

## **Scottish Health Planning Note 22**

Accident and emergency facilities for adults and  
children

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**Disclaimer**

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## About this series

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The Scottish Health Planning Note series is intended to give advice on the briefing and design of healthcare premises in Scotland.

These Notes are prepared in consultation with representatives of NHSScotland and appropriate professional bodies. Scottish Health Planning Notes are aimed at multidisciplinary bodies engaged in:

- designing new buildings;
- adapting or extending existing buildings.

Throughout the series, particular attention is paid to the relationship between the design of a given department and its subsequent management. Since this equation will have important implications for capital running costs, alternative solutions are sometimes proposed. The intention is to give the reader informed guidance on which to base design decisions.

This document was adapted by Health Facilities Scotland from the core text provided by NHS Estates, England.

It is acknowledged that the title Accident and Emergency (A&E) does not necessarily follow current thinking, that the word 'Accident' should be dropped. Nowadays, units are sometimes referred to as Emergency Departments, Emergency Medicine or Emergency Receiving. As the English guidance has retained the Accident and Emergency title and all the direction signs on public roads indicate routes to A&E, it was decided in the meantime to retain the same title for this document.

## Aims and objectives

This document is aimed at a broad audience and covers the subject from its clinical and operational roots through to the design and equipping of emergency departments.

The key role is to report on the built environment required to implement the planning, construction, commissioning and operation of a new or upgraded facility. This extends to improving the built environment in which care is delivered, to promote efficiency and raise service quality. This document attempts to cover all the facilities which may be included within an A&E department. Some may not be required or may already exist within an adjacent department.

This document also aims to employ innovation in the built environment, advancing the modernisation of diagnosis and treatment in order to provide an environment that is genuinely sympathetic to the needs of all users and recognises the broad range of activities present and their significance.

Designers must comply with DDA, particularly Part 3, which requires all new buildings and upgrades are fully accessible to all people with a disability. This legislation underlines architects, planners, building owners and users responsibilities.

## Overview of the subject

This guidance covers facilities for emergency care located within an Accident and Emergency (A&E) department in an acute general hospital, which functions 24 hours per day, seven days per week, is consultant-led, and treats and cares for people of all ages.

Generally this guidance is based on the 'see and treat' best practice model which has been adopted in England and Wales. This is the model which is increasingly being adopted in Scotland and involves assessing and treating patients with relatively minor problems as soon as they arrive in the department.

The standards set out in this guidance essentially apply to new-build facilities. However, the principles are equally valid, and should be applied when existing accommodation is being upgraded or new accommodation is being constructed within an existing building that may previously have been used for other purposes.

It excludes minor injury units, Walk-in-Centres (WiCs), and primary healthcare facilities that are not integral to a bespoke A&E department situated within an acute general hospital. However, some NHS Boards, taking into consideration demographics and geographical spread of their facilities, may wish to consider the co-location of one or more of these in the interests of efficiency and service delivery.

It describes the optimum design and functional requirements of an A&E department where 50,000 patients attend per year, but the Schedules of Accommodation include information for different ranges of attendances. Planning teams should consider the provision of a separate children's area with its own dedicated entrance for all departments with an attendance of over 70,000 per year.

Boards should check the Department of Health's Knowledge and Information Portal (KIP) website for up-to-date sample Schedules of Accommodation.

Reference may be made to HBN 23 'Hospital accommodation for children and young people' which can be used with general caution in Scotland until such time as a Scottish version is produced.

This document gives guidance on general and specific design considerations in patient and support areas. It also covers general functional design requirements and engineering services in some detail.

Some example room layouts are provided in the Appendices, along with a comprehensive list of useful references and a glossary of abbreviations.



NHS Boards must ensure that everyone involved in the planning and design process has access to all NHS guidance relating to A&E departments. Where direct access to documentation is not possible electronically then copies should be made easily available in the project information room or website.

## 1. Scope of SHPN 22

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### Influences

- 1.1 The A&E Modernisation Programme ensured that A&E departments were providing maximum benefit to patients and staff and best value for money in five main areas:
- increasing the circulation space in clinical treatment areas, most particularly in resuscitation rooms;
  - installing technology for telemedicine and other IT developments;
  - increasing the level of security;
  - improving facilities for babies, children and young people;
  - identifying ways in which to increase the privacy and dignity of all patients.

### The service model

- 1.2 The service model covers both the built environment and the way in which non-clinical support services are delivered. Targets for waiting times in A&E can only be met by optimising patient flow through the department, with minimal restrictions to the delivery of care.
- 1.3 In England, the 'See and Treat' system has been designed to reduce waiting times and improve the patient's experience in A&E departments. Increasingly this system is being implemented in Scotland although some emergency departments may continue in the meantime with the 'Registration, Triage and Treatment' model. The 'See and Treat' model is based on the principle that on arrival in A&E, patients are seen, treated and referred for further assessment or discharged. Currently in Scotland this takes in about 65% of A&E attendances. More seriously ill patients, or those who require in-depth assessment or treatment, should be streamed to, and dealt with in, a separate area. Under this system the prioritisation of patients in terms of 'safe' waiting times is unnecessary. For further details refer to 'See and Treat', NHS Modernisation Agency, 2002 (<http://www.modern.nhs.uk/emergency>).
- 1.4 Patients are streamed into the following categories:
- simple injuries or illnesses;
  - further assessment of those with more serious or complex conditions;
  - resuscitation.

## Patients with simple injuries or illnesses

- 1.5 Designers should recognise that these patients, most of whom arrive by their own means, form a large proportion of those who attend A&E departments, although they are unlikely to require subsequent admission to hospital. Clinicians are able to assess, diagnose, reassure, and treat, if appropriate, many of the patients in this stream. Most patients will be discharged at this stage.
- 1.6 Other patients will need further intervention or tests. Direct access or teleradiology links will be needed for specialist staff, for example radiologists, cardiologists etc.
- 1.7 Immediate referral of some patients to specialist teams, for example to paediatricians, surgeons or physicians, may be necessary. For other patients who have been transferred to the treatment room it may be more appropriate for the A&E staff to order tests and await the results before a decision to refer is made.

## Patients requiring further assessment

- 1.8 These patients may arrive by ambulance or may self-refer. A number will arrive on stretchers, but others will be walking or in wheelchairs. Many will have been assessed by paramedics in the ambulance.

## Patients requiring resuscitation

- 1.9 Many patients arriving by ambulance will be taken to the resuscitation room. Others will be transferred from treatment rooms if their condition deteriorates. Babies, children and young people needing resuscitation will require an appropriately equipped area.

## Babies, children and young people

- 1.10 Typically, 25–30% of patients attending A&E departments are children. Children undergo the same streaming process so that early discharge to self-care and treatment by primary care practitioners is available when appropriate.
- 1.11 The design of facilities should seek to minimise stress in children whilst ensuring that they do not become an isolated stream.
- 1.12 Young people with simple injuries or illnesses, or those requiring rapid assessment, will follow a similar journey to adults but will be examined and treated in designated child-friendly assessment and treatment rooms. Babies and young children are prioritised within their stream especially at night.

*“There should be provision for them to be examined, parents interviewed and counselled away from the immediate hustle and bustle of acutely ill adults.”*  
(Professor Al Aynsley-Green, National Clinical Director for Children).

- 1.13 Some babies and young children, who may be critically ill, will arrive by means other than by ambulance. It is essential that they are able to gain immediate access to the treatment areas, including the children's resuscitation room if necessary.
- 1.14 In a few large departments, facilities may be provided for staff specialising in caring for children, including for example nursery nurses, play specialists and others who are able to supervise young people. Generally these specialists would require to have dual roles in order to be fully utilised when no children are present.
- 1.15 Planning teams should consider the provision of a separate children's A&E facility for all departments with an attendance of over 70,000 per year. Reference should be made to Emergency Care Framework for Children and Young People published by the Scottish Executive 2006.

### Impact on the built environment

- 1.16 The service model has major implications for the design of A&E departments including:
- the introduction of individual assessment rooms where patients with simple injuries or illnesses are seen. In this room they are attended to, treated and referred or discharged by one clinician;
  - the introduction of individual treatment rooms where more seriously ill patients or those requiring in-depth assessment or treatment are attended to, unless they require resuscitation, when they will be taken to the resuscitation suite;
  - the introduction for adults of a Clinical Decision Unit (CDU) or observation unit, where patients who need further assessment with access to diagnostics are accommodated for a number of hours before being discharged or transferred to other in-patient accommodation. The concept allows patients to be accommodated in an area that would constitute 'admissions'. No guidance on the accommodation required in a CDU is currently available. Facilities should be developed in relation to local service delivery requirements.
  - that ideally children should be looked after by paediatrically trained nurses and for very simple investigations should have their own dedicated waiting area.

### The patient's journey

- 1.17 In designing new facilities it is essential to understand the journey the patient makes through the department. This will vary depending on the means of arrival, the clinical condition, and whether the patient is an adult or a child.
- 1.18 When patients arrive on foot or by public or private transport (see [Figure 1](#)):

- great care must be taken to ensure adequate provision of clear signage, both internally and externally. Patients attending A&E must not have to search for directions as many will be upset and disorientated;
- patients will arrive at the main entrance to the A&E department;
- from there they will go to the reception area where they will be greeted and either directed to an assessment room, or asked to wait a short time before being called to the next available assessment room. A small number of patients will need to be transferred immediately to the treatment or resuscitation room;
- registration, assessment, examination, and minor treatment if appropriate, will take place in the assessment room. Tests will not take place here. The majority of patients are fit to be discharged at this stage;
- other patients will be taken to a treatment room for tests, more extensive clinical examination and treatment;
- some patients may be moved to the clinical decision unit/observation unit for a number of hours depending on local decision. In some instances they may be admitted directly to an acute ward (see SHBN 4 'In-patient accommodation: options for choice').

1.19 When patients arrive by ambulance (see [Figure 2](#)):

- patients arriving by ambulance who require a stretcher will normally be taken to the treatment room or if necessary to the resuscitation room.

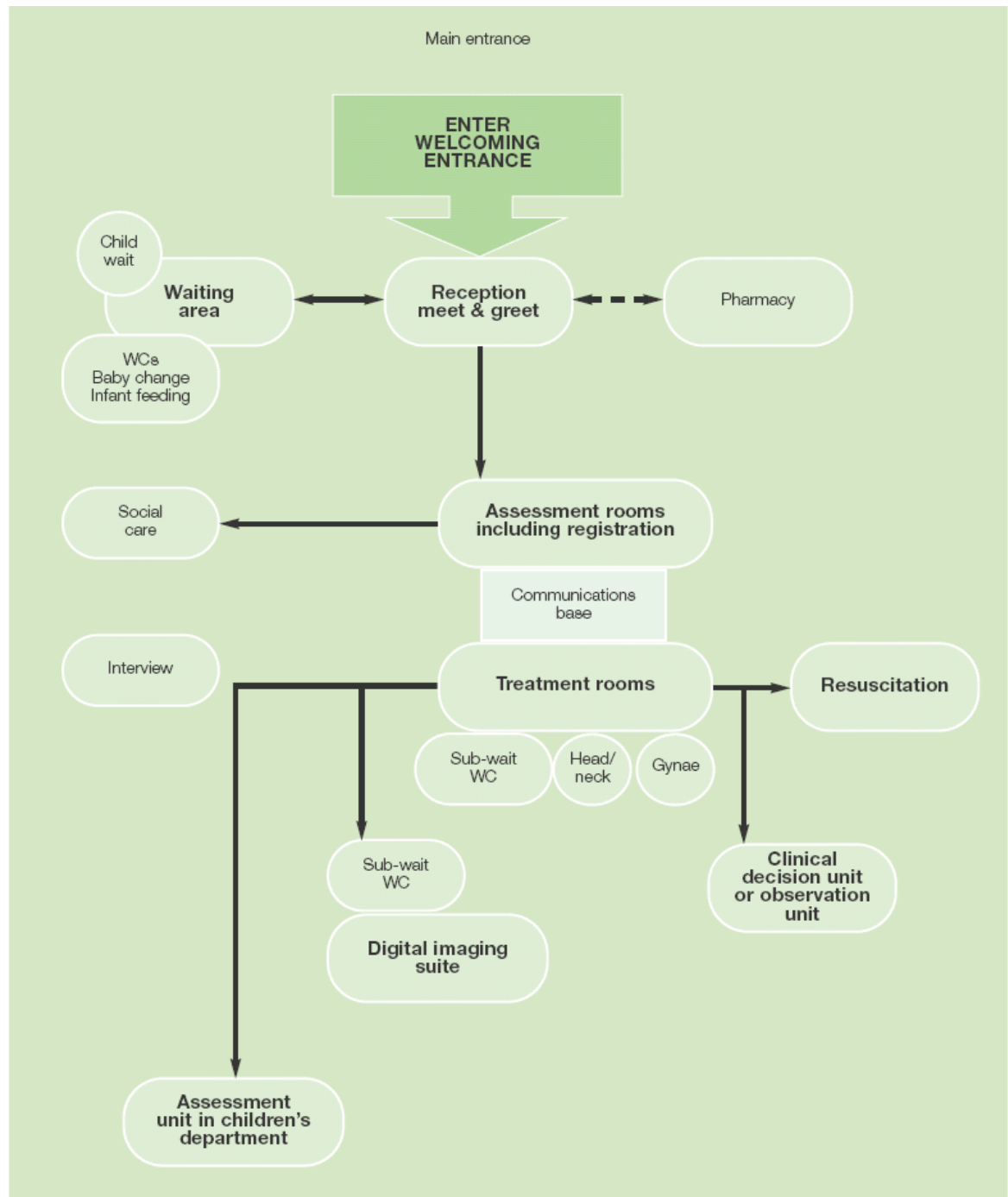


Figure 1: Relationship of rooms and areas to the main entrance where patients arrive on foot or by public or private transport. NB this is an example only.

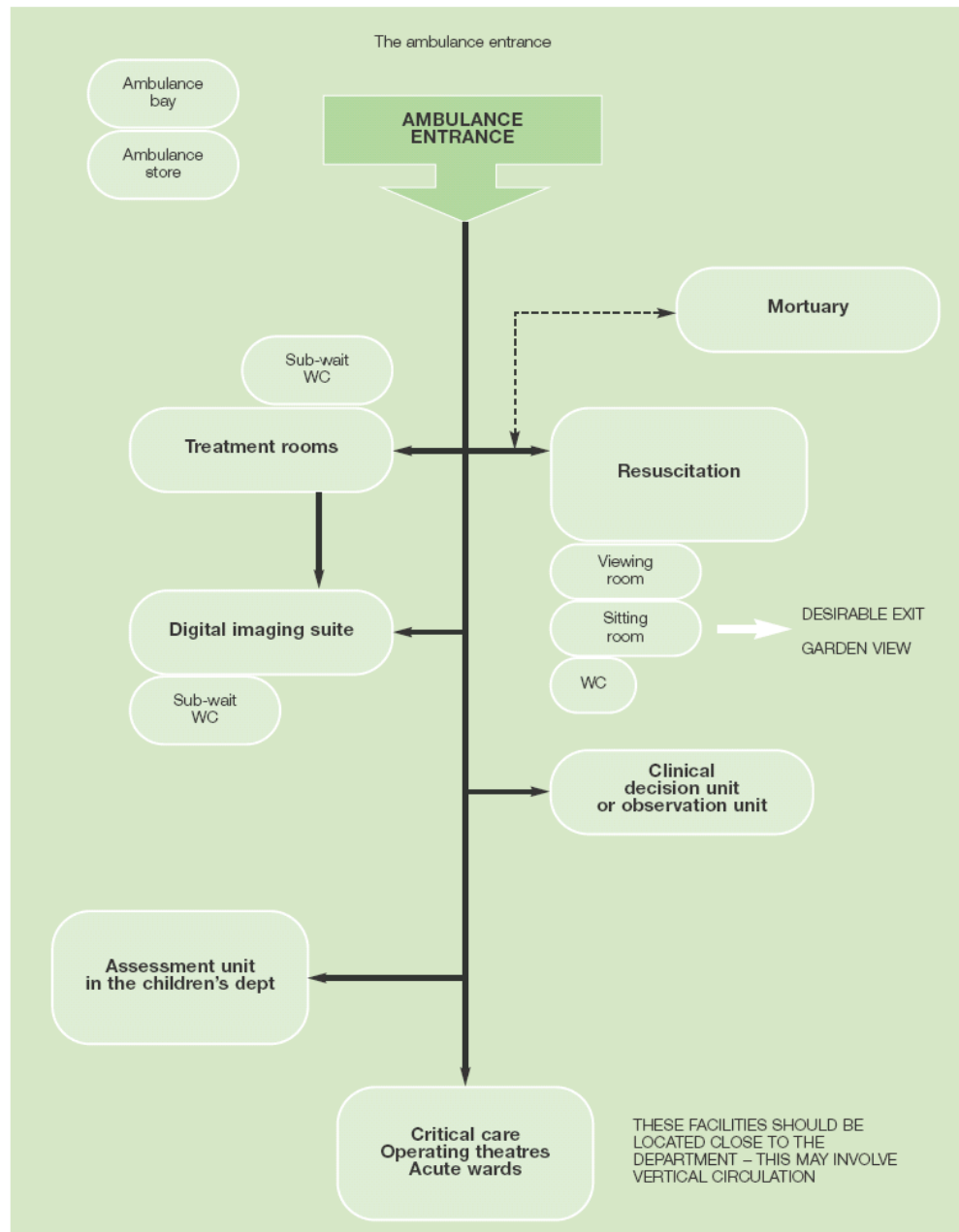


Figure 2: Relationship of rooms and areas for patients arriving by ambulance. NB this is an example only.

## Scope of this guidance

- 1.20 The guidance covers facilities for emergency care located within an A&E department in an acute general hospital, which functions 24 hours per day, seven days per week, is consultant-led, and treats and cares for people of all ages. It reflects current good practice and anticipates future needs.
- 1.21 The standards set out in this guidance essentially apply to new-build facilities. However, the principles are equally valid, and should be applied, where practicable, when existing accommodation is being upgraded but user agreement/approval is essential if full implementation cannot be achieved due



to existing building constraints. This would also apply to new construction within an existing building that had been used for other purposes.

- 1.22 It excludes minor injury units, Walk-in-Centres (WiCs), and primary healthcare facilities that are not integral to a bespoke accident and emergency (A&E) department situated within an acute general hospital. However some NHS Boards, taking into consideration demographics and geographical spread of their facilities may wish to consider the co-location of one or more of these in the interests of efficiency and service delivery.
- 1.23 It describes the optimum design and functional requirements of an A&E department where 50,000 patients attend per year. For Schedules of Accommodation, including different ranges of attendances, see [Section 7](#).
- 1.24 This guidance should be used by all design teams involved in the design of emergency departments. For PFI/PPP projects the guidance should be assessed by the Board/Client and any modifications required should be clearly indicated within the Client's requirement documentation for the project.



Welcome flooring, Hillingdon Hospital Image



## 2 The built environment – general functional and design considerations

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### Considerations at the initial planning stage

- 2.1 The following criteria are essential in a new-build or newly refurbished A&E department:
- the building should be fit for the purpose intended;
  - the building will facilitate the outcome of clinically safe and effective care;
  - it must comply with all current guidance on prevention of Hospital Acquired Infection (HAI);
  - it should be aesthetically and environmentally pleasing;
  - the building should be acceptable to the patients and their carers, as well as to the staff who work in it;
  - it should be capable of adapting to change.

These criteria are an appropriate framework for each planning team to adopt from the outset of their discussions.

- 2.2 There is no single model for the organisation and delivery of A&E services within acute general hospitals that is appropriate for implementation. Each locality will have its own specific requirements and needs.
- 2.3 When preparing an outline business case, local planning teams should:
- consider the broader healthcare system, including geographical location, proximity and function of other healthcare facilities such as a Walk-in Centre or minor injury unit within the locality;
  - consider the relationship with other hospital departments;
  - undertake a risk assessment of the likelihood and probable nature of major incidents (for example proximity to motorways, airports, railway stations, industrial estates, sports and leisure centres, holiday locations), and any seasonal peaks and troughs in demand for care;
  - project the number of patients who will attend the department every year, together with some anticipation of case mix;
  - consider flexibility and possible requirements for future expansion.

### Siting the A&E department

- 2.4 Ease of access to the department is a prime consideration. An integrated public transport system is required, and appropriate provision must be made for the

safe transfer of people from bus stops, taxi ranks, drop zones and car parks to the main building entrances.

- 2.5 Directions to A&E departments must be clearly signposted on major road routes, and directional signs should continue onto the hospital site right up to the entrance to the department itself. All public signs on the hospital site should always be signed as either 'Accident and emergency' departments or, where appropriate, 'A&E' departments. Other variants are not acceptable. The importance of clear way finding cannot be over emphasised. NHSScotland guidance, 'Way finding (2001): effective way finding and signing systems – guidance for healthcare facilities' must be consulted at the earliest stage of any project so that a co-ordinated internal and external way finding strategy can be prepared.
- 2.6 Wherever possible, the A&E facilities must be situated on the ground floor.
- 2.7 The forecourt should be large enough to accommodate sufficient ambulances to meet local needs. Pass-through ambulance parking bays should be provided close to the entrance so that bays beneath the entrance canopy can be vacated as soon as possible. Ambulances should never have to reverse in the vicinity of these facilities. The design must ensure the separation of pedestrian routes from the vehicular traffic, which may not always be driving carefully and slowly.
- 2.8 Although a number of patients arrive by ambulance, the majority will arrive using other means of transport. Easy and unobstructed access to the A&E department is essential at all times for all patients, although there is a need to balance open access against security considerations (see and pick up 'Effective management of security in A&E', DH, 1997). A monitored drop off zone will be required together with some private car short stay parking for disabled drivers.
- 2.9 The most important considerations regarding accessibility are:
- the entrance should be well signposted and easy to find, adequately sized, and offer level and unobstructed entry;
  - the main entrance should be well lit, staff and patient friendly and signed in such a way that patients and their escorts can find their way immediately, avoiding any confusion with the ambulance entrance. Ideally, patients accessing the main entrance should not have to pass the ambulances offload area;
  - each entrance should have a canopy so that patients are offered protection from adverse weather conditions as they transfer from ambulances, taxis or private transport;
  - consideration could be given to fitting the ambulance entrance with isolatable drainage and roller curtains to act as an external decontamination area. This has successfully been done in other countries and is consistent with the notion that all possible high-risk contaminated casualties should be decontaminated prior to entering the hospital. Currently most Scottish departments have been supplied with inflatable mobile decontamination units in order that this can be done. Internal decontamination facilities are

still required but these should be used for lower grade risk contaminated casualties for secondary decontamination.

- 2.10 The access needs for babies and young children are very similar to those of people with a disability in that the parents or carers require sufficient space in each parking bay. Space is required to enable them to lift children in and out of cars. Lack of designated 'child spaces' located close to the A&E department is a cause of criticism amongst the general public (Tope et al 2001). At the design stage consideration must be given to:-
- the requirements for car parking spaces reserved for people with a disability. These should be designed in line with SHPN/HBN 40 and provide transfer space at both sides and the rear of cars to allow for the use of wheelchairs;
  - the provision of car parking spaces reserved for parents or carers arriving with young children. These should be designed with sufficient transfer space at both sides and at the rear of cars to allow for the use of
  - all parking will be provided in line with the local NHS Boards transport policy and must be clearly signposted;
  - the design of the A&E forecourt must ensure clear easy access for emergency vehicles and that cars and other vehicles are not able to park on pedestrian routes or block access to A&E;
  - the provision of a drop-off zone close to entrances for taxis or cars dropping off patients, which will include elderly or infirm;
  - consideration should be given to the provision of call facilities to request assistance for people on their own who need help from a porter or member of staff.
- 2.11 Patients may in some cases be brought or transferred by helicopter ambulance. Consideration should be given to the provision of landing facilities and transfer arrangements at the planning stage of any project.

