



Australian Government

MSL975056 Perform advanced histological techniques

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSL975028 Apply advanced embedding and microtomy skills. Title changed. Content removed that duplicates the required prerequisite unit and changes to clarify Performance Evidence.

Application

This unit of competency describes the skills and knowledge required to perform procedures associated with embedding tissue and performing microtomy on those tissues in preparation for staining for examination of tissue structure and abnormalities by pathologists and scientists to assist with disease diagnosis.

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 workplace procedures that will clearly describe the scope of permitted practice in modifying testing and quality control procedures. Technical workers may need to interrupt their routine work in order to assist with or perform procedures to facilitate rapid diagnosis of specimens.

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

MSL975057 Perform histological tests.

Competency Field

Testing

Elements and Performance Criteria

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.

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1. Prepare specialised tissues	1.1 Prepare agar plugs for cytological or minute specimens in accordance with workplace procedures 1.2 Prepare blood clot for processing in accordance with workplace procedures 1.3 Prepare friable /tiny tissue in sponges and/or wrapped to ensure tissue integrity and prevent loss during processing in accordance with workplace procedures 1.4 Decalcify bone in accordance with workplace procedures
2. Embed tissue	2.1 Identify and prioritise specimens prior to embedding 2.2 Select appropriately sized mould 2.3 Embed tissue types in correct orientation and characteristics that minimise tissue loss and artefacts during microtomy 2.4 Embed tissue with embedding orientation markings 2.5 Confirm number of tissues is as expected and record any discrepancies 2.6 Inspect blocks, reject and re-embed items that do not meet quality control standards
3. Cut tissue sections	3.1 Prepare and adjust all external parts of a microtome and associated equipment to accommodate requirements of tissue batch 3.2 Orientate the block correctly for each specific tissue in order to maintain sample integrity and minimise artefacts 3.3 Apply microtomy techniques to trim blocks to full face without significant loss of tissue 3.4 Cut and pick up thin tissue sections according to needs of subsequent procedures, maintaining sample integrity, minimising artefacts and conserving tissue for further testing 3.5 Inspect sections and reject any that do not meet quality control standards 3.6 Identify, troubleshoot and resolve common section quality control issues 3.7 Apply quality control procedures to troubleshoot discrepancies between request-sheet and sections on slides

Foundation Skills

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

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Unit Mapping Information

Supersedes and is equivalent to MSL975028 Apply advanced embedding and microtomy skills.

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 MSL975056 Perform advanced histological techniques

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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:

- recorded log sheet 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 each of the following tissue types flat, correctly orientated and in a single layer of wax:
 - core biopsy
 - multiple tiny specimens in a single block
 - punch biopsy of epithelial tissue with embedding orientation
 - tissue prone to distortion
 - bone or other hard tissue
 - shave biopsy or on edge specimen
 - friable tissue processed with sponges
 - excision biopsy
 - fatty tissue
 - bloody tissue or blood clot
 - agar plug
- cut at least 40 paraffin embedded sections, with minimal 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, including:
 - at least one slide from each of the embedded tissue types described above
 - 1 slide each from 11 different blocks cut on the one occasion
 - 1 slide containing at least 3 serial sections
 - 2 slides with both a section of “sample” tissue and “control” tissue
 - 2 slides with at least 3 levels on each.
 - 1 slide with a section 2-3µm
- inspect sections to identify microtomy quality issues and recommend solutions.
- identify tissue types by sight at embedding and microtomy.
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Knowledge Evidence

There must be evidence the candidate has knowledge of:

- specialised handling requirement for cortical and trabecular bone including bone marrow trephines
- orientation criteria for embedding a wide variety of clinically significant tissue, including:
 - multiple small biopsies in a single block
 - epithelial tissue such as skin or tongue with embedding orientation
 - tissue prone to distortion
 - bone, both solid and trabecular
 - shave biopsies
 - excision biopsies
 - fatty tissue
 - bloody tissue
 - blood clot
 - agar plugs
- role of reprocessing tissue that fail processing quality control checks at embedding
- implications of various quality control issues in embedding on microtomy quality control
- purpose of microtome orientation mechanism
- how decalcifiers, tissue softeners, cold plates and wet ice are used in microtomy
- Royal College of Pathologists of Australasia (RCPA) recommendations for specialised cutting techniques and practices for different tissue types including renal, liver and gastric biopsies, lymph nodes and alopecia specimens.
- how section adherents are used for specialised staining techniques
- protocols for drying cut sections for routine and specialised staining
- workplace safety procedures and precautions for:
 - handling potentially hazardous chemicals, such as decalcifiers, tissue softeners and slide adhesives
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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, reagents and filing systems
 - workplace procedures, test methods and equipment manuals.

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

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