ACPSEM

Australasian College of Physical Scientists & Engineers in Medicine

ROMP Workforce Calculator

Contextualised Australasian IAEA Model

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Foreword

Radiation Oncology Medical Physicists are experts on radiation, its interaction with the human body and its application to the treatment of cancer. They create, implement and monitor advanced cancer radiation treatment technologies and procedures that will allow for the best treatment on a case-by-case basis, while also taking into account the protection and safety of patients and staff.

ROMPs are involved in clinical consultancy, treatment delivery and verification, quality assurance and evaluation and implementation of new technologies. They are commonly responsible for the commissioning, safe operation and quality of systems in established medical radiation treatment machines such as linear accelerators, CT scanners, and superficial X-Ray machines, and for the implementation and radiation safety of new treatment technologies, such as image guided radiation therapy. The complex nature of modern radiotherapy requires that the process be overseen by a professional with an understanding of both the big picture and the technical minutia. ROMPs, the professional group with scientific and technical expertise in all technical aspects of radiotherapy, and an education that emphasizes the fundamental understanding of basic science, problem solving and optimisation, are trained for this role[1].

ROMPs work closely and collaboratively with physicians, nurses, therapists and engineers to safely deliver radiotherapy. A radiation oncologist will recommend a radiation dose, a radiation therapist will plan it, and the radiation oncology medical physicist will ascertain the safety of equipment to be used for treatment so that the dose may be delivered correctly. Medical physicists can also provide case-specific advice to radiation oncologists and radiation therapists on the best way to apply medical radiation. They also work with IT and engineering staff on radiotherapy equipment and the computer systems linked to them.

Radiation Safety is the responsibility of medical physicists, no matter their specialty. Other health professionals rely on the medical physicist in radiation safety, advice and policy matters.

This publication presents the ACPSEM ROMP Workforce (ARW) Model, an activity-based workforce model similar to that published by the International Atomic Energy Agency (IAEA) in their Staffing in Radiotherapy: An Activity Based Approach[2]. The ARW Model adapts and contextualises IAEA activity-based principles for Australian and New Zealand practices. Like the IAEA model, the ARW Model uses a calculation algorithm to predict the 'Qualified ROMP equivalent' staffing level based on inputs commonly used for ROMP workforce planning.

The model allows flexibility through have a variable for the level of 'Physics time per task', which allows for variation in radiotherapy facilities staffing composition, automation levels and quality assurance practices. However, like the IAEA model, the ARW Model does not incorporate or assume economic and human resource constraints or model how regulatory requirements may affect the implementation of optimum staffing levels. Staffing requirements are solely influenced by model data inputs that reflect the service and technology mix of each practice setting.

The ACPSEM wishes to express its gratitude to the Radiotherapy facilities that completed the RO Centre Survey. Survey responses provide the crucial case and equipment times that make ARW Model relevant to the Australia and New Zealand region. The ACPSEM would also like to recognise the contributions of the Project Team, in particular the Task Group[3], which was established to guide the delivery of this work.

[1] Baume P., "A Vision for Radiotherapy: Report to Radiation Oncology Inquiry" Canberra, Department of Health and Aging, 2002

[2] IAEA HUMAN HEALTH REPORTS No. 13 - Staffing in Radiotherapy: An Activity Based Approach (https://www.iaea.org/publications/10800/staffing-in-radiotherapy-an-activity-based-approach) (*last accessed 29 April 2021*)

[3] Task Group Members: David Waterhouse, Howell Round *(Chair),* Jenny Lydon, Lotte Fog, Lynne Greig, Lynsey Hamlett, Scott Crowe and Trent Aland.

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Introduction

Background

The Australasian College of Physical Scientists and Engineers in Medicine (ACPSEM) is the peak body for medical physicists, radiopharmaceutical scientists and biomedical engineers. Radiation Oncology Medical Physicists (ROMPs) work with radiation oncologists, nurses, therapists and engineers in the delivery of radiotherapy for the treatment of cancer. ROMPs are involved in clinical consultancy, treatment delivery and verification, quality assurance and the latest technology evaluation.