## Relationships with other hospital specialties

- 2.12 For A&E departments to function safely and effectively, immediate access to key supporting specialties is essential (see [Figure 3](#)). It is desirable that diagnostic imaging and A&E departments are in close proximity. The following services should be available on the hospital site as a minimum (BAEM 1998):
- critical care;
  - operating theatre and anaesthetics;
  - acute medicine;
  - acute surgery;
  - orthopaedic trauma;

- child health;
- 24-hour access to imaging, including CT scanning;
- on-site laboratory services.

## Privacy and dignity of patients

- 2.13 The privacy and dignity of each patient should be maintained at all times whilst allowing for adequate observation of patients by staff. From a clinical perspective the need for staff to have a clear, unobstructed view of a patient in certain circumstances is without question. This should be balanced with a person's right to privacy.

## Needs of people with disabilities

- 2.14 It is essential to ensure that suitable access and facilities are provided for people who have problems of mobility or orientation. These include, but are not restricted to, people who use a wheelchair, those who have difficulty in walking, and those with a visual or hearing impairment. Consideration should be given to the space requirements for powered wheelchairs, which are now in common use and may require greater manoeuvring space. NHSScotland Healthcare Boards must comply fully with the provisions of the Disability Discrimination Act 1995, Disability Equality Duty 2005 and the Scottish Building Regulations. Designers must also comply with local NHS Board's Disability Equality Scheme and Action Plan.
- 2.15 Local representatives of people with disabilities and disability organisations should be involved in the design process particularly with the planning of spaces used by staff, patients and escorts. Project teams must also refer to HBN 40 'Common activity spaces' and SHFN 14 'Disability access'. For existing facilities or buildings being upgraded, reference should also be made to 'Access Audit Survey Toolkit' 2002 produced by Health Facilities Scotland (formerly NHSScotland Property and Environment Forum). The Scottish Dementia Development Centre, Fair For All Disability and similar organisations should be contacted as they can provide valuable advice.  
([www.fairforalldisability.org](http://www.fairforalldisability.org))

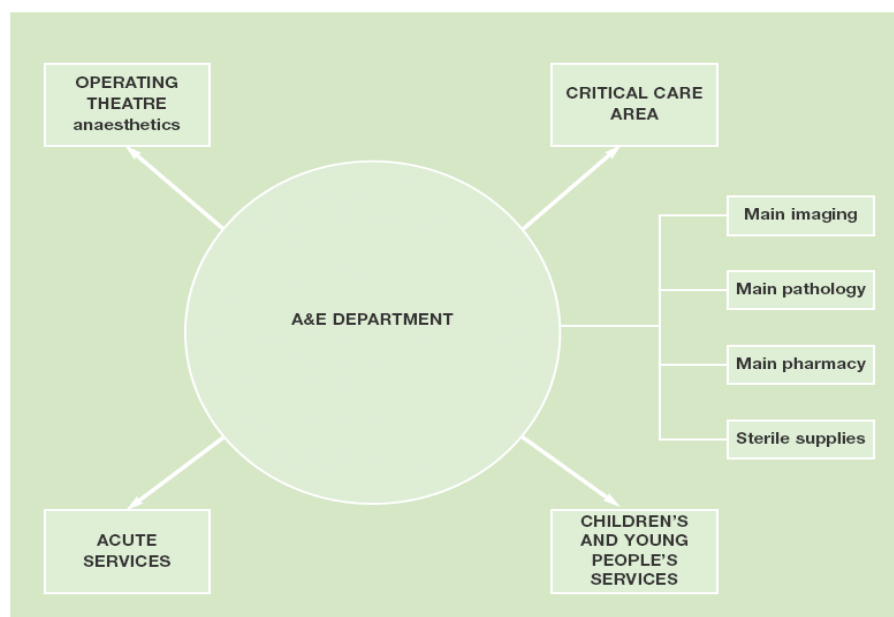


Figure 3: Relationships with on-site services

## Infection control

- 2.16 Reducing the incidence of healthcare associated infection (HAI) is a major challenge for all those working in healthcare. Within the A&E department it is essential to protect patients who are immunocompromised and at high risk of acquiring an infection. Other patients may present with a communicable or infectious disease.
- 2.17 Infection control teams should be consulted at the outset of any new build or renovation project. They will advise on issues such as storage and equipment cleaning areas, appropriate types of ventilation system, where air conditioning will be required, furnishings and appropriate finishes. They should be involved throughout the project right up to handover.
- 2.18 For further information refer to SHFN 30 'Infection control in the built environment' and HAI-SCRIBE 'Healthcare Associated Infection System for Controlling Risk In the Build Environment'. These documents should be the first point of reference for planning teams with regard to infection control.

## Isolation of patients with infectious diseases

- 2.19 Consideration should be given to the provision of isolation facilities for patients with suspected infectious diseases. For further information see HBN 4 Supplement 1 'Isolation facilities in acute settings'.

## Decontamination

- 2.20 Every A&E department should have procedures for the reception or transfer of patients contaminated with radioactive materials or chemicals as well as for social decontamination. This is an area that is currently being developed to

reflect new thinking and will be added to the document at a later stage. Advice must be sought from the Radiation Protection Adviser (RPA), the Emergency Planning Officer (EPO) and the Scottish Environment Protection Agency (SEPA). Storage for all the necessary equipment and protective clothing must also be calculated. All departments must now have facilities for decontamination both externally (with a separate entrance if possible) and internally. At least one isolation room should be available, ideally with access directly from triage.

- 2.21 Reducing the risk of cross-contamination to other areas is essential. The ventilation and drainage systems must be independent and capable of being isolated. The design should reduce the probability of contamination of the rest of the premises, including drainage/sewage system; in particular by providing the following:
- the ability to isolate the decontamination areas and a number of treatment rooms from the rest of the department;
  - the ability to isolate the ventilation system for the decontamination room, and a number of treatment rooms, from the rest of the hospital;
  - the ability to contain 'run-off' water in a containment tank;
  - the availability of direct external access to the decontamination room.
- 2.22 Reference should be made to the Scottish 'Chemical, biological, radiological or nuclear' (CBRN) Guidance titled 'Deliberate release of biological and chemical agents – guidance to help plan the health service response' and also the 'Water UK' protocol for the disposal of contaminated water.

## Major incidents

- 2.23 All hospitals receiving emergency cases should have contingency arrangements for the reception of multiple casualties following a major incident. It is normal practice for the A&E department to be the main focus for the organisation and implementation of these plans.
- 2.24 Planners should identify any design implications that need to be addressed in receiving large numbers of people in the event of a major incident. There are six important planning and design issues associated with the occurrence of a major incident:
- identification of a control centre with multiple telephone lines and ambulance aerial point for information gathering and communications co-ordination;
  - identification of possible usage of adjacent departments and possible reconfiguration of the A&E department and associated parking areas at an early planning stage in the event of an influx of patients;

- provision of adequate storage space for the equipment and supplies that may be required, together with a facility for recharging portable electrical equipment;
- clearance of car parks where necessary to provide ample space for ambulance access and turn-round;
- press liaison room;
- identification of offices and meeting rooms for use in major incidents;
- identification of a single entry point.

2.25 See also 'Planning for major incidents: the NHS guidance' (Department of Health, 1998).

## Security

2.26 Reference should be made to 'Effective management of security in A&E' (Department of Health, 1997).

2.27 Security arrangements centre on two main issues:

- the prevention of crime and abuse by those who use the A&E facilities;
- the protection of the building fabric and the equipment it contains.

2.28 In addition to the recommendations contained in 'Effective Management of Security in A&E' there are a number of other ways in which security can be increased. The planning team should take account of local knowledge coupled with advice from the police crime prevention officer. Any requirement to secure doors should be discussed with the fire officer, as the demands of security and fire safety may conflict. Maintaining a secure environment should include the following measures:

- management should ensure that adequate security staffing levels are maintained to deal effectively and quickly with any issues that arise;
- all staff should wear identity badges with a photograph;
- all staff dealing with the public should attend 'customer care' training;
- staff should be issued with a personal attack alarm (see [paragraphs 6.143–6.147](#));
- a CCTV camera should be positioned behind the reception desk covering a wide-angle view of the waiting area, the images to be displayed on monitors in the central security office;
- panic buttons should be placed in readily accessible, covert locations, and should not be audible on activation. This alarm will alert security officers of an incident to be attended;



- if possible, the alarms should be activated before the incident threatens violence to staff or others, to enable the security team to defuse the situation when they arrive;
- security locks on doors leading into the department beyond reception, public waiting and pharmacy areas;
- a policy should be developed for the security of people with a cognitive impairment or acute confusional state.

2.29 Only after all other options have been tested should a permanent security presence be located in the A&E department.

## Environmental considerations and design

- 2.30 The impact of any new procurement on the environment is of significant importance and is an integral part of NHS responsibility for the health and well being of the community. Care should be taken to contain the environmental impact of activities to a practical minimum, consistent with maintaining responsibilities for providing high-quality patient care. Commitment to the requirements of the Environmental Protection Act 1990 and all other relevant statutory legislation is essential. See 'Environmental strategy for the NHS' (NHS Estates, 2005) for environmental considerations when designing and building healthcare facilities. See also 'Sustainable development in the NHS' (NHS Estates, 2001).
- 2.31 All capital development schemes in Scotland should be subject to an environmental assessment.

## Design considerations

- 2.32 Designers should create an environment in emergency care that will help patients feel at ease, be conducive to efficient working, and contribute to staff morale. Rows of seats facing reception should be avoided; it is important that those attending reception feel secure when divulging personal information. It may be an advantage to have a few seats facing reception for patients with hearing impairments. Also for waiting patients a more relaxed, informal seating layout is essential, which avoids rows of seats facing each other. For information on understanding the five senses in relation to design, see 'Friendly healthcare environments for children and young people' (NHS Estates, 2004).
- 2.33 Indoor planting and external landscaping are of special value. Imaginative use of floor and wall finishes, colour and lighting will help to produce a warm and friendly atmosphere in emergency care (see 'Lighting and colour for hospital design', Dalke et al, NHS Estates, 2004). Floor finishes and colour schemes must be carefully considered with regard to DDA, particularly in connection with people with impaired vision who might perceive colour changes as a level change.



- 2.34 The design process should pay particular attention to the choice of well-designed furniture and fittings, co-ordination of flooring and wall finishes and the use of colour. All areas should be decorated in calming colours. When choosing and positioning furniture and fittings, the size and reach of patients should be considered. Fittings and furniture with sharp corners should be avoided and generally should be secured to walls or floors.

## Art in hospitals

- 2.35 Works of art and craft can contribute significantly to the internal environment. These need not be limited to simply pictures on a wall. Every opportunity should be taken to include works by artists and craftspeople in appropriate spaces in the department. These may include paintings, murals, prints, photographs, sculptures, decorative tiles, ceramics, textile hangings and furniture; the reception desk can also be used in a creative way.
- 2.36 Works of art and craft often lend special identity to individual spaces and help give a sense of locality.
- 2.37 Advice should be sought from experts on:
- obtaining grants. In some cases, money for art within a capital scheme can be matched by grants from charities or regional arts boards;
  - ensuring quality in all art and craft works;
  - appropriately locating art and craft works;
  - selecting artists and crafts people.
- 2.38 Advice should also be sought from the infection control team on the appropriate use of art in hospitals, particularly with regard to location and materials.
- 2.39 See also 'The art of good health: using visual arts in healthcare' (NHS Estates, 2002) and 'The art of good health: a practical handbook' (NHS Estates, 2002).

## Natural and artificial lighting

- 2.40 Sunlight enhances colour and shape and helps to make a room or area bright and cheerful. The harmful effects of solar glare can be dealt with by architectural detailing of window shape and depth of reveals, as well as by installing external and internal blinds and curtains. If solar glazing is utilised, care should be taken to ensure that changes in patients' skin tone and colour can be easily identified.
- 2.41 Natural lighting is important to the well being of patients and staff. Wherever practical and medically possible, spaces to be occupied by patients, escorts and staff should have natural daylight with an outside view.

- 2.42 Artificial lighting, as well as providing levels of illumination to suit activities, can make an important contribution to interior design. Designers should develop a lighting scheme that will help to promote a high-quality image for clinical activities in emergency care and a non-clinical, soft environment in as many spaces as possible. Care must be taken to avoid glare and reflection off hard surfaces and equipment (see also [Section 6](#))
- 2.43 Artificial lighting provided in spaces occupied by patients should enable changes to skin tone and colour to be clearly defined and easily identified.
- 2.44 Luminaires should not be mounted on ceilings immediately above positions where patients lie on a trolley. This applies to all patient spaces, including corridors through which patients may be moved on a trolley (see also [paragraphs 6.110 – 6.122](#) and 'Lighting and colour for hospital design', Dalke et al, NHS Estates, 2004).

## Diagnostic imaging

- 2.45 Facilities for diagnostic imaging are continually changing, therefore design flexibility is the concept to aim for, within the confines of statutory regulations.(See also [paragraphs 3.104 – 3.109](#)).
- 2.46 A significant proportion of patients attending A&E departments need some form of diagnostic imaging. Some may require immediate access to diagnostic services and constant clinical assessment and intervention by a doctor or nurse. A dedicated computed radiography (CR) facility should be provided in close proximity to the A&E department. CT scanning is essential for modern emergency medicine and should be easily accessible directly from the emergency department. In a large hospital campus, consideration should be given to having a dedicated CT scanner for the emergency department. The location of emergency X-ray facilities is crucial to many aspects of departmental functioning. These include security at night, waiting times and the time staff are out of the main A&E department.
- 2.47 The spatial relationship between the A&E department and the general diagnostic imaging facilities will depend on whether additional dedicated trauma imaging facilities are provided within the A&E department. This may be considered necessary in certain contexts to provide good patient care and access to diagnostic imaging in emergency situations (SHPN 06 part 1: 'Facilities for diagnostic imaging and interventional radiology').
- 2.48 In the future, as cost and size of equipment reduce, it is likely that CR imaging will be provided via a medical supply unit in most treatment rooms, thereby negating the need for a separate imaging suite or mobile X-ray facility. However, this development will need to be considered in the context of radiation protection (lead lined walls).

## Ultrasound imaging

- 2.49 Ultrasound is commonly used for diagnosis of patients with abdominal pain, vascular, obstetric and gynaecological problems. Many patients with these types of problems attend A&E departments, therefore access to ultrasound imaging is invaluable. There should be space to store a small ultrasound machine and also a Doppler for deep vein thrombosis (DVT) scanning.

## Transfer of equipment to installation site

- 2.50 The method and routes used to bring diagnostic equipment into a department will need to be carefully considered, particularly in the case of X-ray systems. Although most diagnostic imaging equipment is broken down into modules for transportation and re-assembled on site, these modules can be large and in some cases have masses that exceed 1–2 tonnes.
- 2.51 The equipment will usually be transferred in wooden crates, thus increasing the overall dimensions. It is therefore advised that architects and estates managers consider at early planning stages how the equipment will be transferred to the proposed site. Care should be taken over the width and height of doors, loading specifications for floors and the turning circles of the equipment.

## Near-patient testing

- 2.52 Near-patient testing has assumed a greater significance over the past few years, with a number of studies indicating that there are definite benefits for patients so far as their total time in A&E is concerned. More than 90% of the tests carried out for A&E patients consist of X-ray, full blood count, urea and electrolyte, glucose, ECG and blood gases. The most frequently requested blood tests can be classified into three main groups:
- clinical chemistry;
  - microbiology;
  - haematology.

See [paragraphs 3.101 - 3.103](#).

## Pharmacy

- 2.53 Whenever a patient is prescribed a medicine, quick and easy access to a pharmacy should be available – regardless of whether the consultation has taken place in the hospital or the community, in-hours or out-of-hours. See [paragraph 3.121](#) for information on the storage of drugs.
- 2.54 Locating the central pharmacy close to the A&E department is recommended. Where this is not possible, in existing hospitals for example, a secure medication storage facility may be required. Alternatively a pneumatic tube link to the Central Pharmacy may be sufficient.

## Social care

- 2.55 Social workers should be considered an integral part of the A&E team, hence they will require office accommodation (see [paragraphs 4.17 - 4.26](#)) and access to an interview room with an en-suite toilet facility (see also [paragraphs 3.86 - 3.89](#)).

## Therapies

- 2.56 Therapy staff require an interview room (see [paragraphs 3.86 - 3.89](#)). Space is also needed for the storage of crutches and other mobility aids (see [paragraphs 4.36 - 4.39](#)).

## Caring for people who are distressed or disturbed

- 2.57 A small proportion of people who attend an A&E department in the UK each year are distressed, disturbed, suffer from dementia or exhibit mental health problems. These include people who have substance addiction or abuse problems; those who physically harm themselves deliberately; and those where mental illness is evident or suspected. Designers should seek advice from a qualified member of staff or the Scottish Association for Mental Health to ensure appropriate facilities are included ([www.samh.org.uk](http://www.samh.org.uk)).
- 2.58 Rapid assessment and streaming of these patients is vital, mainly for their own safety, but also for the safety and security of others. Some of these patients need constant supervision and support. The physical layout should allow for the immediate segregation of these patients into a separate area with specific facilities. Some of these patients will be escorted by the police. (see 'Effective management of security in A&E', DH, 1997 and 'Management of Imminent Violence: Quick Reference Guide', Royal College of Psychiatrists College Research Unit, 1998).
- 2.59 The interview room used for social care can also be utilised to enable such patients to pace or walk around without undue restraint, to sit quietly and talk or be interviewed and, in extreme cases, to be restrained if considered necessary on clinical grounds. Facilities for the interviewing of disturbed or psychiatrically unwell patients should not be very far from the main clinical area. This is to allow patients to be moved back into the clinical areas quickly if required and so that additional help can be summoned in case of problems. This is in keeping with the recommendations of the Royal College of Psychiatrists, which should be referred to.
- 2.60 These facilities should be located in a quiet place, away from the general distractions of the department (see also [paragraphs 3.86 - 3.89](#)).
- 2.61 In rare circumstances, in order to protect themselves or for the safety of others, a patient may need to be admitted to a separate room that has the minimum of fittings and furnishings. If necessary, the patient will be left alone in this room

for a suitable 'cooling off' period. Local policy will determine whether this type of room is required in an A&E department (see also [paragraph 3.89](#)).

## Dental care

- 2.62 A number of A&E departments contain a dental surgery. 'Modernising dentistry' (DH, 2000) notes that more than half a million people a year require emergency dental care, with significant numbers of these seeking help from A&E departments. If plans to divert such patients away from A&E departments are successful, there may not be a need to include a dental surgery in A&E departments. If required, reference should be made to SHPN 36 Part 2: NHS Dental Premises in Scotland.
- 2.63 One of the treatment rooms in an A&E department will be used for patients with head and neck problems. It should be furnished with the equivalent of a dentist's chair. If local policy dictates, this room could be furnished with dental equipment. The equipping of this treatment room is discussed in greater detail in [paragraphs 3.57 - 3.58](#).

## Death of a patient in emergency care

- 2.64 Some patients may be pronounced 'dead on arrival' whilst others may die in the department. Provision should be made to deal respectfully with a dead person and their family. The family may need a private room in which they can stay with the body for a period of grieving before it is moved on to the mortuary. The room should be suitable for wheelchair users and people with disabilities.
- 2.65 Following pronouncement of death and the departure of the bereaved, the body will be taken to the mortuary. A route should be designed that avoids patient areas. If this is not possible, for example with existing building refurbishment, transfers along main corridors and hospital streets should only be at times of reduced patient and public use.
- 2.66 See also [paragraphs 3.90 - 3.100](#).

## Activity database

- 2.67 The Activity Database (ADB) data and software assists project teams with the briefing and design of the healthcare environment.
- 2.68 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.
- 2.69 Schedules of equipment can also be obtained at department and project level.
- 2.70 Fully loaded drawings may be produced from the database.

- 2.71 Reference data is supplied with ADB which may be adapted and modified to suit the user's project-specific needs.
- 2.72 For further information refer to the ADB section available from a link on the Department of Health website (<http://www.dh.gov.uk>) under 'Policy and Guidance>Organisation Policy>Estates and Facilities Management>DH Estates and Facilities Knowledge and Information.

## Portering

- 2.73 Whenever possible, the main portering base for the hospital should be located near the Emergency Department as it is the main focus for patient activity out of hours.



### 3. The built environment – specific functional and design requirements

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#### Entrances

- 3.1 The entrances should be bright and easily identifiable from entrance roads, with good signage (see 'Wayfinding' NHSScotland). Larger hospitals are now likely to have separate, but adjoining, children's A&E reception, waiting and also treatment areas. This will have its own dedicated entrance adjacent to the main adult A&E entrance.
- 3.2 There should be two separate entrances to an A&E department, the 'main entrance' for those arriving by their own means and the 'ambulance entrance' for patients arriving by ambulance on a stretcher. In large departments, the separate but adjoining children's A&E will have its own entrance.
- 3.3 All entrances should have canopies. The ambulance canopy should be high enough to clear lights and aerials and large enough to provide adequate protection to all ambulances which are unloading, together with their patients. The main entrance canopy should also be large enough to provide the same protection to cars unloading passengers/patients. The area should be well lit.
- 3.4 All entrances should have a suitable draught lobby, with two sets of automatic sliding doors adequately positioned far enough apart to ensure heat is retained within the building and that patients and staff are not subjected to draughts. It should not be possible to open both sets of doors at the same time unless in an emergency. The main patient entrance lobby is often a busy place. It will need to accommodate patients with a variety of conditions, including those using wheelchairs, those on foot but using walking aids, and those on foot but supported by escorts. It is essential that the lobby is large enough to permit easy movement of this traffic, and it should have a floor covering that will trap dirt carried by footwear or on wheels, and which can be easily cleaned. If metal strips are used then designers should note that these can have an adverse effect on some people's vision. See also 'Welcoming entrances and reception areas' (NHS Estates, 2004). Car parking payment booths should not be located here or anywhere where they will cause congestion near any entrance.
- 3.5 A wheelchair bay should be provided adjacent to the main patient entrance lobby for immediate use. There should be a designated trolley/wheelchair storage area located close to the ambulance entrance lobby.
- 3.6 There should be a telecommunications link from the lobby to the central porters' base. Ambulance crews should have access to changing and wash facilities.
- 3.7 In a few isolated cases, consideration may be given to the provision of external shelters for use by smokers. These must be located away from entrances and opening windows, and careful consideration should be given to wind direction to prevent smoke entering the building.

## Reception area

- 3.8 The main function of the reception area is to meet and greet patients and direct the majority of them to an assessment room or, if necessary, the waiting area. If a receptionist is concerned about a patient's condition, they should be able to summon help from clinical staff. It should be possible to transfer a patient immediately to a resuscitation room, or to a treatment room.



