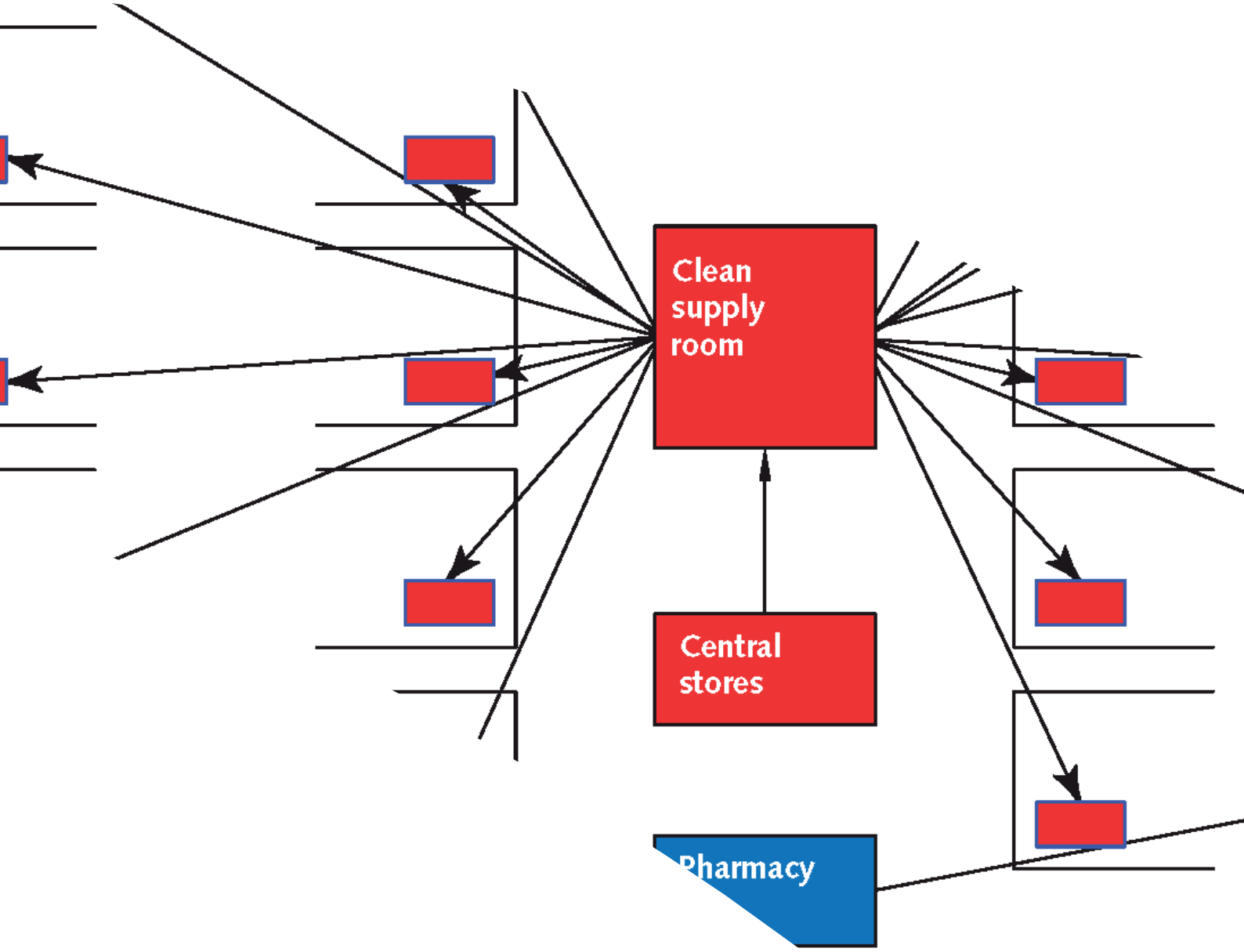
Department of Health

Health Building Note 00-01: General design principles



Health Building Note 00-01
General design principles

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.

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 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.

Health Building Note structure

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

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

Core subjects are 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 is represented as follows:

> "Health Building Note 04-01: Adult in-patient facilities"

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

> "Health Building Note 04-01: Supplement 1 – Isolation facilities for infectious patients in acute settings"

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.

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.

Note

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

Executive summary

This Health Building Note (HBN) sets out general design principles for health and community care buildings. Specific guidance for individual clinical settings is available within the clinical topic itself.

Designers should ensure that they read this HBN as a whole, since further design guidance may be outlined and cross-referenced throughout.

Gateway reference 18494: Changes have recently been made to the 'medicines storage' section of this guidance. No other parts of the guidance have been updated.

However, as a result of the full guidance not having been revised, there may be references to out-of-date legislation, and other guidance may have superseded that currently within the HBN. Consequently, care should be taken when using this guidance to ensure the most up-to-date legislation is complied with and that other guidance is verified for accuracy and relevance.

The Department intends to revise this Health Building Note during 2013/2104 to correct anomalies.

Contents

1 Strategic design issues

Master planning

1.1 Schemes must respond to their local environment if they are to be adopted by local communities. This can be achieved by ensuring that the mix of services delivered reflects local needs, and the building demonstrates appropriate levels of urban design and civic presence.

1.2 Successful design solutions will stem from a full consultation with statutory authorities and a detailed site analysis (existing patterns of built heritage, topography, sun paths, flood risk, noise etc). From this a clear site strategy should emerge, defining access, building location and mass, orientation, car parking and landscape design. The resulting design should be coherent and legible, allowing users of the building to understand how it is put together and organised as they approach it.

Design quality

1.3 The NHS places great importance on design quality, and a conscious effort has been made in recent years to raise the standards of health and community care buildings.

1.4 Currently NHS Design Reviews are available for all schemes with an outturn cost above £15m. The criteria for carrying out design reviews should be used on all schemes, regardless of size, as they provide a useful checklist of design quality requirements.

1.5 A design champion should be identified for every trust to ensure design vision is not lost as design work unfolds.

Quality of place

1.6 Successful schemes have a clear design vision, reflecting the model of care and site strategy while adding an element of delight and striking a chord with the communities that they serve. Routes to and through buildings are important, as are issues of privacy, dignity and the nature of the healing environment.

1.7 The design of most spaces within health and community care buildings will be driven mainly by functional considerations. In public areas and the external expression of the building, however, there are opportunities to create special places through the careful use of scale, materials, colour, sound, scents and lighting.

Sustainability

1.8 All buildings providing services to the public have an obligation to incorporate principles of sustainable development. 'Sustainable health and social care buildings: Planning, design, construction and refurbishment' addresses sustainable development within health and community care facilities by looking at the main issues that should be addressed throughout a building's life. It also explores the reuse of existing buildings and provides advice on possibilities for sustainable refurbishment.

1.9 Healthcare schemes are now required to use the BREEAM Healthcare methodology to demonstrate that healthcare projects are built with sustainability in mind. The threshold for capital projects requiring BREEAM certification can be found at the BREEAM website.

1.10 Health Technical Memorandum 07-07 – 'Sustainable health and social care buildings' makes extensive references to BREEAM Healthcare and offers guidance on how to comply with its criteria. See the Department of Health website and the BREEAM website for an overview of the BREEAM Healthcare methodology.

Designated emergency centres

1.11 Health and community care buildings may be designated as emergency centres for dealing with large-scale emergencies, mass casualties and pandemics, particularly outside major conurbations.

1.12 Such centres need to be resilient in terms of their engineering services, stock levels of consumables/ emergency supplies and accessibility. They also require the capacity to manage high volumes of people.

1.13 The levels of resilience and capacity required will depend on the category of emergency centre, which may change over time and ranges from high to low resilience designations.

1.14 Emergency centres should be sited above flood plains in locations with multiple access roads. They may require extended car parks or easy access to adjacent public/commercial parking.

1.15 For further information, see 'Emergency preparedness' in Health Technical Memorandum 00 – 'General engineering principles' and Health Building Note 00-07 – 'Resilience planning for the healthcare estate'.

2 Functional design issues

Infection control

2.1 The Health and Social Care Act 2008: Code of Practice for health and adult social care on the prevention and control of infections and related guidance has been introduced for NHS organisations. For primary and community settings, PCT advice should be sought on whether the code applies.

2.2 Infection control teams should be consulted from the outset of any new build/ refurbishment project and should form part of the planning team. See Health Facilities Note 30 – 'Infection control in the built environment' for guidance on the role of the infection control team. This document should be the first point of reference for planning teams.

Decontamination of equipment

2.3 The effective decontamination of medical devices is essential in reducing the risks to patients from HCAI (see section on infection control above). Facilities for decontaminating medical devices should be provided centrally.

2.4 Reference should be made to advice and guidance in Health Technical Memorandum 01-01 – 'Decontamination of reusable medical devices'. Further information can be obtained from the Medicines and Healthcare products Regulatory Agency (MHRA).

2.5 Reference should also be made to Health Building Note 13 – 'Sterile services department'.

Accessibility

2.6 Authorities should comply with the provisions of the Disability Discrimination Act (1995), the Building Regulations (including Approved Document M – 'Access to and use of buildings') and the Equality Act 2010. See also BS 8300.

2.7 Door widths into clinical spaces and clinical support spaces should generally allow for ambulant users, semi-ambulant users (including those using crutches, sticks and walking frames) and wheelchair-users.

2.8 Design teams should also refer to Health Building Note 00-04 – 'Circulation and communication spaces'.

Inclusivity

2.9 Project teams should consider the specific needs of different ethnic groups, depending on the local population. In particular, there should be:

- adequate facilities for communicating with non-English speakers, for example rooms that can be used for private communications, often involving interpreters. Sufficient telephone points should be available.
- clear signage for all those using facilities – pictorial signs are often a good solution;
- easy access to prayer facilities for all faiths;
- easy access to appropriate catering facilities (and appropriate provision for those who wish to bring in their own food).

Wayfinding

2.10 The use of colour and art to identify particular routes and rooms can help to reduce the number of signs required. Certain doors, for example fire exit doors, will require conventional labelling. Where signs are used they should not detract from the overall ambience, and should be simple yet sufficiently explicit to be understood without confusing.

2.11 Routes to public WCs should be clearly indicated using the approved international sign of a tactile embossed pictogram incorporating colour/tone contrast. The provision of maps indicating the position of public WCs may be considered.

2.12 Reference should be made to 'Wayfinding: Effective wayfinding and signing systems. Guidance for healthcare facilities'.

Delivering same-sex accommodation

2.13 The Department of Health's delivering same-sex accommodation (DSSA) programme aims to all but eliminate mixed-sex accommodation from hospitals. Although DSSA is primarily an operational issue, the design and layout of health and community care facilities can help support the provision of same-sex accommodation.

2.14 In clinical and waiting areas, planning decisions should take account of patient culture and preferences in terms of privacy, modesty and same-sex accommodation. Preservation of patients' modesty, particularly at points of transfer between changing, sub-waiting and treatment facilities, should be given high priority, and in some cases men and women should be segregated. This may be achieved operationally or by providing separate facilities.

2.15 For further information reference should be made to the letter (PL/CNO/2010/3) from the Chief Nursing Officer and Director General NHS Finance, Performance and Operations (see link below).

Security

2.16 Measures should be incorporated in the design of all health and community care buildings to help protect the safety of staff, patients and visitors and the security of the premises.

2.17 The installation of overt and well-publicised CCTV cameras should be considered for areas where there is an identified security risk. This may include public areas, entrances and exits (which may or may not be access controlled), staff-only areas and circulation routes within high risk clinical departments such as maternity and paediatric units.

2.18 The use of CCTV in healthcare premises as part of an overall integrated security strategy can help to deter, prevent and detect security-related incidents, as well as providing evidence for investigations following an incident.

2.19 CCTV can be intrusive and its operation must comply with the provisions of the Data Protection Act 1998 and the "CCTV code of practice" (Information Commissioner's Office, 2008).

2.20 Access to staff-only areas (e.g. rest rooms, changing and showering areas and staff WCs), restricted clinical areas (i.e. controlled by staff) and storage rooms should be controlled via close-proximity card or similar.

2.21 Signage should be used to deter unauthorised entry into staff-only and restricted clinical areas.

2.22 Natural ventilation and night-time cooling of spaces should not compromise security measures.

2.23 Natural surveillance can assist in the deterrence and detection of crime and contribute to a secure environment. The building design should promote natural surveillance and good visibility by enabling staff to observe their working areas without any fixtures or structures impeding their sightlines.

2.24 Research has shown that good levels of lighting can be effective in reducing the fear of crime and in some instances result in crime reduction. Lighting schemes should ensure there are no dark corners or areas that could be used as hiding places. They also need to take account of CCTV systems as they can help or hinder the identification of individuals on TV screens.

2.25 The project team should discuss security with the local police crime prevention officer and the NHS organisation's nominated local security management specialist (LSMS) at an early stage in the design process. The LSMS will be able to identify specific security risks and offer advice on measures that can be implemented to reduce them. Any plans to install CCTV or expand an existing system should be discussed with the LSMS.

2.26 The local fire officer and security management specialist should be consulted concurrently to avoid the possibility of the demands of security and fire safety conflicting.

2.27 For further guidance, see the Directions to NHS bodies on Security Management Measures 2004 (Amendment) Directions 2006 and 'A professional approach to managing security in the NHS' (DH, 2003).

Finishes

2.28 Materials and finishes should be selected to minimise maintenance and be compatible with their intended function. Building elements that require frequent redecoration or are difficult to service or clean should be avoided. Special design consideration should be given to entrances, corners, partitions, counters and other elements that may be subjected to heavy use.

2.29 Wall coverings should be chosen with cleaning in mind.

2.30 The choice of finishes should form an integral part of the design process and be co-ordinated within the overall design scheme. The selection of colours and reflectances can have a significant impact on the lighting within the room and will need to be coordinated with the lighting design.

2.31 Finishes should be functional and compatible with the need for comfort, cleanliness and safety. Cleaning regimens should be considered when materials are selected.

2.32 See the 'Revised Healthcare Cleaning Manual' for best practice cleaning methods, which should influence the choice of finishes. The advice of the infection control team should be sought on this matter.

Visual and colour contrast

2.33 Visual contrast is as important as colour contrast, as some people with visual impairments confuse different colours of similar tone. Monochromatic colour schemes should be avoided.

2.34 Approved Document M defines visual contrast by referring to a difference in light reflectance values (LRV). Where this website refers to visual contrast, reference should be made to the latest values in Approved Document M.

2.35 Floor colours should contrast visually with wall colours.

2.36 Fittings should contrast visually with the surface to which they are fixed and the surface against which they may be viewed.

2.37 For detailed information on the use of colour and visual contrast, see:

- 'A design guide for the use of colour and contrast to improve the built environment for visually-impaired people' (Dulux Technical Group, ICI Paints);
- Approved Document M and BS 8300;
- 'Colour, contrast and perception – Design guidance for internal built environments' (Reading University);
- 'Building sight' (Royal National Institute for the Blind).

Natural lighting

2.38 Scientific evidence indicates that daylight has beneficial effects on patients (see 'An investigation to determine whether the built environment affects patients' medical outcomes'), visitors and staff. It has been shown to reduce psychological problems and improve patient outcomes, and increase morale and reduce sickness levels amongst staff.

