The workload of UK radiologists: how does it compare to that of international radiologists?

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Purpose

The UK has previously measured radiologist workload by counting the number of imaging studies reported [1]. This is now considered outdated and no longer used. This is due to the increasing complexity of such studies, differences in reporting case-mix between different radiologists, and the many important non-reporting activities radiologists undertake [2]. The purpose of this study was to try and measure workload in such a manner that these issues would be fairly accounted for. Relative value units (RVUs) are a method of comparing reporting workload by giving different imaging studies scores based on how long they take to report. This was identified as a way to neutralise the issue case-mix variation, whilst also allowing non-reporting work to be easily included in calculations. There was no data on applying RVUs to UK radiology reporting, so we set out to calculate the workload in our institution, a large District General Hospital with a catchment area of 540,000 people [3].

The UK has previously been gripped by a shortage of radiologists and increasing demand for reporting [1-2]. This makes accurate analysis of how well radiologists perform particularly important. It is also important to identify what a reasonable level of workload is, to ensure that departments are adequately staffed, and not jeopardising patient care by over-stretching their radiologists. International data from Australia [4-5], and Ireland was used as a comparison to our figures to help identify what level of workload is reasonable [6], and highlight the benefits of using a relative value unit system. A secondary aim of this study was to identify whether the existing RVU system used by these countries was suitable to be used on a national level in the UK.
Methods and Materials

Data on reporting throughput was gathered for 13.5 whole-time equivalent (WTE) consultants at our DGH between April 2010 - March 2011. An adapted version of the Pitman-Jones system was used to assign scores to the images reported by our radiologists during this period Table 1 on page 4 [3]. Under RVU systems higher scores are given to studies that are more complex and take longer to report. There were no scores for nuclear medicine or procedural work available in the RVU system. Also, several newer studies were not originally given scores, and had to be given the scores of the most appropriate existing categories. Exams such as CT enterography and CT colonography, for example, were judged to be most similar in complexity to a CT chest/abdomen/pelvis, and given RVU scores of 27. Additionally, studies that included multiple areas not given a amalgamated score were simply given RVUs for each area examined.

The crude workload per consultant was calculated by dividing the RVU score of the department as a whole by the number of WTEs in it (RVU/WTE). This figure was compared to benchmarks from Australia and results from a similar study in Ireland [4-5]. Time spent on formal teaching, multidisciplinary team meetings (MDTs), and administration was included with nuclear medicine/procedural work and labelled 'non-reporting activities' as these could not be given an RVU score Table 2 on page 4. The proportion of time the department as a whole spent on 'reporting time' was calculated from job plans, and used to create a net workload score. This more accurately assessed workload by dividing the departmental RVU total by the number of WTEs devoted to 'reporting time'.
### Table 1: RVU scoring chart used for our study. Adapted from the Pitman-Jones [4] scoring system.

Table 2: Categories of non-reporting time. This was adapted from that used by Brady [6]. We included supporting programmed activities (SPAs) and time spent travelling between different sites in a single trust in the broad category 'Administration'. These are non-reporting activities, and we wished to take them into account whilst still being able to compare non-reporting activities with the Brady study. SPAs refer to work, such as audit and research, that UK consultant radiologists are expected to do, but have to fit in around their timetabled programmed activities (PAs).

Results

The 13.5 WTE radiologists in our DGH reported 110,315 imaging studies during the year, scoring a total of 649,617 RVUs Table 3 on page 7. Crude reporting workloads were 48,119.78 RVUs/WTE. Consultants spent 42.49% of their time on 'non-reporting activities'. This equates to 7.76 of the total 13.5 WTEs being devoted to reporting and earning and RVUs Table 4 on page 7 Fig. 1 on page 8. The net workload (RVUs/reporting WTEs) pre consultant was therefore 83,674.00 RVUs Table 5 on page 9 [3]. The maximum reporting benchmark recommended in Australia is 45,000 RVUs per WTE per year [5]. Both our crude and net workloads are far above this benchmark. Irish County Hospitals reported net workload figures of 79,135 RVUs/WTE [6].
Table 3: Reporting activity at our DGH, April 2010 - March 2011. This table shows the total numbers of reported imaging studies for each scoring category. Next to each is the corresponding RVU per imaging study, followed by the total RVU score for that RVY category.

Table 4: WTEs doing reporting and non-reporting work.


<table>
<thead>
<tr>
<th>Total Consultant WTEs</th>
<th>13.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Permanent</td>
<td>13.5</td>
</tr>
<tr>
<td>• Temporary</td>
<td>0.00</td>
</tr>
<tr>
<td>% of non-reporting radiologist activity</td>
<td>42.49</td>
</tr>
<tr>
<td>Non-reporting WTEs</td>
<td>5.74</td>
</tr>
<tr>
<td>Reporting WTEs</td>
<td>7.76</td>
</tr>
</tbody>
</table>
**Fig. 1:** Proportions of non-reporting activities. This table shows the proportion of non-reporting activity taken up by each of the four main sub groups. Also included, is a breakdown of the 'Administration' category so that 'SPAs' are removed from it.

Table 5: Performance results. Both crude and net workload figures are higher than the maximum RVU benchmark recommended in Australia [5]. This table also highlights that our department may be understaffed. If the workload of our radiologists was capped at this benchmark, more staff would be required to meet the RVU total scored by the department. This table shows the percentage of staff currently employed in the department compared to the number required if no one exceeded the maximum workload benchmark for crude and net workload calculations.


<table>
<thead>
<tr>
<th>Total RVUs</th>
<th>649,617</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total WTEs</td>
<td>13.5</td>
</tr>
<tr>
<td>Crude workload – RVUs/WTE</td>
<td>48,119.78</td>
</tr>
<tr>
<td>Net workload – RVUs/reporting WTE</td>
<td>83,675.00</td>
</tr>
<tr>
<td>% of WTE needed to achieve 45,000 – crude RVU</td>
<td>93.52</td>
</tr>
<tr>
<td>% of WTE needed to achieve 45,000 – net RVU</td>
<td>53.78</td>
</tr>
</tbody>
</table>
Conclusion

Modern radiology is putting greater and greater burdens upon radiologists. Imaging studies are becoming increasingly complex, and demand for reporting increases every year [7]. Radiologists are supposed to deal with these trends whilst taking on the duties of teaching, MDTs and administration. It comes as no surprise then that work overload is the major cause of stress amongst radiologists [8]. The possibility of over reporting leading to errors is also a concern for many radiologists [9]. As such, it is very important we can assess radiologist workload accurately, and set reasonable benchmarks to avoid overwork.

Firstly, our study proves that it is possible to calculate the workload of radiologists in the UK using RVUs and compare the results to international benchmarks and standards. Although our study is too small to prove statistical significance, our results compare very favourably with these; our net workloads are similar to our Irish counterparts [6], and well above suggested maximum benchmarks [5]. This suggests that UK radiologists deliver a high quality, good value for money service. It may also confirm what many of our radiologists have thought for years, that they are overworked.

The study has also confirmed some limitations in the current Pitman-Jones RVU system [3-6]. Firstly, it is not comprehensive enough. Several imaging studies, such as CT colonograms, were not given scores in the original system, not to mention the complete omission of nuclear medicine/procedural work. The original system has not been updated to include more modern studies. The lack of appropriate individual scores for these reduces the accuracy of workload calculated using this system. The system used to calculate remuneration for healthcare providers in the USA is similar to an RVU system, includes values for all reporting activities, and is updated regularly [10]. A modernised and more detailed RVU system than the Pitman-Jones model would yield more accurate workload results. The original model also failed to take into account 'non-reporting activities'. These are vital for ensuring that the next generation of radiologists are well trained and optimising clinical/departmental management. By calculating net workload based only on reporting WTEs, these difficult to quantify by necessary activities can be given the recognition and protection they deserve in workload calculations [3].

Working practices and case-mix of radiology reporting differ between countries Table 6 on page 13 , and so some modalities may be more important in different areas. Country-specific RVU scores might, therefore, be more appropriate than comparing international data with the same system [3-6, 10]. This may stop different countries comparing data, but make their own calculations more accurate. RVU data could also be used to identify best practice between reporting systems in different hospitals. RVU systems could therefore
be used nationally or internationally to improve the efficiency of radiology reporting, whilst taking into account 'non-reporting activities' and preventing excessive workloads.
Table 6: Differences in reporting case mix percentages between RBH, the US, and Australia.

References

7. Medical staffing and workload in clinical radiology in the UK NHS. The Royal College of Radiologists. 1993.
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