IPEM paediatric working party audit using dose data from dose management systems

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Background

- IPEM paediatric working party formed in Nov 2017

- Work streams include:
  - **CT**
  - Fluoro/interventional
  - Radiography

The story so far……..

CT (dose) survey

- CT survey almost ready to launch
- Protocol form trialled
- Instructions in development

Optimisation strategies
…….

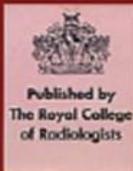**Clinical Audit in Radiology**

100+ RECIPES

Editors

Ray Godwin

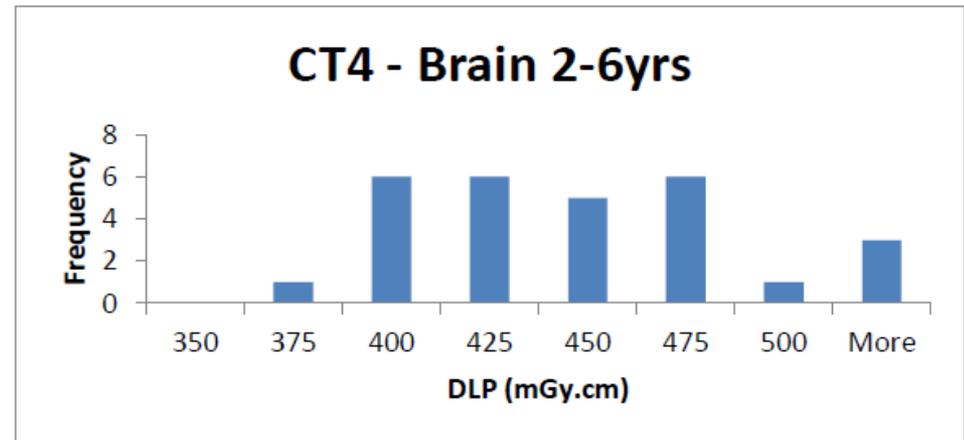**Gerald de Lacey**

Adrian Manhire

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Patient dose audits are very similar to clinical audits.

But what are the recipes ?

Dose audits

- Mean/Median DLP vs National DRL

- Dose/DLP histogram (compare shapes)

- CTDIvol vs National DRL

- High/low DLP studies

- High/low CTDIvol studies

- Inter scanner DLP

- Inter scanner CTDI

CT4 - Brain 2-6yrs

Coding audits

- Protocols used against CRIS codes

- CRIS codes used for protocols

- Number of irradiation events (series) for a protocol

  (Used to demonstrate if protocols are mixed use or standard)

Local Study descriptions used within protocols

Device	Protocol	Local Study Desc	Count
QMC 4	BRAIN 2-6yrs /Head	CT Head	31
		CT Head With Contrast	1
	BRAIN 2-6yrs /TRAUMA	CT Head	2
	BRAIN 6-12yrs /Head	CT Head	15
		CT Head With Contrast	1
		CT Venogram Intracranial	1
QMC 3	11.6 NAI Head (2yrs+)		1
		CT Head	5
		CT Head With Contrast	1
		CT Orbits1	1
QMC 2	BRAIN 2-6yrs /Head	BRAIN 2-6yrs	1
		CT Head	1

Number of irradiation events within single local study description

Device	Protocol	Num of irradiation events (Local Study: CT Head)					
		1	2	3	4	5	6
CT4	BRAIN 2-6yrs /Head	2	28	1	0	0	0
CT4	BRAIN 6-12yrs /Head	0	12	3	0	0	0
CT3	11.6 NAI Head (2yrs+)	0	0	4	1	0	0

Technique audits

- Mean scan length by scanner

- Mean scan length against national data

- kVp(s) used (including kV vs patient size)

- Centering / positioning

- Operator vs dose

- Imaged slice widths

- Noise and image quality

Taken only from main series (scout excluded):

Device	Protocol	Mean DLP (mGy.cm)	Mean CTDI vol (mGy)	Average of KVP	Average of mA	Average Scanning length (mm)
QMC - A&E CT 4	BRAIN 2-6yrs /Head	433	22.0	120	134	158
	BRAIN 6-12yrs /Head	465	23.3	120	142	168
QMC - A&E CT3	11.6 NAI Head (2yrs+)	439	27.0	120	160	163

Others

- mA variation along scan length

  - (e.g. to see if mA is modulated correctly or reaches max)

- Size vs patient dose (Diameter, X area, BMI, Kg etc)

- In hours CT dose vs out of out of hours CT dose.

  (in our centre 11% difference for one protocol)

What do other people find useful?