

## Clinical teleradiology — the purpose of principles

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*Teleradiology is like a “two-edged sword” that requires careful consideration and balancing, needing uniform standards to guide quality care while ensuring patient safety*

The rapid and secure transfer of x-ray and diagnostic imaging studies around the world is being facilitated by new technologies, such as picture archiving and communication systems (PACS), high-speed Internet access, and secure virtual private networks. This transfer of images, usually for assessment by a radiologist at a geographically remote site from where the images were obtained, is known as teleradiology.<sup>1-4</sup>

Domestic and international teleradiology is practised by individuals and imaging practices (private radiology groups and corporate practices), as well as teleradiology groups in Australia. Based on the 2006 Royal Australian and New Zealand College of Radiologists (RANZCR) Workforce Survey,<sup>5</sup> about 67% of Australian radiologists use teleradiology in their daily work: 92% within their own state, 22% between states, and 1.7% internationally. The international teleradiology workflow is bidirectional, with Australian imaging studies being reported overseas and overseas imaging studies being reported in Australia.

Clinical teleradiology has advantages, but there are also potential problems and pitfalls. However, in teleradiology, as in any use of radiology, the provision of high-quality, appropriate clinical care and accountability must remain of utmost importance, and this principle should guide teleradiology's further development.

In Australia, there is an escalating demand for diagnostic imaging services. The RANZCR anticipates that demand will greatly outstrip current supply in the radiologist workforce for at least the next 5 years. Further, this ever-increasing demand on diagnostic imaging services is accompanied by an increasing complexity of studies and a continued expectation that they will be reported promptly, 24 hours a day, 365 days a year.

Given the geography and demographics (including radiology workforce demographics) of Australia, the benefits of using teleradiology are clear. Teleradiology can provide remote interpretation for rural and regional communities; second subspecialist opinion; workload balancing for diagnostic imaging staff; education; research; and clinical/quality audits.<sup>6,7</sup> Out-of-hours interpretation, when local radiology services are unavail-

able, may also be of great benefit to patients if urgent advice is required.

Similarly, however, several potential pitfalls are evident. One key pitfall relates to the “distancing” of the radiologist from patients clinically, as well as geographically — a trend that is already increasing with onsite services, and may only intensify with teleradiology. Radiologists have minimal influence over referrals that occur under a capped diagnostic imaging Medicare budget for billed services or in the public hospital sector. Apart from technological considerations, current legislation, reimbursement schedules and workload demands also exacerbate the increasing distancing of radiologists from clinicians and patients.

Reporting radiologists may have little or no clinical or contextual patient information or direct communication with the clinician caring for the patient, resulting in image interpretation occurring in isolation, rather than provision of an integrated expert opinion. However, if this pitfall is avoided, specialist radiologists can make a pivotal contribution to clinical decision making and management — clinicoradiological discussions can result in a change of clinical diagnosis in 50% of cases and a change in treatment in 60% of cases discussed.<sup>8</sup> Using radiologists and diagnostic imaging wisely could reduce the burden on the entire health system by not only improving diagnosis and management but also by reducing unnecessary and repeated radiation exposure, thus optimising overall patient care.

Other potential problems relate to technical and professional considerations. Transfer of images may result in less than optimal image quality, hampering interpretation. If images are sent overseas, it is possible that the reporting radiologist may not be trained to the same standard as radiologists in Australia. We need to acknowledge that when English is not a radiologist's primary language, there may be increased potential for error. Indemnity may not be guaranteed, and protection for patients may not be available.<sup>2-4,6,9,10</sup>

Perhaps the most serious concern relates to the potential evolution of medical services, including teleradiology, as commod-

ities instead of community services. The globalisation of health care has never been more evident than in international teleradiology. The emerging globalisation of health care generally<sup>1-4,11</sup> and, more specifically, the progressive corporatisation of radiology providers and the prospect of commoditisation of radiology services<sup>9,12</sup> are on our doorstep. To contain cost, maximise efficiency and meet shareholders' expectations, health care providers increasingly use teleradiology to outsource services.<sup>3,4,9,12</sup> In some countries, out-of-hours on-call teleradiology has fully matured, and teleradiology companies are turning to daytime and subspecialty segments to further grow their market share.<sup>9</sup>

Some observers have noted that teleradiology could be treated as a commodity and traded with forward contracts.<sup>12</sup> This concept of forward trading of medical services seems to be quite divorced from more traditional philosophies of the practice of medicine, and, at the very least, the public at large and those who pay for these services should be made aware of this trend.

From a community perspective, if teleradiology is viewed purely as a technical service, with no consideration given to the quality, appropriateness or relevance of the interpretation service, nor to patient safety; if it is driven purely by cost and workforce pressures, convenience, or desire for market share, then this would be highly undesirable. Even within Australia, it is possible that commercial leveraging may occur, resulting in disruption to local radiologists, the local clinical diagnostic imaging team, and community service provision if cost-cutting and market share are primary motives for the introduction or further development of teleradiology.<sup>2,9,13</sup> Thus, where a local clinical radiology service exists, compelling advantages for patient care would need to be identified to justify the additional provision of teleradiology services. However, when teleradiology can facilitate good patient care, this is an excellent outcome of the application of this technology.

Teleradiology, both domestic and international, can be considered a "two-edged sword", requiring careful consideration and balancing. The rapid growth of teleradiology and the globalisation of health care have led to the need for a set of uniform standards to protect consumer rights, define responsibilities, enable inter-jurisdictional recognition, ensure quality and safety, and enable benchmarking.<sup>6,13,14</sup>

Accordingly, the International Radiology Quality Network (IRQN)<sup>13</sup> has developed a set of international clinical teleradiology principles to guide quality care and ensure patient safety. Australian representatives actively contributed to this development, and the RANZCR has adapted the IRQN principles in a position statement applicable to Australia and New Zealand.<sup>15</sup> In general, these principles emphasise that the entire focus of international clinical teleradiology (as for radiology in general) must be solidly based on "what is good for the patient". For example:

- the correct imaging procedure should be performed;
- images should be of a high quality and transmitted accordingly;
- communication must be made between the treating team and the (appropriately credentialled and indemnified) radiologist, providing a high level of clinical information;
- images must be interpreted in light of the full clinical history and available previous imaging; and

- the radiologist's interpretation of the images and medical opinion must be communicated clearly and in a timely manner.

The position statement also addresses specific, serious concerns, including security (eg, sites should comply with all nationally specified data protection standards) and ethics (a system should be in place to document electronic "fingerprints" of interpreting radiologists, to prevent "ghosting" of reports).

The position statement will be updated regularly, with additional input sourced from the RANZCR Quality Use of Diagnostic Imaging Program teleradiology projects and the RANZCR Standards of Practice and Accreditation Committee, as well as IRQN updates. Any practice or hospital considering the use of domestic or international clinical teleradiology will be well served to be guided by these principles, and must, at all times, maintain a principal focus on high-quality patient care. With time, the regulatory, legal and ethical framework applicable to teleradiology may well flow on to other medical disciplines.

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