Evaluation: Ionising Radiation Targeted Inspections

Chiropractors

Q4 January – March 2019

External July 2019

Evaluation of IRRI Inspections Q4 2018/19: Chiropractors

Executive Summary

The Ionising Radiation Regulations 2017 (IRR17) came into force on 1 January 2018 and replaced the Ionising Radiation Regulations 1999 (IRR99). To check compliance with IRR17, the HSE 2018/2019 work plan included a requirement to conduct a number of pro-active site inspections with organisations (from identified industries) registered with HSE.

The General Chiropractic Council (GCC) engaged with HSE regarding compliance with IRR17 and informed their members that HSE inspection visits would take place between January and March 2019. The GCC was also able to explain to their members what the HSE regulatory expectations would be.

Chiropractors selected for inspection were identified from HSE's Graded Approach database of Consents, Registrations and Notifications made under IRR17. This database includes the name and contact details of the person who made the Registration application. The relevant person was therefore able to be contacted by the Inspector and arrangements made to carry out an announced inspection. A copy of the Chiropractors local rules and radiation risk assessment associated with work concerning the x-ray generator were also requested prior to each visit.

A number of scoping visits were carried out by radiation specialists prior to the targeted inspections being carried out by Ionising Radiation Regulatory Inspectors (IRRIs). This initial exercise indicated a reasonable level of regulatory compliance. As part of the Nationwide campaign 55 regulatory radiation inspection visits were allocated to the team of 10 Ionising Radiation Regulatory Inspectors (IRRIs). Out of which, **46** inspections were completed. There were also 3 inspections carried out by Specialist Radiation Inspectors, taking the total number of inspections to **49**.

Following the campaign an evaluation exercise took place. This evaluation concluded that there were 64 contraventions of IRR17 (where an Improvement Notice was not warranted) and 12 contraventions of IRR17 which necessitated the serving of an Improvement Notice. Therefore, the total number of contraventions of IRR17 totalled 76. The table below demonstrates which IRR17 regulations were breached.

Reg No.	Title	Contraventions (no Improvement Notice)	Improvement Notices Served	MBR (nearest whole number)
6	Registration with HSE	4	0	8%
8	Risk Assessments	12	3	31%
9	Restriction of Exposure	13	0	27%
13	Contingency Plans	1	0	2%
15	Information, instruction and training	4	5	18%
16	Co-operation between employers	8	0	16%
17	Designation of controlled or supervised areas	3	0	6%
18	Local Rules and Radiation Protection Supervisors	9	0	18%
19	Additional requirements for designated areas	5	0	10%
20	Monitoring of Designated Area	5	4	18%
Totals		**64**	**12**	**64%**

*MBR = Material Breach Rate

Ionising Radiation Regulatory Inspectors (IRRI's)

An Ionising Radiation Regulatory Inspector (IRRI) is a Regulatory Health and Safety Inspector who has been trained to assist the work of the HSE Radiation team There are 10 IRRI's located across England and Scotland. For support and guidance, each IRRI has an allocated Specialist Buddy.

The table below shows the geographical location of each IRRI and the number of inspections allocated and completed during the campaign.

Office Name	Allocated Inspections	Completed Inspections
CREWE	5	5
BRISTOL	6	5
BIRMINGHAM	7	6
LEEDS	7	5
GLASGOW	7	6
ASHFORD	6	5
CARLISLE	1	1
BEDFORD	7	6
NEWCASTLE	2	2
LONDON	7	5
Total for IRRI's	**55**	**46**
Specialist Radiation Inspector **Glasgow**	1	1
Specialist Radiation Inspector **Leeds**	2	2
Total including Specialist Inspections	**58**	**49**

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No Enforcement Taken

There were 18 duty holders where no enforcement action was taken. Verbal advise was provided where necessary.