2.39 An external view is also beneficial, even if limited. Windows with no significant view are preferable to no natural light at all.

Natural ventilation

2.40 Use of natural ventilation is encouraged wherever possible.

2.41 The use of natural cross-ventilation (reliant on window openings on opposing sides of the building) is in line with reducing carbon footprints but may conflict with requirements for acoustic privacy. Project teams should consider this issue on an individual scheme basis, balancing specific privacy requirements against the capital and revenue cost benefits, as well as the improved sustainability profile, that a naturally ventilated solution can offer.

2.42 Building orientation and design and the use of designed-in background noise can be used to mitigate against the potentially adverse effects of natural cross-ventilation.

2.43 Natural ventilation should not be considered where it could jeopardise control of infection issues.

Art

2.44 There is sufficient evidence to demonstrate that appropriate art and decor reduces the physical and emotional stress of patients and staff. It can also be used to assist wayfinding.

2.45 Art need not be limited to pictures on a wall. It may also include murals, prints, photographs, sculptures, decorative tiles, ceramics and textile hangings. Works of art by local artists and craftspeople may lend a special identity to the facility.

2.46 Artworks should be easy to clean and as dust-free as possible. Design teams should seek the advice of the infection control team. Art should be integrated into a scheme rather than being added as an afterthought. It should work with the building and

landscape design to create a positive experience for users.

2.47 On larger projects it may be beneficial to appoint an arts co-ordinator at an early stage to ensure that a comprehensive arts strategy is established and that artwork is properly integrated into the building fabric. The possibility of involving the local community in the production of artwork should be explored.

2.48 The following documents provide useful guidance on the use of art in healthcare premises:

- 'A prospectus for arts and health', Arts Council England 2007;
- 'Arts and community engagement in LIFT', Community Health Partnerships 2007;
- 'The art of good health – A practical handbook', NHS Estates 2002;
- 'The art of good health – Using visual arts in healthcare', NHS Estates 2002.

2.49 The Arts Council may be approached for advice on funding. For further details go to their website.

3 Building components

Flooring, walls/partitions and ceilings

3.1 The performance requirements for flooring, walls/partitions and ceilings are given in Health Building Note 00-10 Parts A, B and C.

Doors and frames

3.2 Materials used for doors and frames should be able to withstand frequent impact from mobile equipment and should be easily cleanable.

3.3 All double-swing doors should incorporate appropriate glass vision panels; however, privacy, safety and other considerations may require the panels on bedroom doors to be capable of being obscured, possibly with integral blinds.

3.4 The primary opening leaf of a swing door should be side hung with the leading edge of the door in the middle of the room, not the corner.

3.5 Ironmongery should not conflict with clear opening width requirements for access.

3.6 Where necessary it should be possible to secure doors in the open position. In the case of fire doors, this should only be by means of an approved or recognised product linked to the fire alarm and detection system, which is designed to fail to safety. Magnetic door retainers should not restrict the movement of traffic.

3.7 Reference should be made to Health Technical Memorandum 58 – 'Internal doorsets', Health Building Note 00-04 – 'Circulation and communication spaces' (for guidance on clear width requirements for access) and Health Technical Memorandum 05-01 – 'Managing healthcare fire safety'.

Windows

3.8 Guidance on types of window and on the safety aspects is available in Health Technical Memorandum 55 – 'Windows'.

3.9 In addition to the guidance and various statutory requirements, the following issues require consideration:

- daylight and natural ventilation;
- safety;
- attenuation against noise;
- user comfort;
- energy conservation;
- solar control;
- the prevention of glare; and
- the provision of a visual link with the outside world balanced with the need to obscure the views into some areas from the outside.

3.10 Windows in single-bed rooms should be openable but with safety restrictions. They should be double-glazed as a minimum to provide thermal and sound insulation.

3.11 It should be possible for cleaners to gain easy access to the inside and outside of windows.

4 Generic clinical and clinical support spaces

Principle of using generic spaces

4.1 Generic rooms are designed to accommodate a range of activities rather than being tailored for a single function/speciality or narrow range of functions.

4.2 Clinical and clinical support rooms should be generic wherever possible to maximise flexibility in use. Generic rooms make up a high proportion of the spaces within healthcare buildings.

4.3 Clinical spaces are spaces where is patient/staff contact with one or more practitioners. Most of the generic clinical spaces covered by this website may be described as multifunctional. Some are also multidisciplinary. Generally, generic clinical spaces should not be assigned to individual practitioners but shared by a range of practitioners on a timetabled basis. They are not intended to act as a permanent office/base for any one practitioner.

4.4 Clinical administration may take place at computer workstations (that is, a desk or desktop with a computer and telephone). Shared workstations may be provided for those requiring short-term and/or intermittent access to office space. Where workstations may be shared this should result in spaces being more fully utilised than would be the case if dedicated workstations were provided.

4.5 Most of the room layouts of generic spaces on this website are informed by one or more ergonomic drawing (the colour-coding on the room layouts relates to ergonomic information).

4.6 Both the ergonomic drawings and room layouts aim to enable spaces to be designed that are fit for purpose, accessible, safe and secure. The room layouts represent example design solutions, not specific recommendations. Actual requirements should be determined on an individual project basis.

4.7 All clinical rooms have been sized to accommodate an escort.

4.8 The guidance on generic spaces is based on the professional opinion of healthcare planning and design experts and ergonomic research (published and unpublished).

4.9 Although primarily applicable to new buildings, this guidance should also be applied, where practical, when existing facilities are being upgraded.

Standardised room sizes

4.10 The size (and dimensions) of the generic room layouts on this website have been standardised wherever possible. This may mean sizing up to some extent but results in rooms that can be adapted (for alternative use) much more easily.

4.11 Experience and ergonomic analysis suggests the following room sizes provide the best fit for most generic rooms (particularly generic clinical rooms):

- 12 m^2
- 16 m^2
- 32 m^2.

4.12 8 m^2 rooms may also be useful, particularly for clinical support rooms.

4.13 For waiting areas, rest rooms and open plan office space, where a standard room size is not appropriate, this website provides a sizing methodology suitable for briefing purposes.

Use of planning grids

4.14 The example room layouts of generic spaces on this website are based on the following grid systems:

- 3900 mm – with a sub-planning grid of 300 mm.
- 3600 mm – with a sub-planning grid of 300 mm and 1200 mm.

4.15 These grids have been selected for illustrative purposes because they are in common use in the UK health sector.

4.16 The diagrammatic representations of these grids show the width and individual room depth but do not show the overall plan depth. Internal walls are assumed to be 100 mm thick.

4.17 Generally, the most suitable grid has been chosen to inform the room layouts. For some spaces, two room layouts (i.e. using both grid systems) have been produced, with the advantages and disadvantages of each layout noted.

4.18 Using a planning grid may provide planning and flexibility benefits. However, not all healthcare buildings are based on planning grids.

Couches and treatment chairs

4.19 All the couches and treatment chairs (when reclined) on the generic clinical room layouts (and associated ergonomic drawings) on this website are approximately the same length. Except for the bobath plinth, they are also approximately the same width (1900 mm long and 650 mm wide). However, couches range in size from approximately 1800–1900 mm long to 600–1060 mm wide. Where a larger couch is used, the room dimensions may need to increase to maintain the required activity space.

4.20 All allow for one or two practitioners to be positioned at separate locations for carrying out examinations or treatments.

