



Australian Institute of Radiography

**Comments on the content of the
draft capabilities document
on**

**Professional capabilities for medical
radiation practice**

20 July 2013

Introduction

The Australian Institute of Radiography (AIR) welcomes the opportunity to respond to the draft entry-level professional capabilities for the three divisions of the medical radiation practice profession as proposed by the Medical Radiation Practice Board of Australia (MRPBA) and provide input from the peak professional body for radiography and radiation therapy.

These capabilities as proposed by the MRPBA identify the knowledge, skills and professional attributes necessary to practise competently in diagnostic radiography, nuclear medicine technology and radiation therapy.

The core domains and capabilities in the Professional capabilities for medical radiation practice have been informed by a comparative review of the documents that describe the standards and attributes for the 14 health professions regulated by the National Law, with substantial additions and amendments.

The definition of knowledge, skills and professional attributes necessary for competent practice in the profession is approached through capabilities rather than competencies and adopted the following definitions of capability and competence (adapted from Fraser and Greenhalgh, 2001):

- Capability is the extent to which an individual can apply, adapt and synthesise new knowledge from experience and so continue to improve their performance
- Competence is what individuals know or are able to do in terms of knowledge, skills and attitudes

The AIR notes the view of the MRPBA that there is a difference between what the profession demands in a particular workplace setting and what the profession expects every entry level practitioner to be able to do. The purpose of this document then, as the AIR understands it is to focus on the latter, the entry level practitioner.

Background

The AIR has undertaken a major review of the AIR Competency Based Standards (CBS) which is nearing completion and due for final approval by the membership before the end of 2013. This document, now called Professional Practice Standards (PPS), is about to go out to membership for one final consultation. The delays in the delivery of this project have come about largely as a consequence of the working out of the relationship of the AIR and its functions on behalf of the profession prior to the application of the 'National Law' prior to 1 July 2012; and the consequential impact of those changes brought about by the post 1 July regulated environment.

This document was based first on a comprehensive review of the practice standards of not only other Australian health professions, but also other medical radiation science professions worldwide¹. This report was delivered by an external and independent group, led by Donna Cohen of Darcy and Associates and has been in the public domain now for three years.

¹ See Appendix 1 Review of Competency Based Standards for Medical Radiation Practitioners, Final Report. October 2010

The AIR was at that stage responsible for accrediting programs of study and the education providers that deliver those programs. There were then eight Australian universities offering courses in diagnostic radiography/medical imaging and/or radiation therapy (three in NSW, two in Victoria and one each in Queensland, South Australia and Western Australia). A course of study can produce an accredited practitioner (unconditional registration) or a beginner practitioner who requires a further 48 weeks of supervised practice (provisional registration) through a Professional Development Year (PDY). An accredited practitioner was described then as a professional who had received an AIR Statement of Accreditation after satisfying relevant AIR criteria. The AIR also has a responsibility to maintain professional and educational standards relevant to the Medical Radiation Science (MRS) profession in Australia.

In this capacity, the AIR has been involved with CBS for nearly two decades, developing the first MRP CBS in 1992. Following a process of consultation and review between August 2004 and February 2005, a revised set of standards was then adopted and these are still in use today.

The current CBS underpinned a number of AIR activities, including:

- Accreditation of undergraduate and Graduate entry Masters radiography/medical imaging/radiation therapy courses in Australia by the Professional Accreditation and Education Board.
- Assessment of all overseas applications from radiographers, radiation therapists and sonographers by the Overseas Qualifications Assessment Panel for the individual's eligibility to hold a visa to work in Australia.
- Development and periodic review of competency based assessment.

The second dot point above is important in understanding the evolution of professional standards. The National Office of Overseas Skills Recognition (NOOSR) was created in 1989 to oversee and provide assistance for competency development for the professions, as well as incorporating measures to enable the accreditation of overseas skills. The NOOSR format for competency standards is based around individual units of competency. These units of competency are a discrete component or domain of the standard. A unit of competency is in turn, comprised of the following segments:

- Elements – the basic building blocks of the unit of competency, which describe in output terms the things a professional who works in a particular area is able to do.
- Performance criteria – evaluative statements that specify the required level of performance. They set out the required outcomes by which the elements of competency, and the unit as a whole, can be judged by an assessor as being performed to the level acceptable in employment.
- Indicators – the range of context and conditions.

The Board of the AIR took note of the advice from the Darcy and Associates report that in seeking to compare and contrast the standards from different disciplines, making useful comparisons between professions is difficult because of the different approaches within each discipline.

The AIR would strongly recommend that the MRPBA look more broadly at the core domains and capabilities in the Professional capabilities for medical radiation practice than just a comparative

review of the documents that describe the standards and attributes for the 14 health professions regulated by the National Law. It is for this reason that the AIR makes available to the MRPBA, as an appended document, the ninth draft of the AIR Professional Practice Standards due for final release in November 2013².

Submission

The MRPBA seeks answers to a number of questions. This submission will deal with each in detail and again asks the MRPBA to note that the draft Professional Practice Standards (PPS), formerly known as the CBS of the AIR are attached. There is much that is common between the two documents as would be expected, however the layout is differently arranged and the PPS provides further levels of definition, again much as one would expect. The updated professional practice format now comprises five levels:

- Domain
- Standard
- Element
- Indicator
- Cues

Leaving aside the Domains for a moment, the Standards in each domain reflect the level of proficiency and professionalism expected of the graduate practitioner upon attainment of the AIR Statement of Accreditation. Each professional practice standard describes the particular professional activity to be assessed or demonstrated. The standards are the explicit requirements of the Radiation Therapist or Radiographer as they move into the clinical environment.

The standards are further broken down into Elements. These describe the key components or responsibilities within the standard. They aim to integrate knowledge, skills, attitudes and other important attributes of professional performance in the work place. The standards and elements are expressed in active form. There will be overlap, and often a number of elements will be performed simultaneously. Indicators describe the performance criteria associated with each element. They represent actions which should be evident in the daily clinical practice to ensure the standards are being met.

Finally there are Cues which are intended to aid with clarification of the indicators of performance. These may cover aspects such as context for assessment or required evidence of professional ability and competence.

The MRPBA invites comments and feedback on the Professional capabilities for medical radiation practice and directs the questions as defined below.

1. Are the domains for the professional capabilities appropriate?
2. Are there additional domains necessary to identify the professional skills, attributes and the application of knowledge necessary for entry-level independent practice?

² See Appendix 2 AIR Professional Practice Standards 25 6 13 v9

3. Are the descriptions of what a practitioner must be able to do suitable for entry-level practitioners?
4. Are the descriptions of how capability can be demonstrated suitable?
5. Do the descriptors provide sufficient capacity to be applied in a range of clinical settings?
6. Are the definitions of each domain appropriate?
7. Is it appropriate to require the same level of knowledge and skill in CT of entry-level practitioners in each division of practice?
8. Is the document clear?
9. Is the glossary correct and comprehensive?
10. What is the likely impact of this proposal on individual registrants?
11. Are there jurisdiction-specific impacts for practitioners, or governments or other stakeholders that the National Board should be aware of, if these capabilities are adopted?
12. Are there implementation issues the National Board should be aware of?

This submission will take each question in turn.

1. *Are the domains for the professional capabilities appropriate?*

Below we have laid out the two domain structures from the AIR and the MRPBA in columns. The AIR Domains are on the left hand side, those proposed from the MRPBA on the right.

AIR		MRPBA	
Domain 1:	Professional and Ethical Practice	Domain 1:	professional and ethical conduct
Domain 2:	Communication, Teamwork and Autonomy	Domain 2:	professional communication and collaboration
Domain 3:	Knowledge and Understanding	Domain 3:	reflective practice and professional learning
Domain 4:	Critical Thinking and Evaluation	Domain 4:	quality and risk management
Domain 5:	Service Delivery and Clinical Management	Domain 5:	radiation safety
Domain 6:	Lifelong Learning	Domain 6:	practice in medical radiation science
		Domain 6A:	practice in diagnostic radiography
		Domain 6B:	practice in radiation therapy

The AIR submits that there is a strong degree of commonality in the Domain structure overall. Domain 3 in the AIR structure is covered in Domain 6, 6A and 6B. Reference to the PPS document will show that Domain 3 is split into 3A Radiography and 3B Radiation Therapy. AIR Domain 6 is covered in MRPBA Domain 3. The MRPBA domains focus on quality, risk and radiation safety which is to be expected in a document relying on the 'National Law' where "protection of the public is the prime imperative of the statute. Consequentially from the professions view these are built more into the expectations of all of the AIR Domains.

2. *Are there additional domains necessary to identify the professional skills, attributes and the application of knowledge necessary for entry-level independent practice?*

There would not appear to be any need for additional domains. In the event of reference to the domains it would be normal for the MRPBA to rely not only upon its own documents but also to seek to include the standards of others such as the PPS. The logic underpinning this expectation is that any statutory body which seeks to rely on its own information in exercising its functions runs the immediate risk of appeal to its rulings. Consequently the broader the basis of information, the more robust the decision will be and the more likely the ruling of the Registration Board to be supported by a higher court.

The AIR would argue that the MRPBA in this document provides a sound threshold document with an appropriate focus on public safety, and retains the opportunity to refer to other like documents to clarify the professional skills, attributes and application of knowledge necessary for threshold independent practice. It is important to be wary of making such documents over-prescriptive as such a course of action could see the document become out-dated very quickly as technology and practice evolve.

3. *Are the descriptions of what a practitioner must be able to do suitable for entry-level practitioners?*

Not always. The AIR recognises that this is a very difficult area in which to achieve balance and clarity as expectations are constantly adjusted in the light of technology and workplace demands. A good example is the following; "Domain 6A, Section 2 - Provide a verbal radiographic opinion about any abnormal element in a radiographic image set." The AIR advises members that they "should alert medically significant findings to the medical personnel responsible for the patients treatment..."³. To limit such opinions to verbal is to impose unacceptable risks on the performance of a practitioner and remove their capacity to place in writing a record upon which they may later need to rely. The AIR would strongly request that the word *verbal* be removed.

Elsewhere the AIR noted that there appeared to be an application of nuclear medicine or radiation therapy obligations as to the storing, reporting and handling of radiation hazards on radiographers. This should be directed to the particular modality concerned and not provided generally.

³ P3, 'Guidelines for professional conduct for Radiographers, Radiation Therapists and Sonographers'. AIR July 2007

The AIR would refer the MRPBA to the arrangement provided within the AIR's PPS under Domain 3 where the differential between the modalities has necessitated a two path approach to best identify the entry level requirements of practice.

4. Are the descriptions of how capability can be demonstrated suitable?

The AIR notes that this document has encountered the very same challenges as that of the PPS. There was much discussion about what would be expected of an entry level practitioner – particularly in relation to their capacity to effect quality assurance, quality improvement and risk management. These were seen as generally the sphere of activity of more experienced staff than entry level and therefore while awareness and knowledge was expected, it was not anticipated that the entry level practitioner would be functionally providing a lead in these areas.

Similarly the AIR is concerned that there are a number of specified activities which would not normally be within the expected capabilities of an entry level practitioner. MRI/PET planning scans; cone beam CT in diagnostic practice; paediatric behavioural development; mammography and bone densitometry are all not part of the capability expectations of an entry level practitioner. They should be deleted.

5. Do the descriptors provide sufficient capacity to be applied in a range of clinical settings?

While the descriptors indicate the intent of the capacity desired, the AIR is concerned that there is insufficient clarity between the obligation to 'know' and the expectation to 'act'. It was for this reason that the PPS contained further levels and even within the PPS cues for example there is a progression of expectation from knowing, recognising and doing. The MRPBA should give consideration to the language used in this document so as to make sure that an entry level practitioner was in no doubt that simply knowing may not be enough, they must also act. Otherwise they would not be applying the capacity.

Some areas require a capacity which is so broad as to be unhelpful, for example p10, Domain 2.3(a) "have a good working knowledge of the relevant areas of the Australian Health Care system".

There were a number of areas where the capacity described was not general across all modalities and this should be remedied. Where modality specific capacities exist they should be clearly placed within the appropriate modality and the best example of this is in Domain 5, Items 4 & 5 which should have the addition descriptor of the relevant modality. In Domain 6 the AIR was concerned that a number of the capabilities were not consistent with an 'entry level' practitioner. This should be reviewed and rewritten.

6. Are the definitions of each domain appropriate?

The definitions are generally suitable and from the AIR experience in the development of the AIR PPS, the definitions should be reviewed closely so as to ensure that they are consistent in language, meaning and intent. This is a matter of intensive review and iterative rethinking of what the capability so captured is fully about.

7. *Is it appropriate to require the same level of knowledge and skill in CT of entry-level practitioners in each division of practice?*

The AIR would generally advise that a capability statement should not be this specific. There are significant differences between entry level CT in Diagnostic Radiography, Radiation Therapy and Nuclear Medicine, therefore these differences must be spelt out clearly.

Again the AIR would ask the MRPBA to note the implications of technological evolution and the need for a capability expectation to be sufficiently robust so as to withstand further technological change and development, otherwise items would rapidly become inappropriate.

8. *Is the document clear?*

With the objections noted earlier the document generally meets the aim of the MRPBA in providing capability statements for the entry level practitioner.

9. *Is the glossary correct and comprehensive?*

The AIR would argue for a more comprehensive glossary and would refer the MRPBA to the attached PPS as one example, however we would suggest further consideration be undertaken as well.

10. *What is the likely impact of this proposal on individual registrants?*

The AIR is concerned that a document such as this tends to have impact only when a practitioner has a need to use it. With all the best intentions of the MRPBA it is unlikely that most practitioners will use this on even a weekly basis. Given the probable use of this document as the measure of good practice when a notification hearing is commissioned into a person's practice, it is important that it be seen as one of many standards of practice. Clearly this document may be the prime measure of the safe threshold for entry to practice, but the MRPBA should resist relying solely upon it and accept that there are a variety of 'standards' documents for reference.

The AIR would ask the MRPBA to recognise that with such a diverse workforce in MRS, all the permutations relating to this document are unlikely to be experienced for some considerable time and therefore it would be imprudent to make the document too explicit.

11. *Are there jurisdiction-specific impacts for practitioners, or governments or other stakeholders that the National Board should be aware of, if these capabilities are adopted?*

The AIR noted that the structure and differences are extremely wide ranging across all workplaces and working environments. For example completing CPD is familiar and well experienced for some and a totally new expectation for others; for some work places CPD is included in the work expectations and in others it is left completely to the individual. The 'outliers' in practice need to be noted by the MRPBA and when these capability statements are endorsed there is a need for some indication to the profession about what the process to resolve these issues will be.

12. *Are there implementation issues the National Board should be aware of?*

The MRPBA should be aware of what they intend to use this document for. How will they resolve the issues which will arise as the many and varied work environments across Australia try to achieve compliance with the Capability Statement. This document offers something close to a gold standard but not every work place is at that level and the MRPBA will need to be aware of this fact. The document must recognise the scope for the variations which do exist.

The challenge extends to the implementation timeline which is just over three and a half months. The AIR believes that the changes inherent in this document are of such significance that the Universities for example will face significant challenges in bringing those students graduating at the end of this year to a comprehensive understanding of the capability statements in that period of time. Again the AIR submits that the MRPBA should not attempt to impose this document without significant communication and broader consultation. The Board of the AIR, in discussing this submission found itself coming back repeatedly to a view that this brand new paradigm really required a substantial transition programme so as to effect its implementation effectively.



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Australian Institute of Radiography

Professional Practice Standards for the Accredited Practitioner

Revised 2013

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Glossary of Terms

Accredited Course /Program

An accredited course/program is one which has been reviewed and accepted by a recognized accreditation agency and has met certain requirements as defined by the profession within the Education Policy of the AIR.

Accredited Practitioner

An accredited practitioner will have achieved a level of competence to enable them to accept the responsibilities of practising independently and be capable of performing the expected role of a practitioner in a sole practitioner situation. An accredited practitioner is one who has attained a Statement of Accreditation from the AIR, or in the case of an overseas qualified practitioner, has been assessed by the Overseas Qualifications Panel of the AIR as being equivalent to an AIR accredited practitioner.

As Low As Reasonably Achievable (ALARA)

ALARA is an acronym for As Low As Reasonably Achievable. This is a radiation safety principle for minimising radiation doses and releases of radioactive materials by employing all reasonable methods. ALARA is not only a sound safety principle, but is a regulatory requirement for all radiation safety programs. This also applies to the use of ultrasound for imaging purposes.

Australian Institute of Radiography (AIR)

The Australian Institute of Radiography (AIR) is the professional association representing the Medical Radiation Science profession (Radiation Therapists, Radiographers and Sonographers) in Australia.

Carer

Those who provide unpaid or paid care by looking after an ill, frail or disabled family member, friend or partner.

Competency Based Standards (CBS)

CBS describe the performance benchmarks for Radiation Therapists and Radiographers. This was the term used for previous documents of the AIR (1998, 2005) and has been replaced in this document by Professional Practice Standards (PPS)

Graduate Practitioner

A graduate practitioner is a graduate from an accredited Medical Radiation Science course/program whom, upon completion of such course/program, would receive the Statement of Provisional Accreditation of the AIR. The graduate practitioner is required to successfully complete the National Professional Development Program (NPDP) of the AIR to gain recognition as an accredited practitioner.

Medical Radiation Science (MRS)

Medical Radiation Science is the collective term that includes the practice of Nuclear Medicine Technology, Radiation Therapy, Radiography/Medical Imaging and Sonography. For the purposes of this document the term MRS shall only include Radiation Therapy and Radiography. Medical Imaging Technologists and Sonographers will be referred to as such within this document.

National Office of Overseas Skills Recognition (AEI-NOOSR)

This body forms part of the Australian Government International Education Network (AEI) and its function is the development of Australian policy on issues of overseas skills recognition.

Professional Practice Standards (PPS)

PPS describe the performance benchmarks for the Accredited Practitioner in Radiation Therapy and Radiography on the attainment of a Statement of Accreditation.

Professional Accreditation and Education Board (PAEB)

The Professional Accreditation and Education Board was established to advise Council and from 2002, the Board of the AIR on matters related to undergraduate, graduate entry and postgraduate education and development of the Medical Radiation Science profession. It also is tasked with promoting continuing professional development.

Radiation Oncology

In the clinical context, Radiation Oncology is the treatment of malignant and benign disease using ionising radiation. This may be done to cure disease; to palliate the symptoms and signs of disease; as a primary treatment modality; in combination with other treatment modalities; to improve the quality of life; or for research.

Radiation Therapist (RT)

Radiation Therapists are health care professionals primarily concerned with the design and implementation of radiation treatment and issues of care and wellbeing of people diagnosed with cancer and other conditions. The name Radiation Therapist used within this document refers to those professionals that may have been referred to in the past both within Australia and internationally, as Therapeutic Radiographer, Radiation Therapy Technologist, Medical Radiation Science Professional, and Therapy Radiographer.

Radiographer (R)

Radiographers are health care professionals who perform a range of medical imaging procedures, and who interpret the resultant images for the diagnosis and management of medical conditions.

The name Radiographer used within this document refers to those

professionals that may be called within Australia and internationally, Radiographer, Diagnostic Radiographer, Medical Imaging Technologist, Medical Radiation Science Professional and Medical Imaging Scientist.

Radiography/Medical Imaging

In the clinical context, Radiography/Medical Imaging is the professional practice of providing a range of procedures using ionising or non-ionising radiation eg: ultrasound. This may be done to produce an image to confirm or exclude a clinical diagnosis; to assist and monitor treatment processes; for screening programs or for research.

Radiation Management Plan (RMP)

Radiation management plan will help ensure that the radiation doses to users, other persons involved in the practice, members of the public and the environment are below the prescribed limits and are as low as reasonably achievable.

Scope of Practice (SOP)

Scope of Practice defines the major areas of responsibility and application of knowledge, judgment, functions and skills within the profession.

Sonographers

Sonographers are medical imaging professionals who operate ultrasound equipment to provide and interpret images for diagnostic and interventional purposes.

Ultrasound

Ultrasound - is a medical imaging modality using high frequency sound waves to provide high spatial, contrast and temporal resolution images in real-time. It is used to visualise and document anatomy, pathology, vascularity, motion and in interventional procedures.

Professional Practice Standards

Introduction

Professional Practice Standards (PPS) describe the performance benchmarks for the Accredited Practitioner in Radiation Therapy and Radiography on the attainment of a Statement of Accreditation. These standards also apply to practitioners in non-radiation imaging modalities who possess a radiography undergraduate qualification.

The PPS provides a framework for professional and community expectations. The Standards aim to integrate the skills, knowledge and understanding that underpin the professions of Radiation Therapy and Radiography and non-radiation imaging modalities with the unique attributes and attitudes of these disciplines.

The Standards have several purposes:

- To provide standards of practice for the accredited practitioner,
- To provide standards necessary to assess overseas applicants seeking a Statement of Accreditation,
- To assist tertiary institutions to develop undergraduate and graduate entry programs, leading to recognition by the Australian Institute of Radiography,
- To provide a statement on the current status of our profession in the community,
- To provide government bodies such as AEI-NOOSR and DEST with information regarding best practice in our professions,
- To provide a resource for the development of industrial awards,
- To provide a framework for higher levels of practice (and career structure),
- To support registration and licensing issues,
- To provide a framework for resumption of practice,
- To provide a resource document for students entering the profession and practitioners who have had a long period of absence from the profession and employers.

It is not intended for the PPS to set a national curriculum for program development leading to awards in MRS. This document is instead a minimum specification of standards, incorporating academic, clinical and professional elements for a practitioner to embody the principles of practice recognised and encouraged by the profession.

History of the Standards

In 2005 the Australian Institute of Radiography released an updated version of the Competency Based Standards following substantial review of the existing 1998 standards by the Professional Accreditation and Education Board (PAEB). During the development of the 2005 CBS document the PAEB reviewed the approach taken by other Allied Health disciplines both locally and internationally. A significant shift in the philosophy underpinning the 2005 CBS was the development of standards based on outcomes rather than the previously utilised task orientated style.

Following the development of the 2005 standards in draft form, consultation was sought from:

- Radiation Therapists and Radiographers and non-radiation imaging modalities practitioners representing State Branches,
- Specialist Panels of the AIR,
- Academic Institutions and,
- Regulatory bodies.

Information gathered from this consultation process was used to update the draft and finalise the Standards, which were published in November 2005.

The 2005 CBS identified five Standards common in many of the standards of other health professions. These were:

1. Knowledge and Understanding
2. Critical Thinking and Evaluation
3. Professional and Ethical Practice
4. Care and Clinical Management
5. Lifelong Learning

These standards were seen to provide a means of identifying general expectations about the professional practice, attributes and capabilities of Radiation Therapists and Radiographers entering employment immediately following attainment of the AIR Statement of Accreditation. The standards were supported by descriptors and outcome statements.

In 2010 Darcy and Associates were commissioned to conduct an intensive literature review of the CBS and report back to the AIR. This report was also made available to the Council of Regulating Authorities (CORA). Darcy and Associates compared the current standards of practice for medical radiation professionals in Australia, New Zealand, Canada and the United Kingdom, and also examined standards in use by other health professions within Australia. The Darcy and Associates Report maintained that the five standards appeared to be working well for the profession but left open the discussion of what competence was and the part it played in professional activities. The report suggested that by discussing competence as it related to the profession the structural foundation of the revised standards could be organised into domains of competence.

What is Competence?

The term competence can be used in many ways when considering professional practice. A clear definition is needed to guide this review. It is possible, as in Eraut's (1998) review of definitions and meanings of competence, to distinguish between treating competence as a socially situated concept –“ the ability to perform tasks and roles to the standard people expect” -- and those who define it as individually situated, a set of personal capabilities or characteristics (Neufeld and Norman, 1985). Eraut argues in favour of a socially situated definition, because the notion of competence is central to the relationship between professionals and their clients; and recommends using the word capability to describe the individually situated concept of “what a person can think or do”. Whether or not a person's capability makes them competent in a particular job depends on them being able to meet the requirements of that job. Hence competence in a job is defined as “the ability to perform the tasks and roles required to the expected standard” (Eraut, 1998). Further, Fraser and Greenhalgh 2001 define competence as what individuals know or are able to do in terms of knowledge, skills and attributes.

The advantage of using Eraut’s definition is that it can be applied at any stage throughout a professional career. The standard of competence expected will vary according to experience and responsibility. This definition also considers the requirement to keep abreast with current developments and changes in practice. It also leaves open the question of who will decide what is to count as competence when different people have different expectations. Training and experience results in a steadily increasing range of competence, accompanied by gradually decreasing levels of supervision; and the process of expanding one's range of competence continues after completion of training. Throughout this period the principle holds good of not

undertaking work for which one is not competent without appropriate supervision, whatever one's status.

An accredited practitioner will have achieved a level of competence to enable them to accept the responsibilities of practising independently. An accredited practitioner should autonomously perform wide ranging clinical roles within their scope of practice.

There is a further level of judgement and skill which has variously been described as extended practice (carrying out of tasks not included in the normal training of registration) or advanced practice (regularly performing beyond the core practice boundaries of the profession on a regular basis with appropriate availability of resources, educational underpinning and professional mentorship) where the practitioner has the opportunity to develop and demonstrate expertise within an area of specialisation. Specialisation might include further practice in non-radiation imaging modalities.

Scope of Practice for Radiation Therapist

Accredited Practitioner Level

Radiation Oncology is the treatment of malignant and benign disease using ionising radiations. This may be done:

- To cure disease,
- As a primary treatment modality,
- In combination with other treatment modalities,
- To palliate the symptoms and signs of disease,
- To improve the quality of life and,
- For research.

Radiation Therapists are health care professionals primarily concerned with the design and implementation of radiation treatment and issues of care and wellbeing of people diagnosed with cancer and other conditions undergoing radiation therapy.

The scope of practice of the Radiation Therapist (Accredited Practitioner level) shall include:

- Patient assessment including psychosocial issues,
- Patient positioning and immobilisation,
- Manufacture/construction of ancillary equipment,
- Simulation, including tumour localisation, treatment planning and dosimetry,
- Treatment by superficial to megavoltage external beams and verification,
- Imaging for planning and treatment verification purposes,
- Mentoring, clinical reasoning and research.
- Quality assurance and quality improvement

Whilst the Accredited Practitioner has the theoretical knowledge, they do not specifically possess the level of competence to practice independently in specialist areas.

Scope of Practice for Radiographer

Accredited Practitioner Level

Radiography is the professional practice of providing a range of diagnostic imaging procedures and therapeutic procedures using ionising and non-ionising radiation. This may be done:

- To create an image to confirm or exclude a clinical diagnosis,
- To assist, monitor and manage treatment processes,
- For screening programs and,
- For research

Radiographers are health care professionals who provide and assess a range of medical imaging procedures for subsequent diagnosis and management of medical conditions. Radiographers are responsible for optimising diagnostic quality whilst maintaining radiation safety.

The scope of practice of the Radiographer (Accredited Practitioner level) shall include:

- Patient and clinical assessment,
- Application of the science of medical imaging to include:
 - general radiography
 - mobile radiography
 - fluoroscopy
 - operating theatre imaging
 - emergency imaging and
 - computed tomography
- Image processing and data recording
- Quality management and diagnostic efficacy
- Image assessment
- Mentoring, clinical reasoning and research
- Quality assurance and quality improvement

Whilst the Accredited Practitioner has the theoretical knowledge, they do not specifically possess the level of competence to practice independently in specialist areas.

Structure of Professional Practice Standards 2013

The 2013 review of the standards has modified and expanded on the existing format.

The updated competency standard format now comprises five levels:

- Domain
- Standard
- Element
- Indicator
- Cues

Domain

The 2013 standards have been grouped together into domains of professional responsibility. The six domains are:

1. Professional and Ethical Practice
2. Communication, Teamwork and Autonomy
3. Knowledge and Understanding
4. Critical Thinking and Evaluation
5. Service Delivery and Clinical Management
6. Lifelong Learning

It is important to note that the order in which the domains are presented do not indicate an order of importance. Competencies in this framework are focused primarily on the patient's perspective and experience. The priority or importance placed on each category is as follows:

1. Quality Clinical Outcomes
2. Quality Patient Care, Safety and Experience
3. Information and Communication with Patients
4. Communication in a Multidisciplinary Environment
5. Education and Training
6. Research and Development

Standards

The standards in each domain reflect the level of proficiency and professionalism expected of the graduate practitioner upon attainment of the AIR Statement of Accreditation. Each competency standard describes the particular professional activity to be assessed or demonstrated. The standards are the explicit requirements of the Radiation Therapist or Radiographer as they move into the clinical environment.

Elements

The standards are further broken down into elements. These describe the key components or responsibilities within the standard. They aim to integrate knowledge, skills, attitudes and other important attributes of professional performance in the work place. The standards and elements are expressed in active form. There will be overlap, and often a number of elements will be performed simultaneously.

Indicators

Indicators describe the performance criteria associated with each element. They represent actions which should be evident in the daily clinical practice to ensure the standards are being met.

Cues

Cues are intended to aid with clarification of the indicators of performance. These may cover aspects such as context for assessment or required evidence of competency.

Review

Standards will be modified and updated regularly and as necessary to incorporate and reflect advances and developments in the MRS profession. This is part of routine quality assurance to ensure that this professional document meets the requirements of the time.

Domain 1: Professional and Ethical Practice

Standard 1.1	Practises within the Legal Framework
Standard 1.2	Practises to the standards laid down by the profession
Standard 1.3	Fulfils the duty of care in clinical practice
Standard 1.4	Provides patient centred care
Standard 1.5	Acts to preserve the safety of individuals and groups at all times
Standard 1.6	Guided in action by their own and others' Scope of Practice
Standard 1.7	Acts to ensure that patient welfare and rights are appropriately respected
Standard 1.8	Responds appropriately in culturally sensitive situations

This domain deals with the standards that relate to the legal, ethical and professional responsibilities of radiographers and radiation therapists. Radiographers and radiation therapists have a duty of care to both their patients and the other health professionals with whom they interact. Professional behaviour is expected at all times. Radiographers and radiation therapists have an obligation to maintain professional competence, and to only undertake procedures within their own scope of practice.

Practice is regulated by statute law administered by the Medical Radiation Practice Board of Australia and common law. The Australian Institute of Radiography (AIR) provides Guidelines for Professional Conduct for Radiographers, Radiation Therapists and Sonographers and a Code of Ethics. Professional practice consistent with the standards outlined in this domain ensures that medical imaging procedures or radiation therapy treatments performed are of consistent and reliable quality.

Standard 1.1 Practises within the Legal Framework

This standard deals with the legislative requirements that impact on professional radiography, sonography or radiotherapy practice. It delineates the requirement to practise using methods that are compatible with the codes, guidelines and standards that have been set by the Medical Radiation Practice Board of Australia and the Australian Institute of Radiography.

Element 1: Practises in accordance with statute law and the Australian Institute of Radiography's Code of Ethics, Guidelines for Professional Conduct and Professional Practice Standards	
Indicators	Cues
1. Understands and applies the obligations of statute law as they relate to the delivery of their professional services	<ul style="list-style-type: none"> • Has an awareness of the statutory role of the Medical Radiation Practice Board of Australia. • works within the guidelines set out by the national law covering the regulation of Medical Radiation Practitioners. • Complies with the Medical Radiation Practice Board of Australia's Code of Conduct. • Meets their obligations with regard to mandatory notification in cases of "notifiable conduct" of a health practitioner. • Can recognise and manage appropriately situations where the professional conduct of a colleague may indicate intervention or mandatory notification is justified. • Is able to explain the purpose of professional indemnity insurance. • Maintains National Registration and complies with all requirements of MRPBA.
2. Executes the legislative obligations that are relevant to the provision of their professional services	<ul style="list-style-type: none"> • Demonstrates safe practice within the framework of current legislation that governs the use of radiation for medical purposes. • Only undertakes procedures and treatments which have been requested by a health professional properly authorised to request procedures involving the use of radiation.

	<ul style="list-style-type: none"> • Ensures that operational policies and procedures comply with the legislative requirements governing the use of radiation.
3. Practises in accordance with the Code of Ethics for professional practice such as outlined by the Australian Institute of Radiography (AIR)	<ul style="list-style-type: none"> • Has an awareness of and can interpret and implement the obligations outlined by the Code as it relates to their practice. • Demonstrates ethical responsibilities during practice.
4. Practises in accordance with the AIR Code of Professional Conduct	<ul style="list-style-type: none"> • Knowledge of and compliance with the AIR Code Professional Conduct. • Practises in a manner in keeping with that set out in these guidelines. • Practises within legislative requirements and understands the implications of non-compliance within professional, legal and ethical constraints.
5. Practises in accordance with the AIR Professional Practice Standards	<ul style="list-style-type: none"> • Meets the standards expected of a practitioner at the level of own knowledge, skills and experience.
6. Practises in accordance with Occupational Health and Safety Legislation	<ul style="list-style-type: none"> • Understands and executes the legal requirements of maintaining a safe workplace under Occupational Health and Safety legislation. • Has knowledge of and adheres to occupational health and safety procedures in the workplace. • Actively takes responsibility for providing a safe workplace.

Standard 1.2 Practises to the standards of the profession

This standard relates to the responsibility of radiographers, sonographers and radiation therapists have to uphold the reputation, honour, integrity and dignity of the profession. Radiographers and radiation therapists should always behave in a manner which justifies the trust and confidence placed in them by their patients and healthcare colleagues. Radiographers, sonographers and radiation therapists should work to serve the best interests of their patients at all times.

Element 1: Maintains a professional image	
Indicators	Cues
1. Maintains professional integrity	<ul style="list-style-type: none"> • Refrains from engaging in any activity which may bring the profession into disrepute. • Recognises and appreciates the imbalance of power during procedures and takes steps to avoid any misinterpretation of professional behaviour. • Defends against any abuse of the professional relationship formed with patients. • Practises without discrimination. • Works without seeking personal profit or gain from interactions with patients.
2. Understands personal accountability for work and professional conduct	<ul style="list-style-type: none"> • Understands the legal responsibility to be accountable for professional practice, including acts of negligence and acts appropriately. • Accepts responsibility for their decisions during procedures and treatment.
3. Works within the guidelines of the profession	<ul style="list-style-type: none"> • Recognises the scope of practice of their own and other health professions, and works appropriately within those frameworks. • Is able to explain their role within healthcare. • Does not undertake duties which are outside their scope of practice.

Standard 1.3 Fulfils the duty of care in clinical practice

This standard covers the duty of care radiographers, sonographers and radiation therapists have to the patients, particularly with regard to patient safety and well-being.

Element 1: Acts to ensure the rights of individuals are not compromised	
Indicators	Cues
1. Demonstrates practice that recognises, respects and upholds the rights of individuals	<ul style="list-style-type: none"> • Practises in a manner that protects the patient's rights. • Demonstrates respect and discusses with patients their individual rights in relation to their health care. • Acts as an advocate for individual rights.
2. Supports the patient's rights to be informed about their procedure or treatment and make independent decisions	<ul style="list-style-type: none"> • Is proactive in providing information related to the procedures or treatment being undertaken. • Provides patients with the information required for them to make an informed decision regarding their treatment. • Provides the patient with information regarding the procedure being undertaken. • Supports and accepts patient decisions and choices related to their own treatment plan. • Provides appropriate support and advice following the procedure for any after care requirements.
Element 2: Demonstrates duty of care in patient management	
Indicators	Cues
1. Understands their duty of care to patients.	<ul style="list-style-type: none"> • Describes and understands the meaning of professional duty of care as it relates their interaction with patients. • Ensures that patients receive a high quality procedure. • Recognises and understands the legal implications of professional misconduct or negligence. • Holds an appropriate level of professional indemnity insurance as required by National Law.
2. Recognises professional responsibilities and understands accountability	<ul style="list-style-type: none"> • Recognises and evaluates factors which may contraindicate requested procedure. • Questions or clarifies requests for

	<p>procedures which appear inappropriate.</p> <ul style="list-style-type: none"> • Only accepts requests which include adequate clinical information to justify the procedure. • Consults with members of the multidisciplinary team when required. • Evaluates and assesses each request for procedure or treatment thoroughly with respect to the proposed technique. • Ensures that the patient’s clinical status is considered when designing a treatment or procedure for the patient.
<p>3. Ensures treatment is provided within an appropriate time frame</p>	<ul style="list-style-type: none"> • Ensures priority is based on medical urgency. • Can justify assigned priority in terms of the medical urgency and act accordingly. • Recognises factors which might impact on assigned priority, and demonstrates an ability to be flexible when required. • Optimise resources to best meet care needs of patients. • Alerts the appropriate personnel responsible for the patient’s treatment of medically significant findings or of a change in patient condition.

Standard 1.4 Provides patient centred care

This standard deals with patient centred care, which takes into account the patient's wants, needs and preferences regarding the requested procedural pathways. Patients should be provided with the information and support necessary to become actively involved in decisions concerning their procedure.

Element 1: Provides patient focused methods of practice	
Indicators	Cues
1. Recognises, monitors and responds to the needs of patients	<ul style="list-style-type: none"> Identifies and accommodates patient's needs where possible during treatment or procedures. Takes responsibility for the care of patients during the treatment or procedure. Monitors and responds appropriately to the patient's condition throughout the treatment or procedure.
2. Modifies and adapts the treatment or procedure to take account of patients' needs	<ul style="list-style-type: none"> Modifies the treatment or procedure according to patient status. Identifies situations which may affect patient outcome and adapts the treatment or procedure accordingly. Uses initiative for the benefit of the patient.
Element 2: Treats patients with respect and empathy	
Indicators	Cues
1. Uses a respectful and empathetic approach when dealing with patients	<ul style="list-style-type: none"> Introduces and identifies themselves to patients in a respectful manner before commencing the treatment or procedure. Communication with the patient is conducted with sensitivity and respect for their privacy Treats patients with respect, tolerance and empathy. Maintains patient's dignity and maximises comfort throughout the procedure. Practises without discrimination.
2. Encourages the cooperation of patients in their treatment or procedure	<ul style="list-style-type: none"> Encourages the patient to be an active participant in the treatment or procedure. Provides a safe environment for the patient to engage with the practitioner. Engages the patient's cooperation, and allows time for the patient to comply with

	requests.
3. Encourages feedback regarding the procedure	<ul style="list-style-type: none">• Actively seeks patient feedback on care and uses this to improve practice.• Responds appropriately to patient complaints or comments about care received.• Complies with relevant complaints policies and procedures of the workplace

Standard 1.5 Acts to preserve the safety of individuals and groups at all times

This standard relates to the practical applications of the policies and procedures including but not limited to radiation protection, infection control, incident reporting and risk management. Radiographers, sonographers and radiation therapists have a responsibility for the safety of patients, staff, visitors and themselves.

Element 1: Demonstrates a broad and relevant knowledge of radiation safety to a level that supports safe practice in Radiography or Radiation Therapy	
Indicators	Cues
1. Demonstrates a thorough knowledge and adherence to radiation safety and protection policies and legislation that supports safe practice	<ul style="list-style-type: none"> • Adheres to the local radiation management plan (RMP) • Uses equipment only for the purposes intended, applying appropriate techniques safely. • Ensures that all procedures comply with the ALARA principle • Only accepts requests for procedures from authorised personnel. • Uses appropriate radiation safety procedures to prevent unnecessary exposure to staff, public and other patients • Determines and manages pregnancy status when applicable before commencing the procedure. • Recognises potential radiation hazards and takes appropriate action.
2. Withdraws unsafe equipment from clinical use	<ul style="list-style-type: none"> • Recognises faulty or unsafe equipment and • Follows appropriate procedures in response to faulty or unsafe equipment.
Element 2: Identifies risk to safe practice and takes appropriate action	
Indicators	Cues
1. Understands potential risk factors in the clinical environments	<ul style="list-style-type: none"> • Follows the correct patient, correct site, correct procedure guidelines. • Manages workload to ensure safe practice. • Ensures personal mental and physical health is appropriate to allow safe and competent practice.
2. Questions procedures which are potentially inappropriate	<ul style="list-style-type: none"> • Discusses with the referring practitioner when the apparent risk to the patient is greater than the benefit obtained by the procedure.

	<ul style="list-style-type: none"> • Ensures that the documentation is clear, specific and details the appropriate procedure, treatment or intervention for the individual patient.
3. Ensures a safe working environment for patients and others	<ul style="list-style-type: none"> • Ensures that the working conditions adequately provide for the safety of patients, staff and the public. • Ensures the working environment is maintained in a safe and hygienic condition taking into account all occupational health and safety requirements. • Complies with relevant local policy for patient transport. • Uses appropriate immobilisation devices when indicated. • Reports and manages appropriately any situation that may put patients, staff or public at risk.
Element 3: Act to minimise risk of infections	
Indicators	Cues
1. Recognises the potential for spread of infection and minimise hazard through the application of Standard Precautions	<ul style="list-style-type: none"> • Understands and can describe the mode of transmission of microorganisms. • Is able to evidence current knowledge of infection control procedures. • Practises infection control including hand hygiene and equipment cleanliness procedures. • Complies with Standard Precautions guidelines. • Adheres to the protocol regarding the use of personal protective equipment.
Element 4: Reporting of incidents	
Indicators	Cues
1. Manages appropriately incidents involving staff, patients and the public, ensuring correct and timely documentation and reporting through appropriate channels occurs	<ul style="list-style-type: none"> • Complies with the system in place for the reporting of clinical incidents. • Completes appropriate documentation in the event of an incident. • Promptly identifies and reports faults or hazards.

Standard 1.6 Guided in action by their own and others' Scope of Practice

This standard deals with Scope of Practice (SOP), which ensures that a radiographer, sonographer or radiation therapist has completed the relevant training, and has the skills, knowledge and experience to practice safely and effectively for the procedures they are undertaking. The Scope of Practice will generally alter throughout an individuals' career as they gain knowledge and experience. The Scope of Practice may become more focussed with increasing experience as the radiographer, sonographer or radiation therapist moves into specialty areas.

Element 1: Recognise and operate within own SOP	
Indicators	Cues
1. Demonstrate an ability to understand, recognise and work within the framework of his/her own personal and professional skills	<ul style="list-style-type: none"> • Only undertakes procedures independently or with others for which the relevant education and training have been completed.
Element 2: Consults with others when expertise is required beyond own SOP	
Indicators	Cues
1. Seeks assistance and consults colleagues when appropriate	<ul style="list-style-type: none"> • Assesses the situation and recognises when additional assistance is required • Seeks the help of more experienced colleagues when required.
Element 3: Recognises the boundaries of SOP for student and graduate practitioners	
Indicators	Cues
1. Recognises the boundaries of SOP for students, graduate practitioners and others as appropriate	<ul style="list-style-type: none"> • Identifies tasks which can be appropriately delegated to less experienced practitioners • Recognises own accountability and responsibility when delegating tasks to other less experienced practitioners.
2. Instruct and supervises students, graduate practitioners and others as appropriate	<ul style="list-style-type: none"> • Willingly shares knowledge and expertise with students and other staff members. • Assists in the professional development of staff and students. • Ensures appropriate supervision is provided for students and staff members. • Accepts the responsibility that is associated with a supervisory role.

Element 4: Consults with other health care professionals when issues are beyond own SOP	
Indicators	Cues
1. Develops and sustains professional working relationships with other health care professionals	<ul style="list-style-type: none"> • Works in partnership with all members of the multidisciplinary health care team. • Contributes to professional relationships and works as part of a team.
2. Recognises the appropriate time to seek assistance, consult colleagues or refer issues that are beyond own SOP	<ul style="list-style-type: none"> • Recognises the scope of practice of their own and other health professions, and works appropriately within those frameworks. • Understands and describes the chain of clinical responsibility. • Seeks advice or refers on to another member of the health care team when appropriate.

Standard 1.7 Acts to ensure that patient welfare and rights are appropriately respected

This standard enforces the guidelines set out in the AIR Codes of Ethics and Professional Conduct for radiographers, sonographers and radiation therapists, which emphasises that the prime concern of practitioners shall be ensuring that the welfare, safety and rights of patients are upheld at all times.

Element 1: Practises in a manner that upholds the patient's right to privacy.	
Indicators	Cues
1. Knowledge of the legislation relating to privacy	<ul style="list-style-type: none"> • Has knowledge of and complies with the Privacy Act as it relates to Health Care Professionals, and can direct others to the relevant documents. • Complies with the legislations surrounding the collection, use, disclosure and storage of personal information. • Adheres to the legislative guidelines limiting access to patient's personal records.
Element 2: Complies with ethical practice standards	
Indicators	Cues
1. Implements an ethical approach to patient treatment	<ul style="list-style-type: none"> • Behaves in a manner which upholds the good standing and reputation of the profession. • Promotes and adheres to a culture of ethical behaviour. • Does not engage in any behaviour which causes unnecessary physical or psychological distress to the patient or their families.
2. Engages effectively in ethical decision making	<ul style="list-style-type: none"> • Demonstrates an ability to make informed, sensitive, and ethically sound professional judgements and to evaluate the outcomes of clinical practice. • Makes decisions concerning the patient based on a legitimate ethical basis.
3. Identifies, assesses and acts upon physical and psychological needs with an understanding of their impact in clinical decision making	<ul style="list-style-type: none"> • Acknowledges that procedures may need to be flexible • Identifies and modifies approach to meet the needs of those with physical or psychological issues.

	<ul style="list-style-type: none"> • Tailors procedures to the individual patient.
Element 3: Ensures confidentiality of information	
Indicators	Cues
1. Understands the importance of patient confidentiality	<ul style="list-style-type: none"> • Treats all information relating to patients as confidential. • Respects the confidentiality of information relating to patients and their families.
2. Upholds the local Privacy and Confidentiality policies at all times	<ul style="list-style-type: none"> • Confidentiality and privacy is maintained at all times. • Information is only disclosed to other members of the health care team in cases of clinical necessity for the therapeutic benefit of the patient. • Complies with privacy legislation when sharing patient information for health care and treatment purposes. • Complies with statutory reporting requirements
3. Takes care to ensure that patient confidentiality is not breached accidentally	<ul style="list-style-type: none"> • Is aware of situations where patient confidentiality can be breached and takes action to avoid such disclosures • Disposes of identified patient information in an appropriate manner • Comply with legislative requirements and local policy when using patient data
Element 4: Ensures that procedures are undertaken with the appropriate consent	
Indicators	Cues
1. Understands the importance of patient consent	<ul style="list-style-type: none"> • Clearly explains procedures to the patient before commencing. • Only initiates a procedure when the appropriate consent has been obtained. • Organises an appropriate interpreter for the consent to occur if English is not their preferred language
2. Ensures informed consent has been undertaken	<ul style="list-style-type: none"> • Checks to ensure the referring medical practitioner has explained the nature of the examination or treatment, and the reasons for requesting it. • Ensures the patient has been given adequate information about the procedure.
3. Understands the patient's rights relating to consent	<ul style="list-style-type: none"> • Understands, accepts and acts upon the knowledge that the patient can withdraw consent at any stage during the examination. • Knows the steps to take in the case of a patient withdrawing consent.

Standard 1.8 Responds in a culturally sensitive manner

This standard relates to cultural awareness. The radiographer, sonographer or radiation therapist should practice without discrimination and demonstrate respect and sensitivity to patients from different backgrounds and beliefs.

Element 1: Acts in ways that demonstrate respect for the values, customs, spiritual beliefs and practices of individuals	
Indicators	Cues
1. Identifies, assesses and accommodates cultural needs and is aware of how this may impact on the procedure	<ul style="list-style-type: none"> • Ensures practice is sensitive and supportive with regards to cultural issues. • Shows awareness and respect for cultural identity. • Adapts approach to meet the needs of culturally diverse groups. • Identifies situations where cultural needs may influence treatment options and acts accordingly.
2. Respects the values, customs, spiritual beliefs, cultural and linguistic diversity of patients	<ul style="list-style-type: none"> • Recognises situations where the values, beliefs and cultural backgrounds of patients may influence care and treatment. • Recognises situations where there may be potential for misinterpretation or conflict due to cultural differences. • Modifies methods when appropriate to accommodate the values, beliefs and cultural backgrounds of patients. • Ensures that own values and beliefs are not imposed on others. • Understands the obligation to practice without discrimination for race, religion, cultural or spiritual beliefs.

Domain 2: Communication, Teamwork and Autonomy

Standard 2.1	Demonstrates effective communication skills
Standard 2.2	Establishes and maintains appropriate collaborative relationships with colleagues and members of the multidisciplinary team
Standard 2.3	Establishes and maintains effective interpersonal relationships with patients and others
Standard 2.4	Demonstrates well-established conflict resolution skills
Standard 2.5	Operates effectively as an autonomous and responsible practitioner

This domain includes standards that relate both to effective communication and the establishment and maintenance of collaborative working relationships with all members of the healthcare team. Conflict resolution skills are a major part of maintaining effective, collaborative working relationships. This domain also includes the standards relating to the autonomy of radiographers and radiation therapists, their professional responsibilities, and accountability for their own work practices.

Standard 2.1 Demonstrates effective communication skills

This standard relates to the ability of radiographers, sonographers and radiation therapists to use effective communication skills in all aspects of their professional duties. It encompasses verbal, non-verbal and written communication. Radiographers and radiation therapists should be aware of the barriers to the communication process, and understand that cultural diversity may require some modifications to the methods of communication employed.

Element 1: Uses sound communication methods	
Indicators	Cues
1. Maintains effective communication skills	<ul style="list-style-type: none"> • Implements, maintains and concludes appropriate communication with patients and carers, colleagues, health care professionals and members of the public. • Exchanges and shares information with members of the multidisciplinary team. • Selects the appropriate communication technique to suit the relevant situation. • Uses knowledge of effective communication skills for both verbal and written communication.
2. Respects others' opinions	<ul style="list-style-type: none"> • Listens to, and shows respect for other opinions and views.

	<ul style="list-style-type: none"> • Acknowledges differing opinions.
3. Recognises and practises non-verbal communication	<ul style="list-style-type: none"> • Acknowledges non-verbal factors during communication • Interprets and acts upon non-verbal signs from others. • Selects and uses appropriate non-verbal communication.
4. Recognises and overcomes communication barriers.	<ul style="list-style-type: none"> • Avoids the use of jargon and medical terminology when talking to patients. • Recognises and manages the types of barriers to communication which may exist within the clinical environment • Selects and uses the relevant strategies when communication barriers are evident.
5. Modifies communication methods to account for cultural diversity	<ul style="list-style-type: none"> • Responds appropriately to cultural, ethnic and religious variables which may affect communication. • Communicates in a culturally sensitive and inclusive manner. • Employs the use of an interpreter when the clinical situation requires. • Understands that cultural values and beliefs can affect the communication process. • Understands how non-verbal communication can be interpreted differently according to culture, ethnicity, and religious belief. • Selects the appropriate communication style to interact with each specific patient.

Element 2: Adjusts communication technique to suit the situation

Indicators	Cues
1. Adjusts communication effectively in diverse contexts	<ul style="list-style-type: none"> • Adopts and adjusts communication style appropriately when the situation warrants. • Demonstrates awareness of communication needs for patients with impaired decision making capacity, and ensures involvement of the patient's carer as necessary.
2. Utilises a communication style which is suitable, applicable and acceptable	<ul style="list-style-type: none"> • Adjusts language to suit the context. • Is aware of the type of language which may cause offence and takes care to avoid it. • Articulates thoughts and ideas using clear

	<p>concise language.</p> <ul style="list-style-type: none"> • Clarifies information when necessary to aid with understanding. • Uses various forms of communication to ensure information provided is accurate and complete.
<p>3. Confirms that the intended message has been correctly interpreted</p>	<ul style="list-style-type: none"> • Confirms that the information is understood by asking open ended follow up questions. • Responds to feedback and clarifies when necessary. • Watches for non-verbal cues. • Alters vocabulary to aid with understanding when necessary

Standard 2.2 Establishes and maintains appropriate collaborative relationships with colleagues and members of the multidisciplinary team

This standard deals with the radiographer, sonographer and radiation therapist's role as a member of the multidisciplinary team. Radiographers and radiation therapists should endeavour to create strong working relationships with other members of the health care team in order to ensure the best possible care for patients. The standard addresses the communication requirements, networking skills, understanding, and respect necessary to become a functioning member of the team.

Element 1: Ability to work collaboratively within the organisation	
Indicators	Cues
1. Provides information and advice regarding imaging or radiation therapy procedures to other health care professionals.	<ul style="list-style-type: none"> • Discusses alternative pathways with the health care team to enable optimum outcome. • Educates other health care providers about procedures and radiation safety. • Engenders confidence in their role within the health care team. • Acts as a role model within the health care team
2. Establishes the communication pathways necessary to achieve desired work outcomes	<ul style="list-style-type: none"> • Establishes and actively maintains positive working relationships with colleagues.
3. Ability to identify and use effective networks that allow for communication between colleagues and peers	<ul style="list-style-type: none"> • Develops networks with health professionals and support staff. • Forms collaborative affiliations with other health professionals. • Encourages mutual sharing of knowledge and experience with other members of the health care team.
4. Ability to recognise and support the role and function of other health care professionals and ancillary staff	<ul style="list-style-type: none"> • Respects and understands the roles of other health care professionals in the health care environment. • Works in partnership with other health care professionals. • Recognises situations where the expertise of other health professionals is required to undertake an examination.
5. Understands and recognises organisational structure and their responsibility within the health care facility.	<ul style="list-style-type: none"> • Recognises their role within the health care network. • Suggests other treatment options and pathways to referring doctors when appropriate.

Element 2: Advise members of the multidisciplinary team about individual patients needs and know when to make appropriate referrals

Indicators	Cues
<p>1. Communicates patient requirements to members of the multidisciplinary team and applies appropriate referral procedures when necessary</p>	<ul style="list-style-type: none"> • Is proactive in responding to clinical issues that benefit from a team approach. • Contact is made with other health care professionals when relevant. • Discusses unreasonable requests from the team that would compromise practice or patient care. • Explains and justifies reasoning behind suggestions regarding imaging or therapeutic procedures. • Notifies requesting doctor when imaging shows an immediate clinical response is indicated. • Provides a description of images within own Scope of Practice.

Element 3: Demonstrates respect for colleagues and other members of the multidisciplinary team

Indicators	Cues
<p>1. Establishes productive working relationships and team communication through recognition of the role and function of other members of the multidisciplinary team</p>	<ul style="list-style-type: none"> • Establishes and maintains effective relationships with other health professionals. • Employs a positive and collaborative manner with other members of the multidisciplinary team. • Respects the role of other members of the team and their responsibility to the patient.

Element 4: Participate with other members of the health care team in decision making

Indicators	Cues
<p>1. Participates in team approach to patient preparation, management, imaging selection and interpretation</p>	<ul style="list-style-type: none"> • Works to uphold teamwork with relation to patient care. • Supports the role of collaboration in the provision of timely and effective patient care. • Understands their role as part of a multidisciplinary team. • Participates in, and contributes effectively to, a multidisciplinary team. • Discusses treatment with other members of the health care team when required ensuring that patient privacy and confidentiality is maintained.