Bradford Royal Infirmary Accident and Emergency (main patient entrance)

- 3.9 Concerns are frequently expressed over the security of staff and the privacy and confidentiality of patients waiting at the reception desk. It has been identified that the most effective way of overcoming these problems is to register the patient in an assessment room. As each room will be equipped with a computer terminal, a 'roving' receptionist moving between the assessment rooms could obtain the patient's personal details before the assessment by a clinician, unless the patient's condition dictates otherwise.
- 3.10 The risk of violent behaviour in the form of physical or verbal abuse is very high in A&E departments, with reception and waiting areas being particularly vulnerable. Boredom, anxiety or pain, and for some individuals an excess of alcohol or drugs, can trigger acts of verbal or physical aggression. It is not necessarily the patient who will act in an unacceptable way; it may be the person who is accompanying them. The aggression may be directed at members of staff, other patients and visitors, or even between groups which arrived together. (See [paragraphs 3.86 - 3.89](#) for details on facilities for patients).
- 3.11 It is not normal practice for security officers or police to be a permanent presence in the A&E department, as this may serve only to worry patients and visitors unnecessarily. CCTV should be installed in strategic places linked to monitors situated in the central security office (see [paragraphs 6.140 - 6.142](#)). Designers should consult the local police over design proposals for this area in particular, but also for the whole facility.



- 3.12 The reception area should be located in an open space directly inside the entrance. The position of the reception area should allow staff to see all patients and escorts entering the department and have vision to the main waiting and children's waiting/play areas.
- 3.13 The design of the reception desk should be of a high quality and allow access for people with disabilities. It is appropriate to make the desk as friendly as possible; the inclusion of a hearing loop is a requirement. The inclusion of children's decor/mosaics should be considered. 'Friendly healthcare environments for children and young people' (NHS Estates, 2004) gives greater detail on designing a child-friendly environment. Care must always be taken to ensure that designs are suitable for all users; children, people with disabilities and disturbed patients. ([www.fairforalldisability.org](http://www.fairforalldisability.org))
- 3.14 The reception desk should reflect suitable security requirements based on local security advice. In some locations this will involve enclosing the desk with a security-glazed screen. However, a well-designed reception and waiting area with a pleasant ambience will help to reduce tension and security risks. The introduction of security glass may well be counter productive. If security glazing is necessary, people with hearing difficulties should be considered. See also 'Welcoming entrances and reception areas' (NHS Estates, 2004). Where desks are not 'enclosed', there should be a staff retreat available into the main department. Also, desks could be deeper to provide added security and prevent staff from being easily reached. In the event of a retreat being necessary, the staff should be able to 'lock down' all entrances into the clinical area with a single control or panic button.
- 3.15 The reception desk is the focal point of the waiting area. It requires to oversee the waiting area but care must be taken to ensure that those in the waiting area cannot overhear any discussions at reception. Computer facilities will be required to monitor occupation of the assessment rooms.
- 3.16 Space should be provided behind the reception desk for photocopying, faxing, printing equipment and the disposal of confidential waste paper etc.
- 3.17 Security of the reception area should include the use of personal alarm transmitters.
- 3.18 Office chairs with castors and height adjustment should be used for ease of movement and use at lower wheelchair height.
- 3.19 With the advent of computerised medical records, there will be limited need for a records store within the department.

## Waiting facilities for patients, their families and friends

- 3.20 A waiting area will be required to accommodate some patients during very busy periods and for family and friends who accompany the patient to hospital. The general circulation area is the least easily defined, as it has to provide a number of varying environments. From a design professional's viewpoint these are:

- a waiting area for patients prior to their assessment;
- a sitting area for friends and family, as some may elect to stay in the waiting area;
- a designated, secure play and waiting area for children, possibly out of sight from the main adult waiting area but supervised by the staff at reception;
- an area for enquiries, information, and providing literature/notices of primary healthcare and local facilities.



Waiting area – the Hillingdon Hospital NHS Trust (photograph courtesy of the King's Fund's Enhancing the Healing Environment Programme)

3.21 The design of the waiting area and all sub-waiting areas will include:

- circulation space for wheelchair users and pushchairs;
- space around seating for parking pushchairs and wheelchairs without impeding circulation areas;
- access to public or free phones for contacting friends, relatives, work etc;
- access to a text phone for those unable to use a public phone or a sign indicating that staff can make one available at reception or somewhere suitable;
- if TVs are provided, they should include text and locations must not interfere with any hearing loop systems;
- information boards (a sufficient number must be provided to prevent notices being stuck to walls, doors etc.);
- consideration for those under police escort who may be handcuffed;

- access to drinking water dispensers and possibly vending machines for snacks, chocolate etc as some people arrive hungry;
- the use of natural lighting where possible, although thought should be given to shade control;
- appropriate heating and ventilation;
- a secure environment;
- good, clear signage at appropriate height levels with maximum use of symbols or pictorial messages to assist those with poor reading or language difficulties in locating all services.

The seating layout should be considered carefully to prevent confrontational situations, for example, avoid seats directly opposite each other.

- 3.22 The pre-assessment waiting area should be close to WCs, a wheelchair-accessible WC, nappy change and baby feeding area. Each sub-waiting area should have access to WCs. Access to WCs requires to be discreet and should comply with HBN 40 Volumes 1 and 5.
- 3.23 Comfortable seating should be provided in a relaxed and informal layout. The number of seats should be determined locally. The use of durable materials is essential. A variety of chair designs and heights, some with arms and some without, should be available. Occupational therapists or ergonomists should be consulted on the appropriate selection of seating. Generally furniture in the main waiting area should be fixed to the floor to prevent it being used as a potential weapon.
- 3.24 Any waiting area should create a comfortable, relaxing and informal environment. There should be spaces for patients in wheelchairs, for those with assistance dogs and using walking aids. Consideration should also be given to the needs of pregnant and nursing mothers.
- 3.25 Finishes should be easy to maintain, and provide value for money, as well as being aesthetically pleasing and easy to clean.
- 3.26 Public toilets for men and women should be installed close to the reception area and be clearly signed on the doors. At least one wheelchair accessible WC, a nappy change facility accessible to either sex, and a separate infant feeding facility (where a woman, if she chooses, can breast feed her baby in privacy) should also be provided. This will be particularly important in hospitals serving people, or likely to serve people, with different ethnic and cultural backgrounds and beliefs. Careful consideration should be given to the selection of finishes in public facilities. In addition to ease of cleaning, opportunities should not be created for concealment of drugs or weapons. Lighting should be installed that guards against drug abuse, but blue lighting is not recommended as it can cause visual disturbance to some people with visual impairments.
- 3.27 An inner screen should be installed to prevent a direct view into these facilities from the general waiting area. Access to toilets should be capable of being monitored by staff at reception.

- 3.28 WCs should be located at each sub-waiting area, close to the treatment rooms. Access to toilets should be in accordance with HBN/SHPN 40. Doors should ideally open outwards, but not into restricted corridors for circulation, and be fitted with locks which can be opened from the outside in an emergency.
- 3.29 A telephone with a freephone taxi service should be provided. Ideally this would be located within the vestibule between the entrance lobby and reception, and it should meet the criteria of the Disability Discrimination Act 1995 (see SHFN 14 'Disability access'). Provision should also be made for a vending bay and display systems for healthcare information. Assistance may be required for those unable to use a telephone or whose first language is not English.
- 3.30 For further information on waiting facilities see also 'Welcoming entrances and receptions', NHS Estates, 2004.

### **The waiting baby, child or young person**

- 3.31 The children's waiting and play area may be located within the existing main waiting area but placed slightly away from the main section of the seating. Consideration should be given to the use of laminated one-way view glazing so that staff and parents can see in but children cannot see out. The infection control team should be consulted with regard to these facilities as there are significant infection control issues relating to the provision of toys etc. in communal play areas.



**Sub-waiting area – Epsom and St Helier NHS Trust (photograph courtesy of the King's Fund's Enhancing the Healing Environment Programme)**

- 3.32 Toilet facilities, baby changing and infant feeding should be located close to the children's waiting area.

- 3.33 For best practice in designing, furnishing and decorating child-friendly facilities see 'Friendly healthcare environments for children and young people' (NHS Estates, 2004).

### Assessment/triage rooms

- 3.34 A cluster of rooms will be needed that can fulfil the dual functions of assessment/triage and treatment for patients with simple injuries or illnesses. Some patients will complete their journey at this stage and will be discharged.
- 3.35 The initial assessment of a baby, child or adolescent with primary care needs or simple injuries or illnesses will take place in one of the assessment rooms (a number of which should be suitably decorated, furnished and equipped for children). For further guidance on child-friendly facilities see 'Friendly healthcare environments for children and young people' (NHS Estates, 2004).
- 3.36 While there will be rooms specifically designated for babies and children, every room will have the capability of receiving patients of all ages.
- 3.37 The assessment rooms should be located next to the reception area.
- 3.38 Following assessment, unless the patient is discharged at this stage, the relevant information about them will be forwarded to the communications base via the computer link for the next stage of their journey.
- 3.39 Each of these rooms should have a set of lockable doors on each of the front and rear walls (linked to a personal attack alarm). It is important that parents cannot lock themselves in or lock staff in during an assault. Each room should accommodate:
- an emergency care trolley;
  - a clinical hand-wash basin with hands free taps. There should also be washing facilities in the main floor area as well as in the individual rooms/cubicles;
  - a ceiling-mounted adjustable examination/minor operating luminaire;
  - provision for manual blood-pressure monitoring;
  - a wall-mounted auroscope and ophthalmoscope;
  - a lockable cupboard for the storage of drugs, needles and syringes;
  - a mirror and coat hooks;
  - a computer workstation for recording clinical information and viewing digital images, with a adjustable-height office chair;
  - if digital imaging is not part of whole-hospital policy, an X-ray viewing screen will also be required;
  - a dressings trolley suitable for use by those with mobility problems;
  - two small upright chairs, one with arms and one without;



- personal alarm transmitters for the security of staff;
- a staff call system for use of patients, including those with mobility or dexterity problems;
- a clinical emergency call for use by staff;
- bin holders for waste disposal (clinical including sharps, used sterile supplies and general waste).

It is essential that sharps bins are wall or trolley mounted, particularly in any area where children may be present, also any wall mounted fixtures and fittings to be located to ensure they will not cause injury to users including children and wheelchair users.

- 3.40 Assessment and treatment rooms should provide sufficient space to allow patient trolleys to be placed in an 'island' situation when required. As well as reducing the risk of injuries to staff, this will help patients with disabilities. Sufficient space should be provided for this purpose. The rooms/cubicles must not be mirrored/handed, they should all be identically laid out with similar specifications and facilities.
- 3.41 In all assessment and treatment areas, a patient's aural and visual privacy and dignity should be maintained at all times. Unless invited, members of staff, other than those actually assessing or treating a patient, should not enter an occupied room. The use of curtains between bays is no longer acceptable practice, as they offer little visual privacy and no aural privacy. Moreover, a closed, lockable door prevents people (most particularly staff) from entering uninvited. There should be an emergency external override to the locking mechanism. A visual indicator of occupancy should be considered. Portable communicators could be made available.
- 3.42 See [Appendix 1](#) for example room layouts.



Nurse playing with children

## Treatment rooms

- 3.43 The required number of treatment rooms should be determined locally. Treatment rooms should all be identical and of type 2 (e.g. trolley in centre). Small rooms with trolleys against the wall should not be used, even for minor injury units (MIU) or ACAD facilities. All should have piped gases, suction and IT facilities. Any worktops should be 800mm deep to properly accommodate both computers and writing space. They should be decorated in calming colours and also provide suitable explanatory information for those with cognitive impairment on where they are, what is wrong with them, what is happening and that a carer/relative has been informed.
- 3.44 A proportion of these treatment rooms will be multi-functional and equipped and furnished identically to enable clinical staff to consult, examine and treat the majority of patients. A number of these rooms should be suitably decorated, furnished and equipped for children. One should be equipped to deal primarily with patients who have head and neck problems (see [paragraphs 3.57 - 3.58](#)).
- 3.45 One treatment room should accommodate patients with possible gynaecological or genito-urinary problems. It can also be used for other patients requiring extensive clinical examination (see [paragraphs 3.59 - 3.61](#)).
- 3.46 Flexibility of room use is the key to reducing the time that patients have to wait. It is recommended that every treatment room should be built to the same specification, with identical basic fitments and clinical equipment.
- 3.47 There must be sufficient space in each room to enable a minimum of two clinicians to move freely around the trolley and be able to examine and treat the patient from either side. There should be sufficient space to accommodate at least two relatives or friends who are accompanying the patient. Account needs to be taken of different cultural and ethnic expectations in terms of the number of visitors.
- 3.48 Multi-parameter monitoring equipment ideally should be installed in each treatment room and should be centrally monitored, but this will depend on local requirements and budget limitations.
- 3.49 Some pieces of equipment will be ceiling or soffit mounted. The overall height of the ceiling is an important consideration as adequate overhead clearance is essential.
- 3.50 A few emergency departments may still use plaster of Paris. The inclusion of a bespoke 'plaster room' should be a local decision made by the planning team, who should incorporate this into their schedule of accommodation. Provision should also be made for those using resin plaster.
- 3.51 General anaesthetic facilities with a scavenging system will be required in the resuscitation room only.

All other patients requiring an anaesthetic should be transferred to await treatment in the operating theatre suite. Recovery facilities are no longer required in A&E departments.

- 3.52 For maximum flexibility, and to help minimise the risk of cross-infection, all rooms should have doors and full-height walls. Access should be via one-and-a-half leaf doors (half door can be opened to allow width for trolleys and large equipment). For circumstances where observation of occupants is necessary from outside the room, some rooms should have a glazed front wall with integral blinds or a number of open-fronted treatment rooms adjacent to the communications base may be considered.
- 3.53 The engineering requirements for each treatment room will be identical and will allow the majority of clinical procedures to be undertaken. All treatment rooms will need medical gas supplies. For further details on engineering services see [Section 6](#).
- 3.54 To facilitate flexibility of use and efficient management, all treatment rooms should surround, and be accessed from, an open-plan area. Direct access to the supplies base and dirty utility room is required. It should be possible to observe access to the rooms from the communications base.



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### Multi-functional treatment rooms

- 3.55 Each of these rooms should have lockable doors (linked to a personal attack alarm) and should accommodate:
- an emergency care trolley;
  - a ceiling-mounted medical supply unit for multiparameter monitoring and medical gases;
  - a clinical hand-wash basin with hands free tap;



- a ceiling-mounted adjustable examination/minor operating luminaire;
- a wall-mounted auroscope and ophthalmoscope;
- X-ray viewer, wall mounted (if fully digital then this may not be required);
- a lockable cupboard for the storage of drugs, needles and syringes;
- a mirror and coat hooks;
- a computer workstation, with an adjustable-height office chair, for recording clinical information and viewing digital images;
- a dressings trolley;
- two small upright chairs;
- a hands-free telephone, either wall-mounted or attached to the medical supply unit;
- personal alarm transmitters for staff security;
- a staff call system for use of patients;
- a clinical emergency call for use by staff;
- bin holders for waste disposal (clinical – including sharps – used sterile supplies and general waste).

3.56 See [Appendix 1](#) for example room layouts.

### Head and neck treatment room

3.57 The head and neck treatment room should be equipped to deal with patients with ENT, ophthalmic and dental problems. This room, in addition to the flexible treatment rooms, can also be used for patients with minor facial or scalp injuries requiring suturing.

3.58 The equipment required in this room is identical to that listed in [paragraph 3.55](#), with the exception of the trolley. An ENT patient chair, which can also be used for patients with dental problems, and an adjustable anatomic stool will be required. An ophthalmic slit lamp mounted on a desk will also be required.

### Gynaecology/genito-urinary treatment room

3.59 This room will be used for patients who are suspected at assessment, as having gynaecological or genito-urinary problems that require an intimate or internal examination. It should be located adjacent to a WC.

3.60 The equipment required in this room is identical to that listed in [paragraph 3.55](#), with the exception of the trolley. A gynaecology/urology couch may be required depending on local preference.

3.61 For maximum flexibility this room can also be used as a general treatment room.

## Resuscitation room

- 3.62 Local policy will determine the number of resuscitation bays within each A&E department. See [Appendix 1](#) for example room layouts. Resuscitation rooms should be identical and generously large. Facilities are required for overhead x-ray gantry to slide between all the cubicles (remembering that the x-ray gantry is required to swing down parallel to the trolley for certain types of x-rays). Additional space for equipment storage is required immediately adjacent to the resuscitation room.
- 3.63 In an A&E department that receives 50,000 patients a year, generally a minimum of six resuscitation bays will be required. For other levels of attendance see the Schedules of Accommodation ([Section 7](#)). The numbers of patients treated in resuscitation rooms are expected to increase as senior clinicians are starting to undertake rapid assessment in this area before transferring patients, once stabilised, to a treatment room.
- 3.64 The resuscitation room should have easy, unimpeded access from the entrance where ambulances arrive and should not be isolated from the other treatment rooms. It should not share or cross routes used by other patients or visitors, particularly those going to the main hospital.
- 3.65 The recent trend has been to locate the resuscitation room(s) as close as possible to the ambulance entrance of the A&E department, the rationale being the need to admit, assess and treat critically ill patients without delay. Critically ill patients should not be transferred to the resuscitation room through the main waiting area or along/across main circulation routes. A decision on location should be taken locally, based on existing building provision.
- 3.66 The resuscitation room, which will have integral imaging facilities, should be located to enable direct access to the critical care area, coronary care unit, operating theatres, and imaging suite including CT scanning. Pathology services and pharmacy can be more remote if technology is used for communication. The relationship of the resuscitation room to the relatives' sitting room and visiting/viewing room is also very important.
- 3.67 Clinicians must be able to access the patient from all four sides of the trolley at all times. Many clinical interventions take place at the 'head end' of the patient, and this means that plenty of space is required behind the patient as well as at the end and sides of the trolley.
- 3.68 Each resuscitation bay should be contained by retractable lead/PVC protective curtains or lead-lined screens. This will allow several patients to be assessed, treated and resuscitated simultaneously in visual privacy.
- 3.69 Space is required in each resuscitation bay for a minimum of five staff to work at speed and under stress.
- 3.70 Members of the patient's family are sometimes encouraged, if they so wish, to remain with the patient within the resuscitation room itself. Additional space

should be allowed to accommodate them, but this will need to be located to ensure privacy for other resus patients.

- 3.71 Staff will need to perform clinical procedures from all sides of the trolley and to use a variety of equipment. Patients in the resuscitation room may require surgical procedures, which will make them particularly susceptible to temperature changes; accurate temperature control is very important for many resuscitation patients (see also [paragraph 6.37](#)).
- 3.72 The trolley should be capable of being rotated through 360°. Equipment will need to be parked in the bay in accordance with the procedures being performed and, when required, manoeuvred into place without disturbing clinical activity. Staff will also need to take and view X-rays and digital images, view monitors, and access and record data on a computer. Various storage facilities are required for a range of medical and surgical supplies and sundries.
- 3.73 Resuscitation bays should be located in one resuscitation room so that some facilities can be shared.
- 3.74 At least one resuscitation bay should be equipped for babies, children and young people.
- 3.75 Fixtures and fittings required for each resuscitation bay include:
  - ceiling-mounted examination lamps;
  - ceiling-mounted piped oxygen, nitrous oxide, medical vacuum and medical air (4-bar) outlets (service pendants/beams);
  - an adequate number of electrical socket-outlets, on the ceiling-mounted medical supply unit, to minimise obstacles and danger from tangled and trailing leads. A minimum of 12 twin sockets in each resuscitation bay is required. These must be connected to the essential supply;
  - a 'grab' board at the head of the trolley, with 'shadows' of small items of equipment, instruments and medical and surgical sundries stored there;
  - a workstation for preparation, and for monitors and a computer and keyboard;
  - an imaging viewer; a hands-free telephone, either wall-mounted or attached to the medical supply unit;
  - bin holders for waste disposal (clinical including sharps, used sterile supplies and general waste);
  - boards to record progress, drugs etc;
  - screens for posting algorithms;
  - space for ventilator/anaesthetic equipment;
  - space and shelving for immediate supplies such as fluids, oxygen masks etc;
  - anaesthetic gas scavenging.

- 3.76 Furniture, fittings and other equipment that can be shared in a resuscitation room include:
- ceiling-mounted and mobile imaging equipment available to all bays;
  - drugs (including the controlled drugs) cupboards;
  - shelving and racking for medical and surgical sundries, including sterile packs;
  - a refrigerator;
  - clinical hand-wash facilities;
  - storage and recharge of drug pumps;
  - X-ray gown storage;
  - linen storage and disposal;
  - biers cuffs for intravenous (IV) anaesthesia;
  - portable monitors and ventilators to transport patients following resuscitation.
- 3.77 Modern resuscitation techniques may involve patients remaining in the resuscitation area for substantial periods during which frequent and high quality imaging is required. The Resuscitation Council updates its recommendations (which include information on the built environment) every two years, and any changes should be incorporated as appropriate (see <http://www.resus.org.uk/>).
- 3.78 Until recently, mobile imaging machines were mostly used in resuscitation rooms. Planning teams should give preference to a ceiling-mounted solution wherever practical. Differing requirements of trauma patients will determine the type of imaging equipment installed. Where ceiling-mounted imaging equipment is provided, a gantry is required so that the equipment can traverse, and be used in, as many resuscitation bays as possible.
- 3.79 The design of the imaging system and the lighting system should be co-ordinated to ensure that use of either installation is not compromised. Consideration should be given to the ceiling height and protection from radiation hazard, including the use of fixed lead lined curtain systems (to provide visual privacy as well as radiation protection) and lead aprons for use by staff. (See SHPN 6 Part 1: 'Facilities for diagnostic imaging and interventional radiology' for further information). Lead aprons should be stored vertically to maintain their protective quality. Suitable wall brackets or mobile stands are required for this purpose.

### Clinical decision unit/observation unit

- 3.80 Patients may be taken to a clinical decision unit (CDU)/observation unit straight from assessment or treatment, where they will be accommodated for a number of hours before being transferred to other acute accommodation, or discharged. The unit should be located in a separate area within the A&E department and in the absence of a local requirement, should meet the definition of a ward (see

SHPN 04: 'In-patient accommodation: options for choice' to improve the patient experience of their treatment and care. It should be an appropriate environment where patients' needs are met and essential care can be provided, for example privacy and dignity, access to refreshments and meals (if appropriate), toilet and washing facilities including accessible toilets, as well as being suitably equipped to support the observation and monitoring of the patient's condition.

- 3.81 Medical gases (normally oxygen, air and suction) should be provided.

### Communications base

- 3.82 The communications base is the centre for the control of clinical activity within the main clinical area of the A&E department; this is a completely separate base from reception. Patient flow is supervised from here and may make use using an EDIS (Emergency Department Information System) Clinicians carry out administrative tasks here. Partial enclosure of the communication base will prevent conversations being overheard but will permit a good view of patient flow from both the simple injuries or illness stream and rapid assessment stream.
- 3.83 All communication systems should have a terminal here, including computer, short-wave radio in the event of telecommunications failure, telephones, fax, call systems and alarms. Telephones should be located in a private area so that conversations cannot be overheard.
- 3.84 Staff will access initial information about each patient from clinicians in the assessment rooms via a computer link. Space should be provided for multiple PC monitors.
- 3.85 As telephone enquiries regarding the clinical condition of patients will be made at the communications base, adequate provision of space should be made in that area. Text phone facilities should be available as well. See [paragraphs 5.3 - 5.8](#).

### Interview room for distressed or disturbed patients

- 3.86 A room should be provided where interviews and discussions with distressed or disturbed patients may take place in private. It should contain easy chairs and an occasional table, arranged as informally as possible and include space for wheelchairs, prams and assistance dogs. Personal alarm transmitters should be installed. A telephone should be provided with direct access to an outside line, a text phone should be available for use in this room. This space may also function as a small group room. En-suite WC facilities made of stainless steel should be included.
- 3.87 The facilities should be located in a quiet place, away from the general distractions of the department, with an external view. WC facilities should be easily accessible.

