The supply and administration of medicines and contrast agents: results of survey into current practice in imaging and radiotherapy departments

Responsible person: Susan Johnson
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Summary

The Society and College of Radiographers (SCoR) undertook this survey to find out about current practice with regard to supply and administration of medicines (which includes contrast agents). This survey focused on what and how medicines are used in imaging and it included imaging in radiotherapy as part of treatment planning.

Introduction

A survey was conducted by the Society and College of Radiographers (SCoR) between September and November 2013 using the online survey tool SurveyMonkey®. The survey was promoted to managers of diagnostic imaging and radiotherapy departments throughout the UK using the monthly journal (Synergy News), TopTalk, the monthly e-zine which goes to radiography leaders and by direct email to members of the SCoR who have expressed a particular interest in the supply, administration and prescribing of medicines. See Appendix A for the survey questions.

The stated aim of the survey was given as follows:

In this survey, the Society and College of Radiographers (SCoR) wants to know about current practice with regard to supply and administration of medicines (which includes contrast agents). This survey focuses on what and how medicines are used in imaging and it includes imaging in radiotherapy as part of treatment planning.

Response

296 responses were received; 214 from diagnostic departments and 82 from radiotherapy departments. Responses from both diagnostic and radiotherapy departments came from all four countries of the UK: 260 from England, 3 from Northern Ireland, 7 from Scotland and 25 from Wales. See Appendix B for the responses and Appendix C for the freehand responses.

Mechanisms for supply and administration

188 departments (80.3% of those who responded) had patient group directions (PGDs) in place, 62

(26.5%) used patient specific directions (PSDs) and 18 departments (7.7%) had radiographer supplementary prescribers (SPs) in place. Just 11 respondents used local policies or were in the process of setting up PGDs.

Who injects?

Of those who responded, there were seven diagnostic imaging departments where only radiologists undertook intravenous injections. The vast majority used radiographers (86 - 51.5%) or a combination of radiologists and radiographers (74 - 44.3%). In radiotherapy departments, almost all intravenous injections were undertaken by radiographers (65 - 92.9%). Radiologists tended to inject if IV access was deemed difficult or if the patient was a child.

IV training for radiographers

Of those responding, 128 (54.5%) of radiographers from both diagnostic and radiotherapy departments undertaking intravenous injections had undertaken a College of Radiographers (CoR) accredited IV course and 151 (64.3%) took local in-house training including courses run by the trust. Some employing authorities required the radiographers to undertake local courses even if they had completed the SCoR accredited course.

Contrast agents used in diagnostic imaging

The most common contrast agent used was Omnipaque (79 respondents), followed by Gastrografin (73 respondents).

Contrast agent, number and percentage of responses is given here:

Omnipaque	79	56.8%
Gastrografin	73	52.5%
Niopam	54	38.8%
Gadovist	53	38.1%
Primovist	51	36.7%
Dotarem	43	30.9%
E-Z-HD	43	30.9%
Magnevist	40	28.8%
Visipaque	39	28.1%
MultiHance	28	20.1%
Ultravist	15	10.8%
Prohance	13	9.3%
SonoVue	8	5.8%

Contrast agents used in radiotherapy

The most common contrast agent used was Omnipaque (28 respondents), followed by Gastrografin (24 respondents).

Contrast agent, number and percentage of responses is given here:

Omnipaque	28	54.9%
Gastrografin	24	47.1%
Niopam	20	39.2%
Visipaque	15	29.4%
E-Z-HD	4	7.8%
Ultravist	4	7.8%

Optiray	4	7.8%
SonoVue	1	1.9%

Other medicines used

The most common other medicine administered was saline (122 respondents), followed by Buscopan (101 respondents).

In diagnostic radiography, the medicine, number and percentage of respondents is given here:

Saline	100	66.7%
Buscopan	93	62%
Picolax	51	34%
Glucagon	33	22%
Frusemide	33	22%
Maxalon	26	17.3%
Kleen-prep	24	16%
Lignocaine	17	11.3%
Fleet	10	6.7%
Citramag	7	4.7%

In radiotherapy, the medicine, number and percentage of respondents is given here:

Saline	22	68.8%
Buscopan	8	25%
Maxalon	4	12.5%
Lignocaine	4	12.5%
Glucagon	2	6.3%
Picolax	2	6.3%
Citramag	1	3.1%

Radiographers and sedatives

Very few radiographers administer sedatives; just three (1.8%) of respondents from diagnostic imaging departments and six (9.5%) of respondents from radiotherapy departments. Lorazipam was the most common medicine quoted. Sedation may be required in diagnostic radiography for micturating cystourethrograms and arthrograms, for example.

