



## RANZCR Submission to AHPRA Medical Radiation Practitioner Board Consultation on Professional capabilities for medical radiation practice

The Royal Australian and New Zealand College of Radiologists (RANZCR) is the leading professional organisation for the promotion of the sciences and practice of the medical specialities of Radiology (Diagnostic and Interventional) and Radiation Oncology in Australia and New Zealand.

Radiologists are medical specialists who are trained to assist other doctors and specialists to treat their patients by making a diagnosis and providing treatment using medical imaging. Radiologists have the medical knowledge to understand and explain a patient's medical problem or symptom through the images or pictures that are taken of various parts of the inside of the patient's body.

Radiation Oncologists are medical specialists who have specific postgraduate training in management of patients with cancer, in particular, involving the use of radiation therapy (also called radiotherapy) as one aspect of their cancer treatment. They also have expertise in the treatment of non-malignant conditions with radiation therapy. Radiation oncologists work closely with other medical specialists, especially surgeons, medical oncologists and palliative care physicians, as part of a multidisciplinary team caring for patients with cancer.

The focus of this submission is on the generic domains and capabilities, with some specific comments set out in domains 6A and 6B at this stage.

### RANZCR Responses to Questions for Consideration

The National Board invited comments and feedback from interested parties on the *Professional capabilities for medical radiation practice*.

1. Are the domains for the professional capabilities appropriate?

*Yes, however some of the capabilities are considered to be inappropriate to the scope of either the entry-level and/or more experienced medical radiation practitioners.*

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

*No*

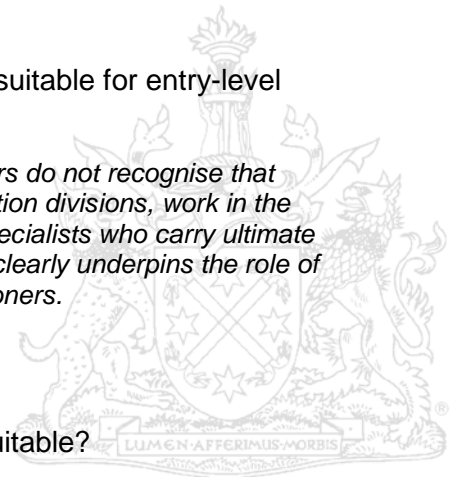
3. Are the descriptions of what a practitioner must be able to do suitable for entry-level practitioners?

*Not universally. It is of concern that the Domains and their descriptors do not recognise that medical radiation practitioners, regardless of their individual registration divisions, work in the context of a multidisciplinary medical radiation team with medical specialists who carry ultimate professional responsibility for the provision of care to patients. This clearly underpins the role of MRPs, but is particularly important with regard to entry-level practitioners.*

*Specific concerns are set out in comments against the tables below.*

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

*Not universally – see comments below.*



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

*Descriptors identified below suggest that MRPs function in a manner that is independent of the medical radiation team led by the relevant medical specialist to the division of registration, rather than the wide range of clinical settings in which they work as members of a medical radiation team. As such, these descriptors do not reflect the role of MRPs in their range of clinical settings.*

6. Are the definitions of each domain appropriate?

*Not universally – see comments below.*

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

*No – please see comments below.*

8. Is the document clear?

*The document is clear, however some content items need to be reconsidered and revised as proposed below.*

9. Is the glossary correct and comprehensive?

*No comment.*

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

*Some items identified below would require individual registrants to operate outside the scope of practice for which they have been trained. Some of these requirements are also inconsistent with jurisdiction-based radiation regulations underpinned by internationally accepted radiation safety practices.*

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?

*No comment.*

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

*These are identified in the Domain tables below.*

Thank you for the opportunity to provide input to the AHPRA Medical Radiation Practitioner Board Consultation on Professional capabilities for medical radiation practice. Please contact the College at [ranzcr@ranzcr.edu.au](mailto:ranzcr@ranzcr.edu.au) or on 02 9268 9777 in relation to this submission.

## Domain 1: Professional and ethical conduct

This domain covers practitioners' responsibility to be professional and ethical, and practise within the current medico-legal framework. It also addresses their responsibility for ensuring that they maintain patient/client confidentiality and privacy at all times whilst recognising the need to be aware of their potential role as a patient/client or client advocate.

**Comment [R11]:** It is unclear how the MRP fulfils the role of "patient/client or client advocate", particularly at entry-level to the profession.

