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WHITE PAPER

The Denial Recovery Engine

How 30 years of tacit RCM expertise became structured data

— and what that means for hospital leaders and hospital associations

May 2026 • HRN Group • Healthcare Revenue Navigation

For thirty years, denial recovery has been one of the structural constraints on American hospital finance. The expertise required to do it well lives in a handful of senior heads — scarce, mobile, increasingly recruited away by payers who pay more. Hospitals that hire and keep that talent recover meaningful revenue. Hospitals that can't — most of them, especially in rural and regional markets — leave millions on the table every year. For the most vulnerable hospitals, that unrecovered revenue is the margin between continuing operations and closure.

That constraint just came off the board.

> *We took something that's been impossible since managed care began and made it usable — usable enough that a first-year RCM associate with our engine outperforms the most accomplished experts without it.*

The senior expert isn't being replaced. What's changed is what they spend their time on — and what every other person on the RCM team can now do. The downstream effects extend well beyond a single revenue cycle department: they reshape what hospitals can recover, what they can afford to deliver, and — for the hospitals on the thinnest margins — whether they remain open.

Why denial recovery has been impossible at scale

Three structural conditions have made denial recovery a craft rather than a process:

The regulatory map is real but fragmented. Every state has its own Medicaid managed care program, its own commercial insurance regulator, its own Medicare Administrative Contractor,

its own workers' compensation framework, its own statutory and administrative-code citations governing provider appeals. Kansas's KanCare 3.0 has different rules than Iowa's IA Health Link, which has different rules than Texas STAR+PLUS, which has different rules than California Medi-Cal. Inside each state, every payer routes appeals differently — UHC calls it a Project Review, BCBSKS calls it a Mass Adjustment, Centene calls it Bulk Reprocessing, the Medicare MAC calls it Reopening under 42 CFR 405.980. A correct appeal depends on knowing the right state, the right payer, the right channel, the right vocabulary, the right citation, and the right escalation path. That knowledge has historically lived in the senior RCM expert's head.

The expertise depreciates and disperses. Statutes change. MCO contracts get re-procured. Submission portals migrate. Payer rep titles shift. The senior expert who learned the landscape five years ago has to relearn pieces of it every year. And when that expert leaves — for a competing hospital, for a payer that pays better, for retirement — their replacement starts from scratch.

The labor math doesn't work. Most hospitals have somewhere between 5,000 and 50,000 open denied or underpaid claims at any given time. At a realistic per-claim portal-submission throughput of 25–40 actions per day per associate, working that backlog without automation requires either a very large team (which most hospitals can't afford) or accepting that most denied claims will never be appealed. The status quo for the vast majority of hospitals has been the second option: most denials go unappealed because the labor cost exceeds the expected recovery.

> None of these constraints has changed in 30 years. Hospital RCM directors have asked for tools, for software, for outsourced expertise — and what they have been offered has mostly been more software that requires more expertise to operate. The expert bottleneck got moved, not solved.

What HRN built

HRN's engine is a structured database that captures what the senior expert knows, organized by the questions an RCM operator actually needs to answer when a denial lands on their desk.

For any combination of state, payer, denial reason, and procedure code, the engine returns the correct submission channel, the correct form, the correct deadline, the correct escalation path, and the correct supporting evidence. It does not require the operator to know any of those things in advance. It does not require the operator to have spent ten years learning the regulatory landscape. The operator looks up the denial; the engine returns the routing manifest; the operator executes.

What's in the engine today

7	**Fully-loaded states** *Kansas, Iowa, Texas, Florida, California, Nebraska, New Mexico — every routing domain (Medicaid, CHIP, Medicare, Commercial, Workers Comp) populated*
≈ 50 M	**Addressable routing combinations** *State × payer × denial-reason-code × remark-code × lane — the*

	universe of denial scenarios the engine can route at HIGH confidence
117	**Canonical payer profiles** *Spanning state-licensed Medicaid MCOs and CHIP plans, commercial carriers, Medicare MACs, Medicare Advantage plans, Medicaid FFS contractors, workers' compensation carriers, TRICARE/VA, and self-funded plan administrators. Each carries submission-channel metadata (portal, mass-adjustment, project-review, reopening, etc.)*
136	**Cited oversight findings** *Across 72 audits from state OIGs, state auditors, MFCUs, HHS-OIG federal, and CMS focused reviews — citable in any appeal letter HRN generates. Citation depth in all 7 states.*
$1.5 B+	**Documented oversight dollar weight** *Total dollar-amount findings in the cited corpus — recoveries, recommendations, and refund obligations identified by oversight bodies across the 7 states*
Hundreds	**Regulatory citations indexed** *State statutes (K.S.A., K.A.R., Texas Gov. Code, Iowa Code, Cal. W&I Code), federal regulations (42 CFR), CMS Transmittals, IROs, and external-review pathways*

Each of these data points took months of primary-source research to extract, verify, structure, and align across states. The result is something that did not exist before in any form available to a working hospital RCM team: a single, queryable, current map of denial recovery across seven of the most operationally complex state markets in the country.

