



GUIDELINES ON EMERGENCY DEPARTMENT DESIGN

PREAMBLE

These guidelines are the first revision of the original publication of 1998. They are designed to assist clinicians, planners and architects in producing a design for an emergency department which is of adequate size and contains adequate facilities to fulfill its role. As emergency departments have high patient turnover, varied casemix and a large workforce, their design is crucial to their function. Emergency departments must be planned with due consideration for the potential for growth and expected changes in health care delivery. Current and potential models of care must be considered.

Key considerations include safety and security, amenity, access, image and consumer expectations, and evolving work practices.

This paper was produced with the input of many people who have direct experience with ED design or redevelopment. The guidelines are based on extensive consultation and research, including results of design and equipment surveys from more than 60 emergency departments over 15 years and detailed evaluation of plans of existing departments.

Recommended sizes for various spaces are expressed in relation to departmental activity. In general, a combination of activity (number of attendances), acuity (types of attendances) and the desired performance level (waiting times and access block) determine the amount and type of space required. In addition, workforce is broadly proportional to activity. Therefore staff area sizes are also related to departmental activity.

These guidelines are based on current Australasian conventional emergency department practice but do include reference to variations in service models that have been incorporated into recent designs. The best outcomes will be achieved if there is close consultation and collaboration between managers, emergency department clinicians and architects in designing emergency department facilities. Consumer involvement at key review points is highly desirable. An image gallery of contemporary facilities is provided for illustrative purposes only.

This is a living document which will evolve as emergency medicine develops.

1. INTRODUCTION

The emergency department is a core clinical unit of a hospital and the experience of patients attending the emergency department significantly influences patient satisfaction and the public image of the hospital. Its function is to receive, triage, stabilise and provide emergency management to patients who present with a wide variety of critical, urgent and semi urgent conditions whether self or otherwise referred. The emergency department also provides for the reception and management of disaster patients as part of its role within the disaster plan of each region. In addition to standard treatment areas, some departments may require additional specifically designed areas to fulfill special roles, such as:

- The management of paediatric patients
- The management of major trauma patients
- The management of psychiatric patients

- The management of patients following sexual assault
- The management of infectious patients
- The extended observation and management of patients
- The management of prisoners in custody
- The management of patients affected by chemical, biological or radiological incidents
- Undergraduate, postgraduate teaching
- Transport and retrieval services
- Telemedicine

In addition to clinical areas, emergency departments require facilities for the following essential functions:

- Teaching
- Research
- Administration
- Staff amenities

Information which would assist in the planning of an emergency department include

- Annual census and trends
- Average daily census with peak patient volumes
- Triage categories of patient presentations
- Admission/transfer rate, including the number of cases requiring monitoring
- Average length of stay
- Turnaround times for radiology and pathology
- Patient mix, identifying those who are >65 years of age, and paediatric cases
- Additional information which pertain to the role delineation of the department ie. trauma service, regional referral service

In general planning, the physical design goals should not be confused with operational goals. Designing a functional emergency department will not resolve access block. In order to maximise functional consideration, it is recommended that

- The clinical areas be designed to accommodate higher acuity patients. All treatment spaces should be wired for monitoring with access to the patient available from all sides
- Paediatric clinical spaces require as a minimum the same space requirements if not more than adult patient care spaces to accommodate family members and /or carers, storage area for toys, books etc
- The department design has the ability to respond to clinical demands.
- The central station or 'arena' department design concept is appropriate to a certain department size. When this is exceeded modular design principles should be adopted to maximise operational practices ie. subgrouping patient care areas each with ready access to its own clinical support areas and its own central station to avoid staff fragmentation
- Overuse of specialty rooms be avoided. Maintain flexibility to cope with emerging advances in clinical care ie. staff access to computer wireless technology in clinical recording
- Spatial consideration be made to accommodate family members and/or carers who will be accompanying the patient
- Privacy and confidentiality be maximised
- The clinical areas have the capacity to be isolated to prevent cross infection or cross contamination in the event that an area becomes contaminated

Once designed, the plan should be tested by using a number of clinical scenarios ie. multiple trauma, chest pain, paediatric resuscitation, mental health presentation with a behavioral problem, gynaecological presentation, potentially infectious or poisoned patients ie. MRSA, TB, SARS, "white powder", fracture, malaria, to ensure optimal patient flow.

2. MAJOR SPACE DETERMINANTS

2.1 General

Space determinants revolve around the major functional areas of the department. These may be divided broadly into:

- Ambulance and ambulatory entrances
- Reception/Triage/Waiting area
- Administrative area
- Resuscitation area
- Acute Treatment area (of non-ambulant patients)
- Consultation area/fast track area (for ambulant patients)
- Staff workstations
- Specialty areas, eg.
 - Paediatric areas
 - Distressed relatives/interview room
 - Procedure room(s)
 - Plaster room
 - Pharmacy/drug preparation
 - Ophthalmology/ENT
 - Mental Health Assessment
 - Isolation room(s)
 - Decontamination areas
 - Teaching areas
 - Tutorial room
 - Support services
 - Storage
 - Clean and dirty utility
 - Shower/bathroom/toilets
 - Staff rooms
 - Linen trolley bay
 - Mobile equipment bay
 - Mobile X-Ray equipment bay
 - Cleaner's room
 - Lounge/beverage preparation area
 - Emergency services officer/lounge
 - Offices and administration area
 - Diagnostic areas eg. medical imaging unit/ laboratory area (optional)
 - Emergency department short stay/observation ward (optional)
 - Circulation space

2.2 Total Size

The total internal area of the emergency department, excluding observation ward and internal medical imaging area if present, should be at least 50m²/1000 yearly attendances or 145m²/1000 yearly admissions, whichever size is greater. The minimum size of a functional emergency department that can incorporate all of the major areas is 700m². These figures are based upon access block being minimal. Emergency Departments may take extended amounts of time from conception to completion, therefore allowances for future growth and development must be made in the design process.

The total size and number of treatment areas will also be influenced by factors such as: patient numbers, casemix and activity; projected population growth and changing population demographics; anticipated changes in technology; laboratory and medical imaging turnaround time; inpatient bed accessibility; and staffing number and structure.

