Structured Reporting Guidelines

Clinical Radiology

Guideline

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About RANZCR

The Royal Australian and New Zealand College of Radiologists (RANZCR) is committed to improving health outcomes for all, by educating and supporting clinical radiologists and radiation oncologists. RANZCR is dedicated to setting standards, professional training, assessment and accreditation, and advocating access to quality care in both professions to create healthier communities.

RANZCR creates a positive impact by driving change, focusing on the professional development of its members and advancing best practice health policy and advocacy, to enable better patient outcomes. RANZCR members are critical to health services: radiation oncology is a vital component in the treatment of cancer; clinical radiology is central to the diagnosis and treatment of disease and injury.

RANZCR is led by clinicians who are democratically elected by the membership. The ultimate oversight and responsibility for RANZCR is vested in the Board of Directors. The work of the RANZCR is scrutinised and externally accredited against industry standard by the Australian Medical Council and the Medical Council of New Zealand.

Our Vision
RANZCR as the peak group driving best practice in clinical radiology and radiation oncology for the benefit of our patients.

Our Mission
To drive the appropriate, proper and safe use of radiological and radiation oncological medical services for optimum health outcomes by leading, training and sustaining our professionals.

Our Values

Commitment to Best Practice
Exemplified through an evidence-based culture, a focus on patient outcomes and equity of access to high quality care; an attitude of compassion and empathy.

Acting with Integrity
Exemplified through an ethical approach: doing what is right, not what is expedient; a forward thinking and collaborative attitude and patient-centric focus.

Accountability
Exemplified through strong leadership that is accountable to members; patient engagement at professional and organisational levels.

Leadership
Exemplified through a culture of leadership where we demonstrate outcomes.

Code of Ethics
The Code defines the values and principles that underpin the best practice of clinical radiology and radiation oncology and makes explicit the standards of ethical conduct the College expects of its members.

1. INTRODUCTION

1.1 Purpose and scope

This guideline is intended to assist The Royal Australian and New Zealand College of Radiologists® (the College), its staff, Fellows, Members and other individuals with quality assessment, or development of, templates (and/or software) for the formal reporting of radiological examinations that:

- Use standardised data formats
- Use standardised terminology
- Have been developed in accordance with current scientific evidence and best practice guidelines

1.2 Definitions

CDA *Clinical Document Architecture, an HL7 standard for documents containing structured data, providing for both machine- and human- readable formats*

Electronic health record (EHR) - means the systematised collection of patient and population electronically stored health information in a digital format. These records can be shared across different health care settings.

FHIR – means "Fast Health Interoperability Resources" a standard for the representation and exchange of health information via application programming interfaces; managed by HL7.

HL7 – formerly "Health Level 7" the dominant standardised computer messaging format for healthcare, managed by the international standards development organisation of the same name. Versions 2.x are widespread in clinical use, v3 has been less successful, there is now a move towards FHIR

Radiology Information System (RIS) – means "the core system for the electronic management of imaging departments. The major functions of the RIS can include patient scheduling, resource management, examination performance tracking, reporting, results distribution, and procedure billing" (Wikipedia)

SNOMED-CT – the largest and most widely used controlled, hierarchically structured vocabulary ("ontology") of standardised clinical terminology in healthcare

Standardised or templated reports ("TR") – means that some or all of the order and content of the radiology report text is predefined. This may simply be as an anatomically itemised list, but can include standardised terminology and/or content tailored to the clinical context. Templates for these are often held in the institution reporting system

Structured reporting means some degree of standardisation of radiology report content and format. There are two major ways this is currently achieved in practice which are defined as standardised/templated reports and structured reporting software as follows:

Structured reporting software ("SRS") – means applications which incorporate predefined tagged data fields requiring specific input. This input may be directly from the radiologist or technologist, often taking the form of options in a pick-list, or transmitted directly from imaging equipment, such as can be performed with some ultrasound measurements. An ideal 'SRS' would tailor the report to the information provided and the clinical context, but would allow the radiologist to add or alter content.

TLAP means Template Library Advisory Panel

Written Radiology Report**:** means the formal record of the radiology examination, specifically including a clinical radiologist's interpretation/opinion. The text may be digital or hard-copy, and held in the RIS (Radiology information system) and/or Electronic health record

