The safety of both patients and practitioners during imaging procedures is paramount, as are resources management and knowledge sharing. ARRS Global Partner, The Royal Australian and New Zealand College of Radiologists (RANZCR), has developed an innovative program that supports improvements in the quality, safety, and sustainability of radiology services in Australia. *InPractice* talked with RANZCR president Chris Milross about the program and its lessons for radiologists.

**What are the aims of RANZCR’s Quality and Safety Program?**

The program aims to improve the quality and safety of radiology services in Australia and New Zealand through a number of implementation projects.

There are several factors to be considered when approaching quality issues in radiology, including:

- **Safety**—avoiding harm to patients from the health care they receive
- **Effectiveness**—basing care on best available evidence, providing services to all who could benefit, and refraining from providing services to those who are unlikely to benefit
- **A patient-centered approach**—ensuring that patient values guide all clinical decisions
- **Timeliness**—reducing delays in the provision and receipt of care
- **Efficiency**—avoiding waste of resources, whether they be skills, equipment, or supplies
- **Equitability**—ensuring that quality care is received irrespective of gender, ethnicity, socioeconomic status, or geographic location

**How has the program evolved from its origins?**

The program began as the Quality Use of Diagnostic Imaging (QUDI) program and has evolved with a greater focus on implementing the findings of the original QUDI projects.

The QUDI program aimed to support improvements in quality, safety, and sustainability of radiology services in Australia. It was committed to the main principles of quality health services delivery:

- Safety
- Effectiveness
- Appropriateness
- Acceptability
- Access
- Efficiency

The initial phase of the QUDI program was established under the Radiology Quality and Outlays Memorandum of Understanding and was managed by RANZCR. The program developed a framework for a systems- and evidence-based approach to the appropriate and high-quality use of diagnostic imaging services in Australia.

Among the many project findings during this period, the following critical questions were identified and/or reaffirmed:

- *Is this imaging actually necessary or appropriate?*
- *Are consumers of health care and clinicians who refer patients for imaging well informed about the risks and benefits, so that they can make clinically appropriate, informed choices?*
- *Is the imaging being performed safely, and does it meet best practice standards?*
- *Is access to imaging services adequate and equitable?*
- *Were errors being made in the diagnostic process, how common are they, who makes them, and how might they be prevented?*
- *How are the results of imaging tests communicated to referring clinicians, and does this meet their needs and those of consumers?*

In 2008 and 2009, QUDI undertook projects that addressed key aspects of good practice in radiology. The projects included:

- Developing consumer and referrer information materials about radiology and the QUDI website
- Optimizing the radiation dose delivered during CT examinations using a quality-improvement activity
- Evaluating the evidence-based medicine and critically appraising the literature and online training program. A web-based resource for publishing appraisals was developed
- Developing guiding principles for best practice in radiology reports to improve information flow between radiologists and referrers
- Continuing the Radiology Events Register (RaER), a database that collates and supports analysis of adverse events and near misses in radiology. The ultimate aim is to provide evidence to support quality improvement in radiology practice

Several of the projects listed above have become key projects for the RANZCR Quality and Safety Program or stepping stones to new projects being carried out today.

For more information about the QUDI program and past projects, please see the Quality and Safety Program section of the RANZCR website: www.ranzcr.edu.au/quality-a-safety/program.

*Q & A continues on p. 18*
The RANZCR Quality and Safety Program has several key projects. What do they contribute to the program?

The program’s key projects are:
- InsideRadiology
- CT Dose Optimisation
- Radiology Events Register
- Radiology Written Report Guidelines
- Education Modules for Appropriate Imaging Referrals
- General Practitioner (GP) MRI Referrals

InsideRadiology provides radiology consumers (patients, caregivers, other potential users of radiology) and referrers (general practitioners, specialists, and other health professionals) with accurate, up-to-date information about radiology tests and procedures. The project addresses five of the six factors considered important for quality in radiology, as the information is patient-centered and the method of delivery is an easy-to-use website that makes this resource timely, efficient, and equitable. It has also been shown to be effective: The website has recorded a hit rate of more than 6 million and more than 600,000 page views since January 2014.

CT Dose Optimisation projects show that an audit/feedback process, a one-day, face-to-face teaching workshop following baseline data collection, and follow-up support from expert medical imaging technologists during optimization resulted in a substantial and clinically important reduction in radiation doses delivered during routine adult clinical CT examinations. A recently completed project reaudited many of the participating scanners from projects carried out since 2008 to assess whether the initially achieved dose reductions were sustained. It identified issues that may be associated with the sustainability of CT optimization quality-improvement activities, such as staff changes, attendance at face-to-face workshops, or both, during the initial optimization projects. The focus of these projects is the safer use of CT imaging, which leads to more effective and efficient use of radiology resources and more equitable care for patients, as the staff are more aware of how to optimize a scan per scan type and patients’ individual circumstances, rather than using one setting for all.