2.3 Total Number of Treatment Areas

The total number of patient treatment areas should be at least 1/1100 yearly attendances or 1/400 yearly admissions, whichever is greater in number. Areas such as procedure, plaster and interview rooms are not considered as treatment areas nor are holding bays or observation unit beds for admitted patients. The number of resuscitation areas should be no less than 1/15,000 yearly attendances or 1/5,000 yearly admissions and at least 1/2 of the total number of treatment areas should have physiological monitoring.

3. FUNCTIONAL RELATIONSHIPS

The functional relationships may be summarised by the following diagram:

EMERGENCY DEPARTMENT		
<i>Direct Access</i>	<i>Ready Access</i>	<i>Access</i>
Ambulance Medical Imaging Short Stay Unit	Car Parking Helipad (if applicable) Coronary Care Unit Intensive Care Unit Operating Rooms Pathology/Transfusion Service Medical Records	Inpatient wards Pharmacy Outpatients Mortuary

3.1 Medical Imaging

The Unit is dedicated to the imaging of emergency department patients. It should have a general X-Ray table, upright X-Ray facilities and an additional overhead gantry in the trauma bay/resuscitation area is recommended. The presence/absence of a film processor is dependent upon proximity to the main Medical Imaging Department or the use of digital radiography. Immediate access to CT scanning, Magnetic Resource Imaging (MRI), Ultrasound and Nuclear Medicine modalities will enhance the emergency department's effectiveness. A system of electronic display of images and reports (ie. Picture Archiving Communications System or PACS) is highly desirable.

3.2 Medical Records

Access is required so that patients' previous medical histories are obtainable without delay. A system of mechanical or electronic medical record transfer is desirable to minimise delays and labour costs. Access to medical records must be available 24 hours/day.

3.3 Intensive Care Unit and Coronary Care Unit

Rapid access is highly desirable to minimise transfer times of critically ill patients.

3.4 Operating Rooms

Rapid access is highly desirable in certain surgical emergencies, eg. ruptured aortic aneurysm, ectopic pregnancy, major trauma etc

3.5 Pathology

Rapid access is highly desirable to minimise turnaround times for laboratory investigations. Mechanical or pneumatic tube transport systems for specimens and electronic reporting of results are recommended. Point of care access for electrolyte/blood gas analysis, pregnancy testing and urine testing are highly desirable.

3.6 Pharmacy

Proximity is desirable to enable prescriptions to be filled by patients with limited mobility.

4. DESIGN CONSIDERATIONS

4.1 General

This should allow rapid access to every space with a minimum of cross traffic. There should be close proximity between the Resuscitation/Acute Treatment areas for non-ambulant patients and other treatment areas for ambulant patients, as staff may require relocation at times of high workload. Visitor and patient access to all areas should not traverse clinical areas. Protection of visual, auditory and olfactory privacy is important whilst recognising the need for observation of patients by staff.

4.2 Site Selection

Decisions regarding site location have a major influence on the eventual cost and operational efficiency of the department and should be made in conjunction with emergency department staff. The site of the emergency department should, as much as possible, maximize the choices of layout. In particular, sites of access points must be carefully considered.

4.3 Staging

If redevelopment is planned, the disruption to the function of the emergency department should be minimised.

4.4 Access and Car Parking

The emergency department should be located on the ground floor for ease of access, should be close to public transport, and adequately signed to ensure ease of way finding (ACEM Guidelines on ED Signage). Car parking should be close to the entrance, well lit and available exclusively for patients, their relatives and staff. Protected proximate parking areas should be available for urgent call in staff. Appropriate physical barriers should protect “drop off” zones.

Undercover parking should be available for:

- Appropriate number of ambulances. This will be determined by case load and availability of ambulance access to other parts of the hospital for non-emergency patients.
- On call duty emergency physician
- Taxis and private vehicles which drop off/pick up patients (including those with limited mobility) adjacent to the ambulance patient entrance.
- Police vehicles
- Fire Brigade

The emergency department should be clearly identified from all approaches. Illuminated signage is required for some signs to ensure visibility at night. The use of graphic and character display (eg. a white cross on a red background with the word "emergency") is encouraged. Multilingual signage may be required in departments with a significant caseload of culturally and linguistically diverse patients.

4.5 Fire Safety

Emergency Departments should be constructed to comply with fire regulations.

4.6 Grouping of Rooms - Functional relationships

An emergency department is comprised of the following functional areas:

Entrance/Reception/Triage area	}	and associated workstations
Resuscitation area		
Acute Treatment area		
Consultation area		
Staff/amenities		
Administration area		

The main aggregation of clinical staff over 24 hours will be at the staff station in the Acute Treatment/Resuscitation area. This should be the focus around which the other clinical areas are grouped. The Entrance/Reception/Triage area is the focus of initial presentation and hospital administrative functions. The Administration area should be accessible to the clinical areas but should not impair the clinical function of the department. These support areas are best arranged around the periphery of the department.

4.7 Bed Spacing

In the Acute Treatment area there should be at least 2.4 metres of clear floor space between beds. The minimum length should be 3 metres.

4.8 Lighting

It is essential that a high standard focused examination light is available in all treatment areas. Each examination light should have a power output of 30,000 lux, illuminate a field size of at least 150mm and be of robust construction.

Clinical care areas should have exposure to daylight wherever possible to minimise patient and staff disorientation. Lighting should conform to Australian/New Zealand Standards.

4.9 Sound Control

Clinical care areas should be designed so as to minimise the transmission of sound between adjacent treatment areas and sound levels should conform to Australian and New Zealand Standards and World health organization guidelines. Distressed relatives/Interview rooms and selected offices should have a high level of sound control to ensure privacy.

