Interventional Radiology Patient Radiation Safety Program

Purpose:
- To minimize risks and appropriately consent patients undergoing potentially high radiation dose procedures.
- To ensure the maximum value of information through monitoring and communication between the technologist and the referring physician. Such communication would lead to dose limiting technical modifications or termination of the study when indicated.
- To establish a follow-up program to track any patient receiving over 3 Gy during a single procedure.

Background:
- Patient safety during fluoroscopically guided interventional procedures has been a growing health concern. Lower dose reports have been reported in the literature [3].
- The ongoing program consists of three parts: pre-procedure outline, intra-procedure monitoring, and post-procedure counseling.

Pre-procedure evaluation:
- Using the findings from the RAD-IR study [5], the current SSM paper [11], and MINCIE historical case data, potentially high dose cases were identified. These included the following:
  1. Any embolisation procedure
  2. Binary drainage (initial access with external or internal/external drainage)
  3. Biliary drainage (initial access with external or internal/external drainage)
  4. Mucosal embolization requiring balloon angioplasty and/or coiling

Selected patients underwent additional counseling, risk assessment and consent in order to better inform them of their increased deterministic risk.

Intra-procedure monitoring:
- During the performance of all intervention cases utilizing fluoroscopy, technologists should immediately record the cumulative dose. An annual dose record for each fluoroscopy unit or name of the technologist performing the procedure should be maintained.
- The technologist must be notified if the cumulative dose threshold of 2 Gy is met.

Post-procedure counseling:
- Immediately following the procedure, all patients receiving 10 Gy or more were assumed to be a physical risk. The patient’s radiation oncologist was notified.

Materials and Methods:
- A single-center program was initiated on July 11, 2009 to enhance patient safety by monitoring and developing radiation exposure during certain interventional procedures. The program involves continuous process improvement initiatives, close technologist searching and post-procedure counseling.

Results:
- Complete dose information was recorded for 3701 cases of 5738 patients between July 20, 2009 and September 1, 2010. The technologist compliance rate was 65%.

Conclusion:
- Improving patient safety in healthcare has been a primary concern since the initial publication of “To Err is Human” by the Institute of Medicine in 1999. Because of progressively more complex and repeated cases, interventional radiology patients are subjected to significant amounts of radiation exposure. Our patient radiation safety program has proven effective for three reasons:
  1. Better informed patients and a more complete consent process
  2. Identifying and counseling 62 patients receiving greater than 3 Gy who would have otherwise gone unnoticed.
  3. Furthermore, identifying four cases of significantly elevated dose which were subsequently reviewed.

Incompleteness dose information was a result of the technologist not recording dose after what were perceived as very low doses cases (e.g., nephroscopy tube change) or cases performed primarily with ultrasound. After six months, an in-service was given by the imaging physicist. Education and end of procedure checks increased the compliance rate to over 75% for the last 7 months of the project.

References: