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# Implementation and evaluation of a rapid access palliative clinic in a New Zealand cancer centre

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## Abstract

**Introduction:** Palliative patients with metastatic bone pain endure long waiting times and multiple visits to radiation therapy departments for treatment. This can prolong suffering and may be a factor in patients consenting for treatment. Rapid Access Palliative Clinics (RAPC) have been established around the world to provide a multidisciplinary approach to consultation, simulation and treatment on the same day. This paper describes the implementation and evaluation of a RAPC at Waikato Regional Cancer Centre (WRCC) by reducing the time from referral to first specialist appointment (FSA). **Methods:** The structure and process for the RAPC day was outlined and the roles of staff were defined. A retrospective study was undertaken of the 261 consecutive patients seen in the RAPC from April 2009 to April 2013. Tracking sheets were created to record patient information at the initial consultation. Follow-up telephone calls were used to assess the patient post-treatment. Patient information was entered into a database. **Results:** A total of 226 patients received radiation therapy treatment to 307 sites. All patients were seen within 1 week of referral. Sixty-three per cent of patients were simulated and treated on the same day. The change in radiation therapy fractionation prescriptions was statistically significant ($P = 0.0012$). There was a statistically significant difference between initial and follow-up pain scores ($P < 0.0001$). **Conclusion:** Evaluation of the clinic has shown that it compares favourably with similar international clinics. The RAPC has decreased the referral to FSA for palliative radiation therapy and reduced the number of visits the patient has to endure due to an increase in single fraction prescriptions. This has resulted in rapid reduction in pain for the majority of patients.

## Introduction

In New Zealand there are approximately 18,500 new registrations of cancer each year. It is the second leading cause of death and a major cause of hospitalisation.[1] At least 50% of oncology patients will require palliative radiation therapy some time in their disease process.[2] Of those with painful bony metastasis, external beam radiation therapy provides significant palliation in up to 50–80% of patients. Complete pain relief can be achieved in up to one third of these patients.[3]

At Waikato Regional Cancer Centre (WRCC) cancer patients referred for palliation of pain commonly wait up to 4 weeks for their first specialist appointment (FSA) and then a further 2 weeks for radiation therapy treatment. The New Zealand national maximum acceptable delay for treatment is 14 days, but the Royal Australian and New Zealand College of Radiologists (RANZCR) state that best practice for palliative treatment is two working days from FSA.[4,5] Radiation therapy departments around the world have experienced similar time delays from FSA to palliative treatment for this cohort of patients.[2,6] The Canadian Association of Radiation Oncologists recommends 2 weeks from referral to consultation and 2 weeks from consultation to radiation treatment. It is reported that patients attending for treatment in Ontario can wait longer than these recommendations.[6] In addition, patients commonly require three visits to the oncology centre for FSA, simulation and radiation therapy treatment. The distance

travelled and the number of visits involved may prolong the patients suffering and become a barrier of receiving treatment.

As a result from concerns over timely access of assessment and treatment for this group, radiation therapy centres around the world have implemented Rapid Access Palliative Clinics (RAPC) for metastatic bone pain.[6–9] These clinics aim at providing a multi-disciplinary approach to assessment, simulation and treatment on the same day. The benefits reported include reduced waiting times from referral to FSA, shorter time to reduction in pain, increased patient satisfaction and patients benefitting from ongoing follow-up.[2,7,8] The clinics have provided advanced practice learning opportunities for radiation therapists (RT), which have proven benefits for the patient and department.[2,10]

Due to the long wait time for palliative radiation therapy the radiation oncologist (RO) who is also a palliative care physician proposed that a RAPC be implemented at WRCC. A discussion was held between the RO and RT to see if it was possible to provide rapid access treatment for these patients. After an evaluation of the literature, the process and the intended benefits to the department were determined including decreased waiting lists and reduction in multiple visits. This resulted in the formation of a RAPC at WRCC in 2009. The objectives were to reduce the number of visits required to the department and provide faster access to palliative radiation therapy with the potential for rapid reduction in pain for the patient. This paper describes the implementation and evaluation of the RAPC.