The ACPSEM ROMP Workforce (ARW) Model (ARW) provides the evidence-based quantification of ROMP staffing levels needed to support a radiotherapy facility in Australia and New Zealand. This work builds on previous activity-based approaches to estimating staffing requirements, particularly the International Atomic Energy Agency (IAEA) *Staffing in Radiotherapy: An Activity Based Approach*.

Model objectives

At the Radiation Oncology Specialty Group (ROSG) recommendation, the ACPSEM ROMP Workforce Model has been based on contextualisation of the IAEA model, including a patient focus, taking into account the complexity of treatments delivered, centre location and management arrangements in place.

The ARW Model has been developed to be a modelling tool applicable at both the site and system levels. Much like the IAEA model, the tool is designed to allow facility managers and workforce planners more transparent and flexible ROMP staffing guidelines, which can be adapted to reflect current, and projected:

- patient mix
- available modalities and technological complexities
- radiotherapy staffing mix and roles
- work practices.

Scope

For each patient treatment type, the ARW Model rolls up Simulation, Treatment Planning, Patient-specific QA Measurements, Patient-Specific QA Analysis and Treatment Delivery and IVD activities. This summary level makes it easier to use the model. Again for usability, different routine equipment QA intervals (i.e. monthly, weekly) are normalised to annual equivalents.

The ROMP role is far broader than direct patient and equipment QA activities. ROMPs have a critical professional function in radiotherapy facilities and provide expertise about radiation safety and protection, educate trainees and other staff and develop clinical practice and services. This extended function is reflected in the ARW Model and requires users to allocate dedicated time.

Like the IAEA model, the ARW Model does not incorporate or assume economic and human resource constraints or model how regulatory requirements may affect the implementation of optimum staffing levels.

Structure

The ARW Model is provided as a spreadsheet. The model user inputs data to reflect the local experience, workforce practices, procedure volumes by technique, equipment, and modality types. Model input variables should be readily understood and be available to facility managers and workforce planners, which was demonstrated through Survey responses.

Use cases

The ARW Model is envisaged as a valuable tool to support many types of decision support activity including, planning for new and expanded services based on anticipated service volumes or future scenarios; national/state projections for capacity and larger–scale planning; evaluation of work practices at individual sites as well as benchmarking for provider groups and networks. The tool may also assist the college in future TEAP program development, recruitment strategies and broader policy development

Activity-based time estimates

Approach to the contextualisation of IAEA

The IAEA model is an activity-based scenario building tool based on empirical evidence and expert judgment that relies on connected variables and assumptions [1]. The ARW Model adapts and contextualises IAEA activity-based principles for Australian and New Zealand practices at a granular level and rationalises model parameters to capture Medical Physicists time only.

The inputs to the ARW Model were obtained via a sector-wide survey. The Project Team worked with the ACPSEM and a specially formed Task Group to design and conduct the data collection. The Task Group members refined the IAEA model activities to reflect the Australian and New Zealand context before collecting data. The resulting RO Centre Survey data then determine representative activity time profiles, which ultimately underpin the ARW Model.

RO Centre Survey – data collected included:

- ROMP and registrar positions (FTE, heads, filled/vacant)
- Case volumes by major service category
- ROMP time spent on patient treatment and equipment QA
- The degree of networked centre support
- Issues relating to workforce recruitment and retention

Methodology

The ACPSEM attempted a fully enumerated approach to obtaining patient-facing treatment and direct equipment QA activity times. The aim was to ensure that estimated average times are representative of all Australian and New Zealand radiotherapy centres.