4.10 Service Panels

Service panels should be minimally equipped as follows:

- a. Resuscitation room (for each patient space)
 - 3 x oxygen outlets
 - 2 x medical air outlets
 - 3 x suction outlets
 - 16 x GPOs in at least two separate panels
 - 1 x nitrous oxide outlet (optional)
 - 1 x scavenging unit

b. Acute Treatment bed - adult and paediatric

- 2 x oxygen outlets
- 1 x medical air outlet
- 2 x suction outlets
- 8 x GPOs in two separate panels
- 1 x nitrous oxide outlet (optional)
- 1 x scavenging unit

c. Procedure room/suture room/plaster room

- 2 x oxygen outlets
- 1 x medical air outlet
- 1 x suction outlets
- 8 x GPOs in two separate panels
- 1 x nitrous oxide outlet
- 1 x scavenging unit

d. Consultation room

- 1 x oxygen outlet
- 1 x suction outlet
- 4 x GPOs

e. External service panels

- 3 x oxygen outlets
- 2 x medical air outlets
- 2 x suction outlets
- 12 x GPOs in at least two separate panels
- 1 x nitrous oxide outlet (optional)
- 1 x scavenging unit

4.11 Physiological Monitors

Each Acute Treatment area bed, should have access to a physiological monitor. Central monitoring is recommended. Monitors should have printing and monitoring functions which include a minimum of:

- ECG
- NIBP
- Temperature
- SpO²

4.12 Storage Around Bed

Adequate storage space for disposable and non-disposable medical equipment should be available near each bed space. Storage space may consist of modular plastic type bins or other materials involving a similar design concept. There should be adequate consideration for the temporary holding of patient belongings.

4.13 Cabling

Adequate cabling should be provided to ensure availability of GPOs to all clinical and non-clinical areas. Provision should also be made for cabling of telephone, patient call, emergency call, and computers to areas where these are necessary. Wide bandwidth cabling should be installed for electronic imaging systems telemedicine and internet applications. It is anticipated the availability of wireless applications will increase, and this will complement the above applications.

4.14 Medical Gases

Medical gases should be internally piped, to all patient care areas.

4.15 Doors

All doors through which patients may pass must be of sufficient size to accommodate a full hospital bed with attached intravenous flasks and traction apparatus with ease and must be designed in accordance with Australian and New Zealand Standards. There should be at least one pathway through the emergency department to key areas (imaging, OR, ICU) that will accommodate a bariatric bed.

4.16 Corridors

In general, the total corridor area within the department should be minimised to optimise the use of space. Where corridors are necessary, they should be of adequate width to allow the cross passage of two hospital beds or a hospital bed and linen trolley without difficulty. There should be adequate space for trolleys to enter or exit any of the consulting rooms, and to be turned around. Standard corridors should not be used for storage of equipment, linen, waste or patients.

4.17 Air Conditioning

The emergency department should have a separate air system capable of rapid change from recirculation to fresh air flow. Special purpose rooms (eg. Infectious Disease Isolation Room) or areas (ie. paediatric waiting area) may have special flow and filtering requirements.

4.18 Information/Communications Support

Emergency departments are high volume users of telecommunications and information technology. Telephones should be available in all offices, at all staff stations, in the clerical area and in all consultation and other clinical rooms. A central communications area for the disposition of all incoming calls is recommended. The use of multifunction, wireless communication devices should be considered. Additional phone jacks should be available for the use of facsimile machines and computer modems where required. A dedicated telephone to receive admitting requests from outside medical practitioners is desirable. Cordless phones or phone jacks should be available for access to patients' beds.

An intercom or public address system that can reach all areas of the emergency department should be available. Public telephones with acoustic hoods should be available in the waiting area. A direct line to a taxi company is desirable. Direct telephone lines bypassing the hospital switchboard should be available. They would be used in internal and external emergencies or when the hospital PABX is out of service. The staff station should have a dedicated inward line for the ambulance and emergency services. There should be facsimile lines in clinical as well as administrative areas. Direct radio communication should be available between the ambulance service and the emergency department, including incoming aeromedical transport.

An electronic emergency department information system should be installed to support clinical management, patient tracking and departmental administration. Sufficient terminals should be available to ensure that queuing does not occur, even at peak times. Computer terminals and telephones need to be co-located to optimize staff efficiency. Workspace design should include sufficient bench-widths or suitable suspension devices for screens, keyboards, drives and printers. Additional computer terminals, software and peripheral devices should be installed to enable other departmental functions. The increasing use of electronic medical records should be anticipated and access to electronic knowledge bases should be routine.

4.19 Patient Call Facilities

All patient care areas including toilets and bathrooms require individual patient call facilities. Emergency department bed spaces should have call buttons that can be easily reached by a patient on the emergency department trolley.

4.20 Emergency Call Facilities

All bed spaces and clinical areas, including toilets and bathrooms, should have access to an emergency call facility so staff can summon urgent assistance. The emergency call facility should alert to a central module situated adjacent to the staff station as well as to the Staff and Tutorial rooms.

4.21 Duress Alarm

A duress alarm system should be available to staff working in any area with potentially aggressive patients, particularly those in isolated areas, to ensure safety.

4.22 Hand Washing Facilities

Hand washing facilities should comply with Australian and New Zealand Standards. Alcohol hand rubs should be available at each bedside. Basins for hand washing should be available within each treatment area and should be accessible without traversing any other clinical area. There should be basins at a ratio of 1 for every 4 beds and at the ratio of 1 to 1 for every Procedure/Resuscitation/Consulting room/Triage/Isolation area. Taps in clinical areas should be fitted with anti-splashback devices and operated hands free. Dispensers for non-sterile latex gloves, face masks and gowns should be available in the vicinity of each hand basin and each treatment area to assist staff compliance with standard precautions.

4.23 Emergency Power

Emergency power must be available to all lights and GPOs in the Resuscitation and Acute Treatment/Observation areas of the department. Emergency lighting should be available in all other areas. All computer terminals should have access to emergency power. In the event of a total power failure, sufficient space and power points should be available to enable a backup system of lighting to be stored and maintained.

4.24 Wall Finish

Hospital beds, ambulance trolleys, and wheelchairs may cause damage to walls. All wall surfaces in areas which may come into contact with mobile equipment should be reinforced and protected with buffer rails or similar. Bed stops should be fitted to the floor to stop the bed head from coming into contact with and damaging fittings, monitors, etc.

4.25 Floor Covering

The floor covering in all patient care areas and corridors should have the following characteristics

- Non slip surface
- Impermeable to water, body fluids
- Durable
- Easy to clean
- Acoustic properties that reduce sound transmission
- Shock absorption to optimise staff comfort but facilitate movement of beds.

Office(s), Tutorial, Staff rooms, Clerical areas and the Distressed Relatives' room should be carpeted.

