ACCELIRATE
Accelerating Automation & AI

Healthcare Revenue Cycle Innovation

The Agentic Engine for Precision Patient Billing

A full-stack platform of specialized agents that pre-validate compliance, reconcile every EOB down to the penny, and post payments instantly with transparent, auditable control.

Executive Summary

Patient billing sits at the critical intersection of healthcare delivery, finance, and patient experience. For providers, it represents the final step in the revenue cycle converting care delivered into revenue collected. For patients, it is often the most visible and sensitive touchpoint with their healthcare provider.

Today's billing processes rely heavily on manual reconciliations, fragmented systems, and limited validation. These inefficiencies lead to delayed or inaccurate statements, increased call center volumes, and uncollected balances that can exceed industry norms. The result is lower patient trust, increased write-offs, and unnecessary operating costs.

Key Challenges

- Manual reconciliations
- Fragmented systems
- Limited validation
- High call volumes

Agentic Automation Solution

Combining AI-driven agents with RPA and human oversight provides an opportunity to transform patient billing. Specialized agents can:

- ✓ Validate adjudication outcomes against payer rules and GFEs
- ✓ Generate accurate, patient-friendly statements
- ✓ Automate payment allocation and reconciliation
- ✓ Manage exceptions and escalate only when needed

By introducing this modular, agent-based approach, providers can expect measurable outcomes: improved collections, reduced call center demand, faster resolution of billing disputes, and enhanced patient satisfaction. A targeted pilot focusing on one payer and one service line will validate the approach, with expected benefits of 10–20% uplift in collections and 20–40% reduction in billing-related inquiries.

10–20%
Expected uplift in collections

20–40%
Reduction in billing-related inquiries

Current Challenges in Patient Billing

Staffing & Operational Burden

- Chronic shortages and high turnover in billing departments.
- Manual steps in statement generation, posting, and patient communication consume hours daily.

Compliance & Regulatory Pressure

- Regulations such as the No Surprises Act and Good Faith Estimates (GFEs) require transparent, accurate, and timely statements.
- Misbilled accounts expose providers to penalties, legal risk, and reputational harm.

Payer–Provider Friction

- Discrepancies between insurer adjudications and patient responsibility create confusion.
- Inconsistent CARC/RARC mapping leads to downstream billing errors.

Financial Impact

- **Up to 20–30% of patient balances go uncollected** due to delays, unclear bills, or dissatisfaction.
- Billing errors increase call center volumes, costing millions in staffing.
- Rising bad debt and charity care threaten already thin provider margins.

How Agentic Automation Transforms Patient Billing

Agentic automation creates a closed-loop, intelligent billing process:

RPA Automates

structured tasks such as data extraction, statement generation, and portal uploads.