- 3.88 Rooms should be decorated in calming colours, with comfortable seating. Care should be taken in choosing furniture and fittings that present the least risk of causing deliberate or accidental injury to the patient and the supervising staff. The need for rapid and thorough cleaning of these rooms is essential. Interior designers with expertise in furnishing such facilities are invaluable and should be consulted at the initial planning stage.
- 3.89 If a special room is provided for patients who are susceptible to self-harm, a mattress on the floor may be the only furniture. None of the fittings in the room should be able to be used as a weapon. Walls should have a non-abrasive finish decorated to achieve a calming environment. Ceiling tiles should not be installed and no fittings should support the weight of a body to prevent their use as a ligature point. A stainless steel en-suite toilet and washhand basin should be installed. The room should have two exits which are lockable from the outside and can provide easy escape for staff from inside. Consideration should be given to noise reduction, alternative means of entry and egress. Concealed heating and recessed lighting of a non-fluorescent type should be provided. The room should be located to provide good observation by staff via a viewing panel which should have interstitial blinds to provide privacy when required.

### Sitting rooms for family and friends

- 3.90 Two sitting rooms with a non-clinical atmosphere should be provided. These should be sensitively decorated, bright, well-lit and homely, where people accompanying seriously ill and injured patients or the recently bereaved may sit and talk, make telephone calls, prepare and consume beverages, and wash their hands and faces. A variety of comfortable seating should be provided for a minimum of eight people (escorts and staff). Ideally, the sitting room should have a window with an outside view. Carpets and wallpaper finishes are appropriate in these rooms. Whatever the smoking policy, distressed relatives may smoke therefore, consideration should be given to installing a smoke extraction system and an appropriate type of fire detectors should be fitted.
- 3.91 Each sitting room should be:
- located adjacent to the visiting/viewing room and near the resuscitation room but not within earshot of any sounds which may be disturbing;
  - accessible from the resuscitation room without having to pass through public areas of the department;
  - accessible by, and with space to accommodate, a person in a wheelchair;
  - close to a wheelchair accessible WC (en-suite an option);
  - provided with tea and coffee making facilities;
  - clearly and well signposted.
- 3.92 These rooms should not be identified as a 'relatives' room'. A more appropriate, less clinical and informal phrase is recommended.



Local knowledge and discussion between staff should help identify the most sensitive name.

- 3.93 It is essential that these rooms are located in a quiet area, away from the activity and noise of the department, where the bereaved may leave the department without having to go through the general waiting or treatment areas.
- 3.94 Specific religious icons and artefacts should be avoided. There are a number of publications that identify the needs of a multi-cultural society, many of which describe the traditions and rituals of death and dying. Many hospitals now have their own reference manuals and associated protocols, and these should be consulted in such circumstances. A copy of the reference manual and any associated protocols should be located permanently within the A&E department (Neuberger 2004, Murray Parkes et al 1997, Collins et al 1993).
- 3.95 A selection of literature may be appropriate, and should include a choice of texts. General advice and information leaflets giving contact details of religious, secular, social and welfare organisations and voluntary bereavement support agencies should be provided.

### The visiting/viewing room

- 3.96 The decor in the visiting/viewing room should be similar to that of the sitting room.
- 3.97 It should be possible to position the trolley carrying the deceased person in a peninsular position with the head to the wall, to permit access to both sides of the body.
- 3.98 Comfortable chairs should be provided, with consideration given to the height of the chairs in relation to the height of the trolley.
- 3.99 A small walk-in cupboard should be provided where linen and amenities required for limited preparation of the deceased person may be stored. For infants and young children, a 'Moses' basket or similar carrier should be available.
- 3.100 The room should be accessible both from the clinical area and from the sitting room, with a lockable door from the viewing room into the sitting room. Consideration should be given to the installation of a window between the sitting room and the viewing room for visitors who might not want to enter the viewing room itself; the sill should be at a height suitable for wheelchair users.

### Near-patient testing area

- 3.101 A near-patient testing area is required for blood gas, electrolyte and glucose analysis and other tests carried out within the unit. The main requirements are for a sink, laboratory benching and adequate bench space on which equipment will be placed, electrical socket-outlet provision, a blood gas machine, a specimen fridge, and sufficient space for staff to perform tests and use

computer equipment. Separate clinical hand-washing facilities are also required.

- 3.102 The laboratory should be quiet and well lit, with seating that is ergonomically appropriate for the task. Variable-height seating (stools/chairs equipped with back-rests) and working surfaces should be provided.
- 3.103 Storage space should be provided for equipment and machinery.

### Digital imaging suite

- 3.104 At least two general imaging rooms will be required within easy access of the A&E department, with an associated sub-waiting area. Local circumstances will determine the exact number required. At least one of the general imaging rooms should be equipped with an orthopantomogram. Every room should be able to accommodate both trolley patients and mobile patients. This will avoid unnecessary delays.
- 3.105 Depending on local policy, a mobile imaging unit may still be required, and adequate space for parking this equipment will be needed. If mobile X-rays are still in use, an illuminated X-ray viewer will be required in each treatment room.
- 3.106 All imaging rooms in the digital imaging suite must be equipped with resuscitation equipment, piped oxygen and suction. They should be connected by an intercom to the A&E department, and an emergency call system should be installed.
- 3.107 SHPN 6 Part 1: 'Facilities for diagnostic imaging and interventional radiology' describes two models for the provision of general imaging services for emergency care.
- 3.108 There are a number of statutory requirements relating to diagnostic imaging that each planning team should take into account. These include the following:
- 1999 Ionising Radiations Regulations (which focus on protecting staff);
  - 2000 Ionising Radiation (Medical Exposure) Regulations (which focus on protecting patients);
  - 1993 Radioactive Substances Act (which is concerned mainly with the safe use of radioactive substances).
- 3.109 Codes of practice issued by the Health and Safety Executive and the National Radiological Protection Board should also be adhered to. See also [paragraphs 2.45 -2.48](#).

## Dirty utility room

- 3.110 At least one dirty utility/sluice room should be provided where the analysis of specimens can be completed. It should be easily accessible from all areas used for treatment.
- 3.111 A storage fridge should be provided for urine samples.
- 3.112 WCs should be located adjacent to the dirty utility/sluice room for patients who are requested to supply a specimen of urine or faeces. A hatch should be provided to enable specimens to be passed from the WC to the dirty utility/sluice room. Hatches should be designed to ensure patients' privacy at all times.
- 3.113 A macerator and a sluice should be provided.
- 3.114 Unused (clean) disposable bedpans, urine bottles and vomit bowls should not be kept in the dirty utility/sluice room because of the risk of cross-infection from dirty equipment. Such equipment should be stored in an appropriate storage room or within a closed cupboard in each treatment room.

## Equipment service room

- 3.115 Facilities are required within this room for equipment servicing as defined in the user manuals supplied by equipment manufacturers, supplemented by any formally agreed local instructions. Such local instructions may require the provision of additional facilities. Visiting electronics and medical engineering (EME) technicians carrying out minor scheduled or unscheduled servicing also use this room. The space provision should be sufficient to park and manoeuvre equipment and accommodate a workbench with integral lockable cupboards, preferably in a self-contained room or space. There should be sufficient socket outlets protected by residual current devices (see [paragraph 6.107](#)). A wash hand basin should also be provided. It is recommended that manufacturers' user manuals be kept in this room.
- 3.116 Medical gas outlets supplying oxygen, medical compressed air and vacuum should be provided. The provision of nitrous oxide together with gas scavenging facilities is a local decision. Some items of equipment may require decontamination prior to scheduled servicing being done. Local policy will identify where this is undertaken, for example, in the SSD and/or EME department.

## Storage and supplies rooms

- 3.117 The planning team should determine the number of storage rooms required. For this it will need to take into account local working practice.
- 3.118 One storage room will be required for the holding of sterile equipment and supplies, and refrigerated storage.

- 3.119 Double-sided cupboards that can be stocked and emptied from the corridor and accessed from within every assessment and treatment room are recommended (see example room layouts in [Appendix 1](#) for details). Where double-sided cupboards are used, it is important to ensure that acoustic properties, ventilation, security and privacy are not compromised.
- 3.120 The introduction of 'just-in-time' storage systems using barcode systems to top up supplies on a regular basis (twice daily if necessary) will reduce the need for large amounts of supplies to be retained in the department.

### Storage of drugs

- 3.121 Controlled drugs storage should be provided for the treatment of patients attending the A&E department. In addition, secure storage space should be provided for take-home drugs when the main pharmacy is closed. These facilities should include space for fridges and for the preparation of IV drugs. The facilities also should comply with current requirements for controlled drugs storage (see [paragraphs 5.13](#) and [6.123 - 6.125](#)).

## 4. Support facilities – general and specific functional and design requirements

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### Staff accommodation

- 4.1 In A&E departments, staff work in stressful situations every day. The provision of well-designed facilities helps morale and contributes to the efficient functioning of the department. Excellent staff facilities that are located within the department will encourage this; these should all be suitable for staff with disabilities.
- 4.2 Ways of preventing access to staff areas, other than by authorised staff, should be implemented. Security locks with close proximity card entry are the preferred option, but planners and designers should consult with police officers and security experts before deciding on the appropriate deterrents.
- 4.3 In new-build facilities, all patients and staff should be able to enjoy natural light and ventilation. However, in existing buildings due for refurbishment this may not be possible.
- 4.4 There are six main categories of staff facility, all of which should be designated clearly as non-patient areas:
- rest and recreation facilities;
  - overnight accommodation for staff;
  - changing rooms and associated facilities;
  - office accommodation;
  - facilities for education and training;
  - storage.

### Rest and recreation facilities

- 4.5 A&E departments employ large numbers of staff, all of whom will need access to the rest and recreation facilities. These facilities are in use every day, 24 hours a day. The principles of good housekeeping (cleanliness and minimising the risk of cross-infection) have to be applied over the same period.
- 4.6 A rest room is required where staff can relax and take beverages and snacks. The room should have windows with a pleasant outlook, be comfortably furnished, and have a telephone. The room should have direct access to the pantry and be located with other facilities for staff and away from patient treatment and traffic areas. A dining table and chairs should be provided to enable staff to eat and drink in comfort. Floor finish should be a welded sheet material coved to form a skirting.

- 4.7 The rest room should be designed so that staff wishing to read or talk are not disturbed by the noise from a TV or music system.
- 4.8 An appropriate number of male and female WCs should be located within the rest and recreation facilities as well as in the staff changing rooms. For guidance see the Workplace (Health, Safety and Welfare) Regulations 1992.

### **Pantry**

- 4.9 Pantry facilities 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 will include a stainless steel sink and drainer, an electric water boiler, a microwave cooker, a worktop with cupboards, an automatic dishwasher and a washhand basin.
- 4.10 The organisation should ensure that patients have access to refreshments at all times. This may necessitate the occasional use of the pantry for preparing beverages for patients and escorts. For this purpose, a separate entrance should be provided so that staff can access the pantry without passing through the rest room.

### **Overnight accommodation for staff**

- 4.11 For senior on-call staff, a minimum of one single en-suite bed/sitting room that provides overnight accommodation is required within the department. The planning team should decide on the number, size and location of rooms following local consultation.

### **Changing rooms and associated facilities**

- 4.12 Clinical staff are in daily contact with patients' body fluids (blood, sputum, vomit, urine and faeces), encounter infection, and handle contaminated instruments and dressings on a daily basis. They may need to shower and change their clothes whilst on duty. It may not be feasible for all staff to use the departmental changing facilities, but it is essential that all clinical staff are able to shower and change without having to leave the department. Designers must take account of individual Boards/Clients' policies when designing these facilities.
- 4.13 Provision should be made for separate male and female changing facilities. Estimates of changing space and locker provision should take into account the number of full-time and part-time staff, including trainees and students. These facilities should always be provided behind keypad or card access doors.
- 4.14 Steps should be taken to ensure the security of personal belongings left in the staff changing facilities. There must be secure lockers, and access to the areas must be via doors with close-proximity card facilities.



- 4.15 The sanitary and shower facilities should be provided in self-contained, full-height rooms to provide maximum privacy; cubicle partitions are not acceptable.
- 4.16 Dry changing areas equipped with mirrors, hair dryers and a shaving point are required. Male and female staff WCs should be provided in association with other facilities for staff. For guidance see the Workplace (Health, Safety and Welfare) Regulations 1992.

### Office accommodation

- 4.17 Office accommodation should be located within the department and not too far from the main clinical area. Entrance to the area should be through a single controlled access door with secure entry facilities (see [paragraphs 6.140 - 6.142](#)).
- 4.18 All single and multi-occupied offices should be equipped with a computer terminal with access to the Internet on each desk.
- 4.19 In certain circumstances it is not appropriate to interview patients, relatives or staff in an office environment. Planners should consider including, as an alternative to more offices, one small informal room that is comfortably furnished and can be used for interviewing patients, relatives or staff, and one larger interview/meeting room that could be accessed by members of staff when required.
- 4.20 Such a strategy would ensure maximum utilisation of interview/meeting rooms, and office space would not need to be increased. All confidential meetings could take place in absolute privacy. Offices can then be used exclusively for administration and clerical work.
- 4.21 A small safe where patients' valuables can be held if necessary should be located in an office that is staffed 24 hours a day or at the communications base (see [paragraphs 3.82 - 3.85](#)).
- 4.22 Most offices described in this Section are similar in size and, providing they are appropriately located, can be used flexibly. All offices should be equipped with a computer with access to the Internet. Telecommunications facilities are essential (see [paragraphs 5.1 - 5.12](#)).

### Single-person offices

- 4.23 Single person offices will be required for senior clinicians and managers. These should be sufficiently private for confidential discussions between staff. They should accommodate an office workstation, with monitor and keyboard, seating for up to three other people, and storage for books and files. The offices should be close to each other and to the secretarial office, and associated with other office accommodation.

### Multi-person staff offices

- 4.24 Multi-person offices are required for secretarial activities and administrative work. The number of offices will depend on local policy, and should be discussed and agreed with the A&E team during the initial planning meetings.

### Additional office space

- 4.25 Additional office accommodation will be required for people who may not be permanent members of the A&E staff but who may still spend substantial periods of time with patients. Health visitors and social workers, for example, are frequently called to A&E departments. This accommodation should be located in close proximity to the department.

### Signposting of offices

- 4.26 Office signs need consistent naming conventions. Signs for 'major incident rooms' should be permanently in place so that staff are familiar with the areas used during an emergency.

### Education and training facilities

- 4.27 Staff should be given every opportunity to use any quiet times to undertake pre-arranged or spontaneous personal or group learning. Continuing professional development (CPD) is now mandatory for all NHS staff. This implies that the number of people needing access to and use of education and training facilities is likely to increase significantly in the future.
- 4.28 Facilities should include a seminar room and library, along with access to a large multi-functional education and training room. All staff will need access to IT facilities and all rooms should have access to a hearing loop systems, either fitted or portable.

### Seminar room

- 4.29 A seminar room should be provided within the A&E department for teaching, tutorials, meetings, case conferences and clinical instruction. Furniture and equipment should include upright stacking chairs with writing arms, a wall-mounted whiteboard, an imaging viewer, a video/TV monitor, a computer and keyboard.
- 4.30 A computer image projector is required. A ceiling mounted screen should be provided, with efficient blackout curtains and facilities for projection of slides and overhead transparencies.
- 4.31 Some guidance now suggests that project teams may wish to consider the provision of a CCTV system with full two-way audio links between treatment areas and the seminar room. In these circumstances it is essential that consent is gained from the patient.

## The library

- 4.32 A separate room, in the form of a small library, with adequate secure storage space for books, should be provided for the purpose of private study. Computer terminals should be provided, each with access to the internet.

## Support spaces

### Ambulance cleaning bay

- 4.33 A bay is required where ambulance staff can clean ambulances (the interior of which can occasionally become excessively soiled). A hose point should be provided. The bay should be located out of public view.

### Ambulance equipment store

- 4.34 This lockable store should be located off the ambulance cleaning bay or, alternatively, the ambulance entrance lobby, so that the ambulance crews can restock their vehicles once they are clean.

### Major incident equipment store

- 4.35 A store is required for the storage of major incident packs and equipment. Emergency signage for external use is also stored here. The store will require to house clothing, boots, helmets, medical packs and drug packs in locked facilities.

A separate decontamination store is required to hold a mobile decontamination unit (MDU) approximately 2m x 2m x 2m when stored, and personal protective equipment (PPE) as supplied by the Scottish Executive. This store should be near the external decontamination facilities with access from both sides. Consideration should be given to a 'hot/cold' system of rooms.

### Equipment and supplies store

- 4.36 A store should be provided for the storage of mobile and smaller items of equipment that are not in regular use or are being held as replacements. Shelving and floor space where mobile equipment can be parked will be required. Some equipment will be delicate and costly, therefore, sufficient space is needed for manoeuvring to permit easy retrieval, with doorways wide enough to allow the largest items to pass freely. Adequate numbers of power points for charging equipment should be provided.
- 4.37 A back-up store for bulk supplies (other than sterile supplies) is required to supplement working stocks held in various spaces throughout the department. Racking and adjustable shelving, as appropriate, should be provided. An exchange linen trolley may be parked here, or linen may be stored on shelves.

- 4.38 Crutches and splints in various sizes, and different types of walking and, should be stored in this room.
- 4.39 Supplies for use in the department should be delivered in accordance with local procedures; for most supplies, this may involve delivery to the major equipment and supplies store and redistribution to user areas.
- 4.40 Bays will be required at the main patients' entrances for wheelchairs and trolleys. Secure parking for storage will be required for shopping trolleys, prams and pushchairs which are brought in by patients and have to be stored while they or their children are being treated.

### **Sterile supplies store**

- 4.41 The 'just-in-time' system should ensure that only small quantities of sterile supplies will need to be stored in the department. A small back-up store for sterile supplies such as dressing packs, syringes and needles may still be required to supplement working stocks held in various spaces, for example every treatment room throughout the department.

### **Ready use medical gas cylinder store**

- 4.42 A dedicated, easily accessible store is required, where gas cylinders for use with anaesthetic machines and anaesthesia ventilators can be stored. It should conform to the requirements of SHTM 2022: 'Medical gas pipeline systems'.
- 4.43 The project team should ensure that the provision of standby gases and equipment reflects the emergency procedures and contingency planning processes developed for the area.
- 4.44 The store should be in a room that is easily accessible from the working environment, enclosed in fire-resisting construction and located on an external wall.

### **Cleaner's/domestic service room**

- 4.45 Space and facilities should be sufficient for parking and manoeuvring cleaning machines and a cleaner's trolley, cleansing of cleaning equipment, and disposal of fluids and used cleaning materials. Hand-washing facilities are also required.
- 4.46 Shelving and vertical storage should not encroach on the working space or restrict access to the cleaner's sink. Not requiring a close relationship with any particular area within the department, this room should be located away from the principal routes used by patients.

### **Disposal hold**

- 4.47 This locked room should be accessible from the hospital street. Collections may then be made without the need for porters to enter the main circulation space of the department.

- 4.48 Bagged refuse and soiled linen are held here safely and securely whilst awaiting collection. They are identified by colour coding, in line with whole hospital policy. The size of the disposal hold should be determined by the frequency of collection.

### **Battery/uninterrupted power supply room**

- 4.49 A room may be required to house the uninterrupted power supply (UPS) to the essential electrical supply to patient ventilators and monitoring equipment. This should be ventilated and kept locked at all times, with access only permitted for estates staff.
- 4.50 Monitoring of the UPS status is advised, this may be connected to the communications base monitoring equipment where appropriate.
- 4.51 The use of centralised rather than distributive UPS arrangements within A&E departments should be considered in view of the likely security and maintenance advantages.
- 4.52 Care should be taken to ensure that lighting circuits within A&E, as well as specialist power supplies, are provided with adequate UPS to maintain lighting at all times.

### **Switch cupboard**

- 4.53 See [paragraph 6.93](#).

## 5. Other general functional and design requirements

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### Communications

- 5.1 Provision of effective communication systems is essential for the efficient management of emergency care. Specialist advice should be sought, and ambulance and police services consulted as appropriate, when systems are being considered and specified. Communication systems are described below.

#### Radio

- 5.2 Radio equipment may be required for direct communication with ambulance vehicles. The risks associated with electromagnetic interferences with medical devices by ambulance radios should be accounted for in the design.

#### Telephones

- 5.3 In locations where public telephones are provided, at least one should be mounted at a height suitable for wheelchair users and the handset fitted with an inductive coupler to assist people using a hearing aid.
- 5.4 Telephones should be provided in accordance with the whole hospital policy for telephone services. Where telephones are provided for reception use, consideration should be given to hands-free systems. Ringing telephones in and adjacent to treatment spaces are a particular nuisance at times of peak activity, and consideration should be given to the installation of a system which will enable calls to be intercepted at an appropriate alternative location. A text phone should be available for use by those unable to use a normal phone.
- 5.5 Staff based in different parts of, and staff moving around, emergency care are required to communicate with each other. Unnecessary or abortive staff movement can be reduced, and messages can be received 'hands-free' of communications equipment, by provision of an intercommunication system. This system should utilise the standard telephone system and telephone instruments, be simple to use, and cover locations of high staff activity. It can also accommodate a wide range of functions, both routine and emergency, and enable staff to communicate rapidly and when they require assistance, for example with calls:
- to all telephone instruments or a selected group of telephone instruments within emergency care. This facility can be used to locate a member of staff, for example a doctor, a senior nurse or a porter, and for emergency calls for assistance in case of clinical need or potentially violent incidents;
  - between two selected telephone instruments, including:



- i. calls for assistance. For example, a nurse working alone could open a communication channel to the communications base and call for assistance without leaving the patient;
  - ii. routine communications;
- to intercommunication systems in other departments, for example the diagnostic imaging department.

- 5.6 At least one ex-directory exchange line or direct line should be provided for communications with the emergency services. Such instruments should have a distinctive bell or buzzer. Also, a number of ex-directory points will be required to allow a major incident communications system to be rapidly set up.
- 5.7 Public telephones for patients and escorts should be located adjacent to the waiting area. This should include a freephone telephone for taxis.
- 5.8 See also [paragraphs 6.134 - 6.139](#).

### **Fax**

- 5.9 Fax equipment will be required for communication with various outside agencies.

### **Patient-to-staff and staff-to-staff call systems**

- 5.10 Patient-to-staff call systems should be provided in all spaces where patients may be left alone temporarily, such as treatment rooms and patient WCs. Staff-to-staff call systems should be provided in all spaces where staff consult, examine and treat patients. The staff systems must have a distinctive ring from the patient system. Terminals to the call systems should be located at the communications base.
- 5.11 The emergency call system in the resuscitation area should have a sound that is distinctive from other alarms.

### **Staff-to-patient communications**

- 5.12 Project teams will need to consider how patients, including those with visual and auditory impairments, can be kept informed should they be required to wait temporarily prior to assessment. Users should be consulted in the most appropriate methods. Options include announcements:
- by a member of staff personally;
  - over a loudspeaker system;
  - using a visual display unit.

## Controlled drugs cupboard

- 5.13 Repeater indicator lights from the controlled drugs cupboard should be provided at a continuously staffed location, for example the reception desk or communications se. (See [paragraphs 6.123 - 6.125](#)).

## Fire alarms

- 5.14 Fire alarms should be provided in accordance with SHTM 82: 'Alarm and detection systems'; see also [paragraphs 6.129 - 6.130](#). Particular consideration should be given to visual aids to assist people with disabilities.

