

The Nature of Reporting Discrepancies and Potential Biases in Radiology Expert Witness Testimony

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When medical professionals are subject to litigation, quite often the case notes, the clinical sequence of events and the actions of medical professionals involved are assessed by an expert witness instructed by either the defendant or the claimant, but acting for the court bound by the Civil Procedure Rules Part 35.

As imaging is an integral part of the diagnostic workup of many patients, the role of the radiologist expert witness is complex, and radiologists may be asked to comment on several issues. These include but are not limited to deciding whether or not:

- a) A reporting discrepancy has occurred.
- b) There has been a dereliction of duty by the medical professional or radiologist involved.

This article will first define a radiology reporting discrepancy. It will then seek to outline the different causes of a reporting discrepancy and highlight the biases that have the potential to cloud an expert witness's medical report when providing an opinion on cases subject to clinical negligence.

The article will conclude by considering some measures that could be employed to reduce bias during the analysis of a clinical negligence case.

By the end of this article, it is hoped that the reader would have a much clearer understanding both of the multifactorial reasons for radiology discrepancies and of the inherent biases in radiology expert witness report writing.

Definition of a reporting discrepancy

The Royal College of Radiologists (RCR) produces helpful guidelines on the handling of reporting discrepancies. It defines a reporting discrepancy occurs when 'a retrospective review or subsequent information about the patient outcome, leads to a different opinion to that expressed in the original report'. It then goes on to say 'Not all discrepancies are errors'.⁽¹⁾

Very few discrepancies result in irreversible patient harm and even fewer discrepancies become the subject of litigation.

Causes of a reporting discrepancy

The RCR details several reasons why a reporting discrepancy might occur, not always as a result of radiological interpretation error.

a) Inadequate, misleading or incorrect clinical information

The process of image interpretation and generating a radiological report is much more than a technical exercise in image description. The radiologist has to weigh information from multiple sources including previous imaging, clinical information, outpatient clinic letters, operation notes, blood and pathological test results. The responsibility for providing this information is the responsibility of both the referring clinician and the radiologist. Often salient points can be neatly and concisely summarised in a request form or referral letter.

This information can completely change the significance of a given radiological finding or appearance. With the addition of the appropriate piece of clinical information, a given radiological finding can be changed from a pathological appearance to a non pathological one. Conversely, omission of vital information can lead to image misinterpretation.

The practice of image interpretation is both an art and a science and therefore the quality of the radiological report is highly dependent on the information provided on the request form. Expert witnesses and counsel should therefore be aware of the critical influence of clinical information on image interpretation in medical litigation cases involving medical imaging practitioners.

b) Reduced image quality

Images that are of reduced quality are often more difficult to interpret and the potential for missing pathological abnormalities increases. There are a large number of factors that affect image quality, too numerous to mention in this article, but these can be divided into patient, equipment and equipment operator factors. In addition, erroneous data produced by artificial means may be projected onto the final radiographic image and confused for pathology this is known as radiological artefact.

Patient factors include, but are not limited to: Patient movement (often due to confusion, fear or pain), obesity, metallic implants and hardware, and problems with positioning.

Equipment malfunction or failure can introduce several radiological artefacts and also reduce image quality. Regular servicing and maintenance of equipment reduces this risk.

The equipment operator, usually a radiographer, has a crucial role in adjusting numerous physical parameters in order to obtain a high quality image. A highly experienced radiographer can usually produce images of a consistently higher standard compared to a less experienced radiographer. Working conditions are also crucial as errors undoubtedly increase during intense periods. Wrong side labelling remains a potentially serious cause of error that remains difficult to eliminate completely.

c) Excessive workload and poor reporting conditions

Advances in imaging technology, new treatment algorithms and guidelines, less acceptance of clinical uncertainty, increasing defensive medical practice and changing patient expectations are some of the reasons why the amount of medical imaging performed has risen exponentially in the last few years. Although there has been an expansion in resource to cope with this, it invariably has been insufficient to meet rising need. Radiology is now an extremely time pressured specialty,

interruptions to reporting are frequent and therefore as a direct consequence, errors can increase across the entire department.

Expert witnesses and counsel should be sentient of the fact that the potential for discrepancies to occur as a result of excessive workload is on the increase and likely to continue an upward trajectory.

d) Observation or interpretation errors

Errors that are judged to fall predominantly into this category are probably the most common reason that radiologists become the subject of litigation. These errors can be of several types ⁽²⁾

i) Errors of perception This is the failure to report an abnormality that is visible in hindsight.

The conspicuity of the lesion when viewed in hindsight can range from an easily identifiable abnormality, to an extremely subtle but definite abnormality, though to findings on a medical image that could conceivably have been reported as within an accepted normal range, but are subsequently felt to be pathological. Subtle fractures and early cancers on chest X rays are common pathologies that can be missed. It is also often the case that if the abnormality is widespread, has a uniform appearance with no disturbance of body symmetry, it becomes harder to perceive.

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A particularly difficult perceptual error is the failure to appreciate the absence of an organ or other anatomical structure.

Radiologists are predominantly trained to identify pathology or disease within an anatomical structure, whereas the absence of a given structure is much harder to perceive.

A much rarer error of visual perception can sometimes occur, particularly when structures are closely opposed, analogous to the image either indicating two opposing faces or a candlestick, whereby the radiologist can perceive



the image in the incorrect manner.
Do you see a candlestick or two faces?

ii) Errors of reasoning The abnormal findings are identified but incorrectly dismissed as normal, or identified as abnormal, but attributed to the incorrect cause.

Such as in the case where a tumour on a medical image could incorrectly be reported as benign, when in fact malignant or vice versa. However, fear of committing this error can give rise to an increased prevalence of the 'blanket diagnosis' whereby every conceivable cause is mentioned as an exercise in defensive medical practice. However 'blanket diagnoses' are usually of limited use to the referring clinician.

Radiologists can occasionally be caught out 'playing the odds'. This is when a given radiological appearance can have a innocent or a more ominous cause. However statistically, the chances of an innocent cause far outweigh the more sinister cause often by many hundreds of times. In order not to subject every patient to further invasive

tests with potential side effects for very little overall benefit, the radiologist may have to accept the small chance of an incorrect diagnosis. There is as yet very little medical or legal consensus as to whether this is an acceptable way of practising medicine.

iii) The false positive A normal appearance, or variant of normal is incorrectly reported as a pathological finding. Potentially invasive further testing may then follow.

iv) Satisfaction of search The phenomenon whereby the successful identification of one abnormality, results in a premature termination of image interrogation, leading to a decreased likelihood of identifying other associated or unrelated abnormalities.

e) Ambiguity of wording or summary of report.

The radiologists' primary medium of communication is the written radiology report. Therefore a high degree of proficiency in the written language is essential in order to impart nuance and emphasis, and produce unambiguous reports that communicate to the reader clearly what the radiologist is thinking.

Occasionally, if ambiguous language is used, a referring clinician can ascribe a completely different meaning to the report than that intended by the radiologist.

f) Report communication issues.

The traditional view is that it is the responsibility of the referring clinician to check the results of all tests that they request. This remains the case for the majority of all studies where the radiology report remains the primary method of communication.

Increasingly however, this traditional view has been called into question. There is now an increasing expectation that important findings are directly communicated to the referring clinician. In the USA, radiologists have been successfully sued for solely relying on the referring clinician to view the radiology report and not directly communicating results of important findings. The remains considerable ambiguity in the accepted method of communication and what constitutes a significant finding. Unsuspected cancers discovered on imaging are usually communicated to the clinical team, however studies that are initially reviewed by the referring clinician and subsequently reported by the radiologist are more difficult as the radiologist has to decide whether the findings are subtle enough to have been missed at initial clinical review. Also occasionally, the communication of a normal radiology report may also be of significance.

Implications for expert witnesses

Expert witnesses and counsel should be aware of the

various reasons why a radiological discrepancy might occur when dealing with cases where radiologists are involved. In particular, they should be aware that good clinical information informs accurate radiology reporting; of the importance of image quality in radiological diagnosis; of the exponential rise in imaging not matched by resource provision; of the different types of observation or perception error; of the importance of language and unambiguous wording and finally new issues that have arisen regarding communication of the report to the referring clinical teams.

Deciding whether there has been a dereliction of duty

In order for negligence to be proven a Claimant (usually the patient him/herself) must show that the doctor owed a duty of care to the patient, that the doctor was negligent in his management, and also that the patient suffered harm as a result. The Claimant has to succeed on both liability (that the medical professional acted in a manner that no other fellow professional would have done) and causation (that harm resulted that would not have otherwise occurred)

Tests of liability The Bolam test

The Bolam test refers to a tort law case of 1957, that established a number of principles in the demonstration of liability that are still applied today. The most important principle arise from this case is that doctors cannot be held liable, and therefore cannot be negligent, if he or she acted in accordance with a 'responsible body of medical opinion'. The Bolam test has since been refined by the Bolitho test, but nevertheless still remains an importance principle of tort law. In practice, in a court setting, the medical expert is required to provide an impartial opinion on the standard of care delivered by the medical professionals involved.

Potential biases during expert witness testimony

Clearly experts are required to provide a dispassionate, impartial and independent review of the facts of the case, and although bias has no place in medicolegal reporting, there is potential for the objectivity of expert witnesses to be influenced by several types of bias.

