AI MedAgent

EHR integration on FHIR · Technical datasheet · v0.3, 25 August 2026

Built and running. Measured, not asserted.

Live records have been read from the **Epic**, **Oracle Health** and **MEDITECH Greenfield** sandboxes, and a CDS Hooks service is deployed at aimedagent.net/cds-services. Every figure in this document came out of a running system between 18 and 25 August 2026. Where something has not been measured, it says so and is marked. No health system is involved and no real patient data has been touched.

A demonstration of a patent-pending method. Advisory only. Not a medical device.

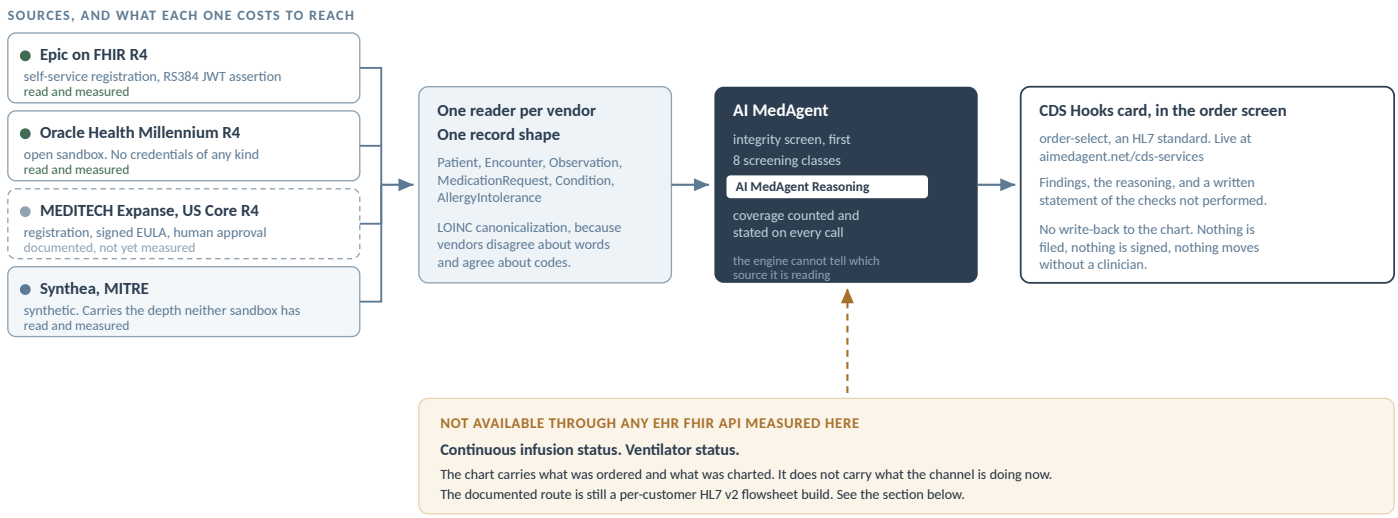
Not an interface developer? *The same findings are written without the acronyms in The connection was the easy part, six pages, no prior knowledge assumed. It explains what a 403 is, why an empty refusal is worse than a rude one, and what the vendors' own demonstration patients actually contain.*

What this document adds

The AI MedAgent technical datasheet describes the method. This one answers the question every evaluator asks within ten minutes: *can it reach the chart.* It now answers it with measurements rather than with capability statements, because the two turned out to disagree in ways that matter.

It sets out what three EHR vendors will actually hand a third party, what each one costs to reach, what arrived when we asked, and the second question that follows immediately: the chart is not a live stream, so where does continuous infusion and ventilator status come from.

The integration, in one picture



Three EHR vendors and one synthetic source, one record shape, one engine. The reader per vendor is the only part that differs, and it exists so that nothing downstream has to know which source it is holding. The device gap at the bottom is not a gap in this design; it is a gap in what any EHR API exposes.

What each vendor costs to reach

This is the first thing anyone building on top of an EHR needs and the last thing anyone publishes. The three vendors sit in three different tiers, and the difference is not technical.

