

Design Team Brief Appendix 10.1.1

Functional Brief

for

Design Team Tender for the Relocation and
Expansion of the Microbiology Laboratory

at

Sligo University Hospital

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1. Introduction

The purpose of this document is to inform of the clinical and service requirements of the Microbiology department. The document describes describe the key operating principles for each unit or function within the building. It describes how each area will operate on a daily basis with information on the activities taking place within it

With regard to Microbiology laboratory service, the key driver behind the model is to provide the environment to enable continued delivery of a high quality, timely and efficient diagnostic regional clinical service to patients, clinicians and other users in hospitals, General Practitioners and Community Care in the HSE North Western area.

2. Model of Care/Operation

2.1.General Specification/ Activity + Work Patterns

The Department of Medical Microbiology is a Consultant led laboratory offering a comprehensive range of diagnostic services in routine Bacteriology, Serology and Molecular Diagnostics as well as consultation in microbiology, infectious diseases and antibiotic utilisation and provision of statistical and cumulative data for infectious disease monitoring. The Department serves hospitals, General Practitioners and Community Care in the HSE North Western area.

Specimens from SUH inpatients/OPD areas are delivered to the laboratory specimen reception area via a chute system or by hand for certain specimens and when the chute is out of service. Specimens from outside locations are delivered by courier directly to the specimen reception area.

Goods deliveries and new equipment are delivered directly to Microbiology.

The Clinical Microbiology laboratory is accredited by the Irish National Accreditation Board (INAB) to the International Standard ISO 15189:2012 (Medical Laboratories-Requirements for Quality and Competence).

Routine working hours are 0800-2000 Monday-Friday. Core working hours are 0900-1700 with variations of 0800-1600 or 0830-1630 depending on workload There is one scientist onsite from 2000-0800 weekdays and all day weekends and bank holidays providing an emergency On-Call service for Sligo University Hospital in-patients. This service responds to urgent test requests and provides results, where there is an immediate clinical requirement for decision making in the patient's care.

The Microbiology Department also provides a regional Food and Water Laboratory service through the Public Health Laboratory (PHL), which is accredited to ISO 17025:2017.

2.2.Description of service

The department offers a comprehensive range of diagnostic services in routine Bacteriology, Parasitology, Serology and Virology. In recent years, molecular detection of respiratory and enteric pathogens has replaced traditional culture techniques..

The department also offers consultation in microbiology, infectious diseases and antibiotic utilisation and provision of statistical and cumulative data for infectious disease monitoring.

Some tests are referred out to various referral laboratories; Mycobacteriology is referred to University Hospitals Galway, with Quantiferon testing being referred to the Mater Hospital Dublin. Mycology (other than Corneal Scrapings) and parasitology samples are analysed by external reference laboratories.

2.3. Activities

The following activities will take place in this area:

- Specimens will be received via the chute or porter into the reception area within the main clinical laboratory.
- The specimens will be crosschecked and registered onto the Laboratory Information System (LIS).
- The specimens will be taken to the appropriate area for analysis. This is either the main clinical laboratory for microbiological culture and referral specimens or the molecular preparation laboratory for the initial preparatory stages of molecular detection of pathogens. Both of these areas will contain Biological Safety Cabinets (BSC).
- All instrumentation for cell counting of urines or other fluids, culture, identification and susceptibility testing of microorganisms will be situated in the main clinical laboratory. This area will also contain Biological safety Cabinets (BSC).
- Molecular Detection of pathogens will take place in the Molecular Clean Lab. The various lightcyclers and rapid molecular platforms will be situated here.
- All refrigerated kits and tests including microbiological culture media will be stored in the cold store.
- All dry goods will be stored in the Dry Store. Bulkier dry goods will be stored in the main pathology store just across the road.
- Coffee room facility off Corridor B025 will be shared with Clinical Administration staff.
- There is a shower facility off Corridor B024.

2.4. Operational Policies

2.4.1. *Department Working Principles*

Microbiological culture and susceptibility testing as well as all molecular detection of pathogens is in accordance with policies and procedures as set out in Microbiology Quality Manual and ISO 15189:2012.

2.4.2. *Visitor flow*

Visitors will access the Microbiology Department directly from the Entrance/Lobby area.

2.4.3. *Staff flow*

Staff flow will be through the entrance from Corridor B204, through to staff changing areas. Staff flow in Clinical Laboratory area will be concentrated around work benches and instrumentation.