What registered practitioners must be able to do	Ways that this capability will be demonstrated at entry or re-entry to the profession
<p>1. Practise in a professional manner that is characterised by integrity, honesty and respect</p>	<p>a. Working knowledge of their legal responsibilities, particularly in respect to confidentiality, informed consent and duty of care.</p> <p>b. Identifying basic principles underpinning bio-ethics within medical radiation science practice:</p> <ul style="list-style-type: none"> <li>i. respect the rights of the individual</li> <li>ii. respect the autonomy of the individual</li> <li>iii. cause no harm, and</li> <li>iv. advance the common good.</li> </ul> <p>c. Practising in a way that engenders trust and confidence in the patient/client.</p> <p>d. Exercising appropriate levels of autonomy and professional judgement in a variety of medical radiation practice settings.</p>
<p>2. Apply the Medical Radiation Practice Board of Australia's <i>Code of conduct</i> to their practice</p>	<p>a. Applying the <i>Code of conduct</i> to their practice, including in relation to:</p> <ul style="list-style-type: none"> <li>i. providing good care, including shared decision making</li> <li>ii. working with patients or clients</li> <li>iii. working with other practitioners</li> <li>iv. working within the health care system</li> <li>v. minimising risk</li> <li>vi. maintaining professional performance</li> <li>vii. professional behaviour and ethical conduct</li> </ul>

What registered practitioners must be able to do	Ways that this capability will be demonstrated at entry or re-entry to the profession
	<ul style="list-style-type: none"> <li>viii. maintaining health and well being for practice, and</li> <li>ix. teaching, supervising and assessing.</li> </ul>
3. Manage their own mental and physical health, and responsibly determine their own ongoing fitness to practise	<ul style="list-style-type: none"> <li>a. Knowing the key elements of fitness to practise.</li> <li>b. Understanding the need to maintain an appropriate work/life balance to promote sound mental and physical health.</li> <li>c. Knowing when, under the National Law, a notification must be made for health reasons, including drug and alcohol abuse.</li> </ul>
4. Explain the legal responsibilities as a medical radiation practitioner	<ul style="list-style-type: none"> <li>a. Understanding what constitutes notifiable conduct for a registered health practitioner under the National Law.</li> <li>b. Understanding their mandatory reporting obligations under the National Law to notify AHPRA about the conduct, health or performance of another health practitioner that may be placing the public at risk, as well as of their own impairments to practice.</li> <li>c. Understanding other relevant legal issues and obligations.</li> </ul>
5. Provide each patient/client with an appropriate level of dignity and care which is culturally respectful, empathetic and non-discriminatory	<ul style="list-style-type: none"> <li>a. Understanding the influence of culture on patient/client attitudes and responses to medical radiation services.</li> <li>b. Having working knowledge of how the geographic, cultural, and socio-economic characteristics of the local community may impact on the health of individuals and their general access to health services, and medical radiation practice more specifically.</li> <li>c. Displaying appropriate professional behaviour in patient/client interactions, including empathy.</li> </ul>
6. Assume responsibility and accept accountability for their own professional decisions	<ul style="list-style-type: none"> <li>a. Recognising, and responding appropriately, to unsafe or unprofessional practice within their division of registration.</li> <li>b. Integrating organisational policies and guidelines with professional standards within their division of registration.</li> <li>c. Acknowledging the differences in accountability and responsibility between registered health practitioners, and licensed and unlicensed health care workers.</li> </ul>

What registered practitioners must be able to do	Ways that this capability will be demonstrated at entry or re-entry to the profession
7. Advocate on behalf of the patient/client, when appropriate within the context of the practitioner's particular division of registration	<ul style="list-style-type: none"> <li>a. Knowing the principles of patient/client advocacy and their application to the medical radiation practice.</li> <li>b. Recognising when it may be appropriate for them to intervene on the patient's/clients behalf.</li> </ul>

## Domain 2: Professional communication and collaboration

This Domain covers medical radiation practitioners' responsibility in utilising appropriate, clear and effective communication. It also addresses their responsibility for ensuring that they function effectively with other health practitioners at all times.

What registered practitioners must be able to do	Ways that this capability will be demonstrated at entry or re-entry to the profession
1. Communicate clearly, sensitively and effectively with patient/clients and their family	<ul style="list-style-type: none"> <li>a. Explaining techniques and procedures to the patient/client/interpreter in plain English, avoiding the use of professional jargon, whenever possible, to enable patients/clients and their family (when appropriate) to make informed decisions.</li> <li>b. Adapting explanatory statements to take into account patients'/clients' English competency, age and or health status, culture or gender.</li> <li>c. Recognising the importance of active listening in promoting patient/client autonomy.</li> <li>d. Understanding the impact of non-verbal communication on a patient/client's understanding of the procedure and how this can be affected by socio-cultural factors (age, gender and religious practices).</li> <li>e. Knowing when to use an interpreter to assist with communication.</li> <li>f. Using culturally competent communication, including with Aboriginal and Torres Strait Islander people.</li> </ul>
2. Communicate clearly and effectively with other health practitioners	<ul style="list-style-type: none"> <li>a. Recognising, prior to delivering a service, when it is necessary to communicate with the referring practitioner.</li> <li>b. Using an appropriate form of communication to engage with other health practitioners, including applying knowledge of departmental/practice protocols.</li> <li>c. Using the medical terminology appropriate to their division of registration.</li> <li>d. Communicating aspects of the patient's condition to other health practitioners, when it could impact on patient/client health outcomes.</li> <li>e. Providing the referring health practitioners with an informed professional opinion about any aspect of the technique or procedure that may assist in patient/client care management.</li> </ul>
3. Work collaboratively with other health care practitioners for the benefit of the patients/clients	<ul style="list-style-type: none"> <li>a. Having a good working knowledge of the relevant areas of the Australian health care system.</li> <li>b. Understanding the role of medical radiation division of registrations within the health</li> </ul>

**Comment [R12]:** This is considered to be outside the scope of independent MRP practice as they are not medically trained to assess the patient's condition other than in very general terms. It is not appropriate for entry-level MRPs.

