ENKIDU

— MIOVSKI GROUP —

CONCEPTUAL ARCHITECTURE

MedBooth

Tangram zone architecture, Origi trust harness, Aegis Defence cryptography, and Helios Grid fleet operations for an autonomous, wheelchair-accessible, hospital-connected first-response telehealth kiosk.

English · Complete edition

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Glossary

Terms used throughout this conceptual architecture. Code names are shown in bold. Framework terms are carried forward from the Tangram, Trust Assurance (Origi), Helios Grid, and Aegis Defence documents and are not redefined except where MedBooth extends them.

MedBooth

An autonomous, AI-augmented first-triage health kiosk: clinical-grade biometric sensing, live telemedicine to a CPSA-registered physician, structured disposition (self-care, urgent referral, emergency escalation), and automated between-session decontamination, in a single wheelchair-accessible enclosure.

Continuum

A connected chain of Tangram zones forming one complete end-to-end process. MedBooth runs two: MB-CLN, the patient-facing Clinical Session continuum, and MB-OPS, the between-session Booth Operational continuum.

Zone

A bounded operational space with one goal and explicit entry and exit conditions. Every MedBooth zone carries three internal layers — Policy, Conops, and Reporting.

Policy layer

What must happen: the governing legal and regulatory instruments and the determinations they require. In MedBooth the policy layer is always human — no AI technology occupies it.

Conops layer

How it happens: the operational steps, device actuations, and workflows that execute inside a zone. AI technologies act here as sensors and actuators of operational steps.

Reporting layer

How it is measured: the KPIs, compliance records, and audit outputs each zone must produce.

Edge AI

AI that runs on-device at the point of care, with no cloud round-trip — required where data residency, latency, or connectivity constraints apply. Produces structured, auditable outputs that enter a zone as conops-layer sensor inputs.

Generative AI

LLM-based synthesis producing narrative outputs — clinical summaries, patient-facing explanations, documentation drafts. Always conops-layer; output is reviewed by a human before any policy-layer determination.

Predictive AI

Statistical or machine-learning models producing scored or classified outputs — risk scores, anomaly flags, triage recommendations. A conops-layer input to a human policy check, logged separately from the determination it informs.

Readiness flag

The exit condition of zone MB-OPS-03 and simultaneously the hard entry condition of MB-CLN-01. The synchronisation point — and primary safety interlock — between the two continuums.

Disposition

The physician's signed clinical determination at MB-CLN-04, which routes the session into exactly one of three exit zones: Self-Care (Green), Urgent Referral (Yellow), or Emergency Escalation (Red).

Session record

The custody-tracked record of one clinical session — identity and consent, sensor data, AI outputs, physician determinations, and delivered outputs — retained as personal health information under the Health Information Act.

PHI / HIA

Personal health information, governed in Alberta by the Health Information Act: lawful-basis collection, purpose limitation, permitted disclosures, ten-year retention, and patient access rights.

CPSA / AHCIP / MDL / SaMD

The College of Physicians and Surgeons of Alberta (physician registration and virtual-care policy); the Alberta Health Care Insurance Plan (coverage and billing); the Health Canada Medical Device Licence each clinical sensor must hold; and Software as a Medical Device — the Health Canada framework under which MedBooth's clinical AI outputs are labelled decision support, never autonomous diagnosis.

Tangram / Origi / Helios Grid / Aegis Defence

The four Enkidu frameworks MedBooth is built on: operational structure, runtime trust, fleet operations, and quantum-resistant cryptography respectively [3][4][6][7].

Abstract

MedBooth brings hospital-grade first triage to wherever a person stands — a pharmacy, a transit hub, a rural community, an emergency staging area — by combining a clinical-grade sensor suite, on-device AI, live telemedicine to a CPSA-registered physician, and automated between-session decontamination in one accessible enclosure [1]. It is also, unavoidably, a system in which software touches patients: it collects personal health information the moment someone steps inside, its decontamination hardware can injure an occupant if misgoverned, and its AI outputs sit adjacent to clinical judgment. An architecture for MedBooth must therefore do more than sequence features; it must make the safety interlocks structural, the legal obligations checkable, and the boundary between machine input and human determination impossible to blur.

This document is that architecture. Its core is the Tangram zone design [2]: two interlocked continuums — the Clinical Session continuum (MB-CLN, eight zones from approach to disposition) and the Booth Operational continuum (MB-OPS, three zones from session closure through decontamination to readiness certification) — each zone carrying explicit entry and exit conditions and a three-layer internal structure of Policy, Conops, and Reporting. One doctrine governs every AI placement: no AI technology occupies the policy layer. Admissibility, consent validity, clinical determination, and prescribing authority are always human decisions; AI produces structured, logged inputs to those decisions from the conops and reporting layers.

Around that zone core, this document aligns MedBooth to the full Enkidu stack: Origi supplies the runtime trust harness — trust-operation zones for the booth's sensors and actuators, hardware-enforced safety interlocks, and a chain of custody in which every AI output and every human determination are separately attributed; Aegis Defence supplies the cryptography — hybrid post-quantum key establishment on the Alberta Netcare tunnel and quantum-resistant signatures on clinical records whose HIA retention obligations outlive any classical-cryptography horizon; and Helios Grid supplies fleet operations — enrolment, staged SaMD-disciplined model rollout, telemetry, and predictive maintenance across a fleet of booths, streaming only signal upstream, never patient data. A hardware reference specification, drawn from the MedBooth concept design [1], closes the document.

The physician decides; the machine measures, assists, and proves what happened. Every zone in this architecture exists to keep those roles from trading places.

1. Context and Scope

1.1 What MedBooth is

MedBooth is a fully autonomous first-triage health kiosk originated as the Smart Health Access Unit concept [1]: a 6 ft × 7 ft enclosure housing ten clinical-grade sensors, an AI intelligence engine, a live telemedicine platform, and an automated UV-C and chemical-mist decontamination system, engineered for full wheelchair accessibility. A complete session — entry, identity and consent, sensor collection, physician consultation, and documented disposition — is designed to finish in eight to fifteen minutes for standard cases, with between-session decontamination completing in two and a half.