## Internal environmental engineering considerations

### Ventilation

- 5.15 Where possible, natural ventilation is preferred, but generally there will be many internal spaces or clinical reasons that call for mechanical ventilation or comfort cooling systems.
- 5.16 Mechanical ventilation and comfort-cooling systems are expensive in terms of capital and running costs; planning solutions should be sought that take maximum advantage of natural ventilation. Mechanical ventilation costs can be minimised by ensuring that, wherever practicable, core areas are reserved for rooms whose function requires mechanical ventilation irrespective of whether their location is internal or peripheral, for example sanitary facilities and dirty utility/sluice rooms. However, it is essential that comfortable conditions be provided for patients and staff at all times. See also [paragraphs 6.50 - 6.64](#).

### Noise and sound attenuation

- 5.17 Any unwanted sound is a noise and may disturb patients and staff. Noise-sensitive areas should be located as remotely as possible from internal and external sources of unavoidable noise. See also [paragraphs 6.22 - 6.23](#).
- 5.18 Speech privacy is essential in spaces where personal and confidential discussions are held, such as interview rooms and any clinical areas; discussions should be unintelligible in adjoining spaces.
- 5.19 Particular care should be taken where the adjoining spaces are waiting areas.
- 5.20 Sound transmission can be reduced by use of sound-containing partitions and doors. Use of soft floor coverings and acoustic treatment of walls and ceilings, where hygienically acceptable, will improve sound absorption in a space. Care should be taken to ensure that sound insulation is not compromised/reduced at service outlets and IPS panels/units.
- 5.21 Induction loops should be fitted in reception areas to assist those hard of hearing.

## Finishes

- 5.22 The quality of finishes in all areas should be of a high standard, and where possible they should all be non-reflective. Guidance on the selection of finishes is provided in the relevant Health Technical Memoranda (HTMs) – see [Appendix 2](#).
- 5.23 Finishes should be robust enough to withstand accidental impact, and additional protection should be provided at likely points of contact. Trolleys and items of mobile equipment that may cause damage should be appropriately buffered. Cleaning regimes should be considered when materials are selected.
- 5.24 The infection control team should advise on the appropriate finishes throughout the project (see also SHFN 30: 'Infection control in the built environment').

## Colours

- 5.25 Colours of surfaces in spaces occupied by patients should not distort the colour rendering of light sources.

It must be possible to clearly define and easily identify changes to a patient's skin tone and colour. Decor should be light and pleasant.

Colour choice and doors should be carefully selected to provide the colour contrasts required by DDA guidance for people with visual impairments and perceptual problems.

## Floors

- 5.26 Floors in emergency care have to withstand harsh treatment. Therefore, the floor coverings and skirtings should be smooth, non-reflective, easily cleaned, contribute to the provision of a non-clinical environment and, at the same time, be hard wearing. They must not present a hazard to disabled people nor restrict the movement of wheeled equipment. Floors must not be, nor appear to be, slippery, and the patterning should not induce disorientation. Particular care required with regards to those with impaired vision in relation to colour contrast with surrounding areas.
- 5.27 Carpets should not be used in clinical areas. Depending on their location, carpets may be suitable for use in the offices, overnight stay accommodation (if included), and visitors' sitting rooms, but not the reception areas. Carpets are extremely difficult to keep clean (sterilising liquids will stain or bleach them) therefore, they must be meticulously monitored and maintained. The infection control team and users should always be consulted on the use of carpets.
- 5.28 Changes of floor level are not acceptable and should be avoided wherever possible. Surface drag, static electricity, flammability, infection hazards and impermeability to fluids must be considered.
- 5.29 HTM 61: 'Flooring' should be consulted for advice on user requirements and performance selection.

## Walls

- 5.30 Wall finishes in A&E departments should be durable and able to withstand wet cleaning and the accidental impact of trolleys and heavy mobile equipment. Especially vulnerable points should have additional protection. Smooth paint surfaces are the easiest for cleaning, for example eggshell or vinyl silk emulsion.
- 5.31 Vinyl wall-coverings can be used in rest, interview and relative rooms.
- 5.32 Ceramic wall tiles are preferable in kitchen, shower and toilet areas, although their use should be discussed and approved by the Infection Control Team. Welded wall vinyl or specialised anti-fungal flexible paint finishes may be accepted or preferred. Colour can be used to help distinguish washhand basins etc against the walls.

## Doors and frames

- 5.33 Doors and frames are particularly liable to damage from mobile equipment, and materials that will withstand this should be used. All double-swing doors should incorporate clear glass vision panels at the level of wheelchair users, children and adults. Privacy, safety, or other considerations may require that the panels should be capable of being obscured. Where necessary, doors should be capable of being held in the open position, this applies to all doors in corridors where trolleys or beds are frequently passing through. Magnetic door retainers should not restrict the movement of traffic.
- 5.34 Doors should be solid core and designed to be resistant to damage from trolleys etc. Those identified by users as requiring to be kept in the 'closed' position should ideally be automatic in operation. Ironmongery must contrast with the door and be suitable for use by people with mobility or dexterity problems. All ironmongery must also be heavy duty and robust enough to withstand the mistreatment it will be subjected to. Particular attention is required for the door edge detailing in order to prevent damage which might compromise infection control.

## Windows

- 5.35 In addition to the various statutory requirements concerning windows, the following aspects require consideration: illumination and ventilation; insulation against noise; user comfort; energy conservation; the prevention of glare; and the provision of a visual link with the outside world. Windows should, if possible, have a pleasant outlook. Given the restrictions in opening, windows should be of the central horizontal pivot type to provide top and bottom ventilation openings.
- 5.36 Guidance on types of window and safety aspects is available in HTM 55: 'Windows'.

- 5.37 Internal glazing in clinical areas will require to be capable of being obscured. In clinical areas, this will be by use of interstitial blinds within double glazing; the Infection Control team will require to approve the operation mechanism/control.

### Corridors

- 5.38 Corridors design can be improved by:
- reducing their length;
  - introducing offsets or changes in shape by inclusion of waiting spaces and lobbies. However, waiting spaces in corridors will require to be agreed with statutory authorities and must not comprise fire escape requirements;
  - introducing daylight;
  - providing views of outside areas such as landscaped courtyards;
  - varying the colour of walls;
  - the use of works of art (see [paragraphs 2.35 - 2.39](#));
  - where long corridors remain, they should be provided with wayfinding signage and aids at regular intervals.

### Maintenance and cleaning

- 5.39 Materials and finishes should be selected to minimise maintenance, comply with infection control requirements 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 corners, partitions, counters and other elements that may be subjected to heavy use. Wall coverings should be chosen with cleaning in mind. Guidance on these aspects is given in HTM 56: 'Partitions', HTM 58: 'Internal doorsets' and HTM 61: 'Flooring'.
- 5.40 The Infection Control team should advise on the maintenance and cleaning of the materials and finishes (see SHFN 30: 'Infection control in the built environment').

### Drinking water

- 5.41 Adequate drinking water points should be provided throughout the department. Preferably these will be mains water cooler/purifier outlets.

## 6. Engineering services

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### General engineering considerations

#### Introduction

- 6.1 This Section provides general engineering guidance for healthcare facilities. Specific guidance on the engineering requirements for an emergency department are set out in [paragraphs 6.33 - 6.148](#) of this document.
- 6.2 Engineering services account for a significant proportion of the capital cost and a continuing charge on revenue budgets. The project design engineer should ensure economy in provision, whilst achieving functional requirements and maintaining clinical standards.
- 6.3 Lifetime costs should be identified as part of the cost-benefit analysis. Energy usage has a major impact on the environment. Heating, ventilation, cooling and lighting should be automatically controlled when not in use, for example at night or weekends.
- 6.4 Engineering installations should provide an organised and systematic arrangement that can be modified to facilitate changes in service requirements. This should be achieved by distributed systems with vertical or horizontal services ducts. These should be readily accessible so they can be remodelled and maintained with minimal disruption to the facility.

#### Model specifications

- 6.5 The National Health Service Model Engineering Specifications are sufficiently flexible to reflect local needs. The cost allowance is based on the quality of material and workmanship described in the relevant parts of the specifications. In addition, the reader is directed towards the range of Scottish Health Technical Memoranda (SHTMs) relevant to this facility (see [Appendix 2](#)).

#### Energy conservation and sustainability

- 6.6 The commitment of the NHS to sustainable development is encapsulated in the document 'Sustainable development in the NHS'. Whilst this document considers a wide range of sustainability issues, one area identified as having a major impact on the environment is the use of energy. The minimising of environmental impact by ensuring that energy is only used necessarily and efficiently is considered in this section with regard to:
- natural daylighting;
  - natural ventilation;
  - night set-back;



- building regulations;
- heat recovery.

- 6.7 Efforts should be made to maximise the use of natural lighting. Passive solar design (PSD) should be employed to ensure, as far as possible, that patient and staff areas are located where they can benefit from natural daylight whilst other areas, for example stores, toilets and utility rooms, are located towards the core of the facility.
- 6.8 Areas where glare may be a problem, for example rooms where VDUs are routinely used, should similarly be located away from direct natural daylight.
- 6.9 Rooms should be naturally ventilated wherever appropriate. The design should incorporate measures for minimising solar heat gains which, if uncontrolled, will precipitate a need for mechanical ventilation. Measures to minimise the need for cooling should include locating temperature sensitive accommodation away from south facing fascias, shading windows with brise soleil, and using solar reflecting glass where this is cost-effective.
- 6.10 Energy using systems including heating, ventilation, cooling and lighting should be controlled to reduce energy input to the facility, or sections of it, when it is not in use, for example at night or weekends.
- 6.11 Energy recovery systems should be considered for air-conditioning and ventilation systems.

### Design for safety

- 6.12 Health and safety legislation imposes a statutory duty on all who design, manufacture, import, supply, install or erect 'articles for use at work' through a range of co-ordinated health and safety regulations enacted under the Health and Safety at Work etc Act 1974.
- 6.13 Key safety regulations relating to healthcare premises and equipment are:
- the Construction (Design and Management) Regulations 1994;
  - the Management of Health and Safety at Work Regulations 1999;
  - the Workplace (Health, Safety and Welfare) Regulations 1992;
  - the Provision and Use of Work Equipment Regulations 1998;
  - the Health and Safety (Safety Signs and Signals) Regulations 1996;
  - the Noise at Work Regulations 1989;
  - the Pressure Systems Safety Regulations 2000;
  - the Pressure Equipment Regulations 1999;
  - the Gas Safety (Installation and Use) Regulations 1994;

- the Control of Substances Hazardous to Health (COSHH) Regulations 2002.

- 6.14 The vulnerability of patients in healthcare premises, where many engineering systems impact on patient safety, introduces additional risks and calls for an increased awareness of the importance of engineering system integrity. This is even more the case in facilities for patients in emergency care, and engineering systems should be designed to be especially robust to ensure that a failure in the quality or continuity of an essential engineering service cannot compromise patient safety.
- 6.15 Designers should be particularly aware of the role of engineering design in the control of infection, particularly in respect of water services (see SHTMs 2027 and 2040) and ventilation systems (see SHTM 2025).
- 6.16 Clearly identified devices for the control and isolation of primary engineering services should be located in areas where they can be protected against unauthorised interference, ideally in plantrooms, engineering service spaces, or circulation areas.
- 6.17 The need to employ formal 'Permit to Work' and 'Permit to Use' procedures should be noted, particularly in respect of electrical systems (see SHTMs 2020 and 2021) and medical gas systems (see SHTM 2022).

### **Ventilation (substances hazardous to health)**

- 6.18 Local exhaust ventilation will be required where exposure by inhalation of substances hazardous to health cannot be controlled by other means. The Health and Safety Executive publication EH40, 'Occupational Exposure Limits', updated annually, sets limits that form part of the Control of Substances Hazardous to Health Regulations 2002 (COSHH).

### **Fire safety**

- 6.19 The guidance in respect of fire safety is set out in the NHSScotland 'Firecode' series of documents. The healthcare organisation should satisfy itself that the design meets the objectives of Scottish technical standards and 'Firecode' by either compliance with SHTMs or a fire-engineered solution that achieves similar objectives. Reference should also be made to the SEHD Fire Safety Policy.
- 6.20 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 architect and engineer should discuss and verify 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 safety strategy for the design. This will include operational aspects (staff responsibilities etc), equipment provision, and building and engineering layouts. SHTMs 57–60 provide detailed information for the selection of fire-resistant building components and materials.

## Fire detection and alarm systems

- 6.21 A fire detection and alarm system complying with SHTMs should be installed throughout the facility.

## Noise

- 6.22 Excessive noise and vibration from engineering services whether generated internally or externally and transmitted to individual areas or noise from other sources, for example speech, which can be transmitted via the ventilation system, can adversely affect the operational efficiency of the department and cause discomfort to patients and staff. The limits and means of control advocated in SHTM 2045: 'Acoustics' should provide an acceptable acoustic environment.
- 6.23 In addition to designing for control of noise levels, there may also be a need to ensure speech privacy, so that confidential conversations are unintelligible in adjoining rooms or spaces.

## Space requirements for services and plant

- 6.24 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 building design should incorporate adequate space for the installation and maintenance of plant, ductwork, pipework and cabling.
- 6.25 Space for plant and services should provide:
- easy and safe means of access;
  - secure accommodation protected from unauthorised access;
  - adequate space around plant and services to permit inspection and maintenance;
  - sufficient space to permit redundant plant to be removed without the need to dismantle other major plant.
- 6.26 Recommended spatial requirements for engineering plant and services are contained in SHTM 2023. Further useful information regarding the provision of space for plant is contained in BSRIA Technical Note TN 9/92, and for building services distribution systems in BSRIA Technical Note TN 10/92.
- 6.27 Space should be allowed within walls and above ceilings to facilitate the concealment of electrical and mechanical services where possible. Securable demountable panels should be provided to allow access to control and isolation valves as well as any equipment that is necessarily concealed within the spaces. Each panel should be clearly, but discreetly, marked to identify the controls or equipment to be found behind the panel.

- 6.28 In general, but with the exception of drainage and, when appropriate, 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 in service spaces on that floor.
- 6.29 Wherever possible, access to plant and services should be from plantrooms or maintenance areas. Where this is not possible, every endeavour should be made to effect access from general circulation areas and not from operational spaces.
- 6.30 In areas where wall mounted heat emitters are installed, they should be contained within a 200mm wide perimeter zone. The 200mm zone, together with the space for minor engineering ducts required to service the emitter, is included in the engineering zone allowance. The space requirement for wall-mounted emitters can be eliminated by the use of ceiling emitters or underfloor heating coils.
- 6.31 Care should be taken to ensure that noise and structure-borne vibration cannot be transmitted from the plantroom to other areas.

### Engineering commissioning

- 6.32 The engineering services should be commissioned in accordance with the validation and verification methods identified in the latest SHTMs. Engineering services for which a specific SHTM is not currently available should be commissioned in accordance with 'Guide to engineering commissioning' (IHEEM, 1995). Flow measurement and proportional balancing of air and water systems require adequate test facilities to be incorporated at the design stage. Guidance is also contained in a series of commissioning codes published by the Chartered Institution of Building Services Engineers.

## Specific mechanical engineering services

### Introduction

- 6.33 Mechanical services may include the following:
- heating system;
  - hot and cold water systems;
  - ventilation systems;
  - refrigeration plant;
  - environmental control and building management systems;
  - medical gases;
  - steam and condensate systems;
  - sterilizing and washer-disinfector equipment.

## Maximum demands

- 6.34 The estimated maximum demand and storage requirements, where appropriate, for each engineering service will need to be assessed individually to take account of the size, shape, geographical location, operational policies and intensity of use of the facility. For the purposes of initial planning only, the services demands in [Table 6.1](#) may be considered typical of an accident and emergency department with a throughput of 50,000 patients per annum.
- 6.35 For the purposes of this document the installation is deemed to include each system from the point of entry to the facility to the final connection to service outlets or specific equipment.

## Heating system

- 6.36 A building management system (BMS) should control the heating system in zones to ensure that it is automatically set back or turned off when the facility, or zones within the facility, is/are not in use. Heating throughout the facility should be controlled to a minimum 'set back' temperature of 10°C during 'out of use' hours. The BMS should be equipped with a manual override to permit restoration of the plant to full operational status at short notice (see also SHTM 2005: 'Building Management Systems').

Service	Typical max demand	Notes
Heating/Ventilation (kw)	90	
Domestic hot water (l/s)	1.8	720 litres storage (2 hours recovery)
Cold water (l/s)	2.6	4000 litres storage (24 hour supply)
Supply ventilation (m3/s)	2.3	
Extract ventilation (m3/s)	2.3	Clean and dirty
Cooling (kW)	33	
Electrical (kVA)	18	
Medical gases (l/min)		
Oxygen	70	
Medical compressed air	300	
Vacuum	100	
Nitrous oxide	60	Anaesthetic gas scavenging required if nitrous oxide provided

**Table 6.1: Service Demands**

- 6.37 In areas other than resuscitation rooms, treatment rooms, and plenum ventilated/air-conditioned accommodation, general space heating requirements can be met by either wall-mounted low-pressure hot water radiators, ceiling located low pressure hot water emitters or underfloor embedded heating coils. Preferably heat emitters should be located out of reach of patients and staff, either by adopting perimeter ceiling mounted radiant panels or underfloor embedded coils. This will avoid space below windows being taken up by emitters, reduce pattern staining etc and enhance flexibility in internal space

planning. Designers should assess likely disruption where existing premises are being upgraded in determining the choice of heating. In new build the choice will be influenced by the layout and size of rooms within the department.

- 6.38 The surface temperature of wall mounted radiators should not exceed 43°C. Ceiling mounted radiant panels can exceed this surface temperature and will allow floor space savings. Exposed heating pipework at temperatures above 43°C and accessible to touch should be encased or insulated. Further information is given in the Scottish Health Guidance Note (SHGN): “Safe” hot water and surface temperatures’.
- 6.39 Where emitters are being retained in refurbishment of existing accommodation they should normally 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, at least several inches, to allow cleaning machinery to be used. Where a radiator is located on an external wall, back insulation should be provided to reduce the rate of heat transmission through the building fabric.
- 6.40 All emitters should be fitted with thermostatic control valves. These should be of robust construction and selected to match the temperature and pressure characteristics of the system. The thermostatic head should incorporate a tamper-proof facility for pre-setting the maximum room temperature. It should be controlled via a sensor located integrally or remotely. To provide frost protection, the valve should not remain closed below a fixed temperature.
- 6.41 Emitters should be used to offset only building fabric heat loss in mechanically ventilated rooms. All rooms should have local heating controls; the facility should be controlled throughout by the BMS.
- 6.42 Ceiling heating panels may operate at higher surface temperatures than 43°C as long as the surface is not readily accessible. Heating panels should 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 down on a patient or member of staff for a prolonged period.
- 6.43 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 device.
- 6.44 Heating loops of ceiling panels should be controlled by automatic valves located above the ceiling and actuated from room thermostats. In large spaces, several loops should be provided, each controlled from its own thermostat to serve separate zones within the space.



## Hot and cold water systems

- 6.45 Hot and cold water storage and distribution systems should be designed in accordance with the requirements of SHTM 2027 and SHTM 2040. Pipework shall be installed from the range of materials set out in Scottish Hospital Technical Note 2 (SHTN 2).
- 6.46 Whilst cold-water storage at high level will be the norm, care should be taken to ensure that all equipment proposed for the department is capable of operating from the available static head. Where the static head is insufficient, a pressurisation set incorporating dual pumps should be installed.
- 6.47 All cold-water pipework, valves and fittings should be insulated and vapour sealed to protect against frost, condensation and heat gain.
- 6.48 The domestic hot water supply should be taken from the calorifiers installation at a minimum outflow temperature of  $60^{\circ}\text{C} \pm 2.5^{\circ}\text{C}$  and distributed to all outlets in a manner that ensures a return temperature to the calorifiers of at least  $50^{\circ}\text{C}$ . Exposed hot water pipework, accessible to touch, should be encased or insulated. Further information is given in SHGN: ‘Safe’ hot water and surface temperatures’.
- 6.49 Where possible, automatic water conserving taps actuated by proximity detectors should be used.

## Ventilation (General)

- 6.50 Mechanical ventilation or air conditioning is essential. High heat gain from electronic equipment as well as large numbers of staff and patients moving through the department 24 hours a day make this extremely important. Any mechanical ventilation or air conditioning should be controllable from within the A&E department so that it can be shut down quickly if the department becomes contaminated.
- 6.51 Air movement induced by mechanical ventilation should be from clean to dirty areas, where these can be defined. Deep planned spaces will require mechanical ventilation. The design should allow for adequate flow of air into any space 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 the requirements of ‘Firecode’ or privacy of patients.
- 6.52 Mechanical ventilation of the unit as a whole should ensure that overall the supply ventilation creates a slight positive pressure to prevent unwanted infiltration.
- 6.53 Fresh air should be introduced via a low velocity system and should be tempered and filtered before being distributed via high-level outlets. Diffusers and grilles should be located to achieve uniform air distribution within the space, without causing discomfort to patients or staff.

- 6.54 A separate extract system will be required for 'dirty' areas, for example toilet facilities. It should operate continuously throughout working hours. A dual motor fan unit with an automatic changeover facility should be provided. Also decontamination areas and a number of treatment rooms require the ability to be isolated from the rest of the department (See [paragraph 2.21](#))
- 6.55 External discharge arrangements for extract systems should be protected against back pressure from adverse wind effects and should be located to avoid reintroduction of exhausted air into this or adjacent buildings through air intakes and windows.

### Ventilation of resuscitation rooms

- 6.56 In establishing the nature of the ventilation regime to be provided in the resuscitation room, it is imperative to ascertain at the outset the spectrum of activity that will be undertaken within the particular facility. In determining the technical solution applicable to the facility, the engineer should consult with the clinical team and the Control of Infection Officer to ensure that the solution is appropriate.
- 6.57 It should be noted that at times there will be high levels of activity in a relatively confined space, and it is essential that the ventilation system is able to respond to demands for the maintenance of comfortable working conditions in such circumstances. It is likely that cooling will be required in these and surrounding areas.
- 6.58 The system should also be capable of responding rapidly to user demands for changing temperature, as required by the condition of the patient. Whilst an over-engineered solution cannot be encouraged, care should be taken to ensure that any agreed solution takes into account any need for future-proofing, since retrospective fitting of full air-conditioning is both expensive and disruptive.

### Ventilation cooling systems

- 6.59 Refrigeration loads for ventilation systems should be met either by the hospital's central water chiller plant, or by a packaged, remotely located water chiller plant dedicated to the facility. Direct expansion systems are not advocated unless the refrigeration load is small, since direct expansion plant can only be controlled in steps, unlike chilled water, which can be continuously modulated.
- 6.60 Heat rejection plant should consist of air-cooled condensers. Wet cooling towers should not be used.

### Ventilation controls

- 6.61 Ventilation systems should be controlled by a Building Management System (BMS) which will automatically set back or turn off plant serving areas that are not in continuous use. Ventilation systems should be controlled to ensure a minimum 'set back' temperature of 15°C during 'out of use' hours to facilitate

rapid warm-up if necessary. The BMS should be equipped with a manual override to permit restoration of the plant to full operational status at short notice.

- 6.62 Supply and extract ventilation systems should include local indicator lamps to confirm the operational status of each system.
- 6.63 The indicators for a system serving a particular space should be both immediately adjacent to the space and at a central staff base.
- 6.64 Where manual controls are available for staff use, they should be provided with labels that clearly define their function.

