IASRJ. Med. Pharm. Sci.
ISSN:2582-9343
Website: https://ijmps.com/
Open Access Journal **Country**: India

IASR Journal of
Medical and
Pharmaceutical Science

ORIGINAL ARTICLE OPEN ACCESS

Common Errors and Overlooked Items in Radiology Reports: A Clinician's Perspective

Dr. Paul Joy
MBBS, MD Department of Radiology, Rajagiri Hospital, Aluva, Kerala, India

OPENACCESS

Corresponding Author
Dr. Paul Joy
MBBS, MD Department of Radiology, Rajagiri Hospital, Aluva, Kerala, India

Received:24-06-2025
Accepted:30-07-2025
Availableonline:25-08-2025

ABS TRAC T

Radiology reports are the interface between images and bedside action. For surgeons, oncologists, internists and emergency physicians, a few lines in the impression can determine admission, operation, anticoagulation or reassurance. When reports are ambiguous, internally inconsistent, or lack a plan, clinicians face uncertainty that delays care and increases downstream testing. From the clinician's perspective, the most disruptive problems are missed yet management-defining findings, dropped negations or laterality errors, overloaded impressions that bury the lede and absent guideline-anchored recommendations. Conversely, reports that answer the referral question in the first sentence, rank items by urgency and offer time-bound guidance linked to society standards are trusted and acted upon. This narrative review synthesizes published evidence and professional guidance to outline a practical, clinician-centric blueprint for radiology reporting. We highlight modality-specific blind spots (thorax, abdomen/pelvis, neuro, musculoskeletal), provide impression stems and a ten-minute sign-off routine, and discuss peer-learning loops and AI/NLP safety nets. Aligning reports with how clinicians read and decide turns them into reliable instruments that improve outcomes, reduce callbacks and strengthen interdisciplinary trust [1–8, 9–14, 15, 23–25].

Keywords: Radiology errors, interpretive discrepancies, cognitive biases, perceptual limits, negation/laterality errors, structured reporting, guideline-anchored recommendations, closed-loop communication, clinician expectations and management-defining misses.

INTRODUCTION

Radiology has become the lingua franca of multidisciplinary care. In the emergency department, stroke pathways hinge on the head CT; in oncology clinics, staging and restaging drive systemic therapy; on surgical rounds, a single sentence about a leak, bleed, or obstruction can redirect the day's plan. Despite these stakes, interpretive discrepancy rates remain non-trivial (≈3–5% overall, often higher overnight or under production pressure) [1–3]. For clinicians, the problem is not only that errors exist, but that they frequently surface as management failures—missed pulmonary embolism (PE) that postpones anticoagulation, stump appendicitis dismissed as nonspecific ileitis, a thin isodense subdural hematoma (SDH) overlooked in an elderly fall, or a dropped "no" converting reassurance into alarm [4, 5, 15, 22].

The drivers of failure are well characterized. Perceptual limits mean a visible abnormality may not be consciously detected. Cognitive biases—anchoring, premature closure, satisfaction-of-search—narrow the differential too early. Language hazards in speech recognition (negation and laterality errors) invert meaning. Process gaps (no prior comparison, protocol misalignment, late addenda) propagate uncertainty and callbacks [2–5, 15, 20, 23]. These are not purely radiologic issues; they are shared system problems whose consequences clinicians shoulder at the bedside.

Clinicians repeatedly articulate six expectations for trustworthy reports: (1) an explicit answer to the referral question in line one; (2) a hierarchy that places life-threatening items first; (3) guideline-anchored follow-up (Fleischner for nodules; ACR incidental findings for adrenal/renal/pancreatic lesions; LI-RADS/PI-RADS for disease frameworks); (4) internal

consistency without dropped "no" or left–right swaps; (5) brevity with clarity; and (6) documentation of closed-loop communication for urgent results [6–14]. Meeting these expectations reliably converts the report from a static narrative into a defensible, clinician-ready plan.

What Clinicians Expect From Radiology Reports

1) Directly answer the clinical question.
   Busy teams skim impressions first. Positioning the answer up front—"No CT evidence of pulmonary embolism"—accelerates decisions and aligns with ACR communication guidance [6, 7]. Deferring the answer to the end, or diluting it with multiple hedges, creates delay and uncertainty.

2) Prioritize by urgency.
   Impressions should present life-threatening issues before important but non-urgent findingsand only then incidental or chronic items. This simple ordering maps cleanly onto how clinicians triage action and has been associated with improved clarity and actionability in structured reporting studies [8, 16, 17].

3) Anchor recommendations to guidelines.
   Hedging without a plan ("cannot exclude," "correlate clinically") transfers cognitive load to clinicians. Time-bound, society-anchored recommendations—Fleischner 2017 for a 6-mm subsolid nodule; ACR white papers for adrenal/renal/pancreatic incidentalomas; LI-RADS/PI-RADS for structured frameworks—standardize care and improve medicolegal defensibility [9–14].

4) Preserve consistency and accuracy.
   Dropped negations and laterality errors are disproportionately harmful. A twenty-second integrity sweep (visually scanning for "no/not/left/right" and reconciling body with impression) prevents most reversals [15].

5) Be concise but complete.
   Micro-paragraphs and standardized stems are easier to parse than dense prose. Evidence shows structured, standardized phrasing reduces variation and aids clinician comprehension without sacrificing nuance [8, 16, 17].

6) Document closed-loop communication.
   For critical or unexpected results, a one-line communication statement—"Findings conveyed to ICU team at 14:20"—meets professional parameters and reassures clinicians that action has been initiated [7].

Common Errors Encountered by Clinicians

Missed but management-defining findings.

Thorax: apical pneumothorax hidden along the pleural stripe; motion-degraded CT pulmonary angiography where subsegmental PE is overlooked; supraclavicular nodes tucked above clavicles during staging [18]. Abdomen/pelvis: tip or stump appendicitis; antidependent free air; intramural small-bowel hematoma; mesenteric root inflammation; hernial orifices missed on fast reads [19]. Neuro: thin, isodense SDH; hyperdense MCA sign; posterior fossa bleeds masked by artifact [20]. MSK: occult scaphoid/talar fractures; perilunate dislocations; tiny cortical breaks at the field periphery—especially after a first abnormality triggers satisfaction-of-search [21]. These misses are decisive for clinicians: anticoagulate vs. observe, operate vs. watch, admit vs. discharge.

Ambiguous or contradictory wording.

Dropped "no" from voice recognition (e.g., "no pneumothorax" → "pneumothorax") and left–right swaps are classic hazards, well documented in safety literature and medicolegal case reviews[15, 22]. Unsupported hedging shifts uncertainty to the treating team; pairing probability language with a concrete plan restores balance [6, 7].

Overloaded impressions.

Listing every finding with equal weight buries the lede. A clinician-friendly impression leads with life-threatening items, then clinically important but non-urgent issues, and finally incidental findings with explicit disposition.

Workflow and process gaps.

Failure to review priors, protocol misalignment, incomplete handoffs, and late addenda are common drivers of callbacks and duplicated imaging. Addendum analyses and QA programs identify these recurrent failure modes and guide fixes [23].

Benchmarks of a "Good" Report

Clinicians routinely contrast "poor" with "good" impressions.

Poor: "Filling defect in pulmonary artery, could be thrombus; artifact not excluded. Clinical correlation advised."

Good: "CT pulmonary angiography shows acute right lower lobe segmental pulmonary embolism. No right heart strain. Anticoagulation recommended."

The latter answers the question, prioritizes action, and frames risk succinctly. Surveys of referring physicians consistently show preference for brevity, prioritization and guideline anchors over exhaustive lists that mix urgent and incidental findings [8, 16, 17].

Practical Fixes Radiologists Can Implement

Lead with the answer.

Open the impression with the referral question resolved. This simple move has the largest impact on clinician confidence and speed to action [6, 7].

Use "What–Where–So What–Now What."

Example: "6-mm subsolid nodule (what), right middle lobe (where), low-risk morphology (so what), CT in 12 months per Fleischner 2017 (now what)" [9]. This scaffolding shortens dictation time and standardizes tone.

Embed guideline anchors.

