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Medicare Advantage Coverage Algorithms: The Algorithm Can Help, the Patient's Chart Decides

Since January 2024 a plan's software may inform a coverage decision, and the patient's own record has to make it.

Jason Newell · MAX Research Collective · Article ART-HLC-023 · Published 9 November 2026
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A computer can estimate how long a patient who broke a leg will need in a nursing home. It finds thousands of earlier patients who looked similar, with about the same age, the same break and the same history, and works out how long people like that usually stayed before they went home. In February 2024 the Centers for Medicare & Medicaid Services (CMS), the federal agency that runs Medicare, told every Medicare Advantage plan where that estimate stops counting. It can't, by itself, be the reason the care stops. The plan has to look at this patient: their history, their doctor's recommendation and their clinical notes. When the answer is no, a physician with the right expertise has to review it.

The plans still run their models. Some of the biggest buy them from vendors. Nearly three years after the rule began governing coverage, CMS has done little to check whether denials follow it, and most of the people denied never ask for a second look.

The Collective has a stake in where that line sits. MARA, the Medical Agentic Resident Assistant we're designing, is built on the same one: the software recommends, and a person decides. Set beside the rule, her design covers most of

what CMS asks of a coverage tool. Some of that runs today in MAX3, and the rest is still on paper.

What the 2024 rule changed

Medicare Advantage is the private-plan side of Medicare, also called Part C. A plan is paid a fixed amount per member and decides, case by case, whether a service is medically necessary. That case-by-case decision is called an organization determination. Before many services, especially care after a hospital stay in a skilled nursing facility, a rehabilitation hospital or a long-term acute care hospital, the plan requires prior authorization, its approval in advance. Post-acute care is expensive, and the denials cluster there.

The rule is CMS-4201-F, the Medicare Advantage final rule for contract year 2024. CMS issued it on 5 April 2023 and published it in the Federal Register at 88 FR 22120 a week later. It took effect in June and governed coverage from 1 January 2024. Its provisions sit in Title 42 of the Code of Federal Regulations (CFR), the title that governs Medicare, and four of them do the work:

Table 1. The four provisions of CMS-4201-F that govern a coverage decision.

PROVISION	WHAT IT REQUIRES
42 CFR 422.101(b)(2)	Plans follow Traditional Medicare's coverage rules for basic benefits: the statute, National and Local Coverage Determinations, and the general coverage conditions.
42 CFR 422.101(b)(6)	A plan may use its own criteria only where Medicare's are not fully established. Then the criteria must be based on evidence, show that the benefit outweighs the harm, and be posted publicly.
42 CFR 422.101(c)(1)(i)	A medical-necessity decision rests on the patient's own medical history (diagnoses, conditions, functional status), the physician's recommendations and the clinical notes.
42 CFR 422.566(d)	A denial based on medical necessity is reviewed by a physician or other appropriate professional with expertise in the field.

The preamble adds that a plan buying its criteria from a vendor still answers for all of this, public posting included, however proprietary the product is.

Assist, never decide

On 6 February 2024 CMS sent a memo of frequently asked questions (FAQ) to every Medicare Advantage organization, applying the rule to algorithms and artificial intelligence (AI). The law firms that summarized it, McDermott Will & Schulte and Manatt among them, read it the same way:

- A tool may assist a coverage determination. The plan stays responsible for the tool's compliance.
- A determination based on a larger data set, instead of the patient's own history, the physician's recommendations or the clinical notes, doesn't comply with 422.101(c).
- A predicted length of stay in post-acute care can't by itself be the reason to end services.
- An algorithm can't by itself deny an inpatient admission or downgrade it to observation.
- Posted criteria are fixed, so an AI tool can't shift them over time.
- Plans should check a tool for bias before using it, and Section 1557 of the Affordable Care Act, which bars discrimination in federally funded health programs, applies.

A population model estimates how long a patient like this usually stays. The rule wants to know whether this patient still needs the care, and the FAQ lets the estimate feed that judgment without standing in for it.

MARA is designed on that line too. She recommends. A person decides, and a provider agrees before any treatment or prescription starts.

