

Further comparison of the technical merit and quality of the reports of magnetic resonance imaging examinations performed by an independent sector provider using mobile MR systems (MR Fastrack) with those from standard NHS MR services (Audit 2).

A second report prepared by the Royal College of Radiologists, in conjunction with the Department of Health (England), April 2006.

Summary

1. Radiological reports were generated by the Independent Sector Provider (ISP) faster than at the two NHS centres reviewed although the time taken for the reports to then get back to the referring clinician was not evaluated.
2. There was little overall difference in the technical quality of the MR examinations between the two services overall, although the best images were generated in an NHS Teaching Hospital.
3. The language of the reports was judged slightly better in NHS generated reports.
4. There was little overall difference in the clinical opinion between the ISP and NHS reports. Amongst 110 examinations, five discrepancies in the reports were identified which could be regarded as General Medical Council Grade 3; three in 61 ISP reports and two in 49 NHS reports. There were no Grade 4 discrepancies.
5. This second audit has shown variations in the technical merit of the examinations performed and in the clinical opinions offered amongst different NHS centres. The best results so far have come from a Teaching Hospital.
6. There is evidence that the service provided by the ISP has improved significantly between January and November 2005.
7. It is again recognised that this second audit only looked at a small number of MR examinations demonstrating a limited range of lesions and that the case-mix was probably biased in favour of the ISP cases, which, by necessity, involved more ambulant patients.

INTRODUCTION

In 2004 the Department of Health (England) announced that, in order to reduce waiting times for magnetic resonance imaging, they were purchasing over 500,000 MR examinations from the independent health sector over the subsequent 5 years (MR Fastrack). Following a National advertisement and tender process, a single supplier (Alliance Medical Limited) was awarded the contract. Under the strict terms of the contract, this MR service based on mobile MR machines had to be initiated 16 weeks later. Radiographers and radiologists providing the services had to be outwith the NHS in order to provide 'additionality' to the health service within the UK.

In the first few months, both the service and the NHS had to overcome numerous teething problems which ranged from the physical difficulties of establishing suitable sites for the mobile MRI vans to link to existing hospital services, down to the administrative problems of identifying suitable patients for this service. The ISP also had to identify radiologists who were on the UK General Medical Council Specialist Register of Radiologists – European Radiologists can gain ready access to this list, but non-Europeans must have their training approved as equivalent by the Postgraduate medical Education and Training Board (PMETB).

Perhaps, the most crucial aspects of any MR service are the quality of the images and the quality of the reports. Local NHS radiologists and referring clinicians get used to certain sequences with images presented in a certain way and reports issued using certain phraseology. At the outset of the new service there were considerable delays in producing the reports, problems with the interpretation of some reports issued by radiologists for whom English was a second language and some problems with reports issued by generalist rather than specialist radiologists. Several unpublished local audits analysing the service and the quality of the reports highlighted to the ISP where improvements needed to be made. Thus, it was deemed appropriate by the Royal College of Radiologists and supported by the Department of Health to audit various aspects of the new service at a point in mid-January 2005. In particular, it was considered appropriate to compare the performance from the ISP with contemporary performance within the NHS.

That January 2005 audit (Audit 1) revealed that there was a longer interval between the examination being performed and the report issued by the ISP than in the 2 NHS centres reviewed. There was little difference in the technical quality of the MR examinations between the two services, but the language of the reports was considered better and the clinical opinion was judged slightly better in NHS generated reports.

As part of continuous audit of this new MR Fastrack service, another audit (Audit 2) was performed of images and reports generated during one week in November 2005.

MATERIALS AND METHODS

An audit was carried out on MR examinations that had been performed during one particular week in November 2005. 60 MR examinations (20 cranial, 20 spine, 20 musculoskeletal) performed by the ISP along with 60 from two NHS hospitals (District General Hospital C and Teaching Hospital D: 10 cranial, 10 spine and 10 musculoskeletal each) were sought. The request form, the hard copy images and the issued report were collected and made available for review at a central site.

The examinations were analysed by four experienced radiologists – Radiologist W had particular neuroradiological expertise and analysed cranial and spinal cases; Radiologist X, a musculoskeletal radiologist, analysed the peripheral musculoskeletal and spinal examinations; a DGH radiologist (Y) with several years of MR experience and an MR radiologist (Z) were scheduled to analyse all examinations.

The date of the examination was recorded along with the date of the issued report – the interval being defined as the reporting time (days).

The technical merit of the examination (quality of the images, completeness of the examination, etc) was recorded on a 5-point scale (1 – uninterpretable, 3 considerable artefacts, 5 perfect).

The language, grammar, style and context of the report were also scored on a 5-point scale (1 uninterpretable, 3 considerable ambiguity, 5 perfect).

The clinical opinion of the report was also scored on a 5-point scale:

1. Major disagreement – report needs a complete rewrite – clinician to be informed.
2. Moderate disagreement - report needs to be amended – send to clinician.
3. Minor disagreement – report needs to be amended for completeness, send to clinician.
4. Trivial disagreement – no need to amend report
5. Complete agreement with report.

The proforma used to analyse the examinations is enclosed as Appendix 1.

The mean scores for each radiologist were calculated and the results for ISP and NHS compared. Comparisons of the means were made by appropriate t tests.

As well as comparing the results from the ISP and NHS services, it was also possible to compare the results from the ISP service as offered in January 2005 (Audit 1) with those from November 2005 (Audit 2).

RESULTS

After gathering the request forms, examinations and reports, it transpired that no musculoskeletal cases were performed at the Teaching Centre during the week in question. Thus, only 110 cases were available for analysis. Thus, there were 61 examinations available for review from the ISP compared to 49 from the NHS. Obviously, the experienced neuroradiologist did not assess musculoskeletal cases, nor did the musculoskeletal radiologist review the cranial examinations. For a variety of technical and logistic reasons, the number of observations about any individual examination varied.

TIME FOR REPORT

As regards objective measures, there was a statistically highly significant difference ($P < 0.0001$) in the mean time between the date of the MR examination and the date of the typed report between the two MR services, with a faster turnaround time from the ISP (ISP 2.01 days (SD 2.63)) compared to 3.90 (SD 3.52) days overall for the NHS Service. The difference in the time taken in the Teaching Centre (3.73 days, SD 4.40) and the DGH (4.02 days, SD 2.67) did not reach statistical significance.

The main results of the subjective scores are shown in the Tables.