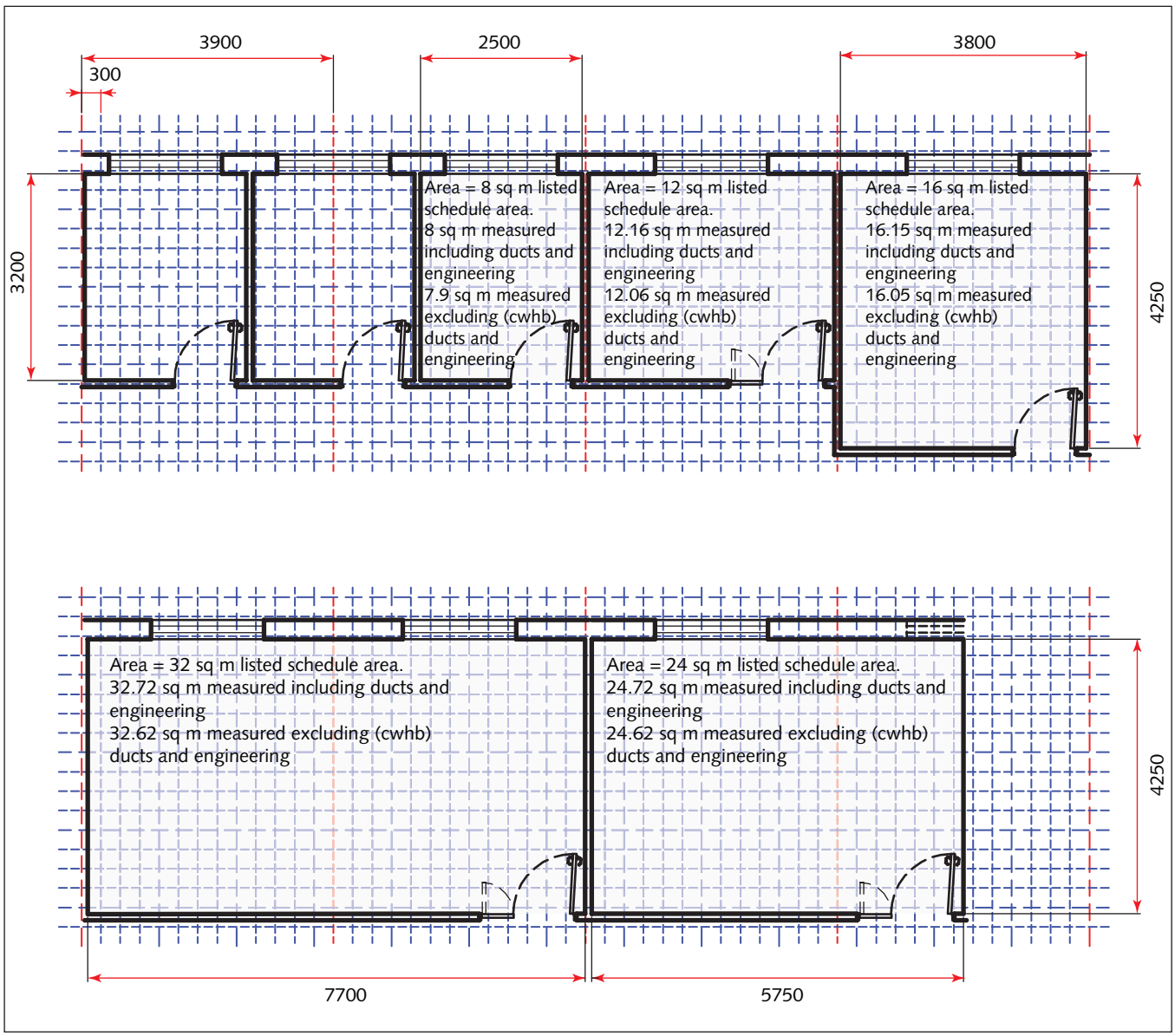


Figure 1 3900 grid

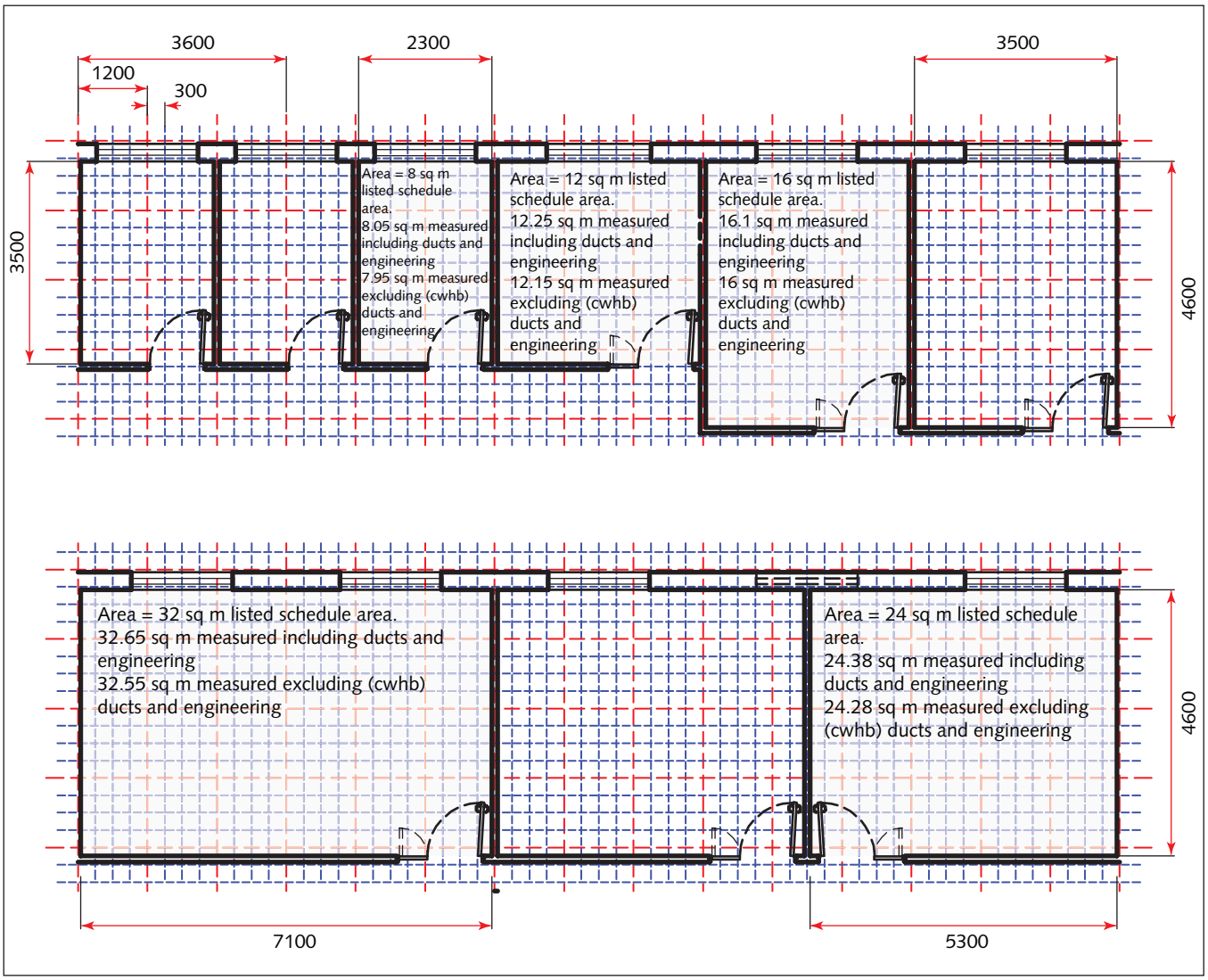


Figure 2 3600 grid

5 Supplies, storage and distribution

Distribution of clean supplies and medicines

5.1 This Health Building Note defines two methods for the distribution of clean supplies and medicines within a healthcare facilty:

- use of dispersed clean utility rooms;
- use of a single central clean supply room and a number of dispersed medicine store/preparation rooms.

