27.0 Laboratory Unit

27.1 Introduction

27.1.1 General

The Laboratory Unit provides facilities and equipment for the examination of body tissues and fluids, involving receipt of patient specimens, testing and issue of reports.

The Laboratory may be divided into specialist disciplines including (but not limited to):

- General Laboratory – involves a mixture of anatomical and clinical laboratory specialties in the one Unit
- Anatomical Laboratory – involves the diagnosis of disease based on the microscopic, chemical, immunologic and molecular examination of organs, tissues, and whole bodies (autopsy); Anatomical Pathology is itself divided in subspecialties including Surgical Pathology, Cytopathology and Forensic Pathology.
- Clinical/Chemical Laboratory involves diagnosis of disease through the laboratory analysis of blood and bodily fluids and/or tissues using the tools of Chemistry, Microbiology, Hematology and Molecular Laboratory;
- Hematology is concerned with diseases that affect the blood and the management of blood transfusion services;
- Microbiology is concerned with diseases caused by organisms such as bacteria, viruses, fungi and parasites; clinical aspects involve control of infectious diseases and infections caused by antibiotic-resistant bacteria;
- Genetics/Clinical Cytogenetics – a branch of genetics concerned with studying the structure and function of the cell, particularly the microscopic analysis of chromosomal abnormalities; molecular genetics uses DNA technology to analyses genetic mutations
- Immunology – a broad discipline that deals with the physiological functioning of the immune system and malfunctions of the immune system such as autoimmune diseases, hypersensitivities, immune deficiency and transplant rejection.

27.2 Planning

27.2.1 Functional Areas

The Laboratory Unit will consist of the following Functional Areas:

- Entry/Reception area with patient waiting
- Specimen collection area including patient toilets (this area may also be located remotely in Ambulatory Care areas); the collection area shall have a workbench, space for patient seating and hand washing facilities
- Specimen Reception registration and sorting area
- Laboratories, which may include specialists laboratories
- Support areas, including Clean-up, Sterilization area, Storage areas for reagents, appropriate storage for flammable liquids, general supplies, refrigerated storage for slides and reagents, disposal facilities for contaminated waste
- Refrigerated blood storage
- Staff Areas including Offices, Meeting Rooms, Staff Room, Lockers and Toilets.

Specimen Reception

The Specimen Reception area is where specimens for analysis are received, sorted and held temporarily before dispatch into laboratory areas. The area will require specimen registration facilities which may include computerized/barcode systems, sorting benches and a holding area for specimens including refrigerated holding if required. Following registration, specimens are transported to the relevant laboratory or area for processing and reporting.

Laboratories

Laboratories will be provided according to the Role Delineation and Operational Policy and will require the following considerations:

- Laboratories must be secure with restricted access for dedicated staff only
- Laboratory workbenches with space for equipment such as microscopes, appropriate chemical analyses, incubator/s and centrifuge/s
- Access to vacuum, gas and electrical services at the workbench
- Sinks with hot and cold water; may be used for the disposal of non-toxic fluids
- Hand basin with paper towel and soap fittings for staff hand-washing
- Emergency shower and eye flushing devices; drainage to a separate holding area.

Note: The size of the laboratory shall be appropriate to the function and provide a safe working environment.

27.2.2 Operational Models

Laboratory Services may be provided according to the following models and will be dependent on the Role Delineation and the Operational Policy of the facility:

- Onsite laboratory providing a comprehensive range of tests and services
- Onsite provision limited to a stat laboratory for a limited range of urgent tests
- Offsite laboratory with services provided by an external laboratory on a contracted or other basis; the external laboratory may be a separate private business unit
- Networking of hospital laboratories across an area or region with varying arrangements for specialization between laboratories.

27.2.3 Functional Relationships

The Laboratory Unit, if in-house, is best located adjacent to the areas that utilize the service the most such as the Operating and Obstetric Units. Collection areas may be located with close access to the Ambulatory Care facilities.

27.3 Design

27.3.1 Environmental Considerations

If radioactive materials are employed, facilities shall be available for long-term storage and disposal of these materials. No special provisions will normally be required for body waste products from most patients receiving low level isotope diagnostic material.

27.3.2 Fixtures and Fittings

The Operational Policy shall describe the type and location of all special equipment that is to be wired, plumbed, or plugged in, and the utilities required to operate each.

27.3.3 Safety and Security

Chemical safety provisions including emergency shower, eye-flushing devices, and appropriate storage for flammable liquids shall be made.

27.4 Components of the Unit

27.4.1 Introduction

The Laboratory Unit will consist of a combination of Standard Components and Non-Standard Components. Standard Components must comply with details in Standard Components described in these Guidelines. Refer also to Standard Components Room Data Sheets.

27.4.2 Standard Components

Provide the Standard Components as identified in the Schedule of Accommodation.
Provide the Non-Standard Components as identified in this section and in the Schedule of Accommodation, according to the Operational Policy and Functional Brief.

27.4.3 Non-Standard Components

Blood Store

Description and Function

The Blood Store provides for the secure, temperature controlled storage of blood and other blood products for access by authorized staff only.