IMAGE QUALITY AND TECHNICAL MERIT OF EXAMINATION

There was no statistically significant overall difference in the quality of the images and technical merit of the examination between the ISP (4.17, SD 0.86) and the NHS (4.13, SD 0.99), $p=0.61$. However, it is of note that the scores for ISP examinations were judged to be between those from the teaching centre (4.51) and the DGH (3.84). There was a highly significant difference ($p < 0.0001$) between the image quality and technical merit of the examinations provided by the teaching hospital and the DGH. The teaching hospital examinations received significantly ($p < 0.005$) higher scores than those provided by the ISP; in turn, the ISP scores were significantly ($p < 0.005$) higher than those from the DGH.

LANGUAGE OF REPORT

The language of the reports was deemed slightly better in the examinations provided by the NHS centres than by the ISP by all four observers. When the results were pooled, the mean scores were 4.50 (SD 0.73) for the NHS versus 4.32 (SD 0.91) for the ISP ($p=0.046$). The language of the report was fractionally higher for the teaching centre (4.59, SD 0.75) than the DGH (4.43, SD 0.70) but this difference did not reach statistical significance. The difference between the scores for the language of the reports in the ISP and the DGH did not reach statistical significance ($p=0.31$). The ISP reports received significantly lower scores than those from the Teaching hospital ($p < 0.05$).

CLINICAL OPINION GIVEN IN REPORT

For the pooled results (Table 2a), there was no significant difference ($p=0.45$) between the clinical opinions given in the reports in the examinations provided by the standard NHS (4.08, SD 1.14) and by the ISP (4.17, SD 1.06). Although the scores were slightly higher for the opinions provided by Teaching hospital D than for the ISP, this difference did not reach statistical significance ($p= 0.13$); the scores for the ISP opinions were significantly higher than those by DGH C ($p<0.05$). However, there were differences between the opinions offered at Teaching Hospital D and DGH C within the NHS arm. For the pooled results, the differences between the opinions provided by the Teaching hospital (4.39, SD 0.94) and the DGH (3.86, SD 1.23) were highly significant ($p<0.005$). Two of the four observers ranked the clinical opinions offered by the ISP between those of the Teaching hospital and the DGH.

CHANGE OVER TIME

With regard to comparison between the service provided by the ISP in the 2 audits, there has been considerable improvement in the objective time taken for the report to be generated (2.01 days in Audit 2 compared to 9.5 days in Audit 1).

All subjective parameters for the service provided by the ISP significantly improved in the interval between Audits 1 and 2 (Table 2). The technical merit of the examinations was judged to be significantly ($p<0.0001$) better in Audit 2 (4.17, SD 0.86) than in Audit 1 (3.69, SD 0.72). The language of the report was significantly ($p< 0.0001$) better in Audit 2 (4.32 versus 3.88). The clinical opinion offered had also significantly ($p< 0.005$) improved (4.17 versus 3.80).

DISCUSSION

The reporting time for the ISP in Audit 2 was significantly shorter than that provided by the NHS Service and had improved significantly since Audit 1. This is to be expected as the suppliers of reporting to the ISP are contracted to provide a prompt turnaround of reports, and they are now fulfilling their contract in this regard. This compares with standard NHS services where reporting of outpatient work has to be prioritised against other (e.g., procedural) duties. Indeed, for some NHS services, non-urgent cases are probably gathered and reported during one or two particular sessions during a week (e.g. musculoskeletal). Once again there were also interesting variations within the service provided by the NHS: for some services (e.g. neuroradiology at a Teaching Centre) a radiologist was probably present on site and reported on the same day. There were also variations within the ISP with spinal examinations being reported more quickly than cranial or musculoskeletal studies.

It is reassuring that the image quality of the two Services is again broadly similar. Of course, it could be argued that the image quality should be better in the ISP arm as the selected patients referred to the mobile systems in the MR Fastrack Service are, by necessity, fairly ambulant and thus less likely to be frail, in pain, etc than some of the more complex procedures/patients

performed within the NHS systems. What was somewhat unexpected in this second audit was the significantly higher scores for the technical merit of examinations performed in a Teaching Hospital compared to those in a DGH. This had not been a feature in Audit 1. Comparison of results between Audit 1 and Audit 2 reveals that the main difference is a remarkably high score for Teaching Hospital D (4.51) compared to Teaching Hosp B (3.83) and DGH A (3.89) in Audit 1 and DGH C in Audit 2 (3.84). Against these scores the quality of the examinations provided by the ISP for ambulant outpatients (4.17) seems satisfactory and, in this relatively small series, no examination was scored as requiring re-examination.

Although the language in the reports from the ISP was not as clear as that from the NHS (mean score 4.32 as against 4.50), this factor is not now perceived to be a major problem. Indeed, the language in the ISP reports was not significantly worse than reports from DGH C (4.43). The significant improvement in the ISP Service has come about through the use of more native English speaking staff (several UK-trained) working abroad and improved feedback by the ISP Clinical Governance team. In the initial stages of the service, all reports had to be provided from within the EU and there were some low scores (the mean score in Audit 1 was 3.88). Subsequent advice allowed the use of radiologists from other countries, provided that the patient consented to their images being transmitted beyond the EU. As stated in the introduction, all radiologists participating in the ISP service had to be on the GMC Specialist Register as a radiologist. Nevertheless, terminology is often used differently in other countries and this can be confusing; for example 'corpus' rather than 'body' of a meniscus. The DGH C scores in Audit 2 may have been fractionally lower than expected because it transpired, during the audit, that a few MR reports in that DGH had been sent abroad for reporting under another outsourcing initiative which had been organised by the local radiology department in order to overcome severe staffing shortages. However, the language scores for DGH C in Audit 2 (mean 4.43) are not all that different from those from DGH A in Audit 1 (mean 4.65).

In this second audit the clinical opinions provided by the ISP (4.17) were rated between those provided by Teaching Hospital D (4.39) and DGH C (3.87). Some would say that the opinions offered at the Teaching Centre might be expected to be better than at a DGH because of a higher degree of sub-specialist reporting; the DGH radiologist has to cover a much broader range of radiology. Interestingly this difference was not so marked in Audit 1 (DGH A 4.13, Teaching Hospital B 4.42). It is interesting that the results for the ISP in Audit 2 are almost identical to those obtained from the DGH in Audit 1. Thus, it can be concluded that the ISP is currently providing clinical opinions equivalent to those provided by one conventional NHS DGH service (DGH A) and significantly better than another (DGH C).

The unanswered question is whether these slight differences in the language and clinical opinion have a negative impact on patient care. In this small series of ISP work nearly all the cranial examinations were normal or nearly normal; the spinal studies showed a range of degenerative changes – as did most of the musculoskeletal examinations. No life-threatening lesion was

seen within patients examined by the ISP. This is not unexpected, given the selection of patients deemed suitable for outpatient examinations on a mobile system.