1.2 Deployment and regulatory frame

The reference deployment is Alberta, Canada. The architecture is designed against the Health Information Act (HIA), the CPSA virtual-care and registration policies, the Alberta Health Care Insurance Plan and its Schedule of Medical Benefits, Health Canada Medical Device Licence and SaMD requirements, the Alberta Occupational Health and Safety Act, the Alberta Public Health Act, and applicable accessibility standards [2][8][9][10][11]. The underlying hardware carries FDA 510(k) clearances from its original design [1]; Canadian deployment additionally requires each clinical sensor to hold a current Health Canada MDL, and the zone architecture treats that licence status as a hard operational gate, not a paperwork item.

1.3 What this document covers

This document reformats and extends the MedBooth Tangram Zone Architecture Design [2] into a full conceptual architecture: the two continuums and their eleven zones (Sections 3–4), the continuum controller (Section 5), the AI technology framework and placement doctrine (Section 6), MedBooth's alignment to each of the four Enkidu frameworks — Tangram, Origi, Aegis Defence, and Helios Grid (Sections 7–10) — and the hardware reference specification (Section 11). It is a conceptual architecture: sufficient to build against, accredit, and procure, without fixing implementation detail that belongs in detailed design.

2. Architectural Principles

2.1 The core premise

One sentence carries the MedBooth architecture: the machine measures and assists; the human determines; the structure proves it. Everything else in this document is that premise made mechanical — zones that will not open until their contract is satisfied, layers that keep AI out of legal determinations, interlocks that keep decontamination hardware away from occupied space, and a custody trail that records the machine's input and the human's decision as separately attributed events.

2.2 The load-bearing invariants

- # — Invariant — What it means in MedBooth
- 1 — No AI in the policy layer — Admissibility, consent validity, clinical determination, and prescribing authority are human decisions. AI produces structured, logged conops-layer inputs to those decisions — never the determinations themselves. This is the legal and clinical foundation of the architecture [2].
- 2 — The interlock is unconditional — Decontamination cannot activate while any occupancy signal is TRUE, under any circumstance, regardless of session state — enforced physically, not merely in software. Its mirror: MB-CLN-01 cannot admit a patient until the MB-OPS-03 readiness flag is TRUE.
- 3 — Incomplete data is disclosed, never masked — A failed or out-of-tolerance sensor reading is explicitly noted in the physician briefing; a decontamination cycle that completes below specification is a failed cycle, recorded as such.
- 4 — PHI moves only under authority — Sensor data is personal health information from the moment of capture; every transmission occurs under a specific HIA authority — consent-scoped disclosure, s.35 permitted disclosure, or emergency disclosure — and under Aegis-protected channels (Section 9).
- 5 — An uncertified booth admits no one — Sensor calibration within MDL tolerance, a valid HIA data-sharing agreement, an authenticated Netcare tunnel, and consumables above threshold are entry stakes for the clinical continuum — readiness is certified, not assumed.
- 6 — Every output carries custody — Every sensor reading, AI output, human determination, transmission, and delivered document is written to the session's chain of custody with attribution and timestamp — the physician's judgment and the AI's suggestion are never merged into one record.

2.3 Design consequences

Three consequences follow. First, safety is topological: the two continuums synchronise at exactly one point — the readiness flag — and the architecture's primary safety mechanism is that interlock, not any individual check. Second, compliance is checkable: because each zone's policy layer names its governing instruments and its exit conditions operationalise them, an auditor can walk any session from motion-detect to disposition and find the statute behind every gate. Third, degradation is admission control: MedBooth has no degraded clinical mode — a booth that cannot certify readiness publishes a fault code and admits no one, which is the clinically safe failure.

3. The Clinical Session Continuum — MB-CLN

3.1 Continuum overview

MB-CLN is the patient-facing continuum: eight zones from physical arrival through clinical determination and discharge. Its entry is gated by the MB-OPS-03 readiness flag; its terminal zones are the three mutually exclusive dispositions driven by the physician's signed clinical note at MB-CLN-04.

- Zone — Name — Zone goal
- MB-CLN-01 — Approach and Access — Confirm physical presence, verify booth readiness, and admit the patient into the session environment.
- MB-CLN-02 — Identity, Consent and Intake — Establish identity, obtain lawful informed consent under Alberta's consent framework, and collect structured symptom history.
- MB-CLN-02B — AHCIP Eligibility and Billing — Determine AHCIP coverage status and billing classification before clinical services are rendered.
- MB-CLN-03 — Automated Sensor Collection — Collect a complete, validated vitals set across all clinical-grade sensors and produce the AI physician briefing — under 3 minutes elapsed, briefing in under 15 seconds.
- MB-CLN-04 — Live Clinical Consultation — Connect the patient with a CPSA-registered clinician, conduct a structured interview informed by the AI briefing, and reach the clinical determination.
- MB-CLN-05A — Self-Care Discharge (Green) — Deliver self-care instructions, prescription if indicated, and complete visit documentation; release the patient.
- MB-CLN-05B — Urgent Referral (Yellow) — Issue a structured referral, confirm a next-available appointment, and ensure a documented, actionable care pathway.
- MB-CLN-05C — Emergency Escalation (Red) — Initiate emergency services, transmit the vitals packet to the receiving hospital, and maintain clinical oversight until handoff.

Each zone below is presented in the same form: its boundary contract (entry and exit conditions), then its three internal layers. AI applications are tagged by type — Edge, Generative, or Predictive — per the framework of Section 6.

3.2 MB-CLN-01 — Approach and Access

Zone goal: confirm physical presence, verify booth operational readiness, and admit the patient into the session environment.

- Entry conditions — Exit conditions
- Motion sensor confirms presence at booth entry · MB-OPS-03 readiness flag = TRUE (booth decontaminated and certified) · Occupancy sensor confirms booth interior is clear · Floor sensor confirms accessibility-compliant entry path clear — Patient physically inside booth, door closed and sealed · Occupancy confirmed: single occupant · Welcome screen activated, console at default height · Session ID generated and timestamped — session record opened
- Layer — Content
- Policy — Accessible admission per integrated accessibility standards. HIA: any retained entry sensor data is PHI — collection must have lawful basis. Alberta OHS Act: safety interlock — the decontamination system is physically disabled while the occupancy sensor is TRUE. The MB-OPS-03 exit condition is a hard gate, not advisory. Edge: presence and occupancy classification from the motion and floor sensor array.
- Conops — Console height adjustment to default · door seal and lock confirmation · welcome screen and language selection · session ID creation and clock-start logged. Edge: vision camera begins passive baseline capture (feeds the MB-CLN-03 briefing); acoustic array activates for ambient baseline.

- Reporting — Session admission timestamp · time-to-door-open from motion detect (throughput KPI) · readiness flag confirmation logged, linked to the MB-OPS-03 exit record.

3.3 MB-CLN-02 — Identity, Consent and Intake

Zone goal: establish patient identity, obtain lawful informed consent, and collect structured symptom history.

- Entry conditions — Exit conditions
- Patient inside booth, door closed (MB-CLN-01 exit met) · Touchscreen operational · Identity verification system available (camera, card reader) · Consent management system connected — Identity confirmed (Alberta Health card scanned or anonymous session declared) · Informed consent obtained, timestamped, logged to HIA-compliant record · Symptom questionnaire complete — chief complaint structured and recorded · Language preference confirmed for all subsequent content
- Layer — Content
- Policy — HIA: PHI collection limited to lawful purpose — AHCIP eligibility is the only valid basis for health-card-number collection; HIA s.27 written statement of information practices available before collection. Consent must be informed, voluntary, and treatment-specific; capacity presumed unless assessed otherwise. CPSA virtual-care policy: a licensed, identified physician must be available before the consultation zone can be entered. Controlled acts require an authorised practitioner — confirmed at intake. Generative: plain-language consent form, jurisdiction-specific, rendered from the policy template. Edge: Alberta Health card authenticity check — optical and chip validation.
- Conops — Card scan or manual DOB / anonymous declaration · accessible consent display and timestamped acknowledgement · eight-question symptom questionnaire, voice and touch, multilingual · chief complaint structured and categorised · preferences recorded. Generative: questionnaire NLP — voice transcription and structured chief-complaint extraction. Edge: acoustic monitoring for distress indicators during intake. Predictive: early triage signal from symptom pattern, before sensor collection.
- Reporting — Consent completion rate · time-in-zone · anonymous-vs-identified ratio · language distribution · capacity-concern flags logged for consent-pathway monitoring. Predictive: intake-completion prediction — flags sessions at risk of abandonment.

3.4 MB-CLN-02B — AHCIP Eligibility and Billing Classification

Zone goal: determine AHCIP coverage status and billing classification before clinical services are rendered — this determination governs what the physician can order and bill in MB-CLN-04.

- Entry conditions — Exit conditions
- MB-CLN-02 exit conditions fully met · Card scanned or anonymous/uninsured declared · AHCIP eligibility verification system available — Coverage status confirmed: Insured / Uninsured / Out-of-Province · Billing classification recorded: Comprehensive / Limited / Self-pay / Third-party · Billing category appended to session record, visible to the attending physician · Applicable fee schedule confirmed
- Layer — Content
- Policy — Alberta Health Care Insurance Act: the health card number may be used only to determine AHCIP eligibility — no secondary use. CPSA billing policy: the physician must know coverage status before rendering services (extra-billing prohibition). Schedule of Medical Benefits determines what is billable; federal privacy alignment limits card-number collection to the stated purpose. Edge: real-time AHCIP eligibility verification with encrypted response. Predictive: billing-category prediction; ambiguous cases flagged for manual classification.
- Conops — Eligibility query to Alberta Health · coverage determination · billing category assignment · fee-schedule lookup · classification appended to session record.
- Reporting — Coverage distribution · uninsured session rate (facility planning) · classification accuracy · revenue per session by category. Predictive: revenue forecasting from aggregate billing mix.

3.5 MB-CLN-03 — Automated Sensor Collection

Zone goal: collect a complete, validated set of biometric readings across all clinical-grade sensors and produce a structured pre-clinical intelligence briefing for the attending physician — under 3 minutes elapsed, AI briefing in under 15 seconds.

- Entry conditions — Exit conditions
- Intake and consent complete (MB-CLN-02 and 02B exits met) · All required sensors operational and within Health Canada MDL calibration tolerance · Patient positioned at console · Physician briefing system available — Complete validated vitals set: BP, SpO2, ECG, temperature, weight, respiratory rate, pulse · Blood glucose if indicated · Computer-vision and acoustic baseline assessments complete · AI physician briefing assembled, timestamped, queued · Physician connection initiated · Any failed or out-of-tolerance readings explicitly noted in the briefing, not silently dropped
- Layer — Content
- Policy — Health Canada MDL: readings taken outside validated operating parameters are not valid clinical readings and cannot be transmitted as though they are. Health Canada SaMD framework: AI outputs from vitals, vision, and acoustic analysis are Software as a Medical Device — labelled clinical decision support, never autonomous diagnosis. HIA: sensor data is PHI from capture; transmission occurs under an HIA-compliant data-sharing agreement. CPSA standard of practice: briefing completeness is a policy obligation. Patient-safety standards: incomplete collection is disclosed to the physician, not masked. Edge: Vitals AI — on-device BP, SpO2, ECG, temperature, weight, respiratory and pulse processing, validated against MDL parameters before inclusion; Computer Vision AI — pallor, diaphoresis, respiratory pattern, visible distress, as structured finding codes; Acoustic AI — breath sounds, voice stress, cough pattern, cardiac sounds. Predictive: risk model integrating all sensor and questionnaire data into a Green / Yellow / Red severity classification with a supporting evidence list.
- Conops — Cuff inflation and dual BP measurement · SpO2 clip guidance and monitoring · 12-lead ECG capture · thermometer reading · weight platform · glucose if indicated · continuous pulse and respiratory monitoring · console repositioning per measurement · screen-and-voice guidance throughout. Edge: all sensor hardware actuated and sequenced by the on-device controller — no cloud dependency for hardware control. Generative: real-time patient guidance voice prompts in the selected language, adapted per step.
- Reporting — Sensor completion rate per type · out-of-tolerance events (maintenance trigger) · time-in-zone (target under 3 minutes) · briefing generation time (target under 15 seconds) · severity distribution (clinical-load indicator) · failed-reading rate by sensor. Predictive: sensor-degradation prediction ahead of calibration failure; severity-trend analysis across the patient population.

3.6 MB-CLN-04 — Live Clinical Consultation

Zone goal: connect the patient with a CPSA-registered clinician, conduct a structured clinical interview informed by the AI briefing, and reach the clinical determination that drives the exit disposition.

- Entry conditions — Exit conditions
- Briefing packet assembled and queued (MB-CLN-03 exit met) · CPSA-registered physician available — registration verified against the CPSA public register in real time · Telemedicine connection established within the encrypted tunnel to Alberta Netcare / Connect Care · Patient alert and able to engage (acoustic and visual confirmation) · Billing category confirmed · Physician confirms apparent capacity before treatment determination — Consultation completed — briefing reviewed, structured interview conducted · Clinical note generated and digitally signed · Disposition determined: Self-Care / Urgent Referral / Emergency Escalation · If prescribing: CPSA- and Alberta-compliant e-prescription generated · Mandatory-reporting assessment completed and documented — child-protection and Medical Officer of Health notifications made if indicated · Billing code confirmed for AHCIP claim
- Layer — Content
- Policy — CPSA registration: current unrestricted Alberta registration required — out-of-province licensure is insufficient. CPSA virtual-care policy: physician identity, location, contact, and licensure disclosed as a policy check. Prescribing: e-prescriptions meet signature requirements; Netcare Narcotics Monitoring System submission for monitored drugs. Scope of practice: diagnosing, treating, and prescribing confirmed as authorised controlled acts. Child, Youth and Family Enhancement Act: mandatory reporting on reasonable suspicion of child abuse. Alberta Public Health Act: reportable-disease notification if indicated. Capacity: if the physician assesses potential

incapacity, the treatment determination cannot proceed without a substitute decision-maker — a mandatory error path. Generative: briefing narrative rendered from structured sensor data and finding codes. Predictive: ranked differential-diagnosis suggestions — decision support, not determination.

- Conops — Physician reviews the briefing and confirms or amends the severity classification · video consultation and structured interview · remote guided self-examination where applicable · mandatory-reporting checklist actively reviewed · disposition decision · prescription and referral drafting if indicated · clinical note from reviewed transcription · billing code selection · digital signature applied, note locked. Edge: real-time on-device NLP transcription, available before sign-off. Generative: clinical note draft (explicitly labelled as draft in the audit trail) and referral letter draft — physician reviews, amends, signs. Predictive: physician–AI agreement monitoring — divergent dispositions recorded as attributed clinical judgment.
- Reporting — Consultation duration · physician–AI classification agreement rate (primary quality metric) · mandatory-reporting completion rate · prescription rate by presenting complaint · billing-code accuracy · capacity-concern rate · time-to-physician-connection. Predictive: consultation-duration prediction for scheduling; clinical-pattern surveillance feeding population-health reporting to Primary Care Alberta.

3.7 MB-CLN-05A — Self-Care Discharge (Green disposition)

Zone goal: deliver self-care instructions, prescription if indicated, and complete visit documentation, then release the patient. Entry requires the signed clinical note with the Self-Care disposition.

- Entry conditions — Exit conditions
- Signed clinical note, Self-Care (Green) · Prescription generated and pharmacist-ready if indicated · AHCIP claim record prepared — Prescription transmitted to the patient-selected Alberta-licensed pharmacy · Netcare NMS submission for monitored drugs · Visit summary emailed and SMS'd · Doctor's note delivered · QR code for Alberta My Health Records generated · AHCIP claim submitted · Patient exit confirmed by occupancy sensor
- Layer — Content
- Policy — Prescriptions transmitted only to registered pharmacies; no paper prescriptions for monitored drugs; NMS submission at point of generation. HIA: visit record retained a minimum of ten years from date of service, with patient right of access. Contribution to Alberta My Health Records under the HIA data-sharing framework. AHCIP claim with correct billing, diagnostic, and service-date coding. Generative: self-care instructions — plain language, in the patient's language, specific to the signed clinical note; prescription formatting for pharmacy transmission.
- Conops — Pharmacy transmission via the Netcare secure channel · NMS submission · summary generation with confirmed email and SMS delivery · doctor's note output · QR generation · claim submission · session closure with exit monitoring.
- Reporting — Delivery confirmation rate for all outputs · prescription transmission success · NMS compliance rate · patient satisfaction score · door-open-to-door-exit duration · claim acceptance rate. Predictive: pharmacy wait-time estimate for patient advisement.

3.8 MB-CLN-05B — Urgent Referral (Yellow disposition)

Zone goal: issue a structured referral, confirm a next-available appointment with an appropriate provider, and ensure the patient leaves with a documented, actionable care pathway.

- Entry conditions — Exit conditions
- Signed clinical note, Urgent Referral (Yellow) · Referral destination identified by the physician · Referral letter generated from the clinical note — Appointment confirmed — time and location communicated to the patient · Referral letter transmitted to the receiving provider under HIA disclosure authority, receipt confirmed · All session outputs delivered · AHCIP claim submitted · Patient exit confirmed
- Layer — Content
- Policy — HIA s.35: disclosure to the receiving provider is a permitted disclosure for the purpose of providing health care, within the scope of the consent obtained at MB-CLN-02. CPSA standard: the referral must be appropriate for the condition and accessible to the patient — an inaccessible referral is a policy failure regardless of documentation. Provincial referral infrastructure used where available; referral structured so the receiving physician can bill. Generative: referral letter, physician-reviewed before transmission. Predictive: provider matching — nearest appropriate provider with next-available appointment.