No	Comments
1	Practice had procured a number of 'Instadose' personal dosimetry badges, the data from which can be periodically uploaded for exposure trend analysis.
2	RPS did not know how to lock off the isolator switch prior to the inspection.
3	Standards reasonable, verbal advice only due to the dutyholders eagerness to correct the few weaknesses identified.
4	Registration completed successfully, certificate available. Good standard of risk assessment, in accordance with ACOP requirements. Verbal advice around a few minor improvements.
5	Reasonable standards of maintenance, no documentation for handover of controlled area. Verbal advice due to good standards and duty holder factors.
6	Duty holder is considering removal of machine as mostly x-rays undertaken as part of visit to doctors before visit to chiropractor.
7	Good set up, local rules adequate. Door lockable, warning light outside, discussed altering wiring but if came through door would have to walk past radiographer. Staff have been trained as necessary. Handover for maintenance to implement.
8	No matters of evident concern identified.
9	No matters of evident concern identified.
10	No material breaches identified, no action taken.
11	No material breaches identified, and no action taken.
12	New Radiation Protection Adviser (RPA) appointed. New RPA had identified all the material breaches of IRR17 which were found during IRRI inspection.
13	Inspector was informed by the duty holder that although there was an x-ray unit within the practice, this was electrically isolated and not in use. No further action.
14	Good level of compliance.
15	No material breaches identified.
16	No material breaches identified – verbal advice only.
17	No material breaches identified.
18	Moved to new premises, awaiting new X-ray machine. Advise given re compliance.
Allocated Chiropractor inspections not carried out and the reason why	
1	X-ray set condemned by service engineer. Exploring possibilities to replace. No inspection due to no risk being present.
2	No trace on COIN (HSE internal database).
3	No visit undertaken as no X-Ray facility currently available, but looking to purchase a new system within the next six months.
4	No longer doing x-rays withdrawn.
5	Withdrawn.
6	Withdrawn.
7	Withdrawn.
8	Created in error.
9	Inspection cancelled.

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Identified Breaches of Ionising Radiations Regulations 2017 (IRR17)

Regulation 6 Registration with HSE			
a	Notification of Contravention (NoC) Non-compliances identified therefore in breach of the conditions of registration.		
b	Notification of Contravention (NoC) Non-compliances identified therefore in breach of the conditions of registration.		
c	Notification of Contravention (NoC) Non-compliances identified therefore in breach of the conditions of registration.		
d	Notification of Contravention (NoC) Non-compliances identified therefore in breach of the conditions of registration.		
Total NoC's	**4**	**Total IN's**	**0**

Regulation 8 Risk Assessments	
a	Notification of Contravention (NoC) Risk assessment had been produced by the **RPA** without visiting site. Several statements in the assessment were not relevant to the practice inspected. This included a reference to non-radiation workers being present in the room in the event of equipment malfunction - but not being at risk as they would be wearing lead apron. However, the practice doesn't take X-Rays requiring the carer to be present and does not have a lead apron.
b	**IMPROVEMENT NOTICE SERVED** No Radiation Risk Assessment in place.
c	Notification of Contravention (NoC) Radiation risk assessment failed to identify the source of radiation, the estimated radiation dose rates, the results of previous area monitoring and also, possible accident situations, their likelihood & potential severity.
d	Notification of Contravention (NoC) No information regarding potential dose rates. Control measures not identified. Foreseeable radiation accidents and dose consequences not identified. The dose investigation limit had been set too high.
e	Notification of Contravention (NoC) Need to consider/improve upon results of previous personal dosimetry and area monitoring. Need to identify reasonably foreseeable radiation accidents with assessment of potential doses. Need to designate areas as controlled or supervised and specify the local rules.
f	Notification of Contravention (NoC) No risk assessment in place.
g	Notification of Contravention (NoC) Improvement required to record results of previous personal dosimetry and area monitoring. Need to identify reasonably foreseeable radiation accidents and assessment of the potential doses. Need to designate areas as controlled or supervised and specify the local rules.
h	Notification of Contravention (NoC) Risk assessment does not adequately address matters in the Approved Code of Practice (specifically in relation to the matters detailed in paragraphs 70 & 71 of the code).
i	Notification of Contravention (NoC) Risk assessment does not adequately address matters in the Approved Code of Practice (specifically in relation to the matters detailed in paragraphs 70 & 71 of the code).
j	**IMPROVEMENT NOTICE** Insufficient risk assessment.
k	**IMPROVEMENT NOTICE** Insufficient risk assessment.

