Improving Waiting Times for Radical Radiotherapy Treatment of Nasopharyngeal Cancer Based on Logistics Re-engineering

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ABSTRACT

Objectives: Waiting time for radiotherapy is an important quality indicator for oncology services, and particularly so in the radical treatment for head and neck cancers where timing impacts treatment outcome. Reducing the waiting time for treatment is therefore highly desirable in nasopharyngeal cancer, which is the commonest head and neck cancer in this locality. Using existing resources, we aimed to reduce waiting time for such radiotherapy, whilst maintaining the quality of services. By identifying important bottlenecks in service delivery, we re-engineered workflow logistics to tackle radiotherapy waiting time holdups.

Methods: The changes in workflow were implemented in two phases. Phase 1 entailed: (i) Setting of a target deadline for radiotherapy commencement, measured from the first consultation. (ii) Prioritising magnetic resonance imaging appointments. Phase 2 entailed: (i) Earlier referral from regional ear, nose and throat departments upon endoscopic diagnosis of nasopharyngeal cancer. (ii) Booking of workup procedures immediately upon receipt of a referral letter (i.e. before the first visit). (iii) Seeing all newly referred patients within 2 weeks. Waiting times data for the period before, during, and after implementation of these logistic changes were compared.

Results: Data from 177 nasopharyngeal cancer patients showed a significant improvement in the waiting times for treatment after implementation of the logistic changes (diagnosis to treatment: 54 days vs. 38 days, p < 0.001). There was also a reduction in waiting times for critical workup procedures and a reduction in patients being referred out to other centres for treatment. These measures did not appear to impact on the waiting times for radical treatment of other cancers.

Conclusions: Logistical re-engineering is feasible and effective in reducing waiting times for radical nasopharyngeal cancer treatment.

Key Words: Nasopharyngeal neoplasms; Neoplasms; Radiotherapy; Time factors; Waiting lists

中文摘要

重新設計工作流程以改善鼻咽癌患者接受根治性放射治療的輪候時間
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目的：腫瘤科其中一個重要的質素指標就是病人接受放射治療的輪候時間，尤其是對於頭頸癌患者來說，接受放射治療的時間大大影響治療結果。本地頭頸癌中以鼻咽癌最為普遍，而縮短放射治療的輪候時間對病人有相當益處，我們致力以現有資源和維持服務質素水平的情況下，改善鼻咽癌患者放射治療的輪候時間，我們找出服務系統的瓶頸，重新設計工作流程以改善放射治療的輪候時間。

方法：新工作流程主要分為以下兩個階段。第一階段包括（1）從首次應診日開始計算，為放射治
Improving Waiting Times by Logistics Re-engineering

INTRODUCTION
Nasopharyngeal cancer (NPC) is one of the commonest cancers in South-East Asia. In Hong Kong, among all cancers it ranks seventh in incidence; over 900 new cases were registered in 2008. NPC is highly treatable by radiotherapy with or without concurrent chemotherapy, with cure rates exceeding 85% for early stages and 60% for locally advanced disease. Waiting time for radical radiotherapy is an important quality indicator for oncology services, such that many countries have issued guidelines for target waiting time, as endorsed by the UK National Cancer Plan 2000 and the Canadian Association of Radiation Oncology. Prompt treatment is of particular importance in head and neck cancers, as treatment delays have a negative impact on outcomes. A recent large meta-analysis of 20 studies has also confirmed increased liability to local recurrence with increasing waiting time for radiotherapy (relative risk, 1.15 per month). Although a large local study on NPC did not find a significant effect on local tumour control, it reported a worrisome trend to increased distant metastases with increasing waiting time to radiotherapy. There is currently much variation in waiting times between treatment centres in Hong Kong. In addition, there is a lack of consensus on precise definitions or optimal targets. This study was undertaken at the Department of Oncology at the Princess Margaret hospital (PMH), which is a newly established oncology centre in Hong Kong.

Study Design
The study design was as follows: (1) Establishing clear definitions of waiting time for radical treatment in our NPC patients; the definitions needed to be logical and clinically relevant, and the parameters easily measured and consistent. (2) Measuring waiting times for radical treatment at our unit as well as identifying important bottlenecks in service delivery. (3) Re-engineering of service logistics to improve / circumvent bottlenecks that could cause delays to treatment delivery.

We aimed to shorten waiting times to treatment by means of logistic re-engineering, whilst maintaining the high quality of treatment using state-of-the-art intensity-modulated radiotherapy (IMRT) for all patients.

Defining Waiting Times
Radical radiotherapy for NPC is a complicated multi-step process (Figure 1) whose logistics can be broadly divided into three phases: (1) pre-referral, (2) workup, and (3) treatment.

For the pre-referral phase, in general, the patient first presents in the community with symptoms. Upon suspicion of NPC, they are referred to ear, nose and throat (ENT) specialists, whereupon the diagnosis is confirmed by naso-endoscopy and biopsy. Upon confirmation of the diagnosis, the patient is referred to oncology for management and is first seen and assessed by us at the new case clinic.

In the workup phase, patients suitable for radical treatment undergo a series of key procedures (pre-requisites for radiotherapy). These entail: staging endoscopy and magnetic resonance imaging (MRI), dental evaluation, moulding, computed tomography (CT) simulation and radiotherapy planning.

In the treatment phase, once the above procedures are completed, radiotherapy can be delivered with or without concurrent chemotherapy. A proportion of patients, particularly those with locally very advanced disease, may receive neoadjuvant chemotherapy prior to definitive radiotherapy.

Based on the Ontario model for radiotherapy waiting