5.2 The method of distribution of supplies will depend on the layout of the facility and operational considerations. The overall space requirements of both solutions are believed to be roughly the same although the use of a central clean supply room and dispersed medicine store/preparation rooms results in more efficient stocking of supplies.

5.3 It has been calculated that a reasonable provision for four 24-bed wards would be one 32 m^2 clean supply room plus four 8 m^2 medicine store/ preparation rooms. This equates, in terms of space requirements, to one 16 m^2 clean utility room per ward, which is generally accepted to be an adequate level of provision. See Figure 3.

Storage of clinical supplies

5.4 Storage facilities for clinical supplies, whether fixed or mobile, are based on the use of a modular storage system.

5.5 Modular storage systems (cabinets, trolleys or shelves) are designed to accommodate standard sized baskets or trays.

5.6 Modular storage systems can be tailored to particular requirements. They assist with segregation of supplies and stock control, and are believed to be more space efficient than standard storage systems.

5.7 In secure store rooms, unless required for hygiene purposes, cabinets and trolleys may be open. Where doors or other means of closing (roller shutters etc) are specified, a system of identifying the contents is necessary.

5.8 The choice of materials for modular storage systems should be based on test-proven performance, availability and cost. Melamine coatings and plastic foil edgings to chipboard are not recommended for healthcare buildings.

Holding supplies in clinical rooms

5.9 This guidance assumes a just-in time approach to the delivery of sterile supplies and consumables to clinical rooms (that is, restocked every 12 hours or according to demand).

5.10 The room layouts for generic clinical spaces are based on the use of supplies trolleys rather than fixed storage units. This maximises the adaptability of such spaces.

5.11 Supplies trolleys may be restocked in either a clean utility room or clean supply room. The option chosen will depend on the staff mix, and location and number of clinical rooms and/or beds served.

5.12 It is assumed that medicines will be stored in clean utility or medicine store/ preparation rooms rather than clinical rooms.

Medicines storage on acute in-patient wards

Scope of guidance

5.13 This section of the manual provides best practice guidance on storage facilities for medicines, including Controlled Drugs (CDs), on acute in-patient wards. The guidance may be applicable to community in-patient wards. Storage requirements for medicines on mental health in-patient wards may differ significantly.

5.14 The references at the end of this chapter highlight relevant legislative standards, national best practice and patient safety recommendations that apply to the safe and secure storage of medicines in hospital wards.

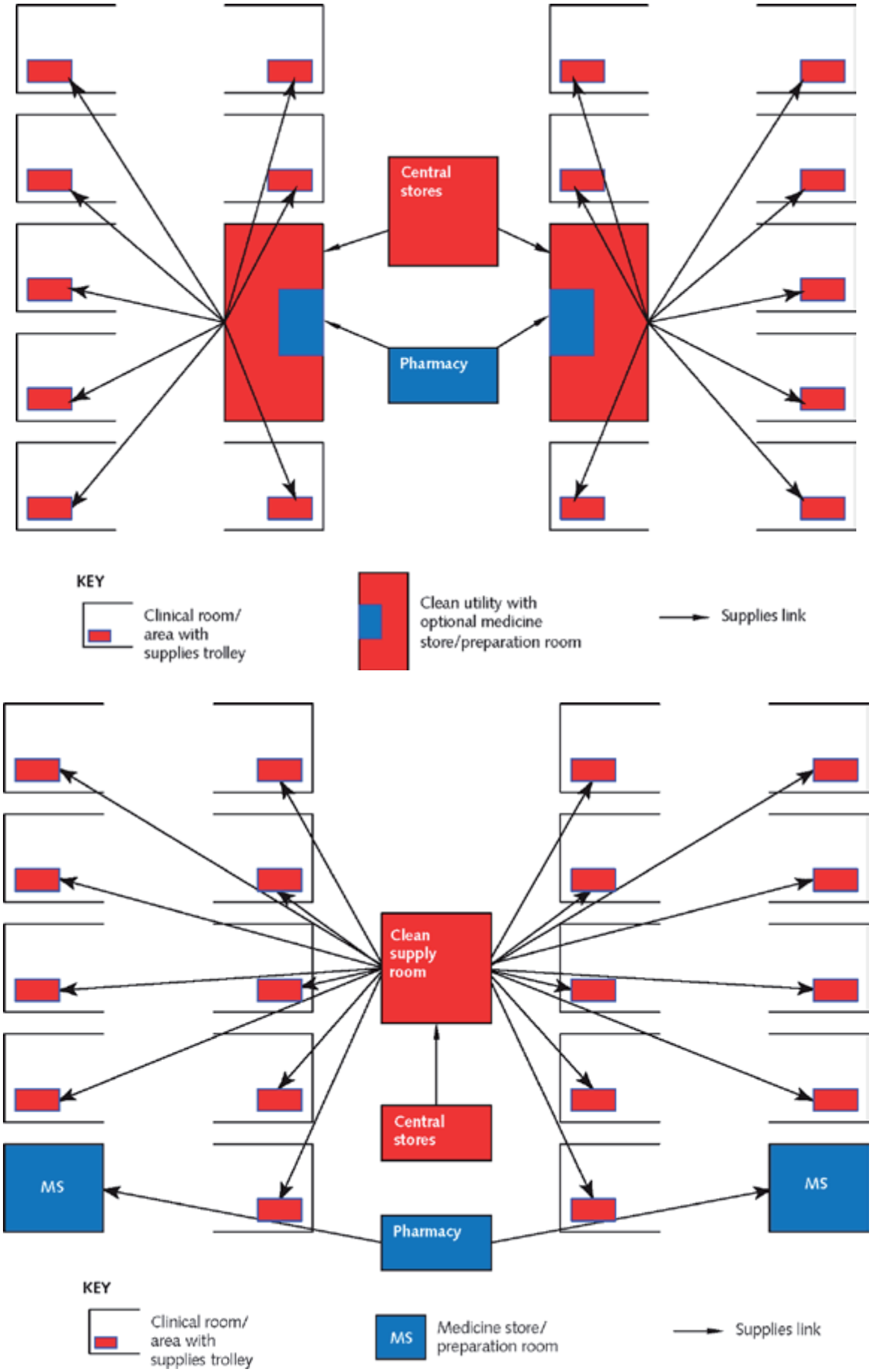


Figure 3 Clean supply and medicine store/preparation rooms – reasonable provision

Basic principles

5.15 There are important patient safety, legal, professional and security requirements to meet when providing medicines storage facilities on acute in-patient wards. Well-designed storage can minimise overcrowding, incorrect selection and missed doses of medicines.

5.16 The amount of drug storage required for any clinical area can be calculated by inspection of the medicine stock list for the specific area or similar area held by the hospital pharmacy.

5.17 The lead or nominated registered Pharmacist, Local Security Management Specialist and lead Nurse must be involved at an early stage in any plans to upgrade or build new medicines storage facilities on acute in-patient wards and must approve final plans prior to placing orders for storage systems. Failure to do this may result in the provision of unsafe, inefficient and potentially illegal storage solutions, which may result in costly retro-fits.

5.18 Periodic review of medicines storage and risk-assessment of security arrangements should be undertaken in organisations to ensure these meet the latest published standards. These should be reflected in organisational policy and procedures and monitored to minimise risk of misuse or diversion, whilst maintaining safe and appropriate access to medicines, in order to meet clinical care requirements.

5.19 Acute in-patient wards require distinct storage facilities for:

a. CDs

b. epidural and intrathecal infusions and other high-risk medicines

c. oral solid medicines

d. injectable medicines

e. oral liquid medicines and rectal medicines

f. medicines to take home

g. flammable medicines

h. medicines requiring refrigerated storage

j. external medicines and dressings

k. IV fluids

m. patients' own medicines.

