Service Priorities and Programmes

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Implementation of step-and-shoot IMRT technique to treat breast cancer patients at the Prince of Wales Hospital

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Introduction

In Hong Kong, the number of new cases for invasive breast cancer was 3508, an increase of 2.6% compared with 2011, an increase of nearly 70% compared with 2002. In the Prince of Wales hospital, as a result of the trend, the number of patients required radiotherapy increased from 296 from 2012 to 363 in 2013, an increase of 22.6%. With a stringent manpower to cope with higher workload, to provide a shorter treatment for breast cancer patients and utilize the resource effectively, we start to use step-and-shoot IMRT for treating these patients in 2014.

Objectives

1. To shorten the treatment time for breast cancer patients and reduce the waiting list for these patients. 2. To increase the turnover rate of RT equipment. 3. To utilize the limited manpower effectively.

Methodology

Most of the breast cancer cases in PWH are planned with 3D or field-in-field conformal technique, with up to 8 fields for tangential cases. With the availability of step-and-shoot function by Eclipse, fields at the same gantry angle can be merged into one field, the number of fields reduces from 8 to 2, a reduction of 75% in field number. To safely implement a new technique, ten treatment plans were created and compared by using both 3D conformal and step-and-shoot IMRT technique. The treatment plans were delivered to the physicists to commission dosimetrically. It was informed that the difference between 3D conformal technique and step-and-shoot IMRT was of less than 1%. Ten plans were tested at the linear accelerators before implementation of the new technique to treat breast cancer patients.

Result

All ten plans for testing can be operated without problems. By using the

step-and-shoot IMRT, the treatment time for breast cancer patients can reduce from 8 minutes to 5.5 minutes, a reduction of 32% time wisely. This is due to saving time to ‘mode-up’ the machine and perform 'time-out' by the staff. Another added advantage is posing a reduced occupational risk of repetitive key-turning action to the staff. Although the number of actual cases using this technique is still small, it is an early stage to give a conclusion. Those who have been treated with the technique completed the whole course of radiotherapy smoothly.