



Australian Government

MSL975029 Perform histological tests

Release: 1

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Modification History

Release	Comments
Release 1	This version was released in <i>MSL Laboratory Operations Training Package Release 2.0</i>. Supersedes and equivalent to <i>MSL975003 Perform histological tests</i>. Prerequisites changed. Change to elements and performance criteria. Foundation skill information added. Range of conditions removed. Assessment requirements amended.

Application

This unit of competency describes the skills and knowledge to perform tests and procedures associated with processing and staining tissues for examination of tissue structure and abnormalities by pathologists and scientists to assist with disease diagnosis. The unit covers tests and procedures that are associated with anatomical pathology and may involve the use of automated processors and staining machines.

This unit applies to laboratory technicians and technical officers in the biomedical sector. The unit principally refers to techniques performed on human tissues, but many aspects may be relevant to animal and plant tissues. This unit of competency assumes that the technical officer would perform tests and procedures under the close supervision of scientific and/or medical staff. Although a supervisor may not always be present, the technician will follow standard operating procedures (SOPs) that will clearly describe the scope of permitted practice in modifying testing procedures, quality control procedures, interpretation of data, and for communicating test results to people outside the laboratory. Technical workers may need to interrupt their routine work in order to assist with or perform procedures to facilitate rapid diagnosis of specimens from patients in the operating theatre. The involvement of the technical officer in mortuary work will be determined by the workplace. Work of this nature will always be closely supervised by scientific/medical staff.

No licensing or certification requirements exist at the time of publication. However, regulations and/or external accreditation requirements for laboratory operations exist, so local requirements should be checked. Relevant legislation, industry standards and codes of practice within Australia must also be applied.

Pre-requisite Unit

MSL973019 Perform microscopic examination

MSL954003 Relate anatomical and physiological features to laboratory samples

Competency Field

Testing

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1	Process specimens and associated request forms	1.1	Identify specimens and request forms that do not comply with minimum industry requirements for labelling, identification and test requests
		1.2	Record any discrepancies and indicate what action is required
		1.3	Log acceptable specimens into a laboratory information management system (LIMS) accurately and efficiently, applying required document tracking mechanisms
2	Process tissue	2.1	Select processor program for routine and non-routine samples
		2.2	Perform equipment pre-use checks on the tissue processor to ensure sample integrity is maintained
3	Embed tissue	3.1	Perform equipment pre-use check on embedding centre to ensure samples integrity and uninterrupted embedding of processor load
		3.2	Embed tissue types in correct orientation and characteristics that minimise tissue loss and artefacts during microtomy
		3.3	Check tissue for complete processing prior to embedding
		3.4	Apply procedures to prevent cross-contamination between tissues
		3.5	Inspect blocks, reject and re-embed items that do not meet quality control standards

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

4 Cut tissue sections

- 4.1 Check the flotation bath is ready and satisfactory for use
- 4.2 Prepare and adjust all external parts of a microtome and associated equipment to accommodate requirements of tissue batch
- 4.3 Secure block in microtome following specified safety directions
- 4.4 Orientate the block correctly for each specific tissue in order to maintain sample integrity and minimise artefacts
- 4.5 Cut thin tissue sections according to needs of subsequent procedures, maintaining sample integrity, minimising artefacts and conserving tissue for further testing
- 4.6 Float sections onto water bath to flatten tissues
- 4.7 Pick up sections onto microscope slides ensuring patient identification on slides matches that on the block
- 4.8 Compare the blocks and sections ensuring the tissue on slides matches that in the blocks
- 4.9 Apply procedures to prevent cross-contamination between patient tissues
- 4.10 Identify, troubleshoot and resolve common section quality control issues
- 4.11 Inspect sections and reject any that do not meet quality control standards

5 Stain tissue sections

- 5.1 Prepare labile reagents for immediate use
- 5.2 Select reagents for specified technique, ensuring reagent sequence matches standard procedure
- 5.3 Stain sections according to method using the required quality control section and accommodating any authorised variations

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
	5.4 Mount slides using medium compatible with staining technique ensuring no bubbles 5.5 Examine control sections microscopically to ensure expected staining outcomes are achieved and procedural artefacts are detected 5.6 Collate and cross-check slides, blocks and test request forms to ensure requirements have been met 5.7 Attach permanent label with case, specimen and stain details as required by workplace 5.8 Confirm microscopically that the type/disease is appropriate and still present in the control sections for each stain 5.9 Approve slides and release to pathologist
6 Maintain laboratory records	6.1 Complete control stain quality assessment forms to report quality control outcomes 6.2 File and store samples to facilitate efficient retrieval as required 6.3 Maintain instrument logs as required by accreditation checks

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

- Oral communication skills to interact effectively with supervisors and managers (laboratory, quality and customer service), personnel in other laboratories in the workplace or in other workplaces to which work may be referred, customers, patients and clients, external auditors and accreditation agencies, such as National Association of Testing Authorities (NATA)
- Problem solving skills to troubleshoot issues and suggest solutions
- Planning and organising skills to work efficiently and manage time effectively.

Other foundation skills essential to performance are explicit in the performance criteria of this unit.

Unit Mapping Information

Equivalent to MSL975003 Perform histological tests, Release 1.

Links

MSL Laboratory Operations Companion Volume Implementation Guide is available from VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>

Assessment Requirements for MSL975029 Perform histological tests

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and:

- registered at least 10 samples into a laboratory information management system (LIMS), (or simulated to reflect an actual LIMS) with 100 % accuracy. identifying specimens and request forms that do not comply with minimum industry requirements for labelling, identification and test requests
 - entered at least 8 samples into the LIMS within five minutes
 - recorded sample and request form discrepancies and indicated what level of action is required, i.e. record only, contact submitter, continue testing or halt testing or return sample to their source with reasons for non-acceptance
- embedded at least 6 tissue types that are flat, correctly orientated and in a single layer of wax, including one of each of the following:
 - large tissues
 - small tissues
 - multiple small biopsies in a single block
 - epithelial tissue such as skin or tongue
 - tissue prone to distortion
 - bone
- inspected and re-embedded blocks that do not meet quality control standards
- cut at least 40 paraffin embedded sections, from at least 5 different tissue types free of wrinkles, scores and folds, at the specified thickness (the complete surface of the tissue must be present on all slides with the remaining tissue in the block conserved for future testing) to industry standard

- produced stained sections that consistently pass industry quality control standards, on separate occasions, that allow for diagnosis and results to be issued, including:
 - stained at least 5 routine paraffin embedded sections from at least 5 different tissue types to demonstrate tissue structure using a regressive Haematoxylin and Eosin stain
 - performed the Periodic Acid Schiffs (PAS) technique using positive control tissue
 - performed at least 5 different specialised/histochemical stains using positive control tissues, to demonstrate at least 5 of the following:
 - connective tissue
 - muscle striations
 - central nervous system
 - basement membrane
 - microorganisms
 - pigments
 - deposits
 - carbohydrates and/or mucins
 - amyloid
- using specialised techniques, including polarising microscopy and use of heat or microwave ovens in histopathology
- consistently produced cover slipped slides, ensuring that no air bubbles are formed and material is preserved for the life of the slide

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- terminology used to describe tissue components being stained, these may be anatomical, physiological, biochemical or immunological, depending on the expected staining outcomes
- interrelationship between the quality of each individual histological step and the impact on subsequent steps and final outcomes, including:
 - fixation and all subsequent steps
 - cut-up and all subsequent steps
 - processing and all subsequent steps
 - embedding and all subsequent steps
 - microtomy and all subsequent steps
 - staining and all subsequent steps
- purpose of and processes involved in surgical cut-up and the factors involved that directly impact on ability to perform histology work
- requirements for ensuring uninterrupted efficient operation of a cut-up area
- basic principle and purpose of decalcification
- importance of recognising the uniqueness of patient histological tissues (a non-renewable resource)
- purpose of and processes for frozen sections

- functions of the components of a rotary microtome
- relationship of the anatomy and morphology of tissue types and the macroscopic and microscopic appearance of stained sections
- advantages and disadvantages of different types of fixatives
- labile nature of histological chemicals and the importance of correct preparation and storage
- effects of the presence of artefacts in sections on microscopic examination of tissues
- purpose of and processes involved in tissue processing and routine Haematoxylin and Eosin staining methods
- purpose of staining procedures implemented (why they are used and what components they demonstrate)
- basic biological principles and concepts behind the steps involved in immunohistochemical staining procedures
- relationship between correct differentiation, and the ability to produce quality stained slides and troubleshoot staining issues
- appropriate storage of specimens
- technological advances that include automation
- awareness of environmental sustainability issues as they relate to the work task
- legal, ethical and work health and safety (WHS) requirements specific to the work task including traceability, confidentiality and security requirements of all clinical information, and laboratory data and records.

Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - a standard histology laboratory with relevant equipment, samples and reagents; and computer information systems, databases, record and filing systems, including specimen accessioning
 - workplace procedures, test methods and equipment manuals.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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