<p>2. Effectively communicates with health care team members</p>	<ul style="list-style-type: none"> • Demonstrates effective skills in communicating information and professional opinion to other members of the health care team. • Uses networks that allow for effective communication with patients, colleagues and others.
<p>3. Collaborates with other professionals within the team for the provision of continuing care</p>	<ul style="list-style-type: none"> • Cooperates in a collaborative manner with colleagues and other health professionals for the benefit of the patient. • Contributes to the treatment path of the patient as part of the health care team. • Works in partnership with other health professionals to achieve optimum clinical outcomes. • Shares knowledge with other health professionals to encourage collaborative practice.

Standard 2.3 Establishes and maintains effective interpersonal relationships with patients and carers

This standard deals with the radiographer, sonographer or radiation therapist's ability to establish a rapport with patients to enable a successful outcome to the examination or treatment program. It also deals with the timely dissemination of information to patients and their carer.

Element 1: Shows empathy towards patients, their carers and colleagues	
Indicators	Cues
1. Communicates support and empathy to the patient.	<ul style="list-style-type: none"> • Establishes a rapport with the patients. • Provides reassurance to patients and their carers as appropriate • Provides information appropriate to the patient's needs. • Listens carefully and responds accordingly.
2. Demonstrates an empathetic approach to patients	<ul style="list-style-type: none"> • Understands the anxiety and uncertainty that may come with illness and injury. • Recognises that this may affect normal behaviour. • Anticipates and responds to the needs of patients to ensure the delivery of quality care. • Gains the confidence and cooperation of patients undergoing a procedure by the use of empathetic communication.
Element 2: Applies strategies to promote individual or group self esteem	
Indicators	Cues
1. Informs and supports patients and others in a timely, appropriate and sensitive manner	<ul style="list-style-type: none"> • Is responsive in providing information to patients within their SOP. • Is respectful of the role of carers and provides information as appropriate, remaining mindful of patient confidentiality at all times.

Standard 2.4 Demonstrate well-established conflict resolution skills

This standard incorporates the process of conflict resolution, and the necessity to address conflict in a timely manner, following appropriate channels.

Element 1: Demonstrates appropriate skills for managing conflict within the workplace.	
Indicators	Cues
1. Manages conflict within the workplace	<ul style="list-style-type: none">• Develops and maintains constructive professional relationships• Deals with conflict promptly• Applies the principles of focussing on the problem rather than the person• Identifies and analyses the reasons behind the conflict.• Works to resolve the conflict and assesses the success of the approach used to resolve the conflict• Cooperates and compromises through negotiation to achieve an acceptable outcome for all parties.

Standard 2.5 Operates effectively as an autonomous and responsible practitioner

This standard addresses the requirement for radiographers, sonographers and radiation therapists to be responsible and accountable for their own work practices. They will demonstrate initiative, acknowledge their own capabilities, and work within the limits of their own Scope of Practice.

Element 1: Assumes responsibility for own actions	
Indicators	Cues
1. Provides a professional opinion of medically significant findings to the medical personnel responsible for the patient's management	<ul style="list-style-type: none"> • Provides an opinion that lies within their knowledge and expertise. • Takes precautions to ensure any opinion provided is accurate and appropriate.
2. Recognises and demonstrates professional responsibilities and accountabilities	<ul style="list-style-type: none"> • Takes responsibility for ensuring professional conduct and behaviour is maintained at all times. • Demonstrates accountability and takes responsibility for own actions. • Strives to minimise the radiation dose to the patient.
Element 2: Demonstrates a conscientious approach to work practices	
Indicators	Cues
1. Self-management for timely and efficient practice is evident	<ul style="list-style-type: none"> • Manages time appropriately. • Works efficiently making the best use of available time for a given task. • Controls and manages interruptions to tasks. • Organises time and prioritises workload appropriately. • Manages conflicting demands on their time. • Adjusts priorities if the situation warrants. • Completes all work to a high standard and in a timely manner.
2. Projects a professional image	<ul style="list-style-type: none"> • Respects the obligation to be punctual for working hours. • Knows their specific conditions of employment, and adheres to them. • Observes all departmental policies and procedures. • Maintains an appropriate standard of

	<p>appearance and demeanour.</p> <ul style="list-style-type: none"> • Clothing and personal presentation is professional and suitable for the workplace. • Maintains composure in the work environment in stressful conditions. • Manages personal circumstances whilst in the work environment.
Element 3: Make independent professional decisions within their Scope of Practice (SOP)	
Indicators	Cues
1. Ability to communicate and liaise with patient, carers and other health care staff in professional decision making	<ul style="list-style-type: none"> • Communicates effectively with patients, departmental staff, wards, clinicians and other health professionals. • Refers patient queries regarding diagnosis and treatment outside of the scope of practice to the relevant health care professional.
2. Examinations or treatment are conducted within the limitations of SOP relating to decision making in equipment and technique used	<ul style="list-style-type: none"> • Works within their SOP. • Procedures within the practitioner's SOP are undertaken competently.
Element 4: Recognises and responds to own level of professional ability	
Indicators	Cues
1. Recognises and works within the limitations of clinical and professional skills	<ul style="list-style-type: none"> • Acknowledges own strengths and weaknesses. • Accepts constructive feedback and uses this to improve professional skills. • Can define their area or responsibility
Element 5: Maintain effective communication throughout a procedure	
Indicators	Cues
1. Elicits patient cooperation and establish rapport	<ul style="list-style-type: none"> • Remains sensitive to the physical and emotional needs of the patient. • Uses various communication methods to gain compliance and participation by the patient.
2. Provides effective communication relating to pre-procedure requirements, during the procedure and aftercare information	<ul style="list-style-type: none"> • Provides a complete explanation of the procedure prior to commencing an examination, so that an informed decision can be made. • Ensures any pre-procedural requirements have been followed • Understands the precautions associated

	<p>with the administration of contrast agents, and checks for any known allergies or contraindications prior to the administration</p> <ul style="list-style-type: none"> • Addresses patient’s concerns before, during and after the examination. • Provides aftercare instructions when appropriate.
Element 6: Ensure documentation is accurate	
Indicators	Cues
1. Ensures that consent protocols have been followed	<ul style="list-style-type: none"> • Follows the consent protocols of the healthcare organisation • Verifies appropriate consent has been obtained before commencing any procedures. • Verifies that the signed consent form including the correct site is listed and present for contrast, simulation and treatment procedures
2. Appropriate identification of all medical records and medical images	<ul style="list-style-type: none"> • Establishes the correct identity of patients prior to commencing examination. • Ensures that all imaging and documentation is identified with the correct details. • Ensures that if an imaging identification error occurs, it is corrected as a matter of priority, and all appropriate remedial actions are taken.
3. Accurately completes all documents within appropriate timeframes	<ul style="list-style-type: none"> • Efficiently completes all administrative responsibilities within the recommended timeframes of the healthcare organisation. • Documents relevant patient data in an accurate and timely fashion. • Documents any deviation from the standard protocol, and the reasons behind this.

Domain 3a: Knowledge and Understanding (Radiography & Ultrasound)

Standard 3a.1	Demonstrates a broad and relevant knowledge and understanding of the key theoretical concepts underpinning Medical Imaging
Standard 3a.2	Demonstrates a broad and relevant knowledge of the practice underpinning Medical Imaging.

This domain includes the core knowledge base, radiographic principles and concepts that are required in the practice of radiography. Radiographers are required to understand the principles of x-ray production and the benefits and risks associated with medical imaging procedures. A thorough understanding of key principles of radiographic practice is adequately demonstrated. Practice will adhere to the ALARA principle. Knowledge of anatomy, physiology and pathology is used to determine the imaging pathway best suited to answer the clinical question. This domain also covers the psychosocial aspects of medical imaging procedures, as well as the duty of care radiographers have to protect the patients and other staff members.

Standard 3a.1 Demonstrates a broad and relevant knowledge and understanding of the key theoretical concepts underpinning Medical Imaging

This standard deals with the knowledge base required by radiographers in order to practice their profession skilfully, efficiently and safely. It covers knowledge of physics, anatomy, pathology, patient behavioural characteristics, and information technology.

Element 1: Demonstrate a broad and relevant knowledge of the science of medical imaging	
Indicators	Cues
1 Demonstrates knowledge of the production and interpretation of the range of medical images	<ul style="list-style-type: none"> • Knowledge and application of the physics of ionising and non-ionising image production. • Knowledge and use of the types of imaging equipment. • Knowledge of positioning for all imaging procedures, including alternate modified techniques. • Adheres to principles of image critique and quality assurance • Distinguishes between normal and abnormal appearances medical images.

<p>2. Demonstrates knowledge of the risk benefit analysis involved in the practice of radiography & ultrasound</p>	<ul style="list-style-type: none"> • Selection of appropriate imaging studies is based on consideration of all relevant risks. • Justifies each imaging procedure, seeking further information from the referring clinician as required. • Provides accurate, pertinent information to patients about radiation or ultrasound safety. • Remains mindful of the duty to limit the radiation exposure to patients.
<p>3. Demonstrates knowledge of the use of medical terminology as it relates to medical imaging</p>	<ul style="list-style-type: none"> • Understands and applies terminology relating to anatomical position, planes and orientations of the body. • Understands and applies terminology relating to the manner in which images are acquired • Interprets a radiological request form, understanding all terminology used, and how it relates to the imaging series performed.

Element 2: Demonstrates a broad and relevant knowledge of physical sciences as it relates to Medical imaging

Indicators	Cues
<p>1. Demonstrates knowledge of the physical principles of medical imaging</p>	<ul style="list-style-type: none"> • Understands the principles of image formation and produces quality images for radiologic assessment.
<p>2. Demonstrates knowledge of principles of radiation dosimetry</p>	<ul style="list-style-type: none"> • Understands and applies the principles of dose calculation. • Adapts and modifies exposure factors based on the variables present in any given situation. • Ensures that the appropriate exposure for the area being examined is used.
<p>3. Demonstrates knowledge of equipment and instrumentation and their principles, application and limitations</p>	<ul style="list-style-type: none"> • Identifies all components of the imaging system. • Understands the function of each item of equipment with regards to image production. • Sets up and uses the medical imaging equipment safely and appropriately for each requested examination.

Element 3: Demonstrate a broad and relevant knowledge of biological sciences as it relates to Medical imaging

Indicators	Cues
1. Demonstrates knowledge of the anatomy and physiology of the human body,	<ul style="list-style-type: none"> • Understands the anatomy and physiology of the human body with relation to medical imaging.
2. Demonstrates knowledge of the pathology, and healing	<ul style="list-style-type: none"> • Understands the signs and symptoms of disease as they relate to medical imaging. • Understands the radiological changes evident with various conditions. • Understands the mechanisms of injury and their relevance to imaging procedures.
3. Demonstrates a knowledge of scientific principles of radiobiology and ultrasound bio-effects	<ul style="list-style-type: none"> • Articulates the biological and cumulative effects of radiation or ultrasound dose including the deterministic and stochastic effects. • Understands and can define the dangers of foetal irradiation.
4. Demonstrates knowledge of the pharmacology of contrast agents and associated drugs used in the medical imaging setting	<ul style="list-style-type: none"> • Knowledge of the characteristics, indications, and potential side effects of contrast agents. • Recognises adverse reactions promptly and seek appropriate treatment. • Understands that iodinated contrast can exert a nephrotoxic effect, and that this is intensified in cases of dehydration. • Understands the need to screen patients for underlying renal disease
5. Demonstrates knowledge of the use of contrast agents and drugs, including intravenous administration and protocols for adverse reactions	<ul style="list-style-type: none"> • Knows the contraindications to the administration of relevant contrast agents. • Determines known allergies prior to the administration of contrast. • Determines the patient's renal function prior to a contrast examination. • Recognises the appropriate type and volume of contrast agent to be administered for a particular examination.

Element 4: Demonstrates a broad and relevant knowledge of humanities and behavioural sciences as it relates to medical imaging

Indicators	Cues
1. Demonstrates knowledge of sociological and psychological aspects of care	<ul style="list-style-type: none"> • Understands the stress associated with medical investigations. • Understands that patients presenting for radiological procedures will have anxieties and concerns relating to the results of the

	<p>investigation.</p> <ul style="list-style-type: none"> • Understands that patients will be anxious about the investigation. • Demonstrates knowledge of significant life stresses/stressors and coping strategies and how they may impact on the patient. • Demonstrates knowledge of significant life stresses/stressors and coping strategies and how they may impact on relatives, friends and carers of the patient • Is able to instigate appropriate interventional protocols to assist patients and their families
2. Demonstrates knowledge of behavioural and communication sciences, and has an in-depth understanding of their relevance and application to the practice of medical imaging and care of the patient	<ul style="list-style-type: none"> • Understands that patients will react to, and cope differently with radiological procedures. • Understands the patient's communication and behaviour may change in response to the illness or injury
3. Recognises the roles of physical and psychological preparation for imaging procedures	<ul style="list-style-type: none"> • Ensures the patient understands any preparation instructions given and the reason for them. • Provides an explanation of the procedure before commencing. • Maintains a professional countenance when performing procedures
Element 5: Demonstrates a relevant and current knowledge of Information Technology as it relates to medical imaging	
Indicators	Cues
1. Demonstrate knowledge of information technology associated with radiography,	<ul style="list-style-type: none"> • Knowledge and application of the appropriate Imaging Information Systems used in their workplace.
2. Demonstrates knowledge of information technology to select, analyse, present, interpret, manipulate and communicate imaging information	<ul style="list-style-type: none"> • Has a working knowledge of PACS • Understands the components and functional relationships of PACS • Understand the functions and components of digital imaging and its manipulation

Standard 3a.2 Demonstrates a broad and relevant knowledge of the practice underpinning medical imaging

This standard deals with the clinical application of theoretical knowledge of medical imaging. It covers positioning, exposure selection, image interpretation, applications of medical imaging and the different imaging modalities, and the correct use of imaging equipment.

Element 1: Demonstrates a thorough knowledge of the principles of medical imaging and their clinical application	
Indicators	Cues
1. Demonstrates a thorough knowledge of patient and clinical assessment, positioning and immobilisation	<ul style="list-style-type: none"> • Assesses the patient to verify the clinical history is accurate and complete. • Plans the procedure according to the individual patient, accounting for any modifications which may be required. • Positions the area being examined taking into account anatomical landmarks, to ensure demonstration of the required anatomical structures. • Uses accessory positioning devices when appropriate. • Uses patient immobilization devices when necessary.
2. Demonstrates a thorough knowledge of the principles, clinical application and performance of general radiography	<ul style="list-style-type: none"> • Performs procedures confidently and safely. • Positions patient and equipment correctly so that quality images are produced. • Collimates to the area of interest. • Uses grids and filters when appropriate for the anatomy being demonstrated. • Has a thorough knowledge of exposure factors • Has a thorough knowledge of CR and DR image receptors, and the differences between the two. • Knowledge of, and can perform, the complete range of radiographic procedures. • Establishes appropriate projections required for the examination requested. • Produces quality diagnostic images by

	<p>adapting the examination to suit the circumstances.</p> <ul style="list-style-type: none"> • Undertakes imaging in the general setting mindful of the need for radiation protection
<p>3. Demonstrates a thorough knowledge of the principles, clinical application and performance of mobile radiography</p>	<ul style="list-style-type: none"> • Performs procedures confidently and safely. • Positions patient and equipment correctly so that quality images are produced. • Collimates to the area of interest. • Uses grids and filters when appropriate for the anatomy being demonstrated. • Thorough knowledge of exposure factors • Knowledge of CR and DR image receptors, and the differences between the two. • Knowledge of, and can perform, the complete range of radiographic procedures. • Establishes appropriate projections required for the examination requested. • Produces quality diagnostic images by adapting the examination to suit the circumstances. • Undertakes imaging in the mobile setting mindful of the need for radiation protection
<p>4. Demonstrates a thorough knowledge of the principles, clinical application and performance of fluoroscopy</p>	<ul style="list-style-type: none"> • Knowledge and application of the complete range of fluoroscopic imaging procedures and the radiographer's role • Collimates to the area of interest. • Uses grids and filters when appropriate for the anatomy being demonstrated. • Thorough knowledge of exposure factors • Determines appropriate parameters for fluoroscopic screening. • Undertakes imaging in the fluoroscopic setting mindful of the need for radiation protection
<p>5. Demonstrates a knowledge of the principles, clinical application and performance of operating theatre imaging</p>	<ul style="list-style-type: none"> • Knowledge and application of the range of operating theatre procedures. • Collimates to the area of interest. • Uses grids and filters when appropriate for the anatomy being demonstrated.

	<ul style="list-style-type: none"> • Thorough knowledge of exposure factors • Knowledge and application of the capabilities and use of a mobile image intensifier. • Determines and sets parameters on mobile image intensifiers. • Acts as part of the team in the operating theatre. • Undertakes imaging in the operating theatre setting mindful of the need for radiation protection
6. Demonstrates a knowledge of the principles, clinical application and performance of emergency imaging	<ul style="list-style-type: none"> • Understands the nature of trauma and emergency imaging. • Participates as part of the patient care team in the trauma setting. • Acquires quality diagnostic images within the emergency setting • Modifies imaging techniques to account for the patient's condition. • Prioritises procedures so that high acuity cases take precedence. • Undertakes imaging in the trauma setting mindful of the need for radiation protection
7. Demonstrates a knowledge of the principles, clinical application and performance of routine Computed Tomography (CT)	<ul style="list-style-type: none"> • Knowledge and application of the range of procedures performed with CT. • Perform routine procedures of the head, chest and abdomen and produces quality images for review in accordance with local protocols. • Undertakes imaging in the CT setting mindful of the need for radiation protection
8. Demonstrates and applies knowledge of paediatric radiation safety principles and techniques in all areas of medical imaging	<ul style="list-style-type: none"> • Applies ALARA principle with paediatric patients • Knowledge and understanding of immobilization for paediatric patients. • Knowledge and understanding of paediatric specific anatomy and pathology.
9. Applies quality assurance processes for all medical imaging procedures	<ul style="list-style-type: none"> • Verifies the patient demographics assigned to the images is accurate. • Verifies that radiographic markers are present on each image, and that they are

	<p>accurate.</p> <ul style="list-style-type: none"> • Determines the need for annotations. • Ensures that any annotations applied are not obscuring patient anatomy. • Ensures that the images are not compromised by artefact, and takes action if required. • Uses established criteria to assess that image quality is of an acceptable standard. • Determines whether the clinical question can be answered from the images obtained
10. Demonstrates an appropriate knowledge of image interpretation	<ul style="list-style-type: none"> • Normal anatomical structures can be correctly identified. • Abnormal findings can be recognised. • Recognises normal and abnormal appearances of diagnostic images which may indicate a pathological process. • Conveys information regarding normal and abnormal appearances to the treating physician.
11. Equipment is operated within its known limitations and in a manner appropriate for its function	<ul style="list-style-type: none"> • Selects the appropriate imaging equipment for the examination being performed. • Understands the applications and limitations of diagnostic imaging equipment. • Knowledge and application of how to use the imaging equipment safely and accurately. • Knows if the equipment is functioning correctly, and removes malfunctioning equipment from operation until the fault is rectified. • Limitations of the equipment are known and an examination is not attempted if a diagnostic outcome cannot be achieved.
12. Demonstrates a knowledge of radiography quality assurance procedures and methods to maximise diagnostic efficacy	<ul style="list-style-type: none"> • Understands and applies the quality assurance processes relevant to medical imaging, including those specific to any subspecialties worked in. • Complies with local quality assurance protocols including repeat analyses
13. Demonstrates a knowledge of monitoring and care of the	<ul style="list-style-type: none"> • Demonstrates a high standard of patient care when performing radiological

patient	<p>procedures.</p> <ul style="list-style-type: none"> • Acknowledges the limitations of a patient to cooperate with the examination depending on their clinical presentation. • Follows infection control protocols when caring for patients.
14. Demonstrates a knowledge of the principles of MRI, ultrasound, advanced applications in CT scanning, paediatric imaging, interventional imaging, advanced angiographic applications, mammography and information systems administration	<ul style="list-style-type: none"> • Understands the physics and applications of MRI. • Understands the physics and applications of ultrasound. • Understands the types of procedures which are undertaken in CT. • Knowledge and understanding of the principles and procedures used in paediatric imaging, and associated dose reduction strategies • Understands the types of procedures which are undertaken in interventional imaging. • Knowledge and understanding of angiography using conventional techniques, CT and MRI. • Knowledge and understanding of mammography. • Knowledge and understanding of the PACS environment.
Element 2: Demonstrates a thorough knowledge of imaging procedures and their application to patient welfare	
Indicators	
1. Demonstrates a knowledge of safe work environment within the context of radiation safety and protection policies	<p style="text-align: center; background-color: #1A3A5A; color: white; margin: 0;">Cues</p> <ul style="list-style-type: none"> • Understands and applies radiation protection principles. • Operates equipment under the guidelines of the national radiation safety legislation. • Knowledge and application of occupational radiation dose standards. • Uses and maintains personal protective equipment. • Wears personal radiation monitoring device when working in an area where ionising radiation is used.
2. Safe practice is maintained according to ALARA principle	<ul style="list-style-type: none"> • Delivers appropriate radiation dose or ultrasound exposure to the patient. • Checks to ensure that the examination is appropriate in the context of prior imaging

	<ul style="list-style-type: none"> • Identifies objects which could produce artefacts prior to the examination and where possible removes them. • Determines the most appropriate examination after reviewing clinical information and assessing the patient. • Uses shielding devices when appropriate • Checks pregnancy status of all female patients of child-bearing age as per local protocol. • If examination of a pregnant patient is clinically indicated, all available steps to minimise the radiation dose to the foetus are taken.
3. Demonstrates a thorough knowledge of the benefits of different imaging techniques and modalities	<ul style="list-style-type: none"> • Advises other healthcare professionals about the benefits and limitations of the various imaging modalities.
4. Assumes responsibility for performance of appropriate medical imaging	<ul style="list-style-type: none"> • Interprets requests and performs the appropriate examination for the patient's presenting condition. • Discusses techniques and alternatives with the requesting doctor when indicated. • Promotes diagnostic quality and safety with each examination.
5. Evaluate the appropriateness of radiographic images produced and determine whether additional or supplementary imaging is required	<ul style="list-style-type: none"> • Ensures the examination undertaken is appropriate to answer the clinical question posed. • Ensures the images produced are of diagnostic quality. • Determines the need for repeat views when imaging achieved is not to the required standard. • Determines whether the images produced answer the clinical question.
Element 3: Demonstrates an understanding of imaging procedures to contribute effectively to MDT decision making	
Indicators	Cues
1. Demonstrates a thorough knowledge/understanding of the multidisciplinary team in the care of the patient	<ul style="list-style-type: none"> • Understands the clinical implications associated with imaging procedures. • Understands the situations which are best addressed by a team approach. • Suggests an integrated team approach when appropriate.

2. Demonstrates a thorough knowledge and understanding of referral information	<ul style="list-style-type: none"> • Ensures that the request form is complete with all required information. • Understands the responsibility to recognise and take action when an incorrect examination is requested.
3. Demonstrates a thorough knowledge and understanding of adapting working practices to meet the needs of individual patients and situations	<ul style="list-style-type: none"> • Tailors the examination to the individual patient. • Reorganises workflow to account for emergencies and high priority situations.
Element 4: Demonstrates a thorough knowledge of information management and confidentiality	
Indicators	Cues
1. Demonstrates a thorough knowledge of organisational and management structure	<ul style="list-style-type: none"> • Demonstrates an understanding of the levels of administration. • Recognises the organisation and management of the department and how it fits within the health service as a whole.
2. Demonstrates a thorough knowledge of information technology associated with medical imaging	<ul style="list-style-type: none"> • Has the appropriate level of computer skills required for their practice. • Understands the computer systems and programs relevant to the medical imaging department.
3. Demonstrates a thorough knowledge/ understanding of confidentiality responsibilities related to information management	<ul style="list-style-type: none"> • Ensures patient data is stored in a secure, readily retrievable and permanent form. • Follows all local healthcare confidentiality protocols

Domain 3b: Knowledge and Understanding (Radiation Therapy)

Standard 3b.1	Demonstrates a broad and relevant knowledge and understanding of the key theoretical concepts underpinning Radiation Therapy
Standard 3b.2	Demonstrates a broad and relevant knowledge of the practice underpinning Radiation Therapy

This domain includes the core knowledge base, principles and concepts that are required in the practice of radiation therapy. Radiation Therapists are required to understand the principles of x-ray production and the benefits and risks associated with radiation therapy procedures. A thorough understanding of the key principles of radiation therapy practice is demonstrated. Practice will adhere to the ALARA principle. Knowledge of anatomy, physiology and pathology is essential for planning and treatment. This domain also includes the psychosocial aspects of the radiation therapy experience, as well as the duty of care radiation therapists have to protect the patients and other staff members from unnecessary radiation dose.

Standard 3b.1 Demonstrates a broad and relevant knowledge and understanding of the key theoretical concepts underpinning Radiation Therapy

This standard deals with the knowledge base required by radiation therapists in order to practice their profession skilfully, efficiently and safely. It covers knowledge of physics, anatomy, pathology, patient behavioural characteristics, and information technology.

Element 1: Demonstrates a broad and relevant knowledge of the science of Radiation Therapy	
Indicators	Cues
1. Demonstrates knowledge of simulation, planning and treatment of malignant and benign diseases	<ul style="list-style-type: none"> • Knowledge of the application of the physics of ionising and non ionising image production and treatment • Knowledge and use of the types of equipment used in radiation therapy for planning and treatment. • Knowledge of positioning and immobilization for radiation therapy treatment • Application of knowledge of the rationale for selection of treatment modality for treating malignant and benign disease.

