Compliant and Effective AI Integration in Middle Revenue Cycle Functions

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The integration of artificial intelligence (AI) into the revenue-cycle management of healthcare systems marks a transformative shift toward more efficient, accurate and streamlined operations, particularly in the middle revenue cycle. According to a recent report, the AI-in-healthcare market is projected to reach $45.2 billion by 2026, growing at a compound annual growth rate (CAGR) of 44.9%.[1] As AI technology continues to evolve, healthcare organizations are already piloting AI in coding, documentation and billing. Early results are mixed but show some positive productivity gains in many cases. This also highlights the importance of rigorous validation, workflow design and compliance oversight before these tools are scaled.

Practical Steps for Internal Audit	
Develop a dedicated audit program	Establish a comprehensive AI-in-Revenue-Cycle audit program that covers compliance, operational resilience, model risk, information security and ethics.
Align with a three-lines model	Clearly define management's ownership of controls, risk/compliance oversight, and internal audit (IA) assurance activities.
Map end-to-end workflows	Chart processes such as pre-bill edits, claim scrubber, and coder review to pinpoint where AI makes decisions and where human review is necessary.
Adopt a risk-based sampling strategy	Use sampling based on encounter type, dollar materiality, and payer; expand coverage for new or high-variance AI use cases.
Include model lifecycle controls	Monitor controls such as data governance, feature management, versioning, change control, validation and post-deployment monitoring.
Report using balanced scorecards	Report on accuracy, throughput, denial trends, compliance exceptions, and staff adoption; track management action plans for continuous improvement.

However, while the benefits are significant, the adoption of AI also introduces complex challenges that must be navigated carefully. Key among these is compliance with stringent healthcare regulations, adherence to ethical standards, and maintaining the effectiveness of AI systems. If not implemented with precision and ongoing oversight, these technologies

[1] "Artificial Intelligence in Healthcare Market Worth $45.2 Billion by 2026 – Exclusive Report by MarketsandMarkets." PR Newswire, June 9, 2020. Accessed August 7, 2025. https://www.prnewswire.com/news-releases/artificial-intelligence-in-healthcare-market-worth-45-2-billion-by-2026---exclusive-report-by-marketsandmarkets-301072636.html

could lead to risks such as privacy breaches, biased decision making, financial discrepancies, or even potential patient-safety issues, all of which could undermine the trust and integrity of healthcare institutions.

Thus, it is crucial for healthcare leaders to approach AI integration with a balanced perspective, focusing on maximizing benefits while diligently mitigating potential risks. Given the importance of getting it right when it comes to making an investment in AI, internal audit (IA) should play a key role in assessing holistically how effectively AI initiatives are undertaken, as well as evaluating any risk-mitigation measures.

AI can significantly enhance various aspects of the revenue cycle in healthcare, including health information management (HIM), medical coding, clinical documentation integrity (CDI) and case management. Below are select examples of AI use cases in these areas by revenue-cycle function:

- **Health information management:** AI can automate the categorization and indexing of medical records, improving the speed and accuracy of retrieving patient information. AI tools can also identify and correct inconsistencies or errors in patient data, ensuring high-quality information for clinical and billing purposes.
- **Medical coding:** AI systems can interpret clinical documentation and automatically assign correct billing codes, reducing human error and increasing coding throughput. Strong use cases are made for outpatient services such as emergency department visits, radiology and imaging, and time-based behavioral health services. However, technology is rapidly evolving to automate even complex inpatient cases. In practice, early adopters often run dual coding (AI vs. human) to validate compliance with ICD-10, CPT, and Centers for Medicare and Medicaid Services (CMS) requirements before automating at scale.
- **Clinical documentation integrity**: AI can use natural language processing (NLP) to scan concurrent medical records proactively and identify documentation with the most optimal provider query opportunities, even suggesting query content, allowing team members to manage their time more effectively for the greatest impact.

AI poses a significant opportunity for revenue-cycle functions (especially within middle revenue cycle functions like CDI and coding), as it can help organizations decrease operational costs, increase reimbursement and enhance the quality of the coded medical record. However, it also poses significant potential problems for provider organizations, including compliance risks, ethical implications and potential to recommend significant financial investments that would bring poor results. Select, salient risks include:

- **Data security and privacy risks:** AI systems typically rely heavily on large volumes of protected health information (PHI). There is a risk of data breaches or unauthorized access, which can lead to severe privacy violations and legal repercussions. If an AI tool managed by a third party is hacked, unauthorized

individuals could access patient accounts, leading to potential misuse of financial information.