4.26 Wall Clocks

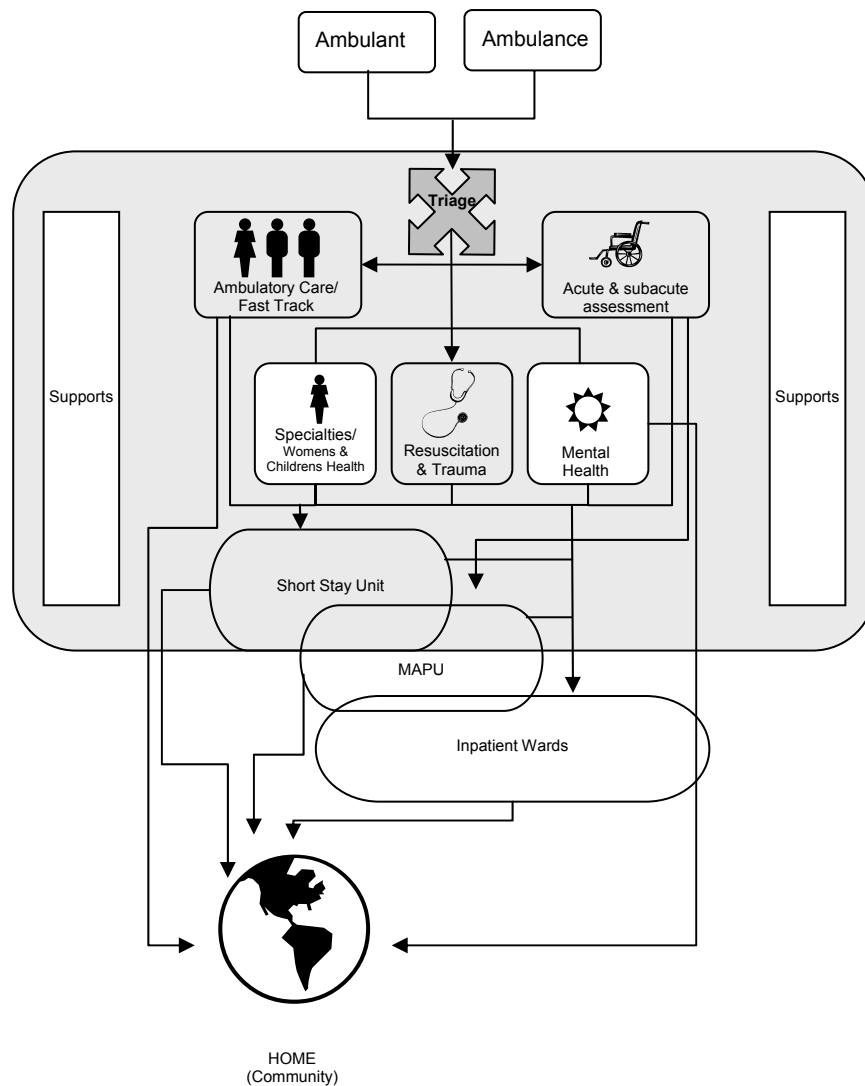
A wall clock should be visible in all clinical areas and waiting areas. Time-elapse clocks are desirable in the resuscitation, procedure and plaster rooms. Times displayed in all areas and on computers must be synchronised.

4.27 Electricity Supply

The electricity supply to the emergency department should be surge protected to protect electronic and computer equipment. The Resuscitation area should be cardiac protected and the Acute Treatment area body protected and the electricity supply to other patient care areas should be in accordance with Australian and New Zealand Standards.

5. DESCRIPTION OF PATIENT FLOWS

The following diagram outlines the various pathways that a patient may follow when (s)he enters the emergency department:



5.1 Triage

Patients may present self-referred or via emergency services (ambulance, police etc). All patients should be triaged through a single point. The aim of triage is to "sort" patients in order to provide optimum care consistent with their medical need and to ensure the efficient utilisation of the available resources. All patients are allocated to a Category of the Australasian Triage Scale.

5.2 Reception

There is a close operational relationship between Triage and reception. After triage, patient details are recorded by the clerical staff and a medical record either raised or a previous medical record retrieved.

5.3 Treatment

Patients may be directed to:

- a. Resuscitation area
- b. Acute Treatment area
- c. Consultation/Fast Track area
- d. Medical Imaging
- e. Waiting area

In areas a. - c., consultation/examination/investigations/treatment will be performed either in sequence or concurrently, depending on the severity of the patient's condition. Support services and, in certain cases, specialised areas, eg. plaster room, may be utilised. After assessment and treatment, patients are either admitted, transferred or discharged.

5.4 Patient and Visitor Exit Routes

Patient and visitor exit routes out of the emergency department should be clearly sign posted from within the emergency department. In situations where doors with electronic locks are utilised, manual locks or release switches are mandated.

5.5 Disasters - Chemical Biological, Radiation Incidents

In these circumstances, plans may provide for Reception, Triage and initial treatment, including wet and dry decontamination to occur outside the Emergency Department.

6. ESSENTIAL CLINICAL AREAS

6.1 General Requirements of all Treatment Areas (Including Triage)

- Service panel
- Examination light
- Wall mounted sphygmomanometer
- Ophthalmoscope/otoscope
- Shelving
- Miscellaneous equipment
- Waste bins and sharps containers
- Patient call and emergency call facilities
- Foot stool
- Patient trolley
- Handbasin for use by Triage nurse and administrative staff
- Access to alcohol hand rubs
- Access to gloves
- Appropriate seating for relatives/carers

6.2 Ambulance Entrance

Apart from vehicular access considerations, signage and weather protection, the Ambulance Entrance and environs may become an important reception and treatment area in the event of a disaster or chemical/biological/radiation incident. The public address system should be switchable to include these areas. The requirement to perform wet decontamination on ambulant and non-ambulant individuals and groups should be available including the deployment of modesty screening. All hospitals should have external service panels. Direct access to an internal decontamination room should be available.

6.3 Resuscitation Room/ Bay

This room is used for the resuscitation and treatment of critically ill or injured patients. It has the following requirements:

- Minimum size for a single bed resuscitation room is 35m² or 25m² for each bed space if in a multibedded room (not including storage area).
- Area to fit a specialised uninterrupted resuscitation bed
- Space to ensure 360° access to all parts of the patient for procedures
- Circulation space to allow movement of staff and equipment around the work area.
- Space for equipment, monitors, storage, wash up and disposal facilities.
- Appropriate lighting, equipment to hang IV fluids etc.
- Maximum possible visual and auditory privacy for the occupants of the room and other patients and relatives.