**Comment [R13]:** MRPs are not trained to meet this capability and should seek the advice and direction of the relevant medical specialist responsible for the patient's care before offering an opinion to a referrer.

What registered practitioners must be able to do	Ways that this capability will be demonstrated at entry or re-entry to the profession
	<p>system.</p> <p>c. Understanding the role of other health professions.</p>
<p>4. Advise, when appropriate, other members of the health care team about the suitability and application of the proposed medical radiation procedure</p>	<p>a. Understanding the relative radiation risks and benefits to patients of the modalities/treatments used within their specific division of registration.</p> <p>b. Having a working knowledge of the efficacy of either current medical imaging modalities or therapy treatment options for the diagnosis and/or treatment of common clinical conditions.</p> <p>c. Recognising when it is appropriate to provide to advice to members of the health care team on the suitability of a proposed examination, therapeutic application or interaction and when it is appropriate to refer them to a medical specialist.</p>

**Comment [R14]:** This capability, which addresses justification of medical radiation exposure, is not appropriate. While it is helpful for the MRP to have an understanding of the relative benefits to patients of modalities/treatments in their specific division of registration, they are not trained medically to independently determine the appropriateness of a medical radiation intervention for the individual patient. This is the role of the medical specialist who has been trained to assess and determine the appropriateness of a medical radiation intervention for an individual patient. Further, medical radiation regulations require the medical practitioner responsible for the examination to justify the medical radiation intervention.

### Domain 3: Reflective practice and professional learning

This Domain covers the medical radiation practitioners' responsibility to engage in evidence based practice and to critically monitor their actions through a range of reflective processes. It also addresses their responsibility for identifying their ongoing professional learning needs and managing their mental and physical health in order to remain fit to practise.

What registered practitioners must be able to do	Ways that this capability will be demonstrated at entry and re-entry to the profession
1. Use the evidence based process to ensure that the patient/client receives the best possible diagnostic/therapeutic outcome	<ul style="list-style-type: none"> <li>a. Understanding the key elements of critical thinking, including skills in questioning, analysing, synthesising, interpreting, and cognitive reasoning and be able to communicate these to others when required.</li> <li>b. Applying critical thinking to resolve clinical challenges and problems within their specific medical radiation division of registration through the formulation of informed and justifiable clinical action plans.</li> </ul>
2. Improve and adapt professional practice by engaging in critical self-reflection, and integrating new experience and knowledge into their own practice	<ul style="list-style-type: none"> <li>a. Distinguishing between personal reflection as a purely introspective process and the process of critical self-reflection as part of improving own practice.</li> <li>b. Evidence of engagement in a recognised method of critical self-reflection.</li> </ul>
3. Critically appraise literature	<ul style="list-style-type: none"> <li>a. Understanding qualitative and quantitative methodologies commonly used in research within the specific medical radiation division of registration.</li> <li>b. Understanding how to match a medical radiation practice research question with a suitable research methodology.</li> </ul>
4. Identify their ongoing professional learning responsibilities	<ul style="list-style-type: none"> <li>a. Engaging in learning that enhances their professional competence.</li> <li>b. Engaging with their professional community.</li> <li>c. Participating in appropriate educational and professional opportunities that may be provided by the broader health care network/practice.</li> </ul>



#### Domain 4: Quality and risk management

This Domain covers the medical radiation practitioners' responsibility to protect patients/clients from harm by managing and responding to the risks inherent in both health care and medical radiation practice. It also addresses their responsibility for ensuring the quality of professional services is maintained and improved for the benefit of patients/clients and other service users.