- Conops — Appointment booking through provincial referral channels · referral transmission with confirmed receipt as an exit condition · session outputs delivered · claim submitted · exit confirmed. Generative: patient-facing care-pathway explanation, on screen and by SMS.
- Reporting — Referral-to-appointment lag · receiving-provider confirmation rate · referral appropriateness via outcome linkage · claim acceptance for referral sessions. Predictive: referral-outcome prediction — 48-hour presentation probability; high no-show risk flagged for care-coordinator follow-up.

3.9 MB-CLN-05C — Emergency Escalation (Red disposition)

Zone goal: initiate emergency services, transmit the complete vitals packet to the receiving hospital, and maintain continuous clinical oversight and patient safety until handoff to emergency responders.

- Entry conditions — Exit conditions
- Signed clinical note with Emergency (Red) disposition, or an autonomous AI escalation trigger (acoustic or vitals distress signature) confirmed by the physician · 911 dispatch reachable · Receiving ER confirmed and reachable via Netcare · Telemedicine connection maintained — the patient is not left unattended — 911 dispatched, confirmation number recorded · Receiving ER notified — vitals packet transmitted, receipt confirmed · Live video maintained to the attending physician until responders arrive · Booth in safe-hold: decontamination disabled, door unlocked for emergency access · Session outputs queued for post-event delivery · Reportable-disease notification if indicated · Exit confirmed by occupancy sensor and the emergency-services handoff record
- Layer — Content
- Policy — HIA s.35(1)(b): disclosure to responders and the receiving hospital without consent where necessary to prevent serious harm — the legal basis for the vitals packet. Alberta Public Health Act: mandatory notification if the condition is or may be a notifiable disease. 911 dispatch authority cannot be delegated to AI — the AI distress trigger requires physician confirmation before dispatch. CPSA: clinical oversight maintained until handoff. Booth safety: the occupancy interlock prevents decontamination while the patient is present, regardless of session status. Edge: autonomous distress detection — fires an escalation alert to the physician for confirmation; never initiates dispatch autonomously. Vitals packet real-time compilation to the receiving ER via the Netcare secure channel. Predictive: deterioration-trajectory model during the emergency wait, informing receiving-ER triage priority.
- Conops — Physician-authorised 911 dispatch · ER notification and vitals transmission · live video maintained · safe-hold activation (door unlock, decontamination disable) · continuous vitals and visual monitoring throughout the wait · reportable-disease notification if indicated · handoff record created. Edge: continuous vitals monitoring to the physician and receiving ER. Generative: emergency summary — a structured paramedic handoff note produced in real time from the session record.
- Reporting — Emergency activation rate by facility and period · dispatch-to-arrival time · vitals-packet confirmation rate · physician-connection-maintained rate · notification compliance · post-event outcome linkage at the receiving ER. Predictive: emergency demand forecasting by location, time of day, and season — informing EMS pre-positioning and facility siting.

4. The Booth Operational Continuum — MB-OPS

4.1 Continuum overview

MB-OPS is the between-session continuum, running automatically after every clinical session exit. Its three zones move the booth from an occupied, contaminated state back to a certified-ready one. The exit condition of its final zone — the readiness flag — is simultaneously the entry condition of MB-CLN-01, and this shared boundary is the architecture's primary safety interlock.

- Zone — Name — Zone goal
- MB-OPS-01 — Session Closure and Safety Confirmation — Confirm patient exit and a physically clear interior before any decontamination is permitted to begin.
- MB-OPS-02 — Decontamination Cycle — Achieve hospital-level sterility across all interior surfaces within the 2.5-minute protocol; a below-specification phase makes the cycle a failed cycle.
- MB-OPS-03 — Readiness Certification — Confirm sensors, connectivity, and consumables are within specification and publish the booth readiness flag — the synchronisation point between the continuums.

4.2 MB-OPS-01 — Session Closure and Safety Confirmation

Zone goal: confirm patient exit and that the booth interior is physically clear before any decontamination activity is permitted to begin. This is a safety-critical zone — its entry conditions protect against patient harm from decontamination activation.

- Entry conditions — Exit conditions
- Clinical session exit met (patient has left one of 05A / 05B / 05C) · Door closed — door sensor confirms · Occupancy sensor confirms zero occupants · Session record closed and timestamped — Clear confirmation logged with timestamp and session ID · Decontamination system armed — physical interlock released · Door locks activated — external entry prevented during the cycle · All peripheral devices returned to safe standby
- Layer — Content
- Policy — Alberta OHS Act: the occupancy interlock is a regulatory safety requirement — decontamination cannot begin while any person is inside, under any circumstance. HIA: the session record must be finalised and timestamped before data is eligible for archiving. Manufacturer standards: UV-C and chemical-mist systems operate only on confirmed unoccupied spaces. Edge: multi-sensor occupancy fusion — motion, weight platform, acoustic, and thermal sensors fused on-device to produce a confident zero-occupancy determination; single-sensor confirmation is insufficient for safety-critical clearance.
- Conops — Occupancy array polled · door closure and seal confirmed · session record closed with final timestamp · peripherals to standby (cuff retract, console safe reposition) · decontamination armed via physical interlock signal.
- Reporting — Occupancy clearance time (exit to arm) · safety-interlock activation log — every clearance recorded with sensor states · false-positive occupancy flag rate (sensor reliability).

4.3 MB-OPS-02 — Decontamination Cycle

Zone goal: achieve hospital-level sterility across all interior surfaces within the 2.5-minute protocol. A cycle that completes with any phase below specification is a failed cycle — not a completed cycle — and must be recorded as such.

