In the interventional cardiology (IC) procedures, the use of fluoroscopy in IC can cause high radiation doses to patients and operators because of the prolonged duration of x-ray exposure. Artificial Intelligence (AI) allows to learn from the data collected in the process, classification and regression of the problems, and improvement of clinical decisions. In the present work, the application of AI in our interventional cardiology (IC) room can be divided into 3 main branches, virtual and physical, imaging decision, and abnormalities detection. Results can be predicted outcomes for future interventional procedures. Imaging decision, clinical decision support systems with computing data are under development using ML and DL in order to improve IC procedures. Abnormalities detection. More recent advances, have given rise to superior algorithms that learn through direct navigation of data to “recognize” some human error findings. AI has been utilized in the practice to analyzing of ESAR measurements for patients undergoing diagnostic and therapeutic interventional procedures, considering variables such as the anatomy of the patient, chance, weight, gender, and dose the complexity of the procedure, radiological parameters as well as cardiological’s expertise. The implementation of AI tools in IC suggested reduction variability and improve the quality, safety, and efficiency of care around radiation dose management. Besides, our findings were used to assist IC staff to be able to visualize and navigate procedures more safely and efficiently with significantly less radiation dose exposure.

In the present work, the correlation coefficient allows us to observe interventional procedures behavior for diagnostics procedures as well as interventional procedures. In figure 1, the cumulative dose of the diagnostic interventional procedures related to body index mass (BMI) are shown, as it seems in the figure interventional procedures are closer to a linear fit, this is increasing as BMI is increased. A correlation of 13% was obtained and meanwhile for interventional therapeutic procedures, was 3% some procedures leave this correlation that indicates a high dose over than 2 Gy. This figure allows us to focus on the procedures for dose optimization.

Figure 2 shows a correlation between cumulative dose as a function of DAP, it seems a linear fit. Some patients received low doses during interventional procedures, but as DAP is increasing the CD also is increasing, some patients received high doses during diagnostic procedures which relate to a radiation risk, this result suggests a collimation of the beam. Some procedures leave of linear fitting which suggest an investigation processes for that higher values mainly for doses higher than 2 Gy.

Figure 3 describes the relationship between cumulative dose (CD) and dose area product (DAP): a correlation coefficient showed of 78.2% for diagnostic procedures and 73.3% for therapeutic procedures. Linear regression shows a behavior prediction, except for at least 10 cases of a diagnostic type and only 8 cases of a therapeutic type. Finally these figures (1, 2, and 3) show how use AI for radiation doses optimization in interventional cardiology processes, the main objective of this work.

AI has initiated a difficult road shift in health care, powered by the increasing availability storage of health care data and rapid changing of the technology revolution. It is expanding its footprint in clinical radiology systems, including databases, image, and interventional cardiology procedure systems, evidence-based, real-time clinical decision support, and the most important them, AI is a great tool for reducing dose during IC procedures. AI leaves at IC staff a guide for future synergistic interaction between man and machine concerning dose optimization, which ultimately will transform IC good practice in efforts to patient dose reduction.

**REFERENCES**