What registered practitioners must be able to do	Ways that this capability will be demonstrated at entry and re-entry to the profession
1. Protect and enhance patient/client safety	<ul style="list-style-type: none"> <li>a. Understanding the principles of quality assurance and quality improvement.</li> <li>b. Understanding the principles of risk management.</li> <li>c. Undertaking activities that support a quality assurance program.</li> <li>d. Recognising when equipment is no longer operating within normal parameters, reporting it and taking corrective action, if appropriate.</li> <li>e. Interpreting basic patient/client monitoring data.</li> <li>f. Recognising when a patient/client's condition is deteriorating and responding appropriately, such as by triggering an alert.</li> <li>g. Understanding and complying with statutory requirements, including relevant workplace health and safety legislation.</li> <li>h. Understanding and complying with statutory requirements relating to adverse and critical incidents and standards for practice at all times</li> <li>i. Having the ability to provide basic patient/client emergency care, including first aid.</li> <li>j. Understanding and complying with the processes for safely receiving a patient/client from other health care staff.</li> <li>k. Physically transferring a patient/client in a manner that is safe for both the patient/client and themselves.</li> <li>l. Understanding medical radiation safety considerations and safety systems.</li> </ul>
2. Adhere to best practice patient/client identification, the verification of the correct procedure and any contraindications to the medical radiation service	<ul style="list-style-type: none"> <li>a. Applying a system that ensures the correct identification of patients and correct matching of patients with their intended procedure by using at least three recognised patient/client identifiers.</li> <li>b. Understanding the contraindications/limitations of the medical radiation services within</li> </ul>

What registered practitioners must be able to do	Ways that this capability will be demonstrated at entry and re-entry to the profession
	their division of registration
3. Respond appropriately to serious and/or unforeseen results of, or reactions to, delivery of the medical radiation service	a. Recognising when to alert the appropriate practitioner about serious and/or unforeseen results of, or reactions to, the delivery of the medical radiation service. b. Ensuring that the patient/client is referred to their general practitioner or hospital emergency department in cases when a serious diagnosis has been identified during an examination, treatment or procedure.
4. Apply current NHMRC infection prevention and control guidelines <sup>1</sup>	a. Understanding the transmission modes of hospital-acquired infections (host, agent and environment). b. Utilising established practices for preventing the transmission of infection in health care. c. Understanding and complying with hand hygiene guidelines.
5. Uphold the patient's/client's right to quality medical radiation practice	a. Understanding and complying with confidentiality and privacy requirements when sharing health information. b. Being aware of the legislative requirements about ownership, storage, retention and destruction of patient/client records and other practice documentation. c. Accurately recording clinical data and patient/client information in a legible, secure and accessible form. d. Appropriately assessing documentation for compliance with legal requirements. e. Utilising the clinical information provided to adapt the requested examination to an individual patient/client or client. f. Completing documentation for compliance with legal requirements. g. Prioritising the examination according to patient's/client's medical status and the available resources.
6. Apply knowledge of pharmaceuticals relevant to their specific division of registration	a. Understanding the principles and applications of pharmaceuticals that are relevant to their division of registration, including risks, precautions and contraindications. b. Having knowledge of pharmacokinetics, pharmacodynamics and the potential range of

**Comment [R15]:** This should refer to "medical radiation specialist".

**Comment [R16]:** This is the responsibility of the medical radiation specialist and not a capability of the MRP

<sup>1</sup> Australian Guidelines for the prevention and control of infection in healthcare (2010)

What registered practitioners must be able to do	Ways that this capability will be demonstrated at entry and re-entry to the profession
	<p>reactions to drugs or agents common to their division of registration.</p> <p>c. Accurately performing checking processes to assure patient/client safety (such as double checking a product label, calculations and measurements).</p>

## Domain 5: Radiation safety

This domain covers the medical radiation practitioners' responsibility for the application and safe use of radiation for the benefit of patients/clients, staff and the general public.

What registered practitioners must be able to do	Ways that this capability will be demonstrated at entry and re-entry to the profession
1. Apply knowledge of radiation biology and radiation dose	<ul style="list-style-type: none"> <li>a. Employing radiation biology knowledge by following the correct procedures for their division of registration.</li> <li>b. Performing procedures in accordance with the ALARA Principle.</li> <li>c. Estimating radiation doses and exposure as required within their division of registration according to ARPANSA guidelines.</li> </ul>
2. Implement safe radiation practice for patients, staff, and the environment as a whole	<ul style="list-style-type: none"> <li>a. Applying knowledge of clinical centre procedures, state and federal radiation safety legislation.</li> <li>b. Understanding of national radiation safety guidelines and international best practice for radiation management.</li> <li>c. Applying safe radiation practice to all procedures.</li> <li>d. Analysing each procedure to ensure justification, optimisation and protection.</li> <li>e. Understanding dose reduction techniques within their division of registration</li> <li>f. Performing setup procedures correctly to ensure that the minimum radiation or prescribed dose is used.</li> </ul>
3. Recognise when equipment is not performing correctly within the prescribed radiation limits	<ul style="list-style-type: none"> <li>a. Being aware of the normal operating parameters</li> <li>b. Recognising when the equipment's operating parameters are abnormal</li> <li>c. Taking appropriate action when equipment is not functioning correctly</li> </ul>
4. Store and dispose of radiation sources safely	<ul style="list-style-type: none"> <li>a. Understanding of the thickness of shielding required for safe and legal storage of radioactive material.</li> </ul>

**Comment [R17]:** This capability should be placed in the Nuclear Medicine specific Domain unless it is intended to refer generically to radiation generating equipment in addition to radioactive sources such as radionuclides.

