

Australasian Health Facility Guidelines

Part B - Health Facility Briefing and Planning 0190 - Sterilizing Services Unit

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01 INTRODUCTION

01.01 Preamble

This Health Planning Unit (HPU) has been developed by the Australasian Health Infrastructure Alliance (AHIA) following extensive consultation during 2015. This HPU is intended to assist in the planning and design process for the design team, project managers and end users.

01.02 Introduction

This HPU outlines the specific requirements for planning and designing a Sterilizing Services Unit. Additional information is included in this revision to inform planning of a decentralised endoscopy reprocessing unit. This information was previously included in HPU 270 Day Surgery / Procedures Unit.

Healthcare facilities should provide adequate facilities to clean, disinfect and sterilize reusable medical devices to optimise the care and safety of patients and staff.

This document does not address procedural practices and does not replace procedure manuals.

This document should be read in conjunction with the Australasian Health Facility Guidelines (AushFG) generic requirements and Standard Components described in:

- Part A: Introduction;
- Part B:Section 80: General Requirements;
- Part B: Section 90: Standard Components, Room Data Sheets and Room Layout Sheets;
- Part C: Design for Access, Mobility, OHS and Security;
- Part D: Infection Prevention and Control; and
- Part E: Building Services and Environmental Design.

01.03 Policy Framework

The overarching standard for Sterile Services Units is AS/NZS 4187:2014 Reprocessing of reusable medical devices in health service organisations (Standards Australia). Standards for reprocessing equipment are listed on p. 35 of this Australian Standard.

Other important policy documents related to sterilizing services include:

- NHMRC, Australian Guidelines for the Prevention and Control of Infection in Healthcare 2010;
- Australian Commission on Safety and Quality in Healthcare, Preventing and Controlling Healthcare Associated Infections Standard 3, October 2012; and
- Infection Control in Endoscopy, 2012, GENCA.

01.04 Description

DEFINITION OF HEALTH PLANNING UNIT (HPU)

The Sterilization Services Unit is a discrete unit of the hospital that:

- cleans, disinfects and/or sterilizes reusable medical devices (RMD) for selected services across the health service and selected outlying services/ centres;
- ensures that all processes are validated by means of quality assurance practices;
- ensures that the items supplied comply with the related standards and meet the requirements of health service organisations; and
- provides leadership, technical advice to users, suppliers and hospital managers on standards relating to the reprocessing of RMD.

TERMINOLOGY

The following definitions have been obtained from AS/NZS 4187:2014 Reprocessing of reusable medical devices in health service organisations.

Cleaning

The removal of contamination from an item to the extent necessary for further processing or for intended use.

Disinfection

Reduction of the number of viable microorganisms on a product to a level previously specified as appropriate for its intended further handling or use.

Reusable Medical Devices (RMD)

A medical device that is designated or intended by its manufacturer as suitable for reprocessing and reuse. It is not a medical device that is designated or intended by its manufacturer for single use only.

Sterilization

Validated process used to render a product free from viable microorganisms. Refer to the AS/NZS 4187:2014 Reprocessing of reusable medical devices in health service organisation, Section 6 for further details on specific methods of sterilization.

Traceability

The ability to trace the history, application or location of that which is under consideration. When considering product, traceability can relate to the origin of materials or parts, the processing history, and the distribution and location of the product after delivery to the patient.

FACTORS INFLUENCING STERILIZING SERVICE REQUIREMENTS

The size and complexity of a Sterilizing Services Unit will be dependent on:

- the number of operating theatres and complex procedure rooms it supports;
- other clinical service requirements;
- the casemix undertaken (e.g. orthopaedic cases utilise a large number of RMD compared with other specialties);
- the extent of services provided to other health related organisations such as general practice and residential aged care. This extended role is common in rural areas; and
- hours of operation.

It is essential that a level of redundancy is factored into calculating service capacity. This will accommodate maintenance and testing activities.

A method for calculating requirements, based on service outputs (i.e. surgical procedure trays arising from projected surgical/ procedural activity) is outlined in the Appendices.

02 PLANNING

02.01 Operational Models

MODEL OF SERVICE DELIVERY

While single use products and devices are replacing the use of RMD in many clinical services, the complexity of patient care and associated equipment is increasing the need for sterilizing services. In practice this means that many clinical services rarely send items for reprocessing (e.g. inpatient units and ambulatory care centres). This has concentrated the activities of sterilizing services to support:

- surgical services;
- procedural services (e.g. endoscopy, transesophageal echo etc);
- specialist clinical services (e.g. radiation oncology, intensive care unit); and
- oral health services.

Selected hospital sterilizing services may also support off-site services (e.g. oral health services). This approach is common in rural areas where infrastructure is limited. Where this model is proposed, systems of transport need to be available for timely delivery and pick-up of RMD. In some cases, equipment holdings may need to be increased.

Most health service organisations will centralise sterilizing services rather than have multiple sites for cleaning, disinfection and sterilization. This concentration of reprocessing activities has arisen as:

- the equipment, training and systems needed to ensure the correct, effective and safe reprocessing of RMD increases its complexity and cost;
- health services must demonstrate an ability to 'trace' the reprocessing of all RMD through instrument tracking systems;
- the efficiencies that can be generated by centralising reprocessing and using automated and/or semi-automated equipment are realised; and
- techniques previously used in decentralised locations are recognised as untraceable and/or unsafe (e.g. glutaraldehyde).

The use of selected satellite units is still an accepted approach for selected services such as endoscopy. A reprocessing unit located close to the point of care is often preferred to reduce the number of scopes needed and reduce opportunities for damage.

While oral health services located in community health settings have traditionally included reprocessing units, many services choose to undertake reprocessing at a nearby hospital unit.

Sterilizing services should use good manufacturing practice approaches to reprocess RMD in a timely way to support the work of selected clinical service providers. These principles will include ensure manufacturing processes that are clearly defined and controlled, systematised procedures are documented and enacted and staff have the necessary training to carry-out the work.

There has been significant improvement in equipment associated with cleaning, disinfecting and sterilizing RMD. Automation of selected processes has improved throughput of devices.

Once the reprocessing process is complete, the RMD will be dispatched to sterile storage areas of each clinical unit (e.g. Operating Unit) rather than stored in the Sterilizing Services Unit.

TECHNOLOGY

New generation major medical equipment and related infrastructure has resulted in major improvements to the efficiency and efficacy of Sterilizing Services Unit. Examples may include:

- central chemical dosing systems for washer disinfectors;

- automation systems to 'feed' RMD to and from batch washers and steam sterilisers;
- locally installed reverse osmosis water supply to improve quality of steam to units; and
- chemical improved disinfecting solutions to improve life of RMD.

02.02 Operational Policies

GENERAL

The following issues should be considered in identifying the models of care to be implemented and developing the operational model for the Centre, as they will all impact the configuration of the Centre and overall space requirements.

Operational policies should be developed as part of the project planning process. Refer to Part B Section 80 for further information.