### Piped medical gases

- 6.65 Medical gases should be provided in accordance with SHTM 2022.
- 6.66 Medical gases should wherever possible be located in overhead supply units or on bed-head beams in order to minimise obstruction of the working area around the patient.
- 6.67 Due consideration should be given to the containment of noise from plant. A suitable acoustic enclosure may be required to effect compliance with the noise levels deemed acceptable in SHTM 2022.

### Medical oxygen

- 6.68 It should be anticipated that the main hospital's vacuum insulated evaporator (VIE) will have capacity to satisfy the requirements of the facility. Should this not be the case, consideration should be given to increasing the capacity of the VIE. Having regard to the probable scale of oxygen consumption, it is unlikely that an oxygen bottle manifold will be appropriate.
- 6.69 Oxygen should be provided to all resuscitation bays, treatment rooms, and bed positions in the clinical decision unit/observation unit.

### Nitrous oxide

- 6.70 Where local anaesthesia policy and risk considerations permit, one nitrous oxide outlet should be provided to each resuscitation bay.
- 6.71 Where provision is made for the supply of nitrous oxide it will be necessary to provide a gas scavenging system.

### Medical vacuum

- 6.72 A separate medical vacuum plant should be provided comprising:
  - at least two identical pumps;
  - a vacuum reservoir with bypass facilities;

- two duplex bacteria filters with drainage traps;
- appropriate non-return valves;
- isolating valves, gauges and switches;
- an operating and indicating system;
- an exhaust system;
- a test point.

6.73 The plant should have good all-round access for maintenance and should be sited to allow for adequate flows of air to cool the pumps.

6.74 Medical vacuum should be provided to all resuscitation rooms, treatment rooms and bed positions in the clinical decision unit/observation unit.

### Compressed air

6.75 Medical compressed air at 400kPa should be provided to all resuscitation rooms, treatment rooms, and bed positions in the clinical decision unit/observation unit.

6.76 Separate medical compressed air plant should be provided comprising:

- air intake filters;
- at least two identical compressors with after-coolers;
- pressure reducing valves;
- appropriate non-return valves;
- an air receiver with pressure relief valve;
- isolating valves;
- gauges and switches;
- an operating and indicating system;
- a test point.

6.77 The plant should have good all round access for maintenance and should be sited to allow for adequate flows of air to:

- provide air to the intakes of the compressors;
- provide cooling of the compressed air by the aftercoolers;
- cool the compressors themselves.

## Pneumatic tube systems

- 6.78 Where possible, pneumatic air tube systems should be installed. These will provide a viable and rapid alternative to porters for moving specimens to pathology and receiving medicines from the pharmacy. To determine the viability of using this type of system, the following factors should be assessed:
- distance, time and cost of travel between the various locations;
  - proportion of pathology specimens that require urgent results;
  - proportion of medicines that are required at short notice;
  - security;
  - whether the system can be used for transportation of other materials, for example general post;
  - parallel use of an electronic data infrastructure for requests and pathology results.
- 6.79 For further guidance on pneumatic tube systems see SHTM 2009: 'Pneumatic air tube transport systems'.

## Fire protection systems

- 6.80 Fire protection systems should comply with the requirements of Scottish technical standards, SHTM 81: 'Fire precautions in new hospitals' and SHTM 82: 'Supplement A, Version 1 – Automatic fire control systems and voice alarm systems'.
- 6.81 Dry risers should be provided adjacent to stairwells with branch hose connections at each landing. First aid hose reels and sprinkler systems will not generally be provided unless there is a specific requirement to do so by the local fire authority.
- 6.82 Where there are major IM&T equipment rooms located within the facility there may be a need for the provision of a gas extinguishing system.

## Internal drainage systems

- 6.83 Internal drainage systems should:
- use the minimum of pipework;
  - remain water and air-tight at joints and connectors;
  - have sufficient ventilation to retain the integrity of water seals;
  - include clear labeling of waste pipes that may contain radioactive waste or effluent;
  - allow for the isolation of decontamination areas and some treatment rooms (See [paragraph 2.21](#)).

- 6.84 The facility should be provided with a system of soil and waste drainage including anti-siphon and ventilation pipework in accordance with BS EN 12056-1.
- 6.85 Where plastic pipework materials are used, suitable intumescent collars should be fitted when breaching fire compartments, and acoustic wrapping must be applied when drainage runs above patient areas.
- 6.86 The gradient of branch drains should be uniform and adequate to convey the maximum discharge to the stack without blockage. Practical considerations, such as available angles of bends, junctions and their assembly, as well as space considerations, will normally limit the gradient to about 1:50 (20mm/m).
- 6.87 For larger pipes, for example 100mm in diameter, the gradient may be less, but this will require high quality workmanship if an adequate self-cleaning flow is to be maintained. It is not envisaged that pipes larger than 100mm diameter will be required within inter floor or ground floor systems serving this facility.
- 6.88 Bedpan washers or macerators should discharge with a short branch to a vertical stack or horizontal drain. Under no circumstances should the branch length exceed the manufacturer's stated maximum. The waste pipe should not be installed above or close to heating or hot water mains. If a bedpan washer or macerator discharges to a 100mm drain, frequently used large volume appliances should be situated upstream of its connection to provide additional flushing.
- 6.89 Provision for inspection, rodding and maintenance should ensure 'full bore' access and be located to minimise disruption or possible contamination. Manholes must not under any circumstances be located within this facility.

## Specific electrical engineering services

### Introduction

- 6.90 Electrical services include the following:
- main intake switchgear and distribution board;
  - emergency electrical supplies;
  - small power distribution systems;
  - lighting systems;
  - IM&T cabling systems;
  - telephone systems;
  - security systems;
  - staff call, public address and entertainment systems;
  - lightning protection.



- 6.91 Electrical installations should comply with BS 7671 and SHTM 2007: 'Electrical services supply and distribution'. The mounting heights for user terminals must be the subject of consultation with the planning team and agreement reached on the strategy for navigation through the building, visual indication of fire alarms and dealing with general emergencies in order to ensure compliance with the Disability Discrimination Act.
- 6.92 Care should be taken to avoid mains borne interference and electrical radio frequency interference affecting diagnostic and monitoring equipment, computers or other sensitive electronic equipment.

### Switch cupboard

- 6.93 The departmental switch cupboard, which houses the main isolators and distribution board, should be:
- sited within the department away from patient areas;
  - accessible directly from a circulation area providing clear and safe access for maintenance staff (access space may be part of the circulation area). Care should be taken to ensure that safety is not compromised during maintenance from passing traffic or the opening of adjacent doors;
  - sited away from water services and lockable.
- 6.94 Wherever possible, equipment should be mounted at a height that gives safe and easy access from a standing position. All switchgear should be lockable in the 'off' position.

### Emergency electrical supplies

- 6.95 Emergency electrical provision should comply, as a minimum, with the requirements of SHTM 2011: 'Emergency electrical services'.
- 6.96 The emergency generator providing electricity in the event of a main supply failure should be capable of providing full (100%) backup to the exclusion of refrigeration plant serving air-conditioning and comfort cooling plant.
- 6.97 If an existing generator is to be used, the extent of emergency coverage will be dependent on the spare capacity available, subject to a minimum provision. If this minimum requirement cannot be met, it will be necessary to either replace the existing generator with a larger set, or provide an additional generator dedicated to the facility.
- 6.98 Equipment and systems that cannot tolerate the delay inherent in bringing a generator supply on line, including imaging systems and computers, should be further protected against outages by the provision of solid-state non-interruptible power supplies.
- 6.99 In the event of a main supply or local final circuit failure, escape routes should be illuminated by self-contained, battery powered luminaires charged

continuously from the main supply and capable of providing illumination for a period of three hours.

### Small power distribution systems

- 6.100 Depending upon the available capacity of the emergency generator installation it may be necessary to provide separate essential and non-essential small power distribution systems as detailed in SHTM 2011.
- 6.101 Thirteen amp switched and shuttered socket outlets in accordance with the requirements of the room data sheets should be provided, connected to ring or spur circuits. It is preferable for socket outlets at bed positions to be unswitched, thus obviating the possibility of essential equipment accidentally being switched off.
- 6.102 Where there is separation between essential and non-essential small power distribution, socket outlets served by the essential distribution should be clearly marked with an engraved red capital letter 'E'. All socket outlets at bed head locations should be served from the essential distribution.
- 6.103 The special requirements of BS 7671 and Guidance Note 7, Institution of Engineering and Technology (IET) (formerly Institution of Electrical Engineers) in respect of medical locations and associated areas should be adhered to. The electrical supply connections to all medical electrical equipment should comply with BS EN 60601-1-2.
- 6.104 Guidance on the power supply requirements for mobile radio-diagnostic equipment is contained in SHTM 2011, whilst guidance on engineering accommodation for this equipment may be found in SHPN 6, Part 1: 'Facilities for diagnostic imaging and interventional radiology'.
- 6.105 Where equipment is permanently installed or where there is a possibility of equipment theft, switched double pole 13-amp spur outlets should be used in preference to socket outlets. The spur outlet should incorporate a red neon lamp indicating when the supply to the equipment is live.
- 6.106 Equipment requiring a three-phase supply should be permanently connected to a separate sub-circuit. The sub-circuits, incorporating a circuit breaker, should be fed from the distribution board and terminate in a local isolator.
- 6.107 Adequate provision should be made in circulation areas, for example corridors and lobbies, to permit the use of domestic cleaning equipment having flexible cords up to 9 metres long.
- 6.108 Isolation switches should be provided immediately adjacent to all engineering plant and equipment, clearly labelled to identify the equipment to which they relate.
- 6.109 Heating appliances and automatic equipment should be provided with red neon lamps indicating when they are energised. The neon lamps should be

incorporated in the control panel of the equipment, in the control switch, or in the socket-outlet or spur unit from which the equipment derives its supply.

### Lighting systems

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

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

See CIBSE guide F for further information.

6.111 For detail regarding illumination levels, designers should consult BS EN 12464, BS EN 60598-2-25 and IEC 60598-2-25.

6.112 Lighting within the facility 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 Estates-funded research project' (Dalke et al, 2004).

6.113 The positioning of artificial lighting should be considered carefully. Clinical task lighting is essential to each bed space and can be part of the medical supply unit. It should be dimmable, flexible and discreet. Potential conflicts with the provision of adequate lighting and gantry x-ray equipment should be avoided. Each light should be adjustable from the patient's bedside and also from the communications base. Staff should be able to read prescriptions and observation charts at night. Further consideration should be given to the type of lighting that can be used by more alert patients, so that they can control their own environment.

6.114 Ceiling mounted fluorescent lighting should not be positioned directly over a bed space, as an awake or lightly sedated patient will find the glare distressing. If ceiling mounted fittings are used they should be located to prevent unwanted glare. The lighting should be dimmable without flicker.

6.115 Floor or low level lighting should be provided to facilitate the observation of chest drains and urinary drainage. The light can also be used around the bed space at night or when the patient is resting.

6.116 Lighting switches should be provided in easily accessible positions within each area, and at appropriate locations in corridors and general circulation areas. In areas with multiple luminaires, switching should permit the selection of luminaires appropriate only to that area requiring illumination.

- 6.117 Where local circumstances permit, the provision of time switches or occupancy controls using infrared, acoustic or ultrasonic detectors should be considered, other than in corridors.
- 6.118 Generally, luminaires should be fitted with fluorescent lamps equipped with low-loss or high frequency control gear. Where luminaires are infrequently used, or where the design intent of the architect in respect of ambience dictates, compact fluorescent, LV or tungsten lamps may be used.
- 6.119 Colour corrected lighting should be provided in all patient areas.
- 6.120 Where necessary, general lighting should be supplemented with dedicated task lighting.
- 6.121 In areas where VDUs are in use, lighting should be designed to avoid any bright reflections from the screen. Generally, the lighting in such circumstances should comply with the guidance given in CIBSE LG3.
- 6.122 Safety escape lighting should be provided on primary escape routes in accordance with the provisions of SHTM 2011, BS EN 12464, BS EN 60598-2-25 and IEC 60598-2-25.

### **Controlled drugs (DDA) cupboards**

- 6.123 Drug cupboards to contain controlled drugs in a secure manner should be provided to BS 2881.
- 6.124 Each controlled drugs cupboard 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.
- 6.125 The normal supply for each cupboard should be backed up by a small UPS to cover the short period between mains failure and the generator supply becoming available.

### **Bedhead services**

- 6.126 Every bed position should incorporate a bed-head unit providing the following:
- 28 No – 13 amp switched and shuttered socket outlets;
  - oxygen and medical vacuum outlets;
  - medical air;
  - bed-head luminaire switch;
  - nurse call button/indicator lamp;
  - staff/staff emergency pull switch;
  - socket for patient handset;
  - IM&T connection(s);

- telephone connection (optional);
- entertainment system (optional).

6.127 A handset control should also be provided incorporating:

- nurse call button;
- reassurance lamp;
- luminaire switch/dimmer control;
- entertainment system control (optional).

6.128 Discussion with staff should be undertaken at planning stage to determine the desirability of providing entertainment functions including radio, television and telephone.

### Fire detection

6.129 Fire detectors throughout the facility should be in accordance with SHTM 82: 'Alarm and Detection Systems'.

6.130 Xenon flashing light indication of a fire alarm situation should be installed alongside sounders, with the sounders being mutable from the communications base. However, this must be fully considered and discussed with the NHS Fire Safety Advisor. Consideration may also need to be given to photosensitive epileptics.

### IM&T and telephone systems

6.131 The approach to provision of IM&T and telephone infrastructure within the facility may be conditioned by existing systems within the hospital. However, where possible, a structured wiring system as described in the SHGN 'Structured cabling for IT systems' should be provided. This will permit a unified approach to the provision of cabling for:

- voice systems;
- data systems;
- imaging systems;
- alarm systems.

6.132 Whilst this 'universal' cabling system is initially more expensive than separate voice and data systems, the long-term cost of ownership is less.

6.133 In determining the nature of the IM&T system to be provided it is necessary to identify:

- areas to be served;
- whether structured cabling will be used;

- what density of outlets is to be provided (not less than two per workstation);
- whether wiring will be on a 'flood' or 'as required' basis;
- special requirements of imaging and picture archiving systems.

- 6.134 The extent and complexity of telephone equipment and associated infrastructure will be dependent on the size of the department.
- 6.135 As stated in [paragraphs 6.131 - 6.133](#), it may be beneficial to integrate voice cabling with the structured wiring system for IM&T, if provided.
- 6.136 Incoming calls to the facility should be routed through the reception. However, depending on the size of the establishment, a limited number of direct dial inwards (DDI) lines may be considered desirable.
- 6.137 Silent methods of annunciation should be considered as an alternative to audible telephones.
- 6.138 A properly planned telephone system will provide prompt intercommunication facilities between all extensions.
- 6.139 Coin and/or card-operated phones may be provided. Payphones should incorporate acoustic hoods to facilitate privacy. If payphones are provided, at least one should be suitable for use by disabled persons. It should be wheelchair-accessible and fitted with an inductive coupler to assist people using a hearing aid.

### Security systems

- 6.140 Any parts of the facility that are only used during the day should be protected 'out of hours' by an intruder alarm system complying with BS 4737, BS 7042 or BS 5979 as appropriate.
- 6.141 Points of ingress and egress from the facility should be monitored by high-definition CCTVs equipped with pan and tilt facility and capable of producing high quality images at low levels of light. Positioning of cameras should be determined with care, selecting optimum positioning for maximum field of coverage. Monitors should be sited at a location that is permanently manned whilst the facility is in use.
- 6.142 Entrances to wards and sensitive areas such as diagnostic and treatment areas should be protected by one of the variety of electronic access control systems available.

### Call systems

- 6.143 Personal attack alarms should be made available to vulnerable staff, preferably capable of identifying the location of a member of staff in difficulty.



- 6.144 Patient/staff call points should be provided in all spaces where patients may be left alone temporarily, such as rooms for consultation/examination rooms, treatment rooms and patient WCs.
- 6.145 Each call unit should comprise a push-button or pull cord, reassurance lamp and reset unit. The audible alarm signal initiated by patients should operate for one second at 10-second intervals with corresponding lamps lit continuously until cancelled. The alarm should be capable of operation by a disabled person.
- 6.146 A visual and audible indication of operation of each call point should be provided at the staff base to give responding staff unambiguous identification of the call source, with a repeater unit in the staff rest room.

### **Public area entertainment facilities**

- 6.147 Cabling provision should be made for television/video and piped music/radio systems in waiting areas where shown on room data sheets.

### **Lightning protection**

- 6.148 Protection of the building against lightning should be provided in accordance with SHTM 2007 and BS 6651.

## 7. Cost information

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### Introduction

- 7.1 For all types of healthcare buildings, it is important that building costs and revenue expenditure are kept consistent with acceptable standards. In applying the guidance in this document to determine a detailed design, the need for economy should always be of prime concern, and the activities should be carefully considered so that, where appropriate, space can be shared for similar activities which are programmed to take place at different times. The solution should not be detrimental to the proper functioning of the spaces involved nor to the needs of the users. Within this general context, this series of documents provides a synopsis of accommodation for healthcare buildings which the Scottish Executive Health Department (SEHD) recommends for the provision of a given service.

### Schedules of accommodation

- 7.2 The schedules at the end of this Section show example notional whole department accommodation. The examples are minimum expected and not to be taken as ideal provision for any particular project local case mix and activity may require more rooms to be available.
- 7.3 The examples included are as follows but not restricted to:
- 40,000 attendances: 6 assessment rooms and 6 treatment rooms;
  - 50,000 attendances: 8 assessment rooms and 8 treatment rooms;
  - 70,000 attendances: 10 assessment rooms and 10 treatment rooms;
  - 90,000 attendances: 12 assessment rooms and 12 treatment rooms.

### Dimensions and areas

- 7.4 In determining spatial requirements, the essential factor is not the total area provided but the critical dimensions, that is, those dimensions critical to the efficient functioning of the activities which are to be carried out. To assist project teams in preparing detailed design solutions for the rooms and spaces, studies have been carried out to establish dimensional requirements in the form of critical dimensions. The results of these studies appear as ergonomic diagrams in HBN/SHPN 40 Volumes 1–5.
- 7.5 For development planning and at the earliest stage of a design, it may be convenient for designers to have data available which will enable them to make an approximate assessment of the sizes involved. For this reason, the areas prepared for the purpose of establishing the cost allowances are listed in the Schedules of Accommodation found at the end of this Section.

- 7.6 It is emphasised that the areas published do not represent recommended sizes, nor are they to be regarded in any way as specific individual entitlements.
- 7.7 Planning of the building efficiently may also necessitate variation of areas, for instance, in the refurbishment or conversion of older property:
- rooms tend to be larger than the recommended area;
  - 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

- 7.8 Space for circulation, that is all internal corridors, small vertical ducts and spaces occupied by partitions and walls, is included as a % addition.
- 7.9 Provision is also made for a 5% planning zone and a 3% addition for an engineering zone adjacent to the external walls.
- 7.10 It is also important to remember that the circulation figures included for this type of accommodation are those anticipated for new purpose built premises with no constraints. Where constraints are encountered, for example in refurbishment or conversion of older types of property, this circulation figure would be likely to increase accordingly, and therefore some adjustment may be necessary to the circulation figure.

## Communications

- 7.11 Staircases and lifts are not included in the English Departmental Cost Advance Guides relevant to this department. Costs related to these elements, along with a suitable space allowance, should be made in the on-costs.

## Land costs

- 7.12 As is the norm for English DCAGs, costs are exclusive of all land costs and associated fees. However, the project team's attention is drawn to the fact that costs associated with these should be included in the Business Case submission, all as detailed in the Scottish Capital Investment Manual, and could therefore be an important part of the overall cost viability of the scheme.

## Engineering services

- 7.13 The following engineering services, as described in Section 6 and exemplified in the Activity Data, are included in the cost allowances. Primary engineering services are assumed to be conveniently available at the boundary of the department.

## Mechanical services

- heating – low pressure hot water system;
- ventilation – mechanical supply and extract to all clinical areas and areas requiring extract due to type of room, that is, WCs, showers etc. Ventilation plant, that is, air handling units/extract fans, are not included in the cost allowances;
- cold water service – centrally supplied to service points including drinking water. Storage tanks are excluded;
- hot water service – supplied from a central system; storage and generation is excluded;
- piped medical gases oxygen, medical compressed air and vacuum. An emergency 2 x 1 oxygen manifold is included in the cost allowances; medical compressed air and vacuum plant are excluded;
- nitrous oxide and anaesthetic gas scavenging system are project options and are not included in the costs;
- pneumatic tube transport systems are project options and are not included in the costs.

## Electrical services

- departmental distribution boards;
- general lighting as required by task;
- examination lighting (examination lamps);
- emergency luminaires as appropriate;
- socket-outlets and other power outlets for fixed and portable equipment;
- supplementary equipotential earth bonding;
- UPS supplies and equipment;
- fire alarm system;
- TV/radio wireways only;
- telephone internal cabling distribution and outlets – handsets are excluded;
- data wireways only included.

## Equipment (Group 1 – for full and most up-to-date range see NHS Activity Database Sheets)

- water boiler in staff room and pantry;
- drugs cupboards;
- service pendants or beams;
- ceiling mounted examination lamps and minor operating luminaries.

## 7.14 Example Schedules of accommodation (For the most up-to-date schedules, Boards must check the Knowledge Information Portal website)

### Clinical decision unit facilities

No guidance on the accommodation required in a CDU is currently available.

Facilities should be developed in relation to local service delivery requirements.

### Patient decontamination facilities

No guidance on the accommodation required in a decontamination area is currently available.

Advice must be sought from the Radiation Protection Officer, Emergency Planning Officer and the Medical Toxicology Unit.

