PERFORMANCE IMPROVEMENT

Assessing excellence: how good is your trust’s imaging department?

Medical imaging costs the NHS over £1bn per annum but there is little guidance on what excellence looks like for the service. Here we outline eight metrics which will help you assess the quality of your department.
Medical imaging accounts for over £1 billion of NHS expenditure (2008/9 figures) covering 2,062 consultant clinical radiologists across over 100 imaging departments. Imaging plays a critical diagnostic role in many patient pathways, and, through interventional radiology, an increasingly important role in patient treatments.

The Department of Health website includes many documents on medical imaging, focused in the main on good practice in specific elements of imaging. However, there is little national benchmarking for imaging department performance, and there is little guidance on what to measure when assessing the overall performance of an imaging department.

In this article we outline some ideas around how and what to measure to assess the performance of a medical imaging department.

What measures can we use to assess excellence, in a medical imaging department?

In order to measure excellence we must first understand the core purpose of a medical imaging department:

- For non-interventional imaging and radiodiagnostic examinations (97% of NHS imaging activity), the primary purpose is around getting an accurate, clinically relevant report based on high-quality images to the referring physician in as short a time and least costly manner as possible.

- For the remaining 3% of interventional activity, a more surgically-oriented purpose should be adopted - ‘diagnosing and treating patients promptly, through minimally invasive procedures resulting in excellent clinical outcomes and minimum patient discomfort, in the least costly manner possible’.

Both definitions above rely on a need for high quality (minimum disruption, high satisfaction and accuracy) at the lowest possible cost. Below, we outline some recommended measures and their rationale, and discuss for each measure the proposed target, the required enablers for good performance and how to evaluate progress against the measure.

1 Waiting times

Diagnostic tests are a vital step on the patient pathway. Any delays or blockages have a detrimental impact on patient care, and also add cost for referring specialties.

The target for waiting times should be:

- Inpatient: ideally under 24 hours, definitely under 48 hours
- Outpatient: national targets require less than 6 weeks, as part of the 18 week pathway - much shorter waiting times (e.g., less than 7 days) are required for cancer patients, and are both possible and desirable for all outpatients if the enablers below are implemented

Enablers for good performance:

Single-point call centre for patient bookings; vigilant management of capacity and demand of service; modality pathway redesign; sweating assets (e.g., CT and MRI scanners) by extension of working hours; dedicated radiology porters.

How to measure:

There are several possible ways to estimate waiting times, for example:

- Based on historic actual waiting times for historic patient cohorts
- Based on clearance times’ for patients currently waiting
- Prospective waiting times ‘based on next available slots’ for different patient types.

Whichever method is chosen, the key is to measure consistently, and to keep waiting times below agreed thresholds.

2 Reporting turnaround times

Low reporting turnaround times minimise the delay before a diagnosis can be made and demonstrate high levels of customer service (to the referring physician).

Best-practice guidance from the NHS Institute for Improvement indicates the following targets for imaging report turnaround times:

- Urgent cases - immediate (within 30 minutes)
- Inpatients and A&E - same working day
- All other cases - by next working day

This is a speed of turnaround time that remains an aspiration for many trusts, in particular for outpatient cases, where turnaround times of up to a week are common.

Enablers for good performance:

Vigilant management of capacity and demand of service; digital direct reporting fully integrated into picture archiving and communication systems (PACS), together with voice recognition; pool-based reporting systems rather than systems that assign scans to individual radiologists for reporting; strong departmental activity resilience; central radiological reporting area; standard reporting format for common examinations.

How to measure:

Historic turnaround times are easy to measure from RIS data.

3 Reporting quality

High reporting quality ensures that reports are clinically relevant and easy for referring clinicians to interpret.

Enablers for good performance:

Referring clinicians say that they see variation in report quality - some reports are better than others in the clarity with which they describe the diagnosis and any relevant context (e.g., from previous scans from the same patient), and in terms of being brief while still including directly relevant information.

How to measure:

Historically, it has been difficult to measure reporting quality in a cost-effective way. However, that is changing - the latest RIS-PACS systems make it possible for a random sample of reports (e.g., 1%) to be double-reported, without the clinicians involved knowing that they are double-reporting. Referring clinicians can then be invited to give each of the two reports a score (e.g., on a range from 1-5). This provides a simple, low cost mechanism for assessing reporting quality.

4 Clinical incidents

To have consistently excellent performance, any clinical department needs to understand what incidents are occurring, what the root causes of the incidents are, and to have a culture of continuous improvement to address root causes.

Enablers for good performance:

Fostering a culture which encourages immediate reporting of clinical incidents, and active management of incident reports (including all incidents responded to within 14 days).

How to measure:

Record all clinical incidents, where they occurred, and the reasons why. Record closure of clinical incidents when agreed actions are completed.
5 Patient experience
In the best cases, imaging can be a quick and seamless part of the patient’s pathway. But, too often, patient experience is poor. This can start with patients finding it difficult to locate the imaging department, then patients misunderstanding what to expect when they arrive (this is especially the case for Interventional Radiology procedures), and also patients experiencing long waiting times or poor signposting within the department.

Enablers for good performance:
Well-designed and patient-friendly departmental layout; low waiting times and report turnaround times; excellent accessibility for patients (e.g., good patient transport and car parking facilities); easy booking processes, with patients being given choice of slot time where appropriate; clear information on what to expect, especially in the case of Interventional Radiology, but also where contrast medium or anaesthetics are used.

How to measure:
Conduct regular patient experience surveys.

6 Staff satisfaction
Staff satisfaction is a key enabler of high clinical quality, good patient experience, high retention rates, and of ability to deliver financial performance improvements.

Enablers for good performance:
Well-designed departmental layout; active positive feedback on staff performance; effective staff appraisal process, with managers well trained in how to complete appraisals effectively; encouragement and support for personal development plans; clearly stated departmental objectives; clear communications of the rationale for changes.

How to measure:
Conduct regular patient experience surveys.

7 Machine utilisation
High-value equipment such as CT and MRI scanners, as well as Nuclear Medicine and Interventional Radiology equipment, are often underutilised - to the extent that a recent NAO report showed that opening hours of CT scanners ranged from 40 to over 100 hours per week.

If a department is to be financially efficient, then it is essential that equipment in these modalities is well used, in each of:
- Absolute number of exams per machine per year
- Complexity-weighted number of exams per machine per year (where departments have an internal recharge model, income can be an appropriate way of weighting for complexity).

The target for machine utilisation should differ by modality and by machine type.

Enablers for good performance:
Extending machine working hours (e.g., 8am-8pm rather than 9am-5pm); clear expectations on number of patients per hour/slot length for different exam type; minimisation of cancellations and ‘Did Not Attend’ (DNA) activity.

How to measure:
Record the total number of exams per machine per annum and total income per machine per annum. Benchmark this data both internally and ‘externally’ across machines and, most importantly, externally with peer organisations.

8 Staff productivity
As around 70% of imaging department costs are pay-related, it is essential that staff are used productively if the department is to be efficient.

Measures of staff productivity will vary by staff group. For instance, for consultant radiologists, a number of imaging departments are using consultant productivity scorecards which show, for each consultant time period:

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\text{% productivity} = \frac{\text{Contracted time available}}{\text{Value (in time) of activities conducted}}
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The outputs of these consultant productivity scorecards can be as shown in Fig 1 above.

The value (in time) of activities conducted is based on a number of minutes allocated to each procedure type. For instance, a consultant radiologist might be credited 4 minutes for reporting a plain film X-ray.

The concept of the productivity scorecard can be applied at an individual level for consultant radiologists, but for radiographers it can more usefully be applied at team level (e.g., for the team of radiographers who deliver MRI scans on site X).

Enablers for good performance:
Measuring, reporting on, and managing output of reports per radiologist or reporting radiographer; measuring, reporting on and managing output of scans per team of radiographers.

Conclusion
There are further metrics which radiology departments are obliged to record (such as Ionising Radiation (Medical Exposure) Regulations and Eliminating Mixed Sex Accommodation) and this would need to continue. In radiology departments in teaching hospitals, academic research outputs will also be important. But stripped down to its core, we believe that the above are the key metrics which give an accurate picture of an excellent imaging department.
About the authors

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