HOURS OF OPERATION

The majority of services operate extended hours services, Monday to Friday. Night, weekend and public holiday coverage is at the discretion of the individual health service facility. Larger tertiary centres may operate 24 hour services, seven days a week.

AFTER HOURS SUPPLIES

An after-hour store is not recommended. As reprocessed RMD are not stored within the Sterilizing Services Unit, clinical services will routinely have the stock levels available to meet requirements.

FLASH STERILIZATION

Emergency instrument ('flash') sterilizers are designed for one-off sterilization of RMD (e.g. an instrument which has been inadvertently left out of a set or dropped) and are generally located in an operating theatre complex.

Most health services do not support the use of flash sterilizers and instead have implemented systems within the Sterilizing Services Unit to ensure urgent items can be processed in a timely way. These systems categorise urgency and can provide the necessary support so that clinical care is not compromised.

HANDLING AND COLLECTION OF USED ITEMS

Procedures for the transportation of used RMD to the Sterilizing Services Unit must be defined to ensure safe and timely transfer.

Health care services must implement procedures for pre-treatment of used RMD at the point of use. Gross contamination should be removed.

Refer to Section 6.2 Cleaning Process Definition of AS/NZS 4187:2014 Reprocessing of RMD in health service organisations.

CLEANING of Reusable medical devices - DECONTAMINATION

Recommended cleaning methods will be prescribed by the manufacturer of the RMD in their instructions for use (IFU).

Manual cleaning and rinsing of an RMD should only be used where it is deemed necessary by the manufacturer.

Mechanical ultrasonic cleaners are available for use with a limited range of jointed and serrated stainless steel instruments, as per the manufacturer's recommendations. They usually operate with cold tap water and only detergents approved by the equipment manufacturer should be used. Items that are lensed or unable to be submerged in a solution should not be cleaned by this method.

Mechanical washers include:

- batch - washer/ disinfectant; and

- index / tunnel washers.

These machines are used for cleaning a broad range of RMD including complex equipment such as anaesthetic breathing circuits, flexible fibre optic endoscopes, and laboratory glassware.

All Sterilizing Services Units will require an ultrasonic cleaner. Systems for mechanical cleaning will need to be determined e.g. batch washers or tunnel washer or a mix of both as this will have major implications on required space and layout of the decontamination area.

A central chemical dosing unit should be provided so that systems are automated.

INSTRUMENT DRYING

Drying cabinets should be used for drying cleaned RMD that have not undergone mechanical washing.

Drying reduces the risk of re-contamination during inspection and assembly of a RMD, and minimises rusting and staining. Following any method of cleaning, RMD need to be dry.

TRACEABILITY of reusable medical devices

A computer based electronic tracking system for RMD enables tracking and traceability of all products processed by the SSU and records their journey through the decontamination, packing and sterilising process including dispatch to the patient.

This system is preferred as it:

- allows integration with all major medical equipment used within the sterilizing services environment;
- allows live data logging and electronic recording of steriliser and washer cycles;
- provides electronic linking to the patient for each RMD used;
- provides a record of the life cycle of the RMD;
- has provision for inventory management and reporting functions that assist with production management and quality control; and
- alerts the user if a product (RMD) from a failed process is dispatched for use e.g. out of date.

Access to a computer and bar coding system will be provided at each stage of the reprocessing process so staff can manage the process as it occurs.

LOAN SETS

The use of surgical 'loan sets' is commonplace in most hospitals. The use of these sets requires careful coordination between surgical suppliers, transport companies, hospitals and Sterilizing Services Units. The process is extremely labour-intensive, requiring repeated manual checking, unpacking and rechecking prior to return. Dedicated space should be provided to receive, manage and dispatch these sets where utilised.

Refer to:

- Design and handling of surgical instrument transport cases, A guide on health and safety standards, WorkCover NSW, May 2011. This document describes processes and facility requirements associated with the management of these sets; and
- Non Standard Components. 190.020.000 Loan equipment – receipt/ dispatch for a detailed description of this room.

SCOPE REPROCESSING

In hospitals with a small endoscopy case load, facilities for scope cleaning may be incorporated into the Sterilizing Services Unit.

Larger services will usually collocate a scope reprocessing unit with the endoscopy service. This arrangement is generally preferred as instruments are delicate, expensive and a fast turn-around is needed.

As with the Sterilizing Services Unit, the reprocessing area will be zoned into:

- a dirty zone where scopes are received and manually cleaned;
- a clean zone where scopes are processed in automated flexible endoscope reprocessors (AFER); and
- a storage area for reprocessed scopes.

These services will usually be managed and staffed by the Sterilizing Services Unit.

Refer to:

- Standards for Endoscopic Facilities and Services, Gastroenterological Society of Australia and Gastroenterological Nurses Society of Australia, 3rd Edition 2006;
- Infection Control in Endoscopy, Gastroenterological Society of Australia and Gastroenterological Nurses Society of Australia, 3rd Edition 2010; and
- Non Standard Component - Endoscopy Reprocessing for details of space required to manage the reprocessing of endoscopes.

If used in Operating Units equipment for reprocessing ultrasonic intraoperative probes may be required.

REPROCESSING RECORDS

It is essential, that records be kept of all items reprocessed and all sterilizing cycles so that a defective item may be recalled if necessary and malfunctioning equipment, operator error and/or product and processing defects identified and corrected.

These records may be included in the individual sterilizer log book or in a separate record and must be retained in accordance with local requirements. Electronic systems will increasingly replace the need to store hard-copy records. Appropriate back-up and storage of these records are also required to meet local policy requirements.

STORAGE - CONSUMABLES

It is important to consider the overall unit's storage requirements.

Bulk storage areas should be located on the periphery of the unit so that deliveries of bulk, non-sterile, and commercially purchased sterile stocks are not delivered through the work areas. Space is needed to unpack cartons.

Storage is required for:

- non-sterile stock;
- medical / surgical consumables that may be incorporated into case packs;
- packaging material (wraps, plastic bags etc);
- spare unsterilized instruments; and
- detergents, disinfectants and chemicals with high acidity or alkalinity should be stored in a chemical storage cabinet.

STORAGE - STERILE SUPPLIES

Once RMD have been reprocessed, items should be returned to the point of use (i.e. operating theatre sterile store, inpatient unit). Large storage areas will not generally be provided within the Sterilizing Services Unit.

THEATRE LINEN

Sterilization services no longer prepare sterile drapes and gowns ('linen') for operating room use as disposable wraps have replaced the reusable product.

TRANSPORTATION SYSTEMS

All soiled RMD must be collected in closed puncture proof containers.

Clean and dirty separation is required.

Transfer of RMD to/ from the Operating Unit will require a trolley system whether open or closed carts. Where the Sterilizing Services Unit is not located on the same level as the Operating Unit, a system for moving both clean and dirty RMD will be needed. Systems may include dedicated lifts or hoists or automated guided vehicles. Numbers will be dependent on the volumes of RMD needed to be moved between these two services. Some 'parking' space will be needed in both the Sterilizing Services Unit and Operating Unit to accommodate excess trolleys.