Pulmonary nodules → Fleischner 2017; adrenal lesions → ACR adrenal white paper; renal masses → ACR incidental findings; pancreatic cysts → ACR recommendations; disease frameworks → LI-RADS/PI-RADS [9–14].

Run a 20-second integrity sweep.

At sign-off, visually search for "no/not/left/right," read the first sentence aloud and reconcile the body with the impression. Many "dropped no" or laterality errors are caught here [15].

Structure the impression.

Three micro-paragraphs: (1) urgent / management-changing; (2) important but non-urgent; (3) incidental with explicit disposition ("no follow-up required under ACR/Fleischner criteria") [8, 16].

Document closed-loop communication.

One sentence with time and recipient for unexpected/critical results meets professional standards and reassures the treating team [7].

Adopt a ten-minute sign-off routine (scales to <1 minute for simple cases).

Images: reverse sweep + modality blind-spots; Language: negation/laterality scan + body–impression reconciliation; Impression: answer first + urgency ordering; Guidelines: add anchor lines; Communication: document if critical [8–14, 15, 23].

Make improvement sustainable.

Peer review (RADPEER-style), addendum audits, NLP safety nets for negation/consistency, and short theme rounds (20–30 minutes) that translate misses into micro-checklists ("Rescroll segmental pulmonary arteries" "Remember posterior fossa sweep") all reduce recurrence [23, 24–25].

Modality-Specific Pain Points

Chest and CTA (PE protocol).

Pain points: subsegmental PE in motion or late bolus; apical pneumothorax; supraclavicular nodes. Counters: deliberate segmental branch pass; pleural apex sweep; thoracic inlet/thyroid glance; adrenal check in thoracic staging. Impression should begin by answering PE. Classic pitfalls and causes of misdiagnosis are well summarized in CTA literature [18].

Abdomen/Pelvis.

Pain points: tip/stump appendicitis; subtle pneumoperitoneum; mesenteric root inflammation; hernial orifices. Counters: structured passes—cecal pole → appendiceal tip/stump → mesenteric root → hernial orifices; adjust windows for free air. Offer time-bound plans when indeterminate ("repeat CT if symptoms persist"). Process lessons from trauma/helical CT underscore the value of structured sweeps [19].

Brain CT.
Pain points: thin isodense SDH; hyperdense MCA sign; posterior fossa hemorrhage. Counters: vertex and posterior fossa review; density check on M1 in narrow windows; compare extra-axial spaces for subtle asymmetry. Neuroradiology safety reviews highlight these recurring issues [20].

Musculoskeletal.
Pain points: occult scaphoid/talar fractures; perilunate dislocations; small cortical breaks at the periphery. Counters: alignment-before-detail; cortical edge pass; inspect "dangerous corners." Satisfaction-of-search looms large after the first fracture is found [21].

Future Directions: Clinician–Radiologist–AI Collaboration
AI and NLP as safety nets, not replacements.
CAD tools for lung nodules and PE can provide second looks at common misses, while NLP can flag probable negation contradictions and body–impression inconsistency before sign-off. Early evaluations suggest these tools improve detection and language integrity when integrated thoughtfully and paired with human oversight [24, 25].

Follow-up tracking and dashboards.

Simple registries or RIS/PACS dashboards that track Fleischner/ACR follow-ups reduce loss to follow-up and distribute accountability across teams. From the clinician's perspective, this converts radiology from a one-time diagnostic event to a longitudinal safety partner.

Transparency and medicolegal defensibility.
Clear documentation of rationale, guideline anchors, and communication creates a robust trail. When disputes arise, a concise, prioritized, guideline-based impression—and a visible communication line—provides strong professional defense [6–8].

Conclusion
The best radiology reports, from a clinician's vantage point, are not the longest— they are the clearest and most actionable. They answer the referral question in the first line, rank findings by urgency, convert uncertainty into guideline-anchored follow-up, and document when urgent findings were communicated. The most disruptive errors—negation/laterality reversals, overloaded impressions, missed management-defining findings—are largely preventable with low-burden habits: a brief integrity sweep, structured impression design, and consistent guideline references. When reinforced by peer learning and AI/NLP safety nets, these habits build sustainable quality. Aligning reports with how clinicians read and act transforms them into indispensable decision instruments that improve outcomes, reduce callbacks, and strengthen interdisciplinary trust.