Radiographers and antibiotics

Nearly a quarter of respondents from radiotherapy departments (15 – 24.6%) supply and/or administer antibiotics. Some of these are from the clinical management plan (CMP) used by supplementary prescribers. Just four (2.5%) of diagnostic departments supply antibiotics although one respondent did comment:

We would be keen for this to happen as prescribing treatment antibiotics for MCUG patients who have reflux would streamline the whole procedure rather than waiting for or finding a radiologist to prescribe.

Radiographers and pain relief

Only 14 diagnostic departments (8.3%) have radiographers supplying and/or administering pain relief; this may be before biopsy, aspiration or steroid injection. This figure is much higher in radiotherapy at 30 (47.6% of respondents). Entonox, pethidine and lignocaine were cited as useful

medicines used to provide pain relief.

Radiographers and radionuclide imagining (nuclear medicine)

Of those responding, 52 (31.1%) from diagnostic imaging departments and 5 (8.1%) from radiotherapy departments had radiographers who administered radiopharmaceuticals.

Radiopharmaceutical administration comes under two pieces of legislation; medicines and medical devices (being regulated by the Medicines and Healthcare Products Regulatory Agency (MHRA)) and Ionising Radiation (Medical Exposure) Regulations (IR(ME)R). This is overseen by the Administration of Radioactive Substances Advisory Committee (ARSAC).

Nuclear medicine technologists work alongside radiographers in radionuclide imaging. Technologists cannot use PGDs nor can they train to become supplementary prescribers.

Other drugs administered by radiographers working in radionuclide imaging departments included frusemide and pharmacological stress agents such as adenosine.

Adverse events and reactions

Respondents in both diagnostic and radiotherapy departments were asked to say how many times, during the past year, a patient had had an adverse event under seven categories.

CATEGORY	NOT AT ALL	1-5	6-10	MORE THAN 10
Severe (protracted) nausea/vomiting	114 (65.1%)	55 (31.4%)	2 (1.1%)	4 (2.2%)
Urticaria	86 (47.3%)	81 (44.5%)	9 (4.9%)	6 (3.2%)
Bronchospasm	144 (86.7%)	21 (12.6%)	0	1 (0.6%)
Laryngeal oedema	158 (94.6%)	8 (4.8%)	0	1 (0.6%)
Hypotension	137 (81.1%)	26 (15.3%)	3 (1.8%)	3 (1.8%)
Anaphylactoid reaction	135 (78.5%)	33 (19.1%)	3 (1.7)	1 (0.6)
Contrast medium extravasation	68 (35.4%)	83 (43.2%)	16 (8.3)	25 (13%)

As can be seen from the above table, the commonest complication is contrast agent extravasation.

This is generally as a result of the use of automated power injection and/or when large volumes are injected which leads to tissue damage. Most extravasations result in minimal swelling or erythema, however severe skin necrosis and ulceration may occur and compartment syndrome may result. The Royal College of Radiologists publishes guidelines on treatment of extravasation within its document ‘Standards for intravascular contrast agent administration to adult patients’, (2nd ed., RCR, 2010). Forty-five respondents (65.2%) who reported extravasation used the RCR guidelines or local amendments to the RCR standards and 38 (55.1%) had a local policy detailing the appropriate treatment.

One respondent commented:

We've had 2 very serious extravasation incidents which were thoroughly investigated and found that all policies and procedures were followed; however we felt that information for treating such cases was patchy and difficult to obtain. There was also no one place to go to for expert advice.

The adverse events caused by reaction to the contrast media itself were relatively unusual and most departments recorded no adverse reactions or events at all.

One department had two episodes of anaphylactoid reaction:

Two episodes of anaphylactoid reaction required Crash team in and resulted in A&E admission. Both situations were managed well without an adverse outcome.