- **Compliance risks:** AI must operate within a patchwork of various regulations, such as state laws aimed at restricting certain uses of AI in healthcare, as well as guidelines from the CMS. Failure to comply can lead to significant fines and penalties. For example, organizations that automate coding without maintaining compliance checkpoints have seen incorrect claims and subsequent payer audits. It is not enough to trust vendor assurances; ongoing validation by HIM and compliance teams is essential.
- **Operational risks:** Dependence on AI can lead to operational risks, particularly if the AI system experiences downtime or errors that disrupt revenue-cycle processes and result in delays in cash collection and loss of reimbursement. Also, integrating AI into existing workflows can disrupt established processes, leading to confusion and inefficiency. Real-world pilots show that when AI tools require significant workflow change, coders and CDS professionals may resist adoption, leading to delays and higher initial error rates. Aligning technology to current processes – or redesigning workflows with expert input – is critical. It is important to remember that these tools require significant financial investment, and if they are not operating smoothly or if they are negatively impacting human workflow (e.g., work conducted by certified coders or CDS nurses), this can compound the net initial losses associated with the tool's implementation.
- **Ethical risks:** There are numerous and serious ethical implications for the use of AI in determining patient care and associated costs that could potentially result in redundancies with human revenue-cycle professionals. For example, AI algorithms can inherit or even amplify biases present in the training data, potentially leading to unfair treatment of certain patient groups (e.g., race, gender, sexual orientation) or inaccurate decision making. Additionally, AI systems can sometimes operate as "black boxes," where the decision-making process is not transparent. This lack of transparency can make it difficult to assess fairness and can erode trust among patients, the community and healthcare provider organizations.

Internal audit's role in successful AI implementation

Given the significant potential risks and rewards associated with implementing AI within the revenue cycle, a collaborative effort among operational, clinical and risk-mitigation leaders is critical to a successful implementation. IA plays a pivotal role in mitigating potential risks associated with the implementation of AI in the revenue-cycle space. By acting as an independent and objective assurance function, IA can proactively identify potential risk areas in AI systems and ensure that they align with compliance, operational efficiency and ethical standards.

Equally important is operational validation: coding and CDI leaders or third parties can confirm whether AI-driven outputs are accurate in practice, whether human oversight mechanisms are functioning effectively, and whether workflows support adoptions

without bottlenecks or inefficiencies. Additionally, IA can examine data security protocols to ensure patient information is safeguarded against breaches and unauthorized access, especially given the sensitive nature of healthcare data. Through regular audits and risk assessments, IA can provide actionable recommendations to strengthen controls and optimize the use of AI technologies.

To assess risk mitigation strategies effectively, Internal Audit leadership should not only ask operational leaders targeted questions that surface key risk areas, but should also design audit procedures that validate the existence, effectiveness and consistency of controls. The following examples illustrate how these questions and audit steps can be applied in practice.

Risk area: AI-generated coding compliance

Risk statement: AI-generated coding may introduce compliance risks if outputs do not align with current billing regulations (e.g., ICD-10, CMS guidelines), potentially leading to inaccurate claims, denials or regulatory scrutiny.

Audit objective: To evaluate whether AI-generated coding decisions are compliant with applicable billing regulations and whether appropriate oversight, validation and corrective mechanisms are in place.

Audit checklist:

1. Dual-coding validation
    - Confirm periodic dual-coding (AI vs. certified coder) using statistically valid samples
    - Define frequency (e.g., weekly during pilot; monthly post-go-live) and acceptance thresholds (e.g., ≥ 95% exact-code match)
2. Regulatory alignment
    - Verify coding against ICD-10-CM/PCS, CPT/HCPCS, NCCI edits, LCD/NCD rules, and CMS transmittals
    - Ensure documented processes exist to update models with regulatory changes
3. Governance and oversight
    - Review ownership of coding policies, model update approvals, and exception handling protocols
    - Confirm logging of overrides and decision rationales
4. Error monitoring and remediation
    - Inspect error logs and trend analyses (e.g., DRG shifts, modifier misuse)
    - Validate root-cause analysis and timely corrective actions
5. Claim scrubber integrity
    - Ensure pre-bill edits remain active post-AI implementation
    - Confirm AI outputs do not bypass established controls