2.4.4. *Delivery and storage of goods in*

Goods will be delivered to the Microbiology entrance off Corridor B024. The goods then will be taken by laboratory porter for storage to either the new Microbiology Dry store, Cold store or main Pathology store across the road.

2.4.5. *Waste Disposal*

Clinical waste, laboratory waste and non-clinical waste will be collected by the laboratory porter and taken to either the Clinical Waste Holding Area, the laboratory autoclave room or the compactor. All of these are all situated just across the road in or outside the existing Microbiology Department.

2.4.6. *Data/Information Flow*

Laboratory Staff will require electrical, telephone, broadband, Wi-Fi and IT data points throughout. Access to networked photocopier and scanner printer will be necessary.

2.5. Major Functional Content

Note 1: Air conditioning will be required throughout the building. This is a necessity to ensure optimum performance from sensitive instrumentation.

Note 2: Approximately 48 m of Laboratory Grade Benching plus 22 no. x 1 m wide Laboratory Grade Cupboards will be required throughout the laboratory.

Note 3: There is currently a wired continuous temperature monitoring system in Microbiology with individual probes in fridges, freezers and incubators. These transmit a signal back to a base system. This system will have to be operable in the new location.

Note 4: Laboratory furniture eg chairs, desks, pc's etc will be relocated from the existing Microbiology laboratory. Some additional pc's, desks etc will be required however.

The major functional content consists of the following components and rooms:

2.5.1. Entrance area

2.5.1.1. Description of Service

This is the main entrance/exit for staff, visitors and goods. It is off Corridor B024 which is a shared space with clinical administration.

2.5.1.2. Major Functional Content

A separate keypad/keycard will be required to gain access to the Microbiology Laboratory area.

2.5.1.3. Activities

Entry/egress of staff, visitors, goods, waste.

2.5.2. Clinical Laboratory Area (~100 m²)

2.5.2.1. Description of Service

This is the main working area of the laboratory. Access for staff, deliveries and visitors is through the main door from Corridor B024 and must be controlled by keycard/keypad.

2.5.2.2. Major Functional Content

The major functional content consists of the following components:

- 3 no. new island bench units (1500x 3000 mm each), one with staining sink.
- new lab grade benching and cupboards as outlined above.
- instrumentation relocation from existing premises of;
 - o MALDI mass spectrophotometer.
 - o biological safety cabinet (BSC) x 2.
 - o Bactec (automated continuous monitoring system for blood cultures).
 - o Vitek 2XL plus associated pc's, densitometers etc.
 - o Biomic antimicrobial susceptibility reader.
 - o automated urinalyser, UF5000i.
 - o various incubators (will require connection to continuous temperature monitoring system).
 - o Anaerobic incubator. Note: will have to be piped for CO2 and special mix anaerobic gases. The incubator will also require connection to continuous temperature monitoring system.

2.5.2.3. Activities

The following activities will take place in this area:

- o Antimicrobial Susceptibility Testing.
- o Culture and Identification of bacteria from clinical swabs, sputa and fluids.
- o Culture and Identification of bacteria from urine specimens.
- o Culture and Identification of bacteria from blood culture specimens to aid in diagnosis of sepsis.

2.5.3. Molecular Lab Preparation Room (28.6m²)

2.5.3.1. Description of Service

This is the main specimen preparation area for molecular technology. This will be the main area of expansion for the laboratory over the coming 10 years as molecular technology will be increasingly used for pathogen detection.

2.5.3.2. Major Functional Content

The major functional content consists of the following components:

- New laboratory benching units plus new laboratory grade cupboards as listed.
- 1 new BSC.
- relocation from existing premises of;
 - o biological safety cabinet (BSC) x 2,
 - o Enteric Bio Workstation, MixMate, Centrifuge and LightCycler.
 - o Seegene Nimbus Preparation station

- centrifuges
- fridges & freezers
- laboratory furniture e.g. chairs, pc's,
- various incubators

2.5.3.3. Activities

The following activities will take place in this area:

- Preparation of specimens for molecular detection of pathogens.
- This involves mixing of specimens, manual addition of specimens to lysis buffer and incubation onto automated preparation station.
- Automated extraction of DNA/RNA.
- All preparation work is carried out in one of the 3 BSC's located here.

2.5.4. Molecular Lab Clean (19.0 m²)

2.5.4.1. Description of Service

This is the Cleanroom for molecular technology. The platforms for rapid molecular detection of pathogens (Genexpert, ePLEX) are located here as are the Lightcyclers which detect amplification products indicating the presence of pathogens.

This will be the main area of expansion for the laboratory over the coming 10 years as molecular technology will be increasingly used for pathogen detection.

2.5.4.2. Major Functional Content

The major functional content consists of the following components:

- New laboratory benching units plus new laboratory grade cupboards as listed.
- 1 new BSC.
- relocation from existing premises of;
 - biological safety cabinet (BSC) x 2,
 - Enteric Bio Workstation, MixMate, Centrifuge and LightCycler.
 - Seegene Nimbus Preparation station
 - centrifuges
 - fridges & freezers
 - laboratory furniture e.g. chairs, pc's,
 - various incubators

2.5.4.3. Activities

The following activities will take place in this area:

- Rapid and batch molecular detection of respiratory pathogens eg. SARS-CoV-2, Influenza A, Influenza B, Respiratory Syncytial Virus (RSV) etc.

- Molecular detection and culture if required of enteric pathogens from faecal specimens eg *Salmonella* spp., *Shigella* spp., *Campylobacter jejuni/coli/lari*, *Cryptosporidium parvum/hominis*, *Giardia lamblia* and verotoxigenic *E. coli* (VTEC).

2.5.5. Cold store (10.2 m²)

2.5.5.1. Description of Service

Refrigerated store for all kits, reagents and culture media that must be stored at 2-8°C.

2.5.5.2. Major Functional Content

The major functional content consists of the following components:

- Will require adjustable height shelving to ceiling level throughout.
- Will require a quarantine area for reagents and kits yet to be Batch accepted.
- Will require connection to existing continuous temperature monitoring system.

2.5.5.3. Activities

Will be in constant use throughout the day as staff take out and put back items that require storage at 2-8°C.

2.5.6. Dry store (9.4 m²)

2.5.6.1. Description of Service

Ambient temperature store for all kits, reagents and culture media that can be stored at room temperature. Larger bulk items will be stored in the Pathology Store across the road.

2.5.6.2. Major Functional Content

The major functional content consists of the following components:

- Will require adjustable height shelving to ceiling level throughout.
- Will require a quarantine area for reagents and kits yet to be Batch accepted.
- Will require connection to continuous temperature monitoring system.

2.5.6.3. Activities

Will be in constant use throughout the day as staff take out and put back items that require room temperature storage.

2.5.7. Male changing area (8 m²) and Female changing area (20.5 m²)

2.5.7.1. Description of Service

Separate changing areas for male and female staff, to be accessible 24/7/365.

2.5.7.2. Major Functional Content

The major functional content consists of the following components:

To provide male and female staff changing areas of adequate size to serve all staff on each shift with changing areas, lockers and toilet facilities.

Provision is to be made for disabled access.

A separate toilet/shower is available just outside main entrance to microbiology laboratory in Corridor B024.

2.5.7.3. Activities

Some staff may change into uniforms and store outdoor clothing in the staff changing facilities and will have access to adequate secure storage for personal and outdoor clothing and footwear.

2.5.8. On call bedroom (6.7 m²)

2.5.8.1. Description of Service

The laboratory is manned by a single scientist from 2000-0800 weekdays and all day Saturday/Sunday and Bank holidays. The on call bedroom provides an area where the scientist can rest, if workload allows during a shift, which may be up to 18 hours due to the combination of working routine day followed by on call.

2.5.8.2. Major Functional Content

The major functional content consists of the following components:

- Will require a bed, bedside lamp & locker.
- Will require a sink/vanity unit.
- Will require a glass window to view out into the main clinical laboratory.

2.5.8.3. Activities

Staff rest area

2.5.9. Senior medical scientists office (15.5 m²)

2.5.9.1. Description of Service

Office area for 4-5 senior medical scientists.

