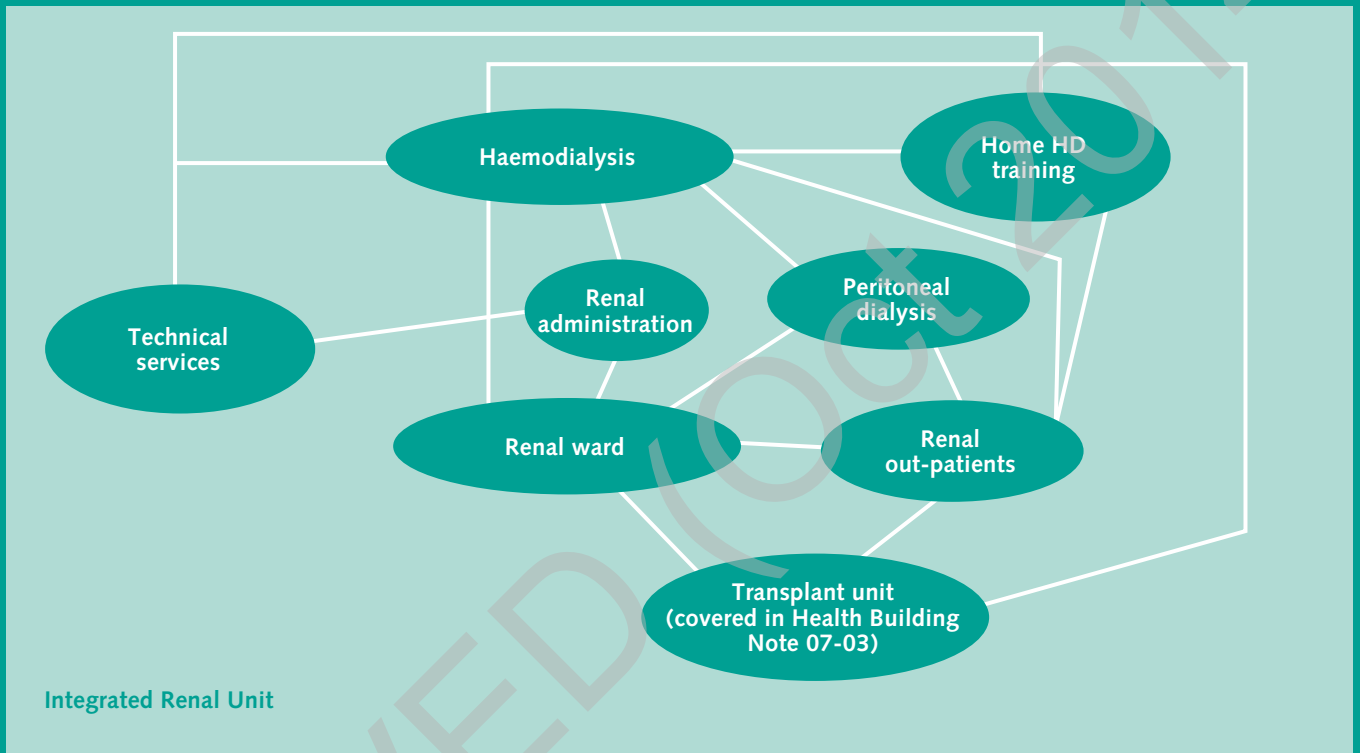
- computer monitoring of the dialysis-machine data;
- computerised transfer of patient information from the initial monitoring area to the dialysis machine, for example by electronic “key”;
- bedhead and dialysis-station access for staff to the renal data system, where telemetry might be a good idea;
- integration of handheld devices with the system; and
- provision of an Internet connection at each dialysis station and bedhead for patients.

Activity DataBase (ADB)

3.41 The Activity DataBase (ADB) data and software assist project teams with the briefing and design of the healthcare environment.

- 3.42 Room data sheets provide an activity-based approach to building design and include data on personnel, planning relationships, environmental considerations, design character, space requirements and graphical layouts. Schedules of equipment/components are included for each room, which may be grouped into ergonomically arranged assemblies.
- 3.43 Schedules of equipment can also be obtained at department and project level.
- 3.44 Reference data is supplied with ADB which may be adapted and modified to suit the users’ project-specific needs.
- 3.45 For further information please refer to the ADB website (www.adb.dh.gov.uk).

Specific functional and design requirements



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4 Haemodialysis

Location

- 4.1 Ideally, facilities for haemodialysis should be located at the fringe of the main renal unit and be on the ground floor.
- 4.2 The haemodialysis area should be adjacent to the other areas within the main renal unit (peritoneal dialysis, renal out-patients, renal administration, renal ward, renal transplant, and renal technical services).
- 4.3 However, project teams should bear in mind that, of all the areas of the main renal unit, the haemodialysis area is the one which most readily is able to operate separately from the other areas.
- 4.4 The haemodialysis area should have covered, bed-accessible links with other hospital departments, particularly radiology, cardiology, urology, diabetology and general wards.

Reception and waiting spaces

Reception office

- 4.5 An office is required at the entrance to the unit and adjacent to the waiting area for receiving and registering patients upon arrival and to provide the administrative and communication centre of the unit.
- 4.6 If the office has a welcoming, open-plan design which allows reception staff to see and receive patients entering the unit, it may not be necessary to provide a separate reception counter. It must be possible for patients, escorts and staff to communicate easily. It is important to ensure that the reception office is accessible to people in wheelchairs and that counters or reception desks are suitable for patients in wheelchairs to be able to communicate with staff at computer terminals.
- 4.7 Consideration should be given to routing all telephone calls to and from the unit through the reception office.

- 4.8 Workstations, computers and photocopying facilities will be required, as well as a fax machine for transmitting messages to the main renal unit, general practitioners and other personnel. Cupboards will be required for storing a working supply of stationery, information leaflets etc.
- 4.9 Confidential medical records will be stored in this office in lockable, fire-resistant filing cabinets or notes trolleys.
- 4.10 From the reception area, it should be possible to visually check persons entering the unit for security reasons.
- 4.11 If the dialysis area is immediately adjacent to the renal ward, it may be beneficial to have a connecting hatch through which staff at the reception desk can communicate with nursing/medical/administration staff on the ward.

Waiting/refreshment area

- 4.12 A waiting area should offer a comfortable and relaxing environment with domestic-type finishes and furnishings. Different types of seating are required, and should include those suitable for older people. The layout should be informal. There should be space for patients in wheelchairs and for people using walking aids. The waiting area can become very busy at changeover times and should be large enough to accommodate two shifts of patients.
- 4.13 The waiting area is an important social space. The provision of noticeboards and posters can help to lend a sense of identity to the unit. Project teams may wish to consider the provision of low-level background music, a TV/video system, facilities for personal entertainment, and internet connections for patients using their own laptop computers. These may help patients relax, alleviate the boredom of essential waiting, and mask confidential discussions. A supply of reading material should be available.

- 4.14 Refreshment facilities should be provided, as patients may spend long periods waiting to be connected to machines and waiting for transport.
- 4.15 A public telephone with an acoustic hood should be provided in accordance with hospital policy. A freephone for taxis may also be considered.
- 4.16 If pre-dialysis or routine clinics are to be held in the main renal unit (this will be a local decision), the waiting area will need to be larger to accommodate the additional numbers of patients who will be in the unit on these days.
- 4.17 A side room to the waiting area, which can be used by the local kidney association/fund as a patient-resource centre, is optional accommodation.

Patient changing area/locker room

- 4.18 Separate male and female patient change/locker rooms should be provided where patients can change into comfortable clothing before dialysis and can store their outdoor clothing and other personal items while they are on the machines.
- 4.19 Full-length lockers for the secure storage of dry outer and middle garments, footwear and small personal belongings are required. Hanging rails, with security, for the storage of wet outer garments, and lockers for large personal belongings should be provided. The number of lockers provided should be arrived at following consultation with patients, bearing in mind any likely future expansion of the unit, and included in the design brief. Lockers could be at the bedside.
- 4.20 A shower can be provided en-suite, but this is optional. The patient change/locker room door should be lockable.

Patients' sanitary facilities

- 4.21 Separate male and female sanitary facilities, including WCs with wash-hand basins, should be located adjacent to the patient changing/locker room.
- 4.22 Patient sanitary facilities should include an accessible toilet, and baby-changing facilities.
- 4.23 Patients need to provide urine samples; thus, this area requires good ventilation.

Wheelchair-storage area

- 4.24 A wheelchair storage area should be included for patients who, while being dialysed, have to leave their chairs.

Treatment areas

Patient-monitoring area

- 4.25 This space is used to monitor and record patients' weight, blood pressure and general health before each dialysis treatment. This area should be either within the dialysis area or adjacent to the dialysis area and/or the patient waiting area depending on operational policy. Data may be recorded either on computer or on paper, depending on local policy.
- 4.26 Facilities required include: chair weighing scales and wheelchair weighing scales; a desk and chair; storage for blood pressure equipment. A clinical wash-hand basin, accessible by wheelchair patients, will also be required, as patients will need to wash their fistula arms before treatment.
- 4.27 There should be sufficient space to accommodate a nurse, one patient, a helper and wheelchair scales.
- 4.28 There should also be mobile and wheelchair scales available so that patients – many of whom are likely to be more dependent than those attending satellite units – can be weighed at the dialysis station or in their wheelchair.

Multi-faith/quiet room

- 4.29 This room will be used as a quiet room for worship, meditation, reflection and counselling. If provided, it should be available to everyone who attends the unit. The project team should give careful consideration to local needs, including the range of denominations and faiths wishing to use the accommodation, as this will vary according to the population served. The room should be comfortably furnished and include easy and upright chairs and an occasional table. Space and the arrangement of seating should accommodate wheelchairs. Accessories of worship vary in accordance with denomination or faith, and therefore suitable storage cupboards should be provided. Appropriate washing facilities should be provided. This room is optional accommodation dependent on the needs of the population served.

Dialysis area

- 4.30 The dialysis area should consist of dialysis stations in increments of three. The schedules of accommodation for this Health Building Note are based on a 24-, 30- and 36-station area. (See [paragraphs 3.30–3.31](#) for privacy and spatial arrangements.)

Note

The schedules of accommodation for this document may be updated from time to time. For the latest version, see the schedule of accommodation database on the DH Estates and Facilities Knowledge and Information Portal (<http://estatesknowledge.dh.gov.uk>).