Why CMS drew the line

Gene Lokken broke his leg and ankle in a fall in May 2022. He was 91 and lived in Wisconsin. His doctor ordered physical therapy in a nursing home, and his UnitedHealthcare plan paid for 19 days of it. His family paid about $150,000 over the next year. He died in July 2023. That November his estate sued UnitedHealth Group in federal court in Minnesota (No. 0:23-cv-03514), alleging that a naviHealth tool called nH Predict set the date his coverage ended.

The complaint puts the tool's error rate at 90%, counting how often its denials were reversed on appeal. That's the plaintiffs' figure; nobody has published a measured one. In February 2025 the court dismissed the other claims as preempted by Medicare law and let the breach-of-contract and good-faith claims go ahead. On 9 March 2026 a magistrate judge ordered UnitedHealth to hand over documents reaching back to January 2017. The class is still uncertified.

Federal auditors had seen the pattern before the lawsuit. In April 2022 the HHS Office of Inspector General (OIG), the watchdog inside the Department of Health and Human Services, looked at 430 denials from 15 large plans in one week of June 2019. It found that 13% of the prior-authorization denials met Medicare's coverage rules, so Traditional Medicare would likely have approved them. Among the payment denials, 18% met both Medicare's and the plan's billing rules.

The tool itself came into view in March 2023, when STAT began its "Denied by AI" series, later a Pulitzer finalist. STAT reported that nH Predict matched each patient against a database of about 6 million others to forecast a length of stay. In November 2023 it reported naviHealth's internal targets: case managers were held first to within 3% of the projected days, then, as the goal for 2023, to within 1%. UnitedHealth says the tool isn't used to make coverage determinations and calls it a guide to recovery.

In October 2024 the majority staff of the Senate Permanent Subcommittee on Investigations (PSI) published "Refusal of Recovery". UnitedHealthcare's denial rate for post-acute care, it found, rose from 8.7% in 2019 to 22.7% in 2022. That's about two and a half times, over the years the company was automating its review.

UnitedHealthcare and CVS denied post-acute care at about three times their overall rate. Humana's ran at about sixteen times.