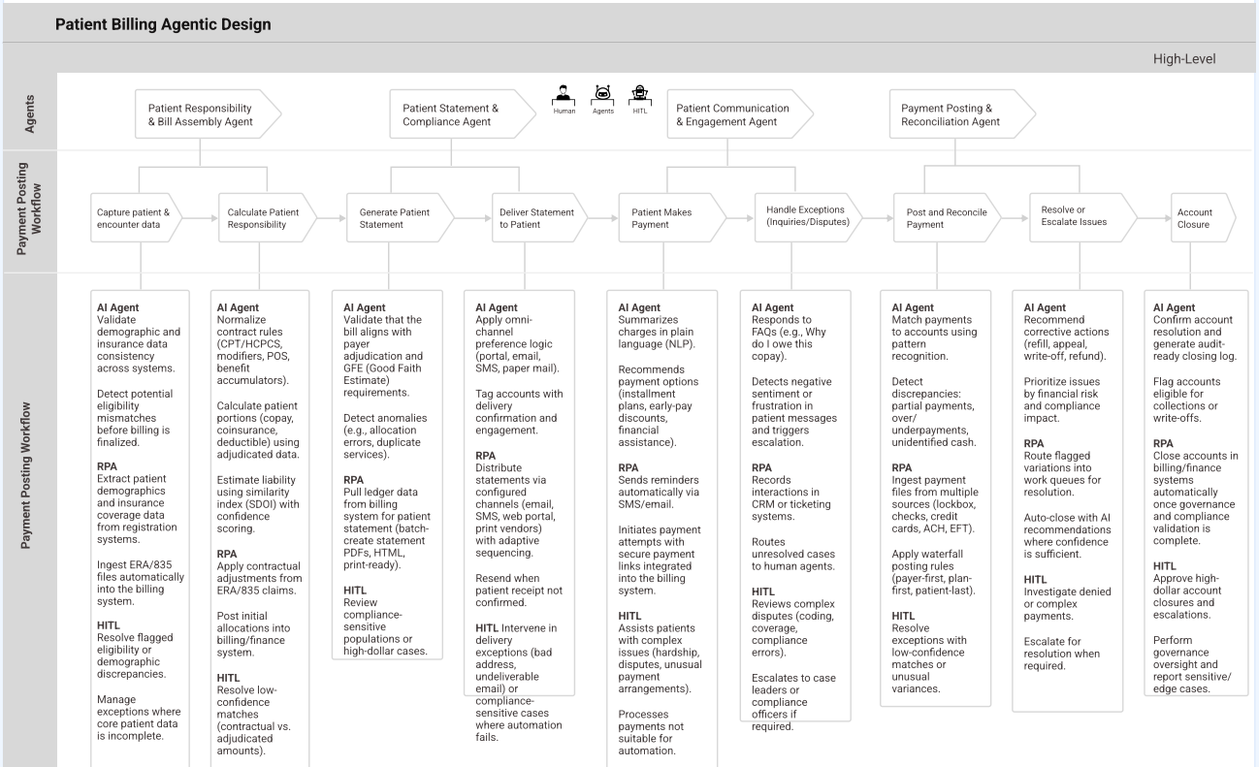
AI Agents

interpret payer adjudications, validate compliance, personalize communication, and predict payment behaviors.

Humans Govern

exceptions, handle high-complexity cases, and maintain patient relationships.

The outcome: fewer errors, faster billing cycles, improved patient trust, and lower cost-to-collect



Next-Generation Patient Billing Automation Agents

1 Patient Responsibility & Bill Assembly Agent

Purpose

- Calculate accurate patient responsibility post-adjudication.
- Assemble a reconciled bill package.
- Recommend payment allocations to minimize unapplied cash.

Augments

Billing Specialists, Claims Post-processors, Payment Posting Clerks.

Inputs

ERA/835, encounter detail, fee schedules, benefit accumulators, prior payments, payment metadata.

Outputs

Patient responsibility ledger (JSON), audit metadata, suggested payment allocations with confidence scores.

Key Functions

- Normalize contract rules.
- Calculate copay/coinsurance/deductible.
- Compare to GFE/price transparency baseline.
- Generate audit-ready ledger JSON.
- Match payments to accounts (oldest-first, plan-first, patient preference).
- Flag unapplied cash and variances.

Decision Logic

- ≥95% confidence allocation → auto-post.
- 70–95% → supervised post.
- <70% → human review.
- High balances (≥$1k) → send to Assistance Agent.
- GFE variance >10% → escalate to Compliance.

Key Performance Indicators

Statement accuracy%	% bills auto-assembled	% auto-applied payments	Adjudication-to-bill time	Reduction in unapplied cash

2 Statement Generation & Compliance Agent

Purpose

- Produce compliant, patient-friendly statements.
- Ensure regulatory and GFE compliance.
- Monitor anomalies and create audit-ready packs.

Augments

Billing Specialists, Revenue Integrity, Compliance Teams.

Inputs

Ledger JSON, patient contact preferences, regulatory templates, GFE data, audit rules.

Outputs

Channel-ready statements, compliance validation report, exception queue with evidence bundles.

Key Functions

- Validate bill vs GFE/regulations.
- Populate plain-language templates.

Decision Logic

- Hold/escalate if GFE mismatch, disclosure missing, or anomaly detected.

- Deliver via omni-channel (email, SMS, portal, print).
- Detect mismatches, allocation errors, missing disclosures.
- Generate audit-ready documentation.

- Prioritize exceptions by financial/regulatory risk.

Key Performance Indicators

First-bill pay rate	% statements auto-generated.	Compliance exceptions per 1,000 statements	Time-to-resolve anomalies.

3 Patient Communication & Engagement Agent

Purpose

- Personalize patient outreach.
- Reduce call volume by providing clear digital communications.
- Escalate unresolved or complex cases to humans.

Augments

Call Center Staff, Financial Counselors.

Inputs

Statement metadata, demographics, payment options, patient behavior history.

Outputs

Personalized reminders/ offers, call scripts, engagement dashboards.

Key Functions

- Summarize charges in plain language (NLP).
- Segment patients and tailor payment options.
- Send reminders with secure payment links.
- Track engagement and trigger escalation if low response.