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l	Notification of Contravention (NoC) Need to review risk assessment to determine if reasonably practicable to fit warning light.
m	Notification of Contravention (NoC) Radiation risk assessment is not suitable or sufficient.
n	Notification of Contravention (NoC) There are five employees, however the radiation risk assessment has not been recorded, nor is it suitable and sufficient.
o	Notification of Contravention (NoC) The Assessment does not identify the controlled area and refers to “passive controls” rather than specific measures to control exposure according to hierarchy of control.

Total NoC’s	**12**	**Total IN’s**	**3**

Regulation 9 Restriction of Exposure	
a	Notification of Contravention (NoC). Warning light outside controlled area should be automatic if reasonably practicable, door to room should be locked when X rays being taken. Local rules should be displayed at the X ray operating position. No monthly checks of the X ray log.
b	Notification of Contravention (NoC) The X ray set is located in a lead-lined room, however room above was occupied - no-one could advise if ceiling was lead lined. Named RPS works part time. No formal handover procedure. Discussed installing a warning light adjacent to the X ray room door.
c	Notification of Contravention (NoC) Controlled area is identified as the X ray room and part of a corridor. The barrier to the controlled area of the corridor inadequate. X ray set lined up to Bucky holder but RPS was unclear as to the level of shielding provided. RPS unsure of shielding provided by door of X ray room or wall beside it. Discussed using TLDs (Thermoluminescent dosimeter) and monitoring the area outside the building adjacent to the outer door. Isolator needs to be moved to more appropriate position, i.e. behind the operator’s screen. X ray room door and warning light are not interlocked into X ray set power supply. Dose investigation level is set at 2mSv/year, which is too high. Monthly inspection of the exposure log should be recorded.
d	Notification of Contravention (NoC) Beyond stud wall partition to the rear of the Bucky was an area accessible during exposures (including members of the public). Absence of a warning light outside the controlled area. In 2008 the RPA had recommended protective screen/barrier between practitioner and patient be dismantled and if necessary, rebuilt to demonstrate adequate beam attenuation characteristics. It was not clear if this advice had been acted upon and there no documentary evidence could be produced to suggest that it had.
e	Notification of Contravention (NoC) Beyond stud wall partition to the rear of Bucky was a communal area accessible by persons during exposures. Wall was not modified thus giving rise to the potential for exposure. Presence of two manually activated warning lights used to indicate exposures taking place.
f	Notification of Contravention (NoC) X ray warning lights absent outside of the controlled area. Entry doors to controlled area – beam attenuation characteristics. Not clear to what extent the two entry doors have been modified to reduce transmission of radiation to as low as reasonably practicable (ALARP).
g	Notification of Contravention (NoC) Absence of warning light outside the controlled area. No documented procedure for isolating the X ray facility in the event of an emergency.
h	Notification of Contravention (NoC) No signage or warning lights.
i	Notification of Contravention (NoC) No automatic warning light to indicate x-ray in use.

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j	Notification of Contravention (NoC) No signage or warning lights to indicate x-ray in use.
k	Notification of Contravention (NoC) No automatic warning light for when x-ray on.
l	Notification of Contravention (NoC) Failure to restrict so far as is reasonably practicable exposure to employees/ others. Door to X-ray room unprotected giving rise to risk for those entering adjacent consulting room and reception. Steps in place to lead line door. No warning lights indicating X-rays on.
m	Notification of Contravention (NoC) Failure to restrict so far as is reasonably practicable exposure to employees and others through inadvertent entry. No warning lights indicating set on and/or X-rays on.