- 4.31 Project teams should involve patients in the choice of chairs, and any conclusions should be included in the design brief (for example, this may include considering modified chairs that can be used by patients as cycle machines for exercise while on dialysis). Sufficient space must be allowed for the chair to be fully reclined, and for nurses to carry out procedures. Treatment stations will need to be arranged so that patients can be attached to the machine either by arm or by cannulae in their neck or groin. If beds are to be used instead of reclining chairs, floor areas for each station will need to be reviewed, as area allowance is slightly larger for bed provision. One emergency call button (with an audible and visual alarm) per station should be provided.
- 4.32 Facilities are required at the station for the storage of frequently used medical items, and for patients to carry out seated activities, including watching television, while undergoing dialysis. Storage shelves should be located so that items can be seen and reached easily by staff and patients. A mobile table may also be used by the patient for storing books, newspapers and other personal belongings, and by staff for recording the patient's notes.
- 4.33 Project teams should consider providing a computer outlet, telephone point and a network connection point at each station. Computer data points for staff use are likely to become increasingly important as remote electronic data access becomes more widespread.
- 4.34 There should be at least one wash-hand basin between two stations. The basin should be located as near to the station as possible without causing risk of splashing and cross-infection. At each station, there needs to be:
- an alcohol hand-rub dispenser;
 - a wall-mounted soap dispenser;
 - a towel dispenser;
 - a clinical and non-clinical waste bin;
- a sharps container.
- 4.35 The floor should be slip-resistant, easily cleanable (see Health Facilities Note 30 – 'Infection control in the built environment'), and have an impervious finish with coved skirting, as the risk of spillage of body fluids and other contaminants is high.
- 4.36 Adequate adjustable lighting should be installed on walls and ceilings for use by staff carrying out procedures and by patients for reading, writing etc. Lighting controls should be within easy reach of patients and staff.
- 4.37 Consideration should be given to the provision of a communication and entertainment system with individual TV, radio, video and stereo headphone systems, and a telephone handset that allows patients to both make and receive calls. Televisions may be suspended from the ceiling, mounted on walls, placed on mobile units, or, if flat-screen, on a swing-out arm for each patient. To avoid disturbance to other patients, sound outputs from radios, televisions and other auditory equipment should be via headphones only. Consideration should also be given to providing access to the internet through a data point or wireless connection for patients who have laptop computers.
- 4.38 It is important to ensure the comfort of patients and staff in all weather conditions. The ability to keep the room temperature low is important for patient well-being and stability during dialysis and for staff working conditions. The extent of ventilation required will depend on the total heat gain within the dialysis area, but project teams should be aware that it is usually more cost-effective to install air-conditioning from the outset than to provide it after the facility has been completed.
- 4.39 The provision of medical gases, including oxygen, medical air and vacuum, at each station is for local consideration.

Isolation room

- 4.40 It is recommended that project teams refer to:
- the Department of Health's (2002) 'Good practice guidelines for renal dialysis/transplantation units: prevention and control of blood-borne virus infection' (www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4005752); and

- Health Building Note 04, Supplement 1 – ‘Isolation facilities in acute settings’.

They should also discuss infection control policies with local experts. The conclusions reached should be included in the written design brief.

Staff base

- 4.41 The staff base should be located so that staff sitting at the base can observe the patients in the dialysis area. If separating screens are used, they will need to be of a height to allow direct vision from a staff base, but allow privacy to patients. The number and location of the bases will depend on local policies and will be arrived at after consultation, the conclusions of which should be translated into the design brief. Staff bases must not be a source of disturbance to patients.
- 4.42 The likely numbers of nursing staff, the choice and location of monitoring and computing equipment, storage policies and requirements for notes, forms and other stationery must be considered.
- 4.43 All communication systems should have a terminal here, including computer, telephones, fax, call systems and alarms.
- 4.44 It is recommended that a separate room be provided for staff handovers to promote privacy. The manager’s office or the seminar room can be used for this function.

Resuscitation trolley bay

- 4.45 A resuscitation trolley bay, with space for parking a resuscitation trolley (with defibrillator), a mobile suction unit and a cylinder of oxygen on a trolley (if these are not piped to the bed or chair side), should be located with easy access to all spaces used by patients. Guidance on gas storage is contained in HTM 02-01 – ‘Medical gas pipeline systems’.

Consulting/examination room

- 4.46 One or more combined consulting/examination rooms will be needed for consultation and examination. The exact number will probably depend on the extent to which the haemodialysis area is used by out-patients as their satellite unit, and the number should be arrived at by local consultations – including with patients – and included in the written brief.
- 4.47 The room should be large enough to accommodate a doctor, a nurse, a patient (who may be in a

wheelchair), and an escort/carer. Space is needed for a desk and chairs, and an examination couch, screened by curtains. There should be enough space within the curtained area for a patient to undress/dress in privacy with assistance when required. Space is needed for storing small items of equipment, small quantities of supplies, blood-pressure monitoring equipment, a computer terminal and an alarm call system. Clinical wash-hand facilities are required (see Health Technical Memorandum 64 – ‘Sanitary assemblies’). A telephone may also be required.

Treatment/procedures room

- 4.48 A treatment room is required for medical and nursing staff to perform minor diagnostic and treatment procedures requiring a clinical environment, for example inserting and changing the lines and cannulae required by CAPD and haemodialysis patients. This will require enclosed storage areas for equipment and disposable items. Ultimately, the kind of treatment room needed will depend on the procedures to be carried out, and these should be clarified at an early stage of planning.
- 4.49 An island couch should be provided, with space for staff to work from all sides. Facilities for recording patient data, and for storage and disposal of dressings and other disposables, should be supplied.
- 4.50 An examination luminaire should be provided over the treatment couch. It should be adjustable in pitch and rotation to allow the beam to be directed locally, and should provide reasonably shadow-free illumination with minimum heat gain to avoid injury to patients and staff. The examination luminaires should be manufactured and tested in accordance with the requirements specified in BS EN 60598-2-25.
- 4.51 A clinical wash-hand basin is required (see Health Technical Memorandum 64 – ‘Sanitary assemblies’). The level of asepsis within this room should be commensurate with the procedures being carried out.
- 4.52 An emergency call system for the staff, and a nurse call system for the patient, should be provided (see Health Technical Memorandum 08-03 – ‘Bedhead services’).
- 4.53 The treatment room should be located adjacent to the dialysis area, dirty utility and clean utility.

Training room

- 4.54 This room is used for the general education of patients and their escorts, for carrying out administrative duties, and for staff training and education. There should be enough space to accommodate a nurse, two patients and two escorts. Clinical wash-hand facilities are required (see Health Technical Memorandum 64 – ‘Sanitary assemblies’), as well as a separate sink for the disposal of saline solution and other waste products.
- 4.55 A workstation and computer terminal should be provided, together with a variety of cupboards and shelves for the storage of equipment, stationery and other office supplies.

Office accommodation

Technical services manager’s office

- 4.56 Office space should be provided for the manager of the renal unit’s technical services, as it is inappropriate to carry out managerial functions within the general working/maintenance area, and there is also a need for privacy. The office should be adjacent to the technical services area. It should accommodate a workstation with computer and keyboard, seating for up to three other people, and storage for books and files.

Support/utility spaces

Water-treatment plantroom

- 4.57 Drinking water standards are inadequate for haemodialysis since patients are exposed to many thousands of litres of dialysis fluid annually. Water to be used for dialysis needs to be treated appropriately to remove impurities. For normal haemodialysis, water purity must meet the minimum standards for regular water quoted by the European Pharmacopoeia. For haemodiafiltration, the water quality must achieve ultra-pure standards (see the European Renal Association-European Dialysis and Transplant Association’s (ERA-EDTA) ‘European best practice guidelines for haemodialysis’). To achieve ultra-pure water standards “double pass reverse osmosis (RO)” may be required, and this will have an effect on the space allocated to the water treatment room. It is also recommended that project teams refer to the Association for the Advancement of Medical

Instrumentation’s (AAMI) standards. (See also [paragraphs 10.32–10.43.](#))

- 4.58 The specification for the water treatment plant will be determined by the composition of the water supply; project teams should seek the advice of the local water authority, a renal technologist, the specialist water treatment plant supplier and the medical physics department.
- 4.59 It is important that the plant be close to the dialysis area (although not adjacent to it because of noise considerations) as this will shorten the distance covered by the distribution ring. It should also be located close to vehicle access to enable deliveries of chemicals and salt (if softening is required).
- 4.60 There should be sufficient space to accommodate a maximum of two people to monitor, adjust, service and repair the water treatment plant. For further guidance on accommodation for plant and services, refer to HTM 2023 – ‘Access and accommodation for engineering services’.
- 4.61 The plantroom should be sized to accommodate the plant and storage of chemicals. Areas within the plantroom providing bulk storage of any corrosive liquids should be suitably sealed and bonded.
- 4.62 The plantroom floor should be sloped to a drain and treated with a chemical-resistant sealant, and the door accesses should have a lip and ramp to prevent water seeping to the rest of the unit in the event of a large water leak. The floor should also be “bunded” to contain any major water leakage (see also [paragraphs 10.47–10.56](#) on “Drainage”).
- 4.63 The door should be lockable for security. The plantroom should be adequately lit and ventilated. Mechanical ventilation may be necessary if the heat gain from the water treatment plant cannot be controlled by natural ventilation.
- 4.64 The plantroom should have provision for local and remote monitoring of the water treatment plant.
- 4.65 The water treatment plantroom should not house any other equipment (for example calorifiers) other than that which is specific to its function. This plantroom is optional accommodation if the dialysis area is near to the renal ward, as departments could share the water-treatment plant. (Note, however, that there should be separate water-treatment systems for the renal ward and for the haemodialysis area.)

Clean utility

- 4.66 A clean utility room is required for storing and preparing drugs, medicines and lotions, and for holding a working supply of clean and sterile supplies. A controlled drugs cupboard – attached to a load-bearing wall and alarmed – may be located here. A refrigerator will be required to store specialist drugs. The clean utility should be adjacent to the treatment room. Clinical wash-hand facilities are required. The floor should have an impervious finish.

Dirty utility

- 4.67 A dirty utility room should be provided, where items of equipment may be cleaned and for the disposal of liquid and solid waste. If a disposal room is not provided, the dirty utility should be large enough to temporarily hold materials for disposal and those items that need to be reprocessed.
- 4.68 The room should be fitted with a sluice sink, a sink-unit with drainer, a wash-hand basin, a worksurface, cupboards and shelves. Bed-pan disposal facilities are required. Space should be available to park trolleys and for temporarily holding bags of soiled linen etc. Pedal-operated sack-stands are also required. The floor should have an impervious finish.
- 4.69 A secure collection area for clinical waste and non-clinical waste should be provided. There should also be separate external access for clinical waste bins.

Disposal room

- 4.70 The disposal room is the temporary storage point for all items of supplies and equipment which have to be removed for cleaning, reprocessing or disposal, for example linen, waste disposal and sharps. The room should allow for cleaning of any spillage from the clinical waste bags. The floor should have an impervious finish.

Staff rest room

- 4.71 Rest room facilities are required where staff can relax and take beverages and snacks. This room is likely to be very busy at changeover periods and lunchtimes. An emergency call system should be located here.

- 4.72 Rest rooms should have windows with a pleasant outlook and be comfortably furnished. Direct access to the staff pantry is required.

Pantries: patients and staff

- 4.73 Pantry facilities, for both patients and staff, are required for the safe handling of food including the preparation of beverages and light snacks, for washing and storing crockery and cutlery, for storing a limited quantity of dry goods, and for the refrigerated storage of milk etc. Equipment should include a stainless-steel sink and drainer, an electric water boiler, a microwave oven, a worktop with cupboards, a commercial automatic dishwasher and a wash-hand basin. It would also be beneficial to provide an ice machine for patient comfort, as dialysis units can become very hot.

Staff change/locker room

- 4.74 Separate male and female staff change/locker rooms should be provided where staff can change into a uniform and store outdoor clothing and other personal items.
- 4.75 Personal full-length lockers for the secure storage of dry outer and middle garments, footwear and small personal belongings are required. Hanging rails, with security, for the storage of wet outer garments



Personal full-length lockers and separate male and female showers should be provided en-suite in the staff change/locker room

and lockers for large personal belongings should be provided. The number of lockers provided should be arrived at following consultation with staff, bearing in mind any likely future expansion of the unit, and included in the design brief.

- 4.76 Separate male and female showers should be provided en-suite.
- 4.77 The staff change/locker room door should be lockable.

Staff sanitary facilities

- 4.78 Gender-specific sanitary facilities, including WCs with wash-hand basins and a WC accessible to the disabled, should be located adjacent to the staff change/locker room.