Delivery to other clinical departments will be carried out by hospital couriers. Items waiting to be collected will be stored on a designated trolley.

TROLLEY WASHING

All transport trolleys must be cleaned after each use, either by manual or mechanical washing. Larger services will generally use a pass through trolley washing system.

WASTE DISPOSAL

All items returned to the unit for sterilization and reissue should have sharps, linen and biological waste removed and sorted at source.

Waste should be placed in the appropriate containers and options for recycling should be considered.

Liner bags used to collect re-usable items, and other soiled materials should be treated as contaminated waste, discarded into appropriate containers and disposed of in accordance with the facility's policy.

'Sharps' containers should be provided for disposal of items inadvertently returned to the Unit with re-usable items.

All waste should be removed from the Unit via a dedicated disposal exit.

STAFF EDUCATION AND TRAINING

Access to a tutorial room is needed to support staff meetings and ongoing education.

STAFFING

The staff will include a unit manager, team leaders and sterilization technicians. The overall workforce profile will be dependent on the size and complexity of the service. Additional positions may be needed to support larger services (e.g. educators).

02.03 Planning Models

LOCATION

The Sterilizing Services Unit should have direct access to the Operating Unit. This may be an adjacent location or accessible by dedicated lifts/ hoist systems.

CONNECTIVITY WITH OPERATING THEATRES

Where the Sterilizing Services Unit is located on a different floor to the Operating Theatres, a vertical transport system for the movement of RMD will be needed. This may include lifts or hoists.

Where hoists are planned separation of clean and dirty hoists will be needed. The number of hoists will be dependent on the volume of clean and dirty RMD that need to be moved during peak times.

A system to notify staff at each end will be needed, such as an alarm, so that their hoist or lifts can be emptied.

The hoists should be located so as to maintain the integrity of designated 'clean' and 'dirty' areas at all department levels.

02.04 Functional Areas

FUNCTIONAL AREAS

The Sterilization Unit comprises the following functional zones and the scope will be dependent on the service level and size. They include:

- entry/ reception;
- receiving area for loan equipment and used RMD;
- cleaning / decontamination / disinfection area;
- packing/ sterilization areas;
- dispatch area;
- support areas, including storage; and
- staff areas including amenities.

ENTRY AREA

The entry should be secure and controlled to prevent unauthorised access. An external intercom point will allow visitors to communicate with sterilizing services staff. This point may be an office space nearby. Alternate points for the delivery of clean consumables should be provided.

A pass-through hatch may be provided to the external service corridor.

RECEIVING/ CLEANING / DISINFECTION AREA

A receiving area is provided to unload, sort and prepare soiled RMD that are received on trolleys from :

- the main service corridor from clinical units throughout the hospital and outlying services (e.g. oral health); and
- by an internal route (hoists, lifts or corridor), from the Operating Unit.

The area should support the cleaning/ disinfection workflow and include stainless steel benches with sinks, ergonomically designed, for the disassembly of RMD prior to pre-treatment or cleaning (where needed) and segregation into major cleaning pathways that include:

- manual cleaning only;
- manual and/or ultrasonic pre-treatment prior to additional cleaning in a washer; and
- cleaning in a washer – a batch washer or index washer. Where batch washers are used, pass through systems will be used. In larger centres, space for automation may be required at feed and unload the batch washers.
- a pass-through drying cabinet for those items that are manually cleaned; and
- a pass-through system for managing the movement of trolleys. These trolleys, once cleaned, will be sent to the dispatch area so that reprocessed RMs can be loaded and returned to the point of use.

A dedicated area is required for the management of loan sets where they are routinely used by surgical services. Instruments in their transport cases will be received and dispatched from this area. Refer to Non Standard Components - Loan equipment – receipt/ dispatch for a detailed description of this room

A hand basin should be readily accessible.

PACKING / STERILIZING AREA

Once RMD have been cleaned/ disinfected they are sorted, checked, scanned and packaged for sterilizing.

Where batch washers are used, trolleys will be used to take carriers from the machines. In larger centres, automated systems may be used. Space is needed to accommodate these trolleys.

The RMD on trolleys are then moved to the packing area. The number of packing tables is determined by the size and throughput of the service. Requirements include:

- one or more tables will be required for instruments but as packaging needs vary, a dedicated area for hollowware and dedicated areas for items intended for low temperature sterilization are recommended;
- packing tables should be height-adjustable with power and data supplied for use with computers and instrument scanners. An illuminated magnifier will also be needed at each station; space for mobile trolleys containing the items awaiting sterilizing;
- storage rails and shelves for packaging wraps;
- the area may also need to contain paper, laminate and heat sealers; and
- a hand basin should be readily accessible but location should ensure that splash contamination of clean, dry goods cannot occur.

The sterilizing area provides a zone where loading trolleys are parked, sterilizers are loaded with a carrier, set into operation, unloaded for cooling and plastic wrapped as necessary following completion of the sterilizing cycle.

In larger centres, a docking station may be provided for carriers. Usually, three carriers are provided for each trolley.

A dedicated area will be provided within the unloading zone for cooling of sterilized RMD.

The size of the area will be dependent on the number and type of sterilizers installed. Pass through sterilizers are assumed as this provides the necessary separation of loading and unloading zones within the sterilization area. Access will be required to the Sterilizer Plant Room.

Direct access is required from the sterilizer loading area to the packing area.

Space will be required in loading and unloading to manoeuvre trolleys. If loading trolleys are electric, power outlets for recharge will be required.

DISPATCH

A dedicated area is required for the temporary storage of reprocessed RMD ready to be returned to the point of use (e.g. operating theatres or other clinical areas). This area may also be used to store trolleys overnight. This dispatch area will be contiguous with the area used for cooling RMD have been removed from the sterilizers.

Hoists or lifts, used to return RMD to the Operating Unit will be located in this area

Direct access is required to the external corridor to return reprocessed items to a range of clinical areas.

SUPPORT AREAS

Selected rooms will be provided to support the activities of this service and include a cleaner's room, disposal room and storage.

Storage rooms for de-doxing and bulk consumables will be provided.

STAFF AREAS

Change rooms with lockers, shower and toilets will be provided for staff working in the Unit. These facilities should be collocated but, may be shared where the Sterilizing Services Unit is adjacent to the Operating Suite.

A staff room may be a shared central facility outside the Sterile Services Unit.

Caps, gowns and footwear protection will be available within the change room.

02.05 Functional Relationships

EXTERNAL

The Sterilizing Services Unit should have direct horizontal or vertical adjacency to the Operating Unit (with own controlled point of entry).

Ready access to:

- critical care units (ICU, NICU, birthing suite);
- emergency unit; and
- inpatient units.

Easy access to:

- oral health unit;
- ambulatory care; and
- hospital dock.

INTERNAL

The Sterilizing Services Unit will be arranged to provide effective segregation of clean and dirty activities. It will provide an environment that minimises the risk of cross contamination of cleaned, disinfected and sterilized RMD. The workflow will be unidirectional from dirty to clean.

The Unit will be accessed controlled and restricted to authorised staff.

03 DESIGN

03.01 Access

There should be separate and distinct entry to the Sterilizing Services Unit separated from other hospital traffic and located to restrict entry by unauthorised staff.

Where possible a direct internal point of access (i.e. corridor, lift or hoist) should be available from the dispatch area of the Sterilizing Services Unit to the sterile storage area of the operating suite.

The entry to the receiving area requires trolley access for department returns as well as returns from the Operating Unit. These return entry points may be achieved by either controlled doors or vertical transport from the Operating Unit.

Controlled exit for trolleys reissuing RMD to other clinical services. This exit must not be used for the return of 'dirty' items to the Sterilizing Services Unit. Return of dirty items requires a separate entry.

Access is needed for loan equipment deliveries.

Special attention should be given to identifying major pieces of equipment early in the design process to ensure that door openings and room dimensions will allow easy delivery and removal (from the point to entry of the building) and access to the equipment for servicing.

MAINTENANCE

Access to the sterilizer plant room for maintenance should be such that disruption to the staff and the operation of the unit is minimal; in particular, access to services should be outside 'clean areas' wherever practicable and preferably away from staff work areas.

Ongoing requirements for testing and documenting that equipment is operating correctly is detailed Sections 7.3 and 7.4 of AS/NZS 4187:2014 Reprocessing of reusable medical devices in health service organisations.

03.02 Parking

Bulk deliveries to the Sterilizing Services Unit will routinely be made via the hospital dock.

03.03 Disaster Planning

The impact on the Sterilizing Services Unit will need to be understood as part of broader disaster planning for the health service and local jurisdictional policies.

Refer to Part B Clause 80 and Part C of these Guidelines for further information.

03.04 Infection Prevention and Control

Infection prevention and control issues that need to be considered include:

- restricted / controlled access to the Unit;
- dirty to clean to sterile workflows with the use of pass-through equipment where available;
- appropriate air handling systems and heat / moisture management;
- dedicate storage areas that prevent cross -contamination of consumables;
- access to hand hygiene facilities (basins and alcohol based hand rub) across all work areas within the Unit ;

- availability of personal protection equipment in all areas of the Unit;
- the use of suitable materials and finishes that are easily cleaned;
- appropriate facilities for cleaning and management of waste; and
- provision of change facilities.

Refer to:

- Part D Infection Prevention and Control;
- Section 5.6, AS/NZS 4187:2014 Reprocessing of reusable medical devices in health service organisations;
- Infection Control in Endoscopy, Gastroenterological Society of Australia and Gastroenterological Nurses Society of Australia, 3rd Edition 2010; and
- jurisdictional policies.

03.05 Environmental Considerations

AIR-HANDLING

Air movement and ventilation must achieve a positive airflow from clean to contaminated work areas. Ventilation rates will be maintained when the zone is not occupied sufficient to ensure dilution rates are maintained. Air quality delivered to the clean zones and sterile storage spaces will be equivalent to that delivered to operating theatres using HEPA filters.

All air handling systems must be tested when the Unit is commissioned.

Refer to:

- Standards Australia 2006, AS 3666: Air-handling and water systems of buildings -Microbial control, SAI Global;
- Standards Australia 2012, AS 1668.2: The use of air conditioning and ventilation in buildings, SAI Global; and
- Standards Australia 2003a, Handbook 260: Hospital acquired infections - Engineering down the risk, SAI Global.

LIGHTING

Natural light is highly desirable especially for the packing workroom. Lighting layout should consider the bench layout and requirements of staff to minimise shadowing. Lighting will enable the visual examination of RMD. Selected areas may need fixed task lighting and magnification.

Light fittings, including covers, should be fully recessed and selected to prevent dust and insects from entering.

TEMPERATURE AND HUMIDITY

Temperatures within the Unit should be maintained within the 'comfort' range of 22-24°C.

In storage areas, temperatures should not exceed 27°C and supplies should be protected from direct sunlight.

Humidity should be maintained at a range between 35 and 70%.

03.06 Space Standards and Components

ERGONOMICS

Equipment selection and design and eliminate or reduce many hazards. Examples include:

- height adjustable work benches for instrument cleaning and packing;
- carrier and trolley systems that integrate with major medical equipment such as batch washers and steam sterilizers to reduce manual handling;
- the use of automated systems for loading and unpacking major medical equipment; and
- the use of hoists to manage loan equipment.

Refer to Part C Section 730.

HUMAN ENGINEERING

Human engineering covers those aspects of design that permit effective, appropriate, safe and dignified use by all people, including those with disabilities. Refer to Part C Section 730.

ACCESS

For information refer to AusHFG Part C: Section 730, Human Engineering.

BUILDING ELEMENTS

Doorways should be sized to admit delivery and dispatch trolleys without impediment. On major travel routes, doors will routinely be automated.

Door and corridors must be wide enough to accommodate large items of equipment.

Building elements are addressed in detail in Part C of these Guidelines Section 710 Space Standards and Dimensions.

03.07 Safety and Security

SAFETY

Automation, through self-loading machines and conveyors can both improve efficiency and reduce manual handling tasks.

The management of loan sets poses a major manual handling risk to staff.

Refer to:

- Design and handling of surgical instrument transport cases, A guide on health and safety standards, WorkCover NSW, May 2011; and
- Non-Standard Components - Loan Equipment – Receipt and Dispatch for details of space and equipment required to manage loan sets.

SECURITY

The periphery of the Unit will be secure and only accessible to authorised staff.

Also refer to AusHFG Part C: Section 790 Safety and Security Precautions.

03.08 Finishes

WINDOWS

Any windows provided within the Unit should not be able to be opened. Window should be easy to access for cleaning and ledges should be avoided.

WALL FINISHES

All walls within the reprocessing areas of the Unit should be washable and/or scrubbable with adequate protection against damage by trolleys. This will include wall, door and corner protection.

Wall finishes should be smooth, non-shedding, water resistant and robust enough to withstand frequent cleaning.

FLOOR FINISHES

Non-slip flooring is essential for all wet work areas.

The floor surface should be impervious, have adequate drainage and be easy to clean. Welded sheet vinyl, covered up the wall, is recommended.

CEILING FINISHES

Ceilings must be washable, impermeable and non-porous. Access points will be needed to maintain essential equipment such as air handling systems.

Refer to AHIA, 2010, Section 710, Space Standards and Dimensions for further information regarding finishes.

03.09 Fixtures, Fittings & Equipment

Room Data and Room Layout Sheets in the AusHFGs define fixtures, fittings and equipment (FFE).

Refer to the Room Data Sheets (RDS) and Room Layout Sheets (RLS) and:

- AusHFG Part C: Section 710, Space Standards and Dimensions; and
- AusHFG Part F: Section 680 Furniture Fittings and Equipment.

GENERAL REQUIREMENTS

All work surfaces, fixtures, fittings and equipment should be constructed from robust materials and be easy to clean. Fittings will be flushed mounted on walls and ceilings where possible.

