



Australian Government

Department of Education, Employment and Workplace Relations

MSL975004A Perform chemical pathology tests

Revision Number: 1

MSL975004A Perform chemical pathology tests

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to perform tests and procedures associated with the detection and monitoring of tissue and bodily fluid responses to normal physiological processes and disease through the identification and quantifying of chemical components. It covers tests and procedures that are usually associated with the discipline of clinical biochemistry.
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Application of the Unit

Application of the unit	The unit of competency is applicable to laboratory technicians working in the biomedical industry sector. The unit principally refers to human pathology but many aspects are relevant to veterinary pathology. This unit of competency describes the testing of tissues, blood, bodily fluids (cerebrospinal fluid, peritoneal and wound aspirates, sweat and sputum), calculi, and excreta (urine and faeces) in laboratories. Tests examine and measure compounds that can give information about alterations in individual physiology and pathology, or compounds, such as therapeutic drugs or drugs of abuse that will alter normal physiology. The tests are performed in a full or partial computerised and automated environment where large numbers of samples must be managed, analysed and their results recorded. 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 technical worker will follow standard operating procedures (SOPs) that clearly describe the scope of permitted practice in modifying testing procedures, interpretation of data and for communicating test results to people outside the laboratory. Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These can be found at the end of this unit of competency under the section 'This competency in practice'.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	
	MSL974006A <i>Perform biological procedures</i>
	MSL973007A <i>Perform microscopic</i>

Prerequisite units		
		<i>examination</i>
	MSL973004A	<i>Perform aseptic techniques</i>

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Process samples and associated request forms	1.1.Ensure sample labels and request forms are correctly completed in accordance with enterprise requirements 1.2.Return samples and request forms that do not comply with requirements to their source with reasons for non-acceptance 1.3.Log acceptable samples, applying required document tracking mechanisms 1.4.Process samples as required by test procedure and request status 1.5.Store sample components under optimal conditions until required for testing
2. Perform tests	2.1.Select authorised tests indicated for the requested investigations 2.2.Conduct individual tests, or batches of tests, according to documented methodologies, applying required quality control procedures 2.3.Manage tasks and organise work to ensure efficient use of time 2.4.Flag test results that are outside accepted quality control limits 2.5.Apply cognitive and technical processes to discriminate between significant data and artefact 2.6.Confirm with supervisor any further testing requirements 2.7.Record all test data, noting any phenomena that may be relevant to the treatment of data or the interpretation of results 2.8.Store unused sample for possible future reference
3. Maintain a safe work area and environment	3.1.Use established safe work practices and personal protective equipment to ensure personal safety and that of other laboratory personnel 3.2.Clean up spills using appropriate techniques to protect personnel, work area and environment 3.3.Identify instrument malfunction that may impact on safe operation 3.4.Ensure the safe disposal of biohazardous materials and other laboratory wastes in accordance with enterprise procedures
4. Maintain laboratory	4.1.Make entries on report forms or into computer

ELEMENT	PERFORMANCE CRITERIA
records	systems, accurately calculating, recording or transcribing required data 4.2. Maintain instrument logs as required by accreditation checklists 4.3. Maintain security and confidentiality of all clinical information, laboratory data and records

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- identifying chemical substances that are associated with organ dysfunction or are indications of success or failure of treatment
- testing for biological activity
- monitoring humoral immune system components
- applying DNA techniques
- testing for evidence of prior exposure to infective agents
- discriminating between significant data and artefact
- using the enterprise information system efficiently
- critically analysing information or documents and responding appropriately to an abnormal result
- preparing documentation that is accurate, concise and in accordance with enterprise requirements
- using samples, reagents and materials correctly and economically
- disposing of wastes safely
- communicating appropriately with a diverse range of internal and/or external customers
- reporting equipment malfunction
- liaising with contracted service technician to ensure equipment downtime is minimised

Required knowledge

Required knowledge includes:

- the central place the patient, client or customer occupies in the business of the enterprise
- scientific, medical, clinical, technical and workplace terminology relevant to job role/function
- relevant terminology and normal and abnormal anatomy, physiology, biochemistry and immunology to enable efficient communication with laboratory and clinical staff
- enterprise procedures relating to selection and use of testing procedures, in terms of the supposed or defined clinical problem
- range of test results that have meaningful clinical significance
- selection and use of quality control and quality assurance processes, as they pertain to the issuance of meaningful results
- sources of error in pre- and post-analyses of samples and corrective actions

REQUIRED SKILLS AND KNOWLEDGE

- need for confidentiality of work results
- management of work flow for effective and efficient use of resources
- relevant health, safety and environment requirements

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessors should ensure that candidates can:

- identify chemical substances that are associated with organ dysfunction or are indications of success or failure of treatment
- test for biological activity (e.g. assessment of enzyme activity indicative of organ/tissue damage)
- monitor humoral immune system components
- apply DNA techniques
- test for evidence of prior exposure to infective agents, as in the case of identifying plasma changes that are consequent to or associated with immune responses
- discriminate between significant data and artefact
- use the enterprise information system efficiently (e.g. networks or ordering for consumable materials)
- critically analyse information or documents and respond appropriately to an abnormal result
- prepare documentation that is accurate, concise and in accordance with enterprise requirements
- use samples, reagents and materials correctly and economically
- dispose of wastes safely
- communicate appropriately with a diverse range of internal and/or external customers
- report equipment malfunction or liaise with contracted service technician to ensure equipment downtime is minimised.

Context of and specific resources for assessment

This unit of competency is to be assessed in the workplace or simulated workplace environment.

This unit of competency may be assessed with:

- *MSL9314002A Apply quality system and continuous improvement processes.*

Resources may include:

- enterprise documents, standard chemical pathology

EVIDENCE GUIDE	
	laboratory with relevant equipment, samples and reagents enterprise procedures, test methods and equipment manuals. Under duty of care requirements, off-the-job training providers should ensure that blood samples are known to be antibody free for hepatitis B and C, syphilis and human immunodeficiency virus (HIV), but this does not preclude the use of universal precaution in the use of blood samples.
Method of assessment	The following assessment methods are suggested: - review of results/data/records generated by the candidate - feedback from peers and supervisors to confirm that enterprise procedures are consistently followed and that results meet enterprise requirements - oral and/or written questions associated with laboratory determinations and record keeping - integrated assessment with a case focus, such as the measurement of single or multiple chemical substances and metabolites in serum or other bodily fluids. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. Access must be provided to appropriate learning and/or assessment support when required. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.
This competency in practice	Industry representatives have provided the case study below to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting.

EVIDENCE GUIDE**Biomedical**

A patient's blood sample and request form have been brought to the laboratory. The sample has been recorded in the laboratory's log as 'urgent cardiac enzymes'. The specimen has been processed ahead of the other routine samples. The technical officer selects the panel of tests in the cluster designated cardiac enzymes on the automated analyser. The technical officer also ensures that the instrument has adequate reagents, quality control sera and reference sera loaded before placing the sample for analysis. At the end of the analysis cycle, the quality control is validated and the result report generated. An elevated troponin is noted. The technical officer alerts the supervisor and confirms that this result can be phoned through to the requesting physician. The rest of the sample is refrigerated awaiting immediate follow-up tests. Within 24 hours, it will be frozen for a week in case more tests are requested. At the end of the day, the technical officer sets the analyser on standby, stows sensitive reagents in the refrigerator, cleans his/ her work area, and safely disposes of biological and non-biological wastes.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Codes of practice

Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used

Standards, codes, procedures and/or enterprise requirements

Standards, codes, procedures and/or enterprise requirements may include:

- Australian and international standards, such as:
 - AS 2252 Biological safety cabinets
 - AS ISO 17025-2005 General requirements for the competence of testing and calibration laboratories
 - AS/NZS 2243 Set:2006 Safety in laboratories set
 - AS/NZS 2982.1:1997 Laboratory design and construction - General requirements
 - AS/NZS ISO 14000 Set:2005 Environmental management standards set
 - AS/NZS ISO 9000 Set:2008 Quality management systems set
- cleaning, hygiene and personal hygiene requirements
- enterprise procedures, SOPs and operating manuals
- incident and accident/injury reports
- instructions to comply with legislation, standards, guidelines and codes
- quality system and continued improvement processes
- safety requirements for equipment, materials or products
- sampling procedures (labelling, preparation, storage, transport and disposal)
- schematics, work flows and laboratory layouts
- statutory and enterprise occupational health

RANGE STATEMENT	
	and safety (OHS) requirements • stock records and inventory • test procedures (validated and authorised) • training program contents • waste minimisation, containment, processing and disposal procedures
Equipment, materials and systems	Equipment, materials and systems may include: • centrifuges, water baths and incubators • manual and automated spectrometers and other related measurement devices • various discrete and multi-channel analysers for chemical analytes • laboratory information management systems (LIMS), databases, record and filing systems • chemicals, reagents and biological materials, including immunological reagents and DNA probes necessary for laboratory testing • laboratory glassware and measuring equipment • materials suitable for the safe collection and disposal of biological and non-biological wastes
Communication	Communication may include: • supervisors and managers (laboratory, quality and customer service) • other laboratory or clinical personnel • patients and clients • external auditors and accreditation agencies (e.g. National Association of Testing Authorities (NATA))
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply

RANGE STATEMENT	
	current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Unit sector	Testing
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		