Final comments about supply, administration or prescribing of medicines including contrast agents

Respondents gave a range of comments, some of which are reproduced below:

Comments from diagnostic imaging departments:

Radiographers are best placed (with training) to supply, administer or prescribe medicines including contrast agents as part of a radiological examination.

I am an independent practitioner and the inability to independently prescribe heeds my practice and does not support my patients. There is no requirement for a radiologist to be on site so it is difficult to cover acute situations where immediate pain relief is required. The requirement for radiographers to be independent in prescribing is essential to deliver best patient care.

Working in MRI we often get asked to prescribe something to relax/calm anxious patients before their scan. This is due to a high number of claustrophobic patients. If MRI staff were allowed to be SPs it would be greatly beneficial for waiting times of patients and time slots on the scanner. Currently if we know in advance, patients have to visit their GP to get some medication. However we often do not know until the time of scan. This leads to trying to get the patient on the scanner for up to thirty minutes and either failing or obtaining a sub-optimal study. Then we have wasted slots.

Needs to be a standard criteria used by all, to include training, monitoring (auditable), testing. There are too many differing policies in place.
As a reporting radiographer it would be very useful to be able to recall patients for IV contrast without having to contact a radiologist

As an experienced MRI radiographer, it would be providing a better service to the patient if I was allowed to make decisions about giving contrast to enhance incidental findings appropriately when a radiologist is not available, to prevent the patient needing to return for it, causing delay to patient treatment.

Would support prescribing rights, plus looking ahead at sedatives for patients with claustrophobia in MRI, and certain pain relief would also be advantageous and both would save on referring back to GPs etc...

Comments from radiotherapy departments:

Within our department we have a team of radiographers who use both PSDs and Supplementary Prescribing to support patients in coping with treatment toxicity. This service could be further improved if radiographers were able to practice as independent prescribers.

Prescribing, supply and administration in the appropriate context by radiographers has brought significant benefits to patients by reducing time in the department through improving access to medicines etc. We currently do not have PGDs in place as previous efforts to establish have proven difficult to agree with local pharmacy.

We really want to be able to prescribe with extended working days and site specialist

staff including a consultant radiographer: this seems the best possible solution for the patient.
As radiographers, we are unwilling to undertake the prescribing courses that are available until we can then independently prescribe in line with nursing staff - it seems unrealistic to complete the same course as nurses to then only be allowed to supplementary prescribe.

Review and consultant radiographers would find it very useful to be independent prescribers when assessing and dealing with radiotherapy reactions and side effects. It can be very restricting if there are only limited or no medications on PGDs and limited access to consultant oncologists to prescribe other medications. It is even more limited out of hours or during bank holiday/weekend working in some centres. Supplementary prescribing is a good start but very limited when dealing with emergency patients who do not have a care plan in place.

Summary

The survey showed that the legal mechanisms for supply and administration of medicines and contrast agents were being widely utilised in both diagnostic imaging and radiotherapy departments. Intravenous injections were being given predominately by radiographers and these radiographers had undertaken CoR accredited IV courses and/or trust and local in-house training.

Medicines used are varied and are used to improve the outcome for the patient. They include contrast agents as well as other medicines that might be given before, during or after an imaging procedure. A variety of contrast agents are in use in both diagnostic and radiotherapy departments which represent the range of imaging techniques and procedures use to image different body parts and/or organs.

There is very little supply and administration of sedatives and antibiotics. Administration of pain relief was unusual in diagnostic radiography. Unsurprisingly, this figure is higher in radiotherapy.

Adverse events caused by reaction to the contrast media were relatively unusual and most departments recorded no adverse reactions or events at all in the past year. Urticaria and severe (protracted) nausea/vomiting occurred at least once in approximately half the departments.

The commonest complication of intravenous injection of contrast agent is extravasation with approximately two thirds of departments reporting at least one episode in the past year. Generally, local policies were in place and the RCR standards for IV contrast agent administration were being followed.

Finally, respondents were positive about use of medicines and contrast media and some took the opportunity to express support for independent prescribing for radiographers.

Appendices

APPENDIX A
2014.01.27 Survey_43930989: survey questions

APPENDIX B
2014.01.27 Survey by discipline: results of survey

APPENDIX C
2014.01.27 Freehand responses 2: all freetext answers