Department functional size/comprising	Example 1 40,000 attendances 6 assessment/ 6 treatment rooms			Example 2 50,000 attendances 8 assessment/ 8 treatment rooms			Example 3 70,000 attendances 10 assessment/ 10 treatment rooms			Example 4 90,000 attendances 12 assessment/ 12 treatment rooms			Para Ref	Notes
Activity Space	Qty	Area	Total	Qty	Area	Total	Qty	Area	Total	Qty	Area	Total		
<i>Entrance, reception &amp; waiting facilities</i>														
Car parking spaces for people with disabilities and parents with young children	–	–	–	–	–	–	–	–	–	–	–	–	Para 2.10	–
Ambulance parking bay	–	–	–	–	–	–	–	–	–	–	–	–	Para 2.7	–
Main entrance draught lobby	1	11.0	11.0	1	11.0	11.0	1	11.0	11.0	1	11.0	11.0	Para 2.9, 3.1, 3.2, 3.4	Main entrance Includes entrance canopy area
Main entrance draught lobby	1	11.0	11.0	1	11.0	11.0	1	11.0	11.0	1	11.0	11.0	Para 2.7, 2.9, 3.1, 3.2, 3.4	Ambulance entrance includes entrance canopy area
Parking bay: 3 wheelchairs	1	2.0	2.0	–	–	–	–	–	–	–	–	–	Para 3.5	–
Parking bay: 6 wheelchairs	–	–	–	1	4.0	4.0	1	4.0	4.0	1	4.0	4.0	Para 3.5	–
Parking bay: 2 accident trolleys & 2 wheelchairs	1	9.0	9.0	–	–	–	–	–	–	–	–	–	Para 3.5	–
Parking bay: 3 accident trolleys & 3 wheelchairs	–	–	–	1	12.0	12.0	1	12.0	12.0	1	12.0	12.0	Para 3.5	–
Reception: 2 staff	1	10.0	10.0	1	10.0	10.0	1	10.0	10.0	1	10.0	10.0	Para 3.8	See Appendix 1 Sheet 6
Parking bay: shopping, prams & pushchairs	1	6.0	6.0	–	–	–	–	–	–	–	–	–	–	Optional
Parking bay: shopping, prams & pushchairs	–	–	–	1	12.0	12.0	1	12.0	12.0	1	12.0	12.0	–	Optional
Waiting area: 15 persons including 2 wheelchair users	1	25.5	25.5	–	–	–	–	–	–	–	–	–	Para 3.20	–
Waiting area: 20 persons including 2 wheelchair users	–	–	–	1	33.0	33.0	–	–	–	–	–	–	Para 3.20	–
Waiting area: 25 persons including 2 wheelchair users	–	–	–	–	–	–	1	40.5	40.5	–	–	–	Para 3.20	–
Waiting area: 30 persons including 3 wheelchair users	–	–	–	–	–	–	–	–	–	1	49.5	49.5	Para 3.20	–
Waiting play area: 5 children	1	13.0	13.0	–	–	–	–	–	–	–	–	–	Para 3.20, 3.31	–
Waiting play area: 10 children	–	–	–	1	18.0	18.0	1	18.0	18.0	1	18.0	18.0	Para 3.20, 3.31	–
Public telephone: single booth, accessible	2	2.0	4.0	2	2.0	4.0	2	2.0	4.0	2	2.0	4.0	Para 3.21, 3.29, 5.7	–
Refreshment: drinking water dispenser	1	0.5	0.5	1	0.5	0.5	1	0.5	0.5	1	0.5	0.5	Para 3.21	–
Refreshment: vending machine	1	3.0	3.0	1	3.0	3.0	1	3.0	3.0	1	3.0	3.0	Para 3.29	–

Department functional size/comprising	Example 1 40,000 attendances 6 assessment/ 6 treatment rooms			Example 2 50,000 attendances 8 assessment/ 8 treatment rooms			Example 3 70,000 attendances 10 assessment/ 10 treatment rooms			Example 4 90,000 attendances 12 assessment/ 12 treatment rooms			Para Ref	Notes
Activity Space	Qty	Area	Total	Qty	Area	Total	Qty	Area	Total	Qty	Area	Total		
WC & hand-wash: accessible, wheelchair assisted	4	2.5	10.0	4	2.5	10.0	6	2.5	15.0	6	2.5	15.0	<a href="#">Para 3.22, 3.26, 3.32</a>	Separate Male & Female
Nappy change room with hand-wash	1	4.5	4.5	1	4.5	4.5	1	4.5	4.5	1	4.5	4.5	<a href="#">Para 3.22, 3.26, 3.32</a>	–
Infant feeding room	1	4.0	4.0	1	4.0	4.0	1	4.0	4.0	1	4.0	4.0	<a href="#">Para 3.22, 3.26, 3.32</a>	–
	1	5.5	5.5	1	5.5	5.5	1	5.5	5.5	1	5.5	5.5	<a href="#">Para 3.22, 3.26, 3.32</a>	–
<i>Social care &amp; distressed/disturbed persons facilities</i>														
Interview room: 5 person	1	11.0	11.0	1	11.0	11.0	1	11.0	11.0	1	11.0	11.0	<a href="#">Para 2.54, 2.58, 3.87</a>	Distressed/disturbed persons
WC & handwash: accessible, wheelchair independent/assisted	1	4.5	4.5	1	4.5	4.5	1	4.5	4.5	1	4.5	4.5	<a href="#">Para 2.54, 2.59, 3.87</a>	–
Special room: distressed/disturbed patient	–	–	–	–	–	–	1	11.0	11.0	1	11.0	11.0	<a href="#">Para 2.60, 3.90</a>	Optional
WC & handwash: accessible, wheelchair independent/assisted	–	–	–	–	–	–	1	4.5	4.5	1	4.5	4.5	<a href="#">Para 3.90</a>	Optional
<i>Assessment facilities</i>														
Assessment room: A&E	3	16.0	48.0	4	16.0	64.0	5	16.0	80.0	6	16.0	96.0	<a href="#">Para 3.34</a>	See Appendix 1 Sheet 1
Assessment room: Paediatric, A&E	3	16.0	48.0	4	16.0	64.0	5	16.0	80.0	6	16.0	96.0	<a href="#">Para 3.35</a>	–
<i>Treatment facilities</i>														
Waiting area: 5 persons including 1 wheelchair user	1	9.0	9.0	–	–	–	–	–	–	–	–	–	<a href="#">Para 3.20</a>	–
Waiting area: 10 persons including 1 wheelchair user	–	–	–	1	16.5	16.5	1	16.5	16.5	1	16.5	16.5	<a href="#">Para 3.20</a>	–
WC & handwash: specimen; accessible, wheelchair	1	4.5	4.5	1	4.5	4.5	1	4.5	4.5	1	4.5	4.5	<a href="#">Para 3.113</a>	–
Treatment room: A&E, multi-functional	4	16.0	64.0	6	16.0	96.0	8	16.0	128.0	10	16.0	160.0	<a href="#">Para 3.43, 3.44, 3.55</a>	See Appendix 1 Sheet 2
														A number of these rooms should be suitably decorated, furnished and equipped for children.
Treatment room: A&E, head & neck	1	16.0	16.0	1	16.0	16.0	1	16.0	16.0	1	16.0	16.0	<a href="#">Para 3.44, 3.57</a>	See Appendix 1 Sheet 4
Treatment room: A&E, gynaecology/genito-urinary colposcopy	1	16.0	16.0	1	16.0	16.0	1	16.0	16.0	1	16.0	16.0	<a href="#">Para 3.45, 3.59</a>	See Appendix 1 Sheet 3
WC & hand-wash: accessible, wheelchair assisted	1	4.5	4.5	1	4.5	4.5	1	4.5	4.5	1	4.5	4.5	<a href="#">Para 3.59</a>	Adjacent
Staff & communication base: 2 staff	1	10.0	10.0	1	10.0	10.0	1	10.0	10.0	1	10.0	10.0	<a href="#">Para 3.83</a>	–
Supplies base	1	10.0	10.0	1	10.0	10.0	1	10.0	10.0	1	10.0	10.0	<a href="#">Para 3.54</a>	–



Department functional size/comprising	Example 1 40,000 attendances 6 assessment/ 6 treatment rooms			Example 2 50,000 attendances 8 assessment/ 8 treatment rooms			Example 3 70,000 attendances 10 assessment/ 10 treatment rooms			Example 4 90,000 attendances 12 assessment/ 12 treatment rooms			Para Ref	Notes
Activity Space	Qty	Area	Total	Qty	Area	Total	Qty	Area	Total	Qty	Area	Total		
<i>Patient resuscitation facilities</i>														
Resuscitation room: 3 places	1	89.0	89.0	–	–	–	–	–	–	–	–	–	<a href="#">Para 3.62</a>	<a href="#">See Appendix 1 Sheet 5</a> One bay equipped for babies, children & young people
Resuscitation room: 4 places	–	–	–	1	116.0	116.0	–	–	–	–	–	–	<a href="#">Para 3.62</a>	<a href="#">See Appendix 1 Sheet 5</a> One bay equipped for babies, children & young people
Resuscitation room: 5 places	–	–	–	–	–	–	1	143.0	143.0	1	143.0	143.0	<a href="#">Para 3.62</a>	<a href="#">See Appendix 1 Sheet 5</a> One bay equipped for babies, children & young people
<i>Distressed &amp; bereaved persons facilities</i>														
Sitting & body viewing room with beverage bay: 8 persons	2	16.0	32.0	2	16.0	32.0	2	16.0	32.0	2	16.0	32.0	<a href="#">Para 2.63, 3.66, 3.91</a>	Family and friends
WC & hand-wash: accessible, wheelchair-assisted	2	4.5	9.0	2	4.5	9.0	2	4.5	9.0	2	4.5	9.0	<a href="#">Para 3.92</a>	En-suite optional
Body viewing/bier room	1	10.0	10.0	1	10.0	10.0	1	10.0	10.0	1	10.0	10.0	<a href="#">Para 3.66, 3.99</a>	Dual access
<i>Support facilities: Clinical</i>														
Near-patient testing/status laboratory	1	8.5	8.5	1	8.5	8.5	1	8.5	8.5	1	8.5	8.5	<a href="#">Para 2.51, 3.102</a>	–
Dirty utility: bedpan disposal & urine test	1	12.0	12.0	1	12.0	12.0	1	12.0	12.0	1	12.0	12.0	<a href="#">Para 3.54, 3.111</a>	–
Parking bay: ultrasound unit	1	1.0	1.0	1	1.0	1.0	1	1.0	1.0	1	1.0	1.0	<a href="#">Para 2.48</a>	–
<i>Staff support facilities: Rest &amp; recreation</i>														
Rest & dining room: 20 staff	1	25.0	25.0	–	–	–	–	–	–	–	–	–	<a href="#">Para 4.6</a>	Direct access to pantry
Rest & dining room: 30 staff	–	–	–	1	40.0	40.0	–	–	–	–	–	–	<a href="#">Para 4.6</a>	Direct access to pantry
Rest & dining room: 35 staff	–	–	–	–	–	–	1	46.0	46.0	1	46.0	46.0	<a href="#">Para 4.6</a>	Direct access to pantry
Pantry: serving 20 persons	1	6.0	6.0	–	–	–	–	–	–	–	–	–	<a href="#">Para 4.9</a>	–
Pantry: serving over 20 persons	–	–	–	1	12.0	12.0	1	12.0	12.0	1	12.0	12.0	<a href="#">Para 4.9</a>	–

Department functional size/comprising	Example 1 attendances 6 assessment/ 6 treatment rooms			Example 2 50,000 attendances 8 assessment/ 8 treatment rooms			Example 3 70,000 attendances 10 assessment/ 10 treatment rooms			Example 4 90,000 attendances 12 assessment/ 12 treatment rooms			Para Ref	Notes
Activity Space	Qty	Area	Total	Qty	Area	Total	Qty	Area	Total	Qty	Area	Total		
Staff support facilities: Overnight accommodation														
On-call overnight stay room	1	13.0	13.0	1	13.0	13.0	2	13.0	26.0	2	13.0	26.0	Para 4.11	—
Shower, WC & wash: ambulant (non patient)	1	5.0	5.0	1	5.0	5.0	2	5.0	10.0	2	5.0	10.0	Para 4.11	—
Staff support facilities: Sanitary & changing														
WC & wash: ambulant	5	2.0	10.0	8	2.0	16.0	10	2.0	20.0	10	2.0	20.0	Para 4.8, 4.16	—
Shower: ambulant (non-patient)	4	2.5	10.0	4	2.5	10.0	4	2.5	10.0	4	2.5	10.0	Para 4.12	—
Staff changing room: 20 places	1	11.5	11.5	-	-	-	-	-	-	-	-	-	Para 4.13	—
Staff changing room: 30 places	1	16.0	16.0	1	16.0	16.0	1	16.0	16.0	-	-	-	Para 4.13	—
Staff changing room: 40 places	-	-	-	1	20.0	20.0	-	-	-	1	20.0	20.0	Para 4.13	—
Staff changing room: 50 places	-	-	-	-	-	-	1	25.0	25.0	1	25.0	25.0	Para 4.13	—
Office: 1 staff	3	10.5	31.5	4	10.5	42.0	4	10.5	42.0	4	10.5	42.0	Para 4.23	—
Office: 2 staff	1	13.0	13.0	1	13.0	13.0	1	13.0	13.0	1	13.0	13.0	Para 4.24	—
Office: 3 staff	2	18.0	36.0	-	-	-	-	-	-	-	-	-	Para 4.24	—
Office: 4 staff	-	-	-	2	24.0	48.0	2	24.0	48.0	2	24.0	48.0	Para 4.24	—
Interview & counseling room: 5 persons	1	9.0	9.0	1	9.0	9.0	1	9.0	9.0	1	9.0	9.0	Para 4.19	—
Interview/meeting room: 6 persons	1	14.0	14.0	1	14.0	14.0	1	14.0	14.0	1	14.0	14.0	Para 4.19	—
Staff support facilities: Education & training														
Seminar & training room: 15 persons	1	27.5	27.5	-	-	-	-	-	-	-	-	-	Para 4.29	—
Seminar & training room: 20 persons	-	-	-	1	37.5	37.5	1	37.5	37.5	1	37.5	37.5	Para 4.29	—
Library & study room: 5 persons	1	20.0	20.0	1	20.0	20.0	1	20.0	20.0	1	20.0	20.0	Para 4.32	—
Support facilities: Holding & storage														
Store: equipment & supplies	1	24.0	24.0	-	-	-	-	-	-	-	-	-	Para 2.55, 4.36	—
Store: equipment & supplies	-	-	-	1	30.0	30.0	1	30.0	30.0	-	-	-	Para 2.55, 4.36	—
Store: equipment & supplies	-	-	-	-	-	-	-	-	-	1	36.0	36.0	Para 2.55, 4.36	—
Store: sterile supplies	1	9.0	9.0	-	-	-	-	-	-	-	-	-	Para 3.119, 4.40	—
Store: sterile supplies	-	-	-	1	12.0	12.0	1	12.0	12.0	-	-	-	Para 3.119, 4.40	—
Store: sterile supplies	-	-	-	-	-	-	-	-	-	1	15.0	15.0	Para 3.119, 4.40	—
Store: major incident equipment	1	6.0	6.0	1	6.0	6.0	1	6.0	6.0	1	6.0	6.0	Para 4.35	—
Store: ready to use medical gas cylinders	1	9.0	9.0	1	9.0	9.0	1	9.0	9.0	1	9.0	9.0	Para 4.41	—
Store: ambulance equipment	1	6.0	6.0	1	6.0	6.0	1	6.0	6.0	1	6.0	6.0	Para 4.34	—
Service room: equipment	1	12.0	12.0	1	12.0	12.0	-	-	-	-	-	-	Para 3.116	—
Service room: equipment	-	-	-	-	-	-	1	21.0	21.0	1	21.0	21.0	Para 3.116	—

Department functional size/comprising	Example 1 40,000 attendances 6 assessment/ 6 treatment rooms			Example 2 50,000 attendances 8 assessment/ 8 treatment rooms			Example 3 70,000 attendances 10 assessment/ 10 treatment rooms			Example 4 90,000 attendances 12 assessment/ 12 treatment rooms			Para Ref	Notes
	Qty	Area	Total	Qty	Area	Total	Qty	Area	Total	Qty	Area	Total		
<i>Support facilities: Miscellaneous</i>														
Ambulance cleaning bay	1	1	1	1	—	—	1	—	—	1	—	—	Para 4.33	—
Hold: disposal	1	6.0	6.0	—	—	—	—	—	—	—	—	—	Para 4.46	—
Hold: disposal				1	10.0	10.0	1	10.0	10.0	1	10.0	10.0	Para 4.46	—
Cleaners/domestic services room	1	7.0	7.0	1	7.0	7.0	1	7.0	7.0	1	7.0	7.0	Para 4.44	—
Switchgear room	1	4.0	4.0	1	4.0	4.0	1	4.0	4.0	1	4.0	4.0	Para 4.52, 6.92	—
Battery & UPS room	1	9.0	9.0	1	9.0	9.0	1	9.0	9.0	1	9.0	9.0	Para 4.48	—
Net Allowance			865.5			1068.5			1229.5			1315.5		
5% Planning allowance			43.5			53.5			61.5			66.0		
Total			909.0			1122.5			1291.0			1381.5		
3% Engineering Allowance			27.5			33.5			38.5			41.5		
33% Circulation Allowance			300.0			370.5			426.0			456.0		
Total Allowance			1236.5			1526.0			1755.5			1879.0		
<i>Essential complementary/shared accommodation</i>														
<b>Activity Space</b>	<b>Qty</b>	<b>Area</b>	<b>Gross</b>	<b>Para Ref</b>	<b>Notes</b>									
Dispenser bay car park ticket	1	10.0	13.5	Para 4.28										
Seminar and training room:30 persons	1	55.0	55.0	Para 4.28										
<i>Optional accommodation</i>														
Waiting area: 5 persons including 1 wheelchair user	1	9.0	12.0	-	Supplementary waiting									
Treatment room: plaster	1	16.0	21.5	Para 3.50	-									
Store: plaster	1	3.0	4.0	—	—									
On-call overnight stay room	1	13.0	17.5	Para 4.11	Additional									
Shower, WC and wash: ambulant (non-patient)	1	5.0	7.0	Para 4.11	Additional									
Parking bay: mobile 1 X-ray unit	1	2.0	2.5	Para 3.106										

## Appendices

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**Appendix 1: Example room layouts**

**Appendix 2: References**

**Appendix 3: Glossary of abbreviations**

## Appendix 1: Example room layouts

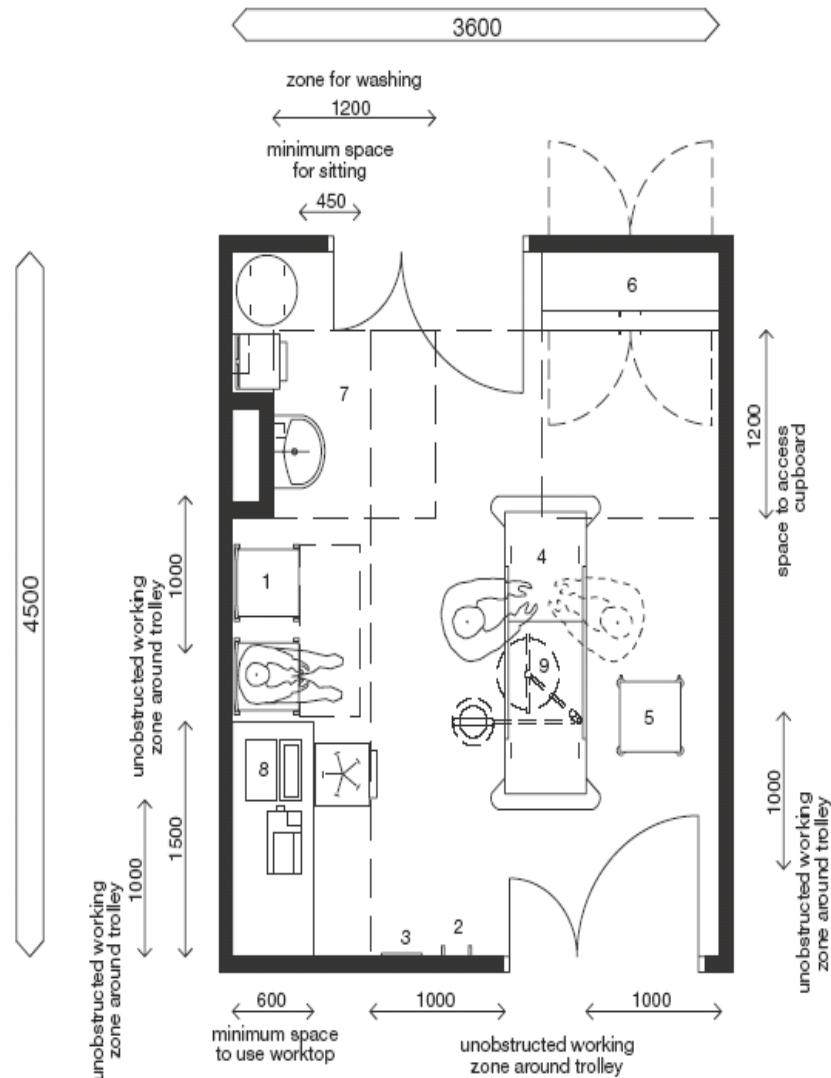
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The following room layouts are provided as a guide only to the organisation of space and equipment in A&E facilities:

- Sheet 1 - Assessment room;
- Sheet 2 - Multi-Functional treatment room;
- Sheet 3 - Gynaecology/genito-urinary treatment room;
- Sheet 4 - Head and Neck treatment room;
- Sheet 5 - Resuscitation room (critical dimensions);
- Sheet 6 - Reception counter.

**Note:** all measurements on the following sheets are given in millimetres (mm).

## Sheet 1 - Assessment room



1. Escorts' stacking chairs
2. Hat and coat hooks
3. Mirror
4. Adjustable trolley
5. Dressing trolley
6. Storage with access from corridor
7. Clinical hand-wash basin
8. Computer terminal and printer on work surface and office chair
9. Examination lamp

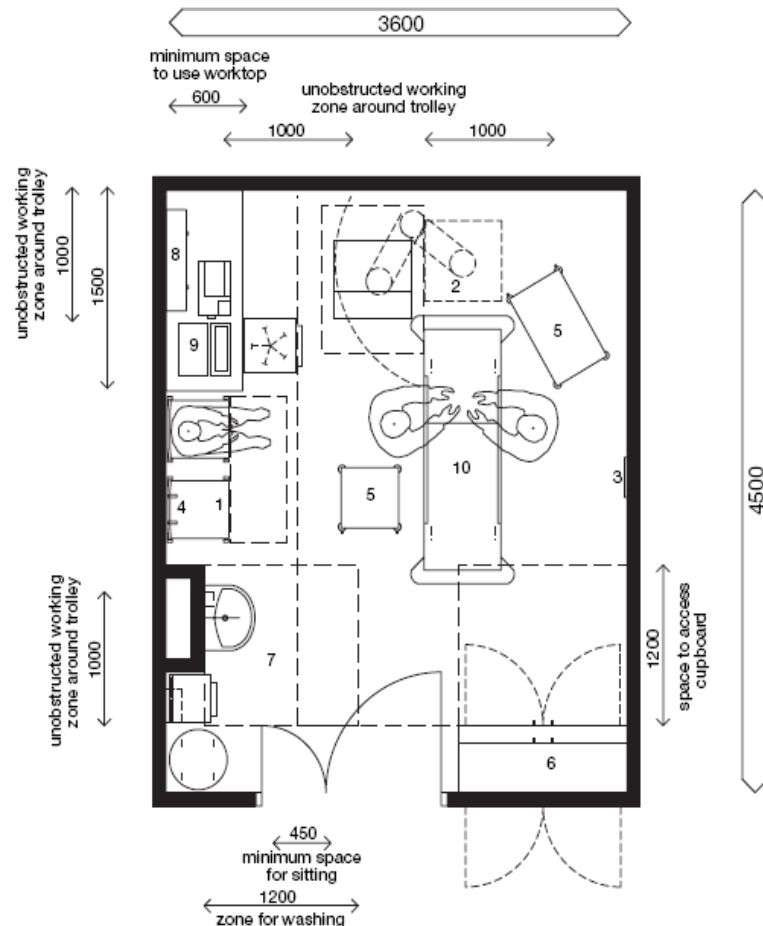
Accommodation for carrying out assessment and registration of patients. The patient may enter the room walking, with or without aids, or using a wheelchair, and may transfer onto the trolley. One or more escorts may be present. The patient may undress with assistance. Examination will be performed by 1-2 staff who may need to work from all sides of the trolley.

Computer facilities for recording patient data by the 'roving' receptionist are required. Facilities for clinical handwashing, storage of medical items, and disposal of soiled dressings must also be provided.

The computer should be on a 750 high worktop. This is satisfactory for short spells of keyboard use, or standing to write. A printer will be required for prescriptions, information sheets, appointments etc. An adjustable height office chair will be required for staff.