The Resuscitation area should be easily accessible from the ambulance entrance and separate from patient circulation areas and must be easily accessible from the staff station in the Acute Treatment/Observation area. The Resuscitation area should have a full range of physiological monitoring and resuscitation equipment. The rooms should be equipped with work benches, storage cupboards, hand basins, X-Ray viewing facilities (or digital imaging system) and computer access. The Resuscitation area should have solid partitions between it and other areas. Movable partitions between bed spaces in multibedded are recommended.

Each Resuscitation bed space should be equipped with:

- Service panel as described. Service pendants or pods should be used to maximise access to patients.
- Physiological monitor with facility for ECG, printing, NIBP, SpO², temperature, invasive pressures, CO² and printing
- An operating room light with a minimum illumination of 80,000 lux
- Radiolucent resuscitation trolley with cassette trays
- Wall mounted diagnostic set (ophthalmoscope/otoscope)
- Overhead IV track

The Resuscitation area should also have

- A full range of airway management equipment
- X-Ray viewing box - 4 panels for each bed, or digital imaging system
- Wall clock with real time and stop clock function
- Paediatric open care unit for the resuscitation of neonates (in departments that see paediatric patients) with oxygen/suction facilities and an overhead radiant heater
- Computer outlet and terminal
- A minimum of 2 standard telephones
- Hands free telephone
- Cardiac arrest/resuscitation drug and equipment trolley
- Portable monitor/ defibrillator

- Transcutaneous pacemaker
- Infusion pumps
- Fluid warming devices including infusors and warming cupboards
- Portable ventilator with invasive and noninvasive functions
- Whiteboards
- Restricted drugs cupboard
- Humidifier
- Patient warming devices (ie. Bair Hugger)

The following should be immediately accessible:

- Intravenous access trolleys
- Thoracotomy tray
- Intercostal catheter
- Urinary catheterisation tray
- Airway management tray (including surgical airway equipment)
- Invasive vascular access insertion tray
- Paediatric resuscitation equipment
- Refrigerator (to Australian Standards for maintenance of cold chains)

Imaging facilities should include:

- Overhead X-Ray
- X-Ray screening (lead lining) of walls and partitions between beds
- Resuscitation trolley with X-Ray capacity
- Portable ultrasound

6.4 Acute Treatment Area

This area is used for the management of patients with acute illnesses.

Its requirements are:

- Area to fit a standard mobile bed.
- Storage space for essential equipment, eg. oxygen masks.
- Space to allow monitoring equipment to be housed.
- Minimum space between beds is 2.4 metres.
- Each treatment area must be at least 12 m² in area.

Patients with serious or potentially serious illnesses, are managed in this area. There must also be a separate Paediatric area for the treatment of children. All of these beds must be situated to enable direct observation from the Staff Station. Access to the Clean and Dirty Utility rooms, Procedure room, Pharmacy room, and patient shower and toilet is necessary. Each area must be separated by solid partitions that extend from floor to ceiling. The entrance to each area must be able to be closed by a movable partition or curtain.

Each bed should be serviced by the following:

- Service panels as above
- Physiological monitor with ECG, NIBP, SpO², temperature, printer
- Sphygmomanometer
- Ceiling mounted rail for IV hooks
- The area must have X-Ray viewing boxes/digital imaging systems located in strategic areas
- Access to alcohol rubs and gloves

6.5 Isolation Rooms

Isolation rooms should be provided for the treatment of potentially infectious patients. They should have negative ventilation, an ante room with scrub up facilities and be self contained such that they have en-suite facilities, compliant with Australian Standards. The spaces themselves should be fitted as per Acute Treatment areas. Position of these rooms should be adjacent to areas where patients are received ie Triage to allow for the immediate isolation of potentially highly infectious patients. Each Department should have one Type 5 isolation room with additional requirements being determined by hospital location, role and patient demographics.

Isolation rooms may also be used to treat patients with conditions that require separation from other patients e.g. patients who require privacy for clinical conditions, or who are a source of visual or auditory distress to others. Deceased patients may be placed there in the company of grieving relatives. These rooms must be completely enclosed by floor to ceiling partitions and have a solid door.

Each department must have at least 2 single rooms, with at least one room/10,000 annual attendances being recommended. The requirement for single rooms will be increased in departments which have a significant casemix of obstetric/gynaecological conditions.

6.6 Decontamination Room

A decontamination room should be available for patients who are contaminated with toxic substances. In addition to the requirements of an isolation room, this room must:

- Be directly accessible from the ambulance bay without entering any other part of the department
- Have a flexible water hose, floor drain and contaminated water trap
- Have storage space for personal protective and decontamination equipment

6.7 Acute Mental Health Area

Patients suffering from an acute psychological or psychiatric crisis have unique and often complex requirements. An Emergency Department (ED) should have adequate facilities for the reception, assessment, stabilisation and initial treatment of patients presenting with acute mental health problems.

It is not intended that this should reproduce the facilities of dedicated mental health admission centres, nor be used for prolonged observation of uncontrolled patients. The main purpose of such an area is to provide a safe and appropriate space for interview and stabilisation.

Acute mental health presentations have the potential to disrupt the normal operation of an ED. Conversely, the busy environment of an ED may not be conducive to the care of patients with acute mental health crises.

Patients presenting with symptoms of an acute mental health crisis may have co-existent medical problems which require concurrent management. Life-threatening illness or injury remains the first priority, and should be managed within the appropriate clinical area of the ED.

In the interests of good patient care, uncontrolled patients should never be left unsupervised in any area of an ED and the acute mental health area should be remote from paediatric areas.

Design Considerations

Principles to be considered in the design include:

Location

The acute mental health assessment facility should ideally be located adjacent to the emergency department. If this is not possible and it is located within the emergency department, patient flows should be separated where possible to maximise privacy and to minimise disruption. A separate secure entrance for use by community emergency mental health teams and police may be desirable.

Patients should be continuously observable by staff either directly or via closed circuit television.