The engine also maintains itself. A weekly automated process scans state Medicaid bulletins, commercial insurance department notices, Medicare MAC updates, workers comp carrier bulletins, and OIG audit releases for every loaded state. When the scan detects a change that doesn't fit existing engine schemas — a new MCO awarded, a new statute enacted, a new audit finding — it generates a targeted research prompt and queues it for human review. The data quality compounds week over week rather than depreciating.

The oversight evidence layer

Routing a denial to the correct lane is the first half of the engine's value. The second half is what gets attached to the appeal once it's routed.

Every denial that runs through the engine can be backed by primary-source regulatory evidence from a register of 136 cited findings across 72 audits. The corpus spans state Offices of Inspector General, state auditors, Medicaid Fraud Control Units, HHS-OIG federal reports, CMS focused program integrity reviews, and external quality review aggregators. This level of evidentiary depth has historically required a dedicated compliance attorney or RAC defense capability — typically out of reach for rural and regional hospitals, and frequently strained even at large systems.

The evidence is not generic. Each finding is tagged against a denial-pattern taxonomy of 44 distinct patterns so it can be matched to specific denial scenarios in real time. When the engine routes an inpatient denial from a Medicaid managed care plan, it surfaces the relevant findings — including, for instance, the CMS 2023 Program Integrity Review observation that all four Texas Medicaid MCOs performed zero investigative provider site visits during FY2020-FY2022, or the HHS-OIG audit showing one state did not refund $106 million in federal-share managed care rebates for the CY2015-2019 period. These are not commentary. They are citable evidence.

The total dollar weight of the cited corpus exceeds $1.5 billion in documented oversight-identified Medicaid waste, fraud, and abuse — anchored by recoveries from state OIGs (the largest state Medicaid OIG reports $442 million in FY2024 alone), state auditors (a single FL rebate-refund finding accounts for $106 million; a single NM MLR remittance is $108 million), Medicaid Fraud Control Units ($544 million across one state's three-year inspection cycle), and HHS-OIG federal audits ($119 million in one state's NFLOC capitated overpayments). For an appeal writer, the practical effect is the difference between a claim dispute that reads as opinion and one that reads as documented evidence — which is often what determines outcomes at the second-level appeal or external review stage.

> *The most common pattern across the entire corpus is MCO oversight gap — documented by 26 separate findings across 5 states. The second is network adequacy. The third is retro-eligibility capitation. These are not isolated state stories. They are structural.*

What this enables: the first-year associate effect

Consider what a denial recovery workflow looked like before the engine, and what it looks like with it.

Before

A Sunflower Health Plan denial lands. The associate needs to know: Is this a Medicaid managed care denial under KanCare 3.0? Is the denial reason a billing error (correct via Rycan as a frequency-7 resubmission) or a coverage decision (formal appeal)? If formal appeal, which lane: MCO reconsideration first, then MCO appeal, then external independent third-party review under K.S.A. 39-709i, then state fair hearing at the Office of Administrative Hearings? What's the timely filing window? Is there a Provider Engagement Manager assigned to the hospital? Has the patient signed the consent form required for provider-filed member appeals? Which K.A.R. citation supports provider standing as an appellant?

Answering correctly takes years of accumulated experience. Most associates can't, so the denial gets routed to the senior expert — who is buried in a queue of similar questions from every other associate.

After

The associate enters the denial into the engine. The engine returns: route as a Bulk Reprocessing Request via the assigned PEM at Sunflower; submission channel is the PEM's

email (named contact, current as of last week's scan); timely filing window is 180 days from date of service (Sunflower's window is the shortest in the Kansas market); supporting citation block includes K.S.A. 39-709i, K.A.R. 30-7-64, and three relevant OIG findings; member consent is not required because this is a claim payment denial (which providers can appeal independently per K.A.R. 30-7-64). The associate sends the email. Done.

The senior expert reviews a few edge cases per day instead of routing every denial. The hospital recovers more revenue, and the senior expert's time gets spent on things that actually need senior judgment — relationship management with the toughest payer reps, contract-renewal strategy, the genuinely novel disputes that the engine has flagged for human review.

> *The expertise was never about the senior person being smarter. It was about them having spent years memorizing the map. Structured data made the map shareable. Everyone now starts with the map.*

What this means for hospital operational leadership

Three implications follow for any hospital with a revenue cycle operation.

1. Talent leverage

RCM hiring is the constraint most hospital leaders quietly accept. Experienced denial-recovery analysts are scarce, expensive, and constantly being recruited away by payers who pay better. With the engine, the hospital can staff differently: a smaller core of experienced people focused on judgment-intensive work, supplemented by a larger pool of associate-level operators executing engine-routed work at scale. The same recovery output requires less senior bandwidth. The same senior bandwidth produces more output.

