



# Medical Billings in the Context of AI

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## Executive Summary

This report explores the transformative potential of Artificial Intelligence (AI) in revolutionizing medical billing processes worldwide. As healthcare systems face increasing complexities and challenges, AI offers innovative solutions to streamline billing operations, enhance accuracy, and improve financial outcomes. By automating the claims processing workflow, AI can significantly reduce the administrative burden on healthcare providers, allowing them to focus more on patient care.

AI-powered coding accuracy systems can analyze medical records and suggest appropriate billing codes, reducing coding errors and claim rejections. AI can also optimize reimbursement strategies by analyzing historical data and identifying patterns to ensure optimal reimbursement rates for healthcare providers. To address the growing concern of healthcare fraud, AI algorithms can analyze vast amounts of data, detect suspicious patterns, and flag potentially fraudulent activities, thus preventing financial losses. Moreover, AI-powered chatbots and virtual assistants can enhance patient engagement by providing personalized support, answering billing-related queries, and guiding patients through the payment process. Adoption of AI in medical billing brings various benefits, it also presents challenges such as data privacy, algorithm bias, and the need for robust infrastructure and training.

Successful case studies from various healthcare settings worldwide demonstrate the tangible advantages of AI implementation, such as reduced billing errors, accelerated reimbursement cycles, and improved patient satisfaction. By harnessing the power of AI, healthcare systems can achieve greater efficiency, financial sustainability, and improved patient experiences.

Medical billing encompasses the crucial process within the healthcare industry involving the management of claims to insurance companies, as well as government-sponsored healthcare programs for services rendered to patients. Billing plays a critical role in the fluidity of timely and accurate reimbursements for services and products that primary healthcare providers deliver. On the financial side, medical billing describes a series of tasks, including recording, processing, and billing for healthcare services provided for patients.

## Current Medical Billing Process

**The medical billing process can be broken down into several distinct steps:**

- 1. Demographic Information Collection:** The process begins with the patient's registration, during which their personal and insurance information is gathered. This includes details such as name, address, date of birth, insurance coverage, and any relevant policy numbers.
- 2. Insurance Verification:** Once the patient's information is collected, healthcare providers verify the patient's insurance coverage and eligibility. This step ensures that the patient's insurance plan covers the services provided and helps avoid potential billing issues later on.
- 3. Documentation of Services:** Healthcare providers document the services rendered during the patient encounter. This includes recording the diagnoses, procedures, treatments, medications



administered, and any other relevant information using standardized medical codes.

4. **Coding:** After documenting the services, the next step involves assigning appropriate codes to each service or procedure performed. These codes accurately describe the medical services provided and facilitate communication between healthcare providers, insurers, and other stakeholders.
5. **Claim Creation:** Once the services are coded, they are compiled into a claim form along with the patient's demographic information, insurance details, and any supporting documentation required for reimbursement. This claim is then submitted to the patient's insurance company or payer for processing.
6. **Claim Submission:** The completed claim form is submitted electronically or via mail to the patient's insurance company or payer. Electronic submission is the preferred method as it expedites the processing time and reduces the likelihood of errors.
7. **Adjudication:** Upon receipt, the insurance company or payer reviews the claim through a process known as adjudication. During adjudication, the claim is assessed for accuracy, completeness, and compliance with insurance policies and regulations. The insurer may request additional information or clarification if needed.
8. **Payment Posting:** If the claim is approved, the insurance company issues payment to the healthcare provider for the services rendered. The payment is typically posted to the provider's account, and the patient's financial responsibility, such as deductibles or co-payments, is also recorded.
9. **Denial Management and Appeals:** In cases where the claim is denied or rejected, healthcare providers engage in denial management and

appeals processes to rectify errors and secure rightful reimbursement.

This may involve providing additional documentation, correcting coding errors, or appealing the decision through formal channels.

10. **Patient Billing and Follow-Up:** Finally, once the insurance portion is settled, any remaining balance or patient responsibility is billed to the patient.

### There are some common errors in the current medical billing process.

1. **Coding Errors:** Incorrect assignment of procedure or diagnosis codes can lead to claim denials or underpayment. This can occur due to insufficient documentation, misinterpretation of medical records, or lack of coding proficiency.
2. **Incomplete or Inaccurate Documentation:** Insufficient documentation of medical services provided can result in claim denials or delays in reimbursement. Missing information such as patient demographics, treatment dates, or medical necessity can lead to billing errors.
3. **Insurance Verification Issues:** Failure to verify patient insurance coverage and eligibility accurately can result in claim denials or delays in reimbursement. This includes errors in policy numbers, coverage limitations, or outdated insurance information.
4. **Duplicate Billing:** Billing for the same service or procedure multiple times can result in overbilling and potential accusations of fraud. This often occurs due to system errors, billing software glitches, or human oversight.



