

DOSIMETRY ASSESSMENT FOR MOBILE C-ARM: USE OF BADGE ATTACHED TO THE EQUIPMENT

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Introduction: Image intensifiers have become popular due to the concept of minimally invasive surgeries leading to decreasing invasiveness, decreased operative time, and less morbidity. The drawback, however, is an increased risk of radiation exposure to the patient and medical staff. These exposures have been of concern due to their potential ability to produce biological effects. When radiation badges are not available, International Atomic Energy Agency (IAEA) propose to use a dosimeter attached to the C-arm to provide an estimate of the dose received by medical personnel. In this work we presented the results of a dosimeter attached to the C Arm in order to evaluate the staff dosimeter.

Material and method: An OSL dosimeter badge (Sapra Landauer®, São Carlos, Brazil) was attached to a mobile C-Arm in order to estimate the exposure at the staff, the dosimeter was placed 60 cm from the centre of the image intensifier in the period of 16/02/2021 to 15/07/2021. A control dosimeter was placed in the equipment room of the cirurgical center, away from artificial radiation sources of any type. Both dosimeters were send to a recognized laboratory monthly (Sapra Landauer) so their dose results were obtained and compared while another two dosimeters replaced the ones being readed. TeamPlay® (Siemens, Germany) was used in order to evaluate the equipment exposures during this period.

Results: According to the data explicit in TeamPlay a total of 340 procedures were performed during this period with a mean time of 7:43 and median of 1:25 per procedure were used during the period.

Figure 1 show data explicit in TeamPlay® according to the amount of procedures performed per week. Fluoroscopy mean time of 7:43 and median of 1:25 per procedure were used during the period. The total dose measured by the OSL badge was 2,0 mSv.

Table 1. OSL badge readings during the assessment period.

Start Date	End Date	Badge-Control Dose
16/02/2021	15/03/2021	0,3 mSv
16/03/2021	15/04/2021	0,5 mSv
16/04/2021	15/05/2021	0,4 mSv
16/05/2021	15/06/2021	0,2 mSv
16/06/2021	15/07/2021	0,6 mSv
Total:		2,0 mSv

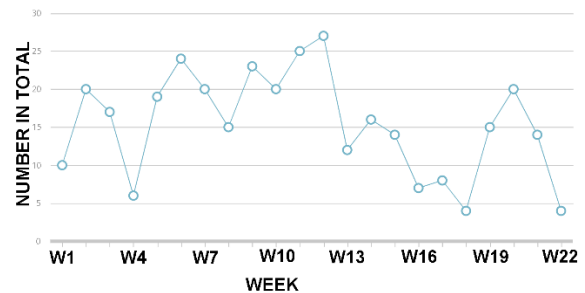


Figure 1. Data explicit in TeamPlay®, a total of 340 examinations with in the 21 weeks evaluated.

Conclusions: The amount of scattered radiation detected by an OSL badge placed at 60 cm from the centre of the image intensifier were obtained. Total dose of 2,0 mSv was perceived in a total of 340 procedures with median time of 01:25 minutes. Since national regulations limits dose to the public at 1 mSv/year, a professional using a lead apron which absorbs 90% of the incident radiation would be able to perform 1700 procedures without overexposure.