Total NoC's	**13**	**Total IN's**	**0**

Regulation 13 Contingency plans			
a	Notification of Contravention (NoC) No contingency plan in place.		
Total NoC's	**1**	**Total IN's**	**0**

Regulation 15 Information, instruction and training			
a	**IMPROVEMENT NOTICE** No specific training to act as RPS.		
b	**IMPROVEMENT NOTICE** Failure to ensure appropriate training for RPS and others.		
c	Notification of Contravention (NoC) RPS training was undertaken in the 1990's. Programme of refresher training to implemented as soon as possible to include all potentially exposed persons including RPS and operators.		
d	Notification of Contravention (NoC) Training was undertaken in 2013. NOC to implement programme of refresher training.		
e	Notification of Contravention (NoC) RPS training was undertaken 5 years ago. No programme of refresher training.		
f	**IMPROVEMENT NOTICE** Doctor, named as the RPS had not received RPS training.		
g	**IMPROVEMENT NOTICE** No RPS training despite being named as the RPS.		
h	**IMPROVEMENT NOTICE** No evidence of any training programme being in place.		
i	Notification of Contravention (NoC) Failure to provide adequate training/refresher training for RPS – last provided in 1999, and provide adequate instruction to employees.		
Total NoC's	**4**	**Total IN's**	**5**

Regulation 16 Co-operation between employers	
a	Notification of Contravention (NoC) No formal handover procedure of controlled area.
b	Notification of Contravention (NoC) No formal arrangement in place for handover of controlled area.
c	Notification of Contravention (NoC) No formal arrangement in place to hand over the controlled area to service engineers.
d	Notification of Contravention (NoC) No formal handover procedure for service engineers.

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e	Notification of Contravention (NoC) No formal handover procedure for service engineers.		
f	Notification of Contravention (NoC) No formal agreement to handover to service engineers.		
g	Notification of Contravention (NoC) No formal exchange for contractors.		
h	Notification of Contravention (NoC) Policy for dealing with contractors to be reviewed.		
Total NoC's	**8**	**Total IN's**	**0**

Regulation 17 Designation of controlled or supervised areas			
a	Notification of Contravention (NoC) Room where x-ray machine situated was not designated as a Controlled area.		
b	Notification of Contravention (NoC) Failure to designate area as supervised – the area behind the door to the X-ray room should kept under review to determine if it should be a controlled area.		
c	Notification of Contravention (NoC) Failure to designate controlled area.		
Total NoC's	**3**	**Total IN's**	**0**

Regulation 18 Local Rules and Radiation Protection Supervisors			
a	Notification of Contravention (NoC) Omitted to specify details of controlled area covered, did not cover warm-up procedures. Dose level investigation level set too high and contingency plans in local rules (LR) did not contain enough detail.		
b	Notification of Contravention (NoC) Key instructions were missing from the LR including not operating at 0.04s exposure or removing key from control panel when x-ray machine not in use. Risk assessment and local rules were inconsistent with each other.		
c	Notification of Contravention (NoC) RPS had insufficient training to undertake the role. LR did not contain all required information for compliance with the law. Risk assessment and local rules are inconsistent with each other.		
d	Notification of Contravention (NoC) Unclear if RPS had had sufficient training to undertake this role. LR did not contain all the required information. RA & LR inconsistent with each other.		
e	Notification of Contravention (NoC) Insufficient and contradictory local rules.		
f	Notification of Contravention (NoC) Insufficient and incorrect information in local rules.		
g	Notification of Contravention (NoC) No written arrangements under which access to non-classified persons is permitted.		
h	Notification of Contravention (NoC) No written arrangements under which access to non-classified persons is permitted.		
i	Notification of Contravention (NoC) Failure to appoint suitable RPS.		
Total NoC's	**9**	**Total IN's**	**0**