<p>2. Demonstrates knowledge of the risk benefit analysis involved in the practice of radiation therapy</p>	<ul style="list-style-type: none"> • Selection of appropriate planning and treatment protocols for treatment is based on consideration of all relevant risks • Justifies each prescription and subsequent planning and treatment protocol, seeking further information from the referring radiation oncologist as required. • Provides accurate, pertinent information to patients about radiation safety issues. • Adheres to the ALARA principle • Selects an appropriate technique resulting in maximum dose to tumour volume while minimising healthy tissue exposure
<p>3. Demonstrates knowledge of the use of medical terminology as it relates to radiation therapy</p>	<ul style="list-style-type: none"> • Understands and applies terminology relating to anatomical position, planes and orientations of the body. • Understands and applies terminology relating to the manner in which images are acquired • Understands and interprets the radiation therapy prescription terminology, and relates it to the planning and treatment processes

Element 2: Demonstrates a broad and relevant knowledge of physical sciences as it relates to Radiation Therapy

Indicators	Cues
<p>1. Demonstrates knowledge of the physical principles of radiation therapy</p>	<ul style="list-style-type: none"> • Understands the effects of the interactions of x-rays with matter and how this contributes to the patient treatment. • Understands the physics of x-ray generation and its uses in the various imaging and treatment modalities. • Understands the principles of image formation in simulation and associated imaging modalities including MRI, CT and PET
<p>2. Demonstrates knowledge of principles of radiation dose, imaging technique and exposure factor selection</p>	<ul style="list-style-type: none"> • Understands and applies the principles of radiation therapy planning • Applies the correct protocols when using on board imaging to manage patient and target movement • Adapts and modifies exposure factors in simulation and treatment unit based on the

	<p>variables present in any given situation.</p> <ul style="list-style-type: none"> • Selects from the appropriate imaging modalities to ensure accurate imaging for treatment purposes.
3. Demonstrates knowledge of equipment and instrumentation and their principles, application and limitations	<ul style="list-style-type: none"> • Understands the function of equipment with regards to image production and delivery. • Understands the function of the equipment used for treatment • Uses all equipment safely and appropriately
Element 3: Demonstrates a broad and relevant knowledge of biological sciences as it relates to Radiation Therapy	
Indicators	Cues
1. Demonstrates knowledge of anatomy and physiology of the human body, with particular emphasis on regional and cross sectional anatomy, histology, haematology and the lymphatic and immune systems	<ul style="list-style-type: none"> • Understands the anatomy and physiology of the human body with relation to medical imaging scans, specifically for contouring purposes, healthy tissue delineation and resultant side effects of structures
2. Demonstrates knowledge of the pathophysiology and behaviour of solid and systemic malignancies and non malignancies, epidemiology, aetiology and the management of these	<ul style="list-style-type: none"> • Understands the signs and symptoms and spread of cancer. • Understands the epidemiology and aetiology associated with various malignant and nonmalignant conditions. • Understands the mechanisms of cancer in the various anatomical regions, and the effects which might be seen. • Understands and can describe the various classification systems when applied to tumour classification • Can describe the various methods in which cancer can spread to secondary sites, and the more common spread patterns for specific anatomical regions.
3. Demonstrates knowledge of the scientific principles of radiobiology	<ul style="list-style-type: none"> • Articulates the biological and cumulative effects of radiation dose including the deterministic and stochastic effects • Understands and can define the consequences of foetal irradiation and acts to minimise dose

<p>4. Demonstrates knowledge of pharmacology of contrast agents, cytotoxic drugs, and drugs used in the relief of symptoms encountered frequently within the oncology setting</p>	<ul style="list-style-type: none"> • Is able to describe the various types of contrast materials used in the radiation therapy planning process. • Has knowledge of the characteristics, indications, and potential side effects of contrast agents. • Recognises the common types of chemotherapy drugs used in cancer patients, and the types of cancers for which they are used. • Recognises the drugs commonly used for the relief of symptoms and the type of cancers for which they are used • Recognises adverse reactions promptly and seeks appropriate treatment
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Element 4: Demonstrate a broad and relevant knowledge of humanities and behavioural sciences as it relates to Radiation Therapy

Indicators	Cues
<p>1. Demonstrates knowledge and understanding of sociological and psychological aspects of care for people undergoing procedures, their families and carers and acts accordingly</p>	<ul style="list-style-type: none"> • Understands the stress associated with medical investigations. • Understands that patients will have anxieties and concerns relating to the their condition and their treatment • Demonstrates knowledge of life stresses and coping strategies and how they may impact on the patient. • Acknowledges that relatives, friends and carers of the patient may also be affected
<p>2. Demonstrates knowledge of behavioural and communication sciences, and has an understanding of their relevance and application to the care of those undergoing Radiation Therapy</p>	<ul style="list-style-type: none"> • Understands that illness can produce emotional reactions such as anger, sadness, frustration, and fear. • Understands that patients may react to, and cope differently with the treatment process depending on where they are within the grief cycle. • Understands the patient’s response to the diagnosis including a possible disruption in their ability to function normally and participate in their planning and treatment process
<p>3. Recognises the roles of physical and psychological preparation</p>	<ul style="list-style-type: none"> • Ensures the patient understands any preparation instructions given and the reason for them.

	<ul style="list-style-type: none"> • Provides an explanation of the procedure before commencing. • Maintains a professional countenance when performing procedures • Ensures the patient understands any specific instructions to assist with the procedures
4. Demonstrates knowledge and understanding of the behaviour of people undergoing procedures and treatments within the oncology setting and acts accordingly	<ul style="list-style-type: none"> • Understands that the behaviour of patients will be altered depending on their anxieties, fears and the nature of the procedure. • Demonstrates a knowledge of psychosocial impact of oncology procedures and the subsequent impact on the patient and their families. • Demonstrates empathy and understanding for the patient, and completes the procedure in a calm and composed manner. • Demonstrates knowledge and understanding of end of life care
Element 5: Demonstrates a relevant and current knowledge of Information Technology as it relates to Radiation Therapy	
Indicators	Cues
1. Demonstrates knowledge of information technology associated with radiation therapy	<ul style="list-style-type: none"> • Knowledge and application of the data information systems in their workplace
2. Demonstrates knowledge of information technology to select, analyse, present, interpret and communicate information	<ul style="list-style-type: none"> • Understands the components and functional relationships of the systems used to capture data in planning and treatment • Transfers information from the planning system to the information and treatment systems • Has a working knowledge of image verification systems.
3. Demonstrates knowledge of data storage, retrieval and manipulation in radiation therapy	<ul style="list-style-type: none"> • Understands the methods used for the storage of data. • Understands the importance of DICOM and its role in defining the protocols for storing, querying, retrieving, and sending digital images. • Uses the planning systems within the workplace to accurately co register data, plan the treatment for the specific patient cases

Standard 3b.2 Demonstrates the broad and relevant knowledge of the practice underpinning Radiation Therapy

This standard covers the clinical application of theoretical knowledge of radiation therapy. It covers positioning, simulation, image interpretation, applications and uses of the different imaging modalities, and the correct use of radiation therapy equipment.

Element 1: Demonstrate a thorough knowledge of the principles of Radiation Therapy and their clinical application	
Indicators	Cues
1. Demonstrates knowledge of patient assessment, positioning, immobilisation and construction of ancilliary equipment	<ul style="list-style-type: none"> Assesses the patient to verify the clinical history is accurate. Plans the procedure according to the individual patient, accounting and recording any modifications which may be required. Positions the area being planned, to ensure demonstration of the required anatomical structures taking into account anatomical landmarks Constructs ancilliary equipment to assist with immobilisation and stabilisation of the patient when required Uses accessory positioning and immobilisation devices when necessary.
2. Demonstrates a thorough knowledge of simulation, including tumour localisation and treatment planning	<ul style="list-style-type: none"> Performs all simulation procedures confidently and safely. Positions patient and equipment correctly so that quality images are produced in the simulation process Ensures that all required patient simulation data is acquired for planning purposes Can perform the complete range of standard/routine radiation therapy prescriptions and techniques Selects the appropriate treatment planning technique for the anatomical sites Has knowledge and understanding of simulation and planning for paediatric cases
3. Demonstrates a thorough knowledge of the rationale for selection of treatment modality	<ul style="list-style-type: none"> Able to define the appropriate modality to treat various tumour presentations as defined by the prescribing radiation oncologist. Presents recommendations for the appropriate modality to achieve the outcomes for treatment

<p>4. Demonstrates a thorough knowledge of the principles of the imaging process for planning and treatment verification purposes</p>	<ul style="list-style-type: none"> • Knowledge of the capabilities and use of equipment in imaging for planning purposes. • Knowledge and application of the range of imaging procedures required for simulation and treatment • Determines and selects parameters to achieve the appropriate images simulation and treatment verification. • Applies the correct protocols for treatment verification imaging
<p>5. Demonstrate a thorough knowledge of the operation of equipment in a manner appropriate for its function</p>	<ul style="list-style-type: none"> • Understands the applications and limitations of radiation therapy equipment. • Ensures that the correct radiation therapy equipment is used for both planning and treatment purposes. • Uses radiation therapy equipment to deliver treatment safely and accurately. • Identifies when the equipment is functioning correctly • Recognises faulty or unsafe equipment • Follows appropriate procedures in response to faulty or unsafe equipment. • Limitations of the equipment are known and a plan is reconsidered if the treatment outcome cannot be achieved.
<p>6. Demonstrates a thorough knowledge of simulation and treatment delivery quality assurance (QA) procedures</p>	<ul style="list-style-type: none"> • Knowledge and application of procedures used in QA of the simulation and treatment units. • Follows department policies and procedures when the QA results are not within the specified limits
<p>7. Demonstrate a thorough knowledge of monitoring and care of the patient</p>	<ul style="list-style-type: none"> • Ensures that the patient is continuously monitored and their needs attended to whilst in the radiation therapy facility • Refers patient to the appropriate members of the multidisciplinary team as required • Proceeds with treatment and planning of the patient accounting for their condition. • Works with the team to ensure timely delivery of treatment

<p>8. Demonstrate a thorough knowledge of the principles of patient management including adjuvant and concomitant therapy</p>	<ul style="list-style-type: none"> • Understands that patients may have adjuvant and concomitant treatment with radiation therapy • Identifies and ensures that any adjuvant therapies are incorporated into the patient's clinical pathway and managed appropriately for quality outcomes. • Follow all requirements of a clinical trial for which a patient is enrolled
<p>9. Demonstrate a knowledge of the principles of brachytherapy, stereotactic radiosurgery, intensity modulated radiation therapy (IMRT), ultrasound, superficial and deep xray therapy, Volumetric Modulated Arc Therapy (VMAT) and tomotherapy,</p>	<ul style="list-style-type: none"> • Knowledge of brachytherapy • Knowledge of stereotactic radiosurgery. • Knowledge of intensity modulated radiation therapy in radiation therapy planning and treatment. • Knowledge of ultrasound. • Knowledge of superficial and deep x-ray therapy • Knowledge of VMAT • Knowledge of tomotherapy • Knowledge and application of Paediatric Radiation

Element 2: Demonstrate a thorough knowledge of Radiation Therapy procedures and their application to patient welfare

Indicators	Cues
<p>1. Demonstrate a knowledge of safe work environment within the context of radiation safety and protection policies</p>	<ul style="list-style-type: none"> • Understands and applies radiation protection principles. • Operates equipment safely • Wears personal radiation monitoring device
<p>2. Safe Practice is maintained according to the ALARA principle</p>	<ul style="list-style-type: none"> • Follows the ALARA principle in simulation, planning and treatment. • verifies location of any previous treatment and takes steps to incorporate into current treatment, modifying plan if required • Determines the most appropriate scan and limits after reviewing clinical information and assessing the patient. • Uses additional shielding devices to protect radiosensitive organs as appropriate • Checks pregnancy status of all female patients of child-bearing age. • Takes all possible steps to minimise dose to foetus if treatment of a pregnant patient is

	<p>clinically indicated</p> <ul style="list-style-type: none"> • Manage Patients with cardiac devices, in compliance with the local policy.
3. Assumes responsibility for performance of appropriate clinical skills in radiation therapy	<ul style="list-style-type: none"> • Applies rationale for selection of various treatment modalities at the time of prescription. • Understands and applies principles of imaging for Radiation Therapy planning and treatment verification purposes. • Explores treatment technique options with the prescribing doctor, to produce the best outcome for the patient • Demonstrates application of radiation therapy planning principles. • Radiation therapy planning and treatment is conducted within a team framework.
4. Demonstrate a thorough knowledge of the requirement of different imaging techniques in relation to radiation therapy	<ul style="list-style-type: none"> • Advises other healthcare professionals about the requirements of imaging modalities for radiation therapy planning • Performs imaging and treatment appropriate to the patient's presenting history and condition
	<ul style="list-style-type: none"> •
5. Evaluate the appropriateness of radiation therapy images produced	<ul style="list-style-type: none"> • Determine whether the images produced meet the requirements of the prescription • Determine whether further imaging is required.
6. Demonstrate a thorough knowledge of critical organ doses	<ul style="list-style-type: none"> • Demonstrate a knowledge of organs at risk and applies the appropriate tolerance doses to these areas • Ensures dose to organs at risk is documented appropriately • Ensures that the area being simulated is restricted to the required anatomical structures. • Ensures that repeat imaging is only performed when the initial images do not adequately answer the clinical question • Ensures that any additional imaging is for the benefit of the patients treatment • Care is taken at all times to ensure that repeat scans are kept to an absolute minimum.

Element 3: Demonstrate an understanding of Radiation Therapy procedures to contribute effectively to MDT decision- making	
Indicators	Cues
1. Demonstrate a thorough knowledge and understanding of the multidisciplinary team in the care of the patient	<ul style="list-style-type: none"> • Understands the situations which are best addressed by a team approach. • Suggests an integrated team approach when appropriate.
2. Demonstrate a thorough knowledge and understanding of referral information	<ul style="list-style-type: none"> • Ensures that referral forms are completed with all required information. • Understands the responsibility to recognise and take action when an incorrect procedure is requested. • Understands the responsibility to recognise and take action when a patient requires additional assistance outside the scope of planning and treatment specific issues.
3. Demonstrate a thorough knowledge and understanding of adapting work practices to meet the needs of individual patients and situations	<ul style="list-style-type: none"> • Tailors the planning and treatment processes to the individual patient. • Monitors and prioritises own workflow.
Element 4: Demonstrate a thorough knowledge of information management	
Indicators	Cues
1. Demonstrate a thorough knowledge of organisational and management structure	<ul style="list-style-type: none"> • Demonstrate an understanding of the departmental structure. • Recognise the organisation and management of the department and how it fits within the health service as a whole.
2. Demonstrate a thorough knowledge of information technology associated with radiation therapy	<ul style="list-style-type: none"> • Has the appropriate level of computer skills required for their practice • Understands the computer systems and programs relevant to the radiation therapy department.
3. Demonstrate a thorough knowledge and understanding of confidentiality responsibilities related to information management	<ul style="list-style-type: none"> • Ensures patient data is stored in a secure, readily retrievable and permanent form.

Domain 4: Critical Thinking and Evaluation

Standard 4.1	Assesses clinical situations, determines the key issues and deliver a timely and quality outcome
Standard 4.2	Evaluates and implements processes and procedures for ensuring quality outcomes
Standard 4.3	Analyses and respond to problems related to patients' treatment and care
Standard 4.4	Analyses and respond to problems of operation and management
Standard 4.5	Initiates and evaluates research outcomes and incorporate into evidence based practice where relevant

This domain encompasses the ability of the radiographer or radiation therapist to think critically, creatively and reflectively. It covers the use of effective evaluation methods for assessing each individual clinical situation, and formulating an appropriate course of action for dealing with the situation. The ability to reflect critically on one's own methods, and review and modify when indicated, is an essential component of effective clinical practice. Another key requirement is the Identification of problems in the clinical arena and the application of problem solving skills. Research and evidence based practice is a component of this domain.

Standard 4.1 Assess clinical situations, determines the key issues and deliver a quality outcome

This standard relates to clinical reasoning and judgment and their role in providing quality clinical services to patients. The radiographer or radiation therapist's ability to provide safe, high-quality care is dependent upon their ability to reason, think, and apply problem solving skills to their clinical practice. Critical thinking is an essential skill in the ongoing provision of excellent clinical care.

Element 1: Apply critical thinking and problem solving skills to formulate appropriate clinical decisions	
Indicators	Cues
1. Evaluate the referral and respond so that the procedure is delivered appropriately and accurately	<ul style="list-style-type: none"> Provides the appropriate procedure for each patient by applying professional judgement to each case individually.
2. Procedures are tailored to the patient's needs and condition	<ul style="list-style-type: none"> Use of appropriate techniques and equipment.

Element 2: Apply critical thinking skills to time management and resource use	
Indicators	Cues
1. Manage time and resources	<ul style="list-style-type: none"> • Efficiently uses resources while maintaining standards of clinical practice and patient care. • Assume responsibility for own work ethics and attitude.
2. Work safely and accurately within time management constraints	<ul style="list-style-type: none"> • Manage time effectively, including prioritisation of work load whilst delivering high standards of care.
Element 3: Evaluation of the appropriateness of the clinical information provided	
Indicators	Cues
1. Evaluate the appropriateness of patient information provided	<ul style="list-style-type: none"> • Ensures sufficient clinical information has been provided. • Seeks additional information from the referring doctor if required

Standard 4.2 Evaluate and implement processes and procedures for ensuring quality outcomes

This standard looks at the evaluation processes used to establish continuous quality improvement. It aims to ensure that procedures developed are based on patients' needs and that procedures are based on predetermined protocols. This standard also incorporates self-evaluation and reflective practice, which improves the quality of care, and leads to increased professional growth and development.

Element 1: Ensure all procedures are provided in accordance with definitive protocols and standards of practice	
Indicators	Cues
1. Departmental protocols for standard procedures are known and adhered to	<ul style="list-style-type: none"> • Knowledge of and compliance with standard procedures.
Element 2: Evaluate personal practice on an ongoing basis	
Indicators	Cues
1. Collect review and interpret a range of information from a range of sources	<ul style="list-style-type: none"> • Ongoing critical reflection takes place to constantly improve skills and knowledge base. • Collects and analyses data on actual performance • Seeks and considers feedback on performance from supervisors with a goal of continual improvement.
Element 3: Ability to audit, reflect upon and review individual professional practice	
Indicators	Cues
1. Audits practice by reflecting on, and reviewing performance	<ul style="list-style-type: none"> • Undertakes regular self-evaluation and reflects on clinical practice methods. • Benchmark personal practice. • Identify and implement corrective actions
2. Recognise self-assessment, reflective learning, peer review and performance review as sources of feedback on professional performance	<ul style="list-style-type: none"> • Describes the reflective learning and peer review processes. • Feedback is sought from supervisors and peers with a goal of continual improvement. • Participates in self-assessment processes. • Seeks and understands regular performance review.

Element 4: Analyse and document issues related to reportable incidents, with recommendations for future corrective actions

Indicators	Cues
1. Incidents involving staff, patients and the public are analysed, reported, documented and actioned promptly through compliance with local protocols	<ul style="list-style-type: none">• Incidents are documented using the appropriate channels clearly and completely in a timely fashion.• Understands the need to be accountable.

Standard 4.3 Analyses and responds to problems related to patient treatment and care

This standard relates to the ability of radiographers and radiation therapists to access, and interpret clinical information and apply professional judgement to formulate an objective response. It looks at their capacity to recognise and define problems within the patient care setting, and to develop a strategy to solve these. It also incorporates evaluation of the proposed solution.

Element 1: Identify problems as they arise in clinical practice	
Indicators	Cues
1. Reflect upon clinical practice to recognise potential problems as they arise	<ul style="list-style-type: none"> • Predicts potential problems, and reacts appropriately to prevent the problem or minimise its effect. • Addresses problems which directly impact on immediate workflow as they occur.
2. Analyses the reason for the problem	<ul style="list-style-type: none"> • Ascertains and describes the cause of problems. • Analyses and describes factors which may lead to an escalation of the issue. • Identifies all involved factors to ensure a comprehensive understanding of the problem.
Element 2: Apply knowledge and experience to solve problems and ensure care is delivered to achieve best practice	
Indicators	Cues
1. Develops a plan for resolving the problem.	<ul style="list-style-type: none"> • Explores options to resolve the issue. • Formulates varying approaches to resolve the problem. • Selects the most appropriate solution for the best possible outcome. • Applies critical thinking and problem solving strategies when indicated.
2. Uses a collaborative approach to reach a resolution	<ul style="list-style-type: none"> • Aim to find a solution which suits all affected parties wherever possible. • Gain the cooperation of all parties in the implementation of the agreed solution to the problem.

Element 3: Monitors and reviews the issue and modifies solutions as required	
Indicators	Cues
1. Regularly reviews the situation once a solution has been established and implemented	<ul style="list-style-type: none"> • Reviews the situation to ensure there has been complete resolution of the issue. • Identifies the need for further action if required.
Element 4: Apply reasoning and problem solving skills to determine appropriate clinical decisions	
Indicators	Cues
1. Manage complex and unpredictable situations	<ul style="list-style-type: none"> • Continue to acquire and apply a strong knowledge base of the principles of radiography or radiation therapy and uses this knowledge to make informed decisions regarding clinical practice in non-standard situations. • Undertakes the examination or treatment based on the patient's condition, and applies the most appropriate technique
2. Respond effectively to emergent needs	<ul style="list-style-type: none"> • Adjusts techniques accordingly if the situation changes. • Makes decisions including modifying or halting the procedure according to the patient's needs.
Element 5: Reflect upon decisions to modify future practices	
Indicators	Cues
1. Adopt a questioning approach	<ul style="list-style-type: none"> • Understands and engages in reflective practice
2. Reflect upon practice modifications and their impact	<ul style="list-style-type: none"> • Plans and modifies approach as a result of reflection. • Evaluates the changes and determines the potential to incorporate them into standard practice.

Standard 4.4 Analyses and responds to problems of operation and management

This standard deals with analysing and defining issues and suggesting improvement strategies that focus on delivering quality patient care, whilst operating as efficiently as possible.

Element 1: Identify problems and apply systematic and logical approaches to their resolution	
Indicators	Cues
1. Identify the problem and seek an effective solution	<ul style="list-style-type: none">• Investigates situations, determines problems, and identifies all potential solutions.
Element 2: Initiate resolution of problems to ensure prescribed protocols are maintained	
Indicators	Cues
1. Implement resolution	<ul style="list-style-type: none">• Demonstrates personal initiative and is able to initiate resolution of problems.• Develops techniques to determine solutions to clinical problems not previously encountered.

Standard 4.5 Initiates and evaluates research outcomes and incorporate into evidence based practice where relevant

This standard deals with the radiographer or radiation therapist's ability to critically evaluate published research, and identify strengths and weaknesses. It also covers judging the overall quality of research regarding its application to clinical practice, and incorporation of research into clinical practice when appropriate.

Element 1: Evaluate the appropriateness of research findings to practice	
Indicators	Cues
1. Analytical approach to research used	<ul style="list-style-type: none"> • Research is critically evaluated with respect to clinical questions.
2. Newly gained knowledge is considered in the context of its application to clinical practice	<ul style="list-style-type: none"> • Review current literature and identifies any information which could improve current practice. • Research findings are critically analysed regarding their application to clinical practice. • Demonstrates analytical skills when evaluating current research. • Knowledge obtained from conferences, workshops and seminars is shared, discussed and reviewed thoroughly prior to implementation as a new protocol in clinical practice.
Element 2: Apply research and evaluation findings to evidence based practice	
Indicators	Cues
1. Seeks to apply newly gained knowledge in the clinical environment	<ul style="list-style-type: none"> • Seeks to introduce research findings into practice. • Research findings are discussed with colleagues.
2. Engage in evidence based practice	<ul style="list-style-type: none"> • Facilitates evidence-based decision making resulting in improved patient outcomes. • Applies an evidence-based approach to daily practice. • Uses evidence base when proposing new protocols.

Domain 5: Service Delivery and Clinical Management

Standard 5.1	Management of quality issues relating to effective practice
Standard 5.2	Demonstrates effective clinical management of individuals
Standard 5.3	Contributes to maintaining a safe working environment
Standard 5.4	Plans resources for service delivery

Standard 5.1 Management of quality issues relating to effective practice

This standard encompasses the responsibility radiographers and radiation therapists have for ensuring the quality of professional services is maintained and improved for the benefit of patients. It deals with quality control and quality assurance activities, including those which are regulated through official accreditation pathways, and those undertaken to ensure the equipment is functioning appropriately, and that the imaging produced, or therapeutic treatment delivered, is of the highest standard.

Element 1: Evaluates the quality of practice in the clinical setting	
Indicators	Cues
1. Rationalised evidence-based clinical practice is used to achieve best practice	<ul style="list-style-type: none"> Ensures services are provided in accordance with professional standards. Complies with policies and procedures for treatment methods that are consistent with professional standards. Recognises that quality improvement is a continuous process incorporating new developments and standards of practice.
Element 2: Contributes to quality assurance procedures	
Indicators	Cues
1. Understands the principles of quality assurance	<ul style="list-style-type: none"> Understands the quality assurance processes relevant to their profession including those specific to any subspecialties worked in. Recognises the need to monitor and evaluate practice to maintain high quality service. Contributes to the maintenance of documented evidence of quality assurance activities Understands the role of audit and review as it relates to quality assurance.

2. Contributes to risk assessment, audit and quality assurance	<ul style="list-style-type: none"> • Participates in departmental quality assurance programmes. • Understands the role quality assurance procedures play in risk management. • Works towards continual improvement. • Assesses the risk of activities in the clinical setting and manages the risk in an appropriate manner. • Follows the risk management process and protocols as defined by the workplace.
3. Evaluates results and takes appropriate action when indicated	<ul style="list-style-type: none"> • Compares quality assurance results to baseline acceptable values. • Ensures all values achieved in quality assurance tests fall within the predetermined limits. • Repeats tests when necessary and takes corrective action if the control limits are not achieved. • Records problems relating to equipment in the appropriate manner • Reports the potential risks to the relevant parties to ensure that risk minimisation is adhered to. • Follows through with the relevant parties to ensure corrective action is taken.

Element 3: Contributes to enhanced service quality

Indicators	Cues
1. Understands the patient's right to receive safe and high quality diagnostic or therapeutic services	<ul style="list-style-type: none"> • Recognises and acts upon the obligation to apply professional care and expertise to deliver quality services. • Leads by example and promotes consistent high quality work from others. • Deliver a high quality service to patients by maintaining professional standards.
2. Understands the means by which the quality of diagnostic or therapeutic services can be maintained and improved	<ul style="list-style-type: none"> • Differentiates between quality improvement and quality assurance. • Applies quality assurance and quality improvement methods.
3. Accepts responsibility for assuring the quality of professional services provided	<ul style="list-style-type: none"> • Identifies mechanisms through which the quality of diagnostic or therapeutic services can be maintained and improved. • Complies with and maintains policies and procedures which are conducive to quality

	<p>practice.</p> <ul style="list-style-type: none"> • Maintains a high personal standard. • Follows departmental policies and protocols to ensure consistency in image quality. • Maintains equipment to ensure safe operation and reports issues with equipment. • Maintains skills in image review for treatment verification in radiation therapy. • Understands the tools and methods available for monitoring the quality of professional services provided • Self-audits the quality of professional services provided against standards and guidelines to identify where change would be beneficial. • Contributes to evaluation of service delivery. • Uses feedback about service to implement any changes required to their practice.
<p>4. Seeks continuous improvement in service quality</p>	<ul style="list-style-type: none"> • Participates in quality improvement or quality assurance activities. • Reviews workplace practices to identify any requirements to modify a standard procedure. • Promotes an environment of continuous improvement.
<p>5. Shows initiative in implementing and evaluating changes to practice</p>	<ul style="list-style-type: none"> • Manage change within the evolving medical imaging or therapeutic environment. • Communicates information relating to changes in practice to colleagues.

Standard 5.2 Demonstrate effective clinical management of patients

This standard relates to the radiographer or radiation therapist's responsibility to ensure that the procedures carried out are applicable and relevant for the patient's. It covers compliance with standard procedures, documentation, and collaboration with other members of the health care team to confirm that patients have the optimum outcome from each procedure.

Element 1: document and apply clinical procedures	
Indicators	Cues
1. prepare and accurately document clinical procedures	<ul style="list-style-type: none"> • Recognises the importance of record keeping. • Apply standard procedure and protocols • Maintains appropriate, accurate, and legible records.
Element 2: Participate in patient care in consultation with the team	
Indicators	Cues
1. Recognition of the patients progress through the management of their condition in the context of the multidisciplinary team	<ul style="list-style-type: none"> • Collaborates with other members of the multidisciplinary team to make treatment recommendations that facilitate quality patient care. • Works within the team to provide treatment that is focused on both the physical and psychological needs of the patient.
2. Determines the appropriate examination for the patient condition	<ul style="list-style-type: none"> • Determines and selects appropriate examination based on established protocols.
3. Initiates the appropriate patient care at all stages of treatment	<ul style="list-style-type: none"> • Identifies the needs of the individual patient. • Provides the appropriate care throughout the treatment.
4. Evaluates each clinical situation and the range of available and appropriate interventions that may be required in a timely fashion	<ul style="list-style-type: none"> • Knows basic life support methods. • Has knowledge of and is able to implement the procedure to follow in case of a clinical emergency.
5. Make judgments from the verbal and physical presentation of a patient and information from referring practitioners	<ul style="list-style-type: none"> • Collects information from a range of sources, and uses this accordingly to determine the appropriate examination. • Procedures are tailored to the patient based on the information collected.