- Entry conditions — Exit conditions
- MB-OPS-01 exits fully met (safety confirmed, system armed) · UV-C lamps verified above minimum output · Chemical mist reservoir above minimum · HEPA ventilation operational · All subsystems reporting ready — UV-C Phase 1 (ceiling) within specification — dose confirmed · UV-C Phase 2 (floor and side) within specification — dose confirmed · Chemical mist spray completed — coverage confirmed · HEPA flush completed — residual chemical

within safe limits · UV-C exposure log entry created with lamp output and phase durations · System self-diagnostic passed

- Layer — Content
- Policy — Alberta OHS Act and workplace hazardous-materials rules: UV-C exposure documentation is a regulatory obligation — every cycle produces a logged record of lamp output and phase duration. Chemical mist is a hazardous material; handling, containment, and residue limits are policy constraints. Health Canada decontamination standards: the cycle must achieve documented sterility — partial cycles do not count as completed, regardless of operational convenience. Infection-prevention standards for shared clinical spaces apply. Edge: UV-C lamp-output dosimetry — real-time per lamp; below-threshold output invalidates the phase; chemical mist coverage sensor confirms distribution before the ventilation flush. Predictive: lamp-degradation prediction — models remaining useful life from cumulative output, triggering replacement before failure.
- Conops — UV-C Phase 1 (ceiling), UV-C Phase 2 (floor and side) timed sequences · automated chemical mist with coverage confirmation · HEPA flush (minimum 60-second exchange) · residual-chemical sensor within safe limits before completion · subsystem self-diagnostic. Edge: on-device decontamination sequencer manages phase timing, sensor polling, and pass/fail without cloud dependency.
- Reporting — Cycle completion rate — pass / fail / partial · UV-C output by lamp and cycle (preventive-maintenance trigger) · reservoir level trend · cycle-duration compliance (within 2.5 minutes) · failed-cycle rate by subsystem (root-cause input). Predictive: reservoir-consumption prediction from session volume; decontamination-efficacy trending against microbiological audit results where available.

4.4 MB-OPS-03 — Readiness Certification

Zone goal: confirm all clinical sensors, connectivity, consumable levels, and system states are within operational specification, and publish the booth readiness flag that is the entry condition for MB-CLN-01. This is the synchronisation point between the two continuums.

- Entry conditions — Exit conditions
- MB-OPS-02 exits fully met — cycle passed all phases · Sensor calibration checks initiated · Connectivity systems available · Chemical and consumable levels available for check — All clinical sensors within Health Canada MDL calibration tolerance — out-of-tolerance sensors flagged and excluded from session availability · Netcare / Connect Care VPN tunnel active and authenticated · HIA data-sharing agreement confirmed current and valid · Reservoir and UV-C output above thresholds (or lamp flagged for replacement) · Console at default, welcome screen active · Booth readiness flag = TRUE, published to the MB-CLN-01 entry monitor
- Layer — Content
- Policy — Health Canada Medical Device Regulations: sensors operated only within MDL conditions — out-of-tolerance readings cannot be used clinically. HIA: Netcare connectivity must fall within a current data-sharing agreement — an expired agreement means PHI cannot be transmitted, so the clinical continuum cannot proceed. CPSA: the physician must be able to access a complete, accurate sensor dataset — an uncertified reading in the briefing is a policy violation. AHCIP claim-system connectivity confirmed before the clinical session begins. Edge: sensor self-calibration against certified reference values, logged with sensor ID, reference, measured value, and pass/fail. Predictive: readiness prediction — models the probability of clean session completion from sensor states, consumables, and recent error history, flagging likely mid-session failures before admission.
- Conops — Calibration verification per sensor · connectivity verification (VPN, Netcare authentication, Connect Care, AHCIP) · chemical and consumable check · console positioning and screen test · HIA agreement validity check · readiness flag publication (TRUE, or FALSE with a specific fault code) · welcome screen activation. Edge: automated readiness sequencer publishes the flag from local device state, no cloud dependency. Generative: plain-language fault explanation for the facility manager when the flag is FALSE.
- Reporting — Readiness certification time (decontamination complete to flag TRUE) · sensor out-of-tolerance rate by type · connectivity failure rate · booth availability rate (sessions possible vs blocked) · pre-session fault distribution by subsystem. Predictive: availability forecasting for the facility scheduling dashboard; sensor-failure prediction from drift trend, triggering maintenance before session blocking.

5. The Continuum Controller

A continuum controller sits above both MB-CLN and MB-OPS with read access to all zone states and the authority to publish constraint flags that zone controllers read and enforce. It cannot modify zone state directly — it is a coordination layer, not a command layer. In Tangram terms it is an overzone; in Origi terms its read-only, flag-publishing authority is a deliberately narrow trust-operation zone (Section 8).

- Function — Description
- Interlock enforcement — Monitors the MB-OPS-03 readiness flag and blocks MB-CLN-01 admission until it is TRUE. Logs every interlock event with timestamps from both continuums.
- Program-integrity reporting — Synthesises zone-level KPIs into continuum-level metrics: clean-path rate, throughput, AI accuracy rates, policy-compliance rates, decontamination compliance, and readiness availability.
- AI-performance monitoring — Tracks the physician–AI classification agreement rate across all sessions; feeds a model-recalibration signal when systematic disagreement emerges; logs every AI output and corresponding human determination as separately attributed events.
- Constraint-flag publication — Publishes system-wide flags — reservoir low, lamp approaching end of life, connectivity degraded — that zone controllers read to adjust behaviour before failure occurs.
- Regulatory reporting — Assembles mandatory outputs: HIA audit trail, CPSA quality data, Health Canada MDR post-market surveillance, AHCIP reconciliation, and OHS decontamination logs.

The controller also hosts the fleet-and-population-level AI applications — all reporting- or conops-layer, none in policy: a Predictive population-health surveillance model and facility-siting/demand model for Primary Care Alberta; a Generative regulatory-report generator (human-reviewed before submission); and a Predictive fleet-wide system-health dashboard for real-time predictive maintenance. These are the natural attachment points for Helios Grid telemetry (Section 10).

6. AI Technology Framework and Placement Doctrine

6.1 Three technologies, one rule

MedBooth uses three classes of AI, and the architecture places all of them identically with respect to authority: as conops-layer sensors and actuators, or reporting-layer measurement synthesisers — never in the policy layer.

- Technology — Role — Placement
- Edge AI — On-device inference at the point of care, no cloud round-trip — for data residency, latency, and connectivity. Structured, auditable outputs. — Conops layer (sensor inputs / actuators).
- Generative AI — LLM-based synthesis — clinical summaries, patient-facing explanations, documentation drafts. Human-reviewed before any determination. — Conops layer; output reviewed before policy.
- Predictive AI — Scored or classified outputs — risk scores, anomaly flags, triage recommendations. — Conops-layer input to a human policy check; logged separately from the determination.