VENDOR	WHAT IT TAKES TO GET IN	TIME TO A FIRST READ	STATUS HERE
Oracle Health Millennium R4 open sandbox	Nothing. No account, no key, no agreement. An unauthenticated GET returns patient data.	Under an hour	**Read and measured**
Epic Epic on FHIR R4 sandbox	Self-service registration. Publish a JWK Set, sign an RS384 client assertion, exchange it for a token. No human in the loop.	Same day	**Read and measured**
MEDITECH Greenfield Workspace, US Core STU6	Registration, then a welcome packet from the Greenfield team, a signed End-User License Agreement, a Google ID, and an OAuth2 client ID and secret. Authorization Code grant only. The client credentials grant is not offered, so there is no unattended access.	Gated on a human, and on a browser at every run	**Serves all four resources Epic answers with 403**

Correction, 24 August 2026. *An earlier version of this sheet said Epic refuses four of seven resource types. That was wrong. Of the four 403s, only Condition and AllergyIntolerance had their scopes granted; Procedure, Immunization and DocumentReference were never requested, and DiagnosticReport was granted and served. Two is the correct number and it is still the finding. The error was found because a reader on chat.fhir.org asked whether the Patient read also returned 403. It does not: Patient, Observation, Encounter, MedicationRequest and DiagnosticReport all returned data for the same patient on the same token.*

MEDITECH row measured 24 August 2026 against the live Greenfield Workspace, patient Sarai Mccall, 321 resources returned by a single `Patient/$everything` call. No fee is stated in the published EULA. Every figure in this row was read from the sandbox, not from the documentation.

What the APIs actually returned

Published capability statements say what a server supports. They do not say what it will give *you*. Those are different questions and only one of them can be answered by reading documentation.

RESOURCE	EPIC SANDBOX	ORACLE OPEN SANDBOX	MEDITECH GREENFIELD	SYNTHEA, FOR SCALE
Patient	served	served	served	served
Observation, vitals	371	1,000 **paging stopped here**	15	1,126
Observation, laboratory	5	345	33	7,766
MedicationRequest	1	500 **paging stopped here**	5	1,113
Condition, problem list	**HTTP 403, zero-byte body. system/Condition.read was in the granted token**	served, not counted	**10**	273
AllergyIntolerance	**HTTP 403, zero-byte body. system/AllergyIntolerance.read was in the granted token**	124	**1 Penicillins, anaphylaxis**	0 recorded
DocumentReference	403. **Scope never requested. Correct behavior, not a finding**	199 **paging stopped here**	10	0
Encounter	10	200 **paging stopped here**	4	453
Procedure	403. **Scope never requested. Correct behavior, not a finding**	563	3	1,421

Read the MEDITECH column carefully too, for the opposite reason. *Those figures are small because they are one real-shaped chart read in full, not a volume generator. The whole column came back in a single* `Patient/$everything` *call, 321 resources, and the bundle carried no* ***next*** *link, so nothing is truncated and no figure in that column is a paging cutoff. It is the only one of the four columns where the count and the total are the same number. MEDITECH is also the only server of the three that offered* `$everything` *at all.*

Read the Oracle column carefully. *Four of those figures are where the loader stopped paging at twenty pages, not how many records exist, and they are marked. More exist and were not read. Oracle answers Condition freely to an unauthenticated request, established by probe, but the bulk pull skipped it because Oracle ignores* ***_count*** *on that resource and the response runs to megabytes. A truncation point printed as a total is the same class of false statement this document is about, so it is not printed as one.*

Epic authorizes below the OAuth scope, and its documentation does not say so

system/Condition.read sits in the granted token. The read still returns **HTTP 403 with a zero-byte body**, which is indistinguishable from a broken endpoint and gives a developer nothing to work with.

The answer came out of an error string on a different endpoint: *"Combination of parameters is not valid for any authorized sub-resource."* Epic authorizes at **sub-resource level, beneath the scope**. Four probes established it by measurement. It is not in the published documentation, and anyone planning a build against Epic should know it before month nine rather than after.

The practical consequence for a medication safety tool is severe and worth stating plainly. Epic proves the connection and then refuses the two resources a medication screen most needs, the problem list and the allergy list, having granted the scope for both. DocumentReference and Procedure also returned 403, but those scopes were never requested, so that is Epic behaving correctly and it is not part of this finding. DiagnosticReport was granted and served seven reports.