The five serious discrepancies on the printed report which came to light in this second audit are of interest. Three were found amongst the 61 reports issued by the ISP; two were found in the 49 issued by NHS Departments. None reach more than Grade 3 in the GMC classification of errors. Such a rate is probably well within normal clinical practice for this type of work. One particular discrepancy discovered during the audit merits further discussion. A patient examined at DGH C was found to have, in addition to the reported widespread degenerative change, an unreported far lateral disc herniation. On contacting the radiologist in DGH C about this patient, the lesion had already been identified during multidisciplinary follow-up and management was not unduly influenced. However, this lesion was only identified by two of the four radiologists reviewing the case during the audit! The scores for the clinical opinion offered in this report were:

1/5 (major disagreement – lateral L5/S1 disc herniation missed),
1/5 (major disagreement – lateral L5/S1 disc herniation missed),
3/5 (minor disagreement – not enough mention made about apophyseal joint degeneration),
4/5 (trivial difference in opinion - not convinced about reported small central L4/5 lesion).

This variation in scores from four experienced MR reporters, two of whom missed the lesion, exemplifies the highly subjective nature of radiological reporting. All radiologists miss lesions from time to time. This can be reduced by double reading which has been introduced into the ISP programme and is used to a variable extent within the NHS – it is likely that informal double reading occurs more in the Teaching Centres, where there radiologists in training often make preliminary reports, than in the DGH setting where the hard-pressed radiologist tends to report in relative isolation.

Despite these substantial improvements to the ISP service, which are most welcome, the MR Fastrack system does put a considerable extra strain on hard-pressed NHS radiology departments which have to identify suitable patients, provide clerical staff and then assimilate the results into the local records system. Local radiologists then have to review numerous extra investigations and reports, before and during multidisciplinary meetings and when clinical colleagues make enquiries. It is to be hoped that improved funding streams will better facilitate such incorporation of outsourced work in the future.

This limited survey yet again highlights the difficulties of establishing standards for radiological reporting. Discrepancies in reporting are common and many RCR members and Fellows and other workers have written extensively on this topic. It also highlights the difficulties of comparing discrepancy rates between single practitioners and different centres. There was considerable inter-observer variation between the reviewers. The samples are small and alternative statistical methodology could have been

employed. Several other potential areas of bias should be aired. Once again only two NHS centres were sampled; they have been compared to the two NHS centres in Audit 1; but it is still not known how far these four centres are representative of the NHS as a whole. Likewise, it is assumed that the examinations from the ISP are representative of all their examinations. It is also assumed that the four experienced radiologists who reviewed the examinations were unbiased. Despite these limitations, it does appear that the ISP service has improved since Audit 1 and is now broadly comparable to what is offered by conventional NHS DGH services.

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APPENDIX 1. The proforma used for the evaluation
RCR/DoH Audit of MRI

Date of Audit: ___ / ___ / ___

Radiologist: _____

Site: **Teaching Hospital**
District General Hospital
Independent Sector Provider

Image site: **Head**
Spine
Extremities

Image number: _____

Date of MR: ___ / ___ / ___

Date of report: ___ / ___ / ___

Technical merit of image	1	2	3	4	5
	artefact +++	poor	adequate	good	perfect
Language of report	1		3		5
	major ambiguity		adequate		perfect
Opinion of report	1	2	3	4	5
	major disagreement	moderate disagreement	minor disagreement	trivial difference of opinion	full agreement
	1-3 Requiring amendment of report				

Further comments:

Mean Score and (Standard Deviations) for MRI Audit

All

ISP n = 212	Head n = 48	Spine n = 119	Musculoskeletal n = 45	TOTAL
Technical merit	4.00 (0.88)	4.24 (0.88)	4.18 (0.78)	4.17 (0.86)
Language of report	4.27 (0.92)	4.37 (0.92)	4.24 (0.88)	4.32 (0.91)
Clinical Opinion	4.48 (0.77)	4.10 (1.12)	4.02 (1.09)	4.17 (1.06)
				4.22 (0.95)

DGH C n = 96	Head n = 28	Spine n = 39	Musculoskeletal n = 29	TOTAL
Technical merit	4.03 (0.88)	3.74 (0.19)	3.79 (1.12)	3.84 (1.11)
Language of report	4.46 (0.84)	4.41 (0.71)	4.41 (0.56)	4.43 (0.70)
Clinical Opinion	4.43 (1.03)	3.59 (1.29)	3.70 (1.17)	3.87 (1.23)
				4.05 (0.33)

Teaching Hosp D n = 71	Head n = 29	Spine n = 42	Musculoskeletal n = 0	TOTAL
Technical merit	4.55 (0.57)	4.48 (0.67)		4.51 (0.63)
Language of report	4.55 (0.78)	4.61 (0.74)		4.59 (0.75)
Clinical Opinion	4.45 (0.95)	4.34 (0.94)		4.39 (0.94)
				4.50 (0.10)

NHS n = 167*	Head n = 57	Spine n = 81	Musculoskeletal n = 29	TOTAL
Technical merit	4.30 (0.87)	4.12 (1.01)	3.79 (1.21)	4.13 (0.99)
Language of report	4.51 (0.80)	4.51 (0.73)	4.41 (0.57)	4.50 (0.73)
Clinical Opinion	4.44 (0.99)	3.98 (1.78)	3.40 (1.17)	4.08 (1.14)
				4.24 (0.98)

*= cases excluded: 10 due to missing data

Consultant A

ISP n = 61	Head n = 16	Spine n = 30	Musculoskeletal n = 15	TOTAL
Technical merit	4.63 (0.50)	4.23 (0.77)	4.80 (0.41)	4.48 (0.67)
Language of report	4.94 (0.25)	4.27 (0.83)	4.47 (0.64)	4.46 (0.54)
Clinical Opinion	4.56 (0.63)	4.27 (0.83)	4.20 (1.01)	4.33 (0.83)
				4.42 (0.08)

DGH C n = 27	Head n = 8	Spine n = 10	Musculoskeletal n = 9	TOTAL
Technical merit	4.50 (0.53)	3.80 (1.14)	4.00 (0.70)	4.07 (0.87)
Language of report	5	4.40 (0.52)	4.67 (0.50)	4.67 (0.48)
Clinical Opinion	4.88 (0.35)	3.40 (1.17)	3.56 (1.13)	3.89 (1.15)
				4.21 (0.41)

Teaching Hosp D n = 20	Head n = 10	Spine n = 10	Musculoskeletal n =	TOTAL
Technical merit	4.60 (0.70)	4.50 (0.53)		4.55 (0.60)
Language of report	5	5		5
Clinical Opinion	4.90 (0.32)	4.70 (0.48)		4.80 (0.41)
				4.78 (0.23)

