

Comparison of Error Detection Rates in Mandatory vs. Voluntary Professional Peer Review

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PURPOSE

Professional Peer review is an essential component to ensure consistent, high- quality radiology interpretations. Peer review implementations vary across institutions, using voluntary selection, predefined case lists or a mandatory randomized selection process. Voluntary submission systems can suffer from both positive and negative selection bias. By creating and implementing a mandatory and a optional voluntary process, we hoped to decrease selection bias and preserve a high rate of peer review. Following the interpretation of one million studies, the results of the two methods are compared.

METHODS

A custom-built electronic Professional Peer Review System, utilizing the American College of Radiology RADPEER™[1] scoring system was implemented within radiologist's workstation. In November 2010, this system was added to a pre-existing, voluntary peer-review system. The mandatory system was electively rolled out over 6 months after which time, radiologist participation was required. The system is, integrated into interpretation workflow . Cases to be peer reviewed are selected real-time from the comparison studies of the study currently under radiologist review. The system ensures each radiologist maintains a threshold of 5% over-read rate from the cases individually interpreted although the radiologists is excluded from mandatory review of prior studies they had interpreted.

Once designated as a "mandatory" QA study, the radiologist is required to submit a peer review event. Additionally, at any time, the radiologist may use the "voluntary" system to score a study not selected for the mandatory process. All QA events are stored in a secure SQL database. All QA submission of 2A or greater are further reviewed by peer review committee for final determination of the submitted discordance and scoring. Mammography studies and interventional radiology studies utilize an alternative peer review system and are exempt from this process[2].

RESULTS

- Study : 11/5/2010-3/31/2013 with 1.01 million interpreted studies.
- Mandatory (Prompted) Peer Review was introduced beginning 11/2010 which supplemented an implemented voluntary system.
- 124,114(12.4%) peer review events were recorded.
 - 62.6% voluntary and 37.4% mandatory peer review events.
- 121,756 events were in agreement – RADPEER™ 1 (Figure 2)
 - 97.63% for voluntary review and 98.89% for mandatory review
- Mandatory RADPEER™ >1 cases: 515 (1.11% of submissions)
- Voluntary RADPEER™ >1 cases: 1,843 (2.37% of submissions)
- With the introduction of the mandatory system the number of cases submitted through the voluntary system has decreased to current state of approximately equal number of mandatory and voluntary case submissions (Figure 1).

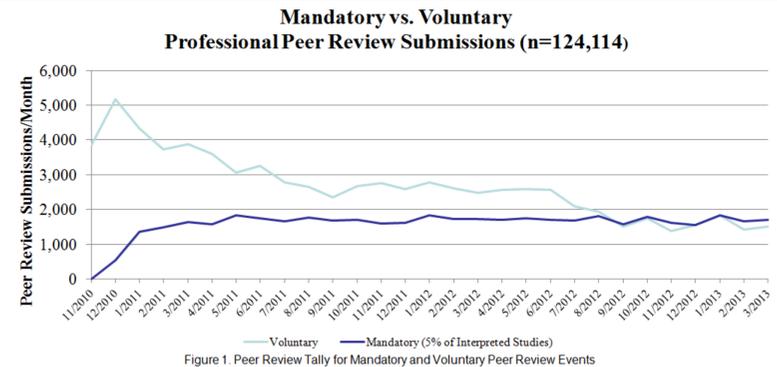


Figure 1. Peer Review Tally for Mandatory and Voluntary Peer Review Events

Voluntary (Non-Prompted) Submissions					Mandatory (Prompted) Submissions				
	1	2A	2B	3A	1	2A	2B	3A	3B
	75,880	711	298	357	45,876	263	88	106	45
	97.63%	0.91%	0.38%	0.46%	98.89%	0.34%	0.19%	0.23%	0.10%
	A + B%		1.30%		A + B%		0.53%		0.33%
	A+B Total		1,009		A+B Total		351		151
	4A	53	79		4A	8			
	0.07%	0.10%			0.02%				
	0.17%	0.17%			0.01%				
	132				13				
	2.37%				1.11%				
	1,843				515				
	77,723				46,391				
	62.62%				37.38%				

Figure 2. Peer Review Tally for Mandatory and Voluntary Peer Review Events – Submission scores represent opinion of submission radiologist prior to QA Committee review of submitted discordance.

Peer Review Process

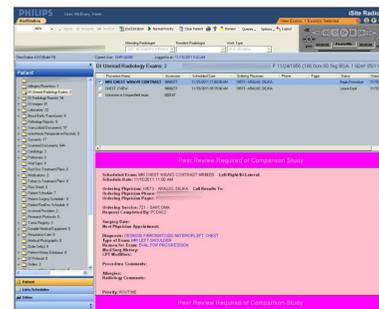


Figure 3. Screen alerts radiologist that peer review of comparison study required during interpretation.