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Regulation 19 Additional requirements for designated areas			
a	Notification of Contravention (NoC) No suitable signage at the entrances to the controlled area to warn people not to enter when exposures are taking place.		
b	Notification of Contravention (NoC) No suitable signage at the entrance to the controlled area.		
c	Notification of Contravention (NoC) Failure to provide signage to indicate controlled/supervised area.		
d	Notification of Contravention (NoC) Failure to provide signage to indicate controlled area, - temporary nature of “blu-Tac” adhesion not appropriate.		
e	Notification of Contravention (NoC) Failure to provide signage to demarcate controlled area.		
Total NoC’s	**5**	**Total IN’s**	**0**

Regulation 20 Monitoring of Designated Area			
a	**IMPROVEMENT NOTICE** Unable to demonstrate monitoring. In particular, that levels were appropriate at operator position outside door, as no radiation protection; such as a lead lining on the door.		
b	**IMPROVEMENT NOTICE**. Failure to periodically monitor and record radiation levels around controlled area.		
c	Notification of Contravention (NoC) No adequate means of monitoring radiation levels.		
d	Notification of Contravention (NoC) No adequate means of monitoring. Door behind Bucky opens onto communal area. Door locked at time of visit, no indication door had additional control measures, i.e. lead lining.		
e	Notification of Contravention (NoC) No monitoring of dose rates outside x-ray room.		
f	**IMPROVEMENT NOTICE**. No evidence of any monitoring.		
g	**IMPROVEMENT NOTICE** No evidence of any monitoring taking place.		
h	Notification of Contravention (NoC) No programme of monitoring in place.		
i	Notification of Contravention (NoC) Monitoring needs to be increased to every 12 months, not every 3 years by RPA.		
Total NoC’s	**5**	**Total IN’s**	**4**

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Conclusion:

Out of the 46 IRRI and 3 specialist inspections carried out, 18 practices had no material breaches of IRR17 identified. However, material breaches of IRR17 were identified for 31 dutyholders.

In total there were 64 individual contraventions of IRR17 plus an additional 12 Improvement Notices being served (76).

The material breach rate for compliance with IRR17 equates to 64%.

When taking into consideration prior notification by the General Chiropractic Council to their members, the material breach rate is disappointingly high, with Regulation 8 (Radiation Risk Assessment) having the highest material breach rate at 31% followed by Regulation 9 (Restriction of Exposure) at 27%.

Interestingly, there were only two practices which did not have any radiation risk assessment in place at all. The other practices did have a risk assessment in place, however, compliance with ACOP L121 paras 70-71 varied significantly. A total of 3 Improvement notices were served for breaches of IRR17 Regulation 8.

With regard to risk assessments, some of the findings indicated a generic approach being taken by some RPA's. For example, several radiation risk assessments carried out by the same RPA had set the dose investigation levels at 2 mSv/yr., which is too high given the monitoring readings of each practice. There was also one risk assessment which had been carried out without the RPA attending site.

There were no Improvement Notices served for IRR17 Regulation 9, however, there were 13 Notifications of Contraventions. The contraventions were mainly for having no warning light to indicate when the X-ray machine was in operation. Other breaches included having no monthly checks in place, local rules not being displayed and the door to the X-ray room not being locked.

There were 5 Improvement Notices served for Breaches of Regulation 15 (information training and instruction). The Improvement Notices were served due to there being no specific training to act as RPS and in one instance, no training programme of any kind being in place. There were also three Notification of Contraventions of Regulation 9 IRR17, mainly because there was a lack of refresher training.

A further 4 Improvement Notices were served for breaching IRR 17 Regulation 20 (failing to monitor designated areas). The Improvement Notices were served because there was no monitoring was taking place at all.

N.B Material breaches of IRR17 constitute a breach of the conditions of the duty holder's registration. Therefore, notification of 31 breaches of Regulation 6 of IRR17 should have been identified, however only 4 breaches of Regulation 6 of IRR17 were notified to dutyholders.

From the findings of this targeted campaign, it is clear there is more work to be done to ensure compliance with the Chiropractor industry. Perhaps, given the high number of insufficient and unsuitable risk assessments, the RPA's providing the advice should also be targeted.

Leona Cameron
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