NHS n = 47	Head n = 18	Spine n = 20	Musculoskeletal n = 9	TOTAL
Technical merit	4.56 (0.62)	4.15 (0.93)	4.00 (0.70)	4.28 (0.80)
Language of report	5	4.70 (0.47)	4.67 (0.50)	4.81 (0.40)
Clinical Opinion	4.89 (0.32)	4.05 (1.09)	3.56 (1.13)	3.56 (1.13)
				4.46 (0.31)

Consultant B

ISP n = 46	Head n = 16	Spine n = 30	Musculoskeletal n =	TOTAL
Technical merit	4.06 (0.25)	5		4.67 (0.47)
Language of report	4.75 (0.45)	5		4.91 (0.28)
Clinical Opinion	4.81 (0.54)	4.63 (0.76)		4.70 (0.70)
				4.76 (0.13)

DGH C n = 19	Head n = 10	Spine n = 9	Musculoskeletal n =	TOTAL
Technical merit	4.30 (0.48)	4.11 (0.33)		4.21 (0.42)
Language of report	5	5		5
Clinical Opinion	4.40 (1.08)	4.11 (1.45)		4.26 (1.24)
				4.49 (0.44)

Teaching Hosp D n = 21	Head n = 10	Spine n = 11	Musculoskeletal n =	TOTAL
Technical merit	5	5		5
Language of report	5	5		5
Clinical Opinion	5	4.64 (0.81)		4.81 (0.60)
				4.94 (0.11)

NHS n = 40	Head n = 20	Spine n = 20	Musculoskeletal n =	TOTAL
Technical merit	4.65 (0.49)	4.60 (0.50)		4.63 (0.49)
Language of report	5	5		5
Clinical Opinion	4.70 (0.80)	4.40 (1.14)		4.55 (0.99)
				4.73 (0.24)

Consultant C

ISP n = 45	Head	Spine n = 30	Musculoskeletal n = 15	TOTAL
Technical merit		4.10 (1.03)	4.13 (0.83)	4.11 (0.99)
Language of report		4.83 (0.38)	4.87 (0.35)	4.84 (0.37)
Clinical Opinion		4.73 (0.45)	4.33 (0.98)	4.60 (0.69)
				4.52 (0.37)

DGH C n = 20	Head	Spine n = 10	Musculoskeletal n = 10	TOTAL
Technical merit		4.60 (0.67)	4.40 (0.97)	4.50 (0.83)
Language of report		4.70 (0.67)	4.70 (0.48)	4.70 (0.57)
Clinical Opinion		4.30 (0.67)	4.20 (1.23)	4.25 (0.97)
				4.48 (0.23)

Teaching Hosp D n = 11	Head	Spine n = 11	Musculoskeletal n = 0	TOTAL
Technical merit		4.73 (0.47)		4.73 (0.47)
Language of report		4.90 (0.32)		4.90 (0.32)
Clinical Opinion		4.60 (0.52)		4.60 (0.52)
				4.74 (0.15)

NHS n = 31	Head	Spine n = 21	Musculoskeletal n = 10	TOTAL
Technical merit		4.67 (0.58)	4.40 (0.97)	4.58 (0.72)
Language of report		4.80 (0.52)	4.70 (0.48)	4.77 (0.50)
Clinical Opinion		4.45 (0.60)	4.20 (1.23)	4.37 (0.85)
				4.57 (0.20)

Consultant D

ISP n = 61	Head n = 16	Spine n = 30	Musculoskeletal n = 15	TOTAL
Technical merit	3.31 (1.08)	3.62 (0.73)	3.60 (0.51)	3.53 (0.79)
Language of report	3.13 (0.50)	3.00 (0.65)	3.40 (0.83)	3.13 (0.68)
Clinical Opinion	4.06 (0.93)	2.72 (1.03)	3.53 (1.19)	3.28 (1.80)
				3.31 (0.20)

DGH C n = 30	Head n = 10	Spine n = 10	Musculoskeletal n = 10	TOTAL
Technical merit	3.40 (1.08)	2.50 (1.18)	3.00 (1.41)	2.97 (1.25)
Language of report	3.50 (0.71)	3.60 (0.52)	3.90 (0.32)	3.67 (0.55)
Clinical Opinion	4.10 (1.29)	2.60 (1.17)	3.30 (1.06)	3.33 (1.30)
				3.32 (0.35)

Teaching Hosp D n = 19	Head n = 9	Spine n = 10	Musculoskeletal n = 0	TOTAL
Technical merit	4	3.60 (0.52)		3.79 (0.42)
Language of report	3.56 (0.73)	3.50 (0.71)		3.53 (0.70)
Clinical Opinion	3.33 (1.00)	3.40 (1.17)		3.37 (1.07)
				3.56 (0.21)

NHS n = 49	Head n = 19	Spine n = 20	Musculoskeletal n = 10	TOTAL
Technical merit	3.68 (0.82)	3.05 (1.05)	3.00 (1.41)	3.29 (1.08)
Language of report	3.53 (0.70)	3.55 (0.60)	3.90 (0.32)	3.61 (0.61)
Clinical Opinion	3.74 (1.20)	3.00 (1.21)	3.30 (1.06)	3.35 (1.20)
				3.42 (0.17)

Comparison ISP Audit 2 and DGH C

ISP n = 212	Head n = 48	Spine n = 119	Musculoskeletal n = 45	TOTAL
Technical merit	4.00 (0.88)	4.24 (0.88)	4.18 (0.78)	4.17 (0.86)
Language of report	4.27 (0.92)	4.37 (0.92)	4.24 (0.88)	4.32 (0.91)
Clinical Opinion	4.48 (0.77)	4.10 (1.12)	4.02 (1.09)	4.17 (1.06)
				4.22 (0.95)

DGH C n = 96	Head n = 28	Spine n = 39	Musculoskeletal n = 29	TOTAL
Technical merit	4.03 (0.88)	3.74 (0.19)	3.79 (1.12)	3.84 (1.11)
Language of report	4.46 (0.84)	4.41 (0.71)	4.41 (0.56)	4.43 (0.70)
Clinical Opinion	4.43 (1.03)	3.59 (1.29)	3.70 (1.17)	3.87 (1.23)
				4.05 (0.33)

t= 2.52

sdev= 0.987

degrees of freedom =922

The probability of this result, assuming the null hypothesis, is 0.012

Breakdown of Comparison with ISP Audit 2 and DGH C:

Technical Merit

t= 2.85

sdev= 0.945

degrees of freedom =306

The probability of this result, assuming the null hypothesis, is 0.0047

Group A (ISP):

Mean = 4.17

95% confidence interval for Mean: 4.047 thru 4.302

Standard Deviation = 0.861

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.627

Group B (DGH C):