What registered practitioners must be able to do	Ways that this capability will be demonstrated at entry and re-entry to the profession
	<ul style="list-style-type: none"> <li>b. Calculating the decay of the material prior to disposal.</li> <li>c. Understanding occupancy as it pertains to proximity of radioactive storage.</li> </ul>
5. Know when to report and how to appropriately deal with a radiation hazard/spill	<ul style="list-style-type: none"> <li>a. Applying safe decontamination and containment procedures.</li> <li>b. Calculating the decay of the residual material.</li> </ul>

**Comment [R18]:** This seems to be a Nuclear Medicine specific capability and should be revised if it is intended to apply to all three divisions.

## Domain 6: Practice in medical radiation sciences

This domain covers the knowledge, skills and capabilities a medical radiation practitioner is required to attain to practise independently. Some elements are common to all medical radiation practitioners, taking into account the different requirements between the divisions of registration, while other capabilities are specific to their division of registration.<sup>2</sup>

What registered practitioners must be able to do within the context of their division of registration	Ways that this capability will be demonstrated at entry or re-entry to the profession
1. Deliver appropriate patient/client care within their division of registration	<ul style="list-style-type: none"> <li>a. Understanding the psycho-social factors influencing the behaviour of patients/clients undergoing medical radiation procedures and/or treatment within their division of registration.</li> <li>b. Applying patient/client assessment skills to determine the extent that pre-existing medical and/or physical conditions might impact on the patient/client's capacity to cooperate during the procedure.</li> </ul>
2. Interpret the request form and match the selection of procedure to the clinical indicators	<ul style="list-style-type: none"> <li>a. Understanding the structure and function of the human body and the principles of human disease: pathology and physiological processes.</li> <li>b. Understanding medical terminology in the context of the patient's/client's clinical history and the procedure being requested.</li> <li>c. Having broad and current knowledge of radiation physics relating to their division of registration.</li> <li>d. Interpreting and analysing information during the initial interaction with the patient/client, including any previous imaging/treatment.</li> <li>e. Adapting and adopting the appropriate protocols for best diagnostic/treatment outcomes during the initial interaction with the patient/client.</li> <li>f. Ensuring that the selection of the imaging projections or protocol takes into account information collected during the initial interaction with the patient/client.</li> </ul>
3. Recognise, and practise within, their own expertise and	<ul style="list-style-type: none"> <li>a. Seeking advice when the needs of patients/clients are beyond the abilities and education</li> </ul>

<sup>2</sup> This sub-domain (6) applies to all three divisions of registration: diagnostic radiography, nuclear medicine and radiation therapy. Each of the supplementary domains, 6A, 6B and 6C, include capabilities specific to each division of registration.

What registered practitioners must be able to do within the context of their division of registration	Ways that this capability will be demonstrated at entry or re-entry to the profession
any professional or organisational limits	of the registrant. b. Performing patient/client assessment and medical radiation interventions in accordance with legislation and standards of practice regulating medical radiation practitioners.
4. Demonstrate broad and current understanding of CT as it relates to the practitioner's division of registration	a. Identifying the sectional imaging representation of the musculoskeletal, cardiovascular, respiratory, genito-urinary, gastro-intestinal, endocrine and neurological systems. b. Identifying the sectional imaging representation of common disease conditions affecting the musculoskeletal system, respiratory, cardiovascular, genito-urinary, gastro-intestinal, endocrine and neurological systems. c. Understanding the physical principles applicable to multislice CT image reconstruction and display.
5. Demonstrate broad and current understanding of information systems within medical radiation science	a. Understanding the principles underpinning the information systems applicable to the practitioner's division of registration. b. Awareness of the role patient information systems play in the management of patients.
6. Demonstrate broad and current understanding of the range of imaging modalities as they relate to their division of registration	a. Understanding the role that the radiation therapy, radiography and nuclear medicine may assume within their specific division of registration. b. Understanding the principles and applications of ultrasound imaging relevant to their specific division of registration. c. Understanding the principles and applications (including safety) of MRI relevant to their specific division of registration. d. Understanding the principles of mammography and bone densitometry as required by their division of registration.
7. Demonstrate broad and current understanding of medical radiation practice within paediatric medicine	a. Having knowledge of childhood behavioural development. b. Having knowledge of congenital and acquired paediatric diseases. c. Adapting procedure techniques to achieve the best diagnostic/ therapeutic outcome for paediatric patients/clients.

What registered practitioners must be able to do within the context of their division of registration	Ways that this capability will be demonstrated at entry or re-entry to the profession
	d. Having the capacity to implement evidence based paediatric dose reduction strategies.

