Competency-based Standards for Medical Scientists

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FOREWORD

In December 1991 the following three organisations:
Australian Association of Clinical Biochemists
Australian Institute of Medical Scientists
Australian Society for Microbiology

made a collective decision to approach the National Office for Overseas Skills Recognition (NOOSR) for funding to develop Competency-based standards for Medical Scientists. The collective approach was successful with funding made available in June 1992.

The three organisations as the "Principal Consultant" then formed a steering group to oversee the development of Competency-based standards for Medical Scientists.

The Steering Group formed consisted of representatives from:

Australian Association of Clinical Biochemists
Australian Institute of Medical Scientists
Australian Society for Microbiology
Australian Society of Clinical & Experimental Pharmacology & Toxicology . Human Genetics Society of Australia
Royal College of Pathologists of Australasia
Australian Hospital Association
Australian Council of Trade Unions
and a representative from NOOSR as an observer.

The Steering Group arranged a number of functional analysis workshops where the Competency-based standards were developed and reviewed by scientists and members of the Steering Group. They also employed Consultants, with expertise in the development of Competency-based standards, from the University of Technology Sydney, Training and Development Services to facilitate at the workshops.

The Competency Standards contained within this booklet are the result of those workshops and many hours work by members of the steering group. As Principal Consultants of the project we have much pleasure in presenting these standards.

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MEDICAL SCIENTISTS' COMPETENCY STANDARDS

PREAMBLE

INTRODUCTION

This document contains Competency Standards for Australian Medical Scientists. They have been developed to reflect the contribution normally expected from a person with a degree in a relevant area of science or applied science from an Australian or equivalent university, together with two years relevant professional experience in an accredited laboratory. This is the entry level of a scientist to this profession and reflects a combination of qualifications, skills and the assumption of personal responsibilities and accountability.

At higher or more experienced levels, more advanced competencies are required, including some in areas not covered by the units and elements appropriate to the entry level. Some of the units of the entry level may no longer be relevant to more senior staff, but they will usually have passed through this stage and demonstrated these competencies at the start of their careers.

Given the wide range of professional groups encompassed by "Medical Science" it is intended that a scientist may be measured against these competencies in relation to a specific discipline, or across several disciplines.

WHAT IS COMPETENCY?

Competency has been defined as "the ability to perform the activities within an occupation or function to the standard expected in employment" (National Competency Standards Policy and Guidelines, National Training Board 1991).

Thus, the term "competency" embodies attributes such as knowledge, skills, abilities, and attitudes required in professional practice.

Competency may be **core, general or task-specific**. Examples of core competencies are literacy, numeracy, reliability, communication skills and ability to work in teams. These are assumed to be present and are not further described in these standards.

This document concentrates on the **general** competencies for Medical Scientists. In contrast, **task-specific** competencies refer to individual disciplines (eg haematology, microbiology) and would be described in **Range Indicators** and **Cues**.

Although the competencies described are for Medical Scientists they are not all exclusive to this group; some, (eg. technical procedures, interpretation, clerical work) would be common to several groups, but practised in different contexts.

THE NATIONAL TRAINING REFORM AGENDA

The development of Competency Standards is part of a much broader reform agenda driven by issues such as Australia's loss of international competitiveness, changing work patterns, technological change and a lack of vocational preparation. One area of Australia's competitive advantage is the skill of its people. The National Training Reform Agenda aims to improve the capacity of Australian employers and employees to be skilled, enterprising and productive.

In this regard, developments in relation to training and skill formation must be seen as pieces in a wider reform jigsaw which includes award re-structuring and enterprise bargaining.

THE BENEFITS FOR THE PROFESSION

National Competency Standards for Australian Medical Scientists are intended to deliver several benefits:

1. Consistency of recognition.
2. Standardised accreditation.
3. More equitable assessment of migrants' skills.
4. Definition of the profession of Medical Scientist which raises its public image.
5. Recognition of competence as a pre-requisite for advancement.
6. Continuing revision through the profession's ownership of the standards.
7. Enhanced communication within the profession.
8. Sharpened focus of continuing professional education and refresher courses.
9. Articulated progression and training.
10. A basis for promoting medical science to the public.

HOW CAN THESE STANDARDS BE USED?

These standards have been compiled with a number of potential uses in mind.

Firstly, the production, adoption and publication of these standards represent an act of self-definition by Medical Scientists, through the professional groups which represent the various areas of clinical laboratory sciences in Australia. This collective action is significant because in the past several of the groups involved have concerned themselves with one subject, or one group of specialisation; there is now a greater recognition that Medical Scientists of differing specialist backgrounds have much in common. Trends in health administration and financing, technical developments, and educational changes all contribute to this commonality.

Secondly, the regulation of clinical laboratories in Australia through the accreditation system places emphasis on the qualifications and professional skills of all staff in the laboratories. By better defining the skills and tasks of Medical Scientists, and the level of performance expected (initially at the entry level), the standards will help to ensure the quality of the majority group in this workforce and hence the quality of service provided.

Thirdly, the standards will be a resource for those offering undergraduate or postgraduate courses in clinical laboratory sciences. The fact that they are written as competency-based standards should not be interpreted as endorsement of the view that universities should teach competencies, or only competencies; the translation into a curriculum and detailed decision on content are the province of the appropriate university staff. The standards will, however, give concrete examples of what new graduates will be expected to do within a short period of experience in one kind of workplace and they indicate the competencies required for success in professional practice and continuing education.

Fourthly, standards which have received widespread professional endorsement may be used as guides by employers in the context of training, staff development, and performance management. They may also have influence in the industrial area, by indicating the high standard of work undertaken by, and expected of, Medical Scientists.

Finally, there is a need for a benchmark for assessment of overseas qualifications and of bridging courses from technical qualifications. The standards will provide a check on whether such courses have sufficient theoretical and practical content to underpin the acquisition and application of the competencies.

THE PROCESS

The hallmark of the process adopted has been widespread consultation. Following discussions among a broad range of professional associations in December 1991 the Australian Association of Clinical Biochemists (AACB), the Australian Institute of Medical Scientists (AIMS) and the Australian Society for Microbiology (ASM) prepared a submission to the National Office for Overseas Skills Recognition (NOOSR) and received funding to develop Competency Standards for Medical Scientists.

The development of the standards has been overseen by a Steering Group comprising the major professional associations, and representatives from employers, unions and NOOSR.

Together with representatives from each of the professional groups, consultants from the University of Technology, Sydney have conducted a series of workshops, resulting in the standards. After circulation of the draft standards and taking into consideration comments received this document has been prepared. The output from the workshops has been tested by the use of a series of critical incident interviews with Medical Scientists in the field, to ensure validity, reliability and comprehensiveness.

UNDERSTANDING THE STANDARDS

The standards do not describe the knowledge required to demonstrate adequate evidence of personal competence. Rather, it is assumed that in the testing of competence a range of appropriate cues would be utilised to confirm the required standard.

The actual standards comprise:

Units

An aspect of work activity which:
describes a broad area of professional performance;
can be undertaken by one individual;
has a real meaning as a "marketable component" of work based activity; can be grouped with other units to form a credible qualification.

Elements

Each unit is further divided into elements which describe what is done in the workplace to ensure that the units can be fulfilled.

Performance Criteria

Specify the type of performance in the workplace that would constitute adequate evidence of personal competence. They seek to specify competent performance in "output" terms. Performance criteria describe the overall evidence from which competent performance in an Element would be inferred.

Range Indicators

Describe more precisely the circumstances and context in which the performance criteria would be applied and are optional additions.

Cues

Are selected concrete examples of activities illustrative of the performance criteria. They assist an assessor to determine whether a competency has been achieved and are optional additions.

METHODS FOR DEVELOPING COMPETENCY-BASED STANDARDS

To develop competency-based standards for Medical Scientists, it was decided to use two major methodologies plus one further supportive method. The major methodologies were functional analysis and DACUM (developing a curriculum). The supportive methodology was the Critical Incident Technique.

Functional Analysis Technique (FAT)