While sterilizers will usually have integrated plant that will be accessible from both sides (clean and dirty), ideally, maintenance should be carried out in the decontamination zone wherever possible.

EQUIPMENT STANDARDS

Equipment typically used within a Sterilizing Services Unit are described in the Non-Standard Components section of this HPU.

Equipment used within the Sterilizing Services Unit should comply with those identified in AS/NZS 4187:2014 Reprocessing of reusable medical devices in health service organisations.

03.10 Building Service Requirements

GENERAL

High cost engineering areas which should receive careful consideration by design teams include:

- lighting and the impact of deep planning on lighting requirements;

- extent of the required emergency power system;
- extent of provision of emergency doors; and
- extent of provision of essential back-up systems (e.g. dual generators, chillers, boilers and dual electrical circuits).

INFORMATION TECHNOLOGY AND COMMUNICATIONS

The following will/may be required:

- intercom at the visitor entry to communicate with internal staff;
- data outlets to packing tables - ceiling-suspended;
- equipment tracking using RFID technology;
- networking of all major medical equipment such as sterilizers and batch washers;
- access to networked PCs and Wi-Fi in all areas of the Unit to facilitate equipment traceability; and
- general phone / data outlets to workstations.

COMPRESSED AIR

Compressed air outlets and pressure guns are required at all cleaning sinks. Extended use of compressed air will be limited and or controlled so that the creation of aerosols is minimised.

HYDRAULIC SERVICES

The trade waste plumbing and drainage system must be designed to meet the requirements of the relevant authorities.

Information regarding the type and amount of chemicals to be used / discharged must be provided by the client to the hydraulics engineer.

Main drains should be protected from potential contaminants.

Systems will be connected to the building maintenance system so that problem can be detected and rectified quickly.

POWER SUPPLY

An emergency back-up system for the power supply should be available for high priority equipment, lighting and systems such as lifters and plant (e.g. chemical dosing and reverse osmosis).

Selected equipment may need to be on uninterrupted power supply (UPS) to support service provision.

Power and Data to the packing tables should be suspended from the ceiling.

STEAM QUALITY

Steam quality requirements should be consistent with Section 7.2.3.2 of AS/NZS 4187:2014 Reprocessing of RMD in health service organisations.

Supply pipework should be correctly trapped to remove condensate and fitted with appropriate strainers. As the Sterilizing Services Unit may be the sole user of steam in a healthcare facility and the size of the steam plant itself would be relatively small, it is important to establish early in the planning process how steam will be delivered, by gas-fired or electric generators.

Not all projects will choose a centralised steam plant. Alternatively, sterilizers with their own steam generators may be used.

For further detailed information, refer to British Standard EN 285:2006+A1:2008 Sterilization, steam sterilizers, large sterilizers.

WATER QUALITY

The quality of water supplied to equipment within the Sterilizing Services Unit should be in accordance with the manufacturer's specification. The quality of water used at all stages of the reprocessing process is critical. A range of treated water is likely to be required including reverse osmosis.

Refer to:

- Sections 5.6.5 and 7 of AS/NZS 4187:2014 Reprocessing of RMD in health service organisations;
- ISO 15883 Washer disinfectors, Parts 1 to 6; and
- Standards Australia 2006, AS 3666: Air-handling and water systems of buildings -Microbial control, SAI Global.

CHEMICAL MANAGEMENT SYSTEMS

A dedicated automated dosing chemical management system ideally will usually be installed to support the detergents needed for batch washers. This system is usually located outside of the Unit and in a location that supports refilling by the supplier. The system will be connected to the staff area within the Sterilizing Services Unit so staff can monitor the amount of chemicals being used.

04 COMPONENTS OF THE UNIT

04.01 Standard Components

Rooms / spaces are defined as:

- *standard components* (SC) which refer to rooms / spaces for which room data sheets, room layout sheets (drawings) and textual description have been developed;
- *standard components – derived rooms* are rooms, based on a SC but they vary in size. In these instances, the standard component will form the broad room 'brief' and room size and contents will be scaled to meet the service requirement;
- *non-standard components* which are unique rooms that are usually service-specific and not common.

The standard component types are listed in the attached Schedule of Accommodation.

The current Standard Components can be found at: www.healthfacilityguidelines.com.au/standard-components

Non-Standard Components for this HPU are described below.

04.02 Non-Standard Components

LOAN EQUIPMENT – RECEIPT/ DISPATCH

Description and Function

A designated area provided for the receipt/ dispatch of loan kits. Delivery crates may be numerous, bulky and heavy. The contents must be unpacked and checked (and may be photographed) against the supplier's inventory and inspected for damage before being put through the normal sterilizing cycle. On return, they must again be checked. This delivery and checking process requires an appropriate delivery area with space to stack the crates, benches for checking and a workstation with computer for the instrument database.

Location and Relationships

To be located so that loan equipment can be received and dispatched from a single location.

Considerations

Adequate space is needed to pack and unpack kits. Transport cases should remain on the wheeled platform at all times to assist with handling and transportation.

The area should be configured to eliminate/ minimise risks associated with manual handling. This will include:

- a designated area with adequate floor space for the systematic packing and unpacking of kits, including the manoeuvring of lifters and associated mobile equipment;
- designated holding and storage areas with adequate floor space;
- adequate access and egress with level non-slip floor surfaces;
- a work area that optimises work flow and minimises lifting and double handling mechanical lifters and height adjustable work benches with fitted rollers;
- mobile equipment to assist with equipment handling and movement;
- digital camera with mount; and
- task lighting and magnification.

For further information, refer to Design and handling of surgical instrument transport cases, A guide on health and safety standards, Workcover NSW, May 2011.

RECEIVING AREA

Description and Function

Area where used RMD for processing are received on trolleys from Units throughout the facility and any waste is disposed of. Will/may also contain facilities for washing trolleys.

Location and Relationships

Direct access from main services corridor.

Direct access from Operating Suite either horizontally or vertically via hoists.

Adjacent to Disposal Room.

Considerations

FF&E will include:

- trolley washing facilities with adequate drainage;
- trolleys; and
- hand basin.

Given the weight of some of the instrument trays, consideration may be given to a roller bench that must be of a height to enable loading.

For further information, refer to Design and handling of surgical instrument transport cases, A guide on health and safety standards, Workcover NSW, May 2011.

CLEANING / DECONTAMINATION

Description and Function

Area for the cleaning of equipment for reprocessing.

Location and Relationships

The Cleaning/ Decontamination area should be located between the Receiving area and the Packing / Clean Workroom area.

Considerations

FF&E will include:

- stainless steel height-adjustable bench for sorting, and manual cleaning in sinks. Sinks should have a depth not exceeding 200mm to avoid injury. Stainless steel deep bowl sinks with tubing manifolds (air and water) and additional water outlets for water pistols;
- instrument and tubing washers / decontaminators according to service requirements plus parking space for loaded / spare trolleys;
- ultrasonic cleaner according to service requirements;
- instrument and tubing dryers, according to service requirements;
- pass through washer/ disinfectors and dryers. Automatic systems for loading/ unloading may be considered;
- PPE and hand basin;
- exhaust air extraction over sinks and equipment doors; and
- pass-through hatch to the packing area for items that will not be cleaned in a batch washer.