Safety for staff

The designated area should be within close proximity of other continuously staffed areas of the department, with ready access to assistance when required. As far as possible, the facility should not contain objects that could be thrown at staff. There should be two separate exits to allow escape of staff if one exit is blocked. The exit doors should open outwards, and should be lockable from the outside but not from inside. If a window is incorporated, it should be made from shatter-proof material. All window furnishings such as shading devices etc., should be appropriately designed and located so that they cannot be accessed by patients and used for potential self harm. All areas should have readily accessible duress alarms. Mobile, wireless duress alarms may be worn by staff.

Safety for patients

As far as possible, the area should be free of heavy or breakable furniture, sharp or hard surfaces which could injure an uncontrolled patient, and should also incorporate tamper resistant electrical fittings. It should also incorporate interior design features that promote calmness, such as muted colours and soft furnishings and appropriate lighting.

Patient tracking devices may enhance security.

Privacy

The area should be separate enough from adjacent patient care areas to allow both privacy for the mental health patient and protection of other patients from potential disturbance or violence. There should be both acoustic and visual separation from adjacent clinical areas, but ready access for staff in the event of an urgent need for intervention. The incorporation of sound-insulating material is recommended.

Intravenous sedation

An appropriate clinical space should be available for the rapid and safe IV sedation of uncontrolled patients. This must include sufficient space for a bed or trolley, several staff, and appropriate monitoring for the care of a heavily sedated patient. According to departmental policy, this may be a clinical bay in the acute treatment area, or a separate facility may be provided in the mental health area. Operational policies should ensure that any patient who has received sedation which impairs their level of consciousness should be managed in a clinical area with appropriate monitoring and observation.

Description of Areas

Ideally the facility should contain at least two separate but adjacent areas:

1. Interview Room

This room should have two exit doors, swinging outward and lockable from outside, to allow for the escape of staff members when one exit is blocked.

One door should be large enough to allow a patient to be carried through it and consideration should be given to the installation of a "barn door" (where upper and lower sections of the door can be opened independently or together). This type of door has the advantage of allowing direct observation of, and communication with, a patient inside the room without staff being required to enter the room.

This room should also be:

- decorated in muted colours
- shielded from external noise
- furnished with only soft furnishings with no hard edges (furniture made mostly of foam rubber have an advantage in this regard)
- designed in such a way that direct observation of the patient by staff outside the room is possible at all times.
- arranged to ensure that patients have no access to air vents or hanging points.
- fitted with a smoke detector
- fitted with a duress alarm at each exit.

Electricity and medical gases should not be available to the patient. The patient must be able to be directly observed. This may be backed up with closed circuit television for the safety of staff.

The room is required to be of sufficient size to enable a restraint team of five members to surround a patient within the room, yet allow sufficient separation between the patient and restraint team to make it difficult for the patient to strike any member of the team. Because of this, and the need to avoid enclosed spaces for agitated patients, the room should ideally be square (or near square) in shape and at least 16m² in floor area.

2. Examination/Treatment Room

This should be immediately adjacent to the interview room. It should contain adequate facilities for physical examination, however the inclusion of unnecessary and easily dislodged equipment should be avoided. If operational policy dictates that IV sedation is to occur in this area, it should contain the appropriate facilities and monitoring equipment, mounted out of reach of the potentially violent patient. It should contain the minimum of additional fittings or hard furnishings that could be used to harm an uncontrolled patient or staff. It should be of sufficient size to allow a restraint team of five people to surround a patient on a standard Emergency Department bed and should be at least 16m² in floor area.

6.8 Consultation Area

Consultation areas are provided for the examination and treatment of ambulant patients who are not experiencing a major or serious illness requiring resuscitation or monitoring. The Consultation area may be configured as a Fast Track area for the treatment of patients who suffer from non-complex and single system conditions. The configuration of the consultation areas will be determined by casemix and local operational policies.

Each area should be of sufficient size to house:

- Service panel as above
- Examination couch/trolley
- Minimum 12 m² in area
- Desk and three chairs
- Computer outlet and terminal

Consultation rooms may be adapted to serve specific functions:

- ENT conditions:
Full ENT set, including suction
ENT microscope
Head light
Tuning forks
Head mirrors
- Ophthalmology conditions:
Motorised vision screen
Slit lamp
IV pole
Room should have black out capability/preferably windowless
Ophthalmology trolley.
- Dressings:
Dressing trolley
Wall storage for dressing materials

6.9 Plaster Room

The Plaster room allows for the application of Plaster of Paris and other splints and for the closed reduction under sedative, or regional anaesthesia, of displaced fractures or dislocations. It must be at least 20 m² in size, excluding crutch or splint storage areas. Provision for physiological monitoring during procedures will be necessary.

The following equipment and fittings are required:

- Service panel as above
- Storage for plaster bandages
- X-Ray viewing panel (2 panels/bed) or digital imaging system
- Monitoring equipment (NIBP, SpO², ECG) including access to resuscitation equipment
- Nitrous oxide delivery system or storage space for a portable nitrous oxide delivery system
- Storage space of a pneumatic cuff and its gas supply
- Plaster trolley
- Sink and drain with a plaster trap
- Work bench
- A splint and crutch store should be accessible to the Plaster room
- Pneumatic tourniquet

6.10 Procedure Room(s)

The Procedure room(s) may be required for the performance of procedures such as lumbar puncture, tube thoracostomy, thoracocentesis, abdominal paracentesis, bladder catheterisation, suturing etc.

It requires noise insulation and must be at least 20 m² in size.

Minimal equipment and fittings include:

- Service panel as above
- Operating theatre light suspended from the ceiling with minimum 80,000 lux
- X-Ray viewing box/digital imaging system
- Monitoring equipment: NIBP, SpO², ECG with access to resuscitation equipment.

6.11 Staff Station

The Staff Station in the Acute Treatment area will be the major staff area within the department. The station should provide an uninterrupted view of patients and the floor may be raised to achieve this aim. It should be centrally located and constructed in such a fashion to ensure that confidential information can be conveyed without breach of privacy. An enclosed area is recommended for this reason and also to provide security of staff, information and privacy. The use of sliding windows and adjustable blinds can be used to modulate external stimuli and a separate write up area may be considered. The staff station(s) must be at least 10m² in size or 1m²/1000 yearly attendances, whichever is larger. Ergonomic design is essential.

The following equipment and fittings should be accessible:

- Telephones
- Direct line for GP admitting calls only
- Direct line telephone for incoming Ambulance/Police use only
- Computer terminals
- Printer
- Facsimile machine
- Photocopier
- GPOs
- X-Ray viewing boxes/digital imaging systems
- Dangerous drugs/medication cupboards
- Emergency and patient call display
- Under-desk duress alarm
- Valuables storage
- SES emergency radio
- Police blood alcohol sample safe (where required)
- Storage for stationery
- Pneumatic tube access or similar for specimens to Pathology, the transfer of medical records and medical imaging requests
- Writing and work benches
- Part of the staff station should be acoustically isolated from the remainder of the department in order to allow privacy of confidential medical discussion

6.12 Short Stay Unit

A Short Stay Unit is used to describe a unit managed within and by the Emergency Department whose prime orientation is to manage acute problems for patients with an expected length of stay of less than 24 hours. Where provided, a short stay unit should be facilitated similar to a hospital ward. 8 beds is considered to be the minimum functional size. The configuration of the short stay unit should be a minimum of 1 bed per 4000 attendances per year. This figure will be influenced by the function and case mix of the unit. All beds should be capable of physiological monitoring at least similar to an acute cubicle. There should be a separate staff station of an appropriate size and an office for the nurse unit manager/clinical nurse consultant. Hospital beds (not ED trolleys) must be provided.

6.13 Medical Assessment and Planning Unit

A Medical Assessment and Planning Unit (MAPU) is used to describe other hospital units which may be co-located with the Emergency Department. The prime orientation is to provide streamlined and intensive assessment utilizing multidisciplinary team interventions in the management of the acutely ill patient to optimize process, length of stay and health outcomes as an alternative to the traditional inpatient units. This unit is usually managed and staffed by inpatient medical teams. The configuration and function of each MAPU will be

determined by case mix and local operational policies. Generally, the MAPU will be configured for up to 30 inpatient beds where patients will be accommodated in standard ward style arrangements.

7. WAITING ROOM

The waiting area should provide sufficient space for waiting patients as well as relatives/escorts. The area should be open and easily observed from the Triage and Reception areas. Seating should be comfortable and adequate space should be allowed for wheelchairs, prams, walking aids and patients being assisted. Zoning of the waiting room should be considered, with quiet areas, a television lounge, and family or small group areas.

Natural lighting should be maximized.

There should be an area where children may play with suitable furnishings. Infection control should be considered.

Television should be available but should not dominate the waiting area or be unduly noisy. The ability to broadcast department status information or public health messages is desirable.

The use of art, photographs and murals, particularly of nature scenes, should be considered.

There must be access to:

- Triage and Reception areas
- Toilets
- Baby change room
- Light refreshment facilities which may include automatic beverage dispensing machines.
- Telephones, taxi phone and change machines
- Health literature

It is desirable to have a separate waiting area for children. This area should be suitably furnished, including a Video/TV, and provided with equipment for safe play activities. It is separated for sound from the general waiting room and must be visible to the Triage Nurse.

The waiting area must be of a total size of at least 5.0m² /1000 yearly attendances in area, that includes seating, telephones, vending machines, display for literature, public toilets and circulation space. The waiting room should include one seat per 1000 yearly attendances.

The area should be continuously monitored by electronic surveillance to safeguard security and patient well being.

7.1 Security Room

The location of an office for security personnel near the entrances should be considered.

This room should be so positioned as to enable direct visualisation of the waiting room, triage and reception areas with immediate access to these areas being essential. Remote monitoring of other areas in the department by CCTV and of staff duress/personal alarms should also occur from this area.

8. RECEPTION/TRIAGE AREA

The department should be accessed by two separate entrances; one for ambulance patients and the other for ambulant patients. It is recommended that each entrance area contains a separate foyer that can be sealed by the remote activation of security doors. Access to treatment areas should also be restricted by the use of security doors. The ambulance entrance should be screened as much as possible for sight and sound from the ambulant patient entrance. Both entrances should direct the patient flow towards the Reception/Triage area. The Reception/Triage area should have clear vision to both the waiting room, the children's play area (if provided) and the ambulance entrance. Assessment, observation and first aid are provided in the Reception/Triage area which should have visual and auditory privacy.

The Triage area should have access to the following equipment and fittings:

- NIBP monitor
- SpO²
- GPOs
- Computer terminal with printer, security mounted
- Handbasin for hand washing, equipment for standard precautions
- Towel rail
- Examination light
- Mobile examination trolley
- Telephone
- Chairs and desk
- Scales
- Storage space for bandages, basic medical equipment, stationery
- Whiteboard

9. RECEPTION/CLERICAL OFFICE

Administrative staff at the reception counter may receive patients arriving for treatment and direct them to the Triage area. After assessment at the Triage area, patients or relatives will generally be directed back to the Reception/Clerical area where clerical staff will conduct registration interviews, collate the medical record, and print identification labels. When the decision to admit has been made, clerks interview patients or relatives at the bedside or at the reception counter to finalise admission details.

The counter should provide seating and be partitioned for privacy at the interview. There should be direct communication with the Reception/Triage area and the Staff Station in the Acute Treatment/Observation area. The area should be designed with due consideration for the safety of staff, and access for the disabled.

Other functions may include:

- General enquiries from the public
- Processing loans of surgical aids
- The receipt of monies

The Reception/Clerical office should have access to the following equipment and fitments:

- Computer terminals
- Telephones
- Facsimile machine
- Photocopier
- Computer printers
- Storage space for stationery and medical records
- GPOs
- Work bench

The combined area of the reception/triage/clerical area should be at least 1.8m² /1000 yearly attendances (not including storage areas for medical records).

10. TUTORIAL ROOM

This room provides facilities for formal undergraduate and postgraduate education and meetings. It should be in a quiet non-clinical area, near the Staff room and offices.

Provision should be made to have the following available:

- VCR/DVD R
- Television
- Slide projector
- Overhead projector
- Projection screen
- Whiteboard
- Computer terminal and outlet
- Digital projector
- X-Ray viewing facilities/digital imaging system
- Telephone
- Examination couch
- Storage cupboard, large enough to store simulation mannequins and training materials

This room must be at least 0.8m²/1000 yearly attendances in area.

10.1 Library

A quiet area containing appropriate written, audiovisual and electronic reference materials. Ideally, all computer terminals will be able to access knowledge databases.