## Methods

### Clinic structure

The RAPC structure and patient eligibility criteria was based on a Canadian paper by Fairfield et al.[7] An RAPC pathway was established for the process of the day and the roles of staff in the clinic (see Appendix I). The RAPC occurred 1 day a week and it was implemented by a dedicated team consisting of a RO, RT and a radiation oncology nurse (RON). On referral the RO prioritised the patients for the RAPC. Initial criteria were established to ensure eligibility into the clinic (see Appendix I). If the patient met the initial criteria for the clinic then they were given the next available RAPC new patient consultation, which would be within 1 week.

All RAPC staff were included in a team briefing which was held prior to the commencement of the clinic to discuss the patients for the day, review diagnostic imaging and laboratory results. Possible treatment sites, patient positioning, dose fractionation, medication and any psychosocial issues identified from the referral or medical records were discussed. Any issues for the day were also identified, for example machine breakdowns or delays.

The RT was dedicated to organising the clinic. For continuity of care the RT followed the patient through all areas including consultation, simulation and treatment delivery. Treatment occurred later in the day at a pre-arranged time to allow for the planning process. The RO provided ongoing clinical training to the RT and RON, in both radiation therapy and palliative aspects of the patient's needs. The training provided to the RT included reviewing diagnostic images to determine the treatment site and discussing the best fractionation regime for the patient. With time the RT was able to assist in the consent process, providing further explanation on the treatment process and side effects to the patient. The RT determined the simulation position and appropriate computerised tomography (CT) scanning levels in consultation with the RO. The RT placed treatment fields in accordance with the diagnostic images onto the patient's scans at planning. An initial plan was then provided for review by the RO, adjustments were made and the RO approved the final plan.

The RON provided support for the patient and their carer/s. Education was given to the patient on possible radiation toxicities and pain flare. If these occurred the patient was advised to contact their general practitioner (GP).Appropriate referrals were made when required, including to the district nurse, hospice, physiotherapy or chaplaincy. Anti-emetics and pain relief prior to treatment were prescribed by the RO and administered by the RON. At the completion of treatment, the patient was discharged back to the care of the referring physician, unless hospital admission, further tests or follow-up were required. The RON organised the follow-up calls to the patient at 3 weeks for assessment of pain and additional support if required. The additional roles and responsibilities of the RT and RON in the RAPC compare favourably with other studies.[10]

Presentations were provided to referrer's and the staff in the oncology department to inform them of the process and intent of the RAPC. The RON presented at the local hospice to inform the staff of the eligibility of patients and the benefits and processes of the RAPC.

### Evaluation

A retrospective study was undertaken for 261 consecutive patients seen in the RAPC from April 2009 to April 2013, irrespective of whether they proceeded to have radiation therapy treatment. This was an audit of data collected retrospectively with approval from WRCC and the New Zealand Health and Disability Ethics Committee

(HDEC).[11] The HDEC provided confirmation that this study is exempt from a formal ethics review.

During the initial consultation a tracking form was created for each patient by the RT. The form was used to prospectively record patient history; site of painful areas, initial baseline pain score recorded by the RON and analgesic requirements that were obtained by the RO. Date of referral to FSA was also recorded. If the patient proceeded to have radiation therapy treatment, the treatment site, fractionation and date of treatment was recorded on the form. At a later date the information from the tracking form was entered into the database by the RT, along with patient information extracted from clinical records to facilitate the RAPC study.

Initially a visual pain scale was used to measure the patient's pain score. It was found within the first month of the RAPC that patients deemed it unnecessary to view the numerical pain scale and they were happy to give a verbal numerical rating. Zero represented no pain and 10 was the worst pain.[12]

At the time of consent, patients were informed that a follow-up phone call would be carried out at 3 weeks following the completion of the radiation therapy treatment. Changes in pain score and analgesic requirements were recorded on the tracking form. Telephone follow-up has been verified as a practical way of assessing patients following radiation therapy.[13,14] If the patient couldn't be contacted or was deceased at the time of the follow-up call, their data were recorded as not available (N/A).