Space to park trolleys is essential.

A trolley wash, if provided, would be located off this area.

Other than pass through equipment (e.g. in drying cabinets), there should be no direct access to the packing areas from the cleaning/ disinfection areas.

Air-handling system to be negative pressure to adjacent areas.

All machinery discharging vapour should be connected to exhaust systems in accordance with the manufacturer's recommendation.

All equipment should be installed and tested as recommended by the manufacturer.

PACKING / CLEAN WORKROOM

Description and Function

Packing Area (Clean Workroom) where clean instruments, equipment and other articles are sorted, checked and packaged for sterilizing.

Location and Relationships

Located between Cleaning / Disinfection and Sterilizing Zones

Considerations

There will be sufficient power and data to support systems of work. The packing workstations will be designed to eliminate risks to staff and provide a platform to prepare and pack RMD (e.g. height adjustable). The workstation will also accommodate packing materials. FF&E will include:

- workstations that may include scanners, printers, label printers;
- trolleys, both washer transfer and sterilizer loading;
- heat sealers (paper);
- access to hand wash facilities;
- task lighting and magnification; and
- storage space for consumables used during the shift.

The workstations should be arranged so that there is adequate space for the movement of staff and materials.

STERILIZERS INCLUDING LOADING AND UNLOADING AREA

Description and Function

Area where sterilizers are loaded, set into operation and unloaded following completion of the sterilizing cycle.

The cooling / unloading area needs to provide parking space for sterilizer loading trolleys holding cooling packs and a work area for plastic wrapping and sealing.

Specialised sterilizers such as ethylene oxide and low temperature plasma require separate installation and accommodation according to manufacturer's recommendations.

The size of the area will be dependent on the number and type of sterilizers installed and, importantly, whether the sterilizers are front loaded or double sided.

Location and Relationships

The Sterilizing and Cooling area should be located between the Sorting and Packing area and the Dispatch area.

Considerations

Special consideration should be given to the location of the sterilizers.

A duct enclosure can also minimise heat build-up within the Workroom. An exhaust over the front of the sterilizer/s should also be considered, to extract both heat (cabinet) and steam (opening door).

The air handling system should be filtered or discharged direct to the outside to prevent lint build-up and related industrial and fire safety problems.

High level supply and low level exhaust is the recommended airflow pattern, with localised high level extraction for heat removal only.

FF&E will include:

- a range of sterilizers including steam and low temperature units;
- sterilizer loading trolleys (and area for charging same);
- automated loading/ unloading systems to maximise utility, improve workflow and reduce manual handling risks;
- height adjustable workstation for computer and QA activities in both loading and unloading zones;
- wheeled trolleys;
- mobile storage shelving for stacking respiratory circuits and accessories;
- workstation for sealing sterilized packs; and
- mobile storage shelving for completed items awaiting placement into steam sterilizers.

The unloading zone will be contiguous with the RMD Dispatch areas. This will make the space flexible and it can be used for storing trolleys overnight. Dispatch areas will store reprocessed items prior to transfer. Items will be held in trolleys.

ENDOSCOPE REPROCESSING

Description and Function

Dedicated area for cleaning and disinfecting endoscopes and accessories.

This space should be divided into three discreet areas:

Dirty Zone

A height adjustable bench with sinks of a material impervious to solution (e.g. stainless steel). It will be large enough to adequately hold a coiled full length colonoscope. Circular sinks are best as they hold the scopes in a way that makes cleaning easy. Hot and cold water needed along with a mechanical flushing unit that can be shared between sinks. These units reduce manual cleaning requirements. Adequate bench space will be needed for holding equipment awaiting chemical disinfection. In some cases, access to an ultrasonic unit will be needed to clean parts associated with procedures such as bronchoscopy.

Space will also be needed for the storage of consumables used in the cleaning process. Access to a hand basin needed.

Clean Zone

Automated flexible endoscope reprocessors (AFER) units will be used. Generally one unit is provided for each procedure room. These units will include both the processor and associated chemicals. Each unit will need hot and cold water, power and data and waste.

Access to a hand basin needed.

While electronic tracking systems may be in place, there will still be some paperwork associated with system checks that will need to be accommodated.

Storage Zone

Storage may include specialised HEPA-filtered storage cupboards for scopes. Additionally, busy services may store scopes on a trolley in racks during the day when turnover is fast. Specialised cupboards will be pass-through from the clean zone to an area where clinical staff can access scopes

Location and Relationships

Adjacent to the endoscopy room/s.

Considerations

Water quality is important and water supply to sinks should be filtered to 0.2 microns. For further details relating to water quality, refer to AS4187:2014; and

Tracking systems will be used throughout the process so space for computers and bar coders may be needed.

AX APPENDICES

AX.01 Schedule of Accommodation

The size and requirements for a Sterilizing Services Unit will vary according to jurisdictional policies and local requirements.

A schedule of accommodation based on two scenarios: a two sterilizer and four sterilizer Units. These schedules are indicative only. Services can use the tool, Calculating Major Medical Equipment Requirements, to assist in assessing specific requirements.

The functional space does not include an allocation for a range of engineering systems (e.g. RO plant, chemical dosing systems etc). This space allocation should be included in engineering plant.

The 'Room/ Space' column describes each room or space within the Unit. Some rooms are identified as 'Standard Components' (SC) or as having a corresponding room which can be derived from a SC. These rooms are described as 'Standard Components –Derived' (SC-D). The 'SD/SD-C' column identifies these rooms and relevant room codes and names are provided.

All other rooms are non-standard and will need to be briefed using relevant functional and operational information provided in this HPU. In some cases, Room/ Spaces are described as 'Optional' or 'o'. Inclusion of this Room/ Space will be dependent on a range of factors such as operational policies or clinical services planning.

STERILIZING SERVICES UNIT - ENTRY

ROOM CODE	ROOM/SPACE	SC	Qty x m ²	Qty x m ²	REMARKS
			2 steam sterilizers	4 steam sterilizers	
OFF-S9	Office – Single Person, 9m2	Yes	1 x 9	1 x 9	Unit Manager
OFF-S12	Office – 2 Person, Shared, 12m2	Yes	-	1 x 12 (o)	Dependent on staff establishment. May accommodate supervisor and educator.
STPS-8	Store - Photocopy / Stationery, 8m2	Yes	1 x 8	1 x 8	
	Discounted circulation		20%	20%	

STERILIZING SERVICES UNIT - PROCESSING AREAS

Note 1: Assumes a dedicated entrance is provided the Receiving/ Cleaning. Decontamination area for the delivery and dispatch of loan equipment and the delivery of used RMD.

Note 2: This space allocation assumes and includes pass-through equipment including batch washers and a pass through cabinet. In larger services, this may include automated loading systems. For the purposes of this indicative schedule of accommodation, two to three batch washers are assumed for a two steam sterilizer scenario and three to six for the four steam sterilizer scenario.