5. **Upcoding or Unbundling:** Upcoding involves billing for a more expensive service or procedure than what was actually provided, while unbundling involves billing separately for services that should be billed together as a single procedure. Both practices can result in overbilling and may constitute healthcare fraud.
6. **Failure to Follow Insurance Guidelines:** Non-compliance with insurance company guidelines and policies, such as pre-authorization requirements or coverage limitations, can lead to claim denials or partial reimbursement.
7. **Timeliness Issues:** Delays in claim submission or follow-up can result in missed deadlines and lost revenue opportunities. Timely filing requirements vary by insurer and failure to adhere to deadlines can lead to claim denials.
8. **Denial Management:** Inadequate follow-up on denied claims or lack of understanding of denial reasons can result in revenue loss. Failure to appeal denied claims in a timely and effective manner can also impact reimbursement.
9. **Patient Billing Errors:** Inaccuracies in patient billing, such as incorrect billing amounts, failure to apply insurance payments correctly, or miscommunication of financial responsibilities, can lead to patient dissatisfaction and payment delays.
10. **Regulatory Compliance Issues:** Non-compliance with healthcare regulations and billing standards, such as HIPAA regulations or Medicare billing guidelines, can result in penalties, audits, and legal repercussions.

## How AI can improve these problems

1. **Coding Errors:** AI-powered coding assistance tools can help healthcare professionals accurately assign procedure and diagnosis codes by analyzing patient records and suggesting appropriate codes based on clinical data.
2. **Incomplete or Inaccurate Documentation:** Natural Language Processing (NLP) algorithms can review clinical documentation and identify missing or inaccurate information, prompting healthcare providers to update records before billing.
3. **Insurance Verification Issues:** AI-driven systems can automate insurance verification processes by cross-referencing patient data with insurance databases in real-time, reducing errors in coverage verification and eligibility checks.
4. **Duplicate Billing:** AI algorithms can flag potential duplicate billing instances by comparing billing records and identifying repetitive patterns, reducing the risk of overbilling and fraud.
5. **Upcoding or Unbundling:** AI-powered auditing tools can analyze billing data to detect instances of upcoding or unbundling by comparing billed services to standard billing practices and guidelines.
6. **Failure to Follow Insurance Guidelines:** AI-driven decision support systems can alert healthcare providers to insurance company policies and guidelines during the billing process, ensuring compliance with pre-authorization requirements and coverage limitations.



7. **Timeliness Issues:** AI-based scheduling and workflow optimization tools can help streamline the billing process, ensuring timely claim submission and follow-up to meet insurer deadlines.
8. **Denial Management:** AI-powered analytics platforms can analyze denial trends and reasons, enabling healthcare organizations to identify and address root causes more efficiently and streamline the appeals process.
9. **Patient Billing Errors:** AI-driven billing platforms can automate patient billing processes, accurately calculating billing amounts, applying insurance payments correctly, and providing clear communication of financial responsibilities to patients.
10. **Regulatory Compliance Issues:** AI-based compliance monitoring systems can continuously assess billing practices against regulatory standards, flagging potential violations and providing recommendations for corrective action to ensure adherence to healthcare regulations and billing guidelines.
11. **Advanced Analytics and Predictive Modeling:** AI-based medical billing systems eliminate repetitive and manual work, boost productivity, automate processes, and, therefore, cut expenses for medical organizations. Through the application of AI algorithms, the systems take care of billing errors by promptly identifying inconsistencies in claim submissions, thus ensuring optimal revenue generation and the least financial loss.
12. **Collaborative Ecosystems:** The introduction of AI in medical billing forges an alliance of all the stakeholders, including healthcare providers, payers, technology vendors, and regulatory bodies among others, which is an ecosystem of knowledge sharing and best practice development. By means of such collaboration the stakeholders in unison innovate, solve common problems and guide the medical billing industry towards effective, responsible and beneficial AI use.
13. **Global Adoption and Standardization:** Healthcare organizations and billing systems need to embrace the AI globally while there should be developed standards and guidelines which will ensure the interoperability among different healthcare systems in the world. Therefore, providing concrete foundation for mutual cooperation and simultaneous AI component availability and integration on the global level will boost the collective power of AI advantages for countries from different regions of the world.
14. **Enhanced Revenue Cycle Management:** AI allows health organizations to improve revenue cycle management by assessing billing information and predicting the revenue result. AI algorithms are capable of rapidly processing massive amounts of data which offers valuable coding trends, reimbursement patterns, and payer insights allowing the organizations to actively identify those opportunities for revenue enhancement and efficiently optimize the billing strategies.
15. **Improved Efficiency and Cost Savings:** AI engineered medical billing solutions secure workflows, task wheel, and administrative duties, resulting in increased efficiency and cost savings for



healthcare organizations. AI-based innovative approaches allow the automation of laborious processes, eliminate manual errors, and provide real-time feedback, resulting in the

maximization of revenue generation and the minimization of losses.

## AI can be applied across the payment integrity value chain

| Area                   | Payment integrity (PI) capabilities                            | Data sources  |
|------------------------|--|---|
| 1.1<br>Efficiency      | Claims editing   | Improved detection of fraud, waste, and abuse                                 |
|                        | Coordination of benefits                                       | Accelerated coordination of benefits process                                  |
|                        | Care delivery organization audit (including prebill discovery) | More-accurate determination of coding errors                                  |
| 1.2<br>Clinical        | Clinical or coding review                                      | Increased consistency and efficiency of clinical coding review                |
|                        | Complex clinical review  | Accelerated review or audit of complex claims                                 |
| 1.3<br>Data & Networks | Data mining  | More-accurate algorithms to analyze large data sets and support PI activities |
|                        | Subrogation  | Automation of notices to stake holders involved in subrogation                |
|                        | Network repricing  | Streamlined and easier network pricing process                                |