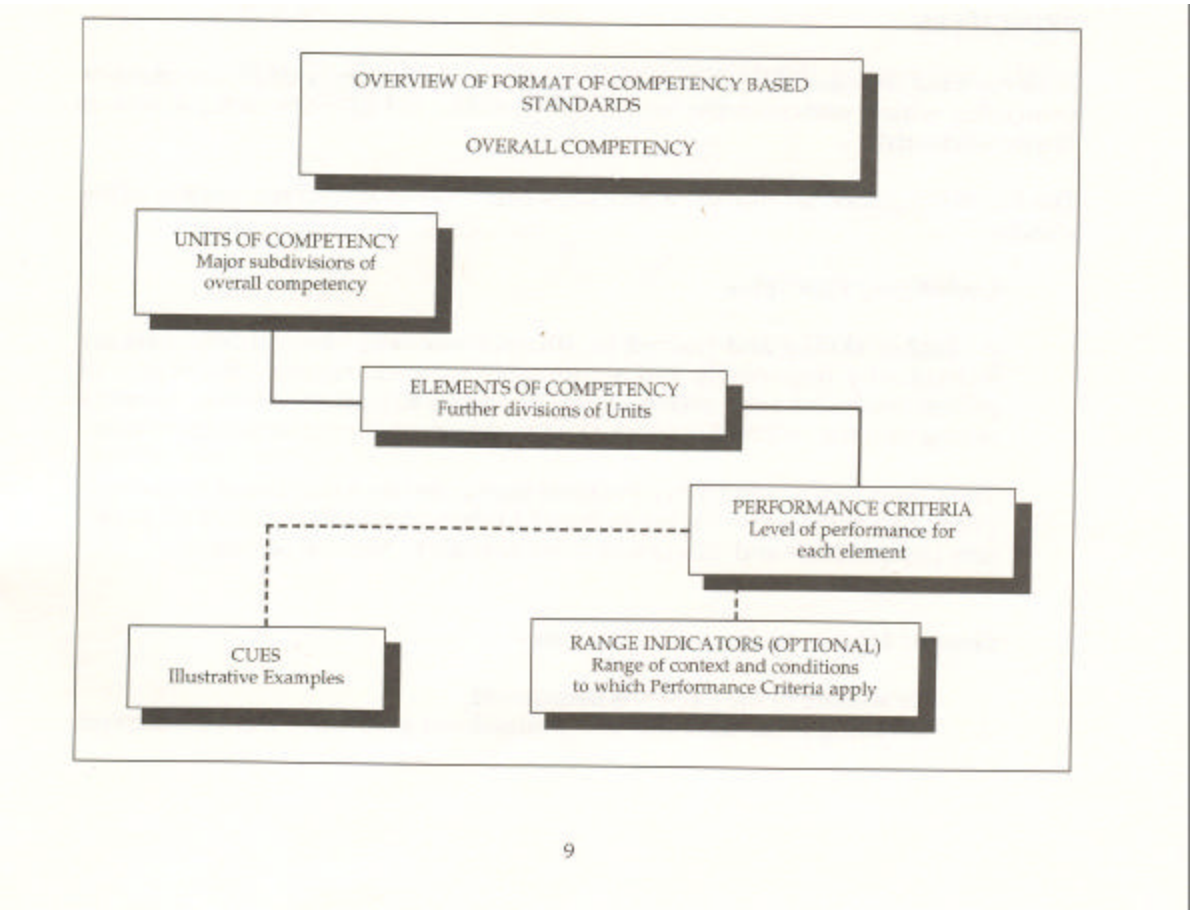
The FAT requires the development of a key purpose statement that is the function of the profession in outcome terms. For Medical Scientists the key purpose statement is:

> Medical Scientists provide information based on investigation of biological material, which assists in the diagnosis, monitoring and prevention of disease.

The question which guides the subsequent analysis is:

What needs to happen for this key purpose to be achieved?
Answering this question involves dividing the key purpose into its major components (ie what roles/units of work need to be performed to achieve the profession's key purpose?). At each stage of the analysis, care is taken to delineate whole work roles e.g. technical skills, contingency management, task management and interaction with the role environment. This process continues until units and elements of the competency are reached. An example of the process is outlined in Figure 1 below.

OVERVIEW OF FORMAT OF COMPETENCY BASED STANDARDS



DACUM Technique

The DACUM technique involves the input of selected individuals, together with a skilled facilitator, who requests ideas from the group about the duties of the occupation. The duties are then listed and the facilitator gathers information about the tasks associated with each duty in turn. Using this technique it is possible to gain information about the tasks in which competence is essential to allow entry to the profession, or to a restricted part of the profession.

Critical Incident Technique

This technique requires that professionals in a specified area of practice be asked to recall incidents from their work, which were of particular significance to them and which had an outcome which was clearly either successful or unsuccessful. The researcher seeks detailed information, about events leading up to the situation and factors which, in the respondents view, were critical in determining the outcome. Any factor which the respondent believes to be important is noted, including things as vague as various types of thought processes. Hence, the critical incident technique has the potential to go beyond descriptions of readily observable sequences of behaviour and gather data about factors on which successful performance (competencies) depends.

PRINCIPLES

In developing the standards, it was essential to clarify a number of assumptions or principles which underpin the work and professional identity of all levels of Medical Scientists.

The following principles provide a necessary backdrop to any understanding of the standards.