### Statistical analysis

Descriptive statistics were used to analyse patient and treatment characteristics. Changes in pain scores before and after treatment were analysed using GraphPad Prism Chi-square test for trend. GraphPad Prism Chi-square was used to analyse trends in radiation therapy fractionation schedules.[15]

## Results

Between April 2009 and April 2013, 261 patients presented with 351 sites, all of whom were new to the radiation oncology department. Patient characteristics are shown in Table 1. Of 261 patients seen for FSA, 254 patients (97%) presented with bone pain. Twenty-four patients (9%) required further diagnostic investigation and could not, therefore be treated on the day of consultation. Twenty-nine patients (11%) were admitted to the ward. About 147 (48%) of the sites treated were in the spinal vertebra. Sixty-five (29%) patients were treated for multiple sites. Five patients were assessed and treated for more than three sites (see Table 2). The referring clinician was most commonly a medical oncologist (Fig. 1). About 146 (56%) of patients travelled more than 100 km to attend the clinic (Fig. 2).

**Table 1.** Patient characteristics for 261 patients entered into the RAPC.

| Gender | (*n* = 261) |
|---|---|
| Male | 170 (65%) |
| Female | 91 (35%) |
| Age (years) | |
| Range | 30–95 |
| Median | 69 |
| Primary diagnosis | |
| Prostate | 79 (30%) |
| Breast | 44 (17%) |
| Lung | 42 (16%) |
| Myeloma | 31 (12%) |
| Bladder | 14 (5%) |
| Unknown carcinoma | 5 (2%) |
| Other carcinoma | 46 (18%) |

RAPC, Rapid Access Palliative Clinic.

All 261 patients were seen within 1 week of their referral. A total of 226 patients received radiation therapy to 307 sites. Of the 351 presented sites only 307 were treated. The reason 44 sites were not treated was either due to the patient presenting at FSA with resolved pain, declining consent for treatment or having been established on other therapies such as hormone therapy for prostate cancer.

Sixty-three per cent of patients were simulated and treated on the same day as FSA. Fifty-one per cent of treated sites received a single 8 Gy fraction. However, this rate increased with time; from year 2 of the study (Fig. 3). Changes in proportions of radiation therapy

**Table 2.** Number of treated sites (*n* = 307) in the RAPC from 226 patients

| Site | No of treat sites (*n* = 307) |
|---|---|
| Spine | |
| C Spine | 10 (3%) |
| T Spine | 76 (25%) |
| L Spine | 46 (15%) |
| Sacrum | 15 (5%) |
| Pelvis/Hips | 78 (25%) |
| Ribs | 21 (7%) |
| Shoulders | 17 (6%) |
| Femur/knee | 13 (4%) |
| Chest | 12 (4%) |
| Other | 19 (6%) |
| Multiple sites | 65 (21%) |

RAPC, Rapid Access Palliative Clinic.

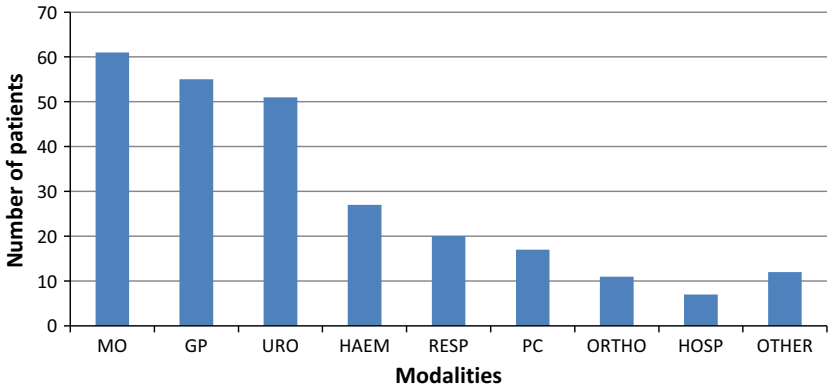


**Figure 1.** Number of referrals by modality. MO, Medical Oncologist; GP, General Practitioner; URO, Urologist; HAEM, Haematologist; RESP, Respiratory Physician; PC, Palliative Care Physician; ORTHO, Orthopaedic Surgeon; HOSP, Hospice; OTHER. Other Specialist.