The Blood Store should be a minimum of 6m².

Location and Relationships

The Blood Store should be located with ready access to Laboratory Unit, Emergency Unit, Operating Unit and Critical Care areas. Consideration shall be given to blood storage location in relation to external after-hours access and security.

Considerations

The blood storage refrigerators shall be secured, accessed by authorized staff only, and equipped with temperature monitoring and alarm signals. Alarms and controls should be located to ensure easy staff control. The blood refrigerators/freezers will require an essential power supply.

27.5 Schedule of Accommodation

Typical Laboratory Unit in a tertiary level hospital

ROOM/SPACE	Standard Component							Level 5/6 Qty x m²			Remarks
Specimen Reception											
Central Specimen Reception	SPREC-SJ							1	x	20	Includes CSR triage and sign on station and lab coats
Pneumatic Tube Station								1	x	7	Optional
Data Entry								1	x	15	Specimen Registration
Processing Area								1	x	60	Preliminary processing
Work Room								1	x	15	Includes hot desks for lab staff
Refrigerator/Freezer Sample Store								1	x	25	
Store – General	STGN-8-SJ							1	x	10	
Specimen Collection (may be a Satellite Unit)											
Reception	RECL-10-SJ							1	x	12	
Office – 2-Person Shared	OFF-2P-SJ							1	x	12	Clerical support
Waiting – Male/Female	WAIT-10-SJ							2	x	10	Separate female waiting
Toilet – Patient	WCPT-SJ							2	x	4	
Toilet – Accessible	WCAC-SJ							1	x	6	
Specimen Collection Bay	SPECC-SJ							4	x	9	Bed or chair bays
Collection Consult/Training								2	x	15	
Store – General	STGN-12-SJ							1	x	12	
Dirty Utility	DTUR-12-SJ							1	x	12	
Transfusion Medicine (Blood Holding)											
Specimen Reception	SPREC-SJ							1	x	15	
Processing Area								1	x	40	
Office Workstation	OFF-WS-SJ							1	x	10	Supervisor
Blood Products Cool Room								1	x	8	
Blood Products Freezer								1	x	5	
Store – General	STGN-12-SJ							1	x	12	
Haematology											
Specimen Reception/Processing	SPREC-SJ							1	x	25	Receiving and preliminary processing
High Throughput Processing								1	x	100	
Microscopy Workstations								1	x	30	Include slide and files storage
Flow Cytometry								1	x	20	
Cool Room	CORM-SJ							1	x	10	Refrigerated store
Store – General	STGN-12-SJ							1	x	12	
Chemical Pathology											
Specimen Reception/Preparation	SPREC-SJ							1	x	10	Receival and preliminary preparation
High Throughput Processing								1	x	50	
Bay – Freezer/Equipment								1	x	20	
Cool Room	CORM-SJ							1	x	6	
Chemical Pathology Workstations								1	x	25	Including manual processing stations and calibration
Serology											
High Throughput Processing								1	x	25	
Low Throughput/Manual Processing								1	x	45	
Write-up								1	x	10	Shared write-up
Microbiology											