## Sheet 2 - Multi-functional treatment room



1. Escorts' stacking chairs
2. Supply unit with medical gases, monitoring equipment and examination lamp
3. Mirror
4. Hat and coat hooks
5. Dressing trolley
6. Storage with access from corridor
7. Clinical hand-wash basin
8. Optional X-ray viewer
9. Computer terminal and printer on worksurface and office chair
10. Adjustable trolley

Accommodation for carrying out clinical examinations and emergency medical and nursing procedures. The patient may enter the room walking, with or without aids, or using a wheelchair and may be transferred to the trolley, or may be brought into the room on a trolley. One or more escorts may be present. The patient may undress with assistance.

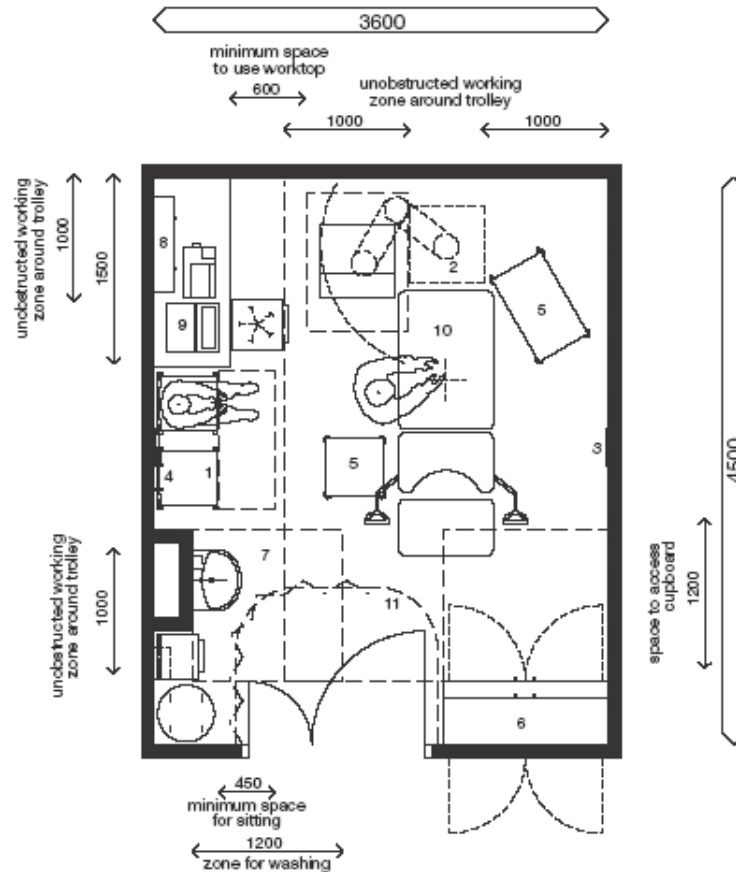
Procedures will be performed by 1-4 staff who may need to work from all sides of the trolley. Minor surgery may take place and plasters may be fitted.

Computer facilities for recording patient data must be provided. Facilities must also be provided for the storage of medical items and disposal of soiled dressings. Clinical handwashing facilities are required. X-ray viewing will be via an illuminator or computer terminal.

The computer should be on a 750 high worktop. This is satisfactory for short spells of keyboard use, or standing to write. A printer will be required for prescriptions, information sheets, appointments etc. An adjustable-height office chair will be required for staff.

Trolley to be adjustable in height to facilitate patient transfer, especially from a wheelchair, and for the requirements of staff of different heights.

## Sheet 3 - Gynaecology/genito-urinary treatment room

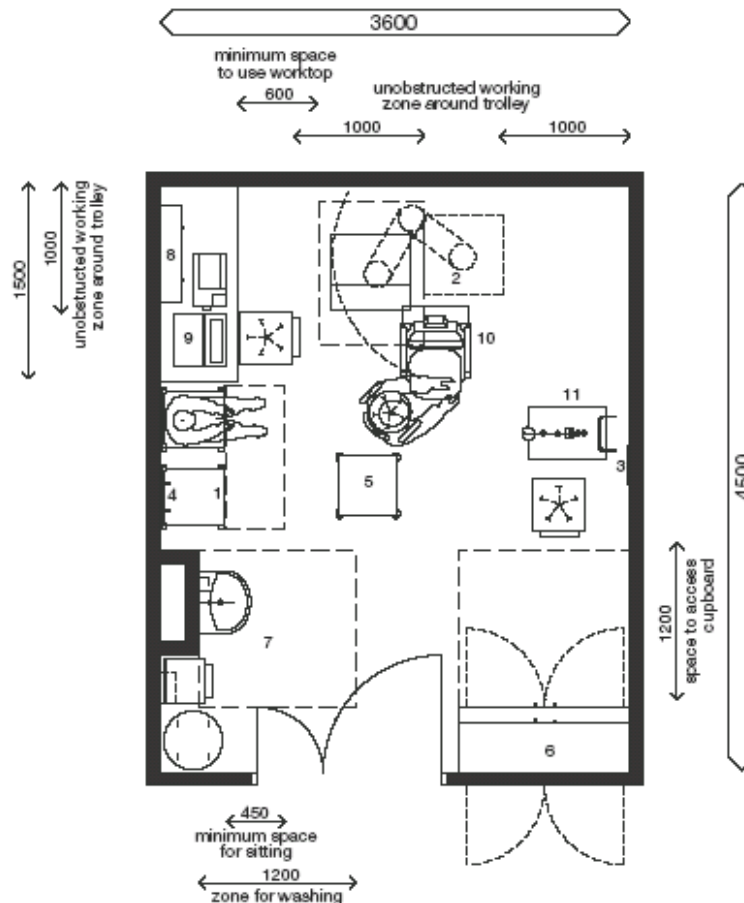


1. Escorts' stacking chairs
2. Supply unit with medical gases, monitoring equipment and examination lamp
3. Mirror
4. Hat and coat hooks
5. Dressing trolley
6. Storage with access from corridor
7. Clinical hand-wash basin
8. Optional X-ray viewer
9. Computer terminal and printer on work surface and office chair
10. Gynaecology/urology couch
11. Curtain and track for privacy

Accommodation for carrying out clinical examinations and treatment for patients with gynaecological or genito-urinary problems. The patient may enter the room walking, with or without aids, or using a wheelchair and may be transferred to the trolley or may be brought into the room on a trolley. One or more escorts may be present. The patient may undress with assistance. Procedures will be performed by 1-4 staff who may need to work from all sides of the trolley. Computer facilities for recording patient data must be provided. Facilities must also be provided for the storage of medical items and disposal of soiled dressings. Clinical handwashing facilities are required. X-ray viewing will be via an illuminator or computer terminal. For maximum flexibility this room can also be used as a multi-functional treatment room.

The computer should be on a 750 high worktop. This is satisfactory for short spells of keyboard use or standing to write. A printer will be required for prescriptions, information sheets, appointments etc. An adjustable-height office chair will be required for staff.

## Sheet 4 - Head and Neck treatment room



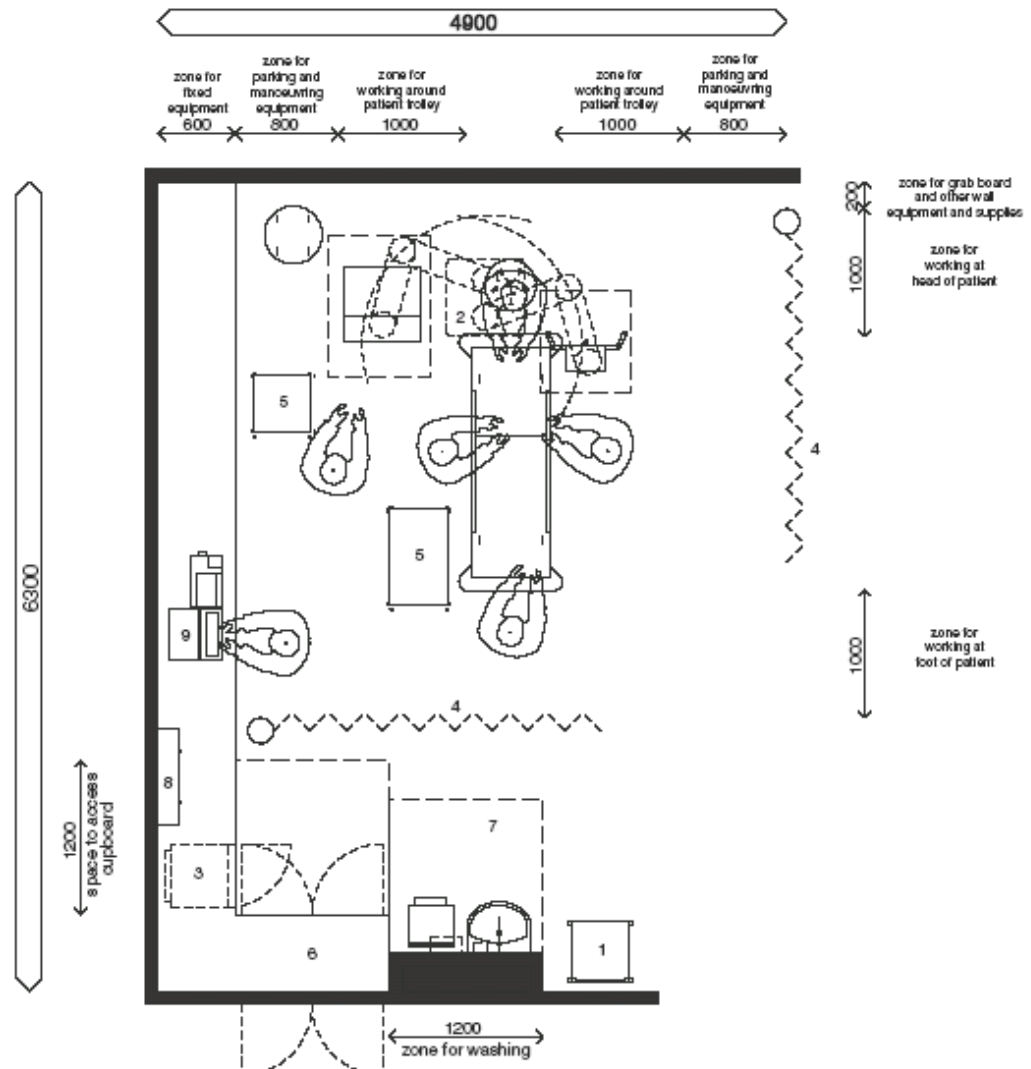
1. Escorts' stacking chairs
2. Supply unit with medical gases, monitoring equipment and examination lamp
3. Mirror
4. Hat and coat hooks
5. Dressing trolley
6. Storage with access from corridor
7. Clinical hand-wash basin
8. Optional X-ray viewer
9. Computer terminal and printer on work surface and office chair
10. Patient ENT chair
11. Slit lamp

Accommodation for carrying out clinical examinations and treatment of patients with ENT, ophthalmic and dental problems. The room can also be used for minor facial or scalp injuries requiring suturing. The patient may enter the room walking, with or without aids, or using a wheelchair. They will be examined and treated whilst sitting on the ENT chair or in a wheelchair. One or more escorts may be present. Procedures will be performed by up to two staff who may need to work from all sides of the chair. Computer facilities for recording patient data must be provided. Facilities must also be provided for the storage of medical items and disposal of soiled dressings. Clinical handwashing facilities are required. X-ray viewing will be via an illuminator or computer terminal.

For maximum flexibility this room can also be used as a multi-functional treatment room.

The computer should be on a 750 high worktop. This is satisfactory for short spells of keyboard use or standing to write. A printer will be required for prescriptions, information sheets, appointments etc. An adjustable height office chair will be required for staff.

## Sheet 5 - Resuscitation room (critical dimensions)



1. Escorts' stacking chairs
2. Supply unit with medical gases, life support, monitoring equipment and examination lamp
3. Drugs cupboard and fridge
4. Lead/uPVC protective curtain
5. Dressing trolley
6. Worktop with storage beneath and access from corridor
7. Clinical hand-wash basin with hands-free taps
8. Optional X-ray viewer
9. Computer terminal and printer

Accommodation for patients who arrive on a trolley seriously ill or injured to be assessed and resuscitated in visual privacy. Facilities for performing emergency medical procedures by a minimum of five staff who require space to work at all sides of the patient trolley, and space to use equipment. One or more escorts may be present.

Ceiling-mounted pendant for multi-parameter monitoring and medical gases.

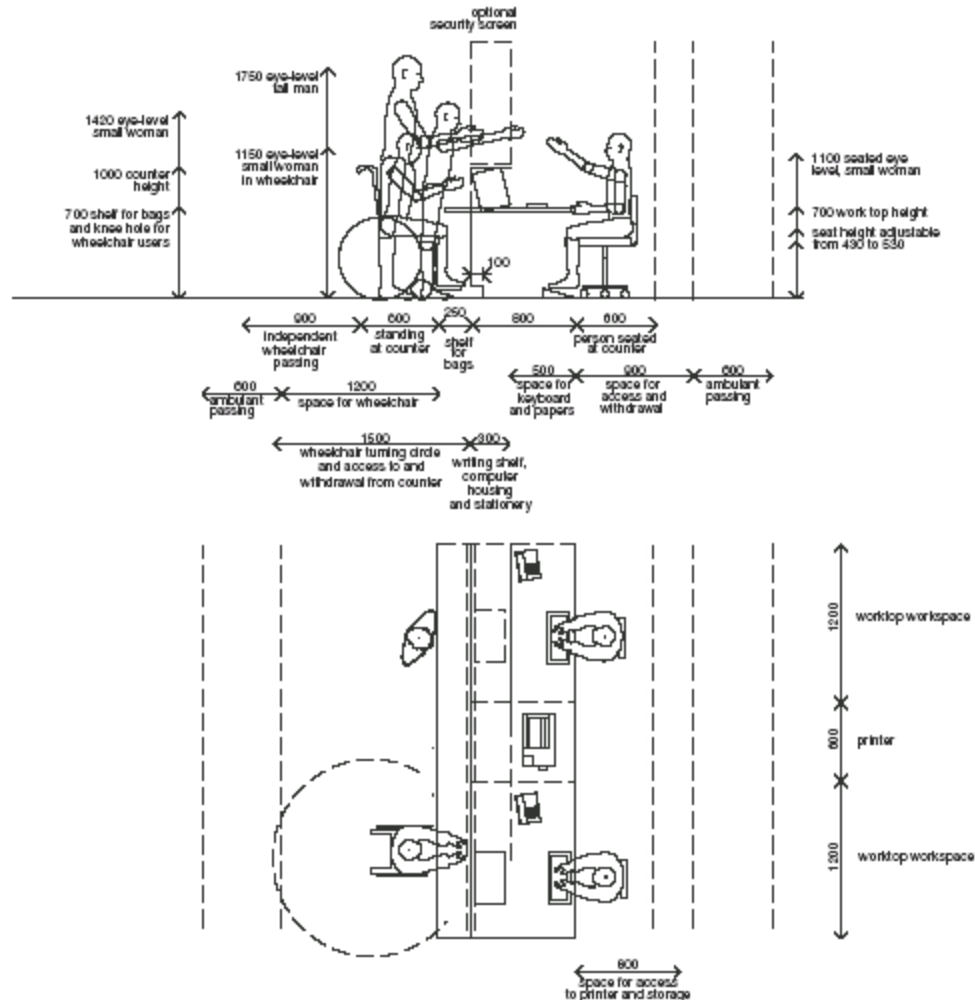
Computer facilities for recording patient data should be provided. Facilities should also be provided for the storage of medical items and disposal of soiled dressings. Clinical handwashing facilities are required, and X-ray viewing will be via an illuminator or computer terminal.

Many more than five staff may be working at speed and under pressure around the patient. The zone indicated around the patient trolley reflects this possibility.

The ceiling height should be 3000 mm to aid positioning the supply unit and to prevent a potential clash with optional overhead X-ray gantry.

A hands-free telephone and intercom should be provided.

## Sheet 6 - Reception counter



One or more reception staff will greet patients and direct them to the assessment room or waiting area. The reception area should be located in an open space directly inside the entrance and be immediately visible, and in full view of the security office. Patients may be adults or children, walking, with or without aids, or using a wheelchair and may be accompanied.

The position of the reception area should allow staff to see all patients and escorts entering the department and have vision to the main waiting and children's waiting/play areas.

The desk height to be 700 mm to allow staff to sit and use computers comfortably, with a desk thickness of 20 mm. This height is appropriate for those who use wheelchairs, and for children.

1200 mm width for the computer workplace will allow for screen, keyboard, mouse mat, papers and telephone. Clear width for legs under desk is 600 mm, so storage space and bins can be accommodated.

Patients, escorts and staff should be able to talk and exchange information with ease. A counter depth of 800 mm will allow adequate space for the computer and help to protect staff whilst still allowing receptionist and patient to hear each other. A raised area should protect the back of the computer, with an area for writing along the top. A shelf for bags is useful on the patient side.

There is evidence that violence occurs less at welcoming, open-plan reception desks than at enclosed 'secure' offices. If a glass screen is fitted, account should be taken of people with hearing difficulties.

An adjustable height (430–530 mm) swivel chair with castors is required for the receptionist. A footrest should be provided.

Each workstation should incorporate an alarm for staff to summon assistance.

## Appendix 2: References

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### Acts and Regulations

**The Building Standards (Scotland) Regulations (As amended) – Technical Standards.** The Scottish Building Standards Agency <http://www.sbsa.gov.uk>

**Construction (Design and Management) Regulations 1994.** SI 1994 No 3140. [http://www.hmsso.gov.uk/si/si1994/Uksi\\_19943140\\_en\\_1.htm](http://www.hmsso.gov.uk/si/si1994/Uksi_19943140_en_1.htm)

**Construction (Design and Management) (Amendment) Regulations 2000.** SI 2000 No 2380. <http://www.legislation.hmsso.gov.uk/si/si2000/20002380.htm>

**The Control of Substances Hazardous to Health (COSHH) Regulations.** SI 2002: 2677. The Stationery Office, 2002.

**Disability Discrimination Act 1995.**  
<http://www.hmsso.gov.uk/acts/acts1995/1995050.htm>

**Environmental Protection Act 1990.**  
[http://www.hmsso.gov.uk/acts/acts1990/Ukpga\\_9900043\\_en\\_1.htm](http://www.hmsso.gov.uk/acts/acts1990/Ukpga_9900043_en_1.htm)

**The Gas Safety (Installation and Use) Regulations.** SI 1886:1994. HMSO, 1994. [http://www.hmsso.gov.uk/si/si1994/Uksi\\_19941886\\_en\\_1.htm](http://www.hmsso.gov.uk/si/si1994/Uksi_19941886_en_1.htm)

**Health and Safety at Work etc Act 1974.**

**Health and Safety (Safety Signs and Signals) Regulations.** SI 341:1996. The Stationery Office, 1996.  
[http://www.legislation.hmsso.gov.uk/si/si1996/Uksi\\_19960341\\_en\\_1.htm](http://www.legislation.hmsso.gov.uk/si/si1996/Uksi_19960341_en_1.htm)

**Ionising Radiation (Medical Exposure) Regulations 2000.** SI 2000 No 1059.  
<http://www.hmsso.gov.uk/si/si2000/20001059.htm>

**Ionising Radiations Regulations 1999.** SI 1999 No 3232.  
<http://www.hmsso.gov.uk/si/si1999/19993232.htm>

**Management of Health and Safety at Work Regulations 1999.** SI 1999 No 3242. <http://www.hmsso.gov.uk/si/si1999/19993242.htm>

**Noise at Work Regulations.** SI 1790:1989. HMSO, 1989.  
[http://www.legislation.hmsso.gov.uk/si/si1989/Uksi\\_19891790\\_en\\_1.htm](http://www.legislation.hmsso.gov.uk/si/si1989/Uksi_19891790_en_1.htm)

**Pressure Systems Safety Regulations.** SI 128:2000. The Stationery Office, 2000. <http://www.legislation.hmsso.gov.uk/si/si2000/20000128.htm>

**Pressure Equipment Regulations.** SI 2001:1999. The Stationery Office, 1999.  
<http://www.hmsso.gov.uk/si/si1999/19992001.htm>



**Provision and Use of Work Equipment Regulations 1998.** SI 1998 No 2306.  
<http://www.hmsso.gov.uk/si/si1998/19982306.htm>

**Radioactive Substances Act 1993.**  
[http://www.hmsso.gov.uk/acts/acts1993/Ukpga\\_19930012\\_en\\_1.htm](http://www.hmsso.gov.uk/acts/acts1993/Ukpga_19930012_en_1.htm)

**Workplace (Health, Safety and Welfare) Regulations 1992.** SI 1992 No 3004.  
[http://www.hmsso.gov.uk/si/si1992/Uksi\\_19923004\\_en\\_1.htm](http://www.hmsso.gov.uk/si/si1992/Uksi_19923004_en_1.htm)

## British Standards

**BS 2881:1989 Specification for cupboards for the storage of medicines in health care premises.**

**BS 4737-2:1986 Intruder alarm systems. Specification for installed systems for deliberate operation.**

**BS 5979:2000. Code of practice for remote centres receiving signals from security systems.**

**BS 6651:1999. Code of practice for protection of structures against lightning.**

**BS 7042:1988. Specification for high security intruder alarm systems in buildings.**

**BS 7671:2001. Requirements for electrical installations.** IEE Wiring Regulations. Amendment No 1 AMD 13628 published February 2002 and AMD 14905 March 2004. British Standards Institution, 2001.

**BS 8300:2001. Design of buildings and their approaches to meet the needs of disabled people.** Code of Practice.

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## Appendix 3: Glossary of abbreviations

A&E	Accident and Emergency
AEMP	Accident and Emergency Modernisation Programme
AGS	Anaesthetic Gas Scavenging
AHPs	Allied Health Professionals
AVSU	Area Valve Service Unit
BAEM	British Association of Accident and Emergency Medicine
BMS	Building Management System
BS	British Standard
CAD	Computer Aided Design
CCTV	Closed Circuit Television
CCU	Coronary Care Unit
CDU	Clinical Decision unit
CHD	Coronary Heart Disease
CHPs	Combined Heat and Power systems
CIBSE	Chartered Institute of Building Services Engineers
CPD	Continuing Professional Development
CR	Computed Radiography
CT	Computed Tomography
DCAGs	Departmental Cost Allowance Guides
DH	Department of Health
DVT	Deep Vein Thrombosis
ECA	Essential Complementary/Shared Accommodation
ECG	Electrocardiogram
EMC/EMI	Electromagnetic Compatibility/Electromagnetic Interference
EME	Electronics and Medical Engineering

ENT	Ear Nose and Throat
EPO	Emergency Planning Officer
EU	European Union
GP	General Practitioner
HAI	Healthcare Associated Infection
HBN	Health Building Note
HTM	Health Technical Memorandum
HWS	Hot Water System
IDEA	Idealised Design of Emergency Care
IET	Institution of Engineering and Technology
LAN	Local Area Network
MDA	Medical Devices Agency
MIU	Minor Injury Unit
NSF	National Service Framework
PACS	Picture Archiving and Communication System
PEU	Paediatric Emergency Unit
PVC	Polyvinyl Chloride
RPA	Radiation Protection Advisor
SHFN	Scottish Health Facilities Notes
SHGN	Scottish Health Guidance Notes
SHPN	Scottish Health Planning Note
SHTM	Scottish Health Technical Memoranda
SSD	Sterile Services Department
TRV	Thermostatic radiator valves
UNICEF	United Nations International Children's Emergency Fund (United Nations Children's Fund)
UPS	Uninterrupted Power Supply
WiC	Walk-in Centre