

## **Real-time patient and staff dose monitoring in IR practice**

**Sailer AM, Paulis L, Vergoossen L, de Graaf R, Schurink GW, de Haan MW, van Zwam WH,  
van der Leij C, Das M, Wildberger JE, Jeukens CLRPN**

### **Purpose**

Patient and staff dose monitoring is gaining increasing interest for legal and personal purposes. In our center, the first dedicated real-time patient and staff dose monitoring system (Philips DoseWise) was installed in our angiosuites in October 2015. Aim of this study was to implement a comprehensive procedural and occupational real-time dose monitoring system to obtain insight in the procedural and occupational dose for all procedures performed.

### **Methods**

All interventional radiologists and technicians wore personal dose meters (PDMs, Philips Doseaware). The dose monitoring system registered simultaneously dose related data such as the dose area product (DAP) and effective staff dose from PDMs for each procedure. Use and type of shielding was recorded. All procedures (n=387) were analyzed according to procedure type; these included among others venous iliac and caval recanalization (n=46), AV fistula maintenance (n=35), SFA and infraglenal interventions (n=43), biliary duct interventions (n=26).

### **Results**

Mean ( $\pm$ SD) DAP doses ranged from  $2.9 \pm 3.1$  Gy $\text{cm}^2$  (percutaneous gastrostomy) to  $12.6 \pm 11.1$  Gy $\text{cm}^2$  (aortic repair procedures). Mean ( $\pm$ SD) first operator doses ranged from  $0.001 \pm 0.001$  mSv (cerebral angiography) to  $0.04 \pm 0.03$  mSv (biliary duct interventions) and did not correlate with DAP ( $R=0.24$ ), indicating large variations in staff dose per unit DAP among the procedure types (e.g. high staff dose per DAP in biliary duct and AV fistula interventions).

## Conclusion

Real-time dose monitoring is able to identify types of interventions with a relatively high staff dose.

Further analysis of influence of shielding and types of acquisition are performed to detect potential sources and patterns of avoidable radiation exposure.