Supplementary: Clinical Vignettes
Clinical vignettes (supplementary).
Vignette 1 (ED PE): A 62-year-old with pleuritic chest pain and tachycardia undergoes CTPA with respiratory motion. The initial impression states "No acute thoracic abnormality." Twelve hours later, a junior clinician queries the D-dimer and ECG discordance; a focused re-review reveals a small segmental PE previously scrolled past. A structured segmental pass during sign-off would likely have prevented the miss [18].

Vignette 2 (stump appendicitis): A 35-year-old post-appendectomy presents with localized RIF pain and fever. The body text notes mild pericecal stranding; impression: "Enteritis; correlate clinically." Surgery later finds stump appendicitis. A dedicated "cecal pole → stump" pass and a time-bound recommendation would have shortened time to theatre [19].

Vignette 3 (isodense SDH): An 80-year-old on antiplatelets falls at home. Head CT impression: "No acute intracranial hemorrhage." The patient returns somnolent; repeat CT shows a thin convexity SDH. Comparative sulcal symmetry and vertex review at first read, with a sentence acknowledging the difficulty of isodense collections, would have prompted closer observation 20.

Vignette 4 (dropped "no"): A trauma chest CT impression intended as "No pneumothorax" is transcribed as "Pneumothorax," leading to an unnecessary chest tube. A 20-second integrity sweep—scanning for "no/not/left/right"—is a simple, high-yield defense [15, 22].

Implementation Toolkit: Checklists, Templates and Workflow Integrations

Clinical alignment checklist (use at sign-off).

• Answer first: Does the first sentence resolve the referral question in plain language? [6–7]

• Urgency order: Are life-threatening findings listed before non-urgent and incidental items? [8,16]

• Integrity sweep: Have "no/not/left/right" been visually checked; do body and impression match? [15]

• Guideline anchors: If nodules/adrenal/renal/pancreatic lesions are present, have Fleischner/ACR/LI-RADS/PI-RADS references been added with a time-bound plan? [9–14]

• Communication: If critical or unexpected, is there a one-line note with time and recipient? [7]

• Priors: Have relevant priors been reviewed and the comparison (growth/stability) stated explicitly? [23]

Micro-templates (sample stems usable across modalities).

• Referral answered up front: "No CT evidence of pulmonary embolism." [6]

• Probability + plan: "Findings favour inflammatory change; repeat CT only if pain persists or CRP rises." [6]

• Guideline anchor: "Solitary 6-mm subsolid nodule; CT in 12 months per Fleischner 2017." [9]

• Incidentaloma disposition: "Stable 1.2-cm right adrenal adenoma; no specific follow-up per ACR 2017 adrenal guidance." [10]

• Communication line: "Result discussed with ED physician at 14:20." [7]

Departmental macros (insertable blocks).

• PE CTA macro: "Impression—No pulmonary embolism identified. No right heart strain. No pneumothorax or pleural effusion. Incidental 5-mm solid nodule, RUL; low-risk profile—no follow-up per Fleischner 2017." 9,18

• Appendicitis macro: "Impression—Acute tip appendicitis; no perforation. No pneumoperitoneum. Surgical consultation recommended. If symptoms persist post-therapy, repeat CT in 24–48 h." 19

• SDH macro: "Impression—Thin acute left convexity subdural hematoma (~3 mm), no midline shift. Posterior fossa intact. Neurosurgical review advised." [20]

• Scaphoid macro: "Impression—Occult waist scaphoid fracture suspected; recommend immobilization and orthopedic follow-up. Consider MRI if symptoms persist." [21]

RIS/PACS prompts.

• Add a mandatory check box trio at sign-off: (i) Answer first? (ii) Integrity sweep done? (iii) Guideline anchor added (if applicable)? [6–15]

• Trigger an alert if "no" appears in the impression but not in the body (proxy for risk of dropped negation) [15,24].

• Auto-suggest guideline sentences when keywords (e.g., "nodule," "adrenal," "cyst") appear [9–12].

• Display prior measurements side-by-side to enforce explicit comparison statements [23].