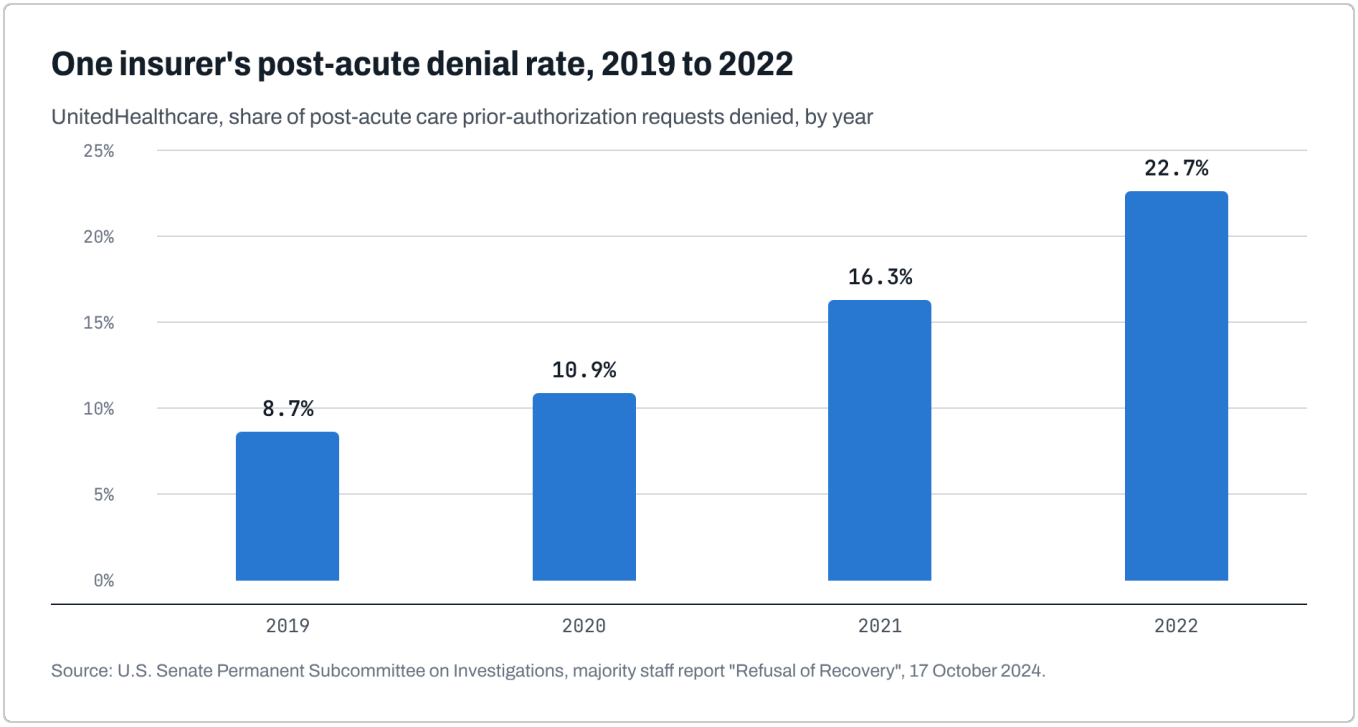


Figure 1. UnitedHealthcare's post-acute denial rate rose every year from 2019 to 2022, from 8.7% to 22.7%. Source: Senate PSI, 2024.

The payment side of the same market, where insurers buy AI to push back on hospitals' coding, is the subject of "AI and Healthcare Payment: The $942 Million Nobody Checked".

What the evidence shows since

OIG came back to the question in June 2026. Two reviews looked at post-acute requests made in June 2024 to 19 insurers, which together covered 29.3 million people, about 86% of Medicare Advantage. The insurers denied 12% of requests to enter a skilled nursing facility. Plans varied widely. The strictest denied 23% and the most lenient 0.4%, a spread of more than fifty to one for the same kind of request. UnitedHealth's naviHealth handled half of all the requests and denied 14%, against 11% for insurers reviewing in-house and 9% for other contractors. When one of its skilled-nursing denials reached appeal, it was overturned 97% of the time.

Plans overturned 95% of the skilled-nursing denials that were appealed, 2,313 of 2,445. Appeals of long-term acute care hospital denials won 36% of the time, and of inpatient rehabilitation denials 43%. Only 18% of the skilled-nursing denials were appealed at all, which means (the arithmetic is ours; OIG didn't publish it) that roughly four in five never reached the step where they'd most likely have been reversed.