Radiotherapy centres do not routinely capture the information that the survey collected. Thus, three levels of data validation were implemented to ensure the reasonableness of the information:

- **Within the Survey:** The data collection tool contained a model which calculated annual estimated ROMP equivalent FTE for each treatment and equipment type. These calculations use the centre's input and included time estimates on direct patient and equipment QA activities, typical work patterns, and other non-direct patient or equipment activities. Results provided instant feedback and a 'sense check' mechanism to understand the reasonableness of respondent estimates.
- **Project Team Validation:** Where individual survey responses highlighted inconsistencies across the inbuilt checks, the project team followed up with individual sites to discuss the reasons for the differences. In some instances, surveys were revised based on new understanding. Sometimes differences were explained through facility circumstances such as network resource sharing arrangements, overtime and vacant roles.
- **Task Group Validation:** The Task Group was provided with aggregated descriptive statistics at varying intervals, emphasising average time estimates by treatment type. Task Group Members also piloted the model with site data to determine the reasonableness of model output.

RO Centre Survey Responses

Radiation Oncology Treatment Centres

According to the Targeting Cancer website operated by the Royal Australian and New Zealand College of Radiologists [2], there are 105 RO Treatment Centres in Australia and nine in New Zealand. The ACPSEM received 100 RO Centre Survey Responses, with 99 surveys providing data that could be used to develop time estimates used in the ACPSEM ROMP Workforce Model.

- 92 Surveys were received from radiotherapy centres in Australia representing 87% of all Australian Centres
- 6 Surveys we received from radiotherapy centres in New Zealand representing 60% of all New Zealand Centres.

Qualified ROMP FTEs

Data from the Royal Australian and New Zealand College of Radiologists indicate that there were approximately 307.6 Accredited and 73.1 non accredited ROMP FTE in 2019, and 100.5 TEAP Registrar FTE. The ACPSEM survey for 2020 (financial year), accounted for:

- 328.7 Registered ROMP FTE
- 22.2 Non-registered ROMP FTE
- 74.3 ROMP Registrar FTE

Whilst a 100% survey response rate was not achieved (as ACPSEM targeted), ARW Model data covers approximately 90% of the sector

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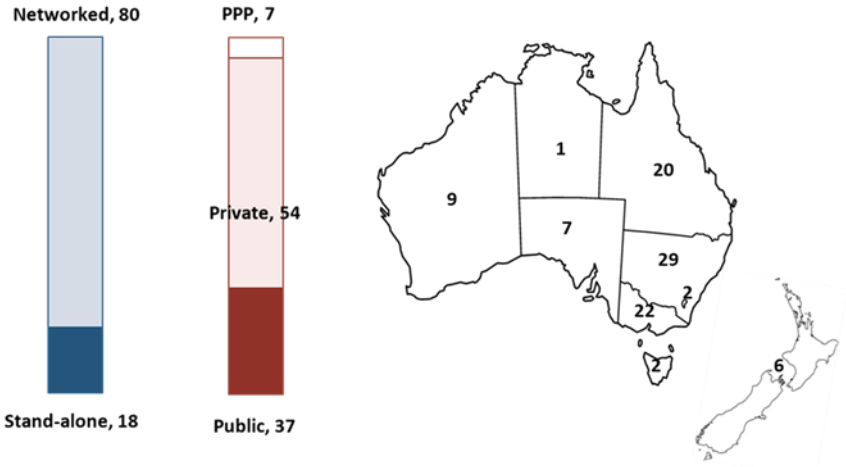
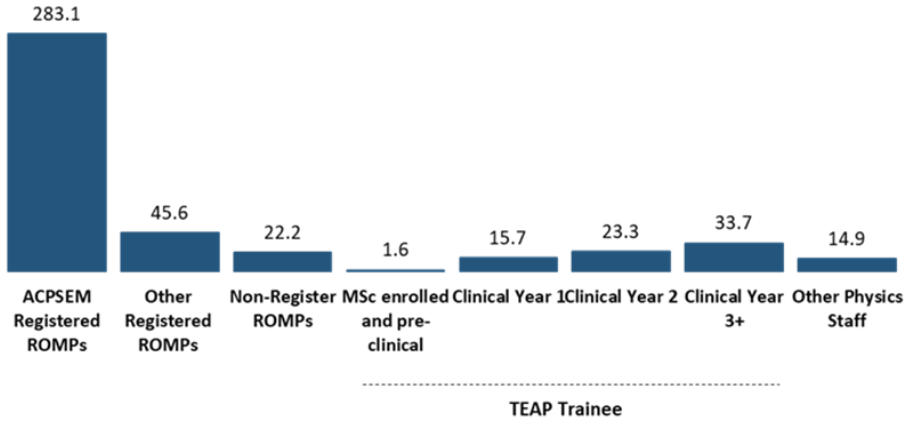
Validated Centre Responses



440.1

Total FTEs



Key Features of the Model

The model reflect an activity based approach for estimating Qualified ROMP staffing levels, and reflect the 'typical' ROMP workflow. Each of the activity has been assigned a total time to realistically complete each activity, with time estimates based on survey consensus.

Model FTE estimates are expressed as Qualified ROMP FTE. ***A site's total physics FTE may differ according to that site's physics staff mix, which may be comprised of Qualified ROMPs, TEAP Trainees, Associate Physicists and Physics Technicians*** i.e. a Physics Technician may spend more time on clinical work than a qualified ROMP, or an Associate may commit more time to their own training than a qualified ROMP; similarly, a facility may have several TEAP trainees who need more time to achieve similar volumes of Qualified ROMP activity.

Representative time per case for each treatment type

The survey collected frequency estimates about ROMP involvement in Simulation, Treatment Planning/Checking, Patient-Specific QA Measurements, Patient-Specific QA Analysis, Treatment Delivery and IVD (expressed as a percentage of cases by treatment type per site). Respondents also estimated the average minutes to perform those activities.

A weighted average time per case for each treatment type was then estimated using activity frequency and minutes. The ARW Model treats each radiotherapy site with equal weighting (i.e. not adjusted for each sites case volume). The representative time estimate for each treatment type was established as the median of the survey responses.

Representative routine QA time per equipment

Survey respondents also estimated the amount of ROMP time spent on routine equipment QA. Radiotherapy centres could provide estimates for each unit of equipment at any, or all, of the following intervals (to allow for varying QA practices): daily, fortnightly, monthly or annually (routine and maintenance and repair work)

Average annual times were then calculated. Like direct patient related time each radiotherapy site's estimates were treated with equal weighting (i.e. not adjusted for each site's equipment counts). The average of the survey responses was used as the representative time estimate for routine QA time per equipment unit.

Incorporation of 'Physics Time per Task' Factors

Survey analysis indicated a broad commonality in radiotherapy centres operations. However, the everyday composition of ROMP workloads varies, being influenced by staff mix, case mix work practices, and the number of staff available.

This project aimed to develop a ROMP workforce calculator representing the Australia and New Zealand Context, not necessarily defining a standard for what could be considered best practice. The ACPSEM ROMP Workforce Model incorporates factors for 'Physics time per task' to capture ROMP involvement in direct patient related activities. The factors allow sites to changes the level of ROMP activity involvement based on variables such as:

- Whether ROMPs are heavily involved in treatment planning
- If QA checks are done for every case, randomly or on a periodic basis
- Whether checks are automated or manual

Commissioning QA time per equipment

The survey also asked respondents to provide equipment commissioning time estimates. However, respondents interpreted this information request in two ways, either providing 2020 actual commissioning time or a 'typical' time based upon equipment lifecycle estimates. As a result, the survey data contains both, which can be up to a magnitude apart.

A Delphi process was conducted with the Task Group, using the average time taken from the survey results as the baselines.

- In the first instance, the Project Team corrected for what appear to be lifecycle estimates to derive actual commissioning times.
- The Task Group provided guidance on whether the average commissioning times were about right, and if not suggest a time which would be more realistic based on their experience.
- The Task Group data was reviewed and the initial average commission times obtain through survey data was harmonised based on Task Group feedback.

The average commissioning time presented in the model should be treated as a guide and ARW Model does allow for commissioning times to be entered manually (average commissioning times and units), so that workforce planners can create comprehensive ROMP FTE estimates.

ACPSEM ROMP Workforce Calculator Descriptions and Guide

The ACPSEM Workforce Model focuses on the routine ROMP workforce practice standard for radiation oncology centres in Australia and New Zealand, including technology and techniques.

Model users are required to enter the number of patients and equipment items available. The mix of time spent due to technology and technique complexities is a function of volume and the representative task times embedded in the model. Further, Radiotherapy Centres can adjust the expected task times using the Physics time per task variable (*described on the previous page – Column F of the Model*).

External beam radiotherapy (EBRT) techniques

The ACPSEM Workforce Model covers a broad range of EBRT treatment technologies, including less commonly used techniques such as Cyberknife, MR Linac, GammaKnife, TSET and IORT.

For each of the EBRT treatment techniques, the time per case reflects the time spent by ROMPs on Simulation, Treatment Planning and Checking, Patient-Specific QA Measurements, Patient-Specific QA Analysis, Treatment Delivery and IVD activities.

- Because the supporting study collected RO Centres' average times per case, these times inherently reflect the number of fractions/procedures per case.
- The times per case also reflect a mix of treatment planning and checking techniques (i.e., Automated vs comprehensive) and the different QA techniques used (i.e., calculated, phantom or a blend of the two approaches).

In using the model, the user is simply required to enter the number of Cases they expect to treat using each of the EBRT treatment techniques per year (Cells E50 to E64 of the Model).

Additional EBRT Activities

The ACPSEM Workforce Model provides workforce estimates that are adjusted for the number of additional EBRT activities that a centre is likely to complete.

These additional activities include:

- *Motion Management:* the number of cases involving ROMPs to ensure treatment can compensate for patient respiratory motion.
- *Patient Positioning:* the number of cases where additional time is needed to optimise patient position and immobilisation method for treatment. Cases numbers are entered separately for simple, complex and custom devices.
- *Additional image acquisition*: the number of cases using additional modalities (i.e., not included in everyday RO Treatment workflow) to improve target definition (e.g., MRI and PET/CT)
- *Additional activities related to TV definition*: the number of cases that need further image fusion due to the use of additional image acquisition (e.g., MRI and PET/CT)
- *Block cutting and accessories:* the number of cases requiring treatment aids, custom blocks, and other modifying devices needed for patient treatment.
- *Advice/Measurement for implanted devices:* the number of cases involving ROMP advice about patient implanted devices such as pacemakers and prostheses
- *Evaluation and advice provided during treatment*: the number of cases where ROMPs provide treatment planning or checking advice during patient treatment.

These activities capture the additional complexities of delivering radiotherapy treatments. The number of cases in each category will not necessarily equal the total number of EBRT cases, although total cases should not exceed total EBRT cases. However, some cases may appear in more than one category, so the aggregate across categories can be greater than the total EBRT cases. Representative activity times already capture the complexity mix.

Users are required to enter the number of cases they expect will require each of the additional activities (Cells E68 to E76).

ACPSEM ROMP Workforce Calculator Descriptions and Guide

Brachytherapy

Brachytherapy treatments are broken down by insertion type and whether or not image guidance is required:

- Simple insertion of applicator or mould placement without image guidance.
- Intermediate insertion of the intracavitary applicator without image guidance (n.b. the activities include theatre time).
- Complex insertion of intracavitary or endocavity or intraluminal or endovascular applicators with image guidance (n.b. the activities include theatre time).
- Complex insertion of hybrid intracavitary and interstitial or multi-catheter applicators, which contain multiple catheters encased in a single device (n.b. the activities include theatre time).
- Complex insertion of interstitial implants not requiring surgical exposure with image guidance
- Complex insertion of interstitial implants requiring surgical exposure with or without image guidance

Similar to EBRT activities, the time per case reflects the time spent by ROMPs on Simulation, Treatment Planning and checking, Patient-Specific QA Measurements, Patient-Specific QA Analysis, Treatment Delivery and IVD activities. Because the supporting study collected RO Centres' average times per case, these times inherently reflect the number of fractions/procedures per case. Users should enter the number of Brachytherapy cases they expect to provide per year (Cells E80 to E85).

Equipment

The model contains a comprehensive list of equipment used in Radiotherapy. Quality assurance hours account for routine quality controls and maintenance activity time per unit. ROMP equipment QA time is expressed annually, although ROMP involvement may occur at various intervals (i,e., a daily basis, weekly, fortnightly or monthly basis). Users are required to enter the number unit per equipment type (Cells E90 to E125).

The model separates out initial equipment commissioning time to allow users to account for non-routine ROMP equipment QA activities. The model starts with a default time that can be overwritten (Cells I90 to I125). The user can refer to the model's indicative range for guidance (based on survey data) if they feel the default setting does not reflect their site's practices. Users must also enter the number of equipment they expect to commission (Cells F90 to F25).

ROMP Activities that are not patient or equipment QA specific

Users can change the balance of ROMP work effort between direct patient/specific equipment QA activity and their time spent on the following:

- *Education:* This is not exclusive to TEAP training and also includes classroom and departmental teaching
- *Quality and Safety activities:* Such as peer reviews and MDC, follow-up evaluations and additional tasks requirement for accreditation purposes.
- *Clinical and Service Development*
- *All other activities:* This includes other activities such as research, CPD administration, document management, college activities and all other ROMP activities not previously classified.

Users enter typical ROMP hours (as an average across all ROMP in the department) on a weekly or monthly basis (Cells E24 to E44).

The proportion of time that a ROMP can devote to patient and equipment activity is used to 'scale up' FTE estimates *(based on the number of cases/equipment and time per case/unit) such that the proportion of time allocated to tasks that are not patients or equipment QA specific is preserved.*

Department Standard Working hours

The model estimates the number of Qualified ROMP FTEs that a department requires based on the individual radiotherapy centre's standard hours. Users need to enter the number of days worked per week, hours worked per day and standard leave entitlements (Cells E11 to E16).

Worked Examples

The ACPSEM ROMP Workforce Model was tested by project Task Group Members. They compared the Model's results to their existing staffing levels based on workload mix and activity composition. The Model provides a tool to help understand ROMP workforce requirements (based on Australian and New Zealand practices); it is not designed to output optimal work practice. Users can adjust time allocated to activities that are not patient-facing or equipment specific and the degree of ROMP involvement for each treatment technique.

Overall, the Task Group considered that the Model was flexible enough for users to reflect their existing staffing levels based on Case workloads and ROMP involvement factors. However, there are some factors to consider when using the Model

- **Level of ROMP involvement and types of activities.** The levels of Physics time per task are based on the interquartile range of the RO Centre Survey Data. As such, for some treatment techniques, when comparing current practices, there will be instances where an RO Centre's ROMP FTE may fall outside modelled bounds. In these instances, the Model will underestimate or overestimate ROMP FTE requirements.

- **Routine Equipment QA.** The annual equipment QA time is based on average annualised times from survey respondents. Thus respondents equipment mix and routine QA interval variations are reflected in the Model's average times. Some centres may have equipment requiring less QA (less intense or less often) due to equipment age or manufacturer specifications. Therefore, in some instances, the time needed for equipment QA may also result in an under or overestimate of ROMP FTE requirements.

The remainder of the paper explores three worked examples showing how the Model could help understand ROMP workforce requirements. The scenarios cannot illustrate the full breadth of practice from the RO Centre Survey. The worked examples consider the following:

1. **A 'Large' Radiotherapy Centre**
2. **A 'Small Standalone' Centre**
3. **A 'Small Networked' Centre**

Scenario 1: A 'Large' Radiotherapy Centre

Work Arrangements:

This Large Radiotherapy Centre provides relatively 'typical' working hours, with ROMPs working 7.6 hour days and 5 days a week. Additionally, this centre allows for 40 days leave, inclusive of public holidays and conference/study leave. Therefore, a ROMP FTE for this centre is defined as working:

- 220 days per year; and
- 1,672 hours per year.

ROMP Activity breakdown:

ROMP activity at this centre is assumed to be typical of Australian and New Zealand Centres. More specifically, it assumes that across the department, all ROMPs would spend:

- 31.3% of time on Patient or Equipment QA activities
- 9.1% of time on Education. It is assumed that this Centre provides TEAP training, with the amount of ROMP time apportioned to this activities set to the Australian and New Zealand average (6.4%).
- 19.6% of time on required quality and safety
- 20.3% of time on Clinical and Service development
- 19.7% of time on other required activities, including research, CPD, document management and so forth.

Radiotherapy Centre Patient Courses:

This Large Radiotherapy Centre is expected to treat (on an annual basis):

- 1,800 external beam patients (89% VMAT/IMRT, 5.5% 3DCRT and 5.5% Electrons)
- 300 stereotactic patients (33.3% SABR Simple, 33.3% SABR Complex and 33.3% SRS)
- 200 brachytherapy patients (25% Simple insertion of applicator or mould placement without image guidance (volume study; 25% Complex insertion of intracavitary or endocavity or intraluminal or endovascular applicators with image guidance; and 50% Complex insertion of interstitial implants requiring surgical exposure with or without image guidance).

The ROMP level of involvement in Simulation, Treatment Planning/Checking, Patient-Specific QA Measurements, Patient-Specific QA Analysis, Treatment Delivery and IVD activities (for each treatment) are in line with 'typical' Australian and New Zealand practice. The Physics Time per Task for all treatment types are set to 'Mid'.

Additional EBRT Activities:

In addition to the ROMP activities outline above, ROMPs are assumed to be required for additional activities relating to those EBRT treatments. Specifically:

- 20% of cases would require Motion Management
- 24% of cases would require additional Image fusion
- 5% of cases would required Block cutting and/or other accessories
- 10% of cases would require advice and/or measure of implanted devices
- 5% would require evaluation and/or advice during treatment.

Equipment

The Major equipment at the site assumed to be:

- 4 Linacs (same vendor) with OBI/CBCT/SGRT
- 1 Stereotactic Linac with non-orthogonal imaging
- 1 Linac being commissioned
- 1 CT-sim and MRI-sim
- 1 HDR and LDR Brachytherapy
- 3 TPS's: External Beam, Stereotactic, Brachytherapy

This Centre has a mix of other equipment associated with the treatment mix

Qualified ROMP FTE Requirement

10.9 FTE

Scenario 2: A 'Small Standalone' Radiotherapy Centre

Work Arrangements:
This Small Standalone Radiotherapy Centre provided for relatively 'typical' working hours, with ROMP working 7.6 hour days and five days a week. Additionally, this Centre allows for 40 days leave, inclusive of public holidays and conference/study leave. Therefore, a ROMP FTE works:

- 220 days per year; and
- 1,672 hours per year.

ROMP Activity breakdown:
ROMP activity at this Centre is assumed to be consistent with typical of Australian and New Zealand Centres. However, the Centre does not provide any TEAP training, and as a result, ROMPs can dedicate slightly more of their time to patient and equipment QA activities. Across the department, ROMPs would spend on average:

- 37.6% of time on Patient or Equipment QA activities
- 2.8% of time on Classroom and departmental teaching and tutorial
- 19.6% of time on required quality and safety
- 20.3% of time on Clinical and Service development
- 19.7% of time on other required activities.

Radiotherapy Centre Patient Courses:
This standalone site is expected to treat (on an annual basis):

- 750 external beam patients (80% VMAT/IMRT, 6.7% 3DCRT and 13.3% Electrons)
- 50 stereotactic patients assumed all be SABR Simple.

The ROMP level of involvement in Simulation, Treatment Planning/Checking, Patient-Specific QA Measurements, Patient-Specific QA Analysis, Treatment Delivery and IVD activities (for each treatment) are considered higher than typical in Australia and New Zealand. This is due to the standalone nature of the Centre and the inability to quickly draw on experience from other ROMPs.

Additional EBRT Activities:
In addition to the ROMP activities outline above, ROMPs are assumed to be required for additional activities relating to those EBRT treatments. Specifically:

- 12.5% of cases would require Motion Management
- 12.5% of cases would require additional Image fusion
- 12.5% of cases would required Block cutting and/or other accessories
- 3.8% of cases would require advice and/or measure of implanted devices
- 2.5% would require evaluation and/or advice during treatment.

Equipment
The Major equipment at the site assumed to be:

- 2 Linacs with OBI/CBCT/SGRT
- 1 CT-sim
- 1 TPS

This Centre has a mix of other equipment required based on its treatment mix including data management systems, Image processing and registration systems, independent dose verification systems, Absolute dosimetry equipment, Relative dosimetry equipment, Survey and monitoring equipment and In-vivo dosimetry equipment.

Qualified ROMP FTE Requirement

3.4 FTE

Scenario 3: A 'Small Networked' Radiotherapy Centre

This scenario is similar to the 'Small standalone' radiotherapy centre, but assumes that the Physics time per task for most treatment activities is low. This reflects efficiencies and assistance gained through being networked.

Work Arrangements:
This Small Standalone Radiotherapy Centre provided for relatively 'typical' working hours, with ROMP working 7.6 hour days and five days a week. Additionally, this Centre allows for 40 days leave, inclusive of public holidays and conference/study leave. Therefore, a ROMP FTE works:

- 220 days per year; and
- 1,672 hours per year.

ROMP Activity breakdown:
ROMP activity at this Centre is assumed to be consistent with typical of Australian and New Zealand Centres. However, the Centre does not provide any TEAP training, and as a result, ROMPs can dedicate slightly more of their time to patient and equipment QA activities. Across the department, ROMPs would spend on average:

- 37.6% of time on Patient or Equipment QA activities
- 2.8% of time on Classroom and departmental teaching and tutorial
- 19.6% of time on required quality and safety
- 20.3% of time on Clinical and Service development
- 19.7% of time on other required activities.

Radiotherapy Centre Patient Courses:
This small standalone site is expected to treat (on an annual basis):

- 750 external beam patients (80% VMAT/IMRT, 6.7% 3DCRT and 13.3% Electrons)
- 50 stereotactic patients assumed all be SABR Simple.

Additional EBRT Activities:
In addition to the ROMP activities outline above, ROMPs are assumed to be required for additional activities relating to those EBRT treatments. Specifically:

- 12.5% of cases would require Motion Management
- 12.5% of cases would require additional Image fusion
- 12.5% of cases would required Block cutting and/or other accessories
- 3.8% of cases would require advice and/or measure of implanted devices
- 2.5% would require evaluation and/or advice during treatment.

Equipment
The Major equipment at the site assumed to be:

- 2 Linacs with OBI/CBCT/SGRT
- 1 CT-sim
- 1 TPS

This Centre has a mix of other equipment required based on its treatment mix including data management systems, Image processing and registration systems, independent dose verification systems, Absolute dosimetry equipment, Relative dosimetry equipment, Survey and monitoring equipment and In-vivo dosimetry equipment.

Qualified ROMP FTE Requirement

2.1 FTE