Rare, medium or well done?

Practising skin care in interventional procedures

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Background

Interventional radiology (IR) and Cardiology (IC) are areas of imaging where there is a possibility of delivering a skin radiation dose exceeding, 500Gycm² dose area product (DAP), 5Gy cumulative air kerma (AK) and 3Gy peak skin dose (extent of radiation received at any point on the skin). These are the recommended trigger points, for initiating further action post procedure, due to possible deterministic injury.[1-3] As the capacity for interventional procedures to take on cases with greater complexity increases, so does the potential for increased radiation dose levels to patients and staff.

Objectives

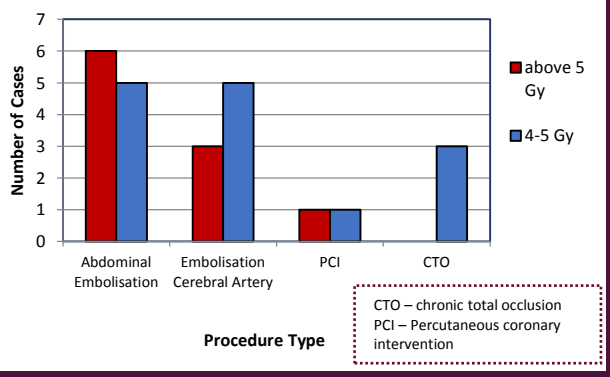
- Outline the importance of continuously measuring practice against international recommendations, so that improvements within service provision can be made
- Illustrate which IR procedures resulted in the highest radiation dose levels
- Support the recognition of cumulative AK and its position within procedural planning and dose management
- Demonstrate the relationship between peak skin AK (PSAK) in comparison to cumulative AK utilising GE DoseWatch data

Methods

- Data were collected retrospectively using GE DoseWatch patient dose management system
- The search parameters were opened to include all IR and cardiology procedures involving a dose >3Gy AK between 1st January 2016 and 5th June 2018 within Nottingham University Hospitals.

Results

Procedures involving the highest DAP (Gycm²)



- 67 procedures concluded with a dose >3Gy AK
- 10 procedures concluded with a dose >5Gy AK

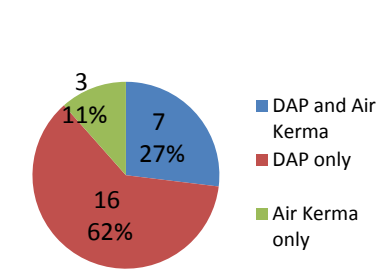
60% of the patient cohort went on to have a CT or second IR procedure within 60 days:

- 55% CT
- 45% IR procedure

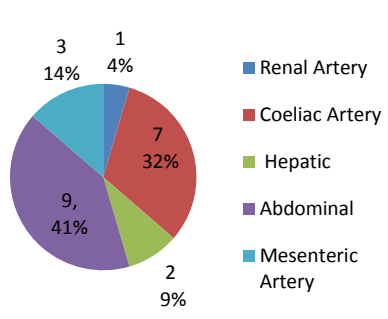
GE DoseWatch demonstrating the relationship between PSAK and cumulative AK

Study description	Cumulative AK (Gy)	Peak skin AK (Gy)			
Tube angulation position		1	2	3	4
Embolisation Renal Artery	**9.6**	**3.59**	**3.03**	**2.95**	**0.05**
Embolisation Cerebral Artery	**7.8**	**5.42**	**1.69**	**0.32**	**0.2**
PCI	**7.3**	**3.48**	**1.6**	**1.12**	**0.69**
Abdominal Embolisation	**5.3**	**5**	**0.33**	**0**	**0**

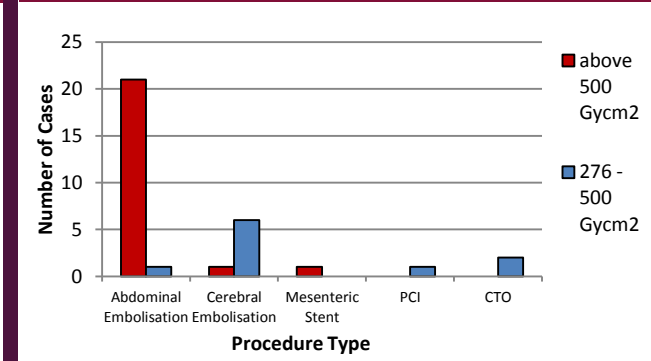
Percentage distribution of initial trigger



Percentage distribution of triggered abdominal embolisations



Procedures involving the highest AK (Gy)



Recommendations

1. Redefine a high radiation dose skin care pathway, aimed at post procedure after care, for patients who trigger with a 'high' skin dose
2. Generate a plan to guide future procedures & radiation dose management
3. Implement departmental use of GE Dose Watch patient dose management system to be used for pre-procedure accumulative dose planning and to allow estimation of peak skin AK post procedure
4. Specify resources to be utilised within the documented procedure to standardise practice, including patient information leaflets and reporting procedures
5. Conduct a second audit to evaluate peak AK in procedures concluding in greater than 4Gy AK or 400Gycm² DAP

To view references and contact details

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