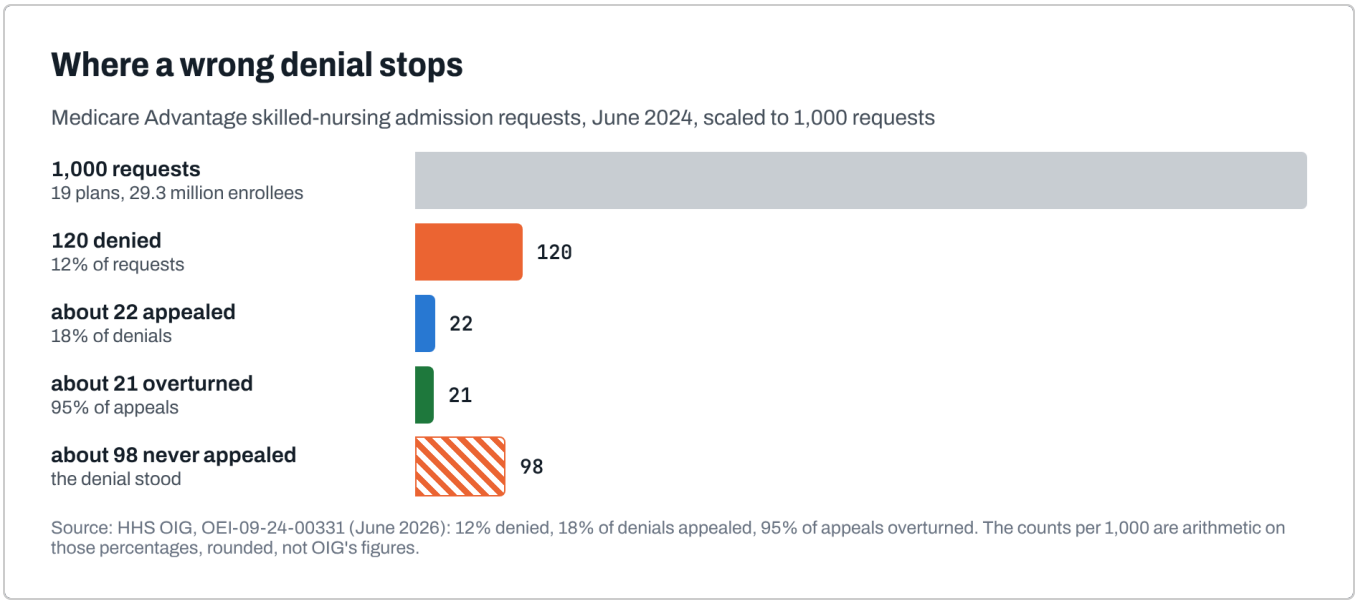


Figure 2. A denial nobody appeals is final. Counts per 1,000 requests are arithmetic on OIG's percentages, rounded.

KFF, the health policy research group, sees the same shape across all of Medicare Advantage. It counted 52.8 million prior-authorization decisions in 2024, against just over 625,000 reviews in Traditional Medicare in fiscal 2024, about 85 to 1. Plans denied 4.1 million requests, 7.7%. Only 11.5% of those denials were appealed, up from 7.5% in 2019, and 80.7% of the appeals succeeded at least in part.

What hasn't happened

The rule itself has had little enforcement behind it.

- The AI guardrails were dropped. CMS's proposed rule for 2026, in November 2024, would have required equitable access whether a decision came from a person or

an automated system. The final rule of 4 April 2025 left that out, and CMS said only that it would keep considering future rulemaking.

- The equity analysis went too. The final rule for 2027, issued on 2 April 2026, removed the utilization-management health-equity analysis and carries no AI provision.
- The core requirement has no public audit. CMS publishes yearly program-audit reports, and no published finding yet tests 422.101(c) itself: whether denials rested on the individual record. A dedicated audit protocol for utilization management was proposed and, by industry accounts, never finalized.
- Congress has asked and hasn't acted. On 14 July 2026 Senators Blumenthal and Hawley asked UnitedHealth, Humana and CVS whether they still hold that AI can't make a final denial. They also asked for an inventory of each company's predictive tools. Ten days later two physicians in the House, Herb Conaway (D-NJ) and Greg Murphy (R-NC), introduced the Protecting Patients from Automated Denials Act, H.R. 9734. It would have a physician review and approve any denial AI helped produce, then attest that the AI didn't dictate it.

California went further for the plans it regulates. Its SB 1120, in force since 1 January 2025, requires a licensed physician or other qualified provider to make a medical-necessity denial. Medicare Advantage is federal and sits outside its reach.

Prior authorization comes to Traditional Medicare

Two things started on 1 January 2026. CMS-0057-F, the interoperability and prior-authorization rule of January 2024, began binding Medicare Advantage on time limits. An expedited decision gets 72 hours and a standard one 7 calendar days, and every denial needs a specific reason. Its four application programming interfaces (APIs), the standard connections that let a provider's system ask a plan's system for a decision, are due a year later.

The other start was WISeR, the Wasteful and Inappropriate Service Reduction model from CMS's Innovation Center, in Arizona, New Jersey, Ohio, Oklahoma, Texas and Washington. It runs to 31 December 2031. It brings prior authorization, reviewed with

the help of contracted AI vendors, to selected services in Traditional Medicare. The vendors are paid a share of the spending they avert, and CMS cuts that payment when their decisions run slow or wrong. Licensed clinicians make every final determination. In July 2026 a Senate vote to repeal the model failed, 46 to 50.

Records KUOW obtained in October 2026 show how the first months went. Virtix Health, the Washington vendor, rejected 53% of the 6,096 cases it reviewed from January to March. CMS put Virtix on a corrective action plan for missing the three-day turnaround. The corrective plan closed on 14 August. Vendors in Arizona, New Jersey and Ohio got warning letters too. Virtix says its final affirmation rate rose to 84.3% once providers resubmitted with better documentation. Different services and patients sit behind the two programs, so the 53% isn't a like-for-like match for Medicare Advantage's 7.7%. Still, more than half of a quarter's requests came back rejected, and each one had to be sent again or given up.

WISeR keeps the shape of the 2024 rule, with a tool that assists and a clinician who signs any denial, but its reviewers are paid on what isn't spent, an incentive Medicare Advantage's rule never had to reckon with.

Where MAX and MARA stand against the rule

MAX is the Collective's AI Resident, a local assistant who learns where the data lives and by default sends none of it anywhere. He has had four generations: HAL 2000 in 2025, MAX3 from 2025 to October 2026, MAX4 from October 2026, and MARA, the medical version, as the end state. MARA is designed for clinics, and her roles run from the triage nurse to the payer's reviewer, which is where a coverage decision would meet her. She's a design. Our demo is scripted, uses fictional patients and touches no real patient data.

Put a plan's coverage tool on MARA's design and each thing CMS asks gets an answer. The answers are at different stages, and Figure 3 marks each one by its border.

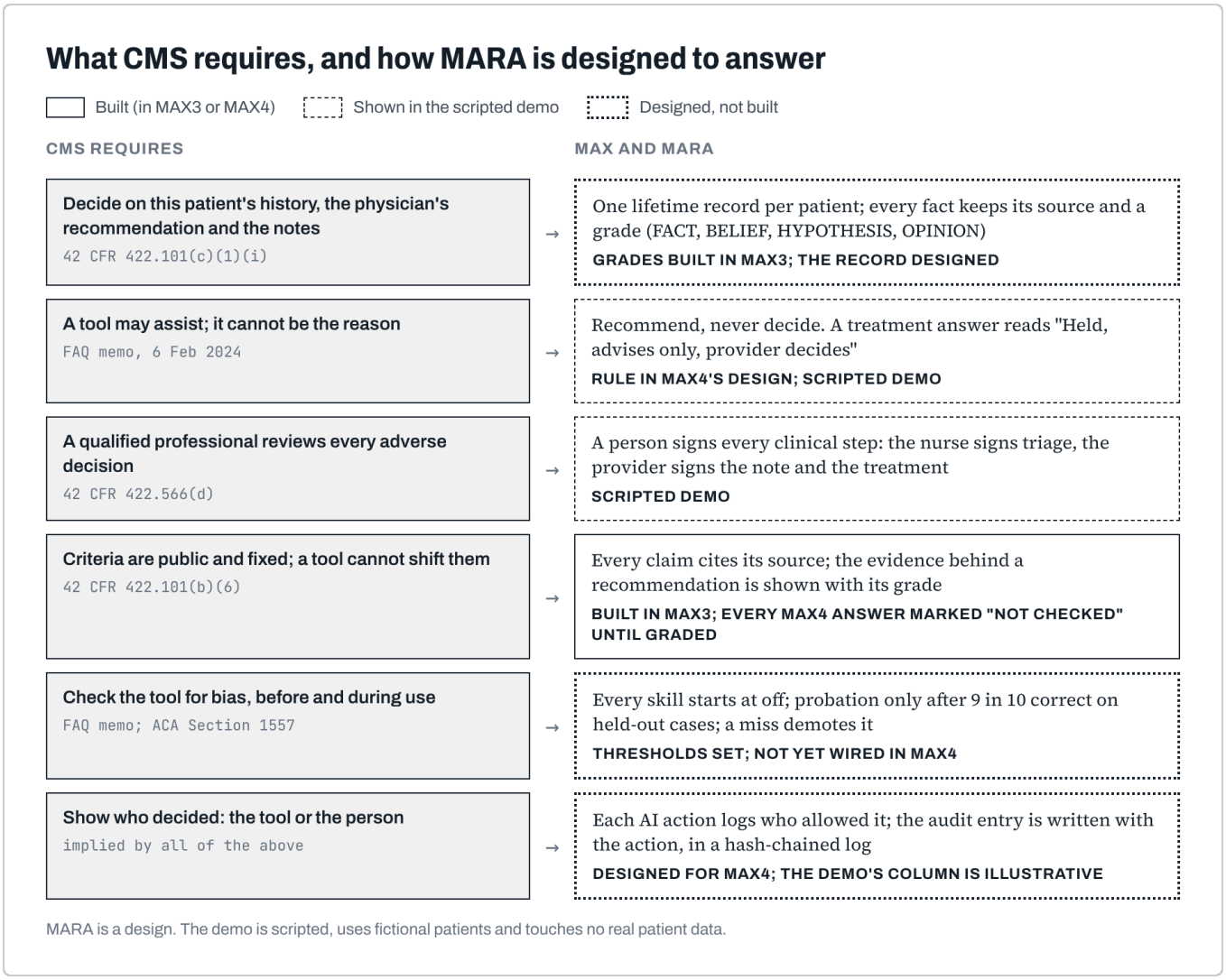


Figure 3. Each CMS requirement beside the MAX or MARA mechanism that answers it. Line style shows how far along it is: solid is built, dashed is shown in the scripted demo, dotted is designed only.