2. BACKGROUND - STRUCTURED REPORTING

2.1 What is structured reporting?

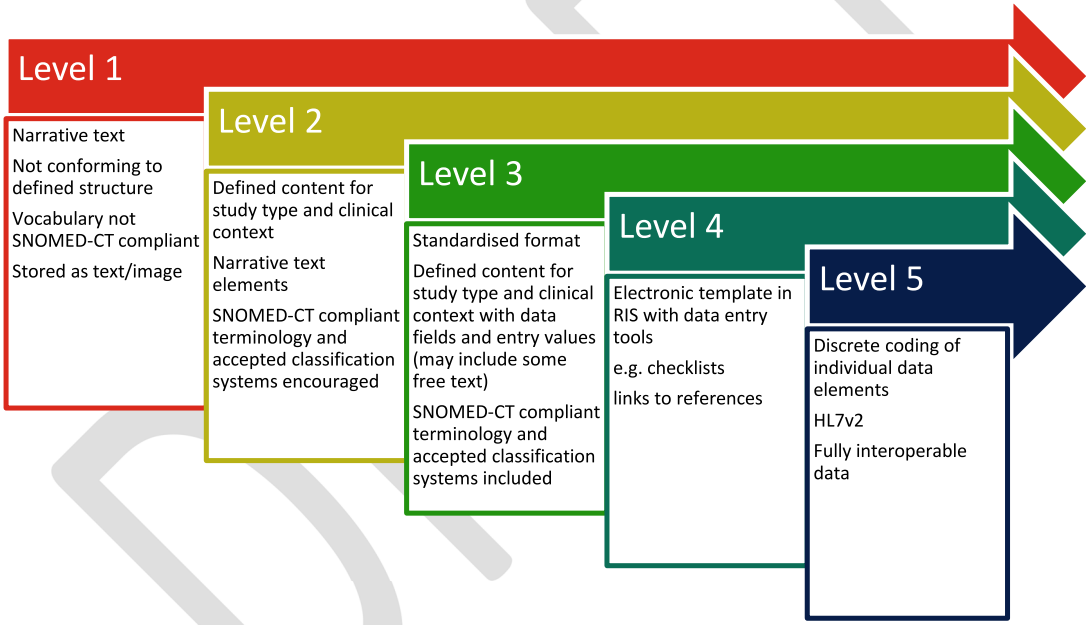
Standardisation of radiology report, content and format can be achieved using standardised or template reports held in existing reporting systems (TR), and / or using dedicated structured reporting software (SRS).

2.2 Why structured reporting?

Structured reporting aims to improve the accuracy, completeness, consistency and clinical relevance of the radiology report by standardising content and format[1]. It also allows the use of interoperable (and "computable") data formats to make the content of the report accessible to other software applications.[2]

2.3 Structured report levels

Levels of standardisation of report content and format can be defined according to the processes and technologies used.



(Adapted from RCPA[3])

2.4 Importance of structured reporting

Research increasingly shows that 'structured' radiology reports with complete, contextually appropriate information, using broadly accepted terminology and clear, consistent formatting show improvements across a range of quality metrics:

- Report accuracy
- Clarity and readability
- Greater clinical utility
- Completeness of key content elements
- Some studies have also shown improvements in reporting efficiency[4-6]

Structured reports and standardisation of data are key to seamless interaction with digital healthcare systems and can give radiologists timely access to clinical, research and guideline information at the point of reporting. Software can improve reporting workflows and defined data elements help tailor report content to specific readers, particularly patients. There will be increasing demand on radiology services for their reports to make data available in standardised interoperable formats for use by clinical applications, including those employing artificial intelligence techniques.

Current international initiatives to promote structured reporting and embed it into evolving healthcare information technology[7] Include:

- The joint Radiological Society of North America and European Society of Radiology RadReport project[8] maintains a template library, overseen by a Template Library Advisory Panel.
- A parallel project, in collaboration with the ACR, aims to establish common data elements (CDEs) with standardised names (which may be mapped to other standardised terminologies), definitions, and allowed values.[9, 10]
- The Integrating the Healthcare Enterprise (IHE) initiative's MRRT (Management of Radiology Report Templates) profile sets out conditions for template interoperability with multiple Radiology Information systems and Clinical Information / Patient Management Systems. This requires use of a tagged data format (HTML5) and standardised data elements (including, but not limited to, "common data elements"). Other applications, using appropriate application programming interfaces (APIs), can then access the tagged data elements they need.
- FHIR – fast healthcare interoperability resources, are the latest generation of HL7, the broader healthcare messaging framework..[9]

Other medical specialities in Australia/New Zealand are also moving to a structured reporting model. In particular, the Royal College of Pathologists of Australasia has run a Structured Pathology Reporting of Cancer project since 2007[3]. A RANZCR member survey in 2021 identified guideline development as a key component of College involvement in structured reporting in our region.[11]

3. GUIDELINE DEVELOPMENT

These recommendations are based on the consensus of the RANZCR structured reporting working group and the following references:

- RANZCR Radiology written report guidelines[12]
- RadReport Template library assessment criteria[8]
- RCPA Royal College of Pathologists of Australasia Structured Pathology Reporting of Cancer[3]

4. TEMPLATE ASSESSMENT CRITERIA

These criteria are designed to allow clinical radiologists to assess the quality of existing individual structured report templates and to guide the development of new structured report templates and software. The report should prioritise communication with the requesting clinical team, and secondarily the patient, while recognising the need to document information that may be required by a range of possible future users, including radiologists reporting subsequent studies.

The reporting clinical radiologist is ultimately responsible for choosing whether to use a particular structured report within the context of the current clinical question and the stage of diagnosis and treatment (undifferentiated presentation, differentiated disease first presentation, disease follow-up or in the acute follow-up of a subset of findings in the context of known multiple abnormalities).

4.1 Content

The report should include all relevant information described as accurately and clearly as possible.

Reports should be modality, examination/anatomic region and clinical context specific.