Equipment store

- 4.79 Depending on the adjacency of the renal ward, this facility could be optional. The choice as to which area of the main renal unit houses this facility should be subject to consultation and local policy, and the conclusion included in the written design brief.
- 4.80 If provided, this store should be large with plenty of racking. The exact size of the store will depend upon how frequently supplies are delivered. However, it is worth pointing out that storage space is frequently understated. There should be provision for a bottled gas rack within this room.
- 4.81 The store will require lockable and alarmed double doors to the exterior for receiving delivered goods.
- 4.82 Additional storage space is required for the storage of equipment (chairs, drip-stands, etc) and of disposables. It is preferable to store these separately.

Fluid store

- 4.83 A storeroom for “bulk fluid” deliveries should be considered. This is a different way of providing dialysis fluid and requires one or more tanks to be installed for storing the fluid. The size of this room will depend on the number of stations and the frequency of delivery. This room is optional accommodation as not every unit will use this system.

Linen storage

- 4.84 There must be segregation of clean and dirty linen. Dirty linen should be temporarily held in the disposal room (see [paragraph 4.70](#)).

- 4.85 There should be sufficient space within the clean linen store for the storage of towels, pillows, blankets etc and access for linen trolleys to be loaded/unloaded.

General storage area

- 4.86 A back-up store specifically for sterile supplies, such as bulk dressing packs, syringes and needles, will be required to supplement supplies held in the clean utility room and working supplies held in individual spaces within the department.

Cleaners’ room

- 4.87 Space and facilities must be sufficient for parking and manoeuvring cleaning machines and a cleaners’ trolley, cleansing of cleaning equipment, and disposal of fluids and used cleaning materials. Hand-washing facilities are also required. Shelving and vertical storage should not encroach on the working space or restrict access to the cleaners’ sink.
- 4.88 Depending on the adjacency of the renal ward or hospital cleaning facilities, this would be essential complementary accommodation. The choice as to which area of the main renal unit houses this facility should be subject to consultation and local policy, and the conclusion included in the written design brief.

Electrical distribution cupboard

- 4.89 An electrical distribution cupboard, with lockable doors, housing the main isolators and distribution fuse switchgear should be:
 - accessible directly from a circulation area (access space may be part of the circulation area);
 - sited away from water services; and
 - lockable.
- 4.90 The electrical distribution cupboard, where possible, should be sited within the unit. There should be clear and safe access for maintenance staff, and care should be taken to ensure that safety is not compromised, during maintenance, from passing traffic or the opening of adjacent doors. All equipment should be mounted at a height to give easy access from a standing position.
- 4.91 Depending on the adjacency of the renal ward, this facility would be essential complementary accommodation. The choice as to which area of the main renal unit houses this facility should be

subject to consultation and local policy, and the conclusion included in the written design brief.

IT room

- 4.92 The main renal unit will need IT facilities; the planning of the IT infrastructure and facilities should be discussed with the trust's IT department, and the results included in the written design brief.
- 4.93 When planning the IT infrastructure for the haemodialysis area, consideration needs to be given to what IT-related equipment will be needed. The possible future expansion of dialysis-based IT facilities must also be considered.
- 4.94 If operational data is to be stored on equipment in the haemodialysis area, arrangements need to be made to ensure that the data is copied onto separate storage media. These backups should be stored away from the equipment that the data was copied off. This means that an appropriately secure and fire-proof storage area will be required.
- 4.95 Backups should be stored off-site, which may involve storing them away from the main renal unit if the haemodialysis area is adjacent to the other areas of the main renal unit.

Technical services area

- 4.96 The technical services area is essential complementary accommodation within the main renal unit. This facility would serve the whole renal unit, not just the haemodialysis area. The size of the area will depend on the number of renal technologists needed for the unit. This in turn will depend on a range of local factors including the number of home haemodialysis patients, haemodialysis patients, dialysis stations operating in the main renal unit, and satellite units that the main renal unit supports. For further information on workforce requirements for renal services, see 'The renal team – a multi-professional renal workforce plan for adults and children with renal disease: recommendations of the National Renal Workforce Planning Group 2002' (British Renal Society, 2002; www.britishrenal.org/workfpg/WFP_Renal_Book.pdf).

Maintenance room: equipment storeroom

- 4.97 A separate equipment storeroom will be needed to store spare and isolated dialysis machines. (The maintenance room itself should not be used to store any spare machines.) A treated water supply, power and drainage facilities are required.



The technical services area should have a treated water supply and drainage facilities



Maintenance room showing workbench and sink for cleaning of components and disposal of non-toxic fluids

5 Peritoneal dialysis

- 5.1 Facilities for consultation and training patients to perform peritoneal dialysis (PD) should be provided. The area could also offer dialysis sessions to in-patients if local policy decides this is an appropriate use of resources.

Location

- 5.2 Ideally, the PD area should be located between renal out-patients and the renal ward or immediately adjacent to the two.
- 5.3 It should have a dedicated reception and waiting area, but this can be shared with the renal out-patients area.
- 5.4 Nevertheless, the PD area should have signposted links with other hospital departments, particularly radiology, cardiology and urology.

WC for patients and escorts

- 5.5 Separate WCs for males and females should be provided close to the waiting area for use by all patients and escorts/carers, any of whom may use walking aids or a wheelchair. Thus, an accessible toilet should also be provided (see Health Technical Memorandum 64 – ‘Sanitary assemblies’ and Health Building Note 00-02 – ‘Sanitary spaces’).

Wheelchair storage area

- 5.6 It may be possible for patients to take wheelchairs into the consultation or teaching/dialysis rooms but, if not, a wheelchair storage area should be included for patients who, while undergoing a consultation or dialysis/teaching session, have to leave their chairs.

Rooms within the PD area

Training room

- 5.7 This room is used to teach patients how to perform their own peritoneal dialysis safely and adequately, and to provide advice and education for patients and their families, enabling them to make best use



PD training room with worktop and clinical wash-hand facilities



An examination couch should also be provided in the training room

of this treatment. Training is usually carried out one-to-one or in small groups. The room should be well-lit and ventilated.

- 5.8 Space must be allowed for fluid-bag warmers and for carrying out fluid exchanges. The room should be able to accommodate three patients/carers and a PD nurse. An examination couch should also be provided. Patients should also have access to mobile or wheelchair scales.
- 5.9 A whiteboard and video/TV should be provided.

- 5.10 A general wash-hand basin and clinical wash-hand basin should be supplied (see Health Technical Memorandum 64 – ‘Sanitary assemblies’).

PD treatment area



PD training room with worktop and clinical wash-hand facilities

- 5.11 This area is for patients who are ready to begin their peritoneal dialysis treatment. Patients need to learn about the different solution strengths to control fluid weight gain and also need to practise carrying out exchanges.
- 5.12 The PD area consists of a number of bays which include treatment chairs, fluid bag holders and an easy chair for escorts. The number of bays which could be accommodated should relate directly to the number of patients a nurse can supervise at the same session: probably two per nurse (see [paragraph 3.30](#) for privacy issues).
- 5.13 Each dialysis/teaching bay should be equipped with an emergency call button.
- 5.14 Project teams should consider providing computer outlets and/or telephone points in each bay. Computer data points for staff use are likely to become increasingly important as remote electronic data access becomes more widespread.
- 5.15 There should be enough space within a bay to accommodate a nurse, a patient and an escort.
- 5.16 Clinical wash-hand facilities are required (see Health Technical Memorandum 64 – ‘Sanitary assemblies’ and also Health Facilities Note 30 – ‘Infection control in the built environment’), as well as a separate sink for the disposal of saline solution and other waste products.
- 5.17 The floor should have an impervious finish – such as vinyl with welded joints and coved skirting – as

the risk of spillage of body fluids and other contaminants is high.

- 5.18 Facilities to operate an automated peritoneal system (APD) should also be provided. The percentage allocated for APD should be decided at the planning stage.

Consulting/examination room(s)

- 5.19 One or more combined consulting/examination rooms will be needed depending on the number of patients the PD area is likely to deal with at any one time.
- 5.20 The exact number will probably depend on how the PD area operates: for example, if it runs as a “clinic”, with many patients attending throughout a single day or period, more consulting/examination rooms will be needed than if an on-demand approach is used. The number should therefore be arrived at by local consultations – including with patients – and included in the written brief (see also [paragraph 4.47](#)).

Treatment/procedures room

- 5.21 A treatment/procedures room may be needed for medical and nursing staff to perform minor diagnostic and treatment procedures which require a clinical environment, for example line changes for CAPD patients. The level of asepsis required will depend on the treatments/procedures proposed.
- 5.22 An island couch or operating table should be provided, with space for staff to work from all sides. Facilities for recording patient data and storage and disposal of dressings and other disposables should be made available.
- 5.23 An examination light should be provided. A clinical wash-hand basin is also required (see Health Technical Memorandum 64 – ‘Sanitary assemblies’).
- 5.24 An emergency call system for the staff and a nurse-call system for the patient should be provided within this room.

Office accommodation

Sister's office

- 5.25 This would be an office environment and would need to be appropriately equipped with a workstation with computer and keyboard, seating for up to three other people, and storage for books

and files. It should be sufficiently private to allow discussions among staff to be held with appropriate privacy.

Multidisciplinary office

- 5.26 This office space may be shared by nursing and other members of the renal team for administration purposes.
- 5.27 It should be equipped as an office with workstations with computers and keyboards, printers, photocopier, fax, seating for the number of people likely to use it at any one time, and storage for books and files.

Support/utility spaces

Clean utility

- 5.28 See [paragraph 4.66](#).

Dirty utility

- 5.29 See [paragraphs 4.67–4.69](#).

Disposal room

- 5.30 See [paragraph 4.70](#).

Fluid store

- 5.31 This store should be large, with plenty of racking, as dialysis fluid is consumed in high quantities. The exact size of the store will depend upon how frequently supplies are delivered. The store may need double doors to the outside of the building for receiving delivered goods. Alternatively, bulk delivery of fluids might go to a store shared with other parts of the main renal unit and then be

redistributed to the PD area internally. Layout of the store – height and positioning of racking, especially – should be in accordance with current and emerging health and safety advice and requirements, especially those concerning manual handling (Health and Safety at Work etc Act 1974; Manual Handling Operations Regulations 1992; The Workplace (Health, Safety and Welfare) Regulations 1992).

- 5.32 Project teams should bear in mind that dialysis fluids need to be moved around on trolleys and pallets; there should be enough space within the PD area and in connecting corridors between the PD area and other parts of the main renal unit for this to be done safely and easily. Depending on the adjacency of the renal ward, this facility could be optional.

General storage area

- 5.33 A back-up store specifically for sterile supplies, such as bulk dressing packs, syringes and needles, will be required to supplement supplies held in the clean utility room and working supplies held in individual spaces within the department.

Cleaners' room

- 5.34 There must be enough space and facilities for the parking and manoeuvring of cleaning machines and a cleaners' trolley, the cleansing of cleaning equipment, and the disposal of fluids and used cleaning materials. Hand-washing facilities are also needed. Shelving and vertical storage should not encroach on the working space or restrict access to the cleaners' sink. This room could be shared with those available in other areas of the main renal unit.

6 Renal ward

Location

- 6.1 Ideally, the renal ward should be located at the centre of the main renal unit and be on the ground floor. It should be adjacent to the other areas of the main renal unit (PD area, out-patients, renal administration and renal technical services) as described below.
- 6.2 The renal ward should have covered, bed-accessible links with other hospital departments, particularly: radiology, cardiology, urology, intensive care, general wards, and operating theatres for vascular access procedures.