What arrived when we asked, and why it matters more than the count

An integration datasheet that only covers how to connect is half a document. The other half is what comes back, and in both certified sandboxes what came back would break a naive reader.

- **A patient losing 37.6 kg in one second.** Oracle's densest hour holds 26 weights ranging 45.359 to 88.904 kg. At 16:02:44 she weighs 87.543 kg and at 16:02:45 she weighs 49.895 kg. Across the whole record, **63% of the weights are an exact whole number of pounds**, and the rest are round kilograms. No scale reads 64.000 kg. These are numbers typed into a test form.
- **A negative potassium.** 224 observations coded **LOINC 2823-3**, "Potassium [Moles/volume] in Serum or Plasma", carrying the unit **g/dL**, with eight values between −1.1 and −0.2. The code says molar concentration and the unit says mass per volume. Seven more of the same code carry mmol/L correctly.
- **Forty-nine impossible vital signs in one Oracle record.** A pulse of 1 bpm and a blood pressure of 1 over 1 on the same date, an oral temperature of 47.5 °C, and one temperature stamped **7 July 2099**.
- **Epic fails the opposite way.** Its densest hour is 32 observations that are the same four values filed seven times in eight minutes: temperature 37, pulse 72, height 175 cm, weight 72.5 kg. Height re-measured every 45 seconds. Zero variance.
- **The synthetic record has none of it.** Zero impossible values and zero negatives across 7,766 laboratory results, because a generator does not fat-finger a decimal point. An empty result there is a fact about the source, not a clean bill of health.

None of this is a criticism of a test environment, which is what a test environment is for. It is the reason the integrity screen runs *before* any clinical content and prints its findings above the clinical section rather than in a footnote. A system that calculates perfectly and understands nothing averages a 37 kg swing into a trend line and hands a clinician a number.

Every figure above is reproducible from the saved records and the loaders in this repository. A reference-range check catches none of them: 45 kg and 89 kg are both plausible weights and 37 °C is a normal temperature. What fails is the rate of change, the variance, and the sign.

How the integration works

- **1. Authenticate, however the vendor requires.** Epic takes a SMART Backend Services client assertion signed with a private key, exchanged for an access token, with no human in the loop and no password anywhere. Oracle's open sandbox takes nothing at all. MEDITECH issues an OAuth2 client ID and secret after a signed agreement. The reader absorbs the difference so that nothing downstream sees it.
- **2. Read the record and normalize it.** Patient, Encounter, Observation, MedicationRequest, Condition and AllergyIntolerance, reshaped into one structure and canonicalized on LOINC. Vendors disagree about display text and agree about codes, so the codes are what the engine trusts.
- **3. Screen the data before reasoning over it.** Impossibility bounds per LOINC code, unit-aware, with a bound applied only when the unit matches and a mismatch reported instead. Checking a value against a bound written for a different unit invents findings, so it is refused.
- **4. Screen the medications.** Eight classes, named against Wolters Kluwer's published Medi-Span module list so the coverage figure is measured against a vendor's own taxonomy rather than one of our own.
- **5. Reason, live.** AI MedAgent Reasoning runs inside the CDS Hooks endpoint, after the deterministic screen and before the cards are written, and is handed the coverage statement so that it knows which classes did not run. A model reasoning without knowing its own blind spots writes confident prose over a hole.
- **6. Surface it where the decision is made.** A CDS Hooks card on **order-select**, which fires after the clinician picks an order and before signing. CDS Hooks is a published HL7 standard and a service is an HTTPS endpoint, so building one requires nobody's permission and the same engine answers any EHR that speaks it.