6. Vendor accountability
    - Review SLAs for validation support, regulatory monitoring and change transparency
    - Examine evidence of recent model updates and backtesting
7. Segregation of duties
    - Assess separation between model tuning, release management and production approval
    - Confirm peer review and auditability of changes
8. Staff competency and escalation
    - Evaluate training of coders reviewing AI output
    - Confirm escalation paths for low-confidence or flagged outputs

Example audit procedures:

- Recode comparison
    - Select a stratified random sample of AI-coded encounters across settings (e.g., ED, radiology, inpatient) and re-code independently
    - Compare variances by code class and financial impact
- DRG validation
    - Re-perform DRG assignment on inpatient cases to assess accuracy of principal diagnosis, CC/MCC capture and POA indicators
- Denial traceback
    - Trace a recent CMS or Medicare Advantage denial to determine AI's role in the error
    - Verify remediation and model update documentation
- Training effectiveness
    - Review training materials and job aids
    - Conduct brief interviews with coders/CDI specialists to confirm understanding of AI outputs and accountability

Risk area: Bias prevention and fairness monitoring

Risk statement: AI tools used in clinical decision support (CDS), coding and billing may unintentionally perpetuate bias or inequities if not properly designed, trained and monitored. Operational risks include poor user adoption due to lack of training, while ethical risks stem from biased outputs affecting patient care or reimbursement.

Audit objective: To evaluate whether appropriate controls are in place to prevent bias in AI algorithms and ensure fairness in decision making across patient demographics, while also confirming that staff are adequately trained and supported in using AI tools responsibly.

Audit checklist:

1. Fairness objectives and metrics
    - Confirm documented fairness goals (e.g., disparate impact ratios, parity in false positives/negatives)
    - Ensure alignment with clinical and billing use cases
2. Disparity testing
    - Verify periodic testing across demographics (race, ethnicity, age, sex/gender, language, payer type, SDOH)
    - Check for documented thresholds and action plans
3. Dataset representativeness
    - Assess diversity in training/validation datasets
    - Review data provenance, de-identification methods, and approval processes
4. Bias mitigation techniques
    - Evaluate pre-processing controls (e.g., rebalancing, feature selection)
    - Review post-processing calibrations to correct for bias
5. Explainability and escalation
    - Confirm use of explainability tools (e.g., feature attribution) accessible to coders/CDI
    - Verify existence of a documented appeal/escalation process
6. Governance and oversight
    - Check for an AI ethics or model risk committee with cross-functional representation (HIM, Compliance, Clinical, IT, IA)
    - Review meeting minutes for bias-related discussions
7. Monitoring and drift detection
    - Verify continuous monitoring for data/model drift and concept drift
    - Confirm triggers for retraining and rollback procedures

Example audit procedures:

- Training and support evaluation
    - Review training materials for CDS, coders, and HIM professionals
    - Interview staff to assess role-specific education and post-training support availability
- Fairness assessment validation
    - Obtain the last two fairness reports
    - Recalculate one metric (e.g., selection rate ratio) using raw model outputs to validate accuracy
- Bias remediation review
    - Inspect a change ticket where bias was identified
    - Confirm remediation steps: dataset revision, redeployment, and post-fix monitoring

- Model design scrutiny
    - Interview model owners about excluded variables (e.g., race) and proxy features
    - Verify that justifications are documented and approved

Risk area: AI lifecycle development and testing

Risk statement: AI solutions, whether developed in-house or customized from vendor platforms, require rigorous lifecycle management to ensure they are safe, effective, and aligned with organizational goals. Risks include inadequate stakeholder involvement, poor testing protocols and lack of controls around deployment, which can lead to operational failures, compliance issues or unintended consequences.

Audit objective: To assess whether the organization's AI development and testing processes include appropriate stakeholder engagement, documented standards, robust validation and controlled deployment procedures that mitigate risk and ensure accountability.