5.20 The room or space where medicines are stored should be provided with Internet and intranet access (physical or Wi-Fi) and power where activities may require this, for example electronic recording of medicines administration, access to electronic references on medicines preparation, barcode scanning and electronic CD register entry.

5.21 Mobile access to IT would be necessary for medicines administration which takes place at the bedside.

Construction of medicines cupboards

5.22 Metal cupboards are recommended for the storage of medicines to ensure compliance with BS 2881. 'The safe and secure handling of medicines: A team approach' states that medicines storage systems should comply with BS 2881. The Department of Health advises all hospitals to take this report into consideration.

5.23 Trays and baskets are considered unsuitable for storing medicines (except external medicines and dressings and IV fluids) because they do not allow medicines to be adequately segregated and clearly displayed and hence may increase the risk of incorrect medicines selection.

Locks on medicines cupboards and fridges

5.24 All cupboards, closed storage units (that is, with doors) and fridges in which medicines are stored must be lockable and should be locked when not being accessed. Locks for metal cupboards (except patients' medicines cabinets) must comply with BS 3621.

5.25 All stock medicines cupboards (except CD cupboards) on a single in-patient ward should have locks that use identical keys. Multiple key copies may be available, to reduce the time needed for authorised staff to unlock the cupboards. Each patient should have a key to their own bedside medicines cabinet to facilitate self-administration of their medicines, where this is appropriate. Each bedside medicines cabinet should have a unique, suited key within that ward, with a master key for that ward suite required for nursing (and visiting pharmacy) staff.

5.26 Locking mechanisms other than keys may be used, except for CD cupboards, provided they comply with BS 3621, where appropriate. Where keypads, electronic keys or swipe cards are used to open medicines cupboards, systems should be in place to ensure codes are regularly changed or swipe cards updated (for example following an incident or staff

dismissal) and dissemination of codes are restricted on a 'need to know' basis. Doors should lock automatically on closing.

Storage requirements for specific categories of medicines

5.27 The following sections provide guidelines for the storage of specific categories of medicines. It is generally recommended that each category of medicine is stored in a dedicated or designated cupboard. This is to ensure appropriate segregation of medicines and reduce the risk of incorrect medicines being selected. 'The safe and secure handling of medicines: A team approach' supports this approach.

5.28 The cupboard sizes given are baseline recommendations for a general 24-bed in-patient ward. However, exact requirements should be determined locally, based on the agreed stock of medicines required within each area. All sizes shown are in mm and represent height • width • depth of the storage cupboard or unit.

Controlled drugs

5.29 In recent years the range and amount of controlled drugs (CDs) required to be stored in clinical area has increased. Traditional designs of quarter-size cupboards within full-sized cupboards are too small to provide suitable controlled drug storage.

- For guidance on facilities requirements for storage of controlled drugs, see the Misuse of Drugs (Safe Custody) Regulations 1973 and 'Safer management of controlled drugs: a guide to good practice in secondary care (England)'. The fixing of CD cupboards is stipulated within the Misuse of Drugs (Safe Custody) Regulations.
- A 24-bed ward area will generally only have one CD cupboard.
- Nominal cupboard size: 550 × 500 × 300. A cupboard within a cupboard is not recommended.
- The National Patient Safety Agency (NPSA) recommends that high doses (30 mg or greater) of morphine and diamorphine are stored on a separate shelf in cupboards used to store CDs. See Safer Practice Notice – 'High dose morphine and diamorphine injections' (NPSA, 2006).
- On in-patient wards that use large quantities of CDs (for example surgical wards) a larger CD cupboard is required.
- All CD cupboards should meet the Sold Secure Standard (SS) 314 – 'Specification for security cabinets' standard – silver level, which exceeds BS 2881 level 2 security. Where local discussions identify additional risks it may be necessary to consider further precautions to the surrounding environment where the CD cupboard is located. This can include placing the CD cupboard in an access-controlled room or an area that is monitored by CCTV. The access control system used should be auditable.
- Following local risk assessment, CD cupboards may be linked to an alarm/indicator system that shows when the door to the cupboard is open. Where fitted, the alarm should display at the staff communication base, or if the ward is not operational, at an alternative suitable location, for example a 24-hour security desk.

Epidural and intrathecal infusions and other high-risk medicines

- NPSA recommends that epidural and intrathecal infusions be stored in a separate cupboard or refrigerator to reduce the risk of the wrong medicines being selected. See Practice Safety Alert 21 – 'Epidural injections and infusions' (NPSA, 2007).
- As some epidural and intrathecal infusions are CDs, it is recommended that cupboards used to store these medicines be constructed to the same standard as CD cupboards.

Oral solid medicines

- It should be possible to adjust the position of the shelves within these cupboards to allow for the wide range of product sizes. Physical barriers (dividers) should be used to separate products with similar names.
- Nominal cupboard size: 600 × 1000 × 300.

Injectable medicines

- It should be possible to adjust the position of the shelves within these cupboards to allow for the wide range of product sizes. Physical barriers (dividers) should be used to separate products with similar names or packaging.
- Nominal cupboard size: 600 × 1000 × 300. Two cupboards needed.

- Some in-patient wards may benefit from a tall cupboard for injectable medicines due to the bulky nature of these products. Nominal size of tall cupboard: 1850 × 500 × 550.

Oral liquid medicines and rectal medicines

- It should be possible to adjust the position of the shelves within these cupboards to allow for the wide range of product sizes. Physical barriers (dividers) should be used to separate products with similar names or packaging.
- Nominal cupboard size: 600 × 500 × 300.

Medicines to take home

- This cupboard will be used for prepared discharge medication, which may be bulky.
- Nominal cupboard size: 850 × 500 × 550.

Flammable medicines

- Flammable medicines should be stored in lockable metal cupboards. A risk assessment should be undertaken to ascertain whether a fire-resisting cabinet is required. This will depend on the quantity and flammability of the medicines.
- Nominal cupboard size: 400 × 400 × 300.

Medicines requiring refrigerated storage

- A specially designed medicines fridge should be used. It should be fitted with a lock and fan-assisted cooling and have a temperature range of 2–8°C.
- Nominal size for under-counter fridge: 900 × 500 × 500.
- For large use areas, for example surgical wards with 3 litre total parenteral nutrition bags or renal wards, a larger fridge would be more suitable. Nominal size: 1900 × 600 × 650.
- Must have an integrated digital thermometer with maximum and minimum recording and audible alarm. Consideration should be given to providing temperature logging capability, especially where high-value stocks are held. This may be achieved via removable data loggers or Wi-Fi/hard-wired network monitoring devices.
- Must be hard wired into a fused spur.
- Glass doors can improve efficiency in product selection and reduce time the door is open in areas that have large stocks.
- On in-patient wards that store cytotoxic drugs a separate cytotoxic fridge should be provided.

External medicines and dressings

- Lockable closed storage units with trays or baskets may be used for these lower-risk medicines.

IV fluids

- Lockable closed storage units with trays or baskets or open shelving can be used for bulk storage of IV fluids (for example boxes of 20 or 50 bags). Where open shelving is used, it should be located in a locked room.
- Nominal storage unit size: 1850 × 450 × 600. Two units needed.
- Some products require protection from light.

Patients' own medicines

- Patients' own medicines should be stored in medicines cabinets beside the patients' beds. Nominal cabinet size: 300 × 400 × 150.
- Medicines cabinets may be permanently attached to a wall, or to a detachable wall plate to allow them to be transferred with patients.
- Following local risk assessment, medicines may be stored in locked bedside cabinets to facilitate access, for example for self-administration by patients who are unable to reach wall-mounted cabinets.

Note

Care is needed if medicines cabinets are integrated into bedside lockers to ensure that transposition of lockers between patients does not occur. In this situation, the patient's name must be clearly visible on the bedside locker.