**Domain 6A: Practice in diagnostic radiography**

What diagnostic radiography practitioners must be able to do, in addition to the capabilities required under domain 6	Ways that this capability will be demonstrated at entry or re-entry to the profession
1. Implement and evaluate projection radiography examinations for a range of patient/client presentations and complexities	<ul style="list-style-type: none"> <li>a. Using their knowledge of surface anatomy and gross anatomy of the axial and appendicular skeleton, respiratory system and abdomen to appropriately and accurately position patients/clients for projection radiography.</li> <li>b. Having knowledge of the standard projection radiography for each body area.</li> <li>c. Having skills in modifying standard projections to take into account patient/client presentation and clinical indications.</li> <li>d. Having knowledge of modern image receptors and x-ray image production.</li> <li>e. Comprehending the physical principles underpinning computed radiography and digital radiography, the interplay of exposure factors and the conditions requiring their manipulation to achieve a diagnostic image.</li> <li>f. Having sound knowledge of projection radiography x-ray equipment.</li> <li>g. Estimating the dose levels associated with projection radiography examinations.</li> <li>h. Having sound knowledge of planar radiographic anatomy.</li> <li>i. Evaluating radiographic images and applying radiographic criteria to these images.</li> <li>j. Applying knowledge of human disease and trauma processes to the evaluation of projection radiography images.</li> </ul>
2. Provide a verbal radiographic opinion about any abnormal element in a radiographic image set.	<ul style="list-style-type: none"> <li>a. Understanding of the legal framework for providing the opinion.</li> <li>b. Having thorough knowledge of the typical radiographic appearances of common disease</li> </ul>

**Comment [R19]:** Change to "Perform"

**Comment [R110]:** Change to "Diagnostic" throughout the document.



What diagnostic radiography practitioners must be able to do, in addition to the capabilities required under domain 6	Ways that this capability will be demonstrated at entry or re-entry to the profession
	processes and trauma affecting the axial and appendicular skeleton, chest and abdomen.
3. Perform and evaluate extra-oral dental imaging.	a. Performing and evaluating OPG, cephalometry and cone beam CT.
4. Implement fluoroscopy in a range of settings (including operating theatre)	a. Understanding digital image processing, including digital fluoroscopy (fixed and mobile systems). b. Estimating the dose levels associated with a range of fluoroscopic examinations. c. Having knowledge of patient/client preparation and delivery systems for contrast examinations performed using fluoroscopy. d. Understanding the complexity of the theatre context and the associated radiation safety issues. e. Being able to undertake adaptive positioning for fluoroscopy
5. Implement CT imaging	a. Understanding the design and operation of CT systems. b. Understanding imaging parameters and scan protocols. c. Understanding post processing techniques, including multi-planar reformats and volume imaging. d. Being skilled in both performance and evaluation of common unenhanced and contrast CT images of the body. e. Understanding patient/client preparation. f. Understanding of contrast timing in CT acquisition, including contrast delivery systems. g. Estimating dose levels associated with a variety of CT scans.
6. Describe the principles and clinical applications of angiography and interventional techniques	a. Understanding the design and operation of angiography systems including contrast delivery systems. b. Understanding angiographic image acquisition and image registration. c. Understanding aseptic techniques, contrast and other delivery systems, diagnostic

**Comment [R111]:** This capability is outside the competency framework of the MRP who is not medically trained to provide a medical opinion or interpretation of radiographic image set (whether verbal or written). The proposed wording does not indicate to whom the MRP would be providing a verbal opinion, nor the limitations of the utility of this opinion, and suggests that a non-medical verbal opinion may be used to inform the medical management of the patient. There is currently no professional, legal, or educational framework to support an interpretive role for MRPs, and this exposes them, the medical specialists who are ultimately responsible for the interpretation of the imaging findings and the patient to substantial risks. Any such verbal opinion should be directed to the medical specialist responsible for providing the medical interpretation to ensure appropriate and comprehensive medical care is provided to the patient. In any case, a verbal opinion would need to be documented to ensure that the limitations of the opinion and follow-through in the form of a final opinion are recorded. This is not an entry-level capability.

**Comment [R112]:** These are not entry-level capabilities and need to be revised or removed.

**Comment [R113]:** These are not entry level capabilities, and some senior MRPs may not have this degree of understanding or experience in CT.

What diagnostic radiography practitioners must be able to do, in addition to the capabilities required under domain 6	Ways that this capability will be demonstrated at entry or re-entry to the profession
	<p>catheters, interventional devices.</p> <p>d. Having knowledge of angiographic anatomy and common pathologies displayed using angiography.</p> <p>e. Understanding patient/client preparation and post-procedure care requirements of contrast delivery systems.</p> <p>f. Understanding the use of angiography as a diagnostic and therapeutic tool.</p> <p>g. Having knowledge of post processing options.</p>
7. Describe how 3D datasets are produced	<p>a. Being skilled in the construction of 3D images through the manipulation of 3D datasets.</p> <p>b. Understanding the potential of 3D images to be used for quantitative and qualitative purposes.</p>
8. Describe the principles and applications of MR imaging	<p>a. Understanding the MR image production</p> <p>b. Understanding the hazards associated with MR imaging.</p> <p>c. Understanding the clinical context for MR examinations.</p> <p>d. Knowing the protocols applicable to neurological MRI in adult patient/clients.</p>
9. Describe the principles and applications of Ultrasound imaging	<p>a. Knowledge of the physics of ultrasound image production</p> <p>b. Knowledge of the strengths and weaknesses of ultrasound imaging</p> <p>c. Knowledge of common ultrasound examinations including patient/client preparation</p>

**Comment [R114]:** This is beyond the scope of entry level MRPs and should only be expected of radiographers who have developed specific skills or practice in supporting interventional radiology procedures.