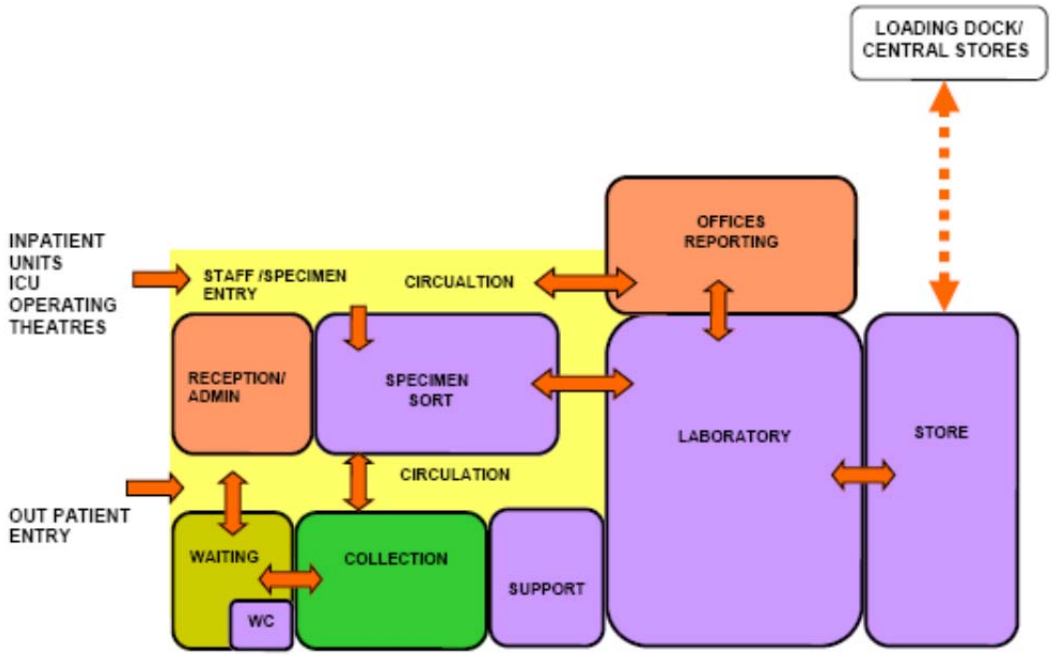
ROOM/SPACE	Standard Component							Level 5/6 Qty x m²			Remarks
Specimen ReceptionSorting	SPREC-SJ							1		40	Receival, sorting and preliminary processing
Blood Culture Processing								1		15	Includes biohazard safety cabinets, freezers and handwashing
Cool Room – Contaminated Samples	CORM-SJ							1		6	
Cool Room	CORM-SJ							1		10	
Incubator Storage								1		15	
Culture/ Plate Reading and Microscopy Stations								1		40	
Mycology/Microscopy Processing								1		20	
PC3 Laboratory								1		25	Special air-conditioning requirements
PC3 Anteroom								1		6	To PC3 Lab
Molecular Suite											
Genomic NA Extraction Lab								1	x	15	Positive pressure air-conditioning required
Infectious NA Extraction Laboratory								1	x	40	Positive pressure air-conditioning required
Specimen Preparation								1	x	15	Positive pressure air-conditioning required
NA Laboratory – Automated								1	x	20	Negative pressure air-conditioning required
NA Laboratory – Manual								1	x	15	Negative pressure air-conditioning required
Preparation Laboratory								1	x	16	For clean reagents; Positive pressure air conditioning required
Virology Laboratory								1	x	55	Include sorting and stat lab
Anteroom								1	x	9	For Negative pressure labs
Store – Equipment	STEQ-10-SJ Similar							1	x	6	
Anatomical Pathology											
Specimen Reception/Sorting	SPREC-SJ							1	x	12	
Cytology								1	x	20	
Cryostat Room								1	x	15	Frozen sections
Immunohistochemisty (IHC) Laboratory								1	x	15	
Specimen Blocking/Embedding								1	x	15	
Specimen Preparation/ Staining								2	x	18	Manual and automated areas
Microscopy Processing								1	x	50	
Tissue Processing and Cutting								1	x	55	
Store – Chemicals	STCM-SJ Similar							1	x	10	Solvents and flammable liquids
Store – General	STGN-8-SJ Similar							1	x	10	
Support Areas											
Bay – Emergency Shower	BES-SJ							7	x	1	Locate in each laboratory area
Cleaner's Room	CLRM-5-SJ							2	x	5	
Store – Bulk	STGN-20-SJ Similar							1	x	60	For reagents and general consumables
Store – Cold Room	CORM-SJ							1	x	20	May be shared
Store – Receipts and Dispatch								1	x	15	Area for receiving and unpacking/sorting, packing and dispatch
Store – Files	STFS-10-SJ							2	x	20	Documents, files, stationery
Store – General	STGN-20-SJ							1	x	10	
Staff Areas											
Reception	RECL-10-SJ							1	x	10	For Office areas

ROOM/SPACE	Standard Component							Level 5/6 Qty x m²			Remarks
Office – Director	OFF-CEO-SJ							1	x	15.0	
Office – Pathologists	OFF-S9-SJ Similar							7	x	12.0	For each Lab; Additional space for microscope work area
Office – Laboratory Managers/Supervisors	OFF-S9-SJ Similar							7	x	12.0	For each Lab; Additional space for Microscope work area
Office – 4-Person Shared	OFF-4P-SJ							7	x	20	Write-up for laboratory staff, provide for each specialty
Office – Workstation	OFF-WS-SJ							10	x	5	Clerical, secretarial, administrative support; as required
Meeting Room – Medium	MEET-L-30-SJ							1	x	30	
Meeting Room – Large	MEET-L-30-SJ Similar							1	x	50	
Training Room – Microscope								1	x	20	
Change – Staff (Male/Female)	CHST-20-SJ							2	x	20	Toilets, Shower, Lockers
Property Bay - Staff	PROP-3-SJ Similar							2	x	10	Include provision for lab coats
Staff Room	SRM-25-SJ							1	x	25	
Net Department Total										2114.0	
Circulation %										25	
Grand Total										2642.5	

Notes:

- *Areas noted in Schedules of Accommodation take precedence over all other areas noted in the FPU*
- *Rooms indicated in the schedule reflect the typical arrangement according to the Role Delineation*
- *Exact requirements for room quantities and sizes will reflect Key Planning Units identified in the Service Plan and the Operational Policies of the Unit*
- *Room sizes indicated should be viewed as a minimum requirement; variations are acceptable to reflect the needs of individual Unit*
- *Office areas are to be provided according to the Unit role delineation and staffing establishment; Executives and Managers may be responsible for more than one area but should have only one office assigned within the campus*
- *Staff and support rooms may be shared between Functional Planning Units dependent on location and accessibility to each unit and may provide scope to reduce duplication of facilities.*

27.6 Functional Relationship Diagram



27.7 Further Reading

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