


# Physician And Patient Barriers To Radiotherapy Service Access: Treatment Referral Implications

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**Abstract:** Radiotherapy is one of the mainstays of cancer treatment, and about 60% of cancer patients receive this type of treatment during their course of treatment. An evident gap between optimal and actual radiotherapy utilization proportions has recently been reported, which has been ascribed to lack of referral to radiation oncology. There are many factors influencing the radiotherapy referral, including patient anxiety about toxicity, wrong perception of efficacy and side effects by physicians and patients, insufficient knowledge of referral process. These factors, defined as barriers can be categorized in health system barriers, physician and patient barriers. In the present brief narrative review, we discussed barriers to radiotherapy referral focusing on physician and patient barriers.

**Keywords:** radiotherapy, referral, barriers

## Introduction

Radiotherapy is one of the main modalities of cancer treatment,<sup>1-7</sup> and about 60% of the patients receive radiation therapy during their course of treatment.<sup>8</sup> An evident gap between optimal and actual radiotherapy utilization has recently been reported, which has been ascribed to the lack of referral to radiation oncology. There are many factors influencing the radiotherapy referral, including patient anxiety about toxicity, wrong perception of efficacy and side effects by physicians and patients, insufficient knowledge of the referral process. These factors, defined as barriers, can be categorized in health system barriers, physician and patient barriers. In the present brief narrative review, we discussed barriers to radiotherapy referral focusing on physician and patient barriers. Recently, the Australian Collaboration for Cancer Outcomes, Research and Evaluation (CCORE) estimated that 48% of Australian cancer patients need at least one radiotherapy treatment during their course of disease<sup>9</sup> and in Europe, it is estimated that the rate is about 51%.<sup>10</sup> Many authors analyzed the evident gap between optimal and actual radiotherapy utilization proportions, which is unrelated to the effectiveness of RT and has been attributed to inadequacies in radiotherapy access.<sup>10-12</sup> Concerning the term “access,” Penchansky<sup>13</sup> defined it as a multidimensional construct expressing the fit between the consumer and the health system. In the context of radiation oncology, “access” has been defined by Turnock<sup>14</sup> as a consultation for radiotherapy. Barriers (namely anything potentially impeding access) to access in radiation oncology<sup>15</sup> have to be analyzed in order to setup proper measures. In our review, we performed a PubMed literature search according to the Preferred Reporting Items and Meta-Analyses (PRISMA) guidelines.<sup>16</sup> We identified articles published within the last 10 years, up to March 30, 2019, using Medline search with the following selection criteria:

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English language, full papers, barriers to access to radiotherapy, physician barriers and patient barriers. We reviewed the full version of each article.

## Physician Barriers

Barriers (namely anything potentially impeding access) can be categorized in health system barriers, physician and patient barriers.<sup>15</sup> Physicians have a pivotal role in referring a patient to a radiation oncologist. Generally, patients depend on their primary care physicians or other specialists to refer them for an RT opinion. There are several factors at the level of the referring clinician, which might act as barriers to referral.

In many cases, there might be a lack of referral because of insufficient knowledge of the referral process itself, which can result in suboptimal care for patients. Knowledge gaps were analyzed by Szumacher et al.<sup>17</sup> They reported that in the region of Ontario referring physicians do not completely understand the RT referral process. Another Canadian study demonstrated that 25% of the primary care physicians had uncertainty about referral processes.<sup>18</sup> Together with the poor knowledge of how to refer and who to refer to, the lack of formal training about radiotherapy is another issue. In a systematic review on barriers to accessing radiation therapy, Gillan et al<sup>19</sup> analyzed the few studies on the awareness of referring physicians about radiotherapy. They demonstrated that there is a general lack of formal training, which has a major impact on physicians' awareness of risks and benefits of radiotherapy, limiting referrals. More specifically, regarding knowledge of the importance of radiotherapy in palliative care, Halkett et al<sup>20</sup> surveyed Australian general practitioners asking whether they would refer for palliative therapy and to which kind of therapy (radiotherapy, chemotherapy or surgery). Answers of the respondents were compared with the opinion of an expert panel of palliative care specialists, showing that agreement on the benefit of radiotherapy ranged from 31% to 80%. Other authors<sup>21</sup> reported that in Canada less than 45% of general practitioners are aware about the effectiveness of radiotherapy in the management of brain metastases, spinal cord compressions, as well as for the treatment of bone metastases.

