Purpose: It is traditional to review clinical cases when the time or entrance skin dose (ESD) reach or surpass certain thresholds (e.g. 60 minutes or 2Gy). We believe that the relevant threshold should be more closely tied to the clinical procedure performed. We aim to provide relevant time and dose thresholds for flagging IR procedures for quality assurance (QA) review by statistically characterizing the distribution of cases for each procedure type.

Methods: Fluoroscopic time and cumulative air kerma (AK) were manually recorded for all IR procedures. We generated a report that separated data by procedure type, and estimated the ESD. For each procedure type, outliers were removed and we calculated the mean (x) and standard deviation (SD) for time and ESD distributions. We set the flagging threshold for time and ESD as x+2SD for each procedure.

Results: For Neuro (NIR) and Vascular (VIR) whereby cases are interventional or therapeutic (e.g. TIPS, embolization), the distribution yielded an average dose at or greater than 2Gy. Over a three month period, the percent of total procedures flagged using 2Gy and x+2SD thresholds were 24.1% and 7.1% for NIR and 17.2% and 6.9% for VIR, respectively. Conversely, for lower-dose procedures (e.g. PICC/port/drain placements, GI, GU), the average dose is less than 2Gy, and the flagged cases were 2.8% and 7.1% for the respective thresholds.

Conclusions: In addition to thresholds based on radiation injury, thresholds based on population statistics for given procedures should be used for QA review. Doing so provides a relevant threshold for identifying cases that deliver higher dose with respect to other identical procedure types. For high-dose procedures where the mean ESD is often over 2Gy, the number of review cases will be limited. For lower-dose procedures where the mean ESD is less than 2Gy, case review includes atypically high dose administration.