In-patient accommodation

- 6.3 Standard design and building guidance on acute wards will also apply to the renal ward – see Health Building Note 04 – ‘In-patient accommodation: options for choice’. Refer to this document for details of rooms, bed clusters and space requirements. Patients who require a higher level of care will be treated in critical care areas. For the planning and design of such facilities, see Health Building Note 57 – ‘Critical care’.
- 6.4 Consideration should be given to the following:
 - a high-dependency area should be provided on the ward, which includes haemodialysis facilities, for those patients who are unable to be moved to the haemodialysis unit for therapy;
 - where an area of the renal ward is provided for simple diagnostic investigations and procedures that may be done on a day-case basis or which require an overnight admission, suitable waiting and recovery areas should be considered;
 - where possible, consideration should also be given to the provision of single-sex bays.

Note

Health Building Note 04 – ‘In-patient accommodation: options for choice’ is soon to be superseded by Health Building Note 04-01 – ‘Adult in-patient facilities’.

Bed spaces

- 6.5 There should be enough space in each bay or room for appropriate weighing equipment to be brought to the bedside or into the bay before a dialysis session. There should also be enough space to use a hoist, as there will be a greater number of wheelchair users in the main renal unit (see Health Building Note 07-01 – ‘Satellite dialysis unit’, Appendix 1).

Bed provision

- 6.6 The total number of beds on the ward will need to be arrived at through local consultations, with assessment of current and projected demand (see the Renal Association’s (2002) ‘Treatment of adults and children with renal failure. Standards and audit measures’).

Bedhead services

- 6.7 Every bedhead should have a nurse call button which can be reached by patients, and an emergency call button for staff.
- 6.8 A communication and entertainment system with individual TV, radio, video and stereo headphone



Each bedhead should have outlets for medical gases and vacuum, and (where required) be plumbed for dialysis-standard water, and have drainage outlet points

systems, and a telephone handset that allows patients to both make and receive calls, should be provided.

- 6.9 Televisions may be suspended from the ceiling, mounted on walls, placed on mobile units or, if flat-screen, secured to a swing-out arm for each patient.
- 6.10 To avoid disturbance to other patients, sound outputs from radios, televisions and other auditory equipment should be through headphones only.
- 6.11 Consideration should also be given to providing patients with laptop-computer access to the internet through a data-point or wireless connection.
- 6.12 Each bedhead should have outlets for medical gases and vacuum, and (where required) be plumbed for dialysis-standard water, and have drainage outlet points (see also Health Technical Memorandum 08-03 – ‘Bedhead services’).

Isolation room(s)

- 6.13 The exact provision of isolation rooms for patients with infections is likely to vary considerably from renal unit to renal unit and would have to be decided after local consultation with all appropriate parties, especially local infection-control experts, and the results of any advice included in the written brief. See Health Building Note 4 Supplement 1 – ‘Isolation facilities in acute settings’.
- 6.14 It is recommended that project teams also refer to:
 - the Department of Health’s (2002) ‘Good practice guidelines for renal dialysis/transplantation units: prevention and control of blood-borne virus infection’ (www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4005752);
 - the National Institute of Clinical Excellence’s (2003) ‘Infection control: prevention of healthcare-associated infection in primary and community care’ (<http://guidance.nice.org.uk/CG2#documents>)

and discuss infection control policies with local experts. The conclusions reached should be included in the written design brief.

- 6.15 Where an isolation room is provided in the renal ward, a negative air-pressure facility may be needed.

- 6.16 The room should be accessible from the main renal ward and have a window through which patient and staff can see one another. The door to the isolation room should be kept closed as much as possible so that the required direction of air movement is minimally disturbed.
- 6.17 An emergency call button is needed in each isolation room.
- 6.18 An en-suite shower and WC should be provided within the isolation room.

Staff base

- 6.19 The staff base/bases should be located so that staff sitting at the base can observe the patients in the bed bays/rooms under their care. The number and location of the bases will depend on local policies and the layout of the ward, and will be arrived at after consultation, the conclusions of which should be included in the written brief. Staff bases should not, however, be a source of disturbance to patients.
- 6.20 The likely numbers of nursing staff, the choice and location of monitoring and computing equipment, storage policies and requirements for notes (with due regard to patient confidentiality), forms and other stationery must be considered. Work-surface provision should cater flexibly for differing and evolving configurations of computers and monitors.
- 6.21 All staff bases should have terminals for ward and hospital communication systems, including computer, telephones, call systems and alarms, and at least one should have a fax terminal.
- 6.22 It is recommended that there is a separate room for staff handovers to promote privacy.
- 6.23 In addition to the above, please refer to Health Building Note 40 – ‘Common activity spaces’ (Volume 3: ‘Staff areas’).

Note

Health Building Note 40 Volume 3 is soon to be replaced by Health Building Note 00-03 – ‘Clinical and clinical support spaces’.

Other rooms on the ward

Waiting area

- 6.24 A waiting area should offer a comfortable and relaxing environment, with domestic-type finishes

and furnishings. Different types of seating are required, and should include those suitable for older people. There should be space for patients in wheelchairs and for people using walking aids. Refreshment facilities offering hot and cold drinks should be provided.

- 6.25 A public telephone with an acoustic hood should be provided in accordance with hospital policy.

Day room

- 6.26 A small day room for patients should be provided. Patients can sit and rest here after meals, watch television and listen to the radio. A bookcase with various reading materials should be provided, and an occasional table.
- 6.27 The day room should be accessible, with a variety of seating heights to help ambulant disabled people.



Day room where patients can sit and rest after meals

Minor operations room(s)

- 6.28 Depending on the size of the ward and local policies and practices, a minor procedures room will be needed in which medical and nursing staff can perform minor diagnostic and treatment procedures requiring a clinical environment: for example, inserting and changing the lines and cannulae required by CAPD and haemodialysis patients, chest drains, and temporary pacing wires.
- 6.29 The level of asepsis required will depend on the treatments/procedures proposed and would normally be higher in a room in which medical procedures are to be performed. The proportion of such rooms should be decided following local consultations and discussions, and the conclusions included in the written design brief.

- 6.30 An island couch or an operating table should be provided, with space for staff to work from all sides. Facilities for recording patient data, and enclosed storage and disposal of dressings and other disposables, should be provided. A theatre-standard examination light should be provided. A clinical wash-hand basin is required (see Health Technical Memorandum 64 – ‘Sanitary assemblies’ and Health Facilities Note 30 – ‘Infection control in the built environment’).
- 6.31 A surgical scrub sink should be installed. This should be large enough to accommodate at least two people scrubbing up simultaneously (see Health Technical Memorandum 64 – ‘Sanitary assemblies’).
- 6.32 An emergency call system should be installed.
- 6.33 The minor operations room should be located adjacent to the bed areas and clean utility room.

Treatment room

- 6.34 One or more treatment rooms will be needed for examining, assessing and treating patients. Patients may arrive in a wheelchair, on a stretcher trolley or in a bed. There should be enough space in the room for one patient and three other people.
- 6.35 A worktop is required where sterile packs, lotions and drugs for immediate use are stored and prepared for use, and where dressing/instrument trolleys can be prepared for use and/or held. An emergency call point and clinical wash-hand facilities are also required.
- 6.36 Clinical-quality colour-rendering light sources should be provided, and walls, ceilings and floors should be of suitable colour and reflectance. The room should be sound-attenuated. Natural light is preferred but not essential.
- 6.37 Data points should be provided for picture archive and communication systems (PACS).
- 6.38 The treatment room should have easy access to both the clean utility and the dirty utility, and have enough space available for the disposal of clinical and non-clinical waste bins.

Multidisciplinary interview room

- 6.39 This office space may be shared on a sessional basis by dietitians, social workers, pharmacists and other members of the renal team, including anaemia coordinators.

- 6.40 It should be equipped with a desk, chairs, a computer terminal, and storage for medical forms and information leaflets etc, although it will not need a full range of office equipment (see paragraph 6.42).

Multidisciplinary office

- 6.41 This office space may be shared by dietitians, social workers, pharmacists, nursing and other members of the renal team for administration purposes.
- 6.42 It should be equipped as an office, with workstations with computers and keyboards, printers, photocopier, fax, seating for the number of people likely to use it at any one time, and storage for books and files.

Ward sister's office

- 6.43 This is the administration base for the ward sister. It should be sufficiently private for confidential discussions among staff. The office should have a workstation with computer and keyboard, printer, photocopier, fax, seating for up to three other people, and storage for books and files. There should be space for a secure, controlled drugs cabinet to be installed on a load-bearing wall. This office should be near the staff base.

Doctor's office

- 6.44 A doctor's office should be provided in which medical staff can hold confidential discussions, make telephone calls and write up medical notes. It should be near the staff base.

Support/utility spaces

Resuscitation trolley bay

- 6.45 A resuscitation trolley bay, with space for parking a resuscitation trolley (with defibrillator), a mobile suction unit and a cylinder of oxygen on a trolley, should be located with easy access to all spaces used by patients. The size and layout of the ward might mean that more than one such bay would need to be provided. Guidance on gas storage is contained in Health Technical Memorandum 02-01 – 'Medical gas pipeline systems'.

Clean utility

- 6.46 See Health Building Note 04 – 'In-patient accommodation: options for choice'.

Dirty utility

- 6.47 See Health Building Note 04 – 'In-patient accommodation: options for choice'.

Disposal room

- 6.48 See Health Building Note 04 – 'In-patient accommodation: options for choice'.

Staff rest room

- 6.49 Rest room facilities are needed where staff can relax and take beverages and snacks. This room is likely to be very busy at changeover periods and lunchtimes, particularly if the hospital canteen is not conveniently located. Whether this room should have an emergency call system should be subject to consultation, as staffing levels on a renal ward might make this unnecessary. The conclusion reached should be included in the written design brief. Rest rooms should have windows with a pleasant outlook and be comfortably furnished. Direct access to the staff pantry (see paragraphs 6.50 and 6.51) is needed.

Staff pantry

- 6.50 Pantry facilities are needed for the safe handling of food including the preparation of beverages and light snacks, for washing and storing crockery and cutlery, for storing a limited quantity of dry goods, and for the refrigerated storage of milk etc.
- 6.51 Equipment should include a stainless-steel sink and drainer, an electric water boiler, a microwave oven, a worktop with cupboards and a wash-hand basin. It would also be beneficial to provide an ice machine for patients' comfort, as bed bays and rooms can become very hot when patients are dialysing.

Equipment store

- 6.52 See paragraphs 4.80–4.82.

Fluid store

- 6.53 A storeroom for bulk liquid deliveries should be considered. This room is optional accommodation.

Linen store

- 6.54 See Health Building Note 04 – 'In-patient accommodation: options for choice'.

Cleaners' room

6.55 See Health Building Note 04 – 'In-patient accommodation: options for choice'.

General storage area

6.56 A back-up store specifically for sterile supplies, such as bulk dressing packs, syringes and needles, will be required to supplement supplies held in the clean utility room and working supplies held in individual spaces within the department.

Ward kitchen

6.57 Please refer to Health Building Note 10 – 'Catering' for design requirements.

Electrical distribution cupboard

6.58 See [paragraphs 4.89–4.91](#).

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7 Renal out-patients

Location

- 7.1 Ideally, renal out-patients should be located at the fringe of the main renal unit and be on the ground floor.
- 7.2 It should be immediately adjacent to the PD area and the renal ward.
- 7.3 The out-patients area should have covered links with other hospital departments, particularly radiology, cardiology, intensive care and urology. Access to adjacent areas that lead off the renal out-patients area should be fitted with disabled access facilities.