Standard 5.3 Contribute to maintaining a safe working environment

This standard deals with the responsibility each radiographer or radiation therapist has by law to maintain the working environment in a safe and hazard-free state. It covers risk management, personal, staff and patient safety.

Element 1: Accepts responsibility for maintaining a safe working environment.	
Indicators	Cues
1. Understands the need to maintain a safe working environment	<ul style="list-style-type: none"> • Complies with Occupational Health and Safety legislation. • Maintains the work environment in compliance with Occupational Health and Safety legislation • Complies with regulations relating to workplace safety. • Undertakes the required workplace training. • Reports any bullying and harassment within the workplace
2. Knowledge of risk management protocols	<ul style="list-style-type: none"> • Complies with risk management protocols. • Promotes a safety culture within the work environment. • Knowledge of safety procedures including evacuation routes, and the actions to follow in the case of fire.
3. Maintains workplace safety	<ul style="list-style-type: none"> • Complies with workplace safety policies and procedures. • Maintains work environment in a clean, tidy, hygienic and hazard-free state. • Undertakes manual handling training, and applies principles. • Applies ergonomic principles in practice to prevent injuries. • Participates in compulsory emergency procedures training. • Identifies potential hazards and deals with them effectively. • Acts to ensure that the physical and radiation safety of all personnel in the workplace is maintained. • Maintains controlled access to x-ray or treatment rooms to prevent accidental

	exposure to radiation. <ul style="list-style-type: none"> • Treats equipment in an appropriate manner
4. Complies with workplace security systems and policies	<ul style="list-style-type: none"> • Understands the key security systems for the workplace. • Understands the methods for ensuring patient records and information are secure.

Standard 5.4 Plan resources for service delivery

This standard relates to the ability of radiographers and radiation therapists to prioritise workload and work flow to make the best use of available resources. It encompasses the requirement to plan for predicted workload and ensure resources will be sufficient to meet workload demands.

Element 1: Confirms resources are sufficient for the workload	
Indicators	Cues
1. Understands the need provide adequate staffing levels	<ul style="list-style-type: none"> • Is aware of the link between excessive workload and fatigue, stress, and error. • Considers workload and staffing levels in order to maintain standards of patient care. • Takes regular breaks to avoid fatigue and resultant errors.
2. Ensures accessory equipment and stock is adequate for the workload	<ul style="list-style-type: none"> • Ensures adequate accessory equipment and stock are available for workload.
Element 2: Manages resources appropriately	
Indicators	Cues
1. Makes best use of available resources	<ul style="list-style-type: none"> • Effectively manages resources according to the workload. • Formulates plans including timeframes for completion of allocated tasks. • Uses disposables efficiently and minimises waste.
2. Ensure waste products are disposed of safely	<ul style="list-style-type: none"> • Follows protocols for the disposal of sharps and biohazardous waste.

Domain 6: Lifelong Learning

Standard 6.1	Demonstrates commitment to ongoing professional development
Standard 6.2	Participates in the training of students and graduate practitioners
Standard 6.3	Participates in guiding the learning of others
Standard 6.4	Participate sin research relating to practice

Standard 6.1 Demonstrates commitment to ongoing professional development

This standard covers acceptance and understanding of, and commitment, to the concept of continuing professional development which is essential to maintain and enhance professional skills and knowledge. It is essential that radiographers, sonographers and radiation therapists keep current with developments, trends and technologies, in all areas relevant to their professional activity.

Element 1: Commits to lifelong learning	
Indicators	Cues
1. Understands the importance of lifelong learning and commits to participation	<ul style="list-style-type: none"> Understands the role lifelong learning plays in professional development, in delivering contemporary quality procedures. demonstrates evidence of lifelong learning relevant to their profession
Element 2: Uses professional practice standards to assess own performances	
Indicators	Cues
1. Reflects on own professional knowledge	<ul style="list-style-type: none"> Reflects on practice to identify own professional development requirements. Identifies and acknowledges limitations to knowledge. Determines own educational needs.
Element 3: Participates regularly in continuing professional development	
Indicators	Cues
1. Engages in and reflects upon professional development to reach goals	<ul style="list-style-type: none"> Compares learning and development accomplishments with previously determined goals to ensure they are being met. Maintains continuing professional development throughout career. Employs efficient strategies for continually developing knowledge and skills. Takes full advantage of educational opportunities.

	<ul style="list-style-type: none"> • Maintains a thorough record of involvement in continuing professional development. • Undertake independent and self-directed study and learning
2. Demonstrates an understanding of developments and trends in radiography, ultrasound or radiation therapy	<ul style="list-style-type: none"> • Undertakes education to ensure current knowledge of advancements in medical imaging and radiation therapy. • Takes responsibility to seek out information relating to technological developments and updating personal knowledge base. • Undertakes appropriate education related to new areas of clinical practice.
Element 4: Participates in training programs related to the introduction of new technologies and procedures	
Indicators	Cues
1. Undertakes applications training following the installation of new equipment	<ul style="list-style-type: none"> • Reads the appropriate manuals regarding operation and safe use of equipment before use. • Participates in training on new equipment prior to using. • Ensures limitations and capabilities of new equipment is understood. • Implements any required practice change subsequent to equipment installation.
Element 5: Commits to the development of the profession	
Indicators	Cues
1. Participates in Australian Institute of Radiography's activities	<ul style="list-style-type: none"> • Understands the benefits to the individual of participating in the professional organisation.
2. Undertakes activities to advance the profession	<ul style="list-style-type: none"> • Supports activities involved in research, investigation and publication for the advancement of radiography, ultrasound and radiation therapy as a profession. • Is an ambassador for the Medical radiation science profession.

Standard 6.2 Participates in the education and training of students and graduate practitioners

This standard relates to the responsibility radiographers, sonographers and radiation therapists have assisting students and graduates to acquire the knowledge, skills and attitudes required by the Australian Institute of Radiography for professional practice. It also deals with the role feedback provides during the learning process.

Element 1: Participates in education of students and graduates undertaking supervised clinical practice	
Indicators	Cues
1. Engages in provision of appropriate clinical practice for students and graduates relevant to their stage of education and experience	<ul style="list-style-type: none"> • Supports students and graduates to work at their own pace to gain the maximum experience from procedures they undertake. • Maintains a positive and helpful attitude • Enables others to learn from own experience. • Promotes opportunities for cooperative learning. • Provides learning opportunities which are relevant and diverse. • Facilitates experiential learning by providing the opportunity to participate in procedures beyond their current competence level under supervision. • Communicates information, ideas and techniques, and encourages the use of problem solving skills. • Helps set specific achievable goals and outcomes for clinical practice. • Encourages the development of reflective practice • Provides constructive feedback to students and graduates to facilitate their learning. • Recognises the importance of role modeling expected behaviors' and attitudes.

Element 2: Evaluates the progress of students towards expected outcomes	
Indicators	Cues
1. Demonstrates the ability to provide formal and informal feedback arising from training provided	<ul style="list-style-type: none"> • Evaluates performance against established criteria for the learning objectives and the clinical placement restrictions. • Evaluates performance based on a variety of sources and procedures. • Provides specific, objective and accurate feedback in a timely manner. • Ensures feedback is given regularly throughout the learning process. •

Standard 6.3 Participates in supporting the learning of others

This standard relates to the role radiographers and radiation therapists have as a health professional to disseminate their knowledge, experience and expertise to their colleagues, health professionals from other disciplines and promotion of the profession to the wider community

Element 1: Contributes to learning experiences and professional development of others	
Indicators	Cues
1. Participates in communication that will educate other health care staff, patients and wider community	<ul style="list-style-type: none"> • Engages in educating other health care professionals and the public about medical imaging or radiation therapy practice. • Educates other professionals and the public about the roles of the radiographer, sonographer or radiation therapist. • Ensures that the information presented is evidence based, accurate and current.
2. Participates in formal and informal education opportunities involving colleagues and peers	<ul style="list-style-type: none"> • Undertakes formal or informal education sessions with colleagues and health professionals from other disciplines. • Presents or contributes to staff development sessions.

Standard 6.4 Supports research relating to practice

This standard looks at the development of a sound scientific research base to inform service planning and decision-making. Radiographers, sonographers and radiation therapists should support ways to increase research capacity within their practice and incorporate initiatives for continual improvement to clinical outcomes.

Element 1: Demonstrates an understanding of the significance of research in contemporary practice	
Indicators	Cues
1. Recognises the value of research in the development of the science and the practice of radiography, ultrasound or radiation therapy	<ul style="list-style-type: none"> Understands the relevance of research for improving individual health outcomes.
2. Demonstrates an understanding of the relevant research methods to the practice of radiography, ultrasound or radiation therapy	<ul style="list-style-type: none"> Is aware of a range of different research methods and how they can be applied.
3. Recognises the impact of research on contemporary practice	<ul style="list-style-type: none"> Shares conclusions of research activities with the profession. Discusses the implications of research with colleagues. Evaluates new evidence based methods of practice and incorporates them into own practice.
Element 2: Demonstrates knowledge of research as it relates to Radiography or Radiation therapy	
Indicators	Cues
1. Demonstrates knowledge of ethical foundation of research	<ul style="list-style-type: none"> Supporting the conduct of research in accordance with all institutional ethics committees, and comply with the ethical principles outlined by the relevant State, National and International organisations.
2. Distinguishes between ethical and non-ethical research	<ul style="list-style-type: none"> Understands the principles of ethical research procedures. Discusses the ethical issues involved with research.
3. Demonstrates knowledge of principles of evidence based practice	<ul style="list-style-type: none"> Ensures the use of current evidence to aid in decision making Understands how to review and critically evaluate literature with respect to research methodology, data collection and analysis of statistics.

Element 3: Support reasoning and problem solving in research,	
Indicators	Cues
1. support developments in the science and practice of radiography, ultrasound and radiation therapy	<ul style="list-style-type: none"> • Contribute to the development of the radiography, ultrasound and radiation therapy knowledge base. • Identifies areas within practice which may benefit from scientific investigation.

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Review of Competency Based Standards for Medical Radiation Practitioners

Final Report

October 2010

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Abbreviations

AAOT	Australian Association of Occupational Therapists
AHPRA	Australian Health Practitioner Regulation Authority
AIR	Australian Institute of Radiography
ALTC	Australian Learning and Teaching Council
AMC	Australian Medical Council
ANMC	Australian Nursing and Midwifery Council
ANZPAC	Australian and New Zealand Podiatry Accreditation Council
APC	Australian Physiotherapy Council
ASRT	American Society of Radiologic Technologists
CAMRT	Canadian Association of Medical Radiation Technologists
CBET	Competency based education and training
CBS	Competency based standards
CBT	Competency based training
EPA	Environmental Protection Authority
HPC	Health Professions Council
MRI	Magnetic resonance imaging
MRP	Medical Radiation Practitioner
MRS	Medical Radiation Science
MRT	Medical Radiation Technologists
NHS	National Health Service
NOOSR	National Office of Overseas Skills Recognition
NP	Nurse Practitioner
NPDPR	National Professional Development Programme Review
NZMRTB	New Zealand Medical Radiation Technologists Board
OAA	Optometrists Association Australia
OCANZ	Optometry Council of Australia and New Zealand
OT	Occupational Therapy
PDY	Professional Development Year
PPAC	Professional Practice Advisory Council (Canada)
PSA	Pharmaceutical Society of Australia
RN	Registered Nurse

Executive Summary

In late 2009, the Australian Institute of Radiography (AIR) commenced a major review of its existing competency based standards (CBS) for the accredited medical radiation practitioner (MRP; which includes diagnostic radiographers, radiation therapists and sonographers). The standards were last reviewed in 2005 and more recently there has been some suggestion the standards may not be meeting the purposes for which they are intended. Furthermore, major structural change to health professions is occurring through the creation of Australia's new national registration and accreditation scheme, which commenced on 1 July 2010 and which the medical radiation profession will join in July 2012.

The current CBS underpin a number of AIR activities, including:

- Accreditation of all undergraduate and Masters radiography/medical imaging/radiation therapy courses in Australia by the Professional Accreditation and Education Board.
- Assessment of all overseas applications from diagnostic radiographers, radiation therapists and sonographers by the Overseas Qualifications Assessment Panel.
- Development and periodic review of competency based assessment.

The standards are also used as the basis of entry-level examinations, to provide guidance in relation to professional development and indirectly are used as the basis for registration of practitioners.

The original project brief included three objectives:

1. To critically compare and contrast the current standards of practice for medical radiation professionals in Australia, New Zealand, Canada and the United Kingdom and other countries.
2. To examine practice standards promulgated by other relevant Australian health professions, with a view to identifying further appropriate approaches to the creation of standards for use by the medical radiation professions.
3. To recommend to the project steering committee the practice standards for medical radiation practitioners which would underpin the accreditation standards, to be recommended to the new National Board for adoption, for the assessment of programs of study.

It was agreed the third objective would follow from the outcomes of the first two objectives and would be undertaken as a separate project. Therefore, this report details the outcomes and findings in relation to the first two objectives, with recommendations for how the third phase of the project should be conducted.

The project was conducted in three phases over the period April 2010 to August 2010. Phase I comprised the project initiation and background research work. Phase II comprised the main research and data collection activities, resulting in the comparison matrices and diagrams. Phase III covered the critical analysis activities and report preparation.

This report is presented in seven sections.

Section 1: Introduction – provides context and background for the project and describes the approach adopted for the conduct of the project and the methodologies used.

Section 2: Literature review – presents the findings of a targeted literature review of published research that has evaluated the success of competency based standards, as well as more general reports around the implementation of CBS.

Section 3: Overview of CBS for MRPs and other health disciplines – presents the results of the data collection activities including consultations with key informants and communication with Australian and overseas professional organisations.

Section 4: Direct comparisons of the CBS – presents the results of the comparisons between the existing Australian MRP competencies and those obtained from four overseas jurisdictions, as well as competencies for six comparable Australian health disciplines.

Section 5: Discussion and recommendations – provides a summary of the critical analysis of the existing Australian competencies and presents recommendations (see below), including a three-stage process for conducting the revision process.

Section 6: Bibliography – includes all references cited in the literature review, as well as references cited elsewhere in the report.

Section 7: Appendices – Owing to the size of the diagrams and tables included as appendices to the report, four of the appendices are presented as separate documents.

The project described in this report sought to provide information that could guide the redevelopment of the Australian MRP CBS. It has transpired that none of the analyses undertaken provide a prescription for conducting the review of the standards. Nevertheless, insights gained through the interviews, literature review and direct comparisons of health professional standards do highlight general issues that should be factored into the revision deliberations and lead to a set of recommendations for the conduct of the review.

Summary of recommendations

Recommendation 1:

The medical radiation profession in Australia should address – and resolve – its outstanding professional issues as a prerequisite to undertaking a consultative revision process for the MRP CBS.

Recommendation 2:

The revision of the Australian MRP CBS should involve meaningful, timely, efficient, profession-wide consultation.

Recommendation 3:

The revision of the Australian MRP CBS should commence with a discussion about the concept of *competence* as it relates to the profession, leading to delineation of appropriate domains of competence as the structural foundation of the standards.

Recommendation 4:

The revision of the Australian MRP CBS should include consideration of the level of detail to be included in each standard (according to the NOOSR hierarchy) and the ancillary information that should accompany the standards, to improve the useability of the standards.

Recommendation 5:

The revision of the Australian MRP CBS should encompass a three-stage process overseen by an appropriately constituted project steering group and supported by a project officer.

1 Introduction

1.1 Competency based standards in Australia: a snapshot

The development and application of competency based standards (CBS) in Australia arose out of a training reform agenda that commenced in the late 1980s. It formed part of a Commonwealth Government response to economic, industrial relations, labour market, and vocational education and training issues that threatened Australia's international competitiveness at the time.

The National Office of Overseas Skills Recognition (NOOSR) was created in 1989 to oversee and provide assistance for competency development for the professions, as well as incorporating measures to enable the accreditation of overseas skills. In 1990 the National Training Board was set up to perform a similar function in relation to industry and to provide assistance for the registration of vocational competencies with industry training boards.

NOOSR produced two documents in 1993 (Implementing CBT: Competency Based Training⁽¹⁾; Competency Based Standards for Medical Scientists⁽²⁾) that established a clear framework for the development of competency standards by the professions. This was the model that most health professions ultimately adopted.

As Spencer summarises, "During the 1990s, many health and allied professional associations developed competency based standards for work in their professions. The competency standards were primarily developed in response to the need for transparent processes in assessing overseas health professionals who wished to practice in Australia. In effect, the competency standards defined the training required to practice in Australia. Consequently, the competency standards were also used by professional associations in their interactions with tertiary institutions"⁽³⁾.

The NOOSR format for competency standards is based around individual *units of competency*. These units of competency are a discrete component or *domain* of the standard. A unit of competency is in turn, comprised of the following segments:

- Elements – the basic building blocks of the unit of competency, which describe in output terms the things a professional who works in a particular area is able to do.
- Performance criteria – evaluative statements that specify the required level of performance. They set out the required outcomes by which the elements of competency, and the unit as a whole, can be judged by an assessor as being performed to the level acceptable in employment.
- Indicators – the range of context and conditions to which performance criteria apply.
- Cues/ Evidence guide – illustrative examples.

The last two segments were conceived as optional for CBS.

In the last twenty years, CBS have developed to fulfil a number of purposes, including:

- As a means for determining whether entry-level practitioners have obtained a minimum level of proficiency;
- Providing open and equitable assessment of international practitioners;
- Guiding curriculum development and accreditation of approved tertiary courses; and
- As a guide for continuing professional development programs.

1.1.1 The medical radiation profession in Australia and the development of its CBS

In Australia, medical radiation practitioners (MRPs) include diagnostic radiographers, radiation therapists and sonographers. To practice in Australia as an MRP (termed *medical imaging technologist* in some states or *medical radiation scientist* in other states) a professional must satisfy the requirements of state-based regulating authorities.

- In Queensland, Tasmania, Victoria and Western Australia, the regulating authority is a registration board;

- In New South Wales and South Australia, registration is handled by the Environmental Protection Authority (EPA) within the relevant state government department.
- In the Australian Capital Territory, registration is handled within ACT Health.
- In the Northern Territory, registration is handled by the Health Professions Licensing Authority.

In addition to registering MRPs, these state-based authorities have a number of other functions, including investigating professional conduct and professional performance or ability to practice; and regulating the standard practice. Some registration authorities also have a statutory responsibility to approve courses of study that provide qualifications for registration or to determine whether an applicant has completed a course that is acceptable as a qualification for registration.

The Australian Institute of Radiography (AIR) is the peak body representing diagnostic radiographers, radiation therapists and sonographers in Australia. The AIR is responsible for accrediting programs of study and the education providers that deliver those programs. There are currently eight Australian universities offering courses in diagnostic radiography/medical imaging and/or radiation therapy (three in NSW, two in Victoria and one each in Queensland, South Australia and Western Australia). A course of study can produce an accredited practitioner (unconditional registration) or a beginner practitioner who requires a further 48 weeks of supervised practice (provisional registration) through a Professional Development Year (PDY). An accredited practitioner is a professional who has received an AIR Statement of Accreditation after satisfying relevant AIR criteria.

The AIR also has a responsibility to maintain professional and educational standards relevant to the Medical Radiation Science (MRS) profession in Australia. In this capacity, the AIR has been involved with CBS for nearly two decades, developing the first MRP CBS in 1992. Following a process of consultation and review between August 2004 and February 2005, a revised set of standards was then adopted and these are still in use today.

The current CBS underpin a number of AIR activities, including:

- Accreditation of all undergraduate and Masters radiography/medical imaging/radiation therapy courses in Australia by the Professional Accreditation and Education Board.
- Assessment of all overseas applications from radiographers, radiation therapists and sonographers by the Overseas Qualifications Assessment Panel.
- Development and periodic review of competency based assessment.

1.2 Background to this project

In 2009, the AIR commenced a major review of its existing CBS. This decision was influenced by a number of factors:

- It is timely. The standards were last reviewed in 2005 and it is generally accepted that competency standards should be reviewed on a regular basis (every three to five years at a minimum).
- There is a perception amongst MRS professionals that the standards may not be meeting the purposes for which they are intended. For example, as a basis for assessment of overseas practitioners, the standards provide insufficient guidance in terms of defining the actual clinical skills that are required.
- Major structural change to health professions through the creation of Australia's new national registration and accreditation scheme, which commenced on 1 July 2010. Under a new federal law (the *Health Practitioner Regulation National Law Act 2009*), the majority of health professions will be regulated by nationally consistent legislation. Ten professions have already moved to the new scheme and the medical radiation profession is one of four health professions that will join the scheme from 1 July 2012 (the other three are occupational therapy, Chinese medicine and Aboriginal and Torres Strait Islander health practice).

It is also important to note some of the major issues and challenges currently being dealt with by the MRP profession within Australia, which include:

- A review of the form and content of the Professional Development Year (PDY).
- Increased clinical responsibility for radiographers and radiation therapists.
- Changes in the technology and their impact upon professional practice.

1.3 Conduct of the project

1.3.1 Project oversight

The project was undertaken by Darcy Associates Consulting Services, who assembled a project team of two consultants led by Dr Donna Cohen. Dr Cohen was responsible for project management, liaison with the AIR and was the primary point of contact for project participants and stakeholders.

A small Steering Group provided oversight of the project (see Appendix 1).

1.3.2 Project scope

The original project brief included three objectives:

1. To critically compare and contrast the current standards of practice for medical radiation professionals in Australia, New Zealand, Canada and the United Kingdom and other countries.
2. To examine practice standards promulgated by other relevant Australian health professions, with a view to identifying further appropriate approaches to the creation of standards for use by the medical radiation professions.
3. To recommend to the project steering committee the practice standards for medical radiation practitioners which would underpin the accreditation standards, to be recommended to the new National Board for adoption, for the assessment of programs of study.

It was agreed a report on the first two objectives would be a prerequisite to determining an appropriate methodology for the third objective. Therefore, this report describes the work completed for the first two objectives, with recommendations for how the third phase of the project should be conducted (see Section 5).

1.3.3 Methodology

The project was undertaken in three phases across an 11-week period (late April 2009 – July 2010). The major tasks of each phase are set out in Table 1.

Table 1: Project phases and major tasks

Project phase	Major tasks
Phase I	<ul style="list-style-type: none"> ▪ Project initiation ▪ Workshop with Project Steering Group ▪ Development of research questions to be used in interviews with key informants and in correspondence with representatives from overseas MRP organisations and comparable Australian health disciplines
Phase II	<ul style="list-style-type: none"> ▪ Key informant interviews ▪ Collection of information from relevant overseas jurisdictions ▪ Collection of standards and other information from comparable Australian health disciplines ▪ Literature review ▪ Construction of the comparison matrices
Phase III	<ul style="list-style-type: none"> ▪ Critical analysis of comparison matrices ▪ Preparation of draft final report ▪ Preparation of final report

Identification of disciplines for inclusion in this project

The initial task of the project was to confirm the scope of the review, identify the overseas jurisdictions for MRP to be included and identify the Australian health disciplines to be included in the review. A half-day workshop was conducted with the Project Steering Group with the following outcomes:

- The initial project brief was confirmed.
- Overseas jurisdictions from which MRP CBS would be obtained to include: Canada, Ireland, New Zealand, United Kingdom and United States.
- Australian health disciplines from which CBS would be obtained to include: nursing, occupational therapy, optometry, pharmacy, physiotherapy and podiatry.

Literature review

Academic literature was identified via the online databases of Ovid Medline, CINAHL Plus and Google Scholar. Internet references and web-based reports were identified using the Google search engine. Some sources of information were obtained through the bibliography and reference sections of previously identified works.

The following search terms were used singly or in combination:

- evaluation
- competency/competency based standards
- radiography (and other variations on the professional nomenclature)
- health profession (and each professional discipline by name)

Interviews with key informants

As part of the background research for the review, interviews were conducted with a small number of Australian medical radiation professionals and academics, as agreed by the Project Steering Group. An additional informant identified by the Australian Nursing and Midwifery Council (ANMC) was also interviewed. Key informants are listed in Appendix 1.

A set of questions was developed for use in these interviews. Most interviews were conducted over the phone.

Contact with organisations responsible for CBS in Australia and overseas

Using information provided by the AIR and through internet research, initial contact was made via email with individuals responsible for developing MRP CBS in their jurisdiction, as well as professional associations in Australia responsible for CBS in their discipline. The email contained a set of questions and included a request to interview an appropriate informant about the use of CBS in their jurisdiction or profession. Follow up emails were sent as required.

Development of the comparison matrices

The information that was obtained from relevant standards was tabulated, as appropriate, against the NOOSR hierarchy (*domain, element and performance criteria*). In constructing the comparison matrices, the approach was as follows:

- For MRP in overseas jurisdictions, each *element* (or its equivalent) was aligned with its corresponding element(s) within the Australian MRP CBS.
- For other Australian health disciplines, it soon became apparent that comparisons between MRP and other disciplines at the level of *element* would not be meaningful, as this level generally includes discipline-specific information. Therefore, each domain in the CBS of other professions was aligned with its corresponding domain(s) within the Australian MRP CBS.

The process of alignment was assisted by reviewing statements at a lower level of the NOOSR hierarchy than is presented in the comparison documents, to ensure the intent of the statements being compared was understood. The completed comparison matrices and diagrammatic presentations were then distributed to the Project Steering Group members and other expert colleagues for comment and critique.

2 Literature Review

2.1 Introduction

This literature review is not intended to be an exhaustive review of all literature related to competency based standards, either in MRS or health professions more generally. Rather, the focus is on identifying and reviewing literature that will help address two fundamental questions for this review of the Australian MRP CBS, namely:

1. Are there any indications about what has worked or not worked well in terms of the *nature* (i.e. the structure, format and content) of the CBS themselves within health professional disciplines?
2. Are there any useful lessons from the processes that have been used to develop CBS within other health professional disciplines that could inform the next stages of the process for MRP?

To address these questions, the literature review examined published research that reported either the results from evaluations/assessments of CBS, or provided more general reflections on the implementation of CBS over the last fifteen years.

2.2 Findings from the literature

2.2.1 General commentary on the value of competency based standards

When the competency-based movement began in the 1990s, there were concerns about the impact on health professions. Since then, numerous authors have addressed whether the concerns have been reflected in the reality of competency based standards and training.

In 2002, Leung reported that: "A recent review of published evaluative studies of competency based training found an increase in administrative burden but no convincing beneficial effects on motivating students, work performance, or relevance to the needs of industry" (Leung, p.693)⁽⁴⁾. While noting the potential benefits of CBS in enabling more flexible training, increased transparency in standards and greater public accountability, Leung also cautioned the inappropriate application of standards could result in a focus on minimum acceptable standards, demotivation, increased administrative burden, and a reduction in the educational content of courses.