Mean = 3.84

95% confidence interval for Mean: 3.654 thru 4.034

Standard Deviation = 1.11

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.698

Language of Report:

t= -1.02

sdev= 0.851

degrees of freedom =306

The probability of this result, assuming the null hypothesis, is 0.31

Group A (ISP):

Mean = 4.32

95% confidence interval for Mean: 4.206 thru 4.436

Standard Deviation = 0.909

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.679

Group B (DGH C):

Mean = 4.43

95% confidence interval for Mean: 4.256 thru 4.598

Standard Deviation = 0.707

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.573

Clinical Opinion:

t= 2.23

sdev= 1.11

degrees of freedom =306

The probability of this result, assuming the null hypothesis, is 0.027

Group A (ISP):

Mean = 4.17

95% confidence interval for Mean: 4.019 thru 4.320

Standard Deviation = 1.06

Hi = 5.00 Low = 1.00

Median = 5.00

Average Absolute Deviation from Median = 0.830

Group B (DGH C):

Mean = 3.86

95% confidence interval for Mean: 3.641 thru 4.088

Standard Deviation = 1.23

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.969

Comparison ISP Audit 2 and Teaching Hosp D

ISP n = 212	Head n = 48	Spine n = 119	Musculoskeletal n = 45	TOTAL
Technical merit	4.00 (0.88)	4.24 (0.88)	4.18 (0.78)	4.17 (0.86)
Language of report	4.27 (0.92)	4.37 (0.92)	4.24 (0.88)	4.32 (0.91)
Clinical Opinion	4.48 (0.77)	4.10 (1.12)	4.02 (1.09)	4.17 (1.06)
				4.22 (0.95)

Teaching Hosp D n = 71	Head n = 29	Spine n = 42	Musculoskeletal n = 0	TOTAL
Technical merit	4.55 (0.57)	4.48 (0.67)		4.51 (0.63)
Language of report	4.55 (0.78)	4.61 (0.74)		4.59 (0.75)
Clinical Opinion	4.45 (0.95)	4.34 (0.94)		4.39 (0.94)
				4.50 (0.10)

t= -3.75

sdev= 0.909

degrees of freedom =845

The probability of this result, assuming the null hypothesis, is 0.0002

Breakdown of Comparison with ISP Audit 2 and Teaching Hosp D:

Technical Merit

t= -2.99

sdev= 0.810

degrees of freedom =281

The probability of this result, assuming the null hypothesis, is 0.0030

Group A (ISP):

Mean = 4.17

95% confidence interval for Mean: 4.065 thru 4.284

Standard Deviation = 0.861

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.627

Group B (Teaching Hosp D):

Mean = 4.51

95% confidence interval for Mean: 4.318 thru 4.696

Standard Deviation = 0.630

Hi = 5.00 Low = 3.00

Median = 5.00

Average Absolute Deviation from Median = 0.493

Language of Report:

t= -2.20

sdev= 0.873

degrees of freedom =280

The probability of this result, assuming the null hypothesis, is 0.028

Group A (ISP):

Mean = 4.32

95% confidence interval for Mean: 4.203 thru 4.439

Standard Deviation = 0.909

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.679

Group B (Teaching Hosp D):

Mean = 4.59

95% confidence interval for Mean: 4.380 thru 4.791

Standard Deviation = 0.752

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.414

Clinical Opinion:

t= -1.52

sdev= 1.03

degrees of freedom =280

The probability of this result, assuming the null hypothesis, is 0.13

Group A (ISP):

Mean = 4.17

95% confidence interval for Mean: 4.031 thru 4.309

Standard Deviation = 1.06

Hi = 5.00 Low = 1.00

Median = 5.00

Average Absolute Deviation from Median = 0.830

Group B (Teaching Hosp D):

Mean = 4.39

95% confidence interval for Mean: 4.144 thru 4.628

Standard Deviation = 0.937

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.614

Comparison DGH C and Teaching Hosp D

DGH C n = 96	Head n = 28	Spine n = 39	Musculoskeletal n = 29	TOTAL
Technical merit	4.03 (0.88)	3.74 (0.19)	3.79 (1.12)	3.84 (1.11)
Language of report	4.46 (0.84)	4.41 (0.71)	4.41 (0.56)	4.43 (0.70)
Clinical Opinion	4.43 (1.03)	3.59 (1.29)	3.70 (1.17)	3.87 (1.23)
				4.05 (0.33)

Teaching Hosp D n = 71	Head n = 29	Spine n = 42	Musculoskeletal n = 0	TOTAL
Technical merit	4.55 (0.57)	4.48 (0.67)		4.51 (0.63)
Language of report	4.55 (0.78)	4.61 (0.74)		4.59 (0.75)
Clinical Opinion	4.45 (0.95)	4.34 (0.94)		4.39 (0.94)
				4.50 (0.10)

t= -5.15

sdev= 0.959

degrees of freedom =497

The probability of this result, assuming the null hypothesis, is less than .0001

Breakdown of Comparison with DGH C and Teaching Hosp D:

Technical Merit

t = -4.53

sdev= 0.936

degrees of freedom =165

The probability of this result, assuming the null hypothesis, is less than .0001

Group A (DGH C):

Mean = 3.84

95% confidence interval for Mean: 3.655 thru 4.032

Standard Deviation = 1.11

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.698

Group B (Teaching Hosp D):

Mean = 4.51

95% confidence interval for Mean: 4.288 thru 4.726

Standard Deviation = 0.630

Hi = 5.00 Low = 3.00

Median = 5.00

Average Absolute Deviation from Median = 0.493

Language of Report:

t= -1.39

sdev= 0.726

degrees of freedom =164

The probability of this result, assuming the null hypothesis, is 0.17

Group A (DGH C):

Mean = 4.43

95% confidence interval for Mean: 4.281 thru 4.573

Standard Deviation = 0.707

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.573

Group B (Teaching Hosp D):

Mean = 4.59

95% confidence interval for Mean: 4.414 thru 4.757

Standard Deviation = 0.752

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.414

Clinical Opinion:

t= -2.97

sdev= 1.11

degrees of freedom =164

The probability of this result, assuming the null hypothesis, is 0.0034

Group A (DGH C):

Mean = 3.86

95% confidence interval for Mean: 3.640 thru 4.089

Standard Deviation = 1.23

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.969

Group B (Teaching Hosp D):

Mean = 4.39

95% confidence interval for Mean: 4.123 thru 4.649

Standard Deviation = 0.937

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.614

Comparison of ISP Audit 1 and ISP Audit 2:

ISP Audit 1 n = 178	Head n = 59	Spine n = 60	Musculoskeletal n = 59	TOTAL
Technical merit	3.81 (0.68)	3.88 (0.69)	3.37 (0.69)	3.69 (0.72)
Language of report	3.84 (1.01)	4.06 (0.66)	3.72 (0.84)	3.88 (0.85)
Clinical Opinion	4.00 (1.28)	3.86 (1.01)	3.53 (1.17)	3.79 (1.17)
				3.79 (0.93)

ISP Audit 2 n = 212	Head n = 48	Spine n = 119	Musculoskeletal n = 45	TOTAL
Technical merit	4.00 (0.88)	4.24 (0.88)	4.18 (0.78)	4.17 (0.86)
Language of report	4.27 (0.92)	4.37 (0.92)	4.24 (0.88)	4.32 (0.91)
Clinical Opinion	4.48 (0.77)	4.10 (1.12)	4.02 (1.09)	4.17 (1.06)
				4.22 (0.95)

Students t-test: Figures are t = (sdev)

ISP n = 392	Head n = 107	Spine n = 180	Musculoskeletal n = 105	TOTAL
Technical merit	-1.24 (0.77)	-0.77 (0.78)	-5.57 (0.73)	-5.94 (0.80)
Language of report	-2.24 (0.97)	-1.34 (0.78)	-3.02 (0.86)	-4.87 (0.89)
Clinical Opinion	-2.27 (1.09)	-3.45 (0.92)	-2.17 (1.14)	-3.29 (1.11)
				-7.79 (0.94)

t= -7.79

sdev= 0.943

The probability of this result, assuming the null hypothesis, is less than .0001

Breakdown of Comparison with ISP Audit 1 and Audit 2:

Technical Merit

t= -5.94

sdev= 0.800

degrees of freedom =388

The probability of this result, assuming the null hypothesis, is less than .0001

Group A (Audit 1):

Mean = 3.69

95% confidence interval for Mean: 3.573 thru 3.809

Standard Deviation = 0.721

Hi = 5.00 Low = 2.00

Median = 4.00

Average Absolute Deviation from Median = 0.534

Group B (Audit 2):

Mean = 4.17

95% confidence interval for Mean: 4.066 thru 4.283

Standard Deviation = 0.861

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.627

Language of Report:

t= -4.87

sdev= 0.886

degrees of freedom =388

The probability of this result, assuming the null hypothesis, is less than .0001

Group A (Audit 1):

Mean = 3.88

95% confidence interval for Mean: 3.751 thru 4.013

Standard Deviation = 0.859

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.579

Group B (Audit 2):

Mean = 4.32

95% confidence interval for Mean: 4.201 thru 4.440

Standard Deviation = 0.909

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.679

Clinical Opinion:

t= -3.29

sdev= 1.11

degrees of freedom =389

The probability of this result, assuming the null hypothesis, is 0.0011

Group A (Audit 1):

Mean = 3.80

95% confidence interval for Mean: 3.636 thru 3.962

Standard Deviation = 1.17

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.916

Group B (Audit 2):

Mean = 4.17

95% confidence interval for Mean: 4.020 thru 4.320

Standard Deviation = 1.06

Hi = 5.00 Low = 1.00

Median = 5.00

Average Absolute Deviation from Median = 0.830

Comparison of ISP and Teaching (excluding Musculoskeletal):

ISP Audit 2 n = 212	Head n = 48	Spine n = 119	Musculoskeletal n = 45	TOTAL
Technical merit	4.00 (0.88)	4.24 (0.88)	4.18 (0.78)	4.17 (0.86)
Language of report	4.27 (0.92)	4.37 (0.92)	4.24 (0.88)	4.32 (0.91)
Clinical Opinion	4.48 (0.77)	4.10 (1.12)	4.02 (1.09)	4.17 (1.06)
				4.22 (0.95)

Teaching Hosp D n = 71	Head n = 29	Spine n = 42	Musculoskeletal n = 0	TOTAL
Technical merit	4.55 (0.57)	4.48 (0.67)		4.51 (0.63)
Language of report	4.55 (0.78)	4.61 (0.74)		4.59 (0.75)
Clinical Opinion	4.45 (0.95)	4.34 (0.94)		4.39 (0.94)
				4.50 (0.10)

Teaching Hosp B n = 102	Head n = 33	Spine n = 39	Musculoskeletal n = 30	TOTAL
Technical merit	3.97 (0.88)	3.84 (0.87)	3.66 (0.95)	3.83 (0.90)
Language of report	4.69 (0.52)	4.61 (0.59)	4.23 (0.85)	4.52 (0.68)
Clinical Opinion	4.78 (0.41)	4.38 (0.84)	4.06 (0.98)	4.42 (0.82)
				4.26 (0.86)

t= -3.30

sdev= 0.882

degrees of freedom =926

The probability of this result, assuming the null hypothesis, is 0.0010

Group A (ISP):

Mean = 4.24

95% confidence interval for Mean: 4.164 thru 4.319

Standard Deviation = 0.953

Hi = 5.00 Low = 1.00

Median = 5.00

Average Absolute Deviation from Median = 0.758

Group B (Teaching Hospitals):

Mean = 4.43

95% confidence interval for Mean: 4.349 thru 4.517

Standard Deviation = 0.791

Hi = 5.00 Low = 1.00

Median = 5.00

Average Absolute Deviation from Median = 0.567

Breakdown of Comparison of ISP with Teaching (excluding Musculoskeletal):

Technical Merit:

t=-0.309

sdev= 0.844

degrees of freedom =353

The probability of this result, assuming the null hypothesis, is 0.76

Group A (ISP):

Mean = 4.17

95% confidence interval for Mean: 4.060 thru 4.289

Standard Deviation = 0.861

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.627

Group B (Teaching Hospitals):

Mean = 4.20

95% confidence interval for Mean: 4.064 thru 4.342

Standard Deviation = 0.818

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.622

Language of Report:

t= -3.37

sdev= 0.818

degrees of freedom =352

The probability of this result, assuming the null hypothesis, is 0.0008

Group A (ISP):

Mean = 4.32

95% confidence interval for Mean: 4.210 thru 4.431

Standard Deviation = 0.909

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.679

Group B (Teaching Hospitals):

Mean = 4.62

95% confidence interval for Mean: 4.485 thru 4.755

Standard Deviation = 0.660

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.380

Clinical Opinion:

t= -2.93

sdev= 0.973

degrees of freedom =352

The probability of this result, assuming the null hypothesis, is 0.0036

Group A (ISP):

Mean = 4.17

95% confidence interval for Mean: 4.038 thru 4.301

Standard Deviation = 1.06

Hi = 5.00 Low = 1.00

Median = 5.00

Average Absolute Deviation from Median = 0.830

Group B (Teaching Hospitals):

Mean = 4.48

95% confidence interval for Mean: 4.318 thru 4.639

Standard Deviation = 0.831

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.521

Comparison of ISP and DGH:

ISP Audit 2 n = 212	Head n = 48	Spine n = 119	Musculoskeletal n = 45	TOTAL
Technical merit	4.00 (0.88)	4.24 (0.88)	4.18 (0.78)	4.17 (0.86)
Language of report	4.27 (0.92)	4.37 (0.92)	4.24 (0.88)	4.32 (0.91)
Clinical Opinion	4.48 (0.77)	4.10 (1.12)	4.02 (1.09)	4.17 (1.06)
				4.22 (0.95)

DGH C n = 96	Head n = 28	Spine n = 39	Musculoskeletal n = 29	TOTAL
Technical merit	4.03 (0.88)	3.74 (0.19)	3.79 (1.12)	3.84 (1.11)
Language of report	4.46 (0.84)	4.41 (0.71)	4.41 (0.56)	4.43 (0.70)
Clinical Opinion	4.43 (1.03)	3.59 (1.29)	3.70 (1.17)	3.87 (1.23)
				4.05 (0.33)

DGH A n = 69	Head n = 12	Spine n = 30	Musculoskeletal n = 27	TOTAL
Technical merit	4.08 (0.66)	4.00 (0.58)	3.70 (1.06)	3.89 (0.82)
Language of report	4.33 (0.77)	4.80 (0.40)	4.63 (0.56)	4.65 (0.56)
Clinical Opinion	4.83 (0.38)	4.30 (0.79)	3.63 (1.11)	4.13 (0.98)
				4.22 (0.86)

t= 1.73

sdev= 0.967

The probability of this result, assuming the null hypothesis, is 0.083

Group A (ISP):

Mean = 4.22

95% confidence interval for Mean: 4.146 thru 4.297

Standard Deviation = 0.947

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.772

Group B (DGH):

Mean = 4.12

95% confidence interval for Mean: 4.035 thru 4.207

Standard Deviation = 0.993

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.731

Breakdown Comparison of ISP and DGH:

Technical Merit

t= 3.21

sdev= 0.923

degrees of freedom =375

The probability of this result, assuming the null hypothesis, is 0.0014

Group A (ISP):

Mean = 4.17

95% confidence interval for Mean: 4.050 thru 4.299

Standard Deviation = 0.861

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.627

Group B (DGH):

Mean = 3.87

95% confidence interval for Mean: 3.725 thru 4.008

Standard Deviation = 0.997

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.630

Language of Report:

t= -2.39

sdev= 0.809

degrees of freedom =375

The probability of this result, assuming the null hypothesis, is 0.017

Group A (ISP):

Mean = 4.32

95% confidence interval for Mean: 4.212 thru 4.430

Standard Deviation = 0.909

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.679

Group B (DGH):

Mean = 4.52

95% confidence interval for Mean: 4.397 thru 4.645

Standard Deviation = 0.659

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.479

Clinical Opinion:

t= 1.71

sdev= 1.09

degrees of freedom =375

The probability of this result, assuming the null hypothesis, is 0.088

Group A (ISP):

Mean = 4.17

95% confidence interval for Mean: 4.022 thru 4.317

Standard Deviation = 1.06

Hi = 5.00 Low = 1.00

Median = 5.00

Average Absolute Deviation from Median = 0.830

Group B (DGH):

Mean = 3.98

95% confidence interval for Mean: 3.808 thru 4.143

Standard Deviation = 1.14

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.873

Comparison of Teaching and DGH:

TEACHING

Teaching Hosp D n = 71	Head n = 29	Spine n = 42	Musculoskeletal n = 0	TOTAL
Technical merit	4.55 (0.57)	4.48 (0.67)		4.51 (0.63)
Language of report	4.55 (0.78)	4.61 (0.74)		4.59 (0.75)
Clinical Opinion	4.45 (0.95)	4.34 (0.94)		4.39 (0.94)
				4.50 (0.10)
Teaching Hosp B n = 102	Head n = 33	Spine n = 39	Musculoskeletal n = 30	TOTAL
Technical merit	3.97 (0.88)	3.84 (0.87)	3.66 (0.95)	3.83 (0.90)
Language of report	4.69 (0.52)	4.61 (0.59)	4.23 (0.85)	4.52 (0.68)
Clinical Opinion	4.78 (0.41)	4.38 (0.84)	4.06 (0.98)	4.42 (0.82)
				4.26 (0.86)

DGH

DGH C n = 96	Head n = 28	Spine n = 39	Musculoskeletal n = 29	TOTAL
Technical merit	4.03 (0.88)	3.74 (0.19)	3.79 (1.12)	3.84 (1.11)
Language of report	4.46 (0.84)	4.41 (0.71)	4.41 (0.56)	4.43 (0.70)
Clinical Opinion	4.43 (1.03)	3.59 (1.29)	3.70 (1.17)	3.87 (1.23)
				4.05 (0.33)
DGH A n = 69	Head n = 12	Spine n = 30	Musculoskeletal n = 27	TOTAL
Technical merit	4.08 (0.66)	4.00 (0.58)	3.70 (1.06)	3.89 (0.82)
Language of report	4.33 (0.77)	4.80 (0.40)	4.63 (0.56)	4.65 (0.56)
Clinical Opinion	4.83 (0.38)	4.30 (0.79)	3.63 (1.11)	4.13 (0.98)
				4.22 (0.86)

t= 4.07

sdev= 0.917

The probability of this result, assuming the null hypothesis, is less than .0001

Group A (Teaching):

Mean = 4.36

95% confidence interval for Mean: 4.277 thru 4.435

Standard Deviation = 0.838

Hi = 5.00 Low = 1.00

Median = 5.00

Average Absolute Deviation from Median = 0.644

Group B (DGH)

Mean = 4.12

95% confidence interval for Mean: 4.040 thru 4.202

Standard Deviation = 0.993

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.731

Breakdown of Comparison of Teaching Hospitals and DGH:

Technical Merit:

t= 2.40

sdev= 0.932

degrees of freedom =336

The probability of this result, assuming the null hypothesis, is 0.017

Group A (Teaching):

Mean = 4.11

95% confidence interval for Mean: 3.970 thru 4.249

Standard Deviation = 0.866

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.653

Group B (DGH):

Mean = 3.87

95% confidence interval for Mean: 3.724 thru 4.009

Standard Deviation = 0.997

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.630

Language of Report:

t= -4.89

sdev= 0.578

degrees of freedom =339 The probability of this result, assuming the null hypothesis, is less than .0001

Group A (Teaching):

Mean = 4.55

95% confidence interval for Mean: 4.466 thru 4.639

Standard Deviation = 0.711

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.448

Group B (DGH):

Mean = 4.86

95% confidence interval for Mean: 4.771 thru 4.945

Standard Deviation = 0.398

Hi = 5.00 Low = 3.00

Median = 5.00

Average Absolute Deviation from Median = 0.142

Clinical Opinion:

t= 3.92

sdev= 1.01

degrees of freedom =335 The probability of this result, assuming the null hypothesis, is 0.0001

Group A (Teaching):

Mean = 4.41

95% confidence interval for Mean: 4.256 thru 4.558

Standard Deviation = 0.870

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.593

Group B (DGH):

Mean = 3.98

95% confidence interval for Mean: 3.821 thru 4.130

Standard Deviation = 1.14

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.873

Comparison of ISP and NHS Audit 2:

ISP Audit 2 n = 212	Head n = 48	Spine n = 119	Musculoskeletal n = 45	TOTAL
Technical merit	4.00 (0.88)	4.24 (0.88)	4.18 (0.78)	4.17 (0.86)
Language of report	4.27 (0.92)	4.37 (0.92)	4.24 (0.88)	4.32 (0.91)
Clinical Opinion	4.48 (0.77)	4.10 (1.12)	4.02 (1.09)	4.17 (1.06)
				4.22 (0.95)

NHS n = 167	Head n = 57	Spine n = 81	Musculoskeletal n = 29	TOTAL
Technical merit	4.30 (0.87)	4.12 (1.01)	3.79 (1.21)	4.13 (0.99)
Language of report	4.51 (0.80)	4.51 (0.73)	4.41 (0.57)	4.50 (0.73)
Clinical Opinion	4.44 (0.99)	3.98 (1.78)	3.40 (1.17)	4.08 (1.14)
				4.24 (0.98)

Students t-test: Figures are t = (sdev)

Comparison	Head n = 105	Spine n = 200	Musculoskeletal n = 74	TOTAL
Technical merit	-1.85 (0.82)	0.89 (0.94)	1.67 (0.97)	0.51 (0.92)
Language of report	-1.42 (0.86)	-1.16 (0.85)	-0.92 (0.78)	-2.00 (0.83)
Clinical Opinion	0.23 (0.89)	0.76 (1.15)	1.24 (1.13)	0.75 (1.09)
				-0.22 (0.96)

t=-0.222

sdev= 0.963

The probability of this result, assuming the null hypothesis, is 0.82

Group A (ISP):

Mean = 4.22

95% confidence interval for Mean: 4.147 thru 4.297

Standard Deviation = 0.947

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.772

Group B (NHS):

Mean = 4.23

95% confidence interval for Mean: 4.150 thru 4.319

Standard Deviation = 0.983

Hi = 5.00 Low = 1.00

Median = 5.00

Average Absolute Deviation from Median = 0.766

Breakdown of Comparison ISP Audit 2 and NHS Audit 2:

Technical Merit

t= 0.513

sdev= 0.920

degrees of freedom =377

The probability of this result, assuming the null hypothesis, is 0.61

Group A (ISP):

Mean = 4.17

95% confidence interval for Mean: 4.050 thru 4.299

Standard Deviation = 0.861

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.627

Group B (NHS):

Mean = 4.13

95% confidence interval for Mean: 3.986 thru 4.266

Standard Deviation = 0.989

Hi = 5.00 Low = 1.00

Median = 4.00

Average Absolute Deviation from Median = 0.677

Language of Report

t= -2.00

sdev= 0.834

degrees of freedom =376

The probability of this result, assuming the null hypothesis, is 0.046

Group A (ISP):

Mean = 4.32

95% confidence interval for Mean: 4.208 thru 4.433

Standard Deviation = 0.909

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.679

Group B (NHS):

Mean = 4.49

95% confidence interval for Mean: 4.367 thru 4.621

Standard Deviation = 0.728

Hi = 5.00 Low = 2.00

Median = 5.00

Average Absolute Deviation from Median = 0.506

Clinical Opinion:

t= 0.753

sdev= 1.09

degrees of freedom =376 The probability of this result, assuming the null hypothesis, is 0.45

Group A (ISP):

Mean = 4.17

95% confidence interval for Mean: 4.022 thru 4.318

Standard Deviation = 1.06

Hi = 5.00 Low = 1.00

Median = 5.00

Average Absolute Deviation from Median = 0.830

Group B (NHS):

Mean = 4.08

95% confidence interval for Mean: 3.917 thru 4.251

Standard Deviation = 1.14

Hi = 5.00 Low = 1.00

Median = 5.00

Average Absolute Deviation from Median = 0.916

Time to report (days) Mean scores and (Standard Deviation)

All

Head n = 111	Spine n = 204	Musculoskeletal n = 75	Total n = 390
3.54 (4.14)	2.16 (2.38)	3.80 (3.15)	2.90 (3.20)

ISP n = 213	Head n = 48	Spine n = 120	Musculoskeletal n = 45
2.01 (2.63)	3.63 (4.84)	1.20 (0.48)	2.47 (1.65)

NHS n = 177	Head n = 63	Spine n = 84	Musculoskeletal n = 30
3.90 (3.52)	3.48 (3.56)	3.52 (3.21)	5.80 (3.77)

Student's t-Test results:

t = -6.03

Sdev = 3.06

Degrees of freedom = 388

The probability of this result, assuming the null hypothesis, is less than .0001

Group A (ISP):

Mean = 2.01

95% confidence interval for Mean: 1.601 thru 2.427

Standard Deviation = 2.63

Hi = 22.0 Low = 0.000E+00

Median = 1.00

Average Absolute Deviation from Median = 1.05

Group B (NHS):

Mean = 3.89

95% confidence interval for Mean: 3.440 thru 4.346

Standard Deviation = 3.52

Hi = 14.0 Low = 0.000E+00

Median = 2.00

Average Absolute Deviation from Median = 2.42

DGH C n = 100	Head n = 30	Spine n = 40	Musculoskeletal n = 30
4.02 (2.67)	3.20 (1.56)	3.30 (1.51)	5.8 (3.77)

Teaching Hosp D n = 77	Head n = 23	Spine n = 44	Musculoskeletal
3.73 (4.40)	3.73 (4.71)	3.73 (4.21)	

Student's t-Test results:

t= 0.547

sdev= 3.53

Degrees of freedom =175

The probability of this result, assuming the null hypothesis, is 0.58

Group A (DGH C):

Mean = 4.02

95% confidence interval for Mean: 3.324 thru 4.716

Standard Deviation = 2.67

Hi = 14.0 Low = 1.00

Median = 3.00

Average Absolute Deviation from Median = 1.96

Group B (Teaching Hosp D):

Mean = 3.73

95% confidence interval for Mean: 2.934 thru 4.521

Standard Deviation = 4.40

Hi = 14.0 Low = 0.000E+00

Median = 2.00

Average Absolute Deviation from Median = 2.87