Decision Logic

- Escalate to human if no response after N attempts, or low propensity-to-pay score.

Key Performance Indicators

Digital self-pay conversion %	Call volume reduction %	Average time-to-first-payment

4 Payment Posting & Reconciliation Agent

Purpose

- Capture and apply patient payments from all sources in real time.
- Reconcile partial payments, unapplied cash, and overpayments.
- Generate audit-ready records and refund recommendations.

Augments

Cash Application Clerks, Billing Specialists, Revenue Cycle Staff.

Inputs

Payment files (lockbox, online, checks, credit cards), ERA/835 data, account ledger, posting rules.

Outputs

: Reconciled accounts, refund recommendations, compliance justification logs, updated financial system records.

Key Functions

- Match payments to the correct accounts and open balances.
- Apply business rules (oldest-first, plan-first, patient-preference logic).
- Reconcile discrepancies (partial payments, overpayments, unapplied cash).
- Generate compliance-ready refund recommendations.

Decision Logic

- ≥95% match confidence → auto-post.
- 70–95% confidence → supervised post.
- <70% confidence → escalate to human for review.

- Post reconciled data into billing/finance systems.

Key Performance Indicators

% of payments auto-applied	Reduction in unapplied cash	Payment posting turnaround time	Refund cycle time

End-to-end: Current State → Future State (focus: billing posting)

Current State (Manual-Heavy)

1. Billing clerks manually compile patient responsibility after payer adjudication.
2. Batch bills are generated with minimal validation, often containing errors or unclear language.
3. Patients receive jargon-heavy, non-transparent statements → leading to high call volumes, disputes, and delayed payments.
4. Payments arrive through multiple channels (online, lockbox, mail, checks), but reconciliation is manual, error-prone, and leaves unapplied cash.
5. Compliance checks are reactive, performed after statements are delivered, creating exposure to GFE/NSA risks.
6. Exceptions (denials, misapplied deductibles, overpayments) are handled case by case with limited audit visibility.

Future State (Agentic Automation – Core Phase)

1. **Patient Responsibility & Bill Assembly Agent** consumes payer adjudication and computes patient share within minutes, producing an audit-ready ledger and minimizing unapplied cash.
2. **Statement Generation & Compliance Agent** produces plain-language, multi-channel statements, validates against GFEs, and auto-flags compliance risks before delivery.
3. **Patient Communication & Engagement Agent** delivers personalized outreach with reminders, secure payment links, and tailored options to reduce call volumes and accelerate collections.
4. **Payment Posting & Reconciliation Agent** applies patient payments across all channels in real time, reconciles discrepancies, generates refunds, and updates financial systems with full audit traceability.

Result: *Human-in-the-loop staff focus only on supervising exceptions, handling escalations, and providing empathetic support for sensitive patient cases.*

Governance & Exception Management

Agentic automation doesn't replace people it elevates them. Governance ensures safety, compliance, and adoption:

Exception Routing
Low-confidence cases auto-route to billing staff for validation.

Dual-Control Posting
Recommend → supervised → autonomous.

Audit Trails
Every agent decision includes line-level rationale, data lineage, and timestamps.

Compliance Updates
Governance board ensures GFE/NSA changes and payer rules are continuously reflected in models.

Implementation Roadmap

Baseline Assessment

Capture current benchmarks: call volumes, billing cycle times, error rates, unapplied cash, and uncollected balances. Establish patient satisfaction baseline.

Pilot Phase

Launch two agents on 1–2 payer groups:

- Statement Accuracy & Transparency (validate responsibility, generate compliant statements).
- Patient Communication & Engagement (deliver statements, handle inquiries, send reminders).

Track KPIs: time-to-bill, accuracy rate, first-bill payment rate, call volume reduction.

Expansion Phase

Add:

- **Financial Assistance & Payment Plan** (tailored plans, charity screening).
- **Payment Posting & Reconciliation** (auto-apply payments, reduce unapplied cash, generate refunds).

Expand to additional payer groups; monitor plan adoption, write-off reduction, auto-post % improvements.

Scaling

Roll out all four agents enterprise-wide. Introduce unified dashboards and continuous model refinement.

Governance

Embed audit logging, exception SLAs, retraining cycles, and feedback loops to ensure compliance, accuracy, and sustainability.

KPIs for Success

90%
% of bills auto-validated against GFE (target)

Time-to-bill
(from adjudication to statement)

First-pass
payment rate (patients paying without disputes).

20–40%
Call center volume per 1,000 bills (target reduction)

10–20%
Bad debt ratio (expected reduction)

< 5 days
Refund turnaround time (target days)

Implementation Roadmap

Inputs
ERA 835 files, EOBs, payer adjudication feeds, benefit accumulators, GFE data.

Expected Outcomes & ROI

Operational Benefits

- **30–50% reduction** in manual billing touches.
- Near real-time statement generation and distribution.
- Significant call center relief due to clearer statements.

Systems touched

EMR/EHR (Epic, Cerner), billing & patient accounting systems, clearinghouses, patient portals, lockbox/bank feeds.

Outputs

Audit-ready statements, reconciled payment allocations, compliance validations, patient-friendly communications, leadership dashboards.

Financial Benefits

- **10–20% uplift** in patient collections through targeted outreach.
- Reduced bad debt via proactive reminders and segmentation.
- Lower cost-to-collect through automation-driven efficiencies.

Quality & Compliance

- Automated GFE/NSA compliance validation.
- Full audit trails for every bill and refund.
- Improved patient trust and satisfaction.

AS-IS PROCESS

The patient billing process begins when clinical services are completed and charges are entered into the billing system.

1 Capture Patient and Encounter Data

Demographic and insurance information is verified and stored.

2 Submit Claim to Payer

Claims are generated and transmitted to the payer via clearinghouse.

3 Adjudication and Response

The payer processes the claim and returns an ERA/835 with approved, denied, or adjusted amounts.

4 Calculate Patient Responsibility

The billing team determines the portion owed by the patient based on payer payment, contractual adjustments, and benefit design.

5 Generate Patient Statement in Batches

Statements are created for all patients with balances after payer adjudication. Statements may include balances for copayments, coinsurance, deductibles, or non-covered services.

6 Deliver Statement to Patient

Statements are mailed or electronically delivered.

7 Patient Makes Payment

Patients may pay online, by mail, by phone, or in person.

8 Post and Reconcile Payment

Payments are applied against open balances. If the payment matches the billed balance, the account is closed. If not, the variance is flagged.

9 Handle Exceptions

If coverage is denied, payment does not match, or an error is detected (e.g., coding error, eligibility mismatch, GFE discrepancy), the case is routed to staff for investigation.

10 Resolve or Escalate Issues

Staff review the denial or variance, correct errors, appeal with payer if needed, or contact the patient for clarification.

11 Account Closure

Once all balances are resolved, the account is closed. If balances remain uncollectible, they may be escalated to collections or written off per policy.

Key Observations

- The process is highly manual in payment allocation and exception handling.
- Gateway decisions (e.g., “Coverage Valid?”, “Payment matches balance?”) are often based on human judgment.
- Exception loops (denials, disputes) extend cycle times and increase administrative costs.

- Patient communication is static and not personalized, contributing to confusion and call center demand.

Conclusion: Why AcceliHealth's Approach is Unique

AcceliHealth brings a comprehensive, agent-driven model to patient billing that directly addresses the root causes of inefficiency, inaccuracy, and patient dissatisfaction. By combining AI-driven intelligence, RPA execution, and human-in-the-loop oversight, we deliver a system that not only streamlines billing operations but also builds trust with patients through clarity, compliance, and transparency.

Unlike point solutions that digitize fragments of the process, AcceliHealth orchestrates the **entire billing lifecycle:**

- **Statement Accuracy & Transparency**
  ensures bills are right the first time.
- **Patient Communication & Engagement**
  reduces call center strain and enhances self-service.
- **Financial Assistance & Payment Plan**
  expands patient affordability and reduces bad debt.
- **Payment Posting & Reconciliation**
  accelerates cash flow while minimizing unapplied balances.

This integrated approach equips providers to collect faster, lower costs, reduce errors, and protect compliance in an environment of growing payer complexity and regulatory oversight.

Looking ahead, selecting AcceliHealth as a partner is not only about fixing today's billing pain points it is about positioning providers for long-term sustainability. With rising denials, shrinking margins, and increasing patient expectations, those who embrace agentic automation will emerge more resilient, agile, and financially secure in the future of healthcare.

Questions? We're Here to Help!

Got inquiries about AI agents and intelligent automation or want to explore the best options for your organization? Reach out to us at info@accelirate.com. We're here to listen and collaborate with you.

Speak with our RCM Automation Expert

Book a call with our Healthcare Automation Expert Today.

Schedule a Call

Powered by Agentic AI and orchestration-first design, AcceliHealth transforms fragmented claim workflows into proactive, payer-ready pipelines.

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