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Title: **Assessment of Quality Assurance Protocols in the Cardiac Catheterization Laboratory at the Eric Williams Medical Sciences Complex (E.W.M.S.C.)**

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In the Cardiac Catheterization Laboratory at the Eric Williams Medical Sciences Complex, fluoroscopically guided procedures using ionizing radiation are conducted. Fluoroscopy machines produce fairly high dose rates and consequently warrant the highest need for control in order to protect both patients and staff from inadvertent over-exposure. At the Cardiac Catheterization Laboratory, the Radiation Safety Officer (RSO) is responsible for assuring the safe and effective delivery of ionising and non-ionizing radiation for the diagnosis and treatment of diseases. The Ionizing Radiation Regulations 1999 and the International Radiation (Medical Exposure) Regulations 2000 have been formulated to control medical exposure. These regulations emphasize the setting up of diagnostic reference levels (DRLs) to minimise radiation exposure and the training of staff. Presently, there is a variation in the DRLs used by different countries since these regulations are provided as recommendations which each country can modify according to their requirements. The International Atomic Energy Agency (IAEA) has formulated Safety Standard Series consisting of Safety Guides, Safety Fundamentals and Safety Requirements. They have set dose limits for medical exposures, public exposures and occupational exposures.

The aim of this project is to assess the Cardiac Catheterization Laboratory and to suggest measures for improving the safety of patients and staff in the laboratory. 135 procedures were conducted by 6 doctors during the period May, 2007 to August, 2008. Of these 90 were Coronary Angiograms, 23 Pacemaker 5 Femoral Angiograms, 7 Nephrostomy, 2

Vena cava filter, 3 Fistulogram and 5 Venograms. The dose-area product of these 136 procedures were compared to the Dose-Area product from the Diagnostic Reference Levels values used by the Hull & East Yorkshire, Hospitals Radiation Services (Radiation Protection Procedure number:24) and represented statistically using column charts. The fluoroscopy time(min) per examination for the Femoral Angiogram, Venogram , Nephrostomy and Coronary Angiogram procedures were compared to the fluoroscopy time(min) per examination from the Guidance on the establishment and use of "Diagnostic Reference Levels" (DRLs) as the term is applied in the Ionising Radiation (Medical Exposure) Regulations 2000 and represented statistically using column charts. Data from the Occupational Radiation Exposure Report for 23 employees at the laboratory were assessed by comparing the dose received by employees to the dose limits from the IAEA Basic Safety Standards. The Radiographer and the Radiation Safety Officer were also interviewed on the functioning of the laboratory.

Exposures from the Cardiac Catheterization Laboratory are high as is to be expected of fluoroscopic procedures. This project will attempt to assist the Department of Nuclear Medicine in its goal of better controlling exposures to patients and medical personnel. As such recommendations will be made towards the re-establishment and regular auditing of a Quality Assurance programme. It is suggested that national Diagnostic Reference Levels should be adopted by E.W.M.S.C. depending on the equipment used, the procedure performed, and patient factors (gender, age, anatomy, radiosensitivity, size). Additionally, staff members should be receiving regular training on the aspects of radiation safety associated with medical facilities and especially with catheterization laboratories.