Table 2. What CMS requires, the MAX or MARA mechanism that answers it, and where it stands.

WHAT CMS REQUIRES	MAX OR MARA MECHANISM	WHERE IT STANDS
Decide on the patient's history, the physician's recommendation and the notes	One lifetime record per patient, in which every fact keeps its source and a grade: FACT, BELIEF, HYPOTHESIS or OPINION	Grades built in MAX3; the lifetime record is MARA's design
A tool may assist; it cannot be the reason	Recommend, never decide. On each clinical screen of the demo, a treatment answer reads "Held, advises only, provider decides"	The rule is in MAX4's design; the demo is scripted
A qualified professional reviews every adverse decision	A person signs every clinical step: the nurse signs triage, the provider signs the note and the treatment	Scripted demo
Public, fixed criteria	Every claim cites its source; the evidence behind a recommendation is shown with its grade	Built in MAX3; in MAX4 every answer is marked "not checked" until it is graded
Check the tool before and during use	Every skill starts at off and reaches probation only after 9 in 10 correct on held-out cases; a miss demotes it	Thresholds set; not yet wired in MAX4
Show who decided, the tool or the person	Each AI action records who allowed it and at what step; MAX4's audit entry is written in the same transaction as the action, in a hash-chained log	Designed for MAX4; the demo's log column is illustrative
Faster, explained decisions (CMS-0057-F)	MARA's design names the HL7 Da Vinci guides for coverage requirements and prior authorization, FHIR R4 and SMART for health records, and X12 837 and 835 for claims and payment	Design only

Grades say how sure MAX is of a claim, from a checked FACT down to an OPINION. A hash-chained log links each entry to the one before it, so a deleted or altered entry

breaks the chain where anyone can see it. In the last row, HL7 is the body behind the Da Vinci guides and FHIR, the format most health records now travel in. X12 837 and 835 are the electronic claim and the payment remittance. CMS-0057-F recommends the Da Vinci guides for its prior-authorization interface without requiring them, so naming them in MARA's design is a choice and makes no compliance claim. The fourth row is the loosest fit. MARA makes no coverage decisions and has no criteria to post; citing every source is the nearest thing she does, since it puts the evidence where a reader can check it.

Two estimates of a recovery

The October demo added a card to MARA's learning loop. On 30 September a six-week outcome came back for an earlier patient whose case resembled the one on screen. MARA had told that patient "back to full duty in 2 weeks", and the patient was injured again. MAX's trust ladder runs off, probation, monitored and trusted, and the demo shows a skill pulled back to advice as Held. Return-to-work estimates stepped down from Trusted to Held: the skill now drafts, and the provider signs. The demotion went into the clinic's AI governance log, where it now governs that skill for every patient in the clinic.

Set that beside nH Predict as STAT reported it. Both are estimates of how long a recovery takes. In MARA's design, the estimate that missed lost its authority. In the reporting on naviHealth, case managers who strayed from the estimate faced discipline, which left the model's authority whole and put the pressure on the people. The demo is fiction and the naviHealth account is reported and disputed, so the comparison is between two designs, and neither has been measured.

The tension we have to name

MARA learns across cohorts, the groups of patients whose cases resemble this one: what happened to similar patients informs this patient's next step. A cohort is exactly the "larger data set" CMS says can't be the reason.

The design's answer is in its grades. A cohort finding enters this patient's record as a HYPOTHESIS until something in the patient's own record supports it. A person

decides. Outcomes feed back, and a wrong estimate costs the skill its authority. That puts the cohort result where the FAQ puts nH Predict's estimate: it can inform the decision as long as something in this patient's record carries it. The demo's demotion is the same idea at the cohort level: one patient's outcome lowered the skill's authority for everyone. Each recommendation still has to stand on the next patient's own record. None of it has been tested on real outcomes yet.