Reception/waiting area

Reception office

- 7.4 Secretarial and other administrative staff are based in this office. Duties of administrative staff may include management of the patient appointment system, management of patient transport systems, general correspondence, and liaison with other parts of the healthcare system, preparation of reports and analysis of statistics (see paragraphs 4.6–4.9).

Waiting/refreshment area

- 7.5 A waiting area should offer a comfortable and relaxing environment with domestic-type finishes and furnishings.
- 7.6 Different types of seating are needed, and should include those suitable for older people.
- 7.7 The layout should be informal. There should be space for patients in wheelchairs to continue sitting in their wheelchairs while waiting, and for people using walking aids. There should also be a children's play area.
- 7.8 The waiting area is an important social space. The provision of noticeboards and posters can help to lend a sense of identity to the facility. A supply of general reading material should be available.

- 7.9 There should be a next-patient call system to alert waiting patients when their appointment time has arrived. This could take the form of both an audible and a visual display system.
- 7.10 A vending machine for hot and cold drinks is an option.
- 7.11 A public telephone with an acoustic hood should be provided in accordance with hospital policy. A freephone for taxis should also be considered.



Out-patients waiting area

- 7.12 The waiting area should have easy access to consulting/examination rooms, treatment rooms and WCs.

WC for patients and escorts

- 7.13 Separate male and female WCs with wash-hand basins should be provided close to the waiting area for use by all patients and escorts/carers (see Health Technical Memorandum 64 – ‘Sanitary assemblies’ and Health Building Note 00-02 – ‘Sanitary spaces’).
- 7.14 There should also be a separate accessible toilet.

Examination/treatment areas

Treatment room

- 7.15 One or more treatment rooms will be needed for examining, assessing and treating patients. Patients may arrive in a wheelchair, on a stretcher trolley or in a bed. There should be enough room for one patient and three other people.
- 7.16 Data points should be provided for picture archive and communication systems (PACS).
- 7.17 A worktop is required where sterile packs, lotions and drugs for immediate use are stored and prepared for use, and where dressing/instrument trolleys can be prepared for use and/or held. An emergency call point and clinical wash-hand facilities are also required.
- 7.18 Clinical-quality colour-rendering light sources should be provided, and walls, ceilings and floors should be of suitable colour and reflectance. The room should be sound-attenuated. Natural light is preferred but not essential.
- 7.19 The treatment room should have easy access to both the clean utility and the dirty utility, and have enough space available for the disposal of clinical and non-clinical waste bins.

Combined consulting/examination room(s)

- 7.20 The main renal unit houses various disciplines. Each discipline will need space to hold its own clinics (although not necessarily separate space).
- 7.21 Therefore, the number of consulting/examination rooms that need to be provided for this purpose should be based on the size of the patient population, the number of clinics and consultants, and the number of services provided in other units. See also Health Building Note 12 – ‘Out-patients department’, which gives guidance on how to calculate the number of consulting/examination rooms.

Venepuncture/phlebotomy

- 7.22 This area will be used for the taking and testing of blood specimens. See Health Building Note 12 – ‘Out-patients department’ for design guidance.

Interview/counselling room

- 7.23 A room should be provided where patients and relatives can be interviewed in a relaxed environment that ensures that their privacy and

dignity are maintained. Acoustic privacy is important (see Health Technical Memorandum 08-01 – ‘Acoustics’). Semi-easy chairs and a desk space for one person should be provided.

Office accommodation

Nurse manager's office

- 7.24 This office is the administrative base for the renal out-patients area. It should be sufficiently private for confidential discussions among staff. The office should accommodate a workstation with computer and keyboard, seating for up to three other people, and storage for books and files.

Nurses' office

- 7.25 Whether a separate administration office will be needed will depend on the size of the out-patients area. It may be possible for its functions to be carried out in the manager's office and/or the reception desk/area. (For accommodation requirements, see paragraph 7.24.)

Support/utility spaces

Staff rest room

- 7.26 Provision of rest-room facilities in the out-patients area, where staff can relax and take beverages and snacks, can be shared with other departments within the main renal unit. However, local considerations, including the length of clinics, may mean that such facilities should be included (refer to [paragraph 6.49](#)).
- 7.27 Pantry facilities for staff may be needed if staff cannot easily use other renal-unit or hospital facilities for consuming or preparing food and beverages.
- 7.28 If provided, these would not need to be as comprehensive as those found in other parts of the main renal unit, but should include facilities for the safe handling of food including the preparation of beverages and light snacks, for washing and storing crockery and cutlery, for storing a limited quantity of dry goods, and for the refrigerated storage of milk etc.
- 7.29 Equipment should include a stainless-steel sink and drainer, an electric water boiler, a microwave oven, a worktop with cupboards, and a wash-hand basin.

Staff change/locker room

7.30 See paragraphs 4.74–4.77.

Staff sanitary facilities

7.31 See paragraph 4.78.

Patients' sanitary facilities

7.32 Separate male and female sanitary facilities, including WCs with wash-hand basins, should be provided (see Health Technical Memorandum 64 – 'Sanitary assemblies' and Health Building Note 00-02 – 'Sanitary spaces').

General storage area

7.33 A back-up store specifically for sterile supplies such as bulk dressing packs, syringes and needles, will be required to supplement supplies held in the clean utility room and working supplies held in individual spaces within the department.

Clean utility

7.34 See paragraph 4.66.

Dirty utility

7.35 See paragraphs 4.67–4.69.

Disposal hold

7.36 See paragraph 4.70.

Cleaners' room

7.37 This could be shared with those available in other functional areas of the main renal unit.

7.38 However, should local policy decide that a separate out-patients-based room is needed, refer to paragraph 4.87 for design requirements.

Electrical distribution cupboard

7.39 See paragraphs 4.89–4.91 for specific design requirements.

8 Renal administration

Location

- 8.1 Ideally, the administration area should be located so as to be easily accessible from all other areas of the unit.
- 8.2 It should have a dedicated entrance off the renal ward, which should be signed to discourage patients, visitors, carers and escorts from entering.
- 8.3 The administration area is essentially a suite of offices and should be appropriately equipped.
- 8.4 As the administration office is likely to be immediately adjacent to the renal ward, administration staff should be able to share this area's rest room facilities, staff change/locker facilities and staff sanitary facilities.
- 8.5 If not conveniently located elsewhere, the following facilities should be provided:
 - a cleaner's room;
 - an electrical switchcupboard;
 - a general storage area;
 - disposal facilities.
- 8.6 All offices should be sufficiently private for confidential discussions among staff. They should be able to accommodate a workstation with computer and keyboard, printer, fax and seating for up to three other people, and storage for books and files. A photocopier bay should also be provided.
- 8.7 Office space should be provided for:
 - the renal services manager (this office is the administrative base for the renal unit);
 - nurse and medical consultants;
 - medical secretaries;
 - junior medical staff;
 - dietitians;
 - renal social workers;
 - renal counsellors;
 - pharmacists;
 - specialist nurses;
 - research staff;
 - professional development;
 - general administration (this could be either a suite of rooms, single open-plan office space, or a mix of the two);
 - home administration team;
 - community staff;
 - matron;
 - IT manager.
- 8.8 To help project teams to be able to provide enough office accommodation to meet estimated staffing requirements, as a guideline see 'The renal team – a multi-professional renal workforce plan for adults and children with renal disease: recommendations of the National Renal Workforce Planning Group 2002' (British Renal Society, 2002; www.britishrenal.org/workfpg/WFP_Renal_Book.pdf).

Office accommodation

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 - specialist nurses;
 - research staff;
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 - general administration (this could be either a suite of rooms, single open-plan office space, or a mix of the two);
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Note

These recommendations are due to be reviewed in 2008.

Research office

- 8.9 This office will be used for the collection and analysis of data relating to the incidence, clinical management and outcome of renal disease. This data will be input onto a database which will be periodically uploaded to the UK Renal Registry and UK Transplant if necessary. Thus, there will need to be a computer terminal connected to the registry computer via the secure NHSIS communications network. Lockable, fire-proof storage should be provided in this room.

Seminar room



Seminar room

- 8.10 A seminar room should be provided for teaching, tutorials, meetings, case conferences and clinical instruction.
- 8.11 Furniture and equipment should include upright stacking chairs with writing arms, a wall-mounted whiteboard, a video/TV monitor and computer-projection facilities, a wall-mounted display panel, and facilities for storing valuable and fragile items.

Waiting area

- 8.12 A waiting area should be provided which offers a comfortable and relaxing environment with domestic-type finishes and furnishings.

Medical records store

- 8.13 Confidential medical records will be stored in this office in lockable, fire-resistant filing cabinets or notes trolleys.
- 8.14 There should be enough room to manoeuvre a wheeled stepladder between cabinets.

IT room

- 8.15 The administration area is the logical place in which to house the main back-office IT facilities for the main renal unit, and it is here that the main renal IT room should be located. The size of this room will depend on the extent to which the main renal unit shares its IT facilities with general-hospital IT facilities, and how these two facilities

link together and interface with other parts of the main renal unit. Consultations with all appropriate parties should be sought, and the conclusions reached should be included in the written design brief.

- 8.16 It is likely, however, that both IT server equipment and IT communications equipment will be needed within the main renal unit.
- 8.17 Any room provided needs to have enough space not only to contain the equipment intended to be installed initially, but also to allow for expansion of facilities at a later date. Project teams should bear in mind that to do the latter, there may be a need at some time to install replacement equipment before the removal of existing equipment.
- 8.18 The room should ideally be separate from other equipment rooms in the administration area, and should be separately securable.
- 8.19 The equipment in the room should not be visible from outside the room.
- 8.20 Arrangements should be made to ensure that the environment in the room is suitable for the equipment that may be kept there. This could include controlling the temperature, humidity, and levels of dust etc in the air.
- 8.21 There needs to be an adequate power supply into the room, which should both be enough for the initially expected load, and allow for possible expansion.
- 8.22 There must be adequate space for appropriate staff to be able to access the equipment for maintenance purposes. It should be ensured that this maintenance can be done without inconveniencing the normal operation of the administration area.
- 8.23 If operational data is to be stored on IT equipment in the administration area, arrangements need to be made to ensure that the data is copied onto separate storage media. These backups should be stored away from the equipment that the data was copied from. This means that an appropriately secure storage area will be needed.
- 8.24 Consideration should be given to storing these backups off the main renal unit site.

9 Home haemodialysis training

9.1 Comprehensive education and training facilities should be provided in the main renal unit for those patients (and their carers/assistants) who would like to undertake independent haemodialysis in their own homes.

Location

9.2 It should have its own separate area – training should not take place where other patients are dialysing. Ideally, it should be adjacent to the renal out-patients and haemodialysis area.

9.3 This unit can share the reception/waiting area with the haemodialysis unit.

9.4 If not conveniently located elsewhere, the following facilities should also be provided:

- a cleaner's room;
- an electrical switchcupboard;
- wheelchair storage area;
- resuscitation trolley bay;
- pantry;
- linen store;
- staff facilities;
- general storage.

Rooms within the home haemodialysis training area

Dialysis area

9.5 The ratio of home haemodialysis patients to unit haemodialysis patients is likely to increase following the NICE (2002) guidelines. When deciding how many stations to provide in this area, project teams should make an allowance of up to 15% (that is, of the number of stations allocated in the haemodialysis area), as the patient will take about three months on average to train and will then relocate to their home. (See paragraphs 4.31–4.39 for specific design requirements.)

9.6 There should be enough space to provide an easy chair next to the treatment chair for escorts/carers who may accompany patients during their treatment/training (for privacy and spatial arrangements, see paragraphs 3.30–3.32). It would also be beneficial to try to replicate the home set-up as accurately as possible by providing space in each station for water treatment equipment, fluid storage and other supplies.

