

# Clinical Training and Practice in Particle Therapy

Radiation Oncology

Guideline

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## About the College

The Royal Australian and New Zealand College of Radiologists (RANZCR) is a not-for-profit professional organisation for clinical radiologists and radiation oncologists in Australia, New Zealand, and Singapore. RANZCR is a membership organisation led by clinicians who are elected by the membership, with oversight from a Board of Directors.

We are the leaders in medical imaging and cancer care. We enable the best practice of clinical radiology, radiation oncology and associated subspecialty areas through engagement, education, and advocacy; and by supporting clinical excellence. Our Fellows play a critical role in the diagnosis and monitoring of disease, provide interventional treatments and targeted treatments for cancer.

Our evidence-based culture focuses on best practice outcomes for patients and equity of access to high quality care, underpinned by an attitude of compassion and empathy. As an organisation we are committed to diversity and inclusion, and to the training and professional development of our Fellows and Trainees throughout their career. We are dedicated to enhancing the health outcomes of Maori, Aboriginal and Torres Strait Islander peoples and to increasing their participation in the professions of clinical radiology and radiation oncology by ensuring our educational programs support best outcomes for them. This includes a commitment to cultural safety in our organisation, for staff and members.

## Purpose

To enable the safe and appropriate use of clinical radiology and radiation oncology to optimise health outcomes for our patients and society.

## Values

Our leadership values underpin all that we do and embody our focus on quality patient outcomes:

### Integrity

We maintain the confidence and trust of our stakeholders through our honesty, transparency, and authenticity.

### Accountability

We take responsibility for all our actions, behaviours, performance, commitments, and decisions.

### Inclusivity

We foster an inclusive workplace and clinical environments for people in Australia and New Zealand.

### Innovation

We constantly strive to reimagine excellence in everything we do.

## Code of Ethics

The Code defines the values and principles that underpin the best practice of clinical radiology and radiation oncology and makes explicit the standards of ethical conduct the College expects of its members.

# 1. INTRODUCTION

## 1.1 Background

The Royal Australian and New Zealand College of Radiologists (RANZCR) Faculty of Radiation Oncology (FRO) recognises that Particle Therapy is a new area of specialty practice which is complex and requires special knowledge, skills, training, and experience to deliver high quality and safe care for patients.

The Australian Bragg Centre for Proton Therapy and Research will be the first particle therapy facility in Australia. It will be supported by a collaborative and networked bi-national approach envisioned to ultimately comprise of one national facility with carbon (and other ions) as well as up to three proton beam therapy centres in Australia.<sup>i</sup>

This Guideline for Clinical Training and Practice in Particle Therapy was developed by The Particle Therapy Working Group after consulting with the Faculty of Radiation Oncology. Certification in particle therapy was considered and rejected. Furthermore, personal communication with leading radiation oncologists practicing at particle therapy facilities in four international jurisdictions in late 2021 and summarised in Table 1 below, identified that certification is not required in other jurisdictions.

Table 1

United Kingdom (Prof Ed Smith)	No College requirements. The Christie NHS Proton Beam Therapy Centre has a credentialing system with renewal each 2-3 years.
United States (Dr Danny Indelicato)	No College requirements. Anticipate proton therapy will be added to the curriculum once the technology is more widely available. Interested residents may undertake a rotation at a proton facility. Fellowships at a proton facility are available.
Italy (Dr Piero Fossati)	No College requirements. 'Proof of experience' in the field of particle therapy may be required.
Denmark (Prof Morten Hoyer)	The Danish Board of Health does not require credentialing in particle therapy.

## 1.2 Purpose and scope

- This Guideline for Clinical Training and Practice in Particle Therapy is intended to assist The Royal Australian and New Zealand College of Radiologists® (ABN 37 000 029 863) (the College), its staff, Fellows, Members and other individuals.
- The purpose of this Guideline is to describe a pathway for RANZCR Radiation Oncology Fellows to train in particle therapy, the skills and experience that the Particle Therapy Working Group recommends are acquired and the necessary verification evidence. The Guideline also sets out the recommended Continuing Professional Development requirements in particle therapy. This Guideline notes that the legal entity with governance control over any particle facility is responsible ultimately for the safe and high-quality delivery of this treatment.

## 1.3 Definitions

In this Guideline for Clinical Training and Practice in Particle Therapy:

**AYA** means Adolescent and Young Adult

**College** means The Royal Australian and New Zealand College of Radiologists.

**ESTRO** means the European Society of Radiation Oncology

**FRANZCR** means Fellowship of the Royal Australian and New Zealand College of Radiologists.

**MDT** means Multidisciplinary Team.

**Member** means a member of the College.

**Particle Therapy** means a form of external beam radiation therapy that uses heavier particles rather than X-rays (photons) or electrons.

**PTCOG** means *the* Particle Therapy Cooperative Group.

## 2. ADVANCED SKILLS, KNOWLEDGE AND EXPERIENCE

The Australian Commonwealth government approved new Medicare Benefits Schedule (MBS) items for proton beam therapy for specified rare cancers in paediatric adolescent and young adult (AYA), and adult cancers in November 2020.<sup>ii</sup>

The specific malignancies are:

- For an adult patient:
  - a tumour of the base of the skull, including meningioma, chordoma or chondrosarcoma; or
  - a tumour of the vertebral column or bony pelvis; or
  - an adenoid cystic carcinoma of the salivary or lacrimal gland.
- For a patient under the age of 25 years:
  - a solid tumour located in:
    - the central nervous system; or
    - the orbit, including retinoblastoma; or
    - the axial skeleton or near the axial skeleton, including bone or soft tissue sarcoma
  - one of the following tumour types:
    - craniopharyngioma
    - intracranial germ cell tumour
    - neuroblastoma
    - nephroblastoma

Additional indications may be included over time, based on new evidence when it is generated.

Advanced skills, knowledge and experience are therefore recommended in these areas by a radiation oncologist taking either a paediatric pathway or adult pathway, or both.

Table 2 summarises the recommended skills, knowledge and experience, and the recommended evidence required to demonstrate this.

Table 2

Field of practice	Skills / training	Recommended Evidence
Paediatric experience  AND / OR	Post-graduate Fellowship in paediatric / AYA radiation oncology which includes a minimum 6-months period clinical experience	Letter of verification from Head of Department. AND

Adult tumour experience	OR	Log of involvement in the management of a minimum of 50 patients
	3 years clinical practice at a consultant level	
	Post-graduate Fellowship in one or more tumour groups for which there are clinical indications for proton therapy (e.g., sarcoma, central nervous system, head and neck cancers)	Letter of verification from Head of Department.
	OR	
	Minimum of 3 years' experience at a consultant level in one of these fields	
<b>AND</b>		
Particle therapy experience	Teaching / training course in particle therapy, e.g., ESTRO, PTCOG.	Certificate of completion (teaching course)
	AND	AND
	Site visit / sabbatical at a proton centre of at least 4 weeks' duration (with a minimum 4-week block at one centre) if > 5 years post award of FRANZCR	Letter from Director of the particle therapy facility
	OR	OR
		Letter of verification from Head of Department of the particle therapy facility and log of involvement in the management of a minimum of 50 patients
	If award of FRANZCR is within five years, a Post-graduate Fellowship in particle therapy for a 12-month period of which 6 months should be clinical	

### 3. EXPECTED COMPETENCIES

Expected competencies in particle therapy include both knowledge and clinical experience domains as summarised in Table 3

Table 3: Competencies in particle therapy

Knowledge	Clinical experience
<ul style="list-style-type: none"> <li>Physics of particle therapy</li> <li>Technology of particle therapy</li> <li>Radiation biology of particle therapy</li> <li>Clinical applications</li> <li>Treatment planning including robust optimisation</li> <li>Treatment delivery in motion management considerations</li> </ul>	<ul style="list-style-type: none"> <li>Treatment planning</li> <li>Managing patients undergoing a course of particle therapy</li> <li>Attendance at MDT where particle therapy is considered</li> </ul>

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• On-treatment imaging verification</li></ul> |  |
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#### 4. CONTINUING PROFESSIONAL DEVELOPMENT

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MBA/MCNZ expectations are that practitioners complete CPD appropriate to their scope of practice.

Recommended requirements for continuing professional development (CPD) (once patient treatment commences in Australia), are as follows:

Core:

1. Participate in multi-disciplinary referral panels for particle therapy.

**Recommended Evidence: attendance log. A minimum of 5 hours per annum is suggested.**

2. Participate in peer-review of proton plans for patients prior to treatment start, including contours of target volumes and organs at risk.

**Recommended Evidence: Completion of the RANZCR Peer Review Audit Tool**

3. Manage a minimum of ten patients each calendar year by particle therapy, if employed at a particle therapy facility.

**Recommended Evidence: Letter of verification from Head of Department and/or evidence log**

4. Enrolment of patients treated by particle therapy on an Australian/New Zealand clinical quality registry that includes tracking long-term outcomes.

**Recommended Evidence: Annual audit**

5. Attend a national or international particle therapy symposium, conference, or course at least once every three years.

**Recommended Evidence: Certificate of attendance**

Paediatric:

1. Attend an international paediatric oncology conference at least once every three years (e.g. PROS (Paediatric Radiation Oncology Society), SIOP (International Society of Paediatric Oncology), COG (Children's Oncology Group), ISPNO (International Symposium on Paediatric Neuro Oncology)).

**Recommended Evidence: Certificate of attendance**

#### 5. CHANGES TO THIS DOCUMENT

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This document will be reviewed by the Particle Therapy Working Group in 2025. Information will be added at that time about becoming a supervisor of training in particle therapy.

#### 6. RELATED DOCUMENTS

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- [RANZCR Certification Policy](#)
- Particle Therapy Position Paper
- Radiation Oncology Peer Review Audit Tool
- Code of Ethics

## 7. REFERENCES

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<sup>i</sup> Thwaites DI, Sykes J, Ahern V. A practical proposal for a collaborative networked national approach to the provision of particle therapy in Australia; comparison to other countries, Proc EPSM2016. Sydney. Australas Phys Eng Sci Med 2016; 39: 1068.

<sup>ii</sup> [http://www.msac.gov.au/internet/msac/publishing.nsf/Content/1F4A7FCD95A965D2CA25856D0080DB48/\\$File/1638%20Final%20PSD\\_Nov2020\\_redacted.pdf](http://www.msac.gov.au/internet/msac/publishing.nsf/Content/1F4A7FCD95A965D2CA25856D0080DB48/$File/1638%20Final%20PSD_Nov2020_redacted.pdf)