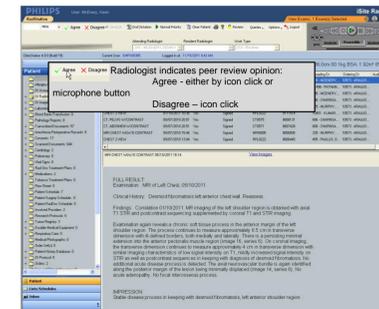


Figure 4. Radiologist click on prior reports folder and the report designated for peer review is displayed.

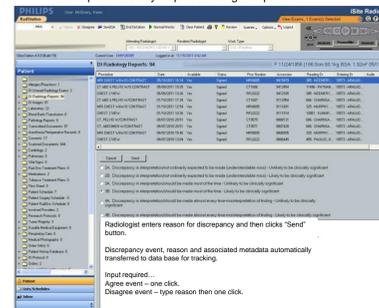


Figure 5. If "Disagree" opinion indicated, entry form appears with radiologist noting reason and severity score.

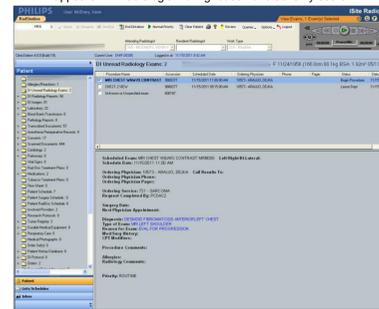


Figure 6. With peer review completed, eRequisition screen returns to standard colorization.

- Mandatory (prompted) cases are identified to maintain a 5% personal peer review submission rate for every radiologist.
- Voluntary peer review of comparison studies can be entered on any available study.
- Peer review of comparison studies identified from those performed within prior 18 months with signed report.
- Process active for all studies excluding mammography and interventional radiology procedures.
- Resident dictated studies excluded.
- Peer review event can be logged at any time during the interpretation process

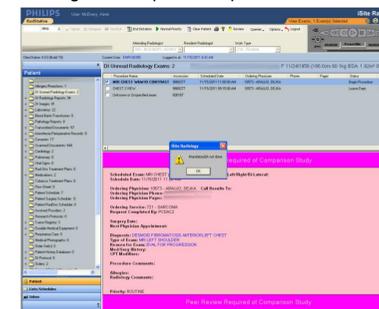


Figure 7. System displays interruptive alert if "End Dictation" clicked and peer review event not yet performed.

BENEFITS

- Assigned peer review eliminates potential for case selection bias of voluntary peer review process.
- Voluntary process remains available to supplement the mandatory process to per review non-assigned studies including a discordant prior interpretations.
- Process utilizes standard RADPEER™ scoring system
- Discordant studies further assessed by peer review process where all submission of 2A or greater are reviewed by sub-specialty section peer review group.

DISCUSSION

The difference in discordance rates between the voluntary (2.37%) and mandatory (1.11%) systems confirms a suspected submission bias for discordant cases of the voluntary system. While the voluntary rate is similar to other reports[3], this is likely an overestimate of the error rate as radiologists disproportionately report identified discordant cases and under report cases in agreement. The presumption is that radiologists are predisposed to interrupt an interpretation and take the necessary time to record a discordant interpretation while less likely to submit a voluntary peer review event when there is agreement with the prior interpretation.

As implemented, a mandatory (prompted) peer review system provides a more reliable assessment of the rate of discordant study interpretations. However, the availability of a voluntary (non-prompted) submissions provides an efficient and effective means to submit identified discordant cases into the peer review process.

CONCLUSION

An integrated system of professional peer review allows an efficient method of peer review submissions by radiologists in a high volume, tertiary referral clinical practice. The mandatory process ensures participation by all radiologists and mitigates case reporting bias of voluntary peer review systems. The discordance rate of a mandatory system likely provides a more accurate assessment of discordance rate especially in the context of a large percentage of peer review case submissions.

REFERENCES

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2. Gupta S, Patel J, McEnery KW, et.al. Early experience using an online reporting system for interventional radiology procedure-related complications integrated with a digital dictation system. *J Digit Imaging*. 2011; 24:672-9
3. Borgstede JP, Lewis RS, Bhargavan M, Sunshine JH, RADPEER Quality Assurance Program: A Multifacility Study of Interpretive Disagreement Rates. *J Am Coll Radiol* 2004;1:59-65.

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