Measuring radiologist workload: how to do it, and why it matters

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Received: 31 March 2011 / Revised: 5 May 2011 / Accepted: 13 May 2011 / Published online: 6 July 2011
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Abstract This article discusses the results and implications of a nationwide survey of radiologist workload. Although the results are specific to one country, the method used, the underlying issues and the discussion engendered should be of interest to all radiologists worldwide. The balance between quality and quantity is highlighted, and the growing impact of activities outside of traditional reporting is considered. Variations in health care funding and staffing amongst countries clearly influence patterns of workload. It is hoped that this discussion will lead other radiologists to consider the method used, and to analyse workload in other countries, with a view to creating more robust workload data and stimulating debate.

“Because I enjoy working in the dark”. Surprising though it may seem, this was the answer given by a candidate during a recent interview for admission to a postgraduate training programme in diagnostic radiology in the UK [personal communication]. It’s a useful metaphor for the gap between the reality of a modern radiologist’s working life and the perception by those outside the specialty of what a radiologist does. The role of the consultant radiologist has changed substantially in recent decades, from that of a doctor whose primary activity was reporting plain films and cross-sectional imaging studies, often in relative isolation from other clinical hospital services, to one where the Radiologist is centrally-involved in patient management through multi-disciplinary teams, frequently with a signif-

icant direct therapeutic interventional role. Yet to many of our colleagues, and particularly to those outside the medical profession who often make the administrative decisions which determine our working environment, we are not far-removed from the era of red goggles and darkened rooms, an occasionally-useful adjunct to the clinical activity of “real” doctors, but in no way central players in patient care. Even among those who appreciate our contributions, our work is visualized in terms of X-rays or cross-sectional studies reported; if we are generating reports, we are working. If we are not producing reports, then we are not being productive.

Of course, I exaggerate, but subtle points are sometimes best made by caricature. In the 21st. century, many of us work in well-ordered and smoothly-functioning multi-disciplinary teams. We are an integral part of the care of our patients; our contributions are central to decision-making, in which we participate, and we are also frequently the primary providers of interventions which play a significant part in determining outcomes. Our rôle has evolved in recent decades in a very positive way. A difficulty which remains, however, relates to how we measure our contribution. Despite the evolution of radiologists’ centrality in patient care, manpower planning in radiology has tended to rely on out-dated methods of workload measurement, often based on crude measures of numbers of studies reported per consultant. In many jurisdictions, radiologist numbers are determined by local need, decided by local radiologist groups or hospitals. Competition between hospitals and radiology groups may influence such decisions. A recently-published survey of German radiologists found that job satisfaction is very high, but 72% of respondents indicated they would not choose to specialize in radiology again, principally citing excessive workload [1]. In some countries, notably Ireland and the

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UK, consultant radiologist numbers in the public hospital service are centrally-controlled, usually by governmental agencies. Thus, the process by which an over-worked radiology department can recruit additional radiologists is often tortuous, opaque and constrained by budgetary issues, which have no direct relationship to the workload demands on the department.

In a recent edition of “Insights into Imaging”, the results of a nationwide survey of radiologists’ workload in Ireland in 2009 are published [2]; that paper seeks to address the difficulty of measuring the amount of meaningful work which cannot be directly counted in numbers of study reports generated. 28 of the 38 public hospital radiology departments surveyed in The Republic of Ireland returned data, identifying the numbers of studies in a variety of broad categories performed in their departments in 2009 (to which were assigned relative value units, RVUs), and also enumerating the number of hours per week their consultant radiologists spent engaged in “non-countable” activities (interventional and procedural work, nuclear medicine, multi-disciplinary meeting (MDM) preparation and conduct, formal teaching and administration). The non-countable activity hours were used to calculate the proportion of the whole-time equivalent (WTE) consultant radiologist staff not available to engage in counted reporting activity. The crude and net RVU/WTE numbers were calculated (crude figures took no account of non-countable activity, net figures were based upon the remaining WTE numbers once allowance had been made for non-countable activity) for each department. Other parameters reported include the relative proportions of different types of radiological investigation reported in hospitals and groups of hospitals.

The RVU assignments to different study types, and the overall method of measuring non-countable activity were based on an Australian method of workload measurement, first published by Pitman & Jones in 2006 [3], and updated in 2009 [4]. This method was chosen for the reasons that the RVUs it used (as opposed to other RVU systems used to calculate reimbursement in other jurisdictions) were a measure of radiologist activity only, without elements allowing for technologist and room costs [5] (this survey was confined to consultant radiologist activity), and that it provided a method for taking account of the growing proportion of radiologists’ time which is not devoted to reporting studies.

The results showed that a mean of 32.47% of consultant radiologist WTEs were engaged in non-countable activity across all hospitals. The commitment to this type of activity was greater (mean 51.84%) in University Teaching Hospitals with full-time radiologists in training, as expected, given that this group accounts for a majority of the larger tertiary-referral hospitals in the country, with more complex interventional workloads, more teaching commitments and more MDMs than some other groups. Interventional, procedural and nuclear medicine activity accounted for

over 40% of this activity. A 2007 review of the impact of MDMs on workload found that, on average, a 1-h MDM required an additional 2 h of radiology preparation [6].

The crude RVU/WTE number was remarkably consistent across all hospital types, ranging from 48,873 in University Teaching Hospitals without trainees to 58,788 in General Hospitals. Net RVU/WTE numbers were more variable, ranging from 63,414 in University Teaching Hospitals without trainees to 126,376 in University Teaching Hospitals with trainees; this in part reflects differences in complexity of work between different hospital groups, but may also reflect some bias in the way some hospital groups recorded their non-countable activities. While net RVU/WTE measurements are undoubtedly a better indication of radiologist workload and activity than crude RVU/WTE figures, they are more subject to bias and “gaming”, given that they rely to some extent on subjective recording. In a hospital system such as ours, convincing employing- (and therefore financing-) authorities of the need to expand radiologist numbers on the basis of subjective assessments of work is more difficult than using crude, but verifiable study numbers. An ideal measurement system would remove all such opportunities for bias, by assigning objective measurements to all radiologist activities. In future iterations of the Australian method used [3, 4] in our survey, modifications may allow for formal RVU assignments for nuclear medicine (including PET) and some procedural activity, but it is difficult to imagine how inclusion of the increasing amount of MDM, teaching and administrative activity can ever be based on any measurement other than the time involved. This being the case, the key task in convincing employers of radiologist need is to have them accept a significant non-countable component of our working commitments: the mean of 32.47% recorded in our survey may, in the opinion of many, understate our non-countable activities, but it is a helpful beginning in establishing this aspect of our work on a numerical basis.

Why does this matter for the majority of jurisdictions, within which radiologist numbers in departments are not centrally-controlled? We work in “interesting times” (in the literal and Chinese-proverb senses), during which many activities we have traditionally undertaken are under threat of competition from non-radiology specialists. The most-effective means of winning turf battles is to provide a better, faster, safer and more-timely service than can be offered by “the competition”. In some circumstances, that may involve taking on more and more work, running faster, as it were, to stand still. A danger of this strategy is that we may allow ourselves to practice less-safely, in order to maintain our position. A recent study of radiologists’ visual accommodation and performance showed that the ability to focus and detect fractures diminished at the end of the work-day [7]. Longer

work-days can only exacerbate this decline in performance, and therefore safety. This is in nobody's best interests.

For different reasons, similar negative outcomes are possible in funding systems where remuneration of radiologists is based on fee-per-item payments, where there are pressures to increase productivity which may compete with the imperative to work safely and conscientiously at all times. An example is a US-reported missed breast cancer malpractice lawsuit, where the radiologist defendant (paid by the number of cases reported) was alleged to have “read too many x-rays on the day in question, demonstrating a wanton disregard of patient well-being by sacrificing quality patient care for volume in order to maximize revenue”. The case was settled for \$1million [8].

Therefore, establishment of reasonable and safe benchmarks for radiologist workload has relevance for all radiologists. The measured 2006 Australian crude RVU/WTE figure of 40,000 per year [3], or even the 2009 Australian measurement of 45,000 per year [43] are helpful starting points. Few Irish radiologists would agree that our 2009 measured crude RVU/WTE workload of 57,659 is appropriate, but at least now we know and can measure how much work we're doing. What we do with the data will be a measure of the commitment of our health service to patient safety.

By the way, the interview candidate was unsuccessful.

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