The rest of the design leans the same way. Asking to talk to a person hands the conversation to a named nurse with the reason and the transcript, and that handoff is audited too. Records a patient uploads stay marked unverified until they're matched to the organization that sent them. Identifiable data enters MARA's graph only where the law allows; the default is de-identified. And MAX3 already holds each automatic action for 30 seconds, long enough to roll it back, a window MAX4's design keeps.

Why it matters

The rule gives each side of a denial something to work with.

- Patients and families can ask for a denial based on their own record, reviewed by a qualified professional and, since January 2026, carrying a specific reason. Appeal it. Skilled-nursing denials were overturned on 95% of appeals in OIG's review, and most people never file one.
- Clinicians now write part of the legal basis of the decision, since the physician's recommendation and the clinical notes are what the plan must weigh. What goes in the note matters to coverage.
- Anyone building these tools has the design requirement in writing. The model reads the individual record, a person owns the adverse decision, and the audit shows which of them decided.

We're building MARA to be that kind of system. From January 2027 the prior-authorization interfaces put every plan's decisions on a standard wire, where an auditor could read them by the thousand. A stay like Gene Lokken's, cut off after 19 days, would be one row in that data, with the plan's reason attached.

Glossary

TERM	DEFINITION
CMS (Centers for Medicare & Medicaid Services)	the federal agency that runs Medicare and writes the rules Medicare Advantage plans follow. Its rules and FAQ memo set the line this article measures plans against.
CMS-0057-F	the January 2024 interoperability and prior-authorization rule. It sets decision deadlines and requires a reason with every denial from 2026, and four prior-authorization interfaces from 2027.
CMS-4201-F	the Medicare Advantage final rule for contract year 2024. It requires decisions to rest on the patient's own record and denials to be reviewed by a qualified professional.
Cohort	a group of patients whose cases resemble one patient's. MARA learns from cohorts, which is why her design treats a cohort finding as a hypothesis until the patient's own record supports it.
FHIR	Fast Healthcare Interoperability Resources, the HL7 standard most health records now travel in. MARA's design names version R4, with SMART for app access to the record.
Grades	how sure MAX is of a claim, marked FACT, BELIEF, HYPOTHESIS or OPINION. A grade travels with the claim, so a reader can see how much weight a recommendation carries.
HL7 Da Vinci guides	implementation guides from HL7, the health data standards body, for coverage requirements and prior authorization. CMS recommends them for the 2027 interfaces without requiring them.
Internal coverage criteria	a plan's own rules for what it covers. CMS-4201-F allows them only where Medicare's are not fully established, and requires them to be evidence-based and public.

Newell, J. (2026). MAX Research Collective, ART-HLC-023. CC BY 4.0

TERM	DEFINITION
Medicare Advantage (Part C)	Medicare benefits delivered by private plans paid a fixed amount per member. Its plans make the decisions this rule governs.
nH Predict	naviHealth's length-of-stay model, reported by STAT and named in the Lokken lawsuit. UnitedHealth says it isn't used to make coverage decisions.
Office of Inspector General (OIG)	the watchdog inside the Department of Health and Human Services. Its 2022 and 2026 reviews supply most of the denial and appeal figures here.
Organization determination	a plan's decision to cover or deny a service. The first appeal of it is called a reconsideration.
Post-acute care	care after a hospital stay, in a skilled nursing facility (SNF), inpatient rehabilitation facility (IRF) or long-term care hospital (LTCH). Denials concentrate there.
Prior authorization	a plan's approval, required before a service is given. It's the step where most coverage algorithms do their work.
Traditional Medicare	the government-run program, also called Original Medicare, that pays providers directly. WISeR brings prior authorization to it for selected services.
Trust ladder	MAX's levels of authority for a skill: off, probation, monitored, trusted. A skill climbs on held-out outcomes, and a miss sends it down.
WISeR	the Wasteful and Inappropriate Service Reduction model, CMS's Innovation Center test of AI-assisted prior authorization in Traditional Medicare in six states. Its vendors are paid a share of the spending they avert, cut when their decisions run slow or wrong.
X12 837 and 835	the electronic formats for a medical claim and for the payment remittance that answers it. MARA's design names them for the payer role.

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// ABOUT THE AUTHOR

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