Patients' sanitary facilities

9.7 Separate male and female sanitary facilities, including WCs with wash-hand basins and shower, should be located adjacent to the patient changing/locker room (see Health Technical Memorandum 64 – 'Sanitary assemblies' and Health Building Note 00-02 – 'Sanitary spaces').

9.8 Patient sanitary facilities should include an accessible toilet, and baby-changing facilities.

Clean utility

9.9 See paragraph 4.66.

Dirty utility

9.10 See paragraphs 4.67–4.69.

Disposal room

9.11 See paragraph 4.70.

Sister's office

9.12 This is an office environment and would need to be equipped with a workstation together with computer and keyboard, printer, photocopier, fax, seating for up to three other people, and storage for books and files. It should be sufficiently private to allow discussions among staff to be held with appropriate privacy. There should be space for a secure, controlled drugs cabinet to be installed on a load-bearing wall.

10 Engineering services

Introduction

10.1 This chapter describes the engineering services required within a main renal unit. The unit will normally be within or adjacent to a main hospital complex, and will need to be provided with primary services from the hospital's distribution network including heating, cooling, emergency power etc which are outside the scope of this Health Building Note.

10.2 A main renal unit will include facilities for more acute cases than could otherwise be attempted at a satellite dialysis unit. A proportion of patients will be high-dependency or infectious cases requiring enhanced electrical and ventilation systems for treatment areas and isolation rooms.

10.3 It is not the intent of this section to be too prescriptive in respect of design solutions, and other primary guidance should be sought, including relevant Health Building Notes, Health Technical Memoranda and NHS Model Engineering Specifications.

10.4 The Health Technical Memorandum series is supported by the overarching publication Health Technical Memorandum 00 – 'Policies and principles: best practice guidance for healthcare engineering', which covers the following issues:

- a. overview of engineering services guidance;
- b. statutory and legislative requirements;
- c. professional support;
- d. operational policy;
- e. training and workforce development;
- f. emergency procedures and contingency planning;
- g. training, information and communications;
- h. maintenance;
- k. engineering services.

10.5 Guidance on specific types of engineering services can be found within the Health Technical Memorandum series of documents as follows:

- a. Decontamination (Health Technical Memorandum 01);
- b. Medical gases (Health Technical Memorandum 02);
- c. Ventilation systems (Health Technical Memorandum 03);
- d. Water systems (Health Technical Memorandum 04);
- e. Fire safety (Health Technical Memorandum 05);
- f. Electrical services (Health Technical Memorandum 06);
- g. Environment and sustainability (Health Technical Memorandum 07);
- h. Specialist services (Health Technical Memorandum 08);
- k. other existing HTM 2000 series guidance documents.

Flexibility of design

10.6 In the light of the projected increase in demand for renal services, engineering services should be designed to accommodate future expansion.

Design for safety

10.7 Designers should be aware of the role of engineering design in the control of infection, particularly in respect of water services (see Health Technical Memorandum 04-01 – 'The control of *Legionella*, hygiene, "safe" hot water, cold water and drinking water systems') and ventilation systems (see Health Technical Memorandum 03-01 – 'Specialised ventilation in healthcare premises').

Space requirements for services and plant

- 10.8 A high level of availability of engineering plant and services is critical to the ability of the facility to function safely and efficiently. It is therefore essential that the building design should incorporate adequate space for the full range of building services and the requirements for installation and maintenance of plant, ductwork, pipework and cabling.
- 10.9 Space for plant and services should provide:
- easy and safe means of access;
 - secure accommodation protected from unauthorised access;
 - adequate space around the plant services to permit inspection maintenance and replacement.
- 10.10 Guidance on spatial requirements for engineering plant and services is contained in Health Technical Memorandum 00. Further information regarding the provision of space for plant is contained in the following BSRIA technical notes:
- TN 9/92: 'Space and weight allowances for building services plant – inception stage design'; and
 - TN10/92: 'Space allowances for building services distribution systems'.
- 10.11 With the exception of drainage and some heating pipework, engineering services should not be brought from the above-ceiling space of a floor below. Service distribution to a particular area should be contained within service spaces on that floor.
- 10.12 Plantrooms, particularly for air-conditioning and ventilation, should be located as close as possible to the areas they serve, thus minimising the amount of space necessary to accommodate large ducts.
- 10.13 Care should be taken to ensure that noise and structure-borne vibration cannot be transmitted beyond the plantroom. Further guidance on acoustics and vibration can be found in Health Technical Memorandum 08-01 – 'Acoustics' (in preparation; to replace Health Technical Memorandum 2045).

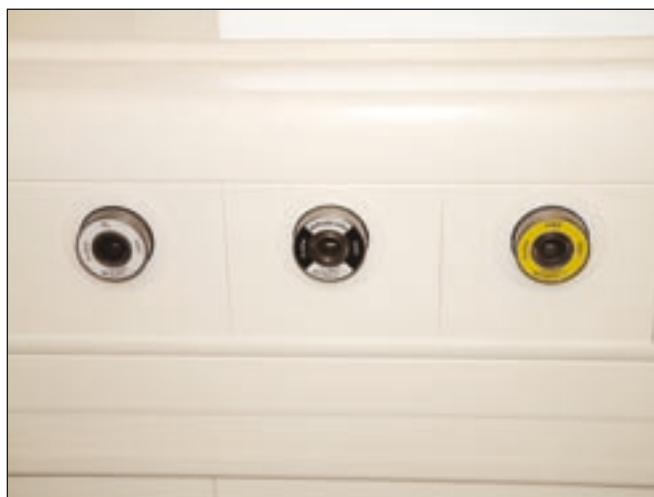
Decontamination

- 10.14 Decontamination is the combination of processes (including cleaning, disinfection and sterilization) used to render a reusable item safe for further use on patients and handling by staff. The effective decontamination of reusable surgical instruments is essential in minimising the risk of transmission of infectious agents. Further guidance is set out in Part A of Health Technical Memorandum 01-01 – 'Decontamination of reusable medical devices'.

Mechanical services

Piped medical gases

- 10.15 Piped medical gases should be designed in accordance with the requirements of Health Technical Memorandum 02-01 – 'Medical gas pipeline systems'.
- 10.16 At each patient location within a bedhead trunking system, oxygen and vacuum services will normally be required. In addition to the above, according to procedures to be undertaken, medical compressed air, nitrous oxide and local anaesthetic scavenging systems may also be required.



At each location within a bedhead trunking system, oxygen and vacuum services will normally be required

Heating

- 10.17 General space heating requirements may be met by a variety of systems including radiators and radiant panels, or within the air-conditioning system. Designers should ensure that the most appropriate method is employed with regard to the healthcare environment being provided.
- 10.18 Where heat emitters are used, the surface temperature should not exceed 43°C. Exposed

heating pipework, accessible to touch, should be encased and/or insulated. Further information is given in Health Guidance Note – “Safe” hot water and surface temperatures’.

- 10.19 Care should be taken to ensure that heat emitters do not adversely affect the local temperature conditions of adjacent storage and preparation areas.
- 10.20 Where used, radiators should be located under windows or against exposed walls. There should be space between the top of the radiator and the windowsill to prevent curtains reducing the output. There should be adequate space underneath to allow cleaning equipment to be used.
- 10.21 Where appropriate, heating controls should be provided to modulate heating circuit flow temperatures in accordance with external temperature. Radiators or radiant panels may also be used to offset building fabric heat losses in mechanically ventilated spaces. The system should be designed to ensure that the heating and ventilation systems operate in a coordinated manner and do not cause the space to overheat.
- 10.22 Ceiling-mounted heating panels can operate at higher surface temperatures than 43°C as long as the surface is not easily accessible. Heating panels should preferably run around the perimeter of the building. Panels should not be located over beds, patient trolley positions or in other locations where they might radiate directly onto a patient or member of staff for a prolonged period.
- 10.23 Ceiling panels should be selected to aesthetically match the adjacent ceiling and should be sealed to the adjacent ceiling by means of a gasket or similar.

Ventilation

General

- 10.24 Designers should undertake summertime temperature calculations to identify whether the internal temperature will rise to an unacceptable level. These calculations should take account of how both externally and internally generated heat gains may be reduced or controlled. It is important to achieve a balance between economy in capital and energy costs and creating appropriate levels of comfort through mechanical ventilation/comfort cooling. For areas where it is considered essential to install chilled ventilation systems, they should

be designed in accordance with the requirements of Health Technical Memorandum 03-01 – ‘Specialised ventilation for healthcare premises’.

- 10.25 Air movement induced by mechanical ventilation should be from clean to dirty areas, where these areas can be defined. The design should allow for adequate flow of air into any spaces having only mechanical extract ventilation, via transfer grilles in doors or walls. However, such arrangements should avoid the introduction of untempered air and should not prejudice fire safety or privacy.
- 10.26 Local exhaust ventilation (LEV) will be required where exposure (by inhalation) to substances hazardous to health cannot be controlled by other means. The Health and Safety Executive publishes guidance notes, updated annually, on occupational exposure limits (Guidance Note EH40 – ‘Occupational exposure limits’) for the control of exposure by inhalation of substances hazardous to health. The limits specified form part of the requirements of compliance with the Control of Substances Hazardous to Health Regulations 2002 (COSHH). Further guidance on the design of LEV systems may be found in Health Technical Memorandum 03-01.

Main renal unit

- 10.27 Designers may be required to provide engineering solutions not covered by existing guidance, but in so doing should remain aware that the solutions proposed must continue to be entirely compatible with the primary objective of maintaining infection control in the main renal unit.
- 10.28 The main renal unit should use 100% fresh-air, low-velocity ventilation systems. Where it is viable to do so, heat should be reclaimed from all extract systems using either recuperators or heat-recovery air-to-water coils.
- 10.29 Cooling should be considered for the dialysis/ treatment areas and isolation room(s) to achieve good comfort levels. Vents should not be positioned directly above patient-occupied areas, that is, directly over beds or chair positions. Grilles and diffusers should be located to provide even air distribution (see Health Technical Memorandum 03-01).

Hot and cold water systems

- 10.30 Hot and cold water storage and distribution systems should be designed in accordance with the

requirements of Health Technical Memorandum 04-01 – ‘The control of *Legionella*, hygiene, “safe” hot water, cold water and drinking water systems’.

- 10.31 Exposed hot-water pipework, accessible to touch, should be encased or insulated. Special care should be taken when facilities are being provided for older, confused or mental health patients.

Water services for haemodialysis

- 10.32 Developing technology and the specialised nature of dialysis equipment will necessitate advice being sought from specialist water treatment companies, a renal technologist with specialist knowledge of treated water for dialysis, and equipment manufacturers.

- 10.33 A chemical water analysis from the local water authority should be obtained before selection of the water treatment plant is made. If on a hospital site, hospitals should conduct their water analysis as close to the proposed point of use as possible, as local pipework may have an effect on the results. The plantroom should be located as near as possible to the renal unit in order to reduce pipe runs. Plant should be in a separate area to hot water/heating services.

- 10.34 Water for dialysis should reach at least the standards given in the following:
- the higher European Pharmacopoeia (EP) XVI standard: ‘Water for diluting concentrated haemodialysis solutions’;
 - ISO 13959: ‘Water for haemodialysis and related therapies’; or
 - AAMI RD-52 2004 (Association for the Advancement of Medical Instrumentation) standards.

- 10.35 New equipment should be capable of producing ultrapure dialysis fluid (bacterial counts <0.1 CFU/mL, and endotoxin <0.03 EU/mL) in order to meet the recommendations given in the European Renal Association-European Dialysis and Transplant Association’s (ERA-EDTA) ‘European best practice guidelines for haemodialysis’. Ideally, this should be achieved using ultrapure water; however, water that meets the minimum standards can be used together with point-of-use filtration on the dialysis fluid.

- 10.36 A routine testing procedure for water to be used in dialysis should form part of the renal unit’s policy (Renal Association, 2007).

Note

The limits for bacterial counts are based on the European Pharmacopoeia and on ERA-EDTA’s ‘European best practice guidelines for haemodialysis’.

A revision of ISO 13952 is currently at the “Committee Draft” stage and should be available by 2008.

- 10.37 To avoid rescheduling of patients in the event of equipment failure, it is essential that the appropriate levels of redundancy be provided. Central water treatment plants should be duplicated to facilitate maintenance work being carried out.

Water supply and pipework

- 10.38 For a main renal unit, the central installation providing water for dialysis should be distributed through a recirculation pipework ring. The design of this ring should minimise the number of direction changes and dead-legs so that the risks from bacteriological infection are reduced, and should also minimise sharp bends and shoulders in joints. The rings should be installed above the floor in the dialysis area and the maintenance room. Installations that utilise ceiling or floor voids are not advised, as these introduce unnecessary dead legs within the ring:

- the pipework should be constructed from rigid ABS, food-quality PEX tubing, hardwearing PVC or stainless steel, depending on the disinfection process to be used;
- the pipework should be capable of being cleaned and/or disinfected by either chemical or heat treatment to maintain hygiene:
 - (i) PEX can support both chemical and heat treatment;
 - (ii) it will be possible to use only chemical decontamination with ABS and PVC pipework (not heat);
- all treated water connections to dialysis machines should be of the dead-free-space design or have an automated facility to disinfect the tubing connecting to the dialysis machine on a regular basis.

- 10.39 Flexible hoses connecting the dialysis machine to the water supply and drainage outlet points should be provided with quick-release couplings. To avoid

the risk of accidentally dislodging the drainage hoses from dialysis machines, it is recommended that the quick-release coupling be of a different size to the water-supply coupling to avoid confusion and cross-connection.

- 10.40 The water-supply outlet point for each dialysis station and, as appropriate, in the maintenance room, should be kept as short as possible. This outlet point should also incorporate a means of isolation and a quick-release coupling.

Water treatment plant

- 10.41 Depending on the water supply, the water treatment plant may consist of the following water treatment stages (other equipment may be required for particular problems, high iron, nitrate etc):

- raw water break tank (to water supply regulation standards);
- water-softening plant;
- inorganic and organic scavengers;
- pre-filters;
- two granular-activated carbon (GAC) filters for chlorine and chloramine removal;
- final fine filtration just before reverse osmosis (RO);
- a final treatment RO-RO unit.

- 10.42 The water treatment plant conditions should be monitored by the BMS and a plant status alarm panel providing visual or audible signals. The plant conditions should be capable of being transmitted to remote alarm panels.

- 10.43 The water treatment plant should provide for total redundancy with dual softeners, circulating pumps, RO equipment and carbon filters. Carbon filters should be selected to achieve sufficient contact time to remove all chlorine and chloramines. Connection to the supply must conform to water regulations (the Water Supply (Water Fittings) Regulations 1999).

Maintenance

- 10.44 With regard to the protection of the RO water treatment plant, devices for the control and safe isolation of engineering services should be in a separate secured room.

Building management systems

- 10.45 All engineering plant and equipment associated with the internal environment should, where possible, be controlled, monitored and regulated by a building management system (BMS) in accordance with the provisions of Health Technical Memorandum 08-05 – ‘Building management systems’ (in preparation; to replace HTM 2005).
- 10.46 Requirements for the monitoring and control of plant and systems are also covered in the Health Technical Memorandum that relates to the particular plant or system.

Internal drainage

General

- 10.47 A system of soil and waste drainage including anti-siphon and ventilation pipework should be provided in accordance with BS EN 12056.
- 10.48 Where plastic pipework materials are used, suitable intumescent collars should be fitted when breaching fire compartments, and acoustic wrapping should be applied where drainage runs above wards and other sensitive areas.
- 10.49 Provision for inspection, rodding and maintenance should ensure “full bore” access and be located outside user accommodation. The location of manholes within the building should be avoided.
- 10.50 To prevent the ingress of bacteria, waste outlets from distillation plant and refrigerators should be connected outside of the department, not be directly connected to the drainage system and discharge via a trapped tundish or gully.
- 10.51 Drainage/waste systems from air-conditioning units should be installed to prevent legionnaires’ disease and other bacteria back-feeding.
- 10.52 All drainage that may be used for the passage of contaminated effluent should be clearly labelled.

Main renal unit

- 10.53 The used dialysis solution should be discharged to a drainage outlet point and drainage system for each dialysis station and, as appropriate, in the maintenance room. This outlet point should incorporate a suitable air break, means of isolation, and a quick-release coupling of a different size to that of the water supply outlet point. Drainage pipework materials should be suitable for high-temperature waste at times of automatic cleaning

and disinfection (and also a range of disinfecting chemicals).

- 10.54 It is possible that a protein-type residue will build up in the dialysis (solution) drainage pipework. It is therefore recommended that the pipework gradient from the discharge outlet point to the drainage system be greater than the usual 1 in 50.
- 10.55 At an early stage in the design process, designers should familiarise themselves with the types of discharge produced, and check with the client what effect the mixing of various chemical discharges may have upon the drainage system.
- 10.56 Proposals for the collection and discharge of chemical-contaminated effluent should be discussed and verified with the sewerage undertaker. Some water authorities may impose restrictions on the quantity and rate of discharge of such effluent into public sewers.

Acoustics

- 10.57 Excessive noise in individual areas, whether internally or externally generated and transmitted, can adversely affect the operational efficiency of the main renal unit and cause discomfort. The limits and means of control are described in Health Technical Memorandum 08-01 – ‘Acoustics’.
- 10.58 There will also be a need to ensure auditory privacy in certain rooms. This typically, but not exclusively, is required in the dialysis treatment stations, consulting/examination rooms and isolation room(s); it should not be possible to overhear any discussions taking place in adjoining spaces. Particular care should also be taken where the adjoining spaces are waiting areas. Efforts to ensure auditory privacy should not compromise patient safety during dialysis treatment (by interfering with clinical observation) and should not result in any requirement to increase nursing staffing levels.

Fire safety

- 10.59 Fire safety standards in healthcare premises need to be high owing to the vulnerability of occupants. The policy in respect of fire safety is set out in Health Technical Memorandum 05-01 – ‘Managing healthcare fire safety’. The design team should satisfy itself that the design meets the objectives of this guidance or provide a fire-engineered solution that achieves similar objectives.

- 10.60 It is important to establish during the design stage those aspects of fire strategy that may affect the planning of a project. At appropriate stages of the design process, the appropriate design team members should discuss their proposals with the relevant building control/approved Inspector, and ensure that the project team and all other planning staff are fully acquainted with the fire strategy for the design. This will include operational aspects (staff responsibilities etc), equipment provision, and building and engineering layouts.

Fire detection and control systems

- 10.61 Fire detection, alarm and control systems are an integral part of the overall fire plan for a building. Close coordination between the architect and design engineer is essential to ensure that compartmentation, high-risk processes, dangerous goods and other fire-related risk issues are fully understood and embraced in the fire management solution.
- 10.62 For guidance see the ‘Firecode’ suite of documents (Health Technical Memorandum 05).

Engineering services – electrical

General

- 10.63 Electrical installations should comply with the current edition of BS 7671 IEE Wiring Regulations together with Guidance Note 7 (Special Locations) and Health Technical Memorandum 06-01 – ‘Electrical services supply and distribution’. See also ‘Medical Electrical Installation Guidance Notes’ (MEIGaN; MHRA).
- 10.64 Prior to final design, a full assessment should be made of the risk, function, occupation, equipment and resilience requirements for the area. This will influence the extent and location of services, the availability of alternative electrical supply distribution and the need for local standby supplies if appropriate.

Electrical installation

- 10.65 The electrical supply connections to electro-medical equipment should comply with BS EN 60601-1-2:2002 to avoid corruption of input data; some equipment may require automatic disconnection, with manual reset, following mains failure. Specific dialysis machine requirements are covered by BS EN 60601-2-16:1998.

Electrical interference

10.66 Care should be taken to avoid mains-borne interference, harmonics and electrical radio frequency interference affecting computers and other electronic equipment used in the main renal unit.

Electromagnetic compatibility

10.67 Care should be taken to avoid mains-borne and electrical radio frequency interference affecting diagnostic and monitoring equipment, computers or other sensitive electronic equipment. Guidance on the avoidance and abatement of electrical interference is given in Health Technical Memorandum 06-01 – ‘Electrical services supply and distribution’.

Main intake switchgear and distribution boards

10.68 The main electrical supply should be part of the whole site/building network and provide adequate capacity for both normal and all assessed business-critical needs.

10.69 Main intake and distribution equipment should be sited away from patient areas and areas where access would disrupt normal communication routes.

10.70 Careful consideration should also be given to the impact from flooding, pipework leaks and mechanical damage.

Emergency electrical supplies

10.71 Emergency electrical provision should comply with the requirements of Health Technical Memorandum 06-01.

Small power distribution systems

10.72 Depending upon the capacity of the emergency generator installation and risk assessment, it may be appropriate to provide separate essential and non-essential small power distribution systems.

10.73 Adequate provision should be made in circulation areas, for example corridors and lobbies, to allow the use of domestic cleaning equipment having flexible cords up to 9 metres long.

Lighting systems

10.74 Lighting services, including lighting controls, should comply with CIBSE’s:

- Guide LG2 – ‘Hospitals and healthcare buildings’; and
- Guide F – ‘Energy efficiency in buildings’.

10.75 In areas where VDUs are in use, lighting should be designed to comply with the guidance given in CIBSE Guide LG3 – ‘The visual environment for display screen use’.

10.76 To achieve energy efficiency, lighting systems should be designed to:

- a. maximise use of natural daylight;
- b. avoid unnecessarily high levels of illumination;
- c. incorporate efficient luminaires, control gear and lamps;
- d. incorporate effective controls.

10.77 Lighting and the appearance of luminaires should be coordinated with architectural design. In particular there should be collaboration to ensure that decorative finishes are compatible with the colour-rendering properties of lamps and that the spectral distribution of the light source is not adversely affected. See also ‘Lighting and colour for hospital design – a report on an NHS-funded research project’ (Dalke et al, 2004).

10.78 Light switches should be provided in easily accessible positions and at appropriate locations in corridors and general circulation areas. In areas with multiple luminaires, switches should permit the selection of luminaires appropriate to the area requiring illumination.

10.79 Where local circumstances permit, the provision of time switches or occupancy controls using infrared, acoustic or ultrasonic detectors should be encouraged. Additionally, low-energy or ultra-low-energy lighting should be considered as the primary lighting source.

10.80 Safety escape lighting should be provided on primary escape routes in accordance with the provisions of Health Technical Memorandum 06-01, Health Technical Memorandum 05-02 – ‘Guidance in support of functional provisions for healthcare premises’, and CIBSE’s Lighting Guide LG2 – ‘Hospitals and healthcare buildings’.

10.81 It is essential that fluorescent lighting in all areas where medicines or containers are processed, including stores, is derived from lamps having suitable colour-rendering characteristics.