**Comment [R115]:** This is beyond the scope of the entry level MRP.

**Comment [R116]:** This is not appropriate to entry level MRPs and should be amended to "Basic understanding of the MRI image production"

**Comment [R117]:** This is not appropriate to entry level MRPs and should be amended to "Basic understanding of the physics of ultrasound image production".

**Domain 6B: Practice in nuclear medicine**

What nuclear medicine technology practitioners must be able to do, in addition to the capabilities required under domain 6	Ways that this capability will be demonstrated at entry or re-entry to the profession
1. Implement the preparation of common radiopharmaceuticals	a. Performing the elution and quality control of the $\text{Mo}^{98} \rightarrow \text{Tc}^{99m}$ generator. b. Having the ability to assay the eluate and prepare the common radiopharmaceuticals including correct volume and assay of eluate. c. Having sound knowledge of dose calibrators.
2. Explain normal biodistribution of commonly used radiopharmaceuticals	a. Understanding biodistribution and determining whether it is normal, altered or unexpected. b. Understanding biodistribution as it pertains to breast feeding mothers and be able to give appropriate instructions.
3. Implement the assessment of purity of radiopharmaceuticals	a. Performing quality control on all radiopharmaceuticals and being able to assess the purity of the radioisotope including: <ul style="list-style-type: none"> <li>- radionuclide purity</li> <li>- radiochemical purity, and</li> <li>- chemical purity.</li> </ul>
4. Implement CT imaging for nuclear medicine imaging	a. Understanding the design and operation of CT systems. b. Understanding imaging parameters and scan protocols. c. Understanding post processing techniques, including multi-planar reformats and volume imaging. d. Understanding patient/client preparation. e. Estimating dose levels associated with a variety of CT scans.
5. Implement routine SPECT CT and planar imaging	a. Performing common (see guideline) planar and SPECT/CT studies. b. Knowing the standard nuclear medicine planar projections for each body area. c. Performing patient/client positioning for the best diagnostic outcome.

**Comment [R118]:** This should be carried out under the supervision of the Nuclear Medicine Specialist and may not be suitably worded.

What nuclear medicine technology practitioners must be able to do, in addition to the capabilities required under domain 6	Ways that this capability will be demonstrated at entry or re-entry to the profession
	<ul style="list-style-type: none"> <li>d. Having comprehensive knowledge of patient/client preparation</li> <li>e. Having comprehensive knowledge of appropriate dosage of both isotope and CT for each patient/client.</li> <li>f. Knowing the contraindications or limitations of the particular study.</li> <li>g. Having sound knowledge of nuclear medicine gamma cameras.</li> <li>h. Being skilled in the evaluation of nuclear medicine images and the application of nuclear medicine criteria to these images.</li> <li>i. Having sound knowledge of the principles of SPECT reconstruction.</li> <li>j. Knowing the post processing options.</li> </ul>
6. Implement common PET/CT imaging <sup>3</sup>	<ul style="list-style-type: none"> <li>a. Performing patient/client positioning for the best diagnostic outcome.</li> <li>b. Having the knowledge and the ability to use appropriate dosage of both isotope and CT for each patient/client.</li> <li>c. Having sound knowledge of PET/CT scanners.</li> <li>d. Knowing the contraindications or limitations of the particular study.</li> <li>e. Being skilled in the evaluation of PET/CT images and the application of PET/CT criteria to these images.</li> <li>f. Knowing the post processing options.</li> </ul>
7. Describe how 3D datasets are produced	<ul style="list-style-type: none"> <li>c. Being skilled in the construction of 3D images through the manipulation of 3D datasets.</li> <li>d. Understanding the potential of 3D images to be used for quantitative and qualitative purposes.</li> </ul>

<sup>3</sup> The PET/CT imaging procedures intended to be covered by the capability statement are those listed in the Medicare Benefits Schedule (MBS)

8. Implement the delivery of nuclear medicine radioisotope therapies	<ul style="list-style-type: none"> <li>a. Calculating the dose and decay of therapy doses</li> <li>b. Knowing lesser used therapies, such as S.I.R.T., <math>Y^{90}</math>, MIBG.</li> <li>c. Understanding the difference between a radiation therapy dose and a diagnostic dose, as it affects the patient/client, health practitioner and the general public</li> </ul>
9. Demonstrate a broad and current knowledge of various delivery systems of radioisotopes for diagnostic studies/therapies	<ul style="list-style-type: none"> <li>a. Understanding appropriate dose delivery systems including arterial, oral, I.V and inhalation.</li> <li>b. Being able to gain intravenous access in a safe, aseptic manner.</li> </ul>
10. Demonstrate a broad and current knowledge of the normal biodistribution of radioisotope therapies	<ul style="list-style-type: none"> <li>a. Identifying whether the bio-distribution is normal, altered or unexpected.</li> </ul>
11. Describe how to undertake common in vivo and in vitro lab procedures	<ul style="list-style-type: none"> <li>a. Performing safe aseptic blood labelling procedures.</li> <li>b. Understanding <i>in vitro</i> laboratory procedures, such as Cr GFR, Cr RBC mass</li> <li>c. Identifying whether results of <i>in vitro</i> laboratory procedures are normal, altered or unexpected</li> </ul>
12. Demonstrate a broad and current knowledge of operation of ancillary laboratory equipment	<ul style="list-style-type: none"> <li>a. Being able to count samples using a well counter.</li> <li>b. Knowing how to use a centrifuge safely.</li> <li>c. Knowing how use a fume hood safely.</li> </ul>

**Domain 6C: Practice in radiation therapy**

What radiation therapy practitioners must be able to do, in addition to the capabilities required under domain 6	Ways that this capability will be demonstrated at entry to the profession
1. Demonstrate a broad and current knowledge of treatment planning and of all imaging and treatment modalities used in current standard techniques for radiation therapy practice	<ul style="list-style-type: none"> <li>a. Applying their skills and knowledge in using CT simulation to produce optimal scans for radiotherapy planning.</li> <li>b. Understanding the concept of image co-registration for MRI/PET planning scans.</li> <li>c. Being able to produce standard 3D radiotherapy treatment plans using computerised planning systems.</li> <li>d. Knowing the concepts for generating an IMRT or a VMAT treatment plan</li> <li>e. Understanding radical and palliative treatment doses and acceptable dose limits to critical structures.</li> </ul>
2. Demonstrate an understanding of the radiation physics involved in treatment planning	<ul style="list-style-type: none"> <li>a. Understanding the physical and biological science related to 3D treatment planning.</li> <li>b. Understanding the concept for beam modification in treatment planning.</li> </ul>
3. Demonstrate a broad and current understanding of current treatment simulation techniques related to radiation therapy	<ul style="list-style-type: none"> <li>a. Understanding patient/client positioning.</li> <li>b. Knowing which imaging modality/s is best suited for a particular planning procedure.</li> </ul>
4. Demonstrate an understanding of stabilisation devices related to radiation therapy	<ul style="list-style-type: none"> <li>a. Understanding the immobilisation required for a particular radiation therapy procedure and/or treatment technique.</li> <li>b. Fabricating immobilisation devices and ancillary equipment required in radiation therapy.</li> <li>c. Recognising limitations/restrictions in the use of stabilisation devices.</li> </ul>
5. Demonstrate a broad and current knowledge of current treatment techniques related to radiation therapy	<ul style="list-style-type: none"> <li>a. Interpreting and delivering contemporary treatment techniques from standard information as delivered by treatment planning systems</li> <li>b. Understanding legislative requirements for current treatment delivery recording systems.</li> </ul>

	<ul style="list-style-type: none"> <li>c. Understanding treatment verification.</li> <li>d. Understanding the limitations and restrictions of treatment verification systems.</li> <li>e. Understanding image guided radiation therapy technology for image matching.</li> </ul>
6. Implement CT imaging for oncologic imaging	<ul style="list-style-type: none"> <li>a. Understanding the design and operation of CT systems.</li> <li>b. Understanding imaging parameters and scan protocols.</li> <li>c. Understanding post processing techniques, including multi-planar reformats and volume imaging.</li> <li>d. Being skilled in both performance and evaluation of common unenhanced and contrast CT images of the body.</li> <li>e. Understanding patient/client preparation.</li> <li>f. Understanding of contrast timing in CT acquisition, including contrast delivery systems.</li> <li>g. Estimating dose levels associated with a variety of CT scans.</li> </ul>
7. Describe how 3D datasets are produced	<ul style="list-style-type: none"> <li>e. Being skilled in the construction of 3D images through the manipulation of 3D datasets.</li> <li>f. Understanding the potential of 3D images to be used for quantitative and qualitative purposes.</li> </ul>
8. Knowledge of adjunct radiation therapy techniques	<ul style="list-style-type: none"> <li>a. Understanding brachytherapy, superficial radiotherapy, radiosurgery/stereotactic radiotherapy, paediatric radiotherapy, total body radiation and proton therapy.</li> <li>b. Knowing the physics associated with each of the areas.</li> </ul>