Audit checklist:

1. Stakeholder inclusion
    - Confirm involvement of Compliance, HIM/Coding, CDI, Clinical, IT/Security, Privacy, Revenue Integrity, and IA
    - Review RACI matrix for AI development and deployment activities
2. Model development standards
    - Verify documentation of problem definition, data selection criteria, labeling protocols, performance targets and fairness metrics
3. Independent validation
    - Confirm use of hold-out testing and cross-site validation (if applicable)
    - Check for second-line or third-party review prior to go-live
4. User acceptance testing (UAT)
    - Review UAT plans involving coders/CDI
    - Validate that defects are logged, prioritized and resolved with evidence before promotion
5. Release management
    - Assess version control practices and rollback plans
    - Confirm communication of changes to end users, including effective dates and impact summaries

Example audit procedures:

- Stakeholder engagement review
    - Examine project documentation to confirm stakeholder involvement across phases

    - Interview representatives from Compliance, Clinical, and Revenue Integrity to validate participation
- Development standards validation
    - Review model documentation for completeness: problem statement, data sources, labeling quality controls and performance benchmarks
- Testing protocols
    - Inspect validation reports for evidence of hold-out testing and cross-site comparisons
    - Confirm that independent reviewers signed off prior to production deployment
- UAT evidence
    - Obtain UAT logs and defect tracking reports
    - Verify resolution of critical issues before go-live
- Release controls
    - Review version history and rollback procedures
    - Check communications sent to end users regarding model updates and expected changes

Risk area: Performance monitoring and contingencies

Risk statement: AI systems used in coding, billing and clinical decision support must be continuously monitored to ensure accuracy and reliability. Without proper oversight and contingency planning, organizations risk operational disruptions, financial inaccuracies, and erosion of trust in AI outputs.

Audit Objective: To evaluate whether the organization has implemented effective performance monitoring mechanisms and contingency plans that ensure continuity, accuracy and transparency in AI-supported processes.

Audit checklist:

1. Real-time monitoring
    - Confirm existence of dashboards tracking accuracy, edit/denial rates, coder overrides and AI confidence scores
    - Verify thresholds and alert mechanisms for anomalies or performance degradation
2. Contingency planning
    - Review documented playbooks for system outages or accuracy issues
    - Validate criteria for switching to manual or dual coding and reconciliation procedures
3. Explainability tools
    - Assess availability of tools that allow users to interrogate AI outputs
    - Review metrics on usage and outcomes of challenges or overrides

4. Post-implementation reviews
    - Confirm periodic reviews comparing pre- vs. post-AI KPIs
    - Validate independent assessments of reported benefits and performance

Example audit procedures:

- Dashboard review
    - Inspect monitoring dashboards for real-time metrics and alert configurations
    - Test alert functionality by simulating threshold breaches.\
- Contingency playbook validation
    - Obtain and review contingency documentation
    - Interview operational leads to confirm awareness and readiness to execute fallback procedures
- Explainability access
    - Verify that coders and reviewers have access to explainability tools
    - Review logs of tool usage and outcomes of overridden decisions
- Performance comparison
    - Analyze pre- and post-AI performance reports
    - Confirm that independent validation was conducted and documented

Where to begin

Organizations that succeed with AI don't just deploy technology – they build trust, resilience and accountability around it. Internal Audit can play a pivotal role in this transformation by helping healthcare leaders move from experimentation to assurance.

Here's how to get started:

- **Start with a focused pilot.** Target high-impact areas like outpatient ED coding or CDI workflows where AI can be tested in a controlled environment

- **Audit the ecosystem, not just the tool.** Evaluate surrounding workflows, governance, and user roles to ensure AI is enhancing—not complicating—operations

- **Validate independently and continuously.** Run AI in parallel with human review during pilots. Require third-party validation to confirm accuracy, fairness and compliance, especially when vendors are involved

- **Embed governance early.** Establish cross-functional oversight committees with HIM, Compliance, Finance, Clinical, IT, and Internal Audit to guide AI strategy and monitor risks

- **Measure what matters. Go beyond cost savings.** Track improvements in denial rates, query quality, coding accuracy and staff satisfaction to assess true ROI

By asking the right questions and applying structured audit procedures, Internal Audit can help healthcare organizations proactively identify gaps, strengthen controls and ensure AI delivers on its promise. Done right, AI in the middle revenue cycle becomes not just a tool, but a catalyst for smarter, safer and more equitable healthcare operations.

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