Patient/staff and staff emergency call systems

- 10.82 Patient/staff and staff emergency call systems should comply with the requirements of Health Technical Memorandum 08-03 'Bedhead services' (in preparation; to replace Health Technical Memorandum 2015).
- 10.83 Patient/staff call points should be provided in all spaces where a patient/attendee may be left alone temporarily – for example consulting, examination and treatment rooms and WCs.
- 10.84 Staff emergency call points are for a member of staff to call for assistance from another member of staff. They should be provided in all spaces where staff consult, examine and treat attendees/patients. Consideration should be given to the use of technology as a deterrent or to enable a response to an incident.
- 10.85 The patient/staff and staff emergency call systems may be hard-wired or radio systems.
- 10.86 Where considered necessary, staff crash call points may be specifically provided for members of staff to call the crash team. This is not required as a standard installation, and needs to be specified for individual rooms where the patient is at high risk of suffering a cardiac arrest.
- 10.87 A visual and audible indication of the operation of each system should be provided at a suitable staff base to give responding staff unambiguous identification of the call source, with a repeater unit in the staff rest room.

Security

- 10.88 Measures should be incorporated in the design of all NHS buildings to help protect the safety of staff, patients and visitors and the security of the premises. Security systems will require a local risk assessment and crime prevention survey to be carried out for both daytime and out of hours, to include swipe cards, smart cards, CCTV and other available technological solutions. The project team should discuss security with the local police crime prevention officer and the trust's nominated local security management specialist (LSMS) at an early stage in the design process.
- 10.89 See the Department of Health's 'Directions to NHS bodies on security management measures 2004 (amendment) directions 2006' and 'A professional approach to managing security in the NHS' (NHS Security Management Service, 2003).

- 10.90 The local fire officer and local security management specialist (LSMS) should be consulted concurrently to avoid the possibility of the demands of security and fire safety conflicting.

IT and telephone wiring systems

- 10.91 The approach to provision of IT and telephone infrastructure within the main renal unit may be conditioned by an existing system. However, where possible, a structured wiring system as described in Health Guidance Note 'Structured cabling for IT systems' should be provided. This will permit a unified approach to the provision of cabling for voice systems; data systems; CCTV; and alarm systems.
- 10.92 In determining the nature of the IT system to be provided, it is necessary to identify:
- rooms to be served;
 - whether structured cabling will be used;
 - what density of outlets is to be provided (no fewer than two per workstation);
 - whether wiring will be on a "flood" or "as required" basis, having due regard to the potential expansion of the main renal unit in the future;
 - whether any wireless computer networking will be required.
- 10.93 In addition to the monitoring of dialysis equipment and providing staff access to this data, the IT system should offer telemetry links to other areas within the main renal unit and to other hospital services.

Bedhead services and entertainment systems

- 10.94 Allowance should be made for the introduction of television and radio systems in waiting areas, to create a relaxing atmosphere, in staff rest areas, and in locations where it would be beneficial in masking sound transfer.
- 10.95 Other services should be provided in accordance with Health Technical Memorandum 08-03 'Bedhead services' (in preparation; to replace Health Technical Memorandum 2015).

Pneumatic tube transport systems

- 10.96 If a new pneumatic tube system is to be installed, significant investigation needs to be undertaken to ensure that the system will meet the needs of the

whole or that part of the hospital site. For further guidance on the design of pneumatic tube systems, see Health Technical Memorandum 2009 – ‘Pneumatic air tube transport systems’.

Lifts

10.97 Lifts may be required in order to comply with the requirements of the DDA or Part M of the Building Regulations. For further guidance on the design of lift installations, see Health Technical Memorandum 2024 – ‘Lifts’.

Controlled drugs storage

10.98 Controlled drugs cupboards within wards or clinical areas should be fitted with a red lamp indicating when the cupboard is unlocked. A repeater lamp should be sited outside the doorway of the room in which the cupboard is located. If appropriate, a secondary repeater should be taken to a permanently staffed station.

10.99 The normal power supply for each cupboard should be backed up by a small integral battery to cover the short period between mains failure and the generator becoming available.

10.100 To assist in keeping their contents secure, controlled drugs cupboards should be fitted with a seven-lever mortice lock designed to meet BS 3621.

Sustainability and energy efficiency

10.101 The environment in which people live and work has a key influence on their health. Environmental considerations should therefore be taken into account when building or adapting facilities. The minimising of environmental impact by ensuring that energy is only used necessarily and efficiently is considered in this guidance with respect to:

- a. natural daylighting;
- b. natural ventilation;
- c. night set-back;
- d. building regulations;
- e. heat recovery;
- f. water conservation;
- g. minimising solar gain.

10.102 Efforts should be made to maximise the use of natural lighting. Passive solar design (PSD)

should be employed to ensure that, as far as possible, areas such as wards, recovery units and offices are located where they can benefit from natural daylight, while other areas, for example stores, WCs and utility rooms, are located towards the core of the facility.

10.103 Areas where glare may be a problem, for example rooms where VDUs are routinely used, should similarly be located away from direct natural daylight.

10.104 Natural ventilation of rooms should be employed wherever possible and appropriate. Design should incorporate measures for minimising solar heat gains, which, if controlled, will avoid the need for mechanical ventilation. Measures to minimise the need for cooling should include locating temperature-sensitive accommodation away from south-facing fascias, shading windows, and using reflecting glass where appropriate and cost-effective.

10.105 Energy-using systems including heating, ventilation, cooling and lighting should be controlled to minimise consumption. Consideration may be given to utilising the thermal properties of the building when the facility is not in use, for example at night or weekends, where circumstances permit.

10.106 Energy recovery systems should be employed when possible, and particularly on ventilation systems.

10.107 For further guidance on energy efficiency, see Health Technical Memorandum 07-02: ‘Encode – making energy work in healthcare’.

Commissioning and maintenance

10.108 It is important that, on completion of an installation and prior to hand-over, the performance of engineering services and equipment is fully commissioned to validate their function and achievement of performance.

10.109 The final acceptable performance details should be recorded and, together with full manufacturers’ details, should be made available to users and the maintenance organisation before the facilities are handed over.

10.110 Once the facilities are operational, the overall performance should again be further performance-tested when full operational conditions are achieved. This will check that

the interface between systems has not been compromised and that the systems operate to the designed criteria.

- 10.111** Risk management, operational procedures and contingency plans should be fully evaluated with staff to ensure that, in the event of an emergency,

procedures can be put in place to maximise the safety of patients, staff and visitors. Opportunities should be taken to practise these procedures when it is safe to do so, in order that staff remain fully conversant with what is required of them and can fully appreciate the issues involved.

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11 Cost information

Introduction

11.1 For all types of health building, it is important that building costs and revenue expenditure are best value and consistent with acceptable standards. In applying this guidance, the need for economy should always be of prime concern. Where appropriate, space should be shared between similar activities taking place at different times. However, this solution should not be detrimental to the proper functioning of the spaces involved nor to the needs of users.

Departmental cost allowance guides

- 11.2 Departmental Cost Allowance Guides (DCAGs) related to this Health Building Note are officially notified in 'Quarterly Briefing', published by DH (see www.dh.gov.uk). For a full listing of all DCAGs see 'Healthcare Capital Investment' on the DH Estates and Facilities Knowledge and Information Portal (KIP).
- 11.3 The attention of the project team is drawn to the 'Capital Investment Manual' (Business Case Guide) (see www.dh.gov.uk). This aims to reduce planning work and to encourage the production of sound business case support of both capital and revenue expenditure.
- 11.4 Capital works estimates should be based, wherever applicable, on industry norms, such as DCAGs plus a percentage to cover on-costs.
- 11.5 The DCAGs for this Health Building Note reflect the total building, engineering and accommodation requirements for a main renal unit located on an acute hospital site, where common services are shared. Costs are based on a typical new-build unit on a greenfield site with no planning constraints.
- 11.6 DCAGs are exclusive of VAT, building and planning fees and all local authority charges, and are based on a location factor of 1.00.

On-costs

- 11.7 An allowance for on-costs (such as communication space, external works, external engineering services and abnormalities) should be added to the DCAGs. Abnormalities will largely be determined by site characteristics (such as an inner-city location or poor ground conditions) and by the condition or type of any building to be refurbished.
- 11.8 Project teams should assess all likely on-cost implications of individual sites and schemes at the earliest opportunity.

Locational factors

- 11.9 Locational factor adjustments should be applied to works costs (that is, DCAGs plus established on-costs) to take account of local market conditions. For further information, see 'Quarterly Briefing'.

Schedules of accommodation

- 11.10 The schedules of accommodation for this document are held on the schedule of accommodation database on the DH Estates and Facilities Knowledge and Information Portal.
- 11.11 The schedules show example notional whole department accommodation. The examples are not to be taken as ideal provision for any particular project. Each example has been divided into functional units as defined in [Chapters 4–9](#).

Dimensions and areas

- 11.12 The critical dimensions of an area are determined by the spatial requirements of any activities to be carried out within it.
- 11.13 Space requirements for various generic activities appear in Health Building Note 00-02 – 'Sanitary spaces' (forthcoming), Health Building Note 00-03 – 'Clinical and clinical support spaces' (forthcoming) and Health Building Note 00-04 – 'Circulation and communication spaces'.

11.14 Planning teams should have data available at the earliest stages of a project to enable the approximate assessment of sizes involved. Areas used for the purpose of establishing cost allowances are listed in the schedules of accommodation. These areas do not represent recommended sizes and should not be regarded as specific individual entitlements.

11.15 The efficient planning of a building may necessitate a variation to the areas given. For example, in the refurbishment/conversion of older property:

- rooms tend to be larger than the areas given;
- some rooms may be too small or in the wrong location for efficient use;
- circulation space tends to form a larger than normal proportion of the total area.

Circulation

11.16 All internal corridors, small vertical ducts, spaces occupied by partitions/walls and other space for circulation, are costed in the DCAGs. Provision is also made for a 5% planning zone and 3% engineering zone adjacent to the external walls.

11.17 Circulation figures included in the DCAGs are those anticipated for new-build facilities. Where constraints are encountered, for example in refurbishment/conversion of older types of property, this figure may increase.

Communication spaces

11.18 Hospital “streets”, staircases and lifts (communication spaces) are not included in the DCAGs. Costs related to these elements, along with a suitable space allowance, should be covered in the on-costs.

Land costs

11.19 DCAGs are exclusive of all land costs and associated fees. However, costs associated with land costs should be included in business case submissions (as detailed in the Capital Investment Manual) and may therefore have an important impact on the overall cost viability of a scheme.

Engineering services

11.20 The following engineering services are included in the cost allowances (see [Chapter 10](#) and Activity

DataBase for further information). Primary engineering services are assumed to be conveniently available at the boundary of the department.

11.21 Mechanical services:

- Heating – low-pressure hot water system.
- Ventilation – mechanical supply and extraction to meet clinical and functional requirements, and other areas requiring mechanical ventilation such as WCs and showers (excludes ventilation plant, such as air handling units or extract fans).
- Cold water – central supply to service points including drinking water (excludes storage tanks).
- Hot water – supply from a central system (excludes storage and generation).
- Piped medical gases – oxygen, medical air (400 kPa) and vacuum.

11.22 Electrical services:

- Departmental distribution boards.
- General lighting, as required by task.
- Emergency luminaires, as appropriate.
- Socket-outlets and other power outlets for fixed and portable equipment.
- Supplementary equipotential earth bonding.
- Uninterruptible power supply (UPS) and equipment.
- Fire, security, and controlled drug cupboard alarm systems.
- Telephone internal cabling distribution and outlets (excludes handsets).
- TV/radio wireways.
- Data wireways.
- Building management system.

11.23 Equipment (Group 1):

- Controlled drugs cupboards.
- Water boiler in staff room and pantry.
- Dishwasher.

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