Underlying Principles

As highly skilled and trained health professionals, Medical Scientists are individually responsible and accountable for their actions. The degree of professional autonomy exercised will be related to their experience, the work setting and the availability of peer and more senior support and supervision.

The Competency Standards have been predicated on a number of underlying principles, some of which are believed to characterise the work of all health care professionals and others which are specific to Medical Scientists.

Generic Health Professional Principles

1. The welfare of the patient is paramount.
2. Prevailing legal, technical and professional guidelines will be observed.
   Typically these include Occupational Health and Safety legislation, confidentiality and social justice measures such as Equal Employment Opportunity legislation.
   Practitioners must develop and maintain effective verbal, non-verbal and written communication skills, to optimise interaction with patients and their families, other health professionals, relevant support staff and all others significant in the provision of a high quality professional service.
   There must be a commitment to best practice, quality service and continuing professional education and training.
3. Practitioners must develop and maintain effective verbal, non-verbal and written communication skills to optimise interaction with patients and their families, other health professionals, relevant support staff and all others significant in the provision of a high quality professional service
4. There must be a commitment to best practice, quality service and continuing professional education and training.

Medical Scientists' Ethical Principles

1. Commitment to producing accurate test results, correlating and interpreting test data, assessing and improving existing test methods, designing, evaluating and implementing new methods.

2. Promotion of the scientific method of analysis.

3. Commitment to promoting awareness and understanding of the services Medical Scientists render to the consumer / public and other health care professionals.

4. Commitment to development and implementation of cost-effective administrative procedures for laboratories, including their services and personnel.

5. The code of ethics of the various professional groups comprising Medical Scientists will be respected.

UNIT 1

Prepare and analyse biological material

Element

1.1 Ensure the appropriateness of sample collection procedures

If responsible for collection of specimen:

1.1.1 Correct request form is received as set out in established protocol.

1.1.2 Identification of patient and demographic information is established.

Cues:
Name, date of birth, gender, unit record number, ward, location, photographic identification, third party identification (e.g. relation, nurse, etc),

1.1.3 When request appears inconsistent with patient information data, appropriate action is undertaken.

Cues:
The requestor is contacted to clarify apparent inconsistency and senior staff consulted.

1.1.4 Patient preparation and specimen collection is consistent with test(s) requested.

1.1.5 Patient is informed of procedure, advised of possible associated risks, and agreement to proceed obtained.

Cues:
For agreement not given, refer to requestor, refer to senior laboratory staff. Patient anxieties are considered, discussed and referred to senior staff.

1.1.6 Collection is performed, consistent with established protocols and safe working practices, to produce a satisfactory specimen.

Cues:
Patient's condition is monitored before, during and following specimen collection and action taken consistent with the observations

1.1.7 Specimen is collected into a suitable container, then immediately and appropriately labelled.

Cues:
Labelling could include nature of specimen (e.g. urine, CSF), name, date of birth, ward, unit record numbers, date/time, collector identified on specimen and request form.

1.1.8 Specimen is transported in a safe and timely manner under appropriate conditions according to established protocols and regulations.

Cues:

Biosafety bag, appropriate temperature, lid secured.

On receipt of specimen in the laboratory

1.1.9 Documentation is checked to ensure it matches specimen and complies with current regulations.

1.1.10 Specimen suitability for further processing is established.

Cues:
Subject information data is checked against request, specimen is collected in a suitable container, in time and under correct conditions.

1.1.11 Collection errors are identified and suitable remedies suggested to collector.

1.1.12 Decision is made whether to process sub-optimal specimen, taking into account all relevant circumstances and available resources.

Cues:
Such specimens are flagged: urgency of situation, difficulty of obtaining new specimen e.g., patient access, nature of sample.

1.2 **Evaluate specimen suitability prior to analysis**

1.2.1 Correct and satisfactory labelling and matching of subject details is established.

Cues:

Name, unique laboratory number, unit record numbers, date of birth, etc.

1.2.2 Confirmation is made that the nature of the specimen is consistent with requested analysis.

1.2.3 Receipt of specimen in correct container and in accordance with collection and delivery protocols is confirmed.

1.2.4 Quality of specimen is monitored on receipt and throughout the analysis.

Cues:
Haemolysed, clots, normal flora, epithelial cells.

1.2.5 Appropriate action is taken upon receipt of an *unsuitable specimen.*

Cues:
Rejection, requesting new specimen, notifying requestor, processing specimen, consultation with senior staff, etc.

1.2.6 Satisfactory specimens are registered into the laboratory information system and prepared for analyses.

Cues:
Specimen is stored correctly prior to analysis. Specimen is issued with a laboratory number, etc.