> ### Write-back was considered and rejected
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> An earlier draft of this document proposed filing the consult note to the chart as a DocumentReference. That path was abandoned on 21 August and the reasons are worth keeping.
>
> The Epic sandbox is shared with every developer on fhir.epic.com, so writing to it pollutes somebody else's test. More importantly, a note filed into a chart proves less than a card that appears while the clinician is still deciding. **Nothing in the current design writes anything to any chart.**

What is built, what is proposed, what is unverified

ITEM	STATUS	NOTE
Backend Services authentication to Epic	**Running**	RS384 client assertion, published JWK Set, five read scopes granted.
Unauthenticated read from Oracle Health	**Running**	Full record including the resources Epic refuses.
One record shape across three loaders	**Running**	Epic, Oracle and Synthea. The engine cannot tell which it is reading.
Integrity screen, unit-aware	**Running**	53 LOINC codes with impossibility bounds. Sign check is unit-independent.
Eight medication screening classes	**Running**	Text match only. See the drug knowledge socket below.
CDS Hooks service	**Deployed**	order-select and patient-view, live at aimedagent.net/cds-services. Returns a coverage card on every invocation.
AI MedAgent Reasoning inside the endpoint	**Deployed**	Runs after the deterministic screen. Hard timeout, and a card that says so when it does not complete.
Drug knowledge socket	**Built and empty**	Calling it throws **DRUGKB_NOT_CONNECTED**, in public, on purpose. Seven of eight classes are unserved without a maintained drug knowledge base.
MEDITECH	**Connected 24 Aug 2026**	321 resources on one `Patient/$everything` call, including Condition and AllergyIntolerance, the two resources Epic grants a scope for and then refuses. Authorization Code grant only, so every run needs a browser and a person.
Device cloud feed for infusion and ventilator status	**Proposed**	Not in any EHR FHIR surface measured here. Not carried by IPEC. No standard subscription transaction exists.
Any use with real patient data	**Not possible today**	Requires a named customer of the vendor. This project does not seek one.

The other gap: where the live device data comes from

Everything above concerns the chart. The method reasons over a *stream*, and two of the signals it needs are not in any FHIR surface measured here: **continuous infusion status** and **ventilator status**. Epic's documented route for infusion pump data remains an HL7 v2 flowsheet interface with row mapping negotiated per customer, and no vendor read for this document exposes a channel-level infusion state through FHIR, which is a custom build at the customer's expense and delivers a flowsheet summary rather than a live channel state.

The standards do not close this gap either, and the detail matters. Citations are to the IHE Devices Technical Framework Rev. 10.0, Final Text, 4 November 2024. The domain was renamed from Patient Care Device, which is why transaction identifiers keep the PCD prefix.

- **IPEC does not carry what a reader needs.** Its required event set is three delivery milestones: Delivery Start, Delivery Stop, Delivery Complete. **There is no rate change event, no secondary-to-primary switchover event and no transition-to-KVO event.** Those three are precisely the states a clinician, or a reasoning engine, must have in order to interpret an infusion record.

- **DEC carries periodic observation, which is the right shape, but there is no standard subscription.** Communicate PCD Data [PCD-01] is the reporting transaction. **PCD-02 reads "Reserved" in DEV TF-2 Rev. 10.0.** Subscription is specified only in the Subscribe to Patient Data supplement, Trial Implementation since 2007 and never promoted.
- **The FHIR device path is not a published standard.** The HL7 Point-of-Care Device implementation guide builds on the same ISO/IEEE 11073 information model, but it has never been published. The current artifact is a continuous build carrying "not an authorized publication". It is buildable and it is not citable as conformance.

> ### So the direct feed is not a shortcut around the standard
>
> It is the only place the required data currently exists. A continuous, channel-level view of what an infusion is actually doing is not defined by a Final Text transaction, is not exposed by the EHR, and is not obtainable without either a per-customer HL7 v2 build or a feed from the device manufacturer.
>
> A manufacturer running an always-connected pump already holds this data in its own cloud. Publishing a read-only API over it would create the interface the standard has not yet defined, and would do it with a real device behind it rather than a specification.

What the reasoning engine needs from a device cloud

Read only. Advisory only. No control path of any kind is requested, offered or implied.