2. Scaling and integration

Hospital M&A integration historically takes 12–24 months on the RCM side because the acquiring system's denial-recovery knowledge doesn't transfer to the acquired hospital's local payer mix. With the engine, the acquiring system's RCM team is operational on the acquired hospital's payer mix within weeks. The same is true in reverse: a regional system entering a new state through a partnership or affiliation doesn't have to wait years to build local RCM competence. The engine carries it on day one.

3. Vendor strategy and infrastructure positioning

Most hospital leaders have lived through enough RCM vendor cycles to be skeptical of black-box services. The engine is not a black box. It is structured data with a documented schema. The hospital can engage with it in three ways: (a) use HRN as an operator that runs the work on the hospital's behalf, (b) license engine access and run the work in-house with the hospital's own team, or (c) hybrid — HRN operates the complex lanes (multi-payer Project Reviews, regulatory complaints) and the hospital's internal team runs the high-volume lanes (corrected claims, routine portal submissions). All three are real options. The hospital chooses the model that fits its own operational reality.

> The engine is infrastructure. It is durable, transparent, and the hospital can verify what's in it. That makes the buying conversation fundamentally different from the typical RCM-vendor conversation, which usually requires the hospital to trust that the vendor's process actually works.

What this means for hospital associations

State and regional hospital associations exist to provide shared infrastructure their member hospitals could not build individually. Denial recovery has historically not been one of those infrastructure layers — because the expertise was too distributed and too tacit to share. The engine changes that.

A hospital association can negotiate enterprise terms for member access to the engine, providing every member hospital — including the smallest and most rural — with the same routing capability available to the largest health systems. This is particularly powerful in states with significant rural hospital populations: critical access hospitals, rural emergency hospitals, and small community hospitals routinely under-staff RCM because they cannot afford the senior talent. Engine access through their association lets them operate at the routing accuracy of a much larger system.

Associations can also use the engine to surface state-wide denial patterns across member hospitals — identifying when a particular payer's denial behavior has crossed a threshold that warrants association-level engagement with the state Department of Insurance, the state Medicaid agency, or the legislature. Individual hospitals rarely have the data or the standing to make that case. An association with engine-derived cross-member pattern data does.

What this means for the industry

Denial recovery has been a per-hospital problem for thirty years because the expertise has been a per-hospital constraint. When the constraint applies hospital by hospital, the consequences also apply hospital by hospital: some hospitals recover, some don't, some stay open, some close. The fragmentation has been the structure, not the accident.

Structuring the expertise changes that. When the engine is operable by any hospital regardless of internal RCM bench depth, denial recovery stops being a function of how much senior talent a hospital can afford to retain and starts being a function of how the hospital chooses to deploy a now-shared infrastructure. The same is true for hospital systems integrating acquired facilities, for hospital associations negotiating shared services across their members, and for any new entrant building a revenue cycle operation from scratch.

The downstream implication takes years to play out but is visible from where we sit today. Hospitals that recover more of what they're owed have more capital to deploy into clinical services, into facility investment, into the people who do the work. Rural hospitals that close — and there have been hundreds of rural hospital closures in the last two decades — close in part because denial recovery has been too expensive to operate at their scale. Removing the expertise constraint removes one of the structural pressures on rural hospital survival.

> *The thirty-year trajectory of denial recovery — fragmented, expertise-bound, accessible mostly to hospitals with the talent budget to access it — was not inevitable. It was the shape of an industry working around a constraint that had no solution at hand. The constraint now has one. The trajectory changes from here.*

Where hospital leaders can go from here

HRN is currently operational at engine depth in seven states (Kansas, Iowa, Texas, Florida, California, Nebraska, New Mexico), with a structured roadmap for next-state buildouts driven by customer demand. We work directly with hospitals as an operator, license engine access to hospitals and hospital associations that want to operate the work themselves, and run hybrid arrangements that combine both.

For hospital executives: a 30-minute briefing covers what the engine looks like for your state, what your specific payer mix maps to in routing terms, and what recovery your hospital is likely to be leaving on the table at current operational settings. The briefing is at no cost and produces a concrete recovery estimate you can take to your board.

For hospital association leaders: a separate briefing covers what shared engine access could look like for your member hospitals, with attention to the smaller and more rural members who have historically had the fewest options. This briefing typically generates a member survey to confirm interest, followed by a structured engagement scope.

> The engine made the impossible workable. The next question is not whether to use it. The next question is how — operator, licensee, or hybrid — and how fast to put it in front of the people on your team who have been waiting years for something like this.

About HRN Group

HRN Group provides denial recovery infrastructure and operations to hospitals across the United States, with a focus on rural and regional markets that have historically been underserved by enterprise RCM vendors. HRN operates the engine described in this paper, maintains it through a weekly automated regulatory acquisition process, and engages directly with hospital leadership on data-licensing and operator arrangements.

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