1.3. Define the priority of laboratory requests to arrange the workload

1.3.1 Priority of analysis is determined primarily by clinical necessity, as indicated by medical officer(s) and laboratory guidelines; then by staff and equipment availability.

1.3.2 Workload is organised to ensure optimal patient care and most efficient use of resources.

Cues:
Time, personnel, reagents and equipment.

1.3.3 Workload is continually monitored and reorganised as required to accommodate changes in priority.

1.4 Process specimen utilising appropriate/relevant techniques

1.4.1 Worklists or other appropriate means are used to ensure all samples for analysis are processed.

1.4.2 Test procedure is selected for the analysis required, the nature of available specimen(s) and the urgency for a result.

1.4.3 Standards and controls are selected and prepared; testing is organised in accordance with the analytical procedures/protocol to be undertaken, the urgency, and the nature of the patient's illness.

1.4.4 Reagents are selected and prepared to ensure maintenance of quality and suitability for use.

1.4.5 Processes are performed in accordance with prescribed methods, calibration, quality procedures and safety regulations.

1.5 Read and validate results

Equipment based testing

1.5.1 Outcomes of procedures are measured or assessed.

1.5.2 Results are calculated or data prepared **in** a tabulated or graphical form using computer technology or other means.

1.5.3 Validity of test results is ensured in terms of protocols (including standards, quality control data and performance of analytical systems). Problems are identified and remedied or notified.

1.5.4 Test data, calculations, results and acceptance / rejection of analytical procedure outcome are documented.

1.5.5 The identity of the analyst is documented for each phase of the test.

1.5.6 Storage/ disposal of reagents, standards, controls and specimens is in accordance with regulations and guidelines where applicable.

Observation based testing

1.5.7 Available clinical information is reviewed.

1.5.8 Critical observations are made and recorded utilising the knowledge base required of the analyst.

1.5.9 Observations and evaluations are summarised and the summary recorded.

1.5.10 The identity of the analyst is documented for each phase of the testing.

UNIT 2

Correlate, validate and interpret results of investigation using clinical information

Element

2.1 Assess validity of data/results against possible range of outcomes

2.1.1 Initial observation and limited interpretation for significance of the raw data/results is undertaken.

2.1.2 Implausible results are rejected.

2.1.3 Results are assessed for possible specimen-associated deficiencies.

2.1.4 Results are assessed for possible analytical deficiency.

Cues:
Accept/reject criteria are adhered to: controls, other specimens in batch are assessed.

2.1.5 The validity of the results is assessed on the basis of other test results from internal or external sources.

2.1.6 The validity of the results is then assessed against the clinical information available.

2.2 Interpret validated results

2.2.1 Possible causes of results are identified using knowledge base and/ or protocols.

2.2.2 Causes are reassessed depending on other results available.

Cues:
Immunocompromised patient, timing of drug collection, consideration of factors in relation to test, specimen, patient.

2.3 Make decisions about reporting results, repeating procedures, consulting senior staff and carrying out further tests within established guidelines

2.3.1 Rejected results are dealt with appropriately.

Cues:
Repeating the procedure (with or without change in variables of test), referring problem to senior staff, requesting further sample and discussing with requestor.

2.3.2 For other results an appropriate decision is made to report, refer or conduct further testing.

Cues:

Reporting the result routinely, referring the result to senior staff, communicating result urgently, conducting further tests, checking previous results, obtaining further samples, obtaining further clinical information.

UNIT 3

Report and issue laboratory results

Element

3.1 Verify report with sample identification

3.1.1 Identification code of the result is matched to the sample number.

3.1.2 The sample number is matched to the patient identification data. Throughout the testing process sample identification is traceable.

3.1.3 Throughout the testing process sample identification is traceable

3.1.4 Any inconsistency in the sample identification is identified, investigated, documented and resolved.

Cues:

Documentation of inconsistency and/or consultation with senior staff is *undertaken.*

3.2 Use the administrative systems in place to communicate the results

3.2.1 Results are communicated in a timely manner.

Cues:

Significant/urgent results are communicated verbally; paper or electronic reports are also generated.

3.2.2 Confidentiality of results is assured at all times.

3.2.3 Telephone results are only given to authorised and identified persons using verification and documentation procedures.

3.2.4 Overdue results are identified and investigated.

Cues:

Identification: regular audit, printout, telephone enquiries.

3.2.5 Comments/advice pertaining to the test procedure or outcome are reported in a manner understandable to the receiver.