The Radiology Events Register (RaER) is designed to undertake systematic data collection and analysis of adverse incidents and discrepancies to inform quality improvement and patient safety. The focus of this project is improving safety for all radiology patients (important for patient-centered and equitable care).

The Radiology Written Report Guidelines were developed by a multidisciplinary panel to address the concerns of radiologists writing the reports and the doctors requesting the exam and reading the report to the patients receiving the treatment. The guidelines developed as a result of this project aimed to provide a clear and concise radiology report that addressed the needs of the refererrer—and, hence, the patient—allowing effective and efficient use of the results of the imaging component of the patient’s care to allow safer and more patient-centered treatment.

Education Modules for Appropriate Imaging Referrals have developed interactive learning of clinical decision rules, which aim to improve the appropriateness of referrals by educating health professionals about the place of imaging in patient care.

General Practitioner MRI Referrals developed guidance materials that used existing, evidence-based clinical decision tools, clinical practice guidelines of acceptable standards, and expert consensus to advise the GPs about the appropriate use of the new MRI studies that they can refer for under the Medical Benefit Scheme.

Both the educational modules and the GP MRI referral projects contribute to the program by educating GPs about appropriate timing for referring a patient for certain types of medical imaging to allow more effective, timely, and efficient use of resources to allow for more equitable care.

What Quality and Safety Program resources are available to radiologists?

Resources available as a result of the Quality and Safety Program include:
- The RaER incident-reporting website: www.raer.org.au/
- RaER publications and presentations: www.raer.org.au/publications-presentations.html
- Appropriate imaging referrals interactive modules and eBooks (still in a pilot phase and not widely released)

Open-source project reports, presentations, and papers are also available as a resource on the College website’s Quality and Safety section: www.ranzcr.edu.au/quality-a-safety/program/

Tell us about the Radiology Events Register. How does it work?

RaER is an anonymous, confidential, and secure database for the reporting of radiology incidents. An incident is an event or circumstance that could have resulted—or did result—in unintended or unecessary harm to a person, or a complaint, loss, or damage.

Advanced Incident Management System (AIMS) is a data collection and analysis tool developed by the Anesthesia Patient Safety Foundation. It is used by many hospitals in Australia and overseas.

The database encourages the reporting of so-called near misses or close calls, enabling us to learn from incidents even when there is no harm caused. This type of incident occurs more frequently than the adverse events for which they are precursors, providing a rich source of data to analyze and learn from. Incidents can be reported either with a registered user name or anonymously. Reporting is not limited to radiologists—the system is accessible to anyone involved in an incident: radiographers, nurses, and department managers, for example.

What happens once a physician has reported an incident in RaER?

The incident is securely recorded in the RaER database. Immediately after recording the incident, an acknowledgment screen appears containing some summary statistics of recorded incidents, as depicted on page 20.
More detailed analysis is periodically conducted and fed back to participating institutions; data have also been used in case studies and other papers, which can be accessed at: www.raer.org.au/publications-presentations.html.

**Can you share some of the lessons already learned from the program?**

There are so many lessons in this program—it is hard to cover them all. Some overarching lessons include:

- The importance of building on the existing knowledge and experience of experts in the field who are providing services or will be using the resource to ensure that the project in question meets the needs of the target audience. These experts are not limited to College fellows and staff, but generally are from a wide range of disciplines, from other medical specialists to consumer representatives.

- Although information can be disseminated easily via an article or a flowchart, to better understand and implement information, often more-targeted interaction is required: for example, audits, intervention workshops, and interactive online education modules, or such face-to-face interactions as a trainee sitting with a trainer to check reports against each other or the reporting guidelines and receiving feedback. All are methods that build improvement in the quality and safety of radiology.

![](chart.png)

**Example of RaER acknowledgment screen containing summary statistics of recorded incidents**

---

**ARRS Publication Committee** chair Ruth C. Carlos, University of Michigan Hospital; and Geoffrey B. Johnson, Mayo Clinic.

Participants representing CSR were CSR president Xiaoyuan Feng, Hua Shan Hospital and Fu Dan University; Bin Lu, Fu Wai Cardiovascular Institute and Hospital; CSR vice secretary Bin Song, West China Hospital and Sichuan University; and Shenghong Ju, Zhong Da Hospital and Southeast University.

Observers included Thomas R. Goodman, Yale University School of Medicine; Christine Glastonbury, University of California–San Francisco; Charles E. Kahn, Jr., Medical College of Wisconsin; ARRS president-elect Jonathan S. Lewin, Johns Hopkins School of Medicine; ARRS president Melissa Rosado de Christenson, Saint Luke’s Hospital of Kansas City and University of Missouri–Kansas City; and Andrew B. Rosenkrantz, NYU Langone Medical Center.

---

**References:**