



Cost Justification Model for AI Triage Tool Integration

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Background/Problem Being Solved

Artificial intelligence (AI) tools are increasingly adopted in radiology to enhance diagnostic accuracy, optimize workflows, and reduce turnaround times. However, the financial implications of AI implementation, including initial costs, operational savings, and return on investment (ROI), remain underexplored. Understanding these factors is essential for strategic planning and justifying the adoption of AI solutions in clinical settings.

Intervention(s)

This study evaluates the cost impact of integrating AI-based tools into radiology workflows across three domains: automated triage for critical findings, quality assurance (QA) of imaging protocols, and structured reporting enhancements. Data is collected from a large academic hospital that is implementing AI tools for these purposes.

Barriers/Challenges

There are certain challenges to doing a cost analysis. These include: Data

1. **Availability and Quality:** Access to accurate and comprehensive data on AI implementation costs, workflow metrics, and financial outcomes may be limited. Inconsistent documentation of AI tool performance and operational metrics can hinder analysis.
2. **Generalizability Across Institutions:** The findings may be specific to our institution, limiting the generalizability to other settings with different workflows, patient populations, or financial structures.
3. **Cost Attribution Complexity:** Distinguishing the financial impact of AI tools from other concurrent workflow changes, such as staffing adjustments or new policies, can complicate cost-effectiveness analysis.
4. **Lack of Long-Term Data:** Assessing ROI and cost-effectiveness requires longitudinal data, which may not be readily available since there are a lot of newly developed AI models in the past few years.

Outcome

We plan to analyze the cost associated with AI implementation including licensing fees, infrastructure upgrades, and personnel training, while financial benefits are assessed through metrics such as reduced reporting errors, improved radiologist productivity, and faster critical case turnaround. We also propose to conduct a time-motion study to measure workflow efficiency, and changes in reimbursement rates due to improved reporting quality are also evaluated.

Conclusion/Statement of Impact/Lessons Learned

Integrating AI into radiology workflows offers significant potential to enhance efficiency and improve patient outcomes. This study highlights the critical need for robust cost-benefit analyses to guide institutional decision-making and ensure sustainable AI adoption.

Keywords

Administration & Operations; Applications; Artificial Intelligence/Machine Learning; Clinical Workflow & Productivity; Enterprise Imaging; Quality Improvement & Quality Assurance