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Procedural guideline for a low cost radiotherapy unit in developing country

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Purpose of this study: According to WHO, 2 teletherapy machines are required for one million people. In our country 320 teletherapy machines would be required to meet the needs of a population of 160 million. To ensure the safety setting up and running a radiotherapy unit and also delivering treatment, protocols according to Atomic Energy Commission of each respective country must be followed. This study is aimed to provide a procedure (document) for establishing new Radiotherapy facilities as par Regulatory procedure of Bangladesh Atomic Energy Commission (BAEC). In addition, the capital costs for construction and maintenance of a radiotherapy unit comprises huge expenses including building costs, equipment costs, manpower costs and maintenance costs. For developing countries like Bangladesh, there is a strong need to set up radiotherapy units at the minimum costs as possible consistent with the necessary quality. In this work a cost effectiveness analysis has been done for several aspects. This document is intended to act as a guide to set up a radiotherapy unit in a proper regulatory process in Bangladesh Atomic Energy Commission.

Method & Materials: This work has been done following NSRC Act' 1993 & Rules' 1997, BAEC, all associated calculation has been done according to Safety Report Series (SRS)-47, IAEA as well. Further, is revealed in this study advanced modern techniques in radiotherapy, increases the capital costs due to relevant factors.

Results: The Co-60 modality (new), 6 MV Linac (used), Dual energy Linac (used), needs less total cost about 2.15%, 51.33% & 29.51% respectively in comparison to the new 6 MV Linac machine total cost but on the other hand, dual energy Linac (new) & Linac with IMRT Capability (new) needs 160.31% & 198.81% more total cost respectively. On the other side a Linac may be superior to a Co-60 machine due to better dose distributions, spare of costs for source replacement, shorter treatment times and safety considerations.

Conclusion: But for starting a low budget hospital starting Radiotherapy, it is a good idea to start with good used two Linac machines and after 6 to 8 years we can stop the first machine and get a new one and after another 2 or 3 years change the second for a new one. In any case, professional personnel are needed for all steps during the set up procedure. This may shorten the time in obtaining the approval license to run a radiotherapy unit.

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