Note 3: Hand hygiene facilities will be located throughout. Type B basins should be briefed in reprocessing areas. Numbers and locations will depend on layout and size. Refer to Part D Infection Prevention and Control for further details.

ROOM CODE	ROOM/SPACE	SC	Qty x m2	Qty x m2	REMARKS
			2 steam sterilizers	4 steam sterilizers	
	RECEIVING/ CLEANING/ DECONTAMINATION				
	Loan Equipment - Receipt/ Dispatch		1 x 35	1 x 50	
	Receiving Area - Used Items		1 x 20	1 x 35	
	Trolley Wash		1 x 15	1 x 15	
	Cleaning / Decontamination		1 x 60	1 x 95	
	PACKING/ STERILIZATION				
	Packing / Clean Workroom		1 x 60	1 x 95	
	Sterilizer - Steam		1 x 20	1 x 40	Includes plant
	Sterilizer Loading / Unloading/ Cooling		1 x 30	1 x 60	Plus spare trolleys
	Sterilizer - ETO		0	1 x 25 (o)	Free standing plus anteroom, aeration cabinet and plant. Many services will not use this equipment and replace with alternatives such as other low temperature technology
	Sterilizer - Low Temperature		1 x 6	6	Free-standing. No. larger services needs to be determined as multiple units may be used.
	DISPATCH				
	Dispatch - Other Clinical Services		1 x 10	1 x 15	e.g. IPUs, ED and Critical Care Units. Assumes RMD are returned and stored at the point of use.
	Dispatch – Operating Theatres		1 x 20	1 x 40	Should be contiguous with Sterilizer Loading / Unloading/ Cooling. Assumes RMD are returned and stored in Operating Theatres
	Discounted circulation		20%	20%	

STERILIZING SERVICES UNIT - SUPPORT AREAS

Note 4: Assumes a dedicated entrance is provided the movement of clean stock.

ROOM CODE	ROOM/SPACE	SC	Qty x m2	Qty x m2	REMARKS
			2 steam sterilizers	4 steam sterilizers	
DISP-8	Disposal Room	Yes	1 x 8	1 x 10	Access to external corridor
STGN-9	Store – General	Yes	1 x 12	1 x 20	Bulk goods receipt, deboxing, linen
CLRM-5	Cleaners Room, 5m2	Yes	1 x 5	1 x 5	Within Unit
	Discounted circulation		20%	20%	

STERILIZING SERVICES UNIT - STAFF AREAS

ROOM CODE	ROOM/SPACE	SC	Qty x m2	Qty x m2	REMARKS
			2 steam sterilizers	4 steam sterilizers	
WCST	Toilet – Staff, 3m2	Yes	3	3	No. to suit staff numbers.
CHST-10	Change – Staff (Male/ Female), 10m2	Yes	2 x 10	2 x 14	Could be shared with adjacent OR. Includes shower, toilet and lockers
SMR-15	Staff Room	Yes	1 x 12	1 x 15	Could be shared with adjacent OR
MEET-15	Meeting Room, 15m2	Yes	-	1 x 15	
	Discounted Circulation		20%	20%	

ENDOSCOPY REPROCESSING UNIT

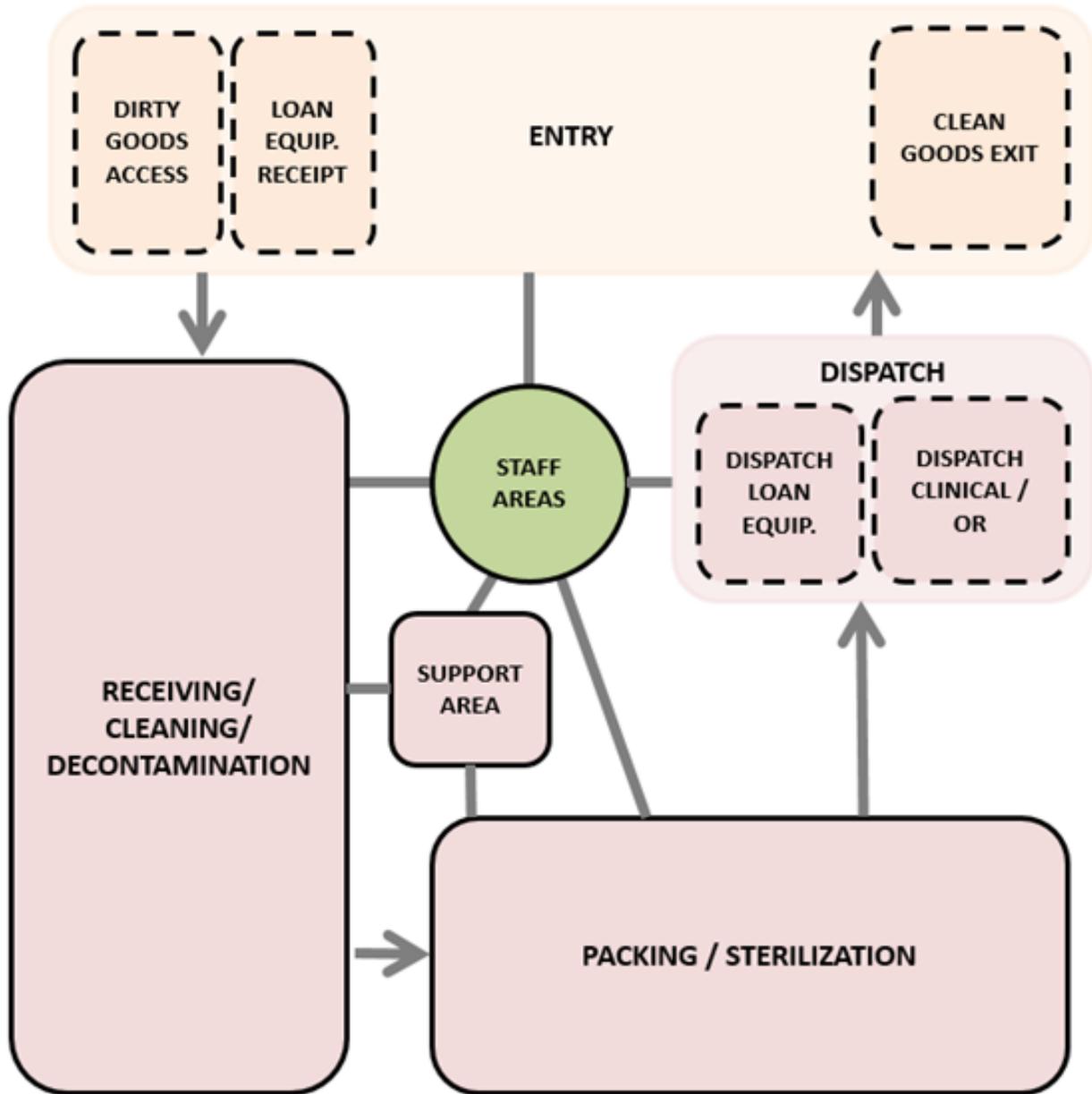
Note 5: This space will be collocated with Procedure Rooms used to support an endoscopy service. It is assumed that staff working in reprocessing areas will share staff amenities with those provided for staff working in the procedure rooms.

Note 6: Should pass through AFER be used, the space allocations may vary as loading space will be needed in the dirty zone.

ROOM CODE	ROOM/SPACE	SC	Qty x m2	Qty x m2	REMARKS
			2 Rooms	4 Rooms	
	Scope Reprocessing – dirty zone		1 x 8	1 x 10	
	Scope Reprocessing – clean zone		1 x 9	1 x 12	If possible, direct access from Endoscopy Rooms
	Endoscope Store		1 x 2	1 x 4	This may be located with the clean zone with pass through cupboards used so that clinical staff can easily retrieve scopes without entering
	Discounted circulation		20%	20%	

AX.02 Functional Relationships / Diagrams

A diagram of key functional relationships shown below.



AX.03 Checklists

For planning checklists, refer to Parts A, B, C and D of these Guidelines.

AX.04 References

- Australasian Health Infrastructure Alliance, Part B Section 90, Standard Components: Design for Access, Mobility, OHS and Security, Australasian Health Facility Guidelines, 2016
- Australasian Health Infrastructure Alliance, Part B Section 80, General Requirements: Design for Access, Mobility, OHS and Security, Australasian Health Facility Guidelines, 2016
- Australasian Health Infrastructure Alliance, Part C: Design for Access, Mobility, OHS and Security, Australasian Health Facility Guidelines, 2016
- Australasian Health Infrastructure Alliance, Part D: Infection Prevention and Control, Australasian Health Facility Guidelines, 2016
- Australasian Health Infrastructure Alliance, Part F: Section 680 Furniture Fittings and Equipment, Australasian Health Facility Guidelines, 2016
- Australian Commission on Safety and Quality in Healthcare, Preventing and Controlling Healthcare Associated Infections Standard 3, October 2012
- British Standard EN 285:2006+A1:2008 Sterilization. Steam sterilizers. Large sterilizers, BSI Group
- Gastroenterological Society of Australia and Gastroenterological Nurses Society of Australia, Infection Control in Endoscopy, 3rd Edition 2010
- Gastroenterological Society of Australia and Gastroenterological Nurses Society of Australia, Standards for Endoscopic Facilities and Services - Endoscopy, 3rd Edition 2006
- ISO 15883 Washer disinfectors, Parts 1 to 6
- NHMRC, Australian Guidelines for the Prevention and Control of Infection in Healthcare (2010)
- Standards Australia 2006, AS 3666: Air-handling and water systems of buildings -Microbial control, SAI Global;
- Standards Australia 2012, AS 1668.2: The use of air conditioning and ventilation in buildings, SAI Global
- Standards Australia 2003a, Handbook 260: Hospital acquired infections - Engineering down the risk, SAI Global
- WorkCover NSW Design and handling of surgical instrument transport cases, A guide on health and safety standards, , May 2011

FURTHER READING

- NSW Health, Infection Control Policy, PD2007_036, May 2007.
- NSW Health, Oral Health: Cleaning, Disinfecting and Sterilizing, PD 2013_024, 12 August 2013
- NSW Health, Management of Instruments, Accountable Items and Other Items used for Surgery or Procedures, PD 2013_054, 18 December 2013
- The Australian College of Operating Room Nurses, 2014-15 ACORN Standards for Perioperative Nursing

ATTACHMENTS

Calculating major medical equipment requirements.

There is an industry 'language' used to describe the capacity of major medical equipment used in Sterilizing Services Units. These terms include:

DIN refers to a German Standard and is a term used to describe the size of a basket used within a batch washer. The sizes routinely used are:

- 1 DIN basket measures 480cm long x 250cm wide and 50cm deep; and

- a half DIN basket is 240cm long x 250cm wide and 50cm deep.

A batch washer would be described with a DIN capacity (e.g. a 15-DIN capacity).

Large dental hospitals will usually process their dental instruments in instrument management system cassettes. Each of the cassettes will hold between 16 to 20 items. As these cassettes can be loaded into batch washers on their side, the throughput can be hugely increased. In practice, a 15 DIN capacity batch washer could accommodate 45 large instrument management system cassettes.

Sterilization Module (SM) is the unit of measure used to describe the capacity of a steam sterilizer. This measurement is aligned to DIN. Most new generation steam sterilizers are manufactured for Sterilization Services Units in a range between 6 to 12 SM. Those with integral steam generators offer a capacity of 6 between 6 to 8 SM. The major measurements relating to SM are:

- 1 SM = 57 litres ;
- each SM measures 60cm long x 30cm wide and 30cm deep; and
- 1 SM = 3 DIN.

A specification for tender may outline a requirement for a steam sterilizer with a 10 SM capacity. This size of sterilizer would have a per load capacity equivalent to 570 litres or 30 DIN.

A Tray is used during procedures to hold instruments. A typical surgical procedure may use between one to two trays. More complex procedures, such as joint replacement, may use many more. When calculating requirements assume 1 Tray = 1 DIN.

Understanding this information can assist services to determine major medical requirements for a project. An example of how this information may be used is described below.

Scenario:

A hospital determines that the new Sterilizing Services Unit will need to process 200,000 trays of RMD per annum. The hospital seeks to estimate how many batch washers and steam sterilizers will be needed to manage this future workload.

Methodology:

To determine broad equipment requirements the health service would need to understand:

- number of trays: This estimate would be derived by analysing the projected surgical/ procedural activity and making assumptions about the number of trays used per case;
- available days: 250 days (assumes 5 days per week at 50 weeks per year);
- available hours: 18 hours per day (assumes Sterilizing Services Unit is open for 18 hours per day);
- no. of trays processed per day = 800 per day (no. trays / no. available days); and
- no. of trays processed per hour – 44 trays per hour (no. of trays processed per day / available hours per day).

To determine how this activity converts to major medical equipment a:

- batch washer with a 15 DIN per load capacity is assumed, then 2.9 batch washers will be needed to manage this workload (no. trays per hour/ assumed DIN capacity of batch washer); and
- steam sterilizer with a 10 SM per load capacity is assumed, then 1.5 steam sterilizers will be needed . As a half unit is not feasible, two steam sterilizers will be assumed. This additional capacity will provide services an ability to manage hollow-wear and bowls etc.

This figure was calculated by:

- converting trays to SM. As 1 DIN = to 1 tray and 3 DIN = 1 SM, divide no. trays / 3. This is 14.6 SM; and
- then, divide to projected SM of 14.6 by the machine capacity which is assumed at 10 SM. This equals 1.5 steam sterilizers.

Using this approach may allow services to test various scenarios. For example, less equipment may be needed if opening hours are extended.

Cycles in a modern batch washer is approximately 45 minutes and 75 minutes in a steam sterilizer.

Note: capacity is intended as indicative only. Available capacity will vary from small to large units.