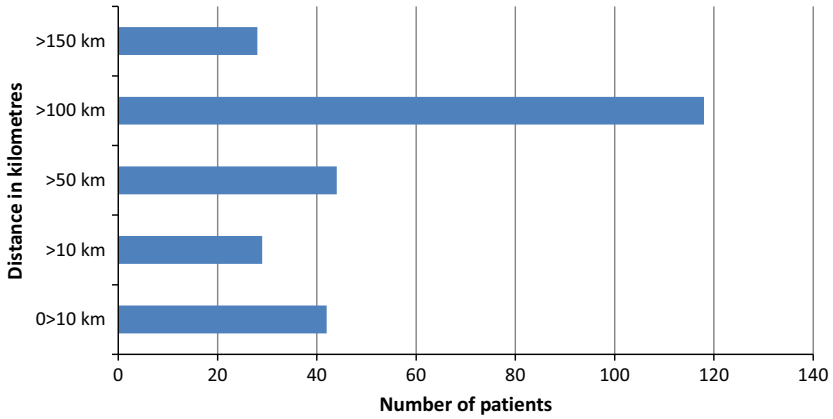


**Figure 2.** Distance travelled to the RAPC.

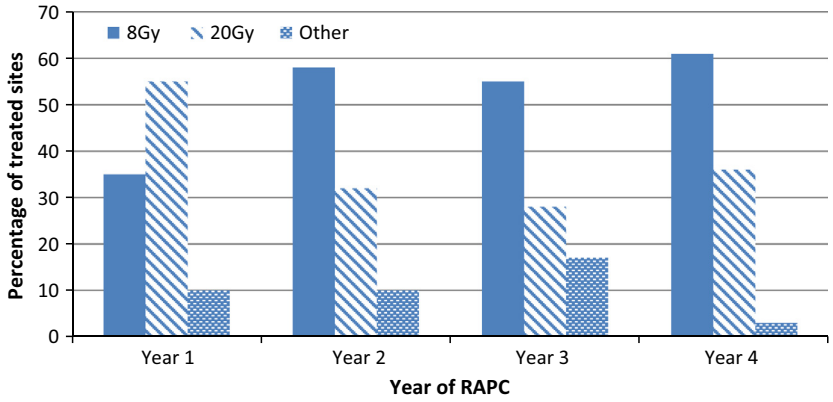


**Figure 3.** Percentage of treated sites receiving radiation prescriptions for each year in the RAPC. Chi-square ($P = 0.0012$).

fractionation schedules used was statistically significant ($P = 0.0012$). In the last year of the study 61% of sites treated received a dose of 8 Gy. Thirty-six per cent of patients were treated within 10 working days of their FSA (this is within the RANZCR recommendations of maximum acceptable delay of 14 days). Three patients

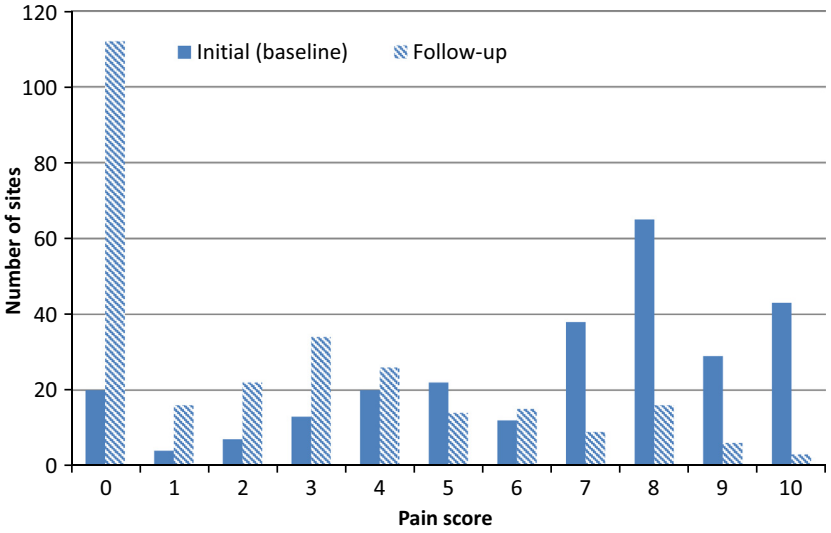


**Figure 4.** Chi-square test for trend ($P < 0.0001$) for initial (baseline) and follow-up pain scores.

received treatment outside the recommended time of 14 days from their FSA.

A numerical rating pain scale was used to obtain initial and follow-up pain scores.[12] Initial pain scores were recorded for 300 treatment sites (7 sites were not recorded at the beginning of the study) where 190 sites (62%) were recorded with a pain score of seven or greater. Follow-up pain scores were recorded for 273 treatment sites. A total of 184 (67%) sites were recorded as three or less. There was a statistically significant trend to lower pain scores at follow-up 3 weeks after radiation therapy ($P < 0.0001$, Fig. 4). Seventy-eight per cent had a reduction in their pain score at time of the follow-up phone call. Follow-up pain scores were not recorded for 34 patients as their contact details had changed and were not able to be contacted or they were deceased at time of follow-up call.

At consultation 22 patients were referred to other multidisciplinary services including, chemotherapy, palliative care, dietician, district nurse and hospice. This multidisciplinary approach allowed for rapid referral and assessment by other services for greater patient and family support.

## Discussion

For patients with advanced and incurable cancer, palliative radiation therapy is a proven modality for relief of pain and improvement in quality of life.[16] It is well reported that multiple visits to a department can influence the palliative patient's decision when considering radiation treatment.[6,7] An RAPC was established at WRCC to reduce the time from referral to FSA and the number of visits to the department through faster access to palliative radiation therapy.

The initial criteria were designed to ensure that appropriate patients were selected into the clinic. At times limited information from the referrer, or a change in status from time of referral to assessment resulted in patients needing further diagnostic investigation before proceeding with radiation therapy. Some patients proved to be unfit for treatment, and as a consequence, a CT simulation and treatment appointment was reserved and not used. This was a disadvantage of the clinic as appointments were booked months in advance, due to the unavailability of a dedicated linear accelerator for the RAPC. If the reserved timeslots were not used, valuable machine time was lost, emphasising the importance of accurate selection criteria.

Overall, 63% of patients were simulated and treated on the same day as FSA. This percentage is similar to other studies that have been completed including De Sa et al. where it was reported that 69% of patients were treated on the same day as consultation.[2] It should be noted that in the fourth year, 78% of patients were simulated and treated on the same day with 57% of the treated sites receiving an 8 Gy prescription. The reason patients were not treated on the same day of their FSA or exceeded the RANZCR recommendations for treatment included, patients receiving chemotherapy at the time of FSA (therefore chemotherapy was suspended for radiation therapy), patient preference for treatment to be at a later date (fatigue, travel issues), admission to the ward for pain control and patient's requiring further diagnostic investigation prior to treatment.

While there is clear evidence to support the use of single fraction treatments for uncomplicated bone pain, there is still reluctance to change from multiple fraction regimes.[17,18] An international literature review was conducted by Bradley et al. where results showed that current patterns of practice prefer multiple fractions for bone metastases, this included New Zealand and Australia. A Canadian survey of RO'S showed 85% of RO's preferred multiple fractions and 90–100% of American RO's preferred multiple fractions.[19] A Norwegian study of 180 patients showed that it is more convenient for the patient and cost effective to the department to use a single fraction compared with multiple treatments. Their results also showed that there was no significant difference in spinal cord compression or pathological fractures between a single fraction and multiple fraction schedules (30 Gy/10).[17] For the 4 years of the study 51% of treated sites received an 8 Gy prescription. This compares very favourably with data from other RAPC's. Studies from Sunnybrook, Toronto[5] and Brisbane, Australia[7] showed that 45% and 65% of patients in their respective RAPC's were treated with single 8 Gy fractions. It should be noted that there was a significant increase in use of a single 8 Gy fraction each year, with 61% of sites treated with a single 8 Gy by the fourth year. The prescription of a longer fractionation schedule (38% received 20 Gy in five fractions) occurred for patients with pain in a weight-bearing area, neuropathic pain or cord compromise and in patients with a favourable prognosis.

During examination, it was ascertained that for some patients additional sites required treatment. Thus, five patients were treated for more than three different sites. If a patient presented in the clinic with multiple sites a maximum of two sites would be treated on the same day. This was due to the limited availability on the treatment machines on the clinic day. The area with the highest pain score was treated first, with further arrangements made for treatment to the remaining painful sites. Numerical rating from 0 to 10 was used to determine the patient's pain score. Paice and Cohen as sited by Chow et al. had examined the visual analogue scales for pain and established that the 0–10 numeric rating scale which was verbally given was a useful alternative.[13] A study where 49 experts were surveyed for the updated international consensus for palliative radiation therapy patients showed that there was 100% agreement to update the Pain and Analgesic Assessment. The update now states 'Assessment of pain should be on a scale of 0 to 10, with boundaries of 0 representing no pain and 10 representing maximal pain'.[20(p6)]

The majority of patients were of suitable status for transfer back to the referring service. However, 29 patients were admitted to the ward for pain control and commonly required prolonged admission. The RON would liaise with the charge nurse in the ward to obtain a bed for the RAPC patients. This could be very difficult at short notice due to lack of bed availability in the ward. The RON tried to hold a bed in advance for the RAPC but due to the limitations of beds this was not possible. There was great benefit to the 56% of patients that had to travel >100 km to the department by eliminating multiple visits.

Patient analgesics were recorded at initial consultation and at the 3 week follow-up phone call. This information was input into the database but was not reported due to the large variety of analgesia used.

### In the future

Now that the clinic has been established and is currently in its sixth year, the team are reviewing ways to improve the service. Referral guidelines and triaging need to be strictly adhered to with improved education of referrers. A quality of life (QOL) survey may benefit the patient and the clinic. A study done by Zeng et al. on QOL surveys after palliative radiation therapy for bone metastasis, proved that patients that gained pain relief from radiation therapy, also had a better QOL.[16]

Several RAPC's include patients with brain metastases. In 2001 Chow et al.[13] documented that 24% of patients entered into the RAPC had brain metastases while Danjoux et al.[6] reported that 14% of patients entered had brain metastases. While this is a possibility for the future, limited resources, means that this is not currently possible within the clinic setting.

International centres are exploring and supporting advanced practice for specially trained RTs to help with the coordination and running of the RAPCs.[2,6,10] Expertise and consistency in staffing is essential in the organising of a RAPC. In the future the RAPC at WRCC could benefit from advances in the training of the RTs in this area.

## Conclusion

Evaluation of the RAPC at WRCC over 4 years has revealed that it compares favourably with similar international clinics. A clear pathway of the RAPC day and the roles of the staff involved have been established. The RAPC was implemented to reduce the number of visits and provide faster access to palliative radiation therapy to patients with metastatic bone pain. The study showed that there was a decrease in wait time from referral to FSA, where all RAPC patients were seen within 1 week compared to 4 weeks. Overall 63% of patients

were consulted, simulated and treated on the same day. Single fraction prescriptions increased throughout the study providing patients with the opportunity to receive treatment in a single visit to the department. There was a substantial difference in the decrease in patient's pain scores at time of follow-up phone calls. Improvements are ongoing and the clinic continues to assess ways to improve service provision for the patient.

## Conflict of Interest

The authors declare no conflict of interest.

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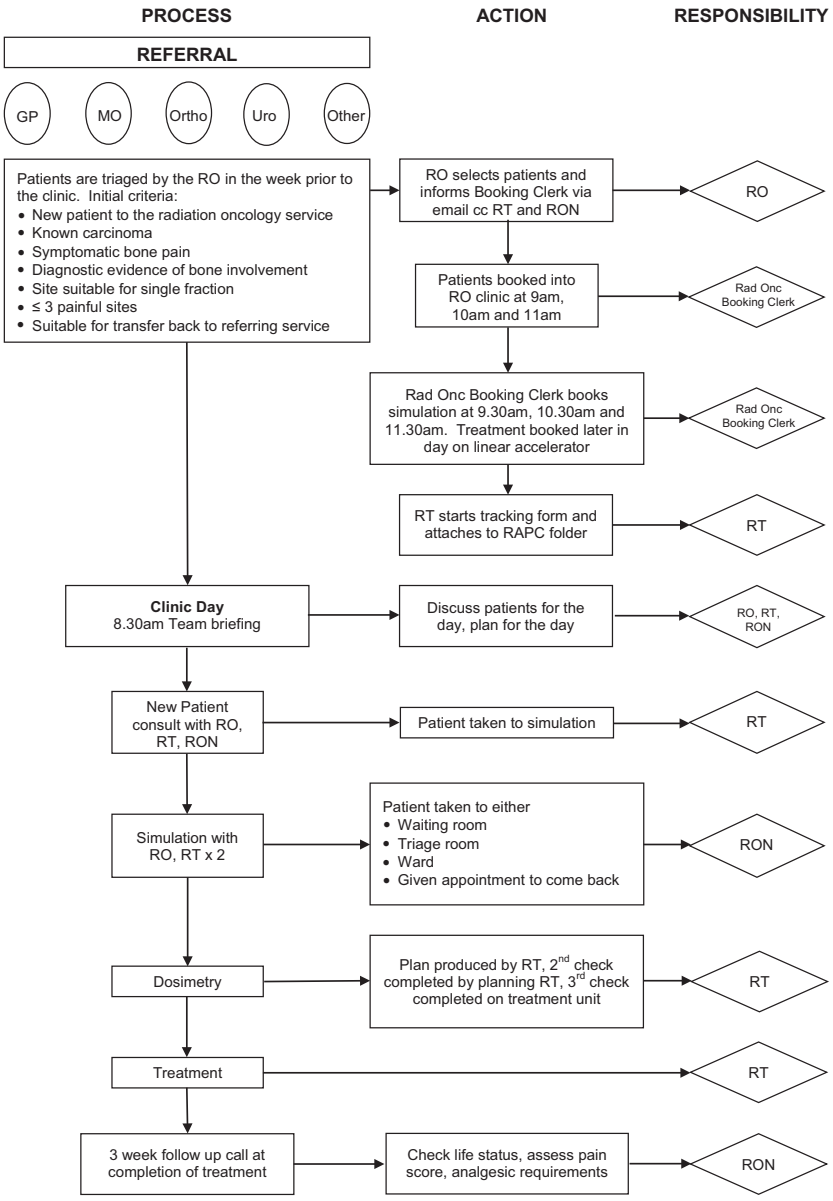
# Appendix I: Rapid access palliative clinic pathway




GP, General Practioner; MO, Medical Oncologist; Ortho, Orthopaedic surgeon; Uro, Urologist; RO, Radiation Oncologist; RT, Radiation Therapist; RON, Registered Oncology Nurse; Rad Onc, Radiation Oncology; RAPC, Rapid Access Palliative Clinic.