Similarly, one of the architects of the Australian competency standards framework adopted by NOOSR has expressed concern about the risk of competency standards becoming more of a hindrance than a help⁽⁵⁾. Other commentators have suggested CBS may actually miss some of the subtleties involved with health professional practitioners' performance⁽⁶⁾. For example, one author warned of the danger of constructing graduate and specialist medical education in the UK based solely upon a "minimalist discourse of competency"⁽⁷⁾. In the Australian nursing context, Chapman warned against university-based education being reduced to a series of outcomes-based, technical procedures⁽⁸⁾.

Hyland, in a review of non-healthcare competency based education and training (CBET), suggested CBS may serve to de-skill and de-professionalise teaching⁽⁹⁾. Hyland was concerned with the "reductionist view of human agency" that underpins CBET and which assumes that "knowledge, skills and values can be codified in terms of lists of competence statements and measured objectively in abstraction from everyday experience" (Hyland, p.495). The focus of CBET is upon reaching the end-point of accreditation of performance, not on reflecting processes of learning and development.

Another area of concern has been whether CBS is the most appropriate way to produce well-rounded or *holistic* clinicians. Gunderman notes: "focusing on basic competencies can lead to the neglect of higher levels of educational excellence, such as expertise and mastery. By tending to promulgate a single set of standards for all programs, we may undercut educators'

and learners' appreciation for innovation, style, and the love of surprises" (Gunderman, p.325)⁽¹⁰⁾.

Cowan *et al*, in a focused review of the literature on competence in nursing practice, suggest a major problem is the confused way that notions of competence and competency have been applied⁽¹¹⁾. The authors argue the need for a holistic definition of competence to be agreed, one which acknowledges that nursing practice requires the application of complex combinations of knowledge, performance, skills, values and attitudes. With respect to CBS, the authors conclude: "clearly, a balancing act needs to be performed whereby competency standards do not become so narrow that they merely represent endless task lists, but that they are not so broad as to become meaningless" (Cowan *et al*, p.25).

While the concerns about the impact of CBS continue to be debated, there have been no reports in the literature detailing any major *deskilling* of health professions or other negative outcomes from CBS. Indeed, a 2005 report for the Department of Human Services in Victoria suggests the adoption of competency standards by the majority of health professions in the Australian context appears to have served the purposes for which they were intended⁽³⁾. This report provided an overview of the implementation of competency based standards in Australian medical and allied health professions up until that time. The existing MRP standards were not included in the review⁽³⁾.

In seeking to compare and contrast the standards from different disciplines, the report noted that making useful comparisons between professions is difficult because of the different approaches within each discipline. In terms of the way in which standards were developed, the report outlines the general approach that was adopted. The process usually commenced with a review of international competency standards (where they were available) and literature reviews. Competencies were drafted or revised utilising specialist reference groups or committees consisting of expert clinicians and other relevant stakeholders. The reference groups then consulted widely with members of the profession, employers and educators.

The report also considered whether there could be one common competency framework across all health disciplines. While acknowledging it would take extensive consultation and negotiation with all stakeholders to achieve, the report recommended this approach only for the purpose of facilitating dialogue and comparison between professions and sectors. Interestingly, a standardised competency assessment framework for all health professional disciplines has been successfully instituted by one US health care provider, namely the six-facility Methodist Le Bonheur Healthcare system in Tennessee⁽¹²⁾.

Finally, the report notes that medical specialty colleges in Australia, under the auspices of the Australian Medical Council (AMC), are required to adopt the principles of the CanMEDS Framework developed by The Royal College of Physicians and Surgeons of Canada. A recent review of this framework found that while the CanMEDS competencies have successfully become part of Canadian medical education at all levels, there are still a number of challenges in their implementation⁽¹³⁾. These include overcoming general resistance to change, educators wanting to see evidence the competencies are not just another education *fad* and a feeling of *overload* amongst some education faculties.

2.2.2 Evaluation of competency based standards for MRP

Review of the literature did not identify any research that has systematically assessed the correlation between MRP CBS and the desired outcomes. In the absence of such analysis, one mechanism to indirectly evaluate the effectiveness of MRP CBS is to consider the literature on practitioner competency in those jurisdictions that have CBS. Much of the research in this field has occurred in the UK.

In this context, Jackson's 1998 UK study of graduate therapeutic radiographers provides some interesting insights on the inter-relationship between curricula, competence assessment and CBS⁽¹⁴⁾. Supervising radiographers from all the UK's radiography departments were asked to assess graduate therapeutic radiographers in their department. A total of 62 practitioners were assessed.

The major finding of the study was that the majority (59/62) of newly qualified therapeutic radiographers were judged to be competent in clinical practice. Importantly, the author concluded the assessments demonstrate the profession is able to identify key skills and characteristics of early career professionals.

An interesting – but minor – point in this study was the fact that three practitioners out of the 62 were found to have achieved lower than expected levels of competence (although not seriously deficient)⁽¹⁴⁾. This raises the issue of the competence level achieved by these practitioners in obtaining their qualification and how the application of the CBS can have produced such an outcome.

This issue is also taken up by Yorke, who considers the implications for public safety from passing students who may become bad practitioners⁽⁶⁾. While acknowledging the need to minimise the number of students who pass but in reality should not, Yorke asserts there may be a cost of failing students who might actually go on to become competent practitioners. The important issue in relation to the CBS is whether the standards are facilitating sufficiently accurate assessments of practitioners to be able to make such a distinction.

A more recent study by Mackay *et al* of newly qualified diagnostic radiographers from the University of Salford and their work-based supervisors examined the graduates' preparedness for clinical practice⁽¹⁵⁾. The major finding was a significant difference between the self-assessed preparedness scores of the graduates compared to the assessment by their supervisors, with supervisors rating the graduates higher than the graduates rated themselves. While the authors acknowledged the study only provided a snapshot of the preparedness of graduates for clinical practice, they concluded the graduates were well prepared for practice.

Another study, involving staff within an NHS trust, investigated the use of occupational standards in professional development programs for a range of health professions including MRP⁽¹⁶⁾. While not providing an overall evaluation of the use of competency standards, the study found competency standards were less likely to be accepted if they failed to recognise the holistic requirements of, or the knowledge that underpins, professional practice.

In one of the few studies undertaken outside the UK, Curtise *et al* investigated MRS students in Hong Kong and overseas (including respondents from the UK, Australia and New Zealand), with the aim of establishing a method of monitoring students' progress towards, and ability to meet, entry level professional competences⁽¹⁷⁾. While the study did not comment on the validity of the MRP competencies themselves, it did note "increasing pressure from the community to ensure that graduates have not only the necessary academic development but also the practice-based skills required by their registering authorities and employers" (Curtise, p.256). The authors noted the difficulty for both academic institutions and students to fully ascertain whether they have attained the necessary levels of professional competence required on graduation.

While the literature cited above focuses on the competency of MRPs, there has also been discourse on MRP CBS in the context of both the changing nature of the profession and the need to create holistic practitioners. For example, in their discussion of the culture of the MRP profession, Yelder and Davis comment on the need for practitioners to move beyond "technical rationality" and the "protocol-driven" nature of the profession⁽¹⁸⁾. Similarly, Baird has expressed concern that competency based descriptions of professional practice don't adequately capture the essence of professional knowledge⁽¹⁹⁾. On the other hand, at the time the Australian MRP CBS were first developed, Egan assessed the standards against what has been defined as *the qualities of a profession* and found the standards did reflect those qualities and the CBS document did define the responsibilities of the MRP profession⁽²⁰⁾.

A recent review of nuclear medicine practice in the UK outlines the changing nature of practice and the need for an evaluation of the fundamental qualities of an MRP⁽²¹⁾. The authors of this review assert the information and guidance provided by the existing core competencies for the European Nuclear Medicine Technologists are "dated" and note competencies are part of a

career framework for practitioners. It stands to reason that unless the competencies reflect current practice, they are of limited use as a career development tool.

Finally, Chianese and Channon reported on their work at one UK university to develop a new teaching, learning and assessment strategy for radiotherapy and diagnostic imaging undergraduates using outcome-based competencies and other tools to progress students' learning through successive levels⁽²²⁾. The authors expressed concern about the potential for students to become too competency driven, with the result they become little more than "technical operatives". While teachers and students rated the new strategy a success, the authors recommended graduates be followed up during employment to investigate how well the new scheme prepared them for practice. Although this study was conducted in the late 1990s, no follow-up research has been reported.

It is worth noting that although the Australian MRP CBS have been in existence for nearly 20 years, there has not been any research published about their effectiveness as a tool to achieve desired outcomes or their perceived value. Two articles were published within the first five years of developing the standards, which examined the process of developing the standards and how that process itself added value to the profession. In the first article, Egan noted the value of the intra-professional communication brokered by the process, as well as issues remaining to be addressed as the profession matured⁽²³⁾. In the second article published three years later, Cowell *et al* examined the methodology used to develop the Australian standards in greater detail and discussed how the approach adopted resulted in a validated and reliable set of standards for the MRS profession⁽²⁴⁾. They noted the process had yielded both a methodology and a set of standards that would be useful for application in other jurisdictions.

2.2.3 Evaluation of CBS in other disciplines

There is a similar dearth of literature from other health professional disciplines with respect to direct evaluations of CBS, the exception being nursing. Several reviewers have commented upon the lack of controlled studies or systematic reviews that assess the effectiveness of CBS and associated educational interventions⁽²⁵⁾. For example, Watson *et al* conducted a systematic review of literature in the period 1980–2000 pertaining to clinical competence in nursing⁽²⁶⁾. The review concluded there was considerable confusion about the definition of clinical competence. Furthermore, most of the methods used to define or measure competence were not developed systematically, and issues of reliability and validity were barely addressed.

There is one substantive study that has evaluated the implementation of nursing CBS. The ANMC reported in 2005 on an interim review of their CBS for the registered nurse⁽²⁷⁾. Of particular relevance to this project is the research undertaken as part of the interim review involving members of the profession. The major findings were:

- Nurses reported a lack of awareness about the CBS, as well as difficulty in using the CBS documents, particularly in clinically assessing other nurses.
- The need for standards to reflect contemporary practice was highlighted as an area where the standards could be improved. A large number of nurses noted that areas previously considered specialist areas of practice were now core areas of nursing practice.
- The nurses reported the standards being used for a wide range of purposes, including: assessment and appraisal; development of curricula and job descriptions; guidance for professional development; policy development and evaluation.
- There was a preference for the standards to contain more detail. Specific suggestions included providing more examples of practice and more cues to assist in identifying the relevance of the standards to practice.
- A number of respondents were concerned about the format of the standards, describing the documents as difficult to work with and not very user-friendly. A clearer and more structured presentation format was requested, as well as greater visibility and accessibility of the standards.

A study of graduate nurses in New South Wales sought to quantify which specific competencies were seen to be of most use in clinical practice⁽²⁸⁾. The study found a positive relationship

exists between *perceived competence* and *frequency of use* (i.e. the more the nurses reported using a competency item in their work, the higher their self-assessed competence) and that competency scores for the *research* element of the standards were substantially lower than all other categories of competency.

The proliferation of *advanced* and *specialist* competency standards in Australian nursing was the subject of a review by Chiarella *et al*⁽²⁹⁾. The authors identified over 30 different existing Australian competency documents available for nursing staff. Nurses reported using the different standards for a variety of purposes (curriculum development, assessment, etc) and were supportive of CBS overall. However, a number of issues and concerns were highlighted:

- There is a need to identify the minimum required level of performance in each competency and to define cultural competence.
- The validity and interpretation of competency domains and their constituent parts remains unresolved for many of the standards.
- There is a preference for client-focused rather than task-focused criteria within CBS.
- Terms must be standardised to ensure there is consistency across the major domains, while allowing for differences to adequately reflect the nature of general, advanced and specialised care.
- Guidelines are required to assist practitioners with understanding the terminology used and how to operationalise competency standards.
- A national, coordinated approach is required to meet the challenges of developing and implementing national competency standards.

Similar issues were revealed in a study conducted with Iranian registered nurses. The study found professional development of competence is dependent upon both the context (the support provided in the working environment) and the individual (the extent to which individuals are committed to their job and seek out learning opportunities) and identified the need for coherent work-based plans to facilitate competency development⁽³⁰⁾.

Various allied health disciplines have also undertaken analysis of their CBS.

Roger *et al* undertook a wide-ranging review of the Australian occupational therapy (OT) competency standards in 2007⁽³¹⁾. The research sought to identify the specific content that should be revised in the standards, rather than examining how the standards had been applied since their creation in 1994. Feedback from OTs indicated the need to have contemporary language and contemporary OT knowledge embedded within the standards. In addition, OTs recommended making the standards freely available to the profession, reviewing the standards on a five-yearly basis and developing a set of national specialist or advanced practice CBS.

The optometry profession in Australia has recently revised its competency standards and the redevelopment process has been reported⁽³²⁾. While mainly focusing on the process and specific content revisions that were made, the report also provides an interesting commentary on the need to interpret the standards holistically. In particular, this includes:

- Being aware that individual elements of the standards are not discrete and independent;
- Ensuring the standards are interpreted or adapted to the situation (requiring professional judgment); and
- Recognising that competence is a *construct* that cannot be directly observed, but rather what is observable is performance on a series of relatively complex and demanding professional tasks.

A critical appraisal of the contribution of CBS to curriculum design in speech pathology programmes in Australia was published in 2006⁽³³⁾. The report notes a number of concerns relating to speech pathology CBS that could equally apply in all health professions. For example, CBS can result in the minimum acceptable standard being viewed as the goal and, furthermore, "the more detailed the standards, the greater the risk that they describe technical and procedural adequacy, but miss capturing the complexities of discipline-specific practices" (Ferguson, p. 27). These concerns notwithstanding, the report presents a positive picture of the way CBS have become embedded within speech pathology education,

contributing to greater diversity in the programs and fostering overall development of the profession.

Some health professions have been examining the range of applications of their CBS. For example, a report outlining the history of CBS within the health promotion profession in Australia identified a range of innovative uses for the standards in the realms of training, recruitment, employment policy, and health promotion practice⁽³⁴⁾. The report also highlights the need for experts, practitioners, trainers and employers to further articulate the potential uses of the CBS. In the case of the marital and family therapy profession, the development of the first set of competency standards for the discipline is seen as providing an opportunity to “review what the discipline is, decide what should be valued, detail what makes it similar to, and distinct from, other mental health professions, and continuously engage in a process that will shape its future” (Miller, p. 68)⁽³⁵⁾.

Bordley *et al* report on how the Accreditation Council for Graduate Medical Education Outcomes Project in the US has successfully initiated a shift in focus on residency education from process measures to educational outcomes⁽³⁶⁾. The use of competency-based assessment is intrinsic to this process and is expected to deliver a number of benefits including identification of residents who are progressing more rapidly than expected.

Osteopathy is another discipline grappling with the need to have valid clinical assessment techniques for measuring competence. London reports on the perceived need within UK osteopathy to develop a reference standard for assessment of their competencies as a benchmark that is more explicit than already exists, and that can be agreed upon between institutions and endorsed nationally⁽³⁷⁾.

2.2.4 Conclusions

Despite the relatively small body of research directly relevant to the current review of CBS for Australian MRPs, there are a number of interesting insights from the literature:

- The limited research that has examined the implementation of CBS for MRPs indicates the existence of standards has, at the very least, not impeded educative objectives aimed at producing competent professionals upon graduation. However, the lack of any evaluative and follow-up studies as professionals progress through their career make it difficult to assess the longer term impact of CBS.
- The need to achieve a balance between training technically competent professionals, as well as those who can be holistic clinicians able to think and use problem-solving skills, continues to be a concern for health professions. The lack of empirical research makes it difficult to know whether CBS are assisting or hindering the development of such professionals. However, the message appears to be the need for CBS to be constructed with a suitable balance between the technical skills (which are more easily quantified and measured) and the more psychological, creative or reflective skills (which are more difficult to quantify and measure).
- The use of CBS in other health professional disciplines, particularly nursing, suggests that while standards are being used for a number of purposes, there is a need for their application to be more widely understood by professions as a whole. Again, the lack of research makes it difficult to assess whether CBS are being used effectively in other domains such as professional development and accrediting of professionals.
- The need for CBS to reflect changes in professional practice is highlighted in a number of the studies and commentaries.

3 Overview of Competency Based Standards for MRP and Other Health Disciplines

3.1 Introduction

A major objective of this project was to directly compare the current Australian MRP CBS with the CBS for radiography/radiation therapy in overseas jurisdictions and the CBS for other comparable health professions in Australia. To make sense of such comparisons, it is necessary to understand the context for each set of CBS including the way the CBS are applied, the process for developing and reviewing the standards, and any issues around their implementation.

To this end, information was gathered from three main sources, namely: key informants identified by the Project Steering Group, contacts in overseas jurisdictions and other health professional disciplines in Australia, and web-based resources.

3.2 Insights from the key informant interviews

Six key informant interviews were conducted with individuals identified by the Project Steering Group. These individuals were selected because their combined knowledge and expertise covered both diagnostic radiography and radiation therapy, and they are experienced practitioners and/or academics from Australian university MRS programs.

Semi-structured interviews were guided by a set of questions and prompts that sought each informant's views on the usefulness of the current Australian MRP CBS, any concerns they have about the standards, the most appropriate consultation process for revising the standards and any insights they might have about radiography CBS in other jurisdictions. The results are presented according to the main topics that were discussed.

The usefulness of the current Australian MRP CBS

Apart from one informant who indicated the CBS are being used as the basis for an assessment/examination framework for overseas trained professionals, most informants were doubtful about the usefulness of the existing CBS, mainly because of the lack of specificity. Comments included:

- The standards are not regularly referred to within the profession, because they do not provide any practical guidance for the practitioner.
- The standards are not very useful in terms of designing curriculum because they are open to wide interpretation.
- The current standards don't specify who can do what.
- The standards don't set out the number of competencies that need to be achieved over a period of time.

Concerns about the current Australian MRP CBS

A number of common themes emerged from the discussion with key informants. In particular:

- A concern expressed by all informants was the existing standards do not reflect the changes that have occurred in practice, particularly major changes in medical technology, since the standards were first developed in 1992. Some informants commented that the 2005 review of the CBS only resulted in "tinkering" with the standards.
- There is an issue with the extent to which the current CBS reflect variations in practice, particularly for radiation therapy, across Australia. One informant noted the different approach between the states is a major problem for the profession. There are also differences between practice in public and private health services and between metropolitan and regional/rural settings.
- The application of the standards is problematic since it is not clear which of the professional competencies are compulsory as opposed to just desirable.

- The PDY was raised in the context of concerns about the current CBS. While the continuation and/or structure of the PDY are primarily professional issues, there are implications for the CBS. In particular, there is some question about how the CBS can reflect the appropriate competency level for graduates of three-year versus four-year programs.
- One informant suggested different standards are being applied to graduates then to overseas trained professionals.
- The CBS don't accommodate competencies that cannot easily be quantified, such as the socialisation skills necessary to be an effective professional.

How the current Australian MRP CBS could be improved

Informants made the following suggestions:

- The CBS should have sufficient specificity to ensure a common minimum skill set for practitioners while not being overly prescriptive. Currently, as the standards are very high level and non-specific, university courses can be quite different in what they teach and still turn out qualified practitioners. This results in different skill sets amongst professionals.
- There should be clarity about the standard that applies to each level of learner or practitioner (or between professional groups).
- The CBS should be maintained as a living document, particularly in relation to accrediting university courses, to ensure the standards remain relevant as the nature of practice changes.
- The provision of case studies to illustrate what is meant by the standards would enhance their usefulness.

The consultation process for revising the current Australian MRP CBS

Interestingly, all informants had different views about the format for the consultation process to be undertaken in the third phase of this project. There were two main schools of thought: those who supported a wide-ranging consultation process involving as many stakeholders as possible versus those who recommended limiting the consultation to an *expert* group. The rationale for the latter approach was the need to produce a consensus on revised standards: the broader the consultation, the more difficult it might be to achieve consensus. However, this may be a risk with any process of consultation. One suggestion for mitigating this risk was to use an expert group to develop revised standards, which would then form the basis for consultations more widely with the profession.

A number of specific suggestions were made about the consultation process, including:

- Use as many face-to-face meetings/workshops as possible.
- Consider treating the different practitioner groups (i.e. diagnostic radiographers, radiation therapists, etc) as separate processes.
- Ensure all end-users of standards (e.g. universities, hospitals, etc) are consulted.
- Include a process of validation by the industry.

Medical radiation practice in overseas jurisdictions

Key informants were asked a series of questions about their awareness of the application of MRP CBS in overseas jurisdictions. These included:

- Which overseas jurisdictions are worth investigating?
- How successfully have CBS been applied in these jurisdictions?
- Are there any factors that should be taken into account when making comparisons with overseas jurisdictions?
- Are there any other factors that should be considered?

The feedback provided by the key informants is presented below according to the main jurisdictions that were highlighted in their responses.

New Zealand

New Zealand (NZ) was identified as being a key jurisdiction for comparison because the profession is organised similarly to Australia. NZ MRPs are generally considered to be of a high standard and have a good reputation internationally.

The NZ professional group is only responsible for professional development, providing a code of conduct and organising conferences. The NZ registration board assesses courses, determines competency and sets standards.

According to one informant, the CBS in NZ is being used as the basis for an examination at the end of courses to assess fitness for practice. This model (of one test at the end of three years) was not seen by this informant as being ideal.

NZ was also noteworthy for the number of clinical hours they include in their university courses and the absence of a professional development year.

Canada

Several of the informants noted the Canadian system is very similar to the Australian system and is a good fit in relation to competencies. The Canadians have licensing and registration (although not in all provinces) and very rigorous and demanding standards.

The Canadian Association of Medical Radiation Technologists (CAMRT) standards are very generic (high level) but at the registration level, the standards are very detailed. One informant suggested the Canadian model is not a recommended approach, since the Canadian standards appear to be "more about the patient than about the practitioner".

Canada has an overarching national entry examination, even though each province might have different courses/standards. A comment was made that differences in the profession were quite marked between the east and west coast of the country.

Australian-trained MRPs have to sit an entrance exam in Canada (and the US), but once they pass the exam, they are well regarded.

Canada is also noteworthy for making some progress towards giving MRPs the authority to prescribe.

United Kingdom

The United Kingdom was described as being quite different to Australia in their approach to medical radiation practice. The two major differences highlighted were:

- The UK standards are very reliant on issues around radiation dose and this governs practice.
- The CBS don't reflect or encourage independence of professionals. Medical radiation practice is a very medically dominated profession and this has hindered its development. By way of example, UK radiation therapists are only permitted to undertake very limited treatment planning.

However, it was noted the UK model is undergoing changes and is now moving towards the Australian model. Changes in scope of practice are occurring, which have increased job satisfaction. The challenges associated with these opportunities sometimes come from within the profession. For example, although some of the medical dominance has been removed, many radiation therapists are still working within the traditional confines.

Other interesting aspects of the UK system noted by informants were:

- The development of the Health Professions Council (HPC) model through a Government authority was contrasted with Australia, where changes have been managed by the profession.
- In UK there are still a high proportion of clinical hours as part of the course (they don't have a professional development year).

- One key informant reported on their personal experience in working in the UK and how they had never seen the CBS used in practice. They also told of being left to practice with no real supervision.
- Australian trained MRPs are generally held in high regard in the UK.

United States

The key informants provided only limited information about medical radiation practice in the United States (US). However, there was general agreement about there being a very different professional approach within the US compared to Australia. In the US, there is a clearer distinction between radiologists and MRPs in advanced practice, in that MRPs are encouraged to be procedural specialists rather than just interpreting the images.

In the US, MRS is not taught as a degree course and graduates achieve specific modality-based competency. Furthermore, the US is at a different level of continual professional development (CPD), but their approach to facilitation of CPD is seen as being excellent.

Interview with Roy Brown, Senior Lecturer, School of Nursing, Midwifery and Indigenous Health, University of Wollongong

An additional interview was conducted with Mr Roy Brown from the University of Wollongong. He was identified by the ANMC as a source of valuable information in relation to competency assessment tools.

Mr Brown is part of a team that has been funded by the Australian Learning and Teaching Council (ALTC) to develop a generic nursing competencies assessment tool. The tool will be used to rate newly graduating Registered Nurses against the ANMC regulatory competencies and employer competencies regarding *reasonable* expectations of new nursing graduates. This tool will be available to all nursing schools across Australia, and could also be used for the assessment of overseas qualified nurses seeking registration in Australia.

The project has examined all nursing programs in Australia to determine how they are assessing students against the standards. The tool is intended to assess how students are actually doing the job of nursing. Part of this process involves ensuring there is clarity about what is being assessed.

The new assessment tool being developed by the University of Wollongong is based around a *tick-a-box* approach but also contains some descriptions that assist with interpreting each domain. The tool will be used diagnostically to assess students and will also be expected to sit within a development portfolio maintained by the learner that demonstrates progress of skill acquisition and understanding.

According to Mr Brown, the aim is to have a “narrower band” of what is an acceptable standard. This is also an issue for the MRP profession.

Some of the other issues and questions from the University of Wollongong project that could be applied to MRPs include:

- How can it be demonstrated that a student has achieved an integration of all aspects of knowledge and understanding? That is, whether the student knows how to work out something from first principles (as opposed to just knowing the answer).
- Assessment does have tick-a-box components, but there is also the need to assess the “artistry” elements to clinical practice.
- There is a need to differentiate between *tasks* (employment competencies) and *skills* (statutory competencies).

Mr Brown referred to similar work being done in other professions, namely physiotherapy and speech pathology. In physiotherapy, the Assessment of Physiotherapy Practice (APP) tool has been developed as a single instrument with known validity and reliability, which is available to replace 25 distinct assessment practices formerly in use⁽³⁸⁾. In speech pathology, a project sponsored by the ALTC, has seen the effective integration of the COMPASS™ assessment tool within learning, teaching and assessment practices in the profession⁽³⁹⁾.

3.3 MRP CBS in overseas jurisdictions

Table 2 identifies the jurisdictions consulted and the CBS documents reviewed in this project. CBS were obtained for all targeted overseas jurisdictions apart from Ireland, where the contacted individual indicated no CBS have been developed for Irish medical radiation professionals.

Table 2: Jurisdictions and CBS included in this project

Jurisdiction	Document title	Year	Responsible professional organisation
Canada	Radiation Therapy – Competency Profile (Note: There are separate documents for MRI, nuclear medicine and radiological technology that were not reviewed for this project.)	2006	Canadian Association of Medical Radiation Technologists
New Zealand	Registration Requirements. Diagnostic Imaging - General. Volume 1A (Note: There are separate documents for mammography, MRI, nuclear medicine, radiation therapy and ultrasound that were not reviewed for this project.)	2009	New Zealand Medical Radiation Technologists Board
United Kingdom	Standards of Proficiency: Radiographers	2007	Health Professions Council
United States	The Practice Standards for Medical Imaging and Radiation Therapy: Radiography Practice Standards (Note: there are a total of 12 separate standards, representing each major modality.)	2007	American Society of Radiologic Technologists

The following sections outline the responses received from the overseas jurisdictions regarding the way in which their standards have been developed, the purposes for which they are currently used and other relevant information.

Table 3 provides a summary of the information about the practical uses of the standards within each overseas jurisdiction, as well as the current uses of the Australian MRP CBS.