6.2 Why the doctrine is load-bearing

The placement rule is not stylistic; it is the legal and clinical foundation of the system. Every determination that carries legal weight — admissibility, consent validity, clinical diagnosis, prescribing authority, 911 dispatch — is reserved to a human, with the AI's contribution reduced to a structured, logged input to that human's decision. Three properties follow directly: the SaMD obligation is satisfied by construction (AI outputs are decision support because the architecture gives them nowhere else to be); confident-wrongness is contained (a wrong AI severity classification is an input the physician can override, recorded as attributed clinical judgment via the agreement-monitoring metric); and accountability is unambiguous (the chain of custody shows the AI suggestion and the human determination as separate, separately-attributed events — the difference, in Origi's terms, between an input and a verdict).

6.3 The distribution across zones

Edge AI dominates the sensor-collection, decontamination, and readiness zones, where on-device inference and hardware control must survive connectivity loss. Generative AI concentrates in the consent, consultation, discharge, and referral zones, where narrative must be drafted for human review. Predictive AI runs throughout, always producing a score or flag that a human — or a downstream reporting process — consumes. The full zone-by-zone, layer-by-layer inventory of AI applications is retained from the zone design [2] and belongs in the detailed-design annex; the doctrine above governs every entry in it.

7. Tangram Alignment — Operational Structure

MedBooth is a Tangram deployment in the strict sense [3]: its two continuums are Tangram continuums, its eleven zones are Tangram zones, and its Policy/Conops/Reporting layering is the Tangram three-layer zone model applied to a clinical setting. The correspondences are exact enough to be worth stating, because they are what make the architecture auditable rather than merely organised.

Zones and boundary contracts. Each MedBooth zone has one goal and two boundary conditions, and the exit condition of one zone is the entry stake of the next — the readiness flag passed from MB-OPS-03 to MB-CLN-01 is the textbook case of an exit condition becoming the next zone's entry contract. A session cannot skip a gate: MB-CLN-04 will not open without a queued briefing packet, which will not exist without a completed MB-CLN-03, which will not begin without consent from MB-CLN-02.

Policy purity. Tangram's central discipline — a policy answers only "is this permissible?", never "how do we do it?" — appears in MedBooth as the AI-placement doctrine of Section 6. Keeping the determination (admissible? consented? prescribable?) separate from the operation (measure, transcribe, draft) is exactly what lets compliance be measured: the physician–AI agreement rate is meaningful precisely because the two are never merged.

Error zones as first-class citizens. MedBooth designs its failure paths rather than deferring them. The three dispositions are not exception handling but designed exits; the capacity-concern path at MB-CLN-04 routes to a substitute-decision-maker rather than proceeding; a failed decontamination phase enters a recorded failed-cycle state; a readiness failure publishes a fault code and blocks admission. In Tangram's phrase, none of these is "an undesigned zone."

Continuums and the overzone. The continuum controller (Section 5) is a Tangram overzone: it aggregates zone-level reporting into continuum-level program integrity and publishes constraint flags downward, without ever executing zone operations itself.

8. Origi Alignment — Runtime Trust

Where Tangram gives MedBooth its structure, Origi — the Trust Assurance harness [4] — governs what the booth's software and AI are permitted to do at run time, and proves what they did. For a system whose actuators can harm an occupant and whose outputs inform clinical decisions, this is not optional infrastructure.

Trust-operation zones for sensors and actuators. Origi grants each software element only the capability its role requires. The decontamination controller holds the most tightly scoped and most heavily monitored capability in the booth — it can act only on a signed zero-occupancy verdict from MB-OPS-01, and the occupancy interlock is enforced as a hardware-backed control, not a software check that a fault could bypass. The clinical AI agents hold read-and-analyse capability over sensor streams but no authority to transmit, prescribe, or dispatch: those cross a boundary Origi brokers to a human.

The human seam is a designed boundary. Every consequential action — transmitting PHI, generating a prescription, dispatching 911 — is, in Origi terms, an actuator action requiring a verdict from outside the AI. MedBooth's version of that verdict is the physician's signature or explicit authorisation. The autonomous distress trigger at MB-CLN-05C is the sharpest example: the AI may detect and alert, but the dispatch authority is human, and Origi's separation between the component that assesses and the component that acts is what enforces it.

Chain of custody. Origi's signed, hash-linked custody record is the mechanism behind Invariant 6: every sensor reading, AI output, human determination, transmission, and delivered document is written with attribution and timestamp, so a session is fully reconstructable and every AI suggestion is distinguishable from the human decision it informed. This is simultaneously the HIA audit trail, the CPSA quality record, and the Health Canada MDR post-market surveillance feed — one custody chain serving three regulators.

Fail-closed and defence-in-depth. MedBooth has no unsafe permissive failure. A sensor that cannot validate against its MDL parameters is excluded, not trusted; a booth that cannot certify readiness admits no one; an evaluator that errors blocks rather than proceeds. No single probabilistic check is ever a sole gate — the deterministic interlocks and the human determination bound the impact of any AI error, exactly as Origi's defence-in-depth prescribes.

9. Aegis Alignment — Secure Communications

MedBooth handles personal health information whose HIA retention obligation is a minimum of ten years, and transmits it across public networks to Alberta Netcare, receiving hospitals, pharmacies, and emergency responders. That combination — long-lived sensitivity plus networked transmission — is precisely the profile that makes the quantum threat a present-tense problem: traffic harvested today can be decrypted once a cryptanalytically relevant quantum computer exists. MedBooth therefore adopts Aegis Defence [7] as its cryptographic layer.

Hybrid key establishment on every channel. The encrypted tunnel to Netcare / Connect Care, the pharmacy transmission channel, the receiving-ER vitals-packet channel, and the patient-facing session all run hybrid post-quantum key establishment (X25519 + ML-KEM-768), so a session key survives the failure of either the classical or the post-quantum component. This upgrades — rather than replaces — the concept design's TLS 1.3 transport [1].