Where possible, reports should be tailored to the clinical indication and/or significant findings.

Requirements

- Report specifies the modality and study type using SNOMED-CT preferred terms and coding system for exam names.[13]
- Report includes clinical notes provided by the referrer, and any other contextual clinical information obtained directly from the patient or other sources (e.g. smoker / non-smoker, history of malignancy etc.).
- Report includes all relevant content elements required by the current RANZCR Written Radiology Report Guidelines[12] and any other applicable and widely used guidelines or standards (for instance those issued by a local or international subspeciality group)
- Report uses accepted management-based grading, where possible, for instance: LI-Rads, PI-Rads, TNM staging, etc.
- The default setting/template reflects a normal exam (or most common state) with minimal or no editing.
- In reports with higher levels of structuring, radiologists are required to enter information in designated fields. Permitted field values should be clearly prompted by the report structure. These responses may take the form of:
    - Text/narrative.
    - Value list with single selection (e.g. radio button or pop-up menu)– which may be one or two values such as 'present' or 'absent'.
    - Value list with multiple selections (e.g. tick boxes).
    - Value list plus text. In some cases one or more of the responses in a value list may require further detail such choosing an 'other' option (or providing additional details if something is 'present' rather than absent).
    - Numbers – such as measures.
- Conditional fields which rely on the response to a previous question.
- The report highlights whether individual findings/field values are normal or abnormal, and clearly reflects whether the examination as a whole is normal or abnormal. Unexpected and emergent findings are clearly identified.
- Recommendations for further imaging or non-imaging management should be based on strong or established evidence and be linked to universally/widely accepted protocols based on grading/classification systems where relevant.
- Where pre-defined field order or content is unsuitable for clarity in any given report instance, this must be able to be over-ruled. Caution is required in over-fitting individual studies to predefined fields, for example with unconfirmed lesions in oncology imaging using a Tumour-Node-Metastasis reporting framework.

Evidence*:*

- Specification of applicable modality, study parameters, clinical indications and disease process**.** iRefer/Medicare other item numbers providing clinical context.
- Checklist showing compliance with RANZCR and any other applicable reporting standards.
- Field list showing permissible values and terminology with reference to standard or classification system where relevant.

4.2 Format, brevity and efficiency

The report should minimise the work required for the radiologist to produce it and for the user to read and understand it. There may be a significant difference in functionality that supports streamlined and speedy data entry by the radiologist and functionality that supports clear and accurate assimilation of key information by the reader

Requirements

- End user report is succinct and clearly laid out with a clean and professional appearance
- Logical grouping of text within a report facilitates information entry by the radiologist
- Limit the number of fields that require action
    - Internal logic should minimise the number of fields and clicks
    - Conditional fields – where supported, should set certain fields to only appear when previous conditions met. It must be possible to see and review full field logic.
- Report uses standard and correct Australian/New Zealand English and defines any abbreviations or acronyms
- Report content should follow rules of grammar and syntax, both within fields and with attention paid to the final report flow after completion of all fields
- An ideal structured report output should consider knowledge level of likely readers (e.g. physiotherapists, chiropractors, GPs and/or other specialists) and consider generation of different report versions

Evidence

- Field logic diagram specifying permitted data types and values
- Grammar, spelling, and punctuation check documentation

4.3 Technical considerations

The report should be compatible with existing RIS/PACS systems in the radiology practice and also with the evolving broader electronic health record.

Requirements

- Report should specify level of structuring.
- For higher level reports and software:
    - Report should be compatible with existing RIS/PACS systems, ideally use name from the RANZCR Radiology Referral Set
    - Conformant with IHE MRRT HTML5 profile
    - Minimal metadata (data about the report or exam that is stored elsewhere)
        - Data elements should be interoperable with relevant software (e.g. DICOM SR, ACR Rad Elements, FHIR resources where applicable, OpenEHR archetypes)
    - Incorporation into HL7 V2 messages?

Evidence:

- Documentation of level of structuring.
- Documentation of compliance as above.

4.4 Evidence of quality improvement

Requirements

- There should be evidence of improvement in one of more metrics of report quality from local or international sources.
- Evidence of successful implementation in Australia/New Zealand practice settings

Evidence

- Improvement in metric/s of report quality in peer reviewed published literature.

- Special interest group endorsement within RANZCR.
- Endorsement by multidisciplinary organisations especially clinical counterparts
    - Peer testing opportunities at a Connectathon
- Approval by other radiology organisations e.g. RadReport TLAP
- Evidence of appropriateness to ANZ Practice – documented implementation and use in local settings

4.5 Implementation tools

Reports should be supported by tools to facilitate implementation and use by radiologists

Evidence

- Example cases
- Word versions of lower level templates

5. CHANGES TO THIS DOCUMENT

The College may amend this guideline at any time and will ensure that future amendments comply with applicable law.

6. RELATED DOCUMENTS

Clinical Radiology Written Report Guidelines

Radiology Referral Set Position Statement

Towards Interoperability: Clinical Radiology Forging the Path Ahead

7. ACKNOWLEDGEMENTS

Thank you to the Structured Reporting Working Group who developed these guidelines.

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