Other considerations

Temperature

5.30 Most medicines require storage below 25°C, and medicines storage areas must be mechanically temperature controlled to ensure this is provided. Medicines storage must not be located near to sources of direct heat, for example radiators.

Lighting

5.31 A lighting level of 1460 Lux has been shown to reduce the incidence of errors when selecting and

preparing medicines. Medicines storage and preparation areas require this level of lighting. Appropriate switching should be provided to allow this to be operated "stand-alone", for example at night.

Working space

5.32 Medicines may be prepared in wards. Sufficient space to allow safe working is required especially for the safe preparation of injectable medicines. Work surfaces must be easily cleaned and not cluttered. At least 2 metres of such worktop is required for medicine preparation in each 24-bed ward area.

Medicines trolleys

5.33 Where medicines trolleys are used on in-patient wards, anchor points (that is, to secure the trolleys to the floor or wall) should be provided for these trolleys when not in use, or they should be secured in a locked room.

Electronic medicines storage and issuing systems

5.34 Automated electronic medicines storage and issuing systems are now available for all types of medicines, including CDs. Local discussions are essential regarding such requirements. Note: power and data connectivity will be required for these systems.

Other clinical areas requiring medicines storage

5.35 A wide range of other clinical areas in acute hospitals require medicines storage facilities. All the above principles apply, although space requirements in the following areas are likely to be significantly different from in-patient wards:

- day case units
- out-patient departments
- A&E departments
- operating theatre departments
- cardiac catheter laboratory suites
- chemotherapy units
- dialysis units.

5.36 Clear dialogue with NHS staff is essential for specialised areas.

References

5.37

BS 2881: 1989

The safe and secure handling of medicines: A team approach

Guidance about compliance: Essential standards of quality and safety

Hospital Pharmacy Standards – optimising patient outcomes from medicines

Misuse of Drugs (Safe Custody) Regulations 1973 and subsequent amends. SI 1973 No 798

BS 3621: 2007

Safer management of controlled drugs: a guide to good practice in secondary care

Patient safety Alert 01. Potassium solutions: risks to patients from errors occurring during intravenous administration

Patient Safety Alert 21. Epidural injections and infusions

Safer Practice Notice. High dose morphine and diamorphine injections

SS 314 – Specification for Security Cabinets

6 Compliance with statutory and other requirements

6.1 The guidance on this website takes account, as far as possible, of all statutory and other requirements and guidance in force or available at the time of publication. The following is intended only as a brief summary of compliance requirements.

Manual Handling Operations Regulations 1992

6.2 Manual handling and health and safety regulations relate to lifting and turning patients and moving heavy equipment. Planning and design teams should take these into account when designing facilities. Refer also to 'Moving and handling patients'.

The Construction (Design and Management) Regulations 2007

6.3 These regulations, and the related Approved Code of Practice, focus attention on health and safety planning and management throughout construction projects, from design concept onwards. Designers have a duty to eliminate hazards and reduce risks. Planning teams have a duty to provide project-specific health and safety information needed to identify hazards and risks.

Safety regulations

6.4 For health and safety regulations see 'Statutory and legislative requirements' in Health Technical Memorandum 00 – 'General engineering principles'.

Environmental legislation

6.5 See Health Technical Memorandum 07-07 – 'Sustainable health and social care buildings: Planning, design, construction and refurbishment' and the rest of the Health Technical Memorandum 07 series for further guidance.

7 Sanitary spaces

7.1 This Health Building Note, Health Technical Memorandum 00 – 'General engineering principles' and Health Building Note 00-02 – 'Sanitary spaces' provide evidence-based best practice guidance on the design and layout of recurring sanitary spaces for use in healthcare settings to cater for the needs of patients, visitors and staff. They aim to enable sanitary facilities to be designed that are safe, accessible and fit for purpose within a clinical environment.

7.2 They do not provide guidance on main public WCs or specific requirements for religious or ethnic groups (for example Muslims' ablution facilities). Where these facilities are required, other guidance should be sought.

7.3 Unless otherwise stated, sanitary facilties in public areas of healthcare premises must address the requirements of Approved Document M. However, within patient areas of healthcare premises, independent use of facilities may not be appropriate or desirable, particularly in the case of private facilites for single-person use.

7.4 Where the guidance on sanitary spaces exceeds or specifically varies from BS 8300 or Approved Document, this guidance is intended to supersede these standards for healthcare premises.

7.5 Most of the sanitary spaces described in these documents come under one of four categories:

- Ambulant: suitable for fully ambulant users (staff and visitor spaces only).
- Semi-ambulant: suitable for people who walk with difficulty and/or are physically unstable and who may use a walking aid (sticks, crutches, walking-frame etc).
- Independent wheelchair: suitable for people in wheelchairs, including inexperienced wheelchair users.
- Assisted: suitable for users who may be in a wheelchair, mobile hoist, sanitary or shower chair or may use a walking aid, who need the help of at least two staff to use the facilities (patient spaces only).

7.6 Space recommendations take account of the inexperience of some users in manoeuvring wheelchairs or using walking aids but do not take account of the use of specialist large wheelchairs or mobility scooters.

7.7 Example room layouts are provided for independent and assisted use WCs, shower rooms and bathrooms.

7.8 It is assumed that bathrooms are only required for patients (that is, shower rooms will be provided, where required, in place of bathrooms for staff and visitors). Guidance has not been provided on ambulant bathrooms because ambulant spaces are not considered appropriate for patients (the majority of whom will not be fully ambulant).

7.9 Example room layouts of a nappy changing room and accompanied changing rooms (for public use), changing rooms (staff or independent adult patient) and staff changing areas are also provided.

7.10 The example room layouts are supplemented by activity space drawings, which illustrate functional space requirements around basins, toilets, bidets, showers, baths etc for the different categories of users. See 'Element 4: Sanitary assemblies' for technical guidance on sanitary components.

7.11 The sanitary facilities described on this website do not address the need to avoid ligature points.

WCs

Provision and location of WCs

7.12 All WCs should include a toilet, wash-hand basin or hand-rinse basin, soap and paper towel dispenser.

7.13 Separate WCs should be provided for patients, clinical staff and visitors/non¬clinical staff.

7.14 Semi-ambulant, wheelchair and assisted WCs should not be located within lobby areas as space

restrictions may make entry and exit more difficult for disabled users.

7.15 Disabled users of the building (whether patients, visitors or staff) should not have to travel further, or make more effort than other users, to use a WC.

7.16 For reasons of privacy, WC doors should not open directly off busy circulation spaces and room layouts should be such that open doors do not give a view of the interior of the WC.

7.17 The use of privacy curtains inside sanitary spaces should be avoided, both to optimise the functional space within what are generally small rooms and to avoid the resultant maintenance and cleaning issues. See Health Building Note 00-04 – 'Circulation and communication spaces' for further details on privacy curtains.

Provision of independent wheelchair WCs

7.18 Independent wheelchair WCs may be provided on a unisex or "integral" basis.

7.19 With an "integral" facility, single sex facilities are provided within separate areas for males and females. This precludes assistance from a companion of the opposite sex. Where integral facilities are provided, this should be in addition to an appropriate number of unisex facilities.

7.20 A standalone unisex facility has the following advantages: may be more easily identified:

- permits assistance by a companion of either sex;
- can be used by others who require more space (such as those with a pushchair, child or guide dog).

7.21 A unisex facility is potentially less demanding of space than an "integral" facility; the integral facility effectively has to be duplicated in order to achieve the same level of provision for both sexes in any location.

Bathrooms and shower rooms

Provision and location of shower rooms and bathrooms

7.22 All patient bathrooms should include a bath, toilet, wash-hand basin, soap dispenser, towel rail and chair or tip-up seat.

7.23 All patient shower rooms should include a shower, toilet, wash-hand basin, soap dispenser, towel rail, a chair or tip-up seat in the dry area of the room for semi-ambulant use, and a tip-up shower seat in the wet area.

7.24 Shower rooms and bathrooms should not be used for the storage of hoists, weighing chairs or sanitary chairs etc. Adequate storage space for these items should be provided elsewhere within the department/facility.

En-suite shower rooms

7.25 The en-suite shower rooms described on this website are intended primarily for individual patient use with assistance. They include an adjustable-height wash-hand basin suitable for standing and seated users.

7.26 The en-suite shower room layouts are based on a series of mock-up trials, which were commissioned by the Department of Health and carried out by Robert Feeney Associates in 2006. The trials involved evaluating space requirements within en-suite shower rooms for use by ambulant and semi-ambulant people, independent wheelchair users and those requiring assistance (using rollators, sling hoists and standing/raising aids).

7.27 Some of the requirements for independent wheelchair use are incompatible with assisted use (for example the requirement to locate a hand-rinse basin adjacent to the toilet). Within in-patient healthcare environments the primary concern is to provide space and facilities for assisted use. Certain limitations/restrictions on independent wheelchair use are considered reasonable including provision of hand wipes (rather than a hand-rinse basin) from a seated position on the toilet.

7.28 This guidance generally recommends a tip-up seat within the dry area of a shower room for drying and changing. However, in the en-suite layouts, it is assumed that the toilet pan or shower seat will be used instead.

Seating in shower rooms and bathrooms

7.29 All chairs in bathrooms and shower rooms should have backrests. Wall-mounted tip-up seats, in the wet areas of shower rooms, should have wall-mounted hinged grabrails.

7.30 Stools are inappropriate, as a user's ability to balance may be impaired.

7.31 Where a wall-mounted tip-up seat is to be used, local infection control advice should be sought and consideration given to:

- the design of the seat to ensure that minimaldirt traps exist;
- the provision of a suitable cleaning regime.

7.32 The tip-up shower seat or shower chair should be padded and include a central hole to provide maximum opportunity to wash properly.

Shower floors

7.33 The room layouts of assisted and semi-ambulant shower rooms (and associated ergonomic drawings) on this website generally illustrate the minimum recommended wet floor area (approximately 100 mm outside the shower curtain line). The use of a wet floor room is a project option.

7.34 Where a wet floor system is used, the type and location of the floor gully should ensure that excess water does not leave the room, and should be easy to maintain.

7.35 The waste outlet should discharge water effectively to prevent ponding and to minimise the risk of slips and falls.

Help call reset in shower areas

7.36 Paragraph 5.4 h ii of Approved Document M states: "any emergency assistance alarm has . . . a reset control reachable from a wheelchair and the WC, or from the wheelchair and the shower/ changing seat". See also BS 8300 paragraph 12.3.14.

7.37 However,

- neither Approved Document M nor BS 8300 have included call resets within their drawings for shower cubicles;
- a reset within a shower cubicle would need to be IPX5 rating (not generally manufactured by system suppliers);
- locating a reset in the shower area runs the risk of patients groping around, eyes closed because of soap and water.

7.38 Consequently, the room layouts of shower rooms on this website have not included a reset within the shower area. This is considered a reasonable approach within a patient area where clinical staff has responsibility.

Fixtures and fittings in sanitary spaces

Dispensers

7.39 Soap and paper towel dispensers should not be positioned over taps, as this may impede the dispensing action and paper towels may become wet during hand-rinsing if they are too close to the basin.

7.40 Paper towel dispensers should not require strength to remove the paper towels. Hand dryers should be avoided, as some disabled people find them difficult to use. Where paper towels are used, a clearly-marked waste bin, which can be easily opened, should be provided. In wheelchair-accessible spaces, bins that rely on the use of foot pedals should not be used.

7.41 Toilet paper dispensers within non-assisted spaces should be within easy reach of the toilet. In spaces intended for independent wheelchair and semi-ambulant use, they should dispense individual sheets or incorporate a locking device that allows sheets to be easily torn off with one hand.

7.42 Toilet paper dispensers within assisted spaces should be located on a hinged grabrail for access by the user or nearby on the wall for access by an assistant.

Grabrails

7.43 Grabrails are used to provide support and stability when transferring horizontally, sitting down and standing up, and while adjusting clothing. They should allow for a firm grip whether wet or dry.

7.44 Horizontal, vertical and hinged grabrails should be installed to allow users to choose the rail most appropriate for their needs. The grabrail positions on the drawings on this website are generally in accordance with Approved Document M unless stated otherwise.

7.45 Hinged grabrails should lock in the vertical position, but be easy to unlock with one hand. Hinged grabrails should be capable of use with a vertical weight of 88 kg + 50% = 132 kg and a horizontal force of 155 N + 50%, that is, 233 N.

7.46 Grabrails should be provided in place of (and to act as) towel rails.

Coat hooks

7.47 Coat hooks should be provided in all WCs and bathrooms, and within the dry area of all shower rooms.

7.48 In independent wheelchair and assisted WCs there should be a minimum of two coat hooks, one at 1400 mm and the other 1050 mm from floor level for semi-ambulant and wheelchair/seated users respectively.

7.49 Coat hooks in bathrooms and shower rooms should be within reach of a seated user and positioned to ensure that clothing remains dry.

Mirrors

7.50 Mirrors should be provided within each bathroom and shower room. Where mirrors are provided above basins, full-length mirrors should also be provided nearby.

Shelves

7.51 At least two non-breakable shelves should be installed in each shower room and bathroom for holding toiletries. Shelves should incorporate a raised edge to avoid items slipping off, but should allow water to drain away. One shelf should be reachable for a seated user at the basin and the other should be accessible from the bath or shower. Consideration should be given to the use of modular/adjustable shelving.

Shaver sockets

7.52 A shaver socket should be provided in all bathrooms and shower rooms, adjacent to a mirror and accessible from a seated position (800-1000 mm from the floor).

Doors into sanitary spaces

Outward-opening doors

7.53 Doors into sanitary spaces, in all accessible and patient areas, should open outwards. There should be adequate clearance for doors to open without hitting people waiting outside the cubicles/rooms.

7.54 In public spaces, doors closers should be fitted to prevent outward-opening doors to sanitary rooms being left ajar and causing a hazard (rising butt hinges are not acceptable). Acoustic seals on doors should not interfere with the use of door closers.

Inward-opening doors

7.55 If an inward-opening door is unavoidable:

- the room depth should be increased so that the door swing does not interfere with use. (see BS 8300 and/or seek professional guidance on specific space requirements);
- the door should also be able to open outwards to enable access in an emergency (an inward opening door does not function if a user has fallen against it).

Power-operated doors

7.56 Consideration may be given to the use of power-operated doors, which would negate the requirement for door closers in public spaces.

Privacy and dignity of sanitary spaces

7.57 Doors to sanitary facilities should be lockable from the inside but capable of being opened from the outside in an emergency.

7.58 The sound attenuation of doors, ceilings and partitions of sanitary rooms/facilities should ensure the privacy and dignity of users. Toilet and shower facilities should be provided in self-contained, full-height spaces. See Health Technical Memorandum 08-01 – 'Acoustics'.

7.59 The entrance and layout of sanitary facilities should be carefully considered to ensure that when the entrance door is open it is not possible to directly see into the facilities from adjacent spaces that may be occupied.

7.60 The use of privacy curtains inside sanitary spaces should be avoided, both to optimise the functional space within what are generally small rooms and to avoid the resultant maintenance and cleaning issues. See Health Building Note 00-04 – 'Circulation and communication spaces' for further details on privacy curtains.

8 References

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