Table 3: Application of MRP CBS in Australia and other jurisdictions

Jurisdiction	Applications for which standards are used			
	Accreditation of courses	Basis of entry-level examination	Registration of practitioners	Guidance for professional development
Australia	Yes, for AIR accreditation of courses.	Yes	Yes, though not officially	Yes
Canada	Yes. Programs are accredited by the Canadian Medical Association (CMA), Conjoint Accreditation Services. CAMRT is a sponsor of the CMA accreditation process.	Yes. CAMRT is also the certifying agency in Canada. Currently with the exception of Quebec, CAMRT is the sole provider of the entry-to practice exam (beginning in June 2012, the province of Quebec will be using the CAMRT exam as well).	No	No
New Zealand	Yes	Yes	Yes	Yes
United Kingdom	Yes. The Standards of proficiency must be shown to be achieved	No	Yes, specifically for entry to the register for all	No. The Society's Learning and

	for an education program to be approved by the HPC.		non-UK trained MRPs.	Development Framework address this.
United States	Unsure as ASRT not responsible for accreditation of courses	Unsure as ASRT not responsible for entry-level exams	Unsure as to whether organisation responsible for registering practitioners use the standards	Unsure whether standards are used in this way

3.3.1 Canada

The context within which the medical radiation profession is practiced

As the national professional association, CAMRT is a federation of ten provincial associations who share a common membership of approximately 12,000. CAMRT is the leading national body for the medical radiation technology profession and has the ability to bring all relevant stakeholders to the table.

As the national certifying body, CAMRT develops and administers national certification exams for the four disciplines among its membership (namely, radiation therapy, MRI, nuclear medicine and radiological technology). CAMRT recommends the exams test against a pre-determined standard that is reflective of the competency required to practice safely and effectively at the entry-to-practice level in the current Canadian healthcare environment.

Process for developing the standards

The CAMRT Professional Practice Committee, now the Professional Practice Advisory Council (PPAC), was responsible for developing the standards, utilising a consensus approach amongst stakeholders.

Process for reviewing the standards

CAMRT have established a Best Practice Guidelines development project. The project formally began in early 2010 with the selection of four chairs to head committees for the four professional disciplines and the hiring of a project manager to take on the work of researching and writing the material. The project is expected to take up to two years to complete.

3.3.2 New Zealand

The context within which the medical radiation profession is practiced

The New Zealand Medical Radiation Technologists Board (MRTB) includes five gazetted scopes of practice (excluding training scopes), namely diagnostic imaging; radiation therapy; nuclear medicine; MRI; and ultrasound. Similar to the situation in Australia, the NZMRTB is responsible for ensuring practitioners registered in the profession are competent and fit to practice.

The Board has developed a set of competency document for each scope of practice. These competencies are the cornerstone for registration and ongoing competency and are used extensively by the Board in its regulatory work.

Process for developing the standards

The competencies were developed by the Board in consultation with practising MRT practitioners who had in-depth knowledge and experience of the relevant scope of practice.

Process for reviewing the standards

The standards are reviewed every three or four years through consultation with experts from the MRT industry (including experienced MRT practitioners and representatives of the NZMRTB) and education specialists (including representatives from the relevant tertiary educational institutions).

3.3.3 United Kingdom

The context within which the medical radiation profession is practiced

The peak organisation within the UK is the Society of Radiographers (of which the College of Radiographers is the charitable subsidiary). The Society represents more than 90 per cent of the diagnostic and therapeutic radiographers in the UK and is responsible for their professional, educational, public and workplace interests.

The Health Professions Council (HPC) is the registration body for fifteen medical and allied health professions in the UK, including radiography. The HPC standards of proficiency are the standards every practitioner must meet to become registered, and must continue to meet to maintain their registration.

Process for developing the standards

HPC standards were first published in July 2003. Initially, a major piece of work was commissioned to develop the standards, followed by considerable public consultation prior to approval and adoption by the HPC.

Process for reviewing the standards

The HPC establishes a small group (including members of the HPC, representatives from professional bodies and patient groups) to review the standards periodically, followed by a period of consultation. A major review was conducted in October 2005 and the revised standards were effective from November 2007. A further revision was conducted in September 2009.

Other insights

The standards make a distinction between generic standards, profession specific standards and then between therapeutic radiographers and diagnostic radiographers.

The Society has a Learning and Development Framework that provides curriculum guidance to assist education providers in ensuring their programs achieve the required proficiency standards.

3.3.4 United States

The context within which the medical radiation profession is practiced

The American Society of Radiologic Technologists (ASRT) is the main professional association in the US for the medical imaging and radiation therapy community and provides education, advocacy and research services.

The ASRT is not responsible for implementing any of the main uses for its practice standards. In addition, ASRT practice standards are always subservient to federal and state law and institutional policy. If the federal or state government or a healthcare facility determines that an item in the Practice Standards is outside the scope of practice for medical imaging or radiation therapy professionals, the law or institutional policy prevails.

Process for developing the standards

ASRT hired a consultant to lead a team of volunteers to develop the format for the Practice Standards for Medical Imaging and Radiation Therapy Professionals, followed by development of standards for each modality. The volunteers appointed to the team represented each of the modalities/specialties for which practice standards were being developed.

Process for reviewing the standards

ASRT has a committee of appointed volunteers whose task is to review and recommend revisions to the practice standards. The Practice Standards Council has representatives from each modality/specialty and is purposely chosen to provide representation from across the US geographically.

For each modality/specialty, each section of the standards is reviewed in depth every four years by a sub-committee of experts (ASRT members who work in the modality/specialty). The sub-committee provides recommendations for changes that must be approved by the Practice Standards Council, the ASRT Board of Directors, and the ASRT House of Delegates before being finalised. The revision process includes a 30-day public comment period for proposed changes, so any practitioner is able to review the proposals and provide ASRT with feedback.

Other insights

ASRT purposely develops statements that are broad in nature. Because of this, ASRT has an office of practice standards that assists individuals in assessing if specific tasks are or are not within the scope of practice. If ASRT finds that a specific task appears to be a topic that needs further clarification, the Practice Standards Council is requested to develop an Advisory Opinion Statement that addresses the topic specifically.

3.4 CBS in Australian health disciplines

Table 4 identifies the professions that were consulted and the CBS documents reviewed for this project. CBS were obtained for all targeted Australian health disciplines.

Table 4: Australian health profession standards reviewed in this project

Profession	Document title	Year	Responsible professional organisation
Nursing	National Competency Standards for the Registered Nurse	2005	Australian Nursing and Midwifery Council
	National Competency Standards for the Midwife	2004	
	National Competency Standards for the Nurse Practitioner	2006	
Occupational Therapy	Australian Competency Standards for Entry Level Occupational Therapists	1994	The Australian Association of Occupational Therapists
Optometry	Optometrists Association Australia Universal (entry-level) and Therapeutic Competency Standards for Optometry 2008	2008	Optometrists Association Australia
Physiotherapy	Australian Standards for Physiotherapy	2006	Australian Physiotherapy Council
Pharmacy	Competency Standards for Pharmacists in Australia 2003	2003	Pharmaceutical Society of Australia
Podiatry	Podiatry Competency Standards for Australia and New Zealand	2009	Australian and New Zealand Podiatry Accreditation Council

The following sections outline the responses received from the six comparable Australian healthcare disciplines regarding the way in which their standards have been developed, the purposes for which they are currently used and other relevant information.

3.4.1 Overview of uses of standards

Table 5 provides an overview of the standards for the disciplines of nursing (including registered nurses, midwives and nurse practitioners), occupational therapy, optometry, pharmacy, physiotherapy and podiatry, respectively. The table indicates the applications for each set of standards and characterises the level of specificity of the CBS for each discipline.

Table 5: Overview of Australian health professional standards

Health discipline	Level of specificity within standards	Applications for which standards are used			
		Accreditation of courses	Basis of entry-level examination	Registration of practitioners	Guidance for professional development
Nursing – Registered Nurse	Not very specific. Nursing is so broad a field that it is considered more appropriate to provide a decision-making framework rather than prescriptive standards. The standards are expected to provide guidance on professional competency rather than a list of tasks.	Yes, some universities use standards when developing curricula, but there are eight different mechanisms for accrediting courses in Australia.	Students are meant to be assessed against these standards, but this does vary. There is some self-assessment by students against these standards.	Registration of entry-level practitioners is based on passing an accredited course. The low rate of graduate nurses facing disciplinary action by regulatory boards is seen as a validation of accredited courses producing graduates that are worthy of registration.	No. These standards are only for entry-level registrants. There are separate requirements for registered nurses to maintain their registration status. Also, specialist groups have developed standards for building on these basic competencies.
Nursing – Midwifery	Midwifery is a more narrowly defined profession than nursing and therefore the standards do not have to take account of the same breadth of practice. The competencies are fairly general, but cues are provided to give examples of competent performance.	These standards are intended to be used by universities in developing their courses and assessment.	There is no entry-level examination, but standards are intended to be used as the basis of assessing students.	Expected to be used by state/ territory registration authorities to assess: <ul style="list-style-type: none"> • Competence as part of the annual renewal of license • Overseas midwives • Midwives returning to work after breaks in service 	Not explicitly designed for this purpose.
Nursing – Nurse Practitioner	The standards are framed quite differently to the other nursing competencies in terms of the focus on three cores areas: dynamic practice, professional efficacy and clinical leadership.	Yes (universities use standards when developing curricula).	No information obtained on this aspect.	Yes.	Yes (Professional conduct matters).
Occupational Therapy	Standards are written around core elements of practice.	Yes	No. However, a number of universities require their students to prepare a portfolio	Yes - but in a general sense only.	Yes and for performance review by some OT managers.

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			that demonstrates how they meet the competencies as a final assessment task.		
Optometry	Standards are quite detailed in the elements and associated performance indicators that are provided.	Yes. Part of the accreditation manual for Australian university courses makes reference to student assessment against competency standards.	The Competency in Optometry Examination tests the ability of the candidate in the areas addressed in the CBS.	No information obtained on this aspect.	The CBS list the minimum standards of knowledge, skills and attitudes that a new graduate entering employment as an optometrist needs to meet, to perform to an appropriate standard in the workplace.
Pharmacy	These standards have an extra level compared to most other standards.	They are intended for this use, but not sure of the extent to which they are used.	They are intended for this use, but not sure of the extent to which they are used.	They are intended for this use, but not sure of the extent to which they are used.	They are intended for this use, but not sure of the extent to which they are used.
Physiotherapy	The standards are framed in relation to scopes of practice (rather than levels of practice) and are intended to allow practitioners to take account of the context, complexity and types of patients.	Yes, but the accreditation framework is very outcome focussed, rather than being very prescriptive.	There is no entry-level examination, but standards are intended to be used as the basis of assessing students.	Yes, but mainly in that students who pass a course accredited against these standards gain their registration. The standards are also used to assess overseas trained professionals for registration in Australia.	No, the Australian Physiotherapy Association (APA) sets the levels for career development. However, performance assessment by employers is based on the standards.
Podiatry	The domains and elements of the standards are quite high-level in their descriptions. There are a large number of performance criteria provided for each element of the standards.	Yes. There are also accreditation standards for programs.	There is no entry-level examination, but standards are intended to be used as the basis of assessing students.	Yes.	These standards are only for entry-level practitioners; continuing professional development is the mechanism for ensuring practitioners continue to improve their competencies over the years.

3.4.2 Nursing

Process for developing the standards

Registered Nurse

The national competency standards for the registered nurse were first developed by the ANMC in 1990. The ANMC suggests the standards are regularly reviewed and validated to ensure they remain reflective of the evolving roles, scopes of practice and legislative requirements for nurses.

Midwives

The ANMC commissioned a national research project in 2004 to examine the role and scope of practice of the Australian midwife and to develop the CBS as well ⁽⁴⁰⁾. The project commenced with a literature review and the development of a draft document. Wide ranging consultation then proceeded using a range of techniques (including workshops and key informant interviews). The draft CBS were then validated by observing the use of the standards at seven sites, which were chosen to provide a broad representation from metropolitan (tertiary and non-tertiary centres), rural and remote settings, private, public and independent centres.

Nurse practitioner

The nurse practitioner standards were developed as part of a research project that sought to articulate the role of the nurse practitioner in Australia and New Zealand in 2004⁽⁴¹⁾. The study consisted of a literature review and in-depth interviews with a range of authorised nurse practitioners in Australia and New Zealand. Having described the core role of the nurse practitioner, the researchers then synthesised their findings into competency framework and a set of competency standards.

Process for reviewing the standards

The CBS for registered nurses were reviewed in 2005. The aims of the review were to:

- Review the ANMC Competency Standards for the Registered Nurse (RN);
- Analyse issues affecting competency standards for the RN; and
- Produce generic description of the RN on entry to practice.

The review was conducted in two phases. The first phase consisted of a national and international literature review, a survey, teleconference and focus groups which produced a draft version of the existing standards. The second phase involved verification of the draft version through teleconferences and written submissions.

The standards have yet to be reviewed for midwives and nurse practitioners.

Other insights

The review of the RN standards revealed some interesting issues that remain to be addressed, including:

- The need for competency standards to be sufficiently dynamic to accommodate the RN's role in a changing health care environment.
- The interrelationship between competency standards, nursing practice and nursing regulations.
- The complexity of undertaking competency assessments.

The revised standards were generally welcomed as being broad and principle-based; however – paradoxically – greater assistance was also sought in using them in practice. Following analysis of international nursing literature, a number of potential solutions were identified:

- Develop more detailed and structured models of standards, elements and cues that particularly apply to education for entry to practice.
- Continue to have broad and principle-based competency standards and develop detailed guides/tools to assist application at the organisational level.

- Redesign the approach to standards for nursing practice to highlight a closer articulation with the code of conduct and scope of practice documents. This could include greater emphasis on competency standards and competency assessment at the point of entry to practice.

3.4.3 Occupational Therapy

Process for developing the standards

The 1994 standards were developed through a profession-wide consultation process, with verification through observation of graduate occupational therapists within the first two years of graduation.

Standards were developed around core elements of practice. In the 1994 document, cues were provided that were meant to be potential examples of prompts for different areas of practice.

Process for reviewing the standards

A review is currently being undertaken through a funded project (a combination of external funds and funds from the professional association) by a team from the University of Queensland. The research team has a steering committee and reference group to drive it; the team has conducted focus groups nationally to find out about the required updates to the standards, and is now refining the standards through two rounds of broad consultation. The draft revised standards for consultation will be posted on the AAOT website in the near future.

Other insights

Originally there was a vision for the standards to be followed up with the development of a specific strategy for assessment of competence, however this has not occurred to date.

The AAOT also noted that developing and/or revising competency documents is time-consuming and expensive, and relies on significant unpaid input by members of the profession.

3.4.4 Optometry

Process for developing the standards

Entry-level competency standards for optometry were first developed in 1993 with the aim of describing the skills and knowledge an optometrist required to be regarded as sufficiently qualified to be registered to practice optometry in Australia⁽⁴²⁾. These standards were revised in 1997 to reflect the growing scope of the profession and to incorporate modifications identified through the experience of implementing the standards.

Process for reviewing the standards

Documentation was circulated to over 80 optometrists in all Australian states, as well as members of registration boards, seeking suggestions about how the standards should be amended to reflect current expectations for entry-level to the profession and the requirements for therapeutic endorsement.

Other insights

The latest review of the optometry CBS did not add any additional domains, but did add three new elements and 23 new performance criteria. An attempt has also been made to present the standards in a manner which is more meaningful and practical for the profession.

3.4.5 Pharmacy

Process for developing the standards

The standards were first developed in 1994. Another iteration of the standards was completed in 2001. A major review was undertaken in 2003, in which all the major stakeholders from within the pharmacy profession participated. This culminated in the publication of a further revised CBS.

Process for reviewing the standards

A review of the CBS is currently in progress, using the same process as the 2003 review. Consultation on the revised standards will be at the discretion of members of the review steering committee. The process will not be completed until late 2010.

The Pharmaceutical Society of Australia (PSA) has indicated the new national registration board for pharmacy has adopted the 2003 standards and will examine the 2010 revised standards when they are finalised. It is anticipated the board will adopt the new standards.

Other insights

The PSA has not yet identified a suitable method to evaluate how the CBS are actually being used. Some anecdotal evidence suggests those using the standards do not deviate much from the suggestions made in the evidence guide that accompanies the standards. In fact, the PSA suggests that if these were not provided, then it would be difficult for clinicians to know how to operationalise the standards.

The PSA has acknowledged one of the areas where improvement is required is in educating the profession on the suitable methods for applying the standards within practice. Furthermore, the standards may need development in addressing the issue of multidisciplinary approaches to clinical practice.

3.4.6 Physiotherapy

Process for developing the standards

The original standards were developed in 1994. There was a minor review after five years and a major review undertaken in 2004.

Process for reviewing the standards

The review of the original standards was conducted by a consultant and no report was prepared.

For the 2004 review, an external consultant (a non-physiotherapist) was engaged to assist the profession in considering both content and format of the existing standards and developing new standards. The process included a nationwide consultation involving meetings and forums, as well as submissions and surveys.

Other insights

The Australian Physiotherapy Council (APC) is very careful to make a distinction between CBS and their standards, which they do not consider to be competency-based. Rather, the physiotherapy standards are intended to provide the profession with a benchmark for the knowledge, skills and attributes of a safe and effective entry-level physiotherapist.

The standards are presented in a modular format, to allow those sections that require more frequent updating to be reviewed independently of other sections.

The APC believes the standards are being used as intended, probably reflecting the extensive consultation process that went into developing the revised set of standards.

3.4.7 Podiatry

Process for developing the standards

The standards were originally created in 1994. They are reviewed every three years. A report on the evaluation of the 1994 standards was prepared; this report was requested, but never received.

Process for reviewing the standards

In the 2008-2009 competencies revision work, a three-stage process for updating the Australian and New Zealand Competency Standards was utilised. This included a review of the competency standards by a working group, a workshop to develop new standards and wider

consultation with podiatrists working in a variety of settings. The new standards have subsequently been trialled prior to finalisation and ratification.

Other insights

Continuing professional development is the mechanism used by the profession to ensure practitioners continue to develop and improve their competencies throughout their career.

3.5 Summary of findings

This overview of CBS for MRPs in overseas jurisdictions and in comparable Australian health professional disciplines indicates there is a diversity of approaches in relation to developing, implementing, reviewing and revising CBS. Similar insights were gained from interviews with key informants.

While no *gold standard* has been identified in terms of a method for developing and revising CBS, there are several key themes that emerge from the information collected.

- The processes employed to review competency standards have generally involved gathering a wide representation of views from within the relevant professions. It is also apparent there is a need for broad buy-in from the profession for the end-product to be widely accepted and used.
- Most professions have a commitment to reviewing their CBS on a maximum five-yearly cycle.
 - The length of review cycle will be largely dependent on the depth of the review and revision intended. That is, if only minor revisions are expected, the process could take up to one year and could be conducted every three years. On the other hand, if major revisions to structure and content are expected, the process is likely to take closer to two years and would be conducted every five years.
 - The length of review cycle will also reflect the rate of change within the profession. The more volatile the environment and the nature of clinical practice, the more difficult it will be to develop standards that are long-lasting. As a technology-centred profession, medical radiation practice has been through considerable change (and will continue to change as technologies develop) and therefore more frequent and in-depth review may be necessary, balanced against the potential counter-productivity of *review fatigue*.
- A number of professions are undertaking a review of their CBS at this time. There may be some lessons to be learned from these other processes, although it might be difficult to coordinate activities in MRS with those in other professions.

The preceding discussion has focussed on the process of review, which can be as large or as small as deemed appropriate. The deciding factor is how much the standards need to be revised and the following section details comparison between the current Australian MRP CBS and their counterparts in other jurisdictions and other Australian health professions. This may provide a useful starting point in determining the extent to which the Australian MRP CBS need to be revised.

4 Direct Comparison of the Competency Based Standards

4.1 Overview of information collected

As described in Section 1.3.3, each set of CBS to be used in the comparisons was reviewed and tabulated according to the NOOSR hierarchy (see Appendix 2). The purpose of this exercise was to enable comparisons between components of each set of standards, to examine similarities and differences in both structure and content as a guide to what might be most appropriate for the Australian MRP CBS.

In the comparisons between MRP CBS in different jurisdictions, a more detailed level of comparison was appropriate, since the professional references are more likely to be common. On the other hand, the comparisons with other Australian health professions were undertaken at a higher level, since the specifics of each profession made comparisons at lower levels not particularly meaningful. In both cases, the process of alignment was assisted by reviewing statements at a lower level of the NOOSR hierarchy than is presented in the comparison documents, to ensure the intent of the statements being compared was understood.

The comparisons were initially completed in table format (presented in Appendix 3) and then translated into diagrams showing the alignment. The following sections discuss the alignment of Australian MRP CBS with other jurisdictions and other professions, respectively.

4.2 Comparison between Australia and overseas jurisdictions for MRP

In making sense of the direct comparisons between jurisdictions, an important point relates to the *concentration of alignments* between the two sets of standards. In this section, the alignments are presented in two diagrammatic versions. The first diagram for each overseas comparison (which is presented in Appendix 4 owing to the large size of the diagram) shows the linear relationship between elements in each CBS; the second diagram shows the alignment in matrix format. Both versions are presented because the linear diagrams show the text of the elements being compared, whereas the matrix version is an overall representation of the alignment that is less detailed but more easy to interpret.

In the linear representation, as a general principle, the more lines emanating from a given element in one set of standards, the more the concepts that are embodied within that element are distributed across the other set of standards. This implies each of the jurisdictions views those professional competencies differently. On the other hand, a one-to-one alignment between two elements indicates that both jurisdictions are encapsulating the same qualities, skills and knowledge in that element.

In the matrix representation, the number of shaded fields a given element from one CBS corresponds to in the other CBS provides an indication of whether there is a one-to-one or one-to-many alignment.

Canada

Figure 1 (see Appendix 4) and Figure 2 (overleaf) show the comparison between the Australian and Canadian MRP CBS. For this comparison, the Canadian competency profile for radiation therapy is cited, although the Canadian competency profile for radiological technology was also examined. The two competency profiles do not differ significantly in the four domains considered in the following discussion.

The Canadian CBS includes four domains that do not correspond particularly well to the five domains of the Australian standards. For example, *professional practice* in the Canadian standards maps across all five Australian domains, with major overlaps in *professional and ethical practice* and *care and clinical management*. Similarly, *radiation health, safety and protection* maps across three Australian domains, *quality management* maps across four Australian domains and *patient management* maps across three Australian domains. The Canadian competency profiles also include other domains that are very task-specific for the components of daily practice of MRPs, which have no counterpart in the Australian standards.

As the figures show, most of the elements in the Australian domains of *knowledge and understanding*, *critical thinking and evaluation* and *lifelong learning* have only single linkages to elements within the Canadian standards. In contrast, the elements in the Australian domains of *professional and ethical practice* and *care and clinical management* tend to map to multiple elements in the Canadian CBS.

Australia		Canada																	
		Professional practice							Patient management					Radiation health, safety and protection		Quality mg'tment			
		A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	C1	C2	C3	C4	D1	D2
Knowledge and understanding	1.1																		
	1.2				■														
Critical thinking and evaluation	2.1	■						■	■	■	■								
	2.2	■																	
	2.3	■						■											
	2.4					■													
	2.5		■						■		■	■		■					■
Professional and ethical practice	3.1				■					■									
	3.2	■	■																
	3.3	■	■	■															
	3.4	■	■						■	■				■	■	■	■		
	3.5	■	■	■					■	■		■	■	■	■	■	■	■	■
	3.6	■	■						■	■		■	■	■	■	■	■	■	■
Care and clinical management	4.1	■	■	■					■	■	■			■	■			■	
	4.2	■	■	■					■	■	■								
	4.3	■	■	■					■	■	■								
	4.4	■	■						■		■								
Lifelong learning	5.1				■														
	5.2			■	■														
	5.3					■													■

Figure 2: Matrix comparison of Australian and Canadian MRP CBS

Other specific points of note include:

- The only alignment for the Australian domain of *knowledge and understanding* with the Canadian standards is to *professional practice* (where the Australian element *clinical skills and practice* aligns with the Canadian element of *participate in professional development*).
- The Canadian element *understand the application of resource management principles* (within the domain of *professional practice*) has no counterpart in the Australian standards.
- The Australian element of *key knowledge concepts* (within the domain of *knowledge and understanding*) has no counterpart in the Canadian standards.

- *Quality management* is a domain in the Canadian standards, whereas it is covered by elements within four domains in the Australian CBS.
- The Canadian standards have elevated issues associated with radiation health and safety to the level of domain, whereas these issues are dealt with in the Australian standards as performance criteria that satisfy the objectives of several elements within the domain of *professional and ethical practice*.

United Kingdom

Figure 3 (see Appendix 4) and Figure 4 show the comparison between the Australian and UK MRP CBS.

Australia		United Kingdom					
		Expectations of a health professional		The skills required for the application of practice			Knowledge, understanding and skills
		1(a)	1(b)	2(a)	2(b)	2(c)	3(a)
Knowledge and understanding	1.1						Brown
	1.2						
Critical thinking and evaluation	2.1			Orange			
	2.2						
	2.3						
	2.4						
	2.5						
Professional and ethical practice	3.1	Yellow			Yellow		
	3.2						
	3.3		Yellow				
	3.4	Yellow					Yellow
	3.5						
	3.6					Yellow	
Care and clinical management	4.1	Orange	Orange				
	4.2		Orange				
	4.3	Orange					Orange
	4.4		Orange	Orange	Orange		
Lifelong learning	5.1	Pink				Pink	Pink
	5.2		Pink				
	5.3						Pink

Figure 4: Matrix comparison of Australian and UK MRP CBS

As is immediately apparent from the figure, the UK standards are much less detailed than the Australian CBS, with only three domains and six elements in total. This drills down to 25 performance criteria for the UK standards, as compared to 70 performance criteria defining the Australian standards (see Appendix 2). It is also apparent that all elements in the Australian CBS have counterparts in the UK standards.

Specific points of note include:

- There is very good correlation between the Australian domain of *critical thinking and evaluation* and the UK domain of *the skills required for the application of practice*.
- As there are only six elements in the UK standards, all of the UK elements map one-to-many, whereas eight of the Australian elements (40 percent) map one-to-one with their UK counterparts.
- Although both sets of standards include a domain covering knowledge and understanding, the UK domain actually maps across four of the Australian domains. In contrast, the Australian domain of *knowledge and understanding* only maps to the UK domain of *knowledge, understanding and skills*.
- Similarly, the Australian domain of *critical thinking and evaluation* only maps to the UK domain of *the skills required for the application of practice*, while this UK domain maps to four of the Australian domains.

New Zealand

Figure 5 (see Appendix 4) and Figure 6 (overleaf) show the comparison between the Australian and NZ MRP CBS.

The outstanding feature of the NZ CBS is the domains appear to reflect the workflow a clinician would expect to undertake in daily practice. For example, in the domain of *imaging requirements*, the five elements are: *interpret request form; evaluate patient compatibility with protocols and imaging requirements; obtain informed consent; ensure patient preparation; and recognise the need to consult*. While the Australian standards are focused on the *skills* of the practitioner, the NZ standards are more about what the practitioner *does*.

This difference in the approach is very much in evidence in the comparisons shown in Figure X. Seven of the ten NZ domains map across three or more of the Australian domains. Similarly, the Australian domains map across a minimum of four and a maximum of nine of the NZ domains. This makes comparison between the two sets of standards difficult, because a general standard can underpin many specific standards, but it is not possible in this type of analysis to know whether the intent is necessarily the same.

Other specific points of note include:

- There are seven elements within the NZ standards that have no counterpart in the Australian CBS.
- The NZ domain of *management* only maps to the Australian domain of *critical thinking and evaluation*.
- The NZ standards have elevated communication to the level of domain, whereas communication is covered by all domains of the Australian CBS.
- There is a more of a focus on quality in the NZ standards - where *quality service management* is a domain – while quality is an element within three domains of the Australian standards.