SIGNAL	SHAPE	WHY IT IS NEEDED
Channel infusion state	periodic, per channel	rate, dose, VTBI, volume infused, and running, paused, KVO or alarming. This is the signal IPEC does not provide.
Programmed against delivered	both, kept distinct	a record of what was programmed is not a record of what was given, and collapsing them is the failure this whole method exists to address
Containment hierarchy	MDS, then VMD or channel, then metric	a multi-channel pump is one device with several channels. Flatten it and you lose which channel delivered which drug, which on a vasopressor and a maintenance fluid is the entire meaning of the message
Drug identity and concentration	with the dose, always	rate is not dose. Converting mL/h to mcg/kg/min needs concentration and weight. A dose carried without its basis cannot be recomputed or audited
Event stream	timestamped	the three IPEC milestones, plus rate change and KVO transition if the platform can emit them. Those two are the valuable ones precisely because the standard omits them
Ventilator status	periodic	mode, set parameters and measured parameters. Same gap, different device
Time base	synchronized, source named	an event stream that says the rate changed before the infusion started is a clock problem, and it is indistinguishable from a device problem without a stated time source

Terminology. ISO/IEEE 11073-10101 nomenclature with the Rosetta Terminology Mapping value set, whose use is required in IHE DEV profiles per DEV TF-1 section 2.6, and UCUM for units. **No specific MDC codes are asserted in this document.** Codes look memorable and are easy to recall almost correctly, and an almost-correct code is worse than a missing one because it validates. Every code would be looked up in the published tables and agreed in writing before use.

What any such interface has to get right

These are not integration details. Each one is a way the record becomes wrong while every system reports success.

- **KVO is still infusing.** A pump in keep-vein-open mode delivers at a rate that has nothing to do with the order. Charting it as the administration rate misrepresents the therapy.
- **A secondary pauses the primary.** Treating them as concurrent double counts volume. Treating them as one channel loses the drug identity. Both are common.
- **A bolus from a running container is not a new infusion.** Modeling it as one corrupts the volume record and the event sequence together.
- **The drug library does not travel in the message.** Dose limits live in the pump, versioned per care area, and nothing in a transaction tells the receiver which version was in force.
- **Patient identity binding is explicitly out of scope of the framework.** The DEV Technical Framework says so plainly, which means the specification will not save anyone here. Wrong-patient association of an infusion record is among the worst outcomes in this domain, and how association is done has to be answered before anything else.

A device cloud API that handles those five is worth more than one that merely exists, and none of them is solved by choosing a transport.

The honest limits

- **Both sandboxes are test environments and behave like it.** The data quality findings above are evidence about the sandboxes, not about Epic's or Oracle's production systems, and this document does not claim to know how a live instance behaves.
- **Sandbox CDS Hooks support is still unconfirmed at the vendor end.** Our service is live and conformant and answers any client that calls it. Whether either vendor's sandbox will call out to a third-party service has not been tested, and no claim is made that it will.
- **Oracle Health and MEDITECH are named Da Vinci CRD contributors.** Da Vinci CRD is built on CDS Hooks. That is a contribution to a standard and it is *not* verified production CDS Hooks support in either product. The distinction is deliberate.
- **Seven of eight screening classes have no source.** Allergy matching is substring matching on product names, which is why a saturated screen prints a count instead of a list. Ingredient-level

Security and governance

- Authentication is a signed assertion, not a password. The private key stays server side and is never committed to source control.
- Every sandbox used here contains synthetic patients only. Vendor terms prohibit identifiable information in a sandbox, and this project has no use for it.
- All traffic is TLS 1.2 or higher.
- Advisory only, human in the loop. Every write lands somewhere a clinician has to sign, adjust or discard.
- The integration is developed in isolation from the public demonstration site, and reaches it only by a deliberate act.

checking needs a maintained drug knowledge base and the socket for one is deliberately empty.

- **Production is walled at every vendor, by design.** There is no self-service route to a real chart at any of the three, and this project does not seek one.

What this is not

This is not a partnership with, an endorsement by, or a listed application of Epic, Oracle Health or MEDITECH. None of them certifies, endorses or verifies third-party applications, and Epic says so plainly. It is not a product, not a pilot, and not a medical device. It is a demonstration that a method already shown to work on a simulated encounter can be fed by a real chart, built so that a licensee can evaluate the integration path instead of being asked to take it on faith.

Patent and provenance

Patent pending. The method is the subject of US provisional patent applications filed in 2026. It continues one long thread of the same idea: real-time reasoning over a live physiological signal (a processed-EEG algorithm, 1986), population-scale medical-terminology reasoning (UMLS on the MediCompass platform, 2003), and now language-model reasoning over the live medication context.

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