Improving the efficiency of mounting a Miniature X-Ray Source (XRS 4) onto the INTRABEAM Surgical Support System for Intraoperative Radiation Therapy (IORT)

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INTRODUCTION

Intraoperative radiation therapy (IORT) from the Intrabeam system delivers low energy X-Rays with a high dose, precisely into the tumor or directly after resection to the tumor bed. Mounting the 1.6kg X-Ray Source (XRS 4) onto the suspension system is one of the most crucial steps during setup. The current mounting process is done freehand by a handler.

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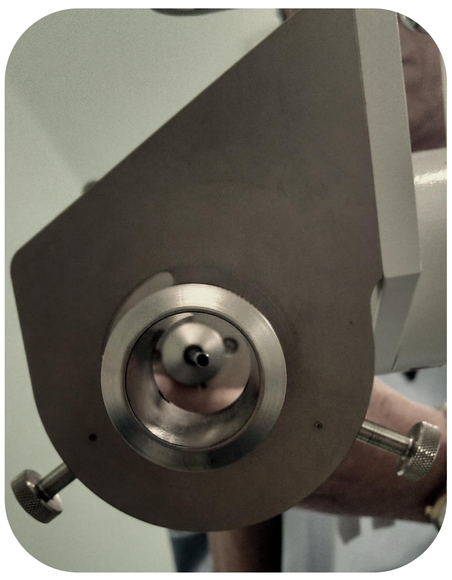
To maintain the mechanical straightness of the probe and preventing it from coming into contact with the suspension system, the handler needs to have stable hands, experience in handling the weight and a good estimate of the angle for entry. These factors vary with each individual handling the XRS.

METHODOLOGY

Mounting the 1.6kg X-Ray Source (XRS) onto the suspension system is one of the most crucial steps during setup.



The current mounting process is done freehand by a handler. To maintain the mechanical straightness of the probe and prevent it from coming into contact with the suspension system, the handler needs to have stable hands, experience in handling the weight and a good estimate of the angle for entry. These factors vary with each individual handling the XRS.

A Multi-Disciplinary Team of Radiation Therapist, Radiation Physicist, and Technician is formed to take on this challenge to reduce the variables caused by different handlers. A transparent Acrylic Guide for the XRS is designed and manufactured by the Technician. The time taken by 3 different handlers is recorded before and after using the Acrylic Guide to measure their mounting speed for comparisons.

AIM

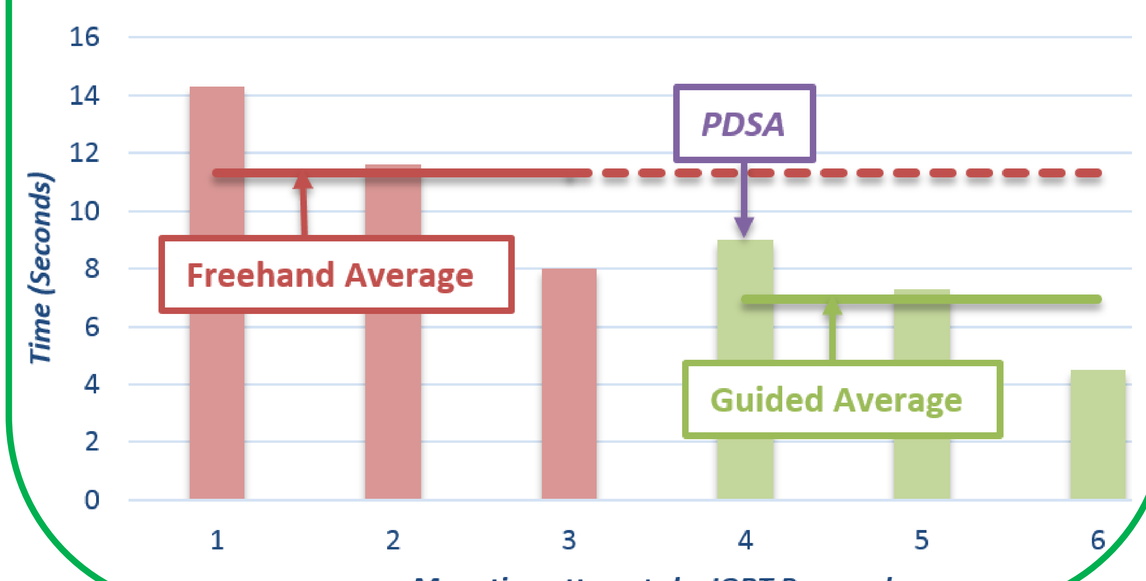
To increase the speed of mounting an X-Ray Source by 30% while maintaining the mechanical straightness of the XRS probe during this process.

RESULTS

The average XRS mounting speeds were 11.3 seconds before, and 6.9 seconds after using the Acrylic Guide.

An average reduction of 4.4 seconds is observed from ONE PDSA cycle!

XRS Mounting Speed



CONCLUSION

*A speed improvement of **39%** is achieved using this new Acrylic Guide product. The handlers reported more confidence in mounting the XRS for IORT procedures without compromising the mechanical straightness of the XRS probe from just one PDSA cycle.*