Table B.7: Diagnostic Errors, Peer Review—Single Studies

Note: Full references are available in the [Section 1.4 reference list](#Section1point4refs).

| **Author, Year** | **Description of Patient Safety Practice** | **Study Design; Sample Size; Patient Population** | **Setting** | **Outcomes: Benefits** | **Outcomes: Harms** | **Implementation Themes/ Findings** | **Risk of Bias (High, Moderate, Low)** | **Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Agrawal et al., 201718** | Simultaneous double-reporting of emergency teleradiology examinations with discrepancies adjudicated by the radiologists before finalization of the report | Descriptive analysis of retrospective data; 3,779 double-read radiological procedures over 4 months | International teleradiology practice and two non-teaching mid-sized to large community hospitals, United States | Of the 145/3,779 procedures (3.8%; 95% confidence interval [CI], 3.2 to 4.4) for which the double-reporting identified undetected or incompletely evaluated findings that led to report modifications, 69 were clinically significant. MRI spine studies contributed significantly more than other study types to these errors. | Not provided | To promote efficiency, limit double reviews to certain study types that have the greatest risk of diagnostic errors. | Moderate | In Geijer, 2018 |
| **Harvey et al., 201610** | Regularly scheduled consensus-oriented group reviews (3 or more radiologists) of randomly selected recently interpreted computerized tomography (CT), magnetic resonance imaging (MRI), and ultrasound cases (within 3–7 days) | Descriptive analysis of retrospective data. A total of 11,222 studies reported by 83 radiologists were peer-reviewed using COGR at 2,027 conferences during the 2-year study period | Radiology department at a 950-bed tertiary care academic center, United States | The average radiologist participated in 112 peer review conferences and had 3.3% of their available CT, MRI, and ultrasound studies peer reviewed. The discordance rate was 2.7% (95% CI, 2.4 to 3.0), with significant differences found on the basis of division and modality. | Not provided | Necessary to have stakeholder buy-in.  Implementation associated with increased staffing needs, workload, and associated costs. Concern over maintenance of confidentiality may affect implementation. | Moderate | None |
| **Itri et al., 201811** | Peer review of randomly selected (20 cases/month adjudicated by third party) and nonrandomly selected (diagnostic errors found during routine clinical practice) radiologist interpretations and peer learning conferences (PLCs) | Descriptive analysis of retrospective data; 1,880 total abdominal imaging cases (190 identified via nonrandom peer review process; 1,690 identified via random peer review process) read by 10 radiologists | Abdominal imaging section of a radiology department in an academic tertiary care medical center, United States | Random peer review process: 1,690 cases reviewed, 2.6% with incidental errors. None considered to be significant or major discrepancies. Nonrandom process: 190 cases identified, 94 categorized as significant, 36 categorized as major discrepancies. CTs and MRIs accounted for 164 of the cases. | Not provided | Not provided | Moderate | None |
| **Kamat et al., 201115** | Laboratory information system-driven pre-signout quality assurance tool to randomly select an adjustable percentage of pathology cases for peer review and adjudication by the pathologists prior to release of the final report | Descriptive analysis of retrospective data; 1,339 (7.45%) out of a total 17,967 non-gynecologic cytopathology cases over an 18-month period | Pathology department at a university medical center, United States | In 2.6% of cases there were discrepancies, including 34 minor and 1 major. | Not provided | Implementation associated with increased staffing needs, workload, and associated costs. | Moderate | None |
| **Lauritzen, 201619** | Prospective radiologist-requested double-reading of CT abdomen examinations | Retrospective cross-sectional study; 1,071 consecutive double-reported abdominal CT examinations of surgical patients | Multicenter study; five public hospitals, Norway | Of 1,071 reports, 146 contained clinically important changes (14%, 95% CI, 11.6 to 15.8), with changes to 108 reports (10%, 95% CI, 8.3 to 12.0) considered intermediate, 35 major (3%, 95% CI, 2.3 to 4.5), and 3 critical (0.3%, 95% CI, 0.06 to 0.8). | Not provided | Concern over maintenance of confidentiality may affect implementation. | Low to moderate | In Geijer, 2018 |
| **Lauritzen et al., 201620** | Prospective radiologist-requested double-reading of CT chest examinations | Retrospective cross-sectional study; 1,023 consecutive double-reported chest CT examinations | Multicenter study; five public hospitals, Norway | Report changes were classified as clinically important in 91 (9%) of 1,023 reports. Of these, 3 were critical (demanding immediate action), 15 were major (implying a change in treatment), and 73 were intermediate (affecting subsequent investigations). | Not provided | Not provided | Low to moderate | In Geijer, 2018 |
| **Layfield and Frazier, 201714** | Random peer review (10% of all surgical pathology cases); nonrandom peer review (solicited review correlation of internal and external diagnoses; unsolicited correlation of internal and external diagnoses in cases sent for review at a second institution treating the patient; and review of all dermatopathology cases) | Descriptive analysis of retrospective data; all cases undergoing review by any of the four review protocols over a 1-year period were included | Department of Pathology and Anatomical Sciences at a university medical center, United States | The 10% random review detected 17 errors in 2,147 cases (0.8%); solicited case consultations detected 5 errors in 70 cases (7.1%); unsolicited reviews by outside institutions detected 3 errors in 190 cases (1.6%); and focused reviews of dermatopathology cases identified 5 errors in 59 cases (8.5%). | Not provided | Implementation associated with increased staffing needs, workload, and associated costs. | Moderate | None |