10.2 Telemedicine Area

Departments using telemedicine facilities should have a dedicated, fully enclosed room with appropriate power and communications cabling provided. This room should be of suitable size to allow simultaneous viewing by members of multiple service teams and should be close to, or integrated with the Staff Station.

11 ADMINISTRATION AREA

Offices provide space for the administrative, managerial, safety and quality, teaching, and research roles of the emergency department.

Consistent with the role delineation of the Emergency Department, office space should be provided for the following:

- Director
- Deputy Director
- Director of Emergency Medicine Training
- Director of Emergency Medicine Research
- Nurse Manager
- Nurse Educator
- Nurse Practitioner(s)
- Staff Specialist(s)
- Registrars
- Secretary
- Social worker/Mental health crisis worker
- Information support officer/data manager
- Research and project officers
- Clerical supervisor
- Other support staff as necessary (eg CARS nurse, Aged Services Emergency Team, dedicated allied health etc)

All departments should incorporate private meeting room/s into the office area.

The total office area must be at least 4m² /1000 yearly attendances. Offices should be at least 9m² in size and be equipped with a telephone and computer terminal. Open plan offices with multiple workstations may be suitable.

12. CLINICAL SUPPORT AREAS

12.1 Clean Utility

This should be of sufficient size for the storage of clean and sterile supplies and should possess adequate bench top area for the preparation of procedure trays and equipment.

12.2 Dirty Utility/Disposal Room

Access should be available from all clinical areas.

There should be sufficient space to house the following:

- Stainless steel bench top with sink and drainer
- Pan and bottle rack
- Bowl and basin rack
- Utensil washer
- Pan/bowl washer sanitiser
- Flushing sink
- Storage space for testing equipment, eg. urinalysis
- An optional disposal room adjacent to the dirty utility should be considered.

12.3 Equipment/Store Room

This is used for the storage of equipment (eg. IV poles) and disposable medical supplies for the department. There should be sufficient space and GPOs to store and charge battery powered equipment, eg. infusion pumps. The total area of dedicated store rooms must be at least 2.2m²/1000 yearly attendances. This does not include storage space within treatment areas. As a general principle, emergency departments should have sufficient storage space to carry one week's supply of disposable medical supplies and intravenous fluids. Local logistic issues and risk management considerations may dictate larger storage capacity.

12.4 Pharmacy/Medication Room

Used for the storage of medications used by the department. Entry should be secure with a self-closing door. The area should be accessible to all clinical areas and have sufficient space to accommodate a pharmacy preparation area, the pharmacy impress system, and a refrigerator suitable to ensure cold chain integrity. Consideration of the space requirements for automated dispensing machines may need to be considered.

12.5 Linen Trolley Bay

12.6 Mobile Radiology Bay

This is used to house and charge mobile x-ray equipment which should be readily accessible to the major treatments areas including the Plaster room.

12.7 Trolley/Wheelchair/Hoist/Gazunda Bays

12.8 Beverage Bay with ice maker

12.9 Blanket Warming Cupboard

12.10 Disposal Room

12.11 Disaster Equipment Store

This should be located near the Ambulance Entrance and should be of a size consistent with the role of the ED in a major incident or disaster. There needs to be hanging space for specialised clothing/protective suits, work benches for equipment checking and GPO's for battery banks.

12.12 Cleaners Room

12.13 Patient Bathroom

- Shower and toilet facilities
- Hospital bath with hoist

12.14 Interview Room

This is used for relatives who may be interviewed or counselled in private. It should be acoustically treated and be removed from the main clinical area of the department.

12.15 Distressed Relatives' Room

All emergency departments should have a distressed relatives room. Departments with more than 25,000 yearly attendances should have 2 rooms for the relatives of seriously ill or deceased patients. They should be acoustically insulated and have access to beverage making facilities, a toilet and telephones. A single room treatment area should be in close proximity to these rooms and should be of a size appropriate to local cultural practices. In departments with less than 25,000 yearly attendances a single distressed relatives' room is usually sufficient.

12.16 Laboratory

A designated area for performing point-of-care investigations such as arterial blood gas and electrolyte analysis and urine testing should be considered.

13. STAFF FACILITIES

13.1 Staff Room

At least one room should be provided within the department to enable staff to distress during rest periods.

Food and drink should be able to be prepared and appropriate table and seating arrangements should be provided. It should be located away from patient care areas and have access to natural lighting and appropriate floor and wall coverings. The staff room should be based upon the number of staff working at any one time and their anticipated needs, and as an initial guide, this should be at least 0.8m² /1000 yearly attendances adjusted depending on staff numbers.

13.2 Staff Change/Lockers/Toilets/Shower Facility

Access to male and female staff change, locker rooms and shower facilities should be available. Appropriate security and restricted access to this area should be available.

14. SECURITY

The emergency department receives a large number of patients and their visitors, many of whom may be distressed, intoxicated or involved in violence. The hospital has a duty of care to provide for the safety and security of employees, patients and visitors. Policies, structures and training should be in place to minimise injury, psychological trauma and damage or loss of property. The precise details of security features should be designed in conjunction with a security risk assessment for the specific site. The following specific security issues should be considered:

14.1 Perimeter Access Control

Ambulatory and Ambulance entrances should be separate, with electronically operated locks, and glass should have high impact resistance. Access from the waiting areas to the treatment areas should be controlled. There should be restricted access from the remainder of the hospital into the ED.

14.2 Design of Reception/Triage Areas

The interface between the waiting areas and the reception/triage areas should be carefully designed so as to permit appropriate communication, to patients and visitors. It should also provide an unobstructed view of the waiting area, whilst maintaining adequate safety for staff. Security can be provided through counter design, vertical partition or other methods. The reception/triage area should be designed to cater for the easy access of wheelchair bound or otherwise disabled patients.

14.3 Duress Alarms

Fixed and/or personal duress alarms should be positioned in suitable areas as suggested by the security risk assessment.

14.4 Security Personnel

Uniformed security personnel may be required at very short notice to assist with a safety or security issue. Their base should be positioned either within or immediately adjacent to the ED, with rapid communication links.

14.5 Electronic Surveillance

Relatively secluded or isolated areas should be monitored electronically (for example, by closed circuit TV), with monitors in easily visible and continuously staffed areas.

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