2.5.9.2. Major Functional Content

The major functional content consists of the following components:

- Facilitate administrative duties.
- Require local storage facilities for records and stationary supplies.
- The office will be large enough to contain at least 4 desks/workstations.
- Window into main clinical laboratory required.
- Desks, pc's, chairs etc to be relocated from existing Microbiology Department.
Some new desks, pc's, chairs may be required

2.5.9.3. Activities

- Review of positive microbiology Culture reports.
- Review plus authorisation of negative microbiology Culture reports.
- Planning, prioritising and supervising the work of the Department.
- Maintenance of the Quality Management System i.e. auditing, non-conformances, complaints, incidents and near miss investigations.
- Preparation and review of standard operating procedures.
- Investigation, documentation and repair of equipment malfunctions.
- Stock management.
- Evaluation, procurement, validation and implementation of new analytical equipment, methods and software.

2.5.10. accreditation, surveillance and clerical office (11.5 m²)

2.5.10.1. Description of Service

Office area for 3-4 senior and specialist medical scientists.

2.5.10.2. Major Functional Content

The major functional content consists of the following components:

- Facilitate administrative and clerical duties.
- Require local storage facilities for records and stationary supplies.
- The office will be large enough to contain at least 4 desks/workstations.
- Window into main clinical laboratory if possible.
- Desks, pc's, chairs etc to be relocated from existing Microbiology Department.
- Some new desks, pc's, chairs may be required.

2.5.10.3. Activities

Surveillance

- Managing the surveillance of notifiable diseases.
- Managing and reporting on healthcare associated infections.
- Managing and reporting on other organisms and diseases of infection control or public health interest.
- Sending all surveillance data (infections and antimicrobial resistance) to relevant institutions in Ireland and worldwide as required.
- Implementation of the SARI and AMRIC recommendations.
- Organising antibiotic trials in the diagnostic laboratory including documentation, sample monitoring, collection and forwarding of bacterial strains.
- Sending surveillance cultures or other surveillance material for identification or other characterisation to reference laboratories and assimilation of results.
- Assessment and management of outbreaks.

Quality management

- Maintenance of the Quality Management System i.e. auditing, non-conformances, complaints, incidents and near miss investigations.
- Preparation and review of standard operating procedures.
- Investigation, documentation and repair of equipment malfunctions.
- Evaluation, procurement, validation and implementation of new analytical equipment, methods and software

2.5.11. Chief medical scientist office (9 m²)

2.5.11.1. Description of Service

Office area for chief medical scientist.

2.5.11.2. Major Functional Content

The major functional content consists of the following components:

- Private office area for one-on-one confidential discussions/conversations with team members, consultant microbiologists, laboratory manager etc.
- Facilitate Microbiology Department administrative duties.
- Window to outside required.

2.5.11.3. Activities

- Day to day oversight of Microbiology department staff, policies and procedures.
- Liaison with other pathology departments and the wider hospital.

2.5.12. Specimen Delivery Chute (hospital specimens)

2.5.12.1. Description of Service

Pneumatic system to facilitate rapid delivery of clinical specimens into the laboratory.

2.5.12.2. Major Functional Content

The major functional content consists of the following components:

- requires connection with the main SUH chute system.
- hand delivery by hospital porters will be required in the event of chute breakdown.

2.5.12.3. Activities

Receipt of clinical specimens and return of empty chute pod to consignor ward/clinical area.

3. List of Rooms

Rooms proposed are:

- Clinical Laboratory Area
- Office(Chief medical scientist)
- Molecular Lab Preparation Room
- Molecular Lab Clean Room
- Cold Store
- Dry Store/Fridges
- Bedroom-on call
- 3 Person Office (Surveillance, quality management & clerical)
- 4 Person Office (senior scientists)
- Staff Changing + WC Female
- Staff Changing + WC Male

4. Area Schedule

	Area Schedule			
Nr	Name	Area	UOM	Floor
1	Clinical Laboratory	100	m2	Lower Ground
2	Molecular Lab Prep	28.6	m2	Lower Ground
3	Molecular Lab Clean	19	m2	Lower Ground
4	Cold Store	10.2	m2	Lower Ground
5	Dry Store / Refrigeration	9.4	m2	Lower Ground
6	Female Changing	20.5	m2	Lower Ground
7	Male Changing	8	m2	Lower Ground
8	On Call Rm / Bedroom	6.7	m2	Lower Ground
9	Office 1	15.5	m2	Lower Ground
10	Office 2	11.5	m2	Lower Ground
11	Office 3	9	m2	Lower Ground
12	Circulation	44	m2	Lower Ground
	Total	282.4	m2	

Refer to feasibility drawings included in tender pack for further information.

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