Cues:

For telephone enquiries a confirmation is *established.*

3.2.6 Relevant reference ranges are included.

Cues:

Age, sex, dose, disease.

3.3 Ensure that results with important diagnostic or treatment implications are received by the responsible person

3.3.1 Significant results are identified.

Cues:
Life threatening, urgent, therapeutic.

3.3.2 Appropriate action (including urgent telephoning, faxing) is taken to commu nicate significant result(s).

Cues:
Action is documented, relevant person e.g. doctor, nurse, subject is notified.

3.4 Ensure appropriate storage and disposal of data and reports

3.4.1 All results are recorded and stored according to current regulations and guidelines.

Cues:
These could include: Health Insurance Commission, National Pathology Accreditation Advisory Council.

3.4.2 Reports are disposed of according to regulations and guidelines.

Cues
For example National Pathology Accreditation Advisory Council guidelines. Report and issue of therapeutic products

3.5 Report and issue of therapeutic products

Range Indicator: blood and blood products only

3.5.1 Ensure the product (e.g. blood component) correlates with patient and result information.

3.5.2 Necessary consultation is provided including suitability and availability of various products.

3.5.3 Prepare products for use according to laboratory protocol(s).

Cues
Thawing, filtering in accordance with established protocols.

3.5.4 Products are issued based on request, urgency, availability, suitability and established guidelines.

3.5.5 Stocks of therapeutic goods are prepared, maintained/replenished and stored according to protocols.

3.5.6 Documentation is checked to ensure accordance with regulatory procedures.

3.6 Produce diagnostic products

Range Indicator: culture media

3.6.1 Goods are produced following documented protocols and methods.

3.6.2 Sterility of products is achieved where necessary.

3.6.3 Packaging is checked to ensure adequate and clear labelling with identification of goods, date of manufacture and shelf life.

3.6.4 Goods reach customers in a timely manner and in excellent condition.

UNIT 4

Maintain documentation, equipment and stock

Element

4.1 Coordinate supplies of stocks and reagents

4.1.1 Ensures that conditions of receipt and storage of laboratory supplies are according to manufacturers' specifications and current safety and quarantine regulations.

Cues:
Ensure on receipt that reagents have been kept at correct temperature and are not expired; stored under correct conditions depending on reagent (temperature, security, safety).

4.1.2 Stock supplies are maintained.

4.1.3 Expired or dangerous materials are disposed of according to regulations.

4.1.4 Inadequate stocks (e.g. expired reagents, contaminated reagents) are notified to the responsible staff/member/unit.

4.2 Participate in maintenance of the laboratory environs and equipment

4.2.1 Preventive maintenance protocols are enacted and actions recorded.

Cues:
Maintenance records are up to date. Work area is tidy/clean/organised. Solvents returned to fire-proof cabinets. Waste in correct containers.

4.2.2 Equipment maintenance by supplier is checked against laboratory requirements.

4.2.3 The status of the laboratory environment is monitored and any deficiencies detected are rectified and/ or reported.

4.3 Participate in preparation and revision of manuals and protocols

4.3.1 Methods are continuously monitored for necessary update/modification.

4.3.2 Existing documentation is assembled and checked for appropriate references.

4.3.3 Relevant guidelines for content of manuals and regulatory requirements are determined.

4.3.4 Consultation with peers and senior staff is undertaken to discuss applicability, relevance and need for changes to any existing documentation.

4.3.5 Proposed changes to any existing documentation are discussed with, and approved by senior staff.

4.3.6 Interaction with colleagues is undertaken to test draft for ease of use.

4.3.7 The draft is modified as necessary and submitted to senior staff for approval.

Range Indicators: manuals for analysis including:

a) quality assurance and quality controls
b) specimen acceptance and rejection
c) reporting of outcomes
d) the storage of data, reports and specimens
e) preventative maintenance of equipment and ensuring validity of reagents

UNIT 5

Maintain and promote safe working practices

Element

5.1 Prepare and store reagents and solutions

5.1.1 Reagents and solutions are prepared using established protocols.

5.1.2 The labelling of reagents as laid down by legislative guidelines is ensured.

5.1.3 The maintenance of an up to date inventory of hazardous reagents and supplies is ensured.

5.1.4 Storage of all reagents in the correct facilities and under the correct conditions is ensured.

5.1.5 Reagents are handled as required by regulatory guidelines.

5.1.6 The disposal of reagents and solutions according to expiry date and safety precautions is ensured.

5.2 Identify and respond to unsafe work practices and breaches of regulations

5.2.1 All safe work practices as laid down by legislative guidelines are understood and promoted.

5.2.2 Methods/protocols are checked to ensure that they do not incorporate unsafe work practice.

5.2.3 Upon identification or suspicion of unsafe or improper practices ensure that these are notified to senior staff with suggestions for improvement.

5.3 Ensure correct procedures are followed for acquisition, collection, transportation and disposal of biological, toxic and radioactive wastes

5.3.1 The condition of biological, toxic and radioactive material is monitored on receipt by the laboratory to ensure conformation to current legislation and guidelines.

5.3.2 Ensure that the despatch from the laboratory of biological, toxic and radioactive material is in accordance with current regulations / guidelines.

5.3.3 The disposal of biological, toxic and radioactive material as per current legislation and guidelines is ensured.

5.4 Respond appropriately to emergency situations as they occur in the laboratory

5.4.1 Availability of suitable safety equipment is assured.

5.4.2 Be aware of the possible interactions of the various chemicals, reagents and biological material and their potential for danger.

5.4.3 Develop and maintain sufficient skill and knowledge to respond appropriately to emergencies.

5.4.4 Appropriate actions are taken as described in safety manuals.

Range Indicators: safety manuals including:

Fire
Chemical spills Electrical faults
Basic first aid injury
Radiation spill
Biological hazards
Thermal injury/ damage

UNIT 6

Liaise with health workers and others to continuously improve the service

Element

6.1. Participate in quality improvement activities

6.1.1 Interactions of pathology with other components of the health service are identified and developed.

6.1.2 Complaints, suggestions and comments are documented and brought to the attention of senior staff.

6.1.3 Makes suggestions for the better performance of the laboratory and other areas of the health service.

6.1.4 Quality is improved by acting as a resource for others.

6.2 Optimise relationships with suppliers of goods and services

6.2.1 In-house and external suppliers of goods and services to the laboratory are identified.

6.2.2 Rapid communication channels with suppliers are developed.

6.2.3 An up to date list of contacts of suppliers of goods and services is maintained.

6.3 Optimise relationships with service users

6.3.1 Reports, suggestions, comments regarding the laboratory service by any personnel are acknowledged and referred to senior staff.

6.3.2 Sensitivity is demonstrated to the needs of the service user and communication channels maintained.

Cues:
Formal and informal channels.

6.4 To exchange information with other health care professionals and related industries

6.4.1 Act as a resource for information about pathology.

6.4.2 Maintain a professional standing in dealing with other health care professionals.

Cues:

Assist in the development of interdisciplinary surveys and projects.

6.5 Promote the profile of the profession to the community

6.5.1 Professional expertise is made available to the community.

6.5.2 Information is provided to members of the community.

UNIT 7

Participate in education and training of health workers and others

Element

7.1 Research, prepare and deliver appropriate presentations

7.1.1 Relevant information is identified and obtained with regard to specific topic.

Cues:
Previous presentations, library search, consulting with colleagues, consulting with representative or supervisor of audience on prior knowledge and requirements, review advances since last presentation, assess need for change in relation to target audience.

7.1.2 Presentation is planned and delivered with regard to the particular audience and venue.

7.1.3 Presentation is updated when necessary.

7.2 Participate in interdepartmental and other meetings

7.2.1 Relevant meetings are identified.

Cues:
Intra and extra mural clinical meetings, research groups, courses.

7.2.2 Attend meeting, interacting and exchanging information with other participants.

7.2.3 Relevant information is reported back to colleagues using formal and informal presentations.

7.3 Where appropriate, provide instruction on collection, testing of specimens, interpretation and significance of results

7.3.1 Instruction provided is relevant, accurate, up to date and appropriate to the needs of the audience.

7.3.2 Feedback systems are established in order to assess and improve effectiveness of instruction.

Cues:
Participants' questionnaire, monitoring performance of participants.

7.3.3 Opportunities for follow up information/ advice are established.

7.4 Train personnel in the operation of instruments and equipment, the performance of methods and quality control procedures, and the observation of safety measures

7.4.1 Training is provided is relevant, accurate, and up to date.

7.4.2 Training is planned and undertaken to meet the needs of the audience.

Cues:
Practice sessions, demonstrations.

7.4.3 Feedback systems are established to assess effectiveness of presentation/ training.

UNIT 8

Element

Participate in research and development activities

8.1 Contribute to planning and design of research and development projects

8.1.1 Demonstrate initiative in identifying problems and questions which require investigation.

8.1.2 Communicate with colleagues occurs to discuss the need for further investigation.

8.1.3 Contribute to the experimental design and research protocol.

8.1.4 Participate in funding proposal if necessary.

8.1.5 Information is accessed from libraries and other sources.

8.1.6 Biosafety /Ethics Committees are used when required.

8.2 Follow research/development protocol

8.2.1 Resources are assembled to commence project.

8.2.2 Laboratory procedures are followed.

Cues:
Laboratory methodologies, safety procedures etc.

8.2.3 Outcomes of experimental procedures are continually monitored.

Cues:

Reviewing the direction of a research project.

8.2.4 All experimental steps and observation including updating of protocols are fully documented.

8.3 Evaluate results and the need for further experimental work

8.3.1 All data are collected and prepared for analysis.

8.3.2 Contributions are made to the interpretation of results and conclusions.

8.3.3 Requirements are determined for further experimental work in consultation with collaborators.

8.4 Prepare and deliver report

8.4.1 Contributions are made regarding the format and presentation of outcomes.

8.4.2 Preparation of verbal, written reports, journal article, etc is undertaken.

8.4.3 Report is presented for peer review.

UNIT 9

Demonstrate continuing professional development

Element

9.1 Establish and communicate personal goals in professional development

9.1.1 Opportunities realistically available to the scientist are identified.

Cues:

Promotional, teaching, research, secondment, administration, collaborations etc, are determined, researched and discussed.

9.1.2 Goals are discussed and modified in consultation with relevant personnel.

Cues:
Head of department/mentor.

9.1.3 A program for professional development is established.

9.2 **Maintain and update scientific/technical knowledge and skills**

9.2.1 Relevant meetings are attended.

Cues:
Intra-mural and extra-mural meetings, case presentations, workshops and conferences.

9.2.2 Relevant scientific literature is monitored.

9.2.3 Library use and computer search skills are enhanced.

9.2.4 Information from instrument/reagent/industrial manufacturers and suppliers is critically assessed.

9.2.5 Opportunities to enhance learning from investigation of unusual clinical cases and/or results are pursued.

9.3 Develop skills relevant to the enhancement of professional growth

9.3.1 Demonstrate an understanding of all aspects of laboratory operation and the place of laboratories in health care systems.

9.3.2 Initiative is shown in suggesting or volunteering for, additional tasks.

Cues:
Quality improvement activities, method development, reagent evaluations.

9.3.3 Additional skills are developed through activities in professional organisations and/ or by attending courses.

9.3.4 Research skills are practised and developed.

UNIT 10

Demonstrates professional accountability for Medical Science practice

Element

10.1 Accepts responsibility for own actions/omissions

10.1.1 Justifiable professional decisions are made

10.1.2 Tasks are delegated to other scientists and technical officers commensurate with their abilities and scope of practice.

10.1.3 Tasks are checked to ensure they are completed personally or by another responsible scientist.

10.2 Makes independent, professional judgements

10.2.1 Problems are solved employing critical thinking and sound judgement based upon knowledge and practical experience

10.2.2 Implications associated with various outcomes of decision making are assessed

Cues:
Risk assessment, repercussions

10.3 Complies with profession's code of ethics

10.3.1 Professional conduct is undertaken in a non-discriminatory manner

10.3.2 Professional judgement, skill and care are exercised in such a way as to bring credit to the profession

10.3.3 Reasonable precautions are taken to avoid practices detrimental to patients and others

10.3.4 Confidential information gained in a professional capacity is not disclosed to unauthorised persons

10.3.5 Professional competence throughout career is maintained

10.3.6 Appropriate safety regulations are followed

10.3.7 A responsible approach to the community and the environment with respect to the handling and disposal of hazardous materials is maintained

10.4 Demonstrates knowledge of contemporary ethical issues impinging on Medical Science

10.4.1 Data, events, relationships in the diagnostic and research environment are critically analysed from an ethical perspective.

10.4.2 The rights of individuals/ groups are identified.

10.4.3 Ethical problems and/or dilemmas in the workplace are identified.

10.5 Responds to own abilities and level of professional competence

10.5.1 Unprofessional conduct is identified.

10.5.2 Serious misconduct is reported to appropriate authorities.

10.5.3 Intervention to ensure individual/group's rights/safety is undertaken.

10.6 Recognises own abilities and level of professional competence

10.6.1 Work is only undertaken within one's abilities, qualifications and training.

10.6.2 Consultation with senior scientist or pathologist is undertaken when a situation requires expertise beyond one's own abilities and qualifications.

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Mr. Denis O'Leary
Dr. John Whitfield

Australian Council of Trade Unions
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Australian Hospital Association
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