| **Lian et al., 201122** | Retrospective review by two subspecialists of initially double-read CT angiography studies (head and neck); initial studies read by a staff neuroradiologist alone, by staff and diagnostic radiology resident, and by staff and neuroradiology fellow | Descriptive analysis of retrospective data; 503 sequential neck and intracranial CTA studies performed over a 6-month period | Unspecified | Reviewed 503 studies; 144 were originally reported by a staff neuroradiologist alone, 209 by staff and a diagnostic radiology resident, and 150 by staff and a neuroradiology fellow. Twenty-six significant discrepancies were discovered in 20/503 studies (4.0%). | Not provided | Not provided | Moderate | In Geijer, 2018 |
| **Lindgren et al., 201425** | Retrospective interpretations of radiology studies (CT, MRI, and ultrasound abdominal studies) initially performed at an outside institution | Descriptive analysis of retrospective data; 398 abdominal imaging reinterpretations performed on 380 patients between 1/1/2010 and 7/15/2010 | Single hospital, United States | Three hundred ninety-eight report comparisons were reviewed on 380 patients. The initial report had 5.0% (20/398) high clinical impact interpretive discrepancies and 7.5% (30/398) medium clinical impact discrepancies. The subspecialized secondary report had no high clinical impact discrepancies and 8/398 (2.0%) medium clinical impact discrepancies. | Not provided | Not provided | Moderate | In Geijer, 2018 |
| **Murphy et al., 201021** | Prospective, blinded double-reporting of minimal-preparation CT colon (MPCTC) with discrepancies resolved by followup colonoscopies | Prospective cohort of 186 consecutive patients undergoing MPCTC for lower gastrointestinal symptoms | Single hospital; UK | Of the 186 imaging reports, 111 had at least one discrepancy (60%). Sixty-seven clinically relevant extracolonic lesions were identified (25 identified in one report, 42 in both), and 24 clinically relevant colonic lesions (7 in one report, 17 in both). Of the 17 colonic lesions reported by both radiologists, 5 were false positives as determined by normal colonoscopies. Of, the 7 reported by one radiologist, 1 was a biopsy-proved cancer. | Increased false-positives. Double- reporting found one extra-colonic cancer, but at the expense of five unnecessary endoscopic procedures. | Implementation associated with increased staffing needs, workload, and associated costs. | Low | In Geijer, 2018 |
| **Natarajan et al., 201723** | Retrospective reinterpretations by radiologists of plain radiographs initially read by pediatric orthopedists | Retrospective cohort; 1,570 consecutive pediatric orthopedic clinic patients with 2,509 radiographic studies during a 4-month period | Pediatric orthopedic clinic in an academic children’s hospital, United States | Of 2,264 radiographic studies reviewed by a radiologist, new, clinically important information was added in 23 (1.0%) of studies. In 38 (1.7%) of the studies, the radiologist review missed the diagnosis or clinically important information that could affect treatment. | Not provided | Implementation associated with increased staffing needs, workload, and associated costs. | Low to moderate | In Geijer, 2018 |
| **Onwubiko and Mooney, 201624** | Retrospective reinterpretations of pediatric trauma CT scans initially performed at outside institution | Descriptive analysis of retrospective data; 168 patients transferred with CT abdomen and pelvis scans performed at outside institutions | Level 1 pediatric trauma center, United States | Ninety-eight CT abdomen/pelvis scans were reinterpreted, with 12 new, clinically significant injuries detected. Three patients had solid organ injuries upgraded and four were downgraded to no injury. | Not provided | Implementation associated with increased staffing needs, workload, and associated costs. | Low to moderate | In Geijer, 2018 |
| **Raab et al., 200812** | Random peer review (5% of cases) and focused secondary review (known diagnostically challenging case types) of surgical pathology cases | Nonconcurrent cohort study; 7,444 cases from random review process and 380 cases reviewed using focused review process | Single site within a large multihospital system, United States | The numbers of errors detected by the targeted 5% random and focused review processes were 195 (2.6% of reviewed cases) and 50 (13.2%), respectively (p<.001). The numbers of major errors for the targeted 5% random and focused review processes were 27 (0.36%) and 12 (3.2%), respectively (p<.001). | Not provided | To promote efficiency, limit double reviews to certain study types that have the greatest risk of diagnostic errors. | Low to moderate | None |
| **Swanson et al., 201213** | Peer review of randomly selected radiology studies (4 cases/shift) and voluntary, nonrandom case review with feedback | Descriptive analysis; peer review reports on 5,278 radiologic studies (4,892 mandatory random review; 386 voluntary review) conducted over 4-year period | Large urban multidisciplinary children’s hospital, United States | The discrepancy rate was 3.6% between original interpretation and random peer review and 12% for the nonrandom review. | Not provided | Not provided | Moderate | None |