Follow-up tracking (closing the loop).

• Create a simple registry of guideline-anchored follow-ups (Fleischner/ACR). Auto-populate from key phrases; route monthly reports to referrers and clinic coordinators [9–12].

• Use dashboards to flag overdue surveillance and high-risk patients (oncology, transplant, anticoagulation) [23–25].

• Incorporate "reason not to follow" fields (moved, declined, palliative) to avoid noise and blame.

Sample Impression Stems by Scenario (Clinician-First Language)

Pulmonary embolism (negative study).

"No CT evidence of pulmonary embolism. No right heart strain. No pneumothorax. Incidental 6-mm subsolid nodule, RML; CT in 12 months per Fleischner 2017." [9,18]

Pulmonary embolism (positive study).

"Acute segmental PE in the right lower lobe. RV/LV ratio not enlarged. Anticoagulation recommended per institutional protocol." [18]

Incidental adrenal lesion (oncology staging).

"1.2-cm right adrenal adenoma; benign washout profile; no specific follow-up per ACR 2017 adrenal guidance." [10]

Pancreatic cyst (asymptomatic adult).

"1.6-cm side-branch pancreatic cyst without worrisome features; MRI/MRCP surveillance per ACR 2017 (interval ___)." [12]

Tip appendicitis (no perforation).

"Acute tip appendicitis; no free air or collection. Surgical consultation advised." [19]

Isodense SDH (elderly on antiplatelets).

"Thin left convexity subdural collection (~3 mm) with subtle sulcal effacement; no midline shift. Recommend neurosurgical review and observation." [20]

Occult scaphoid fracture.

"Findings suspicious for occult scaphoid fracture; immobilization and orthopedic follow-up. Consider MRI if pain persists." [21]

Quality Metrics, Audit Plan and KPIs

Purpose: Convert reporting principles into measurable, improvable behaviors.

Core KPIs (monthly dashboard).

• % impressions with answer in first sentence (target ≥95%) [6–7].

• % reports with explicit guideline anchor when applicable (target ≥90%) [9–14].

• % critical/unexpected results with documented communication (target 100%) [7].

• Addendum rate and themes (negation/laterality/contradictions) with downward trend over 6–12 months [15,23].

• Prior-comparison compliance for oncologic and ED cohorts (target ≥95%) [23].

Audit methods.

• Random 2–5% peer review (RADPEER-style) with case-mix stratification; aggregate themes quarterly [23].

• Addendum analysis: categorize by language error, perception, process; feed back into sign-off checklists and templates [23–24].

• Clinician feedback loop: short quarterly survey to referrers on clarity/actionability; review verbatims in M&M [8,16].

Interventions and escalation.

• Micro-teaching (10 min) in reading rooms on top 3 misses by modality [18–21].

• One-click access to guideline anchors within dictation UI [9–14].

• For repeated language errors, enable pre-sign-off NLP checks for negation and body–impression alignment [24–25].

Training, Culture and Human Factors

Psychological safety and learning.

• Frame discrepancies as shared learning, not blame. Celebrate near-miss captures during integrity sweeps to reinforce the behavior[23].

Deliberate practice.

• Build "blind-spot maps" per modality and practice the reverse sweep. Use timed drills (e.g., segmental PE pass; posterior fossa pass) during low-volume windows [18–21].

Language coaching.

• Standardize stems and maintain a small, curated library that maps to guidelines. Run short workshops on hedging vs. probability-plus-plan phrasing [6–14,16–17].

Human factors.

• Limit interruptions during sign-off; cluster pages; use headphones for dictation. Provide ergonomic viewing and enforce eye breaks to mitigate perceptual fatigue [1–3].

Medico-Legal and Ethics

Defensibility through design.

• A report that answers the clinical question, orders by urgency, anchors follow-up to guidelines, compares with priors, and documents critical communication creates a robust professional defense [6–12,23].

Transparency about uncertainty.

• Replace vague hedges with brief rationale and plan: "Favours postoperative change based on distribution and afebrile status; no routine follow-up; re-image only if fever or leukocytosis develops." [6]

Equity and access.