Knowledge of radiation therapy (its efficacy and the related toxicity) is crucial at both primary care and specialist levels. More specifically, it is very important to update health providers about the recent advances in technology, which have changed dramatically the clinical scenarios in oncology, allowing dose escalation in radiotherapy, decreasing toxicity and treatment duration with improved oncologic outcome and

with less impact on patients' quality of life. Techniques such as intensity-modulated radiation therapy (IMRT)<sup>22</sup> or stereotactic radiotherapy<sup>5,7,23</sup> create highly conformal dose distributions with steep dose gradients using advanced planning and treatment equipment. Eventually, image-guided radiotherapy (IGRT) permits daily target localization to guide the dose delivery.<sup>24</sup> It is therefore crucial to raise awareness about the new tools in radiation oncology, which are radically changing treatment delivery, fractionation schemes, and clinical indication. It is to say that there is urgent need of training concerning not only recent clinical advances but also radiotherapy indications, for instance in palliative care. In fact, a survey on behalf of ASTRO (American Society for Radiation Oncology), ASCO (American Society of Clinical Oncology) and AAHPM (American Academy of hospice Palliative Medicine) among members evidenced that the lack of education and of written material about palliative radiotherapy cause the inhibition of palliative radiotherapy referral.<sup>25</sup> Another interesting topic from this survey is the lack of communication within a multidisciplinary team. Respondents specified that increased multidisciplinary activity directly involving radiation oncologists in the treatment decision could allow educating team members about palliative radiotherapy.<sup>26</sup> In clinical oncology, multidisciplinary team (MDT) meetings, which allow discussing clinical cases with the intervention of various specialists, might give the opportunity to overcome barriers related to gaps in knowledge and to physicians' communication and might reduce decision biases related to the individual point of view. More specifically, the MDT might suggest to every patient the best diagnostic and/or therapeutic strategy for a personalized "iter", which needs to be defined by different figures with specific skills that sometimes could offer competing treatments. The opportunity to discuss about every single case within the MDT might mitigate imbalances in the prescription of a single treatment option. A recent review of the literature evidence that between 4% and 45% of patients discussed at MDT meetings had a change in diagnostic reports following the meeting, and that patients were more likely to receive a more accurate treatment strategy.<sup>27</sup> On the other hand, discrepancies exist between MDT referral. For instance, Atwell et al<sup>28</sup> evaluated the MTD referral rates depending on the tumor type at their institution between 2010 and 2015. Regarding patients affected by prostate cancer, only 34% were discussed in the MDT. Although there should be a shared decision-making within MTDs for prostate cancer patients, it seems that the clinical "practice" is completely different from the "theory."

## Patient Barriers

Underutilization of radiotherapy seems to be associated with individual characteristics and choices of patients.<sup>25–31</sup> More specifically, barriers related to the patients seem to cluster around age, comorbidities, education level and socioeconomic status.

One of the most relevant factors as barriers to accessing to radiation therapy is the patient's age. In the analysis by Wong et al,<sup>32</sup> it is quite evident the age disparity with palliative radiotherapy. Using the Surveillance, Epidemiology, and End Results (SEER) database, the authors identified 63,221 patients affected by metastatic cancer in the period from 2000 to 2007, demonstrating that the use of radiation therapy decreases steadily with increasing patient age. More specifically, for the same setting of patient's rates of palliative RT decreased from 42% for patients aged 66 to 69 to 24% for those aged 80 to 84. This kind of inverse relationship between increasing patients' age and actual radiotherapy utilization seems to be present in the United States as in Europe, regarding palliative and radical or post-operative RT as well. In fact, a recent evaluation of the underutilization of radiotherapy in Belgium<sup>12</sup> evidences, in the period from 2009 to 2010, an overall actual radiotherapy utilization proportion (AUP) value of 37% instead of 53% of optimal utilization proportion (OUP). The analysis of data showed the impact of patients' age on the decision to refer to radiotherapy. For instance, among patients affected by prostate cancer, only 11% of those older than 80 years received radiotherapy compared with 31% of those younger than 80 years. Regarding breast cancer, 83% of patients younger than 80 years were irradiated instead of 36% for those older than 80 years.

Along with increasing age, also comorbidities can dramatically influence the RT referral.<sup>33–35</sup> Hayman et al<sup>36</sup> performed a retrospective population-based cohort study analyzing the frequency of use of RT in elderly patients affected by stage IV NSCLC. At multivariate analysis, comorbidity, assessed by the Klabunde modification of the Charlson-Deyo score,<sup>37–39</sup> was associated with a significant decrease of RT use ( $p < 0.001$ ) in patients with a comorbidity score  $\geq 1$  compared with those with a score of 0.

Although radiotherapy as definitive (e.g. for prostate cancer<sup>40</sup>) or adjuvant treatment (e.g. for breast cancer<sup>41</sup>) might not be useful in patients with multiple comorbidities and short life expectancy, palliative RT administered for relief of symptoms might be a very useful treatment in

elderly patients with high comorbidity scores. This is because RT as a palliative treatment can safely act against the symptom (i.e. pain, bleeding) or against the oligometastatic disease in a very rapid and effective way,<sup>4</sup> reducing the load of pharmacological therapy.

Regarding education level and socioeconomic status as barriers, it is very difficult to split these two categories. Puts et al<sup>42</sup> demonstrated that patients refusing an RT referral were mainly older and living alone. The economic impact of radiotherapy concerns not only the patient itself. There is the need of transport, and there is the loss of time and of working days, which involves the relatives (caregivers) too. Low-income patients are more likely to receive a worse health assistance, and this condition has been associated with a reduction in the use of radiotherapy and of more complex treatment modalities.<sup>30,43</sup> For instance, in the United States, the use of cutting-edge techniques such as IMRT might often be denied during insurance appeals although some author demonstrated that insurance or socioeconomic status might not significantly correlate with IMRT delivery.<sup>44</sup> Differences in the insurance status, which are mainly ascribable to a given health system, might influence the radiotherapy referral in certain regions, but it is very difficult to split educational level, socio-economic and insurance status. The socio-economic status and the education level of the patient have been clearly associated with an underutilization of radiation therapy.<sup>29,43,45</sup> It can be argued that a low education level may influence the understanding and perceptions of RT. More specifically, patients with a higher education level can have easier access to accurate information on indications to treatment, modern available techniques, oncologic outcome, and expected side effects.

## Conclusions

The identification of factors influencing the radiotherapy referral is the first step toward the accurate planning of measures to overcome such barriers. One of the main issues is the lack of awareness about radiotherapy.<sup>19</sup> Moreover, advances in molecular biology and new imaging and treatment tools are rapidly changing the role of modern radiotherapy in the cure of cancer. In this scenario, it seems crucial to promote a periodic formal training in radiation oncology for the physicians, and to inform patients about the newly available treatment options explaining the indications of RT, its modalities of delivery and acute and late effects.

Considering the referral process, an insufficient knowledge of the process itself, by physicians and patients, has been reported.<sup>18</sup> Multidisciplinary team meetings might give the opportunity to overcome barriers related to gaps in knowledge of the referral process, and to physicians' communication. Eventually, MDT might allow the discussion between different specialists, and reduce decision biases related to the individual point of view.

## Disclosure

The authors report no conflicts of interest in this work.

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