Types of bias

Hindsight bias

Hindsight bias has been described as 'the tendency for people considering a past event to overestimate the likelihood of having predicted its outcome' ^(3,4). Sometimes called the 'Iknewitallalong' effect, it is ubiquitous in medicine, and particularly in radiology where images and reports are electronically documented and available for scrutiny by a large number of individuals, often in public fora.

Information bias

When instructed by a solicitor, the assessing expert witness would normally be provided with the clinical diagnosis, comprehensive case notes, medical images, operative findings, pathology reports and details of the current patient clinical status, very little of which would have been available to the reporting radiologist. This is known as information bias. The expert witness report using this information would have an inherent advantage compared to the initial reporting radiologist and would therefore be prone to hindsight bias.

Situation bias

The interpretation of the image can be influenced by the situation in which it is interpreted. Regardless of the clinical information available to the expert witness, the expert would spend a lot more time and subject the radiological examination to a higher degree of scrutiny, than would be possible in a busy clinical setting, due to the mere fact that it formed part of a litigation case.

Bias can unwittingly skew the opinion of an expert medical report in a case where a radiological opinion is under the microscope. Psychologically, it is often not possible to completely mentally dismiss all the supplementary clinical information you have just read and provide an opinion based on what the radiologist knew at the time or detached oneself from the fact that you are providing a medico legal report. This information influences the opinion subconsciously.

There are a number of other potential biases which will be detailed in brief.

Conflict of interest bias

This can arise if the expert witness knows any of the parties involved. This is best disclosed at the outset, at which point the expert's ongoing involvement in the case can be reviewed.

Empathy bias

If the subject matter is particularly emotive, this has the potential to influence the medicolegal report. Expert witnesses are therefore reminded to provide opinion on the facts of the case, and not become swayed by empathy for either party.

Instruction bias

Experts are paid by their instructing solicitor, and therefore reports have the potential to be biased in favour of the party the instructing solicitor is acting for. Experts are bound by the civil procedure rules and CPR 35⁽³⁾ states that: 'it is the duty of experts to help the court on matters within their expertise. This duty overrides any obligation to the person from whom experts have received instructions or by whom they are paid.'

Selection bias

The other side of the coin from instruction bias is selection bias. Selection bias means that the experts retained by a party will not represent a random sampling of expert opinions. Rather, they will represent the perspective the solicitor wishes to present to court.

Historical bias

Radiology, is a rapidly evolving specialty within medicine. There are technologies and concepts that were not in clinical practice only a few years ago. The expert must be careful to recognise this and assess the fact in the context of the practice at the time.

Ways of reducing bias

The measures proposed below seek to reduce bias among medical experts when assessing radiology reports. As greater measures are taken to reduce hindsight bias, the practical difficulty and expense involved increases.

- 1) The situation where the expert witness is in receipt of the clinical diagnosis, operative findings, comprehensive clinical information renders the resulting testimony potentially susceptible to hindsight, information and situation bias.
- 2) The expert witness could be provided only with the information that was available to the reporting radiologist at the time. This would eliminate the hindsight bias, however the resulting testimony may still be susceptible to situation bias.
- 3) The expert could be shown a panel of radiology cases, only one of which was the subject of litigation, the reminder being standard clinical cases. This would lessen the situation bias in method 2), but not completely eliminate it.

In all likelihood, the measures detailed above are reasonably practical and these measures with a little effort could possibly be undertaken. The measures detailed below are probably not practical, but are included as theoretical methods of bias reduction.

- 4) The case that is subject to litigation could be inserted into their standard clinical work requiring completion, without the expert's knowledge, with the clinical information that was available to the reporting radiologists' at the time. This would eliminate situation bias but does not account for individual intraobserver variability, that is, the expert radiologist own variation in performance from case to case. There may be ethical issues to blinding the expert witness in this scenario.
- 5) The above process could be repeated, but across a panel of expert radiologists. This would eliminate situation bias and provide a truer indication of a 'responsible body of medical opinion' as defined in the Bolam test. This option is the most practically difficult,

expensive and open to ethical question.

Conclusion

It is important for expert witnesses and solicitors dealing with radiological examinations that are subject to litigation for clinical negligence to appreciate the number of different causes of reporting discrepancy and radiological error. The precise identification of the root causes for reporting discrepancies can therefore be more complex than at first thought.

It is also important to realise that our cognitive apparatus is prone to bias, often on a subconscious level. To pretend that such bias does not exist or can easily be managed is not an appropriate response. By realising that biases exist, expert witnesses and solicitors can take these into account and if necessary put measures in place to reduce them.

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