United States

Figure 7 (see Appendix 4) and Figure 8 show the comparison between the Australian and US MRP CBS.

		United States																					
		Radiography clinical performance standards								Radiography quality performance standards								Radiography professional performance standards					
Australia		2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	4.1	4.2	4.3	4.4	4.5	4.6
Knowledge and understanding	1.1																						
	1.2																						
Critical thinking and evaluation	2.1																						
	2.2																						
	2.3																						
	2.4																						
	2.5																						
Professional and ethical practice	3.1																						
	3.2																						
	3.3																						
	3.4																						
	3.5																						
	3.6																						
Care and clinical management	4.1																						
	4.2																						
	4.3																						
	4.4																						
Lifelong learning	5.1																						
	5.2																						
	5.3																						

Figure 8: Matrix comparison of Australian and US MRP CBS

The US standards have a very different format and approach to the Australian standards and comparison is only relevant for standards 2, 3 and 4 of the US document. Those three standards cover *clinical performance*, *quality performance* and *professional performance*, respectively. Sections 2 and 3 of the US standards incorporate the same eight elements (assessment; analysis/determination; education; performance; evaluation; implementation; outcomes; and documentation) as they apply to clinical or quality performance.

Similar to the NZ standards, the US standards adopt a more task-oriented approach than the Australian CBS and this produces a more diffuse alignment of the two sets of standards. Indeed, the *clinical performance* and *quality performance* domains map across four of the five domains of the Australian CBS (see Figures 7 and 8) and the *professional performance* domain maps across all five Australian domains. Similarly, with the exception of *knowledge and understanding* (which maps to only one domain of the US standards), the other four Australian domains map across all three of the US CBS domains.

A specific point to note is two of the elements in the *quality performance* standard have no counterpart in the Australian standards.

4.3 Comparison between Australian MRP and other Australian health disciplines

There are two aims in undertaking comparisons between the Australian MRP CBS and the CBS in other Australian health professions, namely:

- To identify where there is commonality in approach in the specification of domains; and
- Where there is a divergence in approach, to identify potential new domains that could be considered for inclusion in a revised Australian MRP CBS.

In this section, only linear alignment diagrams are presented for each comparison (i.e. matrix comparisons are not presented). The diagrams are presented in Appendix 5.

Nursing – Registered Nurse

Figure 9 (see Appendix 5) shows the comparison between the Australian MRP CBS and the CBS for Australian registered nurses (RN).

The four domains specified within the RN competencies (*professional practice; critical thinking and analysis; provision and coordination of care; and collaborative and therapeutic practice*) all map to domains within the Australian MRP CBS, although none map to the MRP domain of *knowledge and understanding*.

Interestingly, the terminology between the two sets of standards is quite closely matched. Three of the RN domains have almost identically worded domains in the MRP CBS (e.g. the RN domain *professional practice* has a counterpart *professional and ethical practice* in the MRP domain). The exception is the RN domain *collaborative and therapeutic practice*, which does not have a similarly worded domain in the MRP standards. The concept of *collaboration* appears to have greater emphasis within the nursing profession than for MRP.

The format of the RN competencies is straightforward and relatively easy to follow, and is simply presented. The major noteworthy features are:

- The introduction that precedes the description of the standards is kept to a minimum, totalling just two pages of text.
- Although illustrative examples are provided, they are not specifically identified as such. This may give cause confusion for the reader as to what these statements constitute.
- The inclusion of a glossary at the end of the standards is a useful feature.

Nursing – Midwives

Figure 10 (see Appendix 5) shows the comparison between the Australian MRP CBS and the CBS for Australian midwives.

The four domains contained in the midwifery CBS all map to domains within the MRP CBS, although none map to the MRP domains of *critical thinking and evaluation* and *lifelong learning*.

Another interesting feature of the comparison is that the MRP domain of *professional and ethical practice* maps to three of the midwifery domains (*legal and professional practice; reflective and ethical practice; midwifery as primary health care*). This, together with the non-inclusion in the midwifery CBS of any elements relating to critical thinking and lifelong learning, suggests the midwifery standards are more focussed on the issues of professional and ethical practice.

The format of the Australian midwifery CBS is almost identical to the Australian RN standards; the only notable difference is that cues (illustrative examples) are clearly identified for each element within the midwifery standards.

Nursing – Nurse Practitioner

Figure 11 (see Appendix 5) shows the comparison between the Australian MRP CBS and the CBS for Australian nurse practitioners (NP).

The NP standards were developed in quite a different manner to the other two nursing CBS – and much more recently – and this is reflected in the three high-level domains that map one-to-one to with three of the MRP domains. None of the NP domains map to the MRP domains of *knowledge and understanding* and *lifelong learning*.

One interesting feature of the NP standards is the title of each domain (termed *standard* in the NP CBS) provides a very detailed description of what is covered by that domain, e.g. *dynamic practice that incorporates application of high level knowledge and skills in extended practice across stable, unpredictable and complex situations*. The CBS document also includes a preamble that provides a fulsome description of the core components of each standard.

The format of the NP CBS is similar to the other nursing standards, including the use of a glossary. However, unlike the other nursing CBS, the NP standards make use of *performance criteria* for each element, as opposed to cues/indicative examples.

Occupational Therapy

Figure 12 (see Appendix 5) shows the comparison between the Australian MRP CBS and the CBS for Australian occupational therapy (OT).

The OT CBS incorporate seven competency domains, all of which map to at least one domain within the MRP CBS, although none map to the MRP domain of *knowledge and understanding*. Five of the OT domains map one-to-one with their MRP counterpart. In contrast, the four MRP domains that have OT counterparts map to more than one OT domain. This suggests a narrower focus to the OT domains compared to the MRP domains.

Although the existing document (based on the original 1994 CBS) is not particularly easy to follow from a layout perspective (this is currently under review), the most noteworthy aspect of these standards is their utilisation of all levels of the NOOSR hierarchy, including cues and range indicators.

Optometry

Figure 13 (see Appendix 5) shows the comparison between the Australian MRP CBS and the CBS for Australian optometry.

The optometry CBS incorporate six competency domains, all of which map to at least one domain within the MRP CBS, although none map to the MRP domains of *critical thinking and evaluation* or *lifelong learning*. Three of the optometry domains map one-to-one with their MRP counterpart. In contrast, two of the three MRP domains with optometry counterparts map to more than one optometry domain. Furthermore, the MRP domain of *care and clinical management* maps to five of the six optometry domains and the MRP domain *professional and ethical practice* maps across three of the optometry standards. This suggests these are themes running across most of the optometry standards.

The format and layout of the optometry standards are very clear and make it easy for the reader to align related elements, performance criteria and suggested indicators. The standards also clearly make a distinction between universally applicable competencies, as opposed to those that apply specifically to therapeutic aspects of practice.

Pharmacy

Figure 14 (see Appendix 5) shows the comparison between the Australian MRP CBS and the CBS for Australian pharmacy.

The pharmacy CBS incorporate eight competency domains, seven of which map to at least one domain within the MRP CBS. The pharmacy domain of *prepare pharmaceutical products* has no counterpart in the radiography CBS (not surprisingly) and the MRP domain of *knowledge and understanding* has no counterpart in the pharmacy CBS. Four of the pharmacy domains map one-to-one with their MRP counterpart. In contrast, three of the four MRP domains with pharmacy counterparts map to more than one pharmacy domain.

The pharmacy standards are presented in a very comprehensive and clear format. There is considerable detail in the preamble about the professional context for the standards, how the standards might be applied (and to which professional sub-groups), the structure of the document (including an explanation of each level of the hierarchy that is utilised), a guide to using the standards and a glossary of terms.

The standards themselves are clearly set out in two formats within the document. The abridged version includes elements, sub-elements and performance criteria for each domain. The full version provides complete details of the domains, elements, sub-elements, performance criteria, evidence guides and range of variables.

Physiotherapy

Figure 15 (see Appendix 5) shows the comparison between the Australian MRP CBS and the CBS for Australian physiotherapy.

It should be noted the Australian Physiotherapy Council are very careful to make a distinction between CBS and their standards, which they do not consider to be competency-based. This comes from their view of physiotherapy as a *profession*, as opposed to a *vocation*.

The physiotherapy standards incorporate nine domains (termed *standards*), eight of which map to at least one domain within the MRP CBS. The physiotherapy domain of *develop a physiotherapy intervention plan* has no counterpart in the MRP CBS (again, not surprisingly) and the MRP domain of *knowledge and understanding* has no counterpart in the physiotherapy standards. Seven of the physiotherapy domains map one-to-one with their MRP counterpart. In contrast, three of the four MRP domains with physiotherapy counterparts map to more than one physiotherapy domain. Of particular note is the MRP domain of care and clinical management, which maps to four physiotherapy domains, suggesting the physiotherapy standards are generally more narrowly focussed than the MRP standards.

Similar to the pharmacy standards, the physiotherapy standards are very well presented, with relevant contextual and background information. There is also a guide that explains the format of the standards for easy interpretation. The standards and their elements are initially tabulated and then each standard is presented individually with more detail down to the level of performance criteria. The final section of document includes a very helpful guide to methods of assessment that might be relevant to each standard.

Podiatry

Figure 16 (see Appendix 5) shows the comparison between the Australian MRP CBS and the CBS for Australian podiatry.

The podiatry CBS incorporate eight competency domains, seven of which map to at least one domain within the MRP CBS. The podiatry domain of *develop a patient/client-focussed management plan* has no counterpart in the MRP CBS. Unusually amongst the comparisons between the MRP CBS and the CBS of other professions, all of the MRP domains map to at least one podiatry domain. Four of the podiatry domains map one-to-one with their MRP counterpart. In contrast, four of the five MRP domains map to more than one podiatry domain.

In terms of how the standards are presented, the podiatry document is not quite as comprehensive or clear as, for example, the pharmacy and physiotherapy documents, although many of the same features are present. As with the physiotherapy standards, the standards and their elements are initially tabulated and then each standard is presented individually with more detail down to the level of performance criteria and examples of evidence. The final section of the document addresses assessment issues.

4.4 Summary of findings

Summary of MRP comparisons

Three of the overseas CBS examples included in this analysis (Canada, NZ and US) focus to a greater or lesser extent on domains of activity or, as in the case of NZ, on specific tasks. Thus

while these standards require the practitioner to demonstrate particular skills or knowledge, they tend to deal separately with the domains or tasks in which these skills or knowledge are applied. In contrast, the Australian and UK standards don't distinguish between the types of activities to which a generic skill might be applied. Moreover, Canada, NZ and US have separate CBS for different modalities within the MRP profession, the major difference between the various documents for each jurisdiction being the tasks specific to each modality that are included in each modality's CBS.

This comparison demonstrates there is quite a different approach possible to the current Australian MRP CBS that could address the criticism that has been levelled at the Australian CBS, namely they are insufficiently detailed to be of practical use.

There are a small number of elements in overseas jurisdictions that have no counterpart in the Australian CBS, specifically:

- Understand the application of resource management principles (Canada)
- Minimise potential hazards – chemical (NZ)
- Minimise potential hazards – physical (NZ)
- Minimise potential hazards – electrical (NZ)
- Prepare equipment for use (NZ)
- Use ancillary equipment (NZ)
- Use processing equipment (NZ)
- Demonstrate stock control measures (NZ)
- Implementation (The practitioner implements the quality assurance action plan for equipment, materials and processes.) (US)
- Outcomes Measurement (The practitioner assesses the outcome of the quality management action plan for equipment, materials and processes.) (US)

Whether these elements would be worthwhile inclusions in the Australian CBS is a matter for the profession to consider. However, it must be remembered these originate from standards that are more task specific than the current Australian standards and their inclusion would only be appropriate if the approach adopted for the Australian standards was significantly modified.

In terms of the stylistic presentation of the overseas standards, there were no formats that were clearly an improvement over the current Australian documentation. The use of colour to distinguish information relevant to different professional sub-groups within the UK standards was useful and could be considered for the Australian standards.

In terms of a consensus amongst the four international jurisdictions and Australia, all jurisdictions have a domain that refers in some way to professional practice. Three of the four overseas jurisdictions have elevated quality considerations to the level of domain (Canada, NZ and US). Those same three jurisdictions do not have a domain concerned with *knowledge and understanding*, instead treating this aspect of competency as an implicit component of the other competencies. Australia is the only jurisdiction to have a domain entitled *lifelong learning* (or the equivalent).

None of the international jurisdictions make use of examples to illustrate the range of variables (e.g. small rural setting compared to large metropolitan hospitals) that might impact on the required competency of the practitioner.

The final point that should be made is that this analysis reflects an "outsider's perspective" and might need some input or refinement by MRPs before any action is taken to change the Australian MRP CBS.

Summary of comparisons with other health professions

This comparison is most useful in identifying the extent to which domains of competence are broadly similar between professions. What is apparent from this analysis is the fact that only the domains of *professional and ethical practice* and *care and clinical management* have a counterpart in each of the other professions reviewed for this project. In contrast, the MRP

domain of *knowledge and understanding* has no counterpart in five out of the eight professions reviewed; the domain of *lifelong learning* has no counterpart in three of the other professions; and the domain of *critical thinking and evaluation* has no counterpart in two of the other professions. This might indicate that many of the other professions view the key aspects of knowledge and understanding as being prerequisites for obtaining an entry-level professional qualification, as opposed to competencies that must be acquired along the learning pathway. In the case of lifelong learning, some other professions may view this as an intrinsic expectation of being a health practitioner, rather than an acquired competency.

In terms of domains included in other professions' standards that have no counterpart in the current MRP CBS, none of these would necessarily be appropriate for consideration as potential additional MRP domains. This reflects the profession-specific and somewhat task-oriented nature of the un-aligned domains.

Another key finding of the analysis is that several professions have developed excellent formats for presenting their standards, which could serve as a template for the redesigned MRP CBS.

5 Discussion and Recommendations

5.1 Overview

This project sought to provide analysis to guide the redevelopment of the Australian MRP CBS. To this end, a comparison of the current Australian MRP CBS with its counterparts in other jurisdictions and in a range of other health professions in Australia was undertaken. To complement this analysis, a targeted literature review was conducted, to identify lessons learned from the implementation of CBS in general and in a range of health professions, including medical radiation practice.

The completion of the analyses documented in this report facilitates the development of recommendations on the conduct of the third phase of the project, which will address the third objective of the project brief (see Section 1.3.2). Therefore, this section will discuss the key findings from the analysis to draw out key recommendations relevant to the next phase.

5.2 Discussion of key findings

The literature review revealed there is still considerable debate about the value of CBS, as well as ongoing concern about the impact of such standards on the development of *holistic* professionals that strive for excellence. Additionally, there is a sense the purpose and potential applications of CBS are not widely understood, or being sufficiently exploited, within health professions. The lack of rigorous evaluation of existing CBS means there is no clear indication whether these standards have achieved their intended objectives, or what is required to ensure CBS fulfil their purpose.

Nevertheless, CBS continue to be developed and implemented. Indeed, for many health professions, their current CBS are in their second or third iteration. The reviews conducted in association with revision processes have highlighted the need for CBS to reflect changes in professional practice, as well as the fine balance between standards that are overly prescriptive versus those that are so broad as to be impractical. There is also ongoing concern about achieving a balance between technical competence (which is more easily measured) and those competencies that are not easily codified (such as psychological, creative or reflective skills). These issues have emerged to a greater or lesser extent across the spectrum of health professions and there appears to be no consensus on the solution.

Therefore, while the literature does not provide much specific guidance for reviewing the Australian MRP CBS, it points to some general issues that should be factored into the revision deliberations. These include:

- The level of specificity of the standards, striking an appropriate balance (as determined by the profession) between competencies that relate to adaptive skills and the ability to learn and refine practice, versus the specifics of knowing any particular technique.
- How the *range of variables* of practice (i.e. *indicators* as per Section 1.1) should be accommodated in the standards.
- What contextual information is required to assist practitioners and other users to operationalise the standards.
- Assessment – how the standards should be formulated so their intent is understood, thereby allowing appropriate assessments of competence to be made to ensure practitioners are fit for practice.

The interviews with key informants from the Australian MRP profession were mainly for the purpose of scene-setting and guidance for the conduct of the project. However, these conversations also yielded some insights into the issues confronting MRPs in Australia, which will serve as a backdrop to the revision process. Some of the key issues include debate about the ongoing role and structure of the PDY, the changing professional scope of MRPs (particularly in light of ever-changing technology and the emergence of multi-disciplinary health care), and the state-by-state variation in the organisation and management of the profession.

Some informants expressed the hope that the revised standards will address these professional issues. However, while these issues are significant, to a large extent their resolution must precede the revision of the MRP CBS, since the standards should *reflect* the policy decisions of the profession. It would be inappropriate to attempt to use the development of new CBS as a *de facto* mechanism for defining policy.

If these issues are not resolved ahead of the CBS revision process, they will sit as sub-text to the deliberations on the form and content of the standards. Indeed, some of these issues, if unresolved, could derail the process or result in an inappropriate process being conducted (e.g. working groups don't include appropriate representation, or insufficient breadth is given to the consultative discussions).

This discussion leads to the following recommendation.

Recommendation 1:

The medical radiation profession in Australia should address – and resolve – its outstanding professional issues as a prerequisite to undertaking a consultative revision process for the MRP CBS.

The comparisons between the Australian MRP CBS and standards in other jurisdictions and other health professions were conducted to identify features of those standards that could be adopted in revising the Australian standards. These features include the way the CBS are applied, the process for developing and reviewing the standards, the form and content of the standards, and any issues relevant to their implementation.

The first key finding was the length of time required to revise the standards and the extent of consultation necessary to achieve the desired objectives. In both medical radiation practice and other health professions, review processes were on the order of 12-24 months, largely dependent on the depth of the review/revision and the breadth of consultation. Profession-wide consultation was generally adopted, sometimes supplemented by arrangements involving expert panels. Informants generally indicated their respective professions engaged actively and positively with the process.

On this last point, it is interesting to note the in-house report on the recent process to review the PDY (i.e. the National Professional Development Programme Review; NPDP) indicated there was extensive participation in the early phases of the project, but engagement fell away in subsequent consultations on the draft recommendations. This could be due to many factors, as discussed in the report. However, this highlights an issue that must be factored into the proposed revision process, namely the possibility of encountering *review fatigue* if busy practitioners are required to engage in similar processes repeated over too short a cycle, or if they have to remain engaged over an extended period of time.

The conclusion from this analysis is the consultation process must facilitate sufficient engagement of the wider profession to ensure broad buy-in for the outcomes, without unduly burdening individuals with the tasks that will progress the process overall. Those tasks should ideally be the responsibility of a dedicated project team. It is important that consultation not be conducted for its own sake, but instead seek to maximise the value of the engagement.

This discussion leads to the following recommendation.

Recommendation 2:

The revision of the Australian MRP CBS should involve meaningful, timely, efficient, profession-wide consultation.

The second key finding was that none of the jurisdictions reviewed in this project have formulated their standards in a manner that represents (to a non-MRP) a more *rational* approach than has been adopted in the current Australian MRP CBS. Undoubtedly, other jurisdictions have distributed the elements that comprise their standards across different domains, but there is nothing to indicate the other approaches are more meaningful or useable than the Australian approach. In the course of revising the Australian standards, it is possible that medical radiation practitioners might form a view that specific elements should be included, deleted or amended based on overseas examples, or that elements could be positioned within different domains. This is rightly a decision that must be made by experts in the MRP profession and will be an essential component of the revision process.

The third key finding is that other jurisdictions and other health professions generally do not see *knowledge and understanding* and *lifelong learning* as domains of competence. To the extent the ideas encapsulated within these domains of the Australian MRP CBS are also covered by other CBS, they are elements within other domains. To a large extent, other CBS appear to treat these domains as *implicit* features of a health practitioner, as opposed to competencies that must be specified and measured. Therefore, in reviewing the Australian CBS, it will be necessary for the profession to revisit their shared understanding of what constitutes *competence*, so that appropriate domains can be delineated as a starting point for the revised MRP standards.

This discussion leads to the following recommendation.

Recommendation 3:

The revision of the Australian MRP CBS should commence with a discussion about the concept of competence as it relates to the profession, leading to delineation of appropriate domains of competence as the structural foundation of the standards.

The final key finding relates to the format and presentation of the standards. While none of the other jurisdictions' formats are particularly noteworthy, several of the Australian health professions make use of presentation styles that could be a useful template for the revised MRP CBS. To some extent, the format adopted for the revised standards will depend on decisions about issues such as whether there will be separate sets of standards for each professional sub-group (i.e. scope of practice) and how detailed the new standards will be (i.e. how much of the NOOSR hierarchy will be utilised, including *indicators* and *cues*). An important consideration will also be ancillary information that is to be included with the standards, such as the professional context for the standards, how the standards might be applied, the structure of the document (including an explanation of each level of the hierarchy that is utilised), a guide to using the standards and a glossary of terms. Another feature that could be included is a guide to methods of assessment that might be relevant to each standard.

This discussion leads to the following recommendation.

Recommendation 4:

The revision of the Australian MRP CBS should include consideration of the level of detail to be included in each standard (according to the NOOSR hierarchy) and the ancillary information that should accompany the standards, to improve the useability of the standards.

5.3 A process for revising the Australian MRP CBS

The preceding discussion summarises the major findings and recommendations from the analyses undertaken in this project, none of which provide a prescription for conducting the review of the Australian MRP CBS. Therefore, the protocol presented in this section represent an amalgamation of those findings and other relevant experience of the consultants in the conduct of evaluations and reviews.

The revision process should be conducted under the auspices of an appropriately constituted project steering group. A staged approach is recommended for the revision process, as outlined below.

Stage 1: Resolution of professional issues

A series of working groups is recommended to resolve specific questions or professional issues that must underpin the revised standards. The steps that need to be included in this process are:

- Identify key professional issues requiring resolution.
- Convene working groups to address each issue.
- Working groups seeks input on their issue (e.g. through written submissions or workshops).
- Working groups develop consensus/recommended position on their issue.
- Endorsement is sought from relevant professional bodies.

Ideally, each working group process should occur concurrently, to minimise the overall time taken to resolve professional issues, thereby allowing more time for the subsequent review of the standards. However, the reality may be that some of the issues are very complex and take longer to resolve and there may be cross-membership of some working groups. While it is important to resolve key issues, it is also important to progress the overall review and it is possible that some interim agreement may be necessary on some issues to maintain momentum.

These working groups should be supported by a project officer, who will also be responsible for progressing other stages of the review, and chaired by an appropriate individual appointed by the AIR.

Stage 2: Develop professional consensus on the overarching framework

The main purpose of this stage is to develop profession-wide consensus on the concept of *competence* as it relates to MRPs. This will provide a basis for agreement on appropriate domains of competence that will serve as the structural foundation of the standards.

It is recommended this discussion be conducted as either a national workshop or a series of state-based workshops, depending on the outcomes of deliberations in Stage 1 of the process. For example, if the profession decides each scope of practice should develop its own CBS, it may be prudent to have one national workshop for each scope of practice. The steps that need to be included in this process are:

- Determine the level at which workshops will be conducted.
- Identify appropriate participants.
- Develop agenda and materials to support the conduct of the workshops (this is likely to require expert input).
- Conduct workshops.
- Report findings/outcomes to the project steering group.

Stage 3: Review each domain of the standards

This stage is envisaged as including both expert panels and broad consultation across the profession. For each domain to be included in the revised standards, an expert panel

should be established, with appropriate membership from relevant sectors of the profession and chaired by an appropriate individual appointed by the AIR. Each panel will be tasked with developing a *starting position*, based on earlier resolution of professional issues as appropriate (Stage 1) and drawing on results of this review about appropriate elements and criteria to include in each domain.

Once the expert panels have completed this initial task, their outputs must be compiled and checked for any duplication, to create one coherent set of draft standards. In the first instance, duplication issues should be referred back to the relevant panels; if necessary, the project steering group may need to arbitrate.

The compiled draft standards will then be circulated across the profession, ahead of a series of state-based workshops through which feedback from stakeholders can be obtained. To facilitate the broadest possible consultation, a mechanism for individuals or organisations to provide written submissions should also be developed.

Following the workshops, a final draft of the revised CBS incorporating feedback from stakeholders will then be developed. A further round of consultation could be undertaken, depending on the extent to which the draft standards were amended following the first round of consultation.

The process for final endorsement of the revised standards is a matter for the profession to determine, and may be one of the issues discussed in Stage 1.

It is likely this project will take 15-18 months to complete, but the precise timing will depend to some extent on decisions taken in Stage 1 and the length of time required to reach those decisions. If a total of 18 months is allowed for the whole process, Stage 3 should be allocated 10-12 months of that time, which means Stages 1 and 2 should be completed within the first six months. It may be possible for there to be some overlap in the first two stages, depending on the order in which professional issues are resolved in Stage 1.

As noted under Stage 1, it is recommended that a project officer be appointed (or seconded) to support the conduct of this project. Once the project is underway, this is likely to be a full-time (or close to full-time) position, as the individual will be required to undertake a range of organisational and support activities to maintain the momentum of the project and ensure the various working groups and panels achieve their respective work plans. The project officer should have excellent organisational skills, research and writing skills, as well as an ability to work collaboratively across a range of stakeholders with differing interests and perspectives. It is not recommended an external consultant be engaged for this role, since they are unlikely to be available full-time and the cost will be much higher than if a fixed-term appointment is made. However, an external consultant could be engaged to facilitate the various panels and workshops. One advantage of engaging an external consultant – particularly if they are not from within the profession – is that this individual could provide independent, non-aligned mediation for the various processes.

This discussion leads to the following recommendation.

Recommendation 5:

The revision of the Australian MRP CBS should encompass a three-stage process overseen by an appropriately constituted project steering group and supported by a project officer.

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7 Appendices

7.1 Appendix 1: Project steering group and key informants

7.2 Appendix 2: Tabulated standards for radiography and other health professions

7.3 Appendix 3: Tabulated comparisons between Australian radiography CBS and standards for other jurisdictions or standards for other health professions

7.4 Appendix 4: Linear alignment of Australian radiography CBS and standards for other jurisdictions

7.5 Appendix 5: Linear alignment of Australian radiography CBS and standards for other health professions

7.1 Appendix 1: Project steering group and key informants

Table 6: Project steering group members

Name	Organisation
A/Professor Marilyn Baird	Head, Department of Medical Imaging and Radiation Sciences, Monash University
Ms Sharon Brackenridge	Chair, National Profession Development Programme Review
Mr David Collier	CEO, Australian Institute of Radiography
Ms Ingrid Egan	Chair, AIR (New South Wales Branch) Chief Radiographer, Northern Beaches
Ms Bronwyn Hilder	Chair, Professional Accreditation and Education Board Deputy Chief Radiation Therapist, Hobart

Table 7: Key informants consulted during the project

Name	Organisation	Area of expertise	Date of interview
Meagan Lines	Mona Vale Hospital	Diagnostic radiography	10 May 2010
Shane Dempsey	Newcastle University	Academic and PAEB member	10 May 2010
Rhonda Coleman	WA Department of Health	Radiation therapist	12 May 2010
Bruce Harvey	Barwon Health	Practicing diagnostic radiographer	12 May 2010
Charlotte Sale	Barwon Health	Radiation therapist and researcher	14 May 2010
Marilyn Baird	Monash University	Academic, President of Victorian Registration Board	17 May 2010
Roy Brown	University of Wollongong	Competency assessment in nursing	18 June 2010