• Ensure guideline use does not inadvertently burden patients without access; mention acceptable ranges and alternatives where appropriate [9–12].

References

1. Brady AP. Error and discrepancy in radiology: inevitable or avoidable? Insights Imaging. 2017;8(1):171–182.
2. Lee CS, Nagy PG, Weaver SJ, Newman-Toker DE. Cognitive and system factors contributing to diagnostic errors in radiology. AJR Am J Roentgenol. 2013;201(3):611–617.
3. Waite S, Grigorian A, Alexander RG, et al. Cognitive biases and diagnostic errors in radiology. Radiographics. 2017;37(5):1668–1686.
4. Berlin L. Malpractice issues in radiology: perceptual errors. AJR Am J Roentgenol. 2007;189(3):517–522.
5. Graber ML. The incidence of diagnostic error in medicine. BMJ Qual Saf. 2013;22(Suppl 2):ii21–ii27.
6. Khorasani R, Bates DW, Teeger S, et al. Actionable radiology reporting: consensus recommendations. J Am Coll Radiol. 2014;11(5):484–490.
7. American College of Radiology. Practice Parameter for Communication of Diagnostic Imaging Findings. J Am Coll Radiol. 2014 (reaffirmed 2019).
8. Brook OR, Brook A, Vollmer CM, Kent TS, Sanchez N, Pedrosa I. Structured reporting: impact on clarity and actionability. Radiology. 2015;275(3):844–851.
9. MacMahon H, Naidich DP, Goo JM, et al. Guidelines for management of incidental pulmonary nodules: Fleischner Society 2017. Radiology. 2017;284(1):228–243.
10. Mayo-Smith WW, Song JH, Boland GL, et al. Management of incidental adrenal masses: ACR white paper. J Am Coll Radiol. 2017;14(8):1038–1044.

11. Remer EM, Papanicolaou N, Casalino DD, et al. ACR incidental findings: renal masses. J Am Coll Radiol. 2017;14(5):656–665.
12. Megibow AJ, Baker ME, Morgan DE, et al. Management of incidental pancreatic cysts: ACR recommendations. J Am Coll Radiol. 2017;14(7):911–923.
13. Chernyak V, Fowler KJ, Kamath A, et al. LI-RADS v2018. Radiology. 2018;289(3):816–830.
14. Turkbey B, Rosenkrantz AB, Haider MA, et al. PI-RADS v2.1. Eur Urol. 2019;76(3):340–351.
15. Dickerson EC, Davenport MS, Syed FF, et al. Communication errors in radiology: the role of voice recognition. J Am Coll Radiol. 2018;15(7):973–980.
16. Bosmans JM, Peremans L, Menni M, et al. Structured reporting: review of the impact on radiology. Insights Imaging. 2012;3(2):121–130.
17. Choi MJ, Oh JH, Park JE, et al. Standardized reporting and variability reduction. Eur Radiol. 2018;28(3):1096–1105.
18. Wittram C, Maher MM, Yoo AJ, Kalra MK, Shepard JA, McLoud TC. CT angiography of pulmonary embolism: diagnostic criteria and causes of misdiagnosis. Radiographics. 2004;24(5):1219–1238.
19. Rhea JT, Rao PM, Novelline RA. Helical CT and missed injuries: process lessons. Radiology. 2000;215(2):387–390.
20. Yousem DM. Misses, near misses, and safety in neuroradiology. Radiology. 2012;263(2):312–322.
21. Kahn CE Jr, Jan SC, Kelly WM. Missed fractures in radiology: causes and prevention. AJR Am J Roentgenol. 1990;154(6):1237–1243.
22. Johnson AJ. The Dropped “No.” AHRQ PSNet WebM&M. 2019.
23. Abujudeh H, Boland G, Kaewlai R, et al. Quality improvement in radiology: major initiatives and addendum analysis. Radiology. 2011;258(3):773–781.
24. Gunn AJ, Littenberg B, Marshall NE, et al. Natural language processing to improve radiology reporting safety. J Digit Imaging. 2019;32(5):782–790.
25. Choi JW, et al. Artificial intelligence in radiology reporting: opportunities and pitfalls. Clin Radiol. 2020;75(11):796–803.