Quantum-resistant signatures on clinical records. The physician's digital signature on the clinical note, the integrity signatures on the chain-of-custody records, and the artifact signatures on the booth's own AI models move to ML-DSA, with the symmetric layer (AES-256, SHA-384-class hashing) retained unchanged as already quantum-resistant. A clinical record signed today must remain verifiable across its full ten-year-plus life — a signature scheme with a shorter horizon than the record's retention obligation is a latent compliance gap.

Crypto-agility through the fleet. Because Aegis expresses the active cipher suite as a signed crypto-policy artifact distributed by Helios Grid (Section 10), a MedBooth fleet can migrate algorithms — or respond to a cryptanalytic surprise — as a staged, health-gated rollout rather than a truck-roll to every kiosk. The Cryptographic Bill of Materials that Canadian PQC-migration guidance requires is a query over the fleet's node twins, not a manual audit.

10. Helios Alignment — Fleet Operations

A single MedBooth is a product; a network of them across pharmacies, transit hubs, and rural communities is a fleet, and a fleet must be enrolled, kept current, observed, and recovered without a technician at each site. Helios Grid [6] is MedBooth's control plane, and its defining discipline maps naturally onto a health-privacy setting: it streams only telemetry and signal upstream — never patient data.

Signal, not PHI. Helios carries device health, sensor-calibration status, consumable levels, decontamination-cycle outcomes, connectivity state, and AI-performance metrics from each booth to a central console. It carries no session content: a booth's control channel structurally cannot express a vitals reading or a clinical note, which keeps the fleet observable without creating a second path by which PHI could leave the kiosk — the same schema-level separation Helios enforces on the Northwind fabric, and a direct reinforcement of HIA data-minimisation.

SaMD-disciplined model rollout. Every clinical AI model — vitals, vision, acoustic, risk — reaches a booth as a staged Helios rollout: canary booth, then region, then fleet, with health gates and automatic rollback. Because these models are Software as a Medical Device, the rollout inherits the SaMD change-control discipline: versioned, signed, provenance-tracked, and gated against a curated clinical evaluation set before any patient-facing use. Model versioning is treated as a form of policy change, exactly as Origi requires.

Predictive maintenance as fleet telemetry. The per-booth predictive-maintenance applications — sensor-degradation, lamp-degradation, reservoir-consumption, and availability forecasting — are, at fleet scale, Helios telemetry. The continuum controller's system-health dashboard (Section 5) is the booth-local view; Helios aggregates it into the fleet view that drives consumable resupply, calibration scheduling, and the facility-siting model, with the centre's load growing with the number of booths and exceptions, not the volume of sessions.

Recovery without a site visit. A booth that fails readiness certification is, from Helios's perspective, a node reporting a fault: its twin holds the fault code, its telemetry localises the failing subsystem, and its bounded remediation runbook (restart a subsystem, roll back a model, mark the booth unavailable and page the facility manager) handles the common cases before a technician is dispatched. The clinically safe failure — admit no one — is preserved throughout: Helios can restore a booth's future without ever compromising its present-session safety.

11. Hardware Reference Specification

This section records the reference hardware envelope from the MedBooth concept design [1]. It is a specification target for detailed design, not a fixed bill of materials; Canadian deployment additionally requires each clinical sensor to hold a current Health Canada MDL (Section 1.2).

11.1 Enclosure and accessibility

- Attribute — Specification
- Footprint — 6 ft (W) × 7 ft (D) × 8.5 ft (H); fits standard commercial doorways.
- Construction — Medical-grade powder-coated aluminium frame; anti-microbial polycarbonate panels.
- Entry door — Automatic sliding door, 36-inch clear opening; no-threshold flush floor transition.
- Interior — 60-inch turning radius for 180-degree wheelchair rotation; 18-inch companion side-clear zone.
- Console — Motorised height-adjustable sensor station, 48 in to 28 in; 19-inch knee-clearance depth.
- Interface — 15.6-inch high-contrast touchscreen with voice and gesture; 27-inch 4K consultation display; tactile/Braille labelling; T-coil hearing loop; audio guidance in 12 languages.
- Floor / lighting — Non-slip sealed epoxy, rated for wheelchairs and gurneys; adjustable flicker-free LED, 500–1000 lux.
- Power — 120/240 V AC with integrated UPS (approx. 4-hour runtime).
- Weight / environment — Approx. 900 lb, seismic-anchored, forklift channels; IP54; -10 °C to 45 °C; indoor and sheltered-outdoor.

11.2 Clinical sensor suite

Each sensor is a clinical-grade device; the concept design carries FDA 510(k) Class II clearances, with Health Canada MDL required for Alberta deployment.

- Sensor — Capability
- Blood pressure — Oscillometric auto-inflating cuff; systolic/diastolic/pulse; hypertensive-crisis and hypotensive-shock flags.
- SpO2 pulse oximeter — Photoplethysmographic fingertip sensor; arterial oxygen saturation and pulse; low-SpO2 alerting.
- Temperature — Non-contact infrared tympanic and forehead; fever, hypothermia detection.
- Blood glucose — Fingertip lancet and strip reader; fasting and random glucose; diabetic-emergency identification.
- ECG / heart monitor — 12-lead ECG on adjustable arm; real-time rhythm analysis (AF, STEMI, arrhythmia).
- Weight / BMI — Floor-embedded load cells; wheelchair-seated weighing supported; automatic BMI.
- Acoustic array — Continuous monitoring for laboured breathing, cough patterns, stridor, wheeze, distress vocalisation, or silence.
- AI vision camera — Wide-angle and macro array; pallor, jaundice, cyanosis, rashes/lesions, wound, pupil response, swelling.
- Continuous pulse — Photoplethysmography for heart-rate variability and resting pulse across the session.
- Respiratory rate — Non-contact infrared chest-movement sensor; tachypnea and bradypnea alerting.

11.3 Compute, connectivity, and decontamination

- Subsystem — Specification

- Edge compute — On-device AI inference for all clinical, vