

Cancer services – radiation oncology children’s

CSCF v3.2

Module overview

Please note: This module must be read in conjunction with the Fundamentals of the Framework (including glossary and acronym list), Children’s Services Preamble, Cancer Services Preamble and Radiation Oncology Services module.

Radiation therapy is an important therapy for cancers in children. This type of therapy is used either alone or combined with surgery, chemotherapy and newer biological therapies in the curative or palliative treatment of cancer. Radiation therapy also has a palliative role for metastatic and locally recurrent disease.¹ Radiation oncology services are provided 7 days a week, with staff accessible, as required by the service.

Radiation oncology services are included in a range of strategies designed to optimise cancer service delivery in Queensland.² Strategies include integration of delivery and performance across the continuum of care including supportive care and palliative care.

Radiation oncology services provide a range of treatment services in accordance with standardised, evidence-based guidelines and protocols as appropriate. Where standardised radiation therapy protocols do not exist, or patients are not eligible for clinical trials, it is expected the service will have mechanisms in place for planning, monitoring and reviewing the standard of care provided to these patients.

In addition, radiation oncology services for children provide:

- age - and family-appropriate facilities
- a highly coordinated, multidisciplinary and patient-focused approach to treatment
- supporting infrastructure, including information management, scientific, biomedical and technical services
- documented referral pathways for complications associated with radiation therapy
- access to children’s rehabilitation and psychosocial support services (including psychology / psychiatry, social work and welfare)
- access to appropriate children’s allied health professional specialties, particularly occupational therapy for preparation of children to reduce the need for a general anaesthetic (e.g. use of a mock radiotherapy machine)
- documented processes to manage children’s emergencies within an adult environment
- documented processes with community support services.

The delivery of radiation oncology services requires specialised facilities and equipment, and is supported by a range of clinical specialities and support services.

The CSCF recognises two levels of complexity for radiation oncology service provision for children: Levels 5 and 6. Radiation therapy for children is provided almost entirely at a Level 6 service, principally at the Queensland Children’s Cancer Centre. Palliative treatment for children may be provided at a Level 5 service in conjunction with a Level 6 service (Table 1).

Table 1: Levels of complexity for children’s radiation oncology services

	Level 5	Level 6
Service complexity	Consults with specialist service (Level 6) for all delivery of radiation therapy for children (e.g. palliation)	Provides primary service and consults with Level 5, as required

Service networks

In addition to the requirements outlined in the Fundamentals of the Framework, specific service network requirements include:

- close integration with Children’s Oncology Services, diagnostic services (including high-quality Medical Imaging), and allied health and Palliative Care Services,³ as radiation treatment is often used along with other components of cancer treatment, such as systemic therapy and/or surgery (with these interactions based on the principles of multidisciplinary care)
- utilisation of the Queensland Paediatric Haematology / Oncology Network to enhance seamless delivery of cancer services and manage / reduce risks of gaps in treatment
- very limited outreach radiation oncology services provided for children due to the service’s specialised nature and because radiation therapy for children is provided principally at the Queensland Children’s Cancer Centre
- palliative radiation treatment for children may be provided at a Level 5 service with input from a Level 6 service.

Service requirements

In addition to the requirements outlined in the Fundamentals of the Framework, specific service requirements include:

- adequate radiation safety measures must be observed and the service must comply with the Radiation Safety Act 1999 and Radiation Safety Regulation 2010
- certificates of compliance are required for any radiation apparatus, some radiation sources, and the rooms in which they are housed
- demonstrable and documented policies and procedures for the assessment, treatment, evaluation and risk management, and approved treatment protocols for the

radiotherapeutic management, of specific tumours and/or tumour sites (i.e. both radical and palliative radiotherapy)

- registers of current registrations / licences to practise for all applicable staff
- management of clinical information is planned, systematic, and supports clinical audits, clinical trials, outcome analyses and cancer registry requirements
- service participation in dosimetric intercomparisons of at least one photon beam
- equipment requirements include, but are not limited to:
 - dual-modality linear accelerators equipped with a multileaf collimator, electronic portal imaging and an internal wedging system
 - a three-dimensional planning system
 - access to a digital imaging service for patient image acquisition suitable for planning
 - appropriate immobilisation and shielding requirements (e.g. blocks or a multileaf collimator)
 - access to a dosimeter that has been calibrated by the Australian Radiation Protection and Nuclear Safety Agency or equivalent primary-standard dosimetry laboratory
 - access to a three-dimensional, water-phantom scanning system
 - access to ion chambers and dosimetry phantoms
 - beam modification devices
 - access to an in vivo dose monitoring system
 - access to an information and treatment management system
 - access to information technology services
 - access to clinical information systems
 - resuscitation equipment specifically for infants, children and adolescents
- the service may have documented processes for access to a brachytherapy service, and access to a superficial / orthovoltage x-ray machine
- provide relevant clinical indicator data to satisfy accreditation and other statutory reporting obligations.

Workforce requirements

In addition to the requirements outlined in the Fundamentals of the Framework, specific workforce requirements include:

- staffing numbers established to meet planned patient-care capacity
- registered medical specialist with credentials in radiation oncology and children's expertise
- technician, nursing and allied health staff have experience in children's services
- registered medical specialist with credentials in anaesthetics and subspecialty in children's anaesthetics accessible 24 hours for urgent and elective procedures requiring general anaesthesia

- registered medical specialist with credentials in radiation oncology to: provide an expert opinion on, and integrated management of, children with cancer; participate in children's multidisciplinary teams as a core member; determine treatment regimens, (including treatment volumes, doses and organs at risk) in consultation with a registered medical specialist with credentials in children's oncology; write radiation treatment prescriptions; review treatment plans; and manage care of patients before, during and after treatment
- radiation therapists who are core members of the radiation treatment planning team and who acquire relevant imaging studies, design radiation treatment plans, implement radiation treatment, provide quality assurance for planning and treatment activities, manage department workloads, contribute to the development of departmental procedures, and provide patient care
- qualified radiation oncology medical physicists, whose roles include:
 - equipment quality assurance
 - dosimetry
 - provision of radiation beam data
 - advice on radiation oncology
 - involvement in the planning and treatment of complex external beam treatments
 - involvement in the quality assurance of external beam treatment planning
 - evaluation of the accuracy of treatment planning and treatment techniques
 - planning and delivery of brachytherapy treatments
 - calibration of external beam and brachytherapy sources
 - commissioning of new equipment
 - provision of scientific and technical advice on the selection of new equipment
 - provision of advice on radiation protection and safety⁴
- nursing staff with appropriate training, knowledge, skills and evidence of ongoing competency in the safe delivery of care for children receiving radiation, who are trained in paediatric life support and have knowledge of common side effects and consequences of radiation therapy and other systemic cancer therapies
- access to dentists as required for head and neck patients
- allied health professionals with expertise or interest in childhood cancer, or discipline-specific documented processes with specialty allied health staff within a Level 6 service
- x-ray engineering and radiation mechanics on-site during business hours and accessible after hours, as required
- Aboriginal and Torres Strait Islander liaison officers may provide cultural support and advocacy relevant to Aboriginal and Torres Strait Islander patients and/or carers, as required

Radiation Oncology Service - Children's

	Level 5	Level 6
<p>Service description</p>	<ul style="list-style-type: none"> • deliver a full suite of radiation oncology services for children, including consultative services and treatment. • may provide a short course of palliative radiation therapy for symptom relief at a Level 5 (adult) radiation oncology service under supervision of Level 6 service specialising in children's services. • ideally provides day-stay, children-specific beds. • may include external beam therapy, but exclude specialist children's radiation oncology services. 	<ul style="list-style-type: none"> • provides comprehensive range of specialised radiation oncology treatment services, including total body irradiation, and external beam and brachytherapy services. • provides regional or statewide services, including treatment for rare tumours, delivered by highly skilled, multidisciplinary workforce. • provides support to statewide mortality and morbidity meetings, and has critical mass of expertise or recognised volume of work to ensure quality care. • patients should be cared for by highly skilled, multidisciplinary care team with core members capable of providing full range of management and support, with core multidisciplinary members usually including registered medical specialists with credentials in subspecialties, such as children's surgery and children's oncology; registered medical specialists with credentials in radiation oncology, radiology and pathology; and registered nurses and allied health professionals expert in care of children and their families. • participates in multidisciplinary clinics in the Queensland Children's Cancer Centre, ensuring the child's cancer is staged and appropriate evidence-based treatment recommendations are recorded. • additional special treatments/techniques may include: <ul style="list-style-type: none"> – remote-control intra-cavity equipment with after-loading technique – brachytherapy using eye plaques – stereotactic radiosurgery

	Level 5	Level 6
		<ul style="list-style-type: none"> – intraoperative radiotherapy. • some treatments (such as unsealed source radiotherapy) may not be available at all Level 6 services.
Service requirement	<p>As per module overview, plus:</p> <ul style="list-style-type: none"> • provides limited range of radiation oncology treatment services in accordance with standardised, evidence-based guidelines and protocols, as appropriate. • inclusion in a service network with higher level services, ensuring access to information related to latest evidence-based care and treatments. 	<p>As per Level 5, plus:</p> <ul style="list-style-type: none"> • all clinical staff trained in advanced paediatric life support. • appropriate linear accelerator bunker and equipment to deliver total body irradiation and total skin electron beam therapy. • appropriate inverse planning system and independent Intensity Modulated Radiation Therapy dose verification system. • provision of appropriate anaesthetic equipment and expertise where anaesthetic procedures undertaken (refer to Anaesthetic Services and Anaesthetic Services - Children's modules). • fully integrated, computer-assisted, networked planning and treatment system with capability for verifying precision, planning and treatment modalities. • capacity for safe delivery of sealed and unsealed radioisotopes or radiopharmaceuticals. • appropriate facilities for children's anaesthetics with induction rooms and recovery area 24 hour/s. • support areas (consulting rooms and offices) collocated with radiotherapy service. • in preparation for radiation therapy, a room available for education of children, which may include mock radiotherapy machine. • facilities available for specialised procedures. • documented processes for subspecialist children's services (including process to manage children's emergencies within adult environment).

	Level 5	Level 6
		<ul style="list-style-type: none"> documented processes for adolescent and young adult specialty services when these become available.
Workforce requirements	<p>As per module overview, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> registered medical specialist with credentials in children's and interest in oncology for patient supervision. registered medical practitioners competent in providing advanced paediatric life support. access—24 hour/s— to registered medical specialist with credentials in radiation oncology, for consultation and for children admitted with complications. <p>Allied health</p> <ul style="list-style-type: none"> access—during business hours—to children's allied health professionals. Access—24 hour/s— to general physiotherapist. radiation therapists to meet planning and treatment capacity requirements and clinical need. adequate numbers of qualified radiation oncology medical physicists (or equivalent support) on-site during business hours and accessible after hours, as required. allied health professionals who have access to specialty allied health professionals within Level 6 service who have expertise in management of children undergoing radiation therapy. 	<p>As per Level 5, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> registered medical specialist with credentials in radiation oncology and special interest in children's to develop and supervise treatment regimes in consultation with registered medical specialist with credentials in children's oncology. access—24 hour/s— to registered medical practitioner with credentials in radiation oncology for inpatients. 24 hour/s service for all specialties, where clinically relevant. dedicated registered medical specialist with credentials in children's services. <p>Allied health</p> <ul style="list-style-type: none"> access to radiation oncology staff with special interest in children's radiation services (e.g. total body irradiation, stereotactic radiosurgery, stereotactic radiotherapy and brachytherapy). access to children's allied health professionals, as required (e.g. occupational therapists, dentists, speech pathologists and dieticians).
Specific risk considerations	<ul style="list-style-type: none"> Nil 	<ul style="list-style-type: none"> Nil

Support services requirements for children’s radiation oncology services

	Level 5		Level 6	
	On-site	Accessible	On-site	Accessible
Children’s anaesthetic	5		5	
Medical imaging		5		5
medication		5		5
Nuclear medicine		5		6
Palliative care		5		6
Pathology		3		3
Radiation oncology		5		6

Table note: On-site means staff, services and/or resources located within the health facility or adjacent campus including third party providers.

Accessible means ability to utilise a service (either located on-site or off-site) or skills of a suitably qualified person (who may be either on-site or off-site)—without difficulty or delay—via various communication mediums including but not limited to face-to-face, telehealth, telepharmacy, and/or outreach

Legislation, regulations and legislative standards

Refer to the Fundamentals of the Framework, Children's Services Preamble, Cancer Services Preamble and Radiation Oncology Services module for details.

Non-mandatory standards, guidelines, benchmarks, policies and frameworks

(not exhaustive & hyperlinks current at date of release of CSCF v3.2)

In addition to what is outlined in the Fundamentals of the Framework, Children's Services Preamble, Cancer Services Preamble, Radiation Oncology Services and Cancer Services - Children's modules, the following is relevant to children's radiation oncology services:

- The Royal Australasian College of Physicians. Standards for the Care of Children and Adolescents in Health Services. Sydney: RACP; 2008.
www.awch.org.au/pdfs/Standards_Care_Of_Children_And_Adolescents.pdf

Reference list

1. Gibbs IC, Tuamokumo N, Yock TI. Role of radiation therapy in pediatric cancer. *Hematol Oncol Clin North Am* 2006;20(2):455–70.
2. National Health Service (UK). Manual of cancer services standards. London: NHS Executive; 2001.
3. Oliver L, Fitchew R, Drew J. Requirements for radiation oncology physics in Australia and New Zealand. Australasian College of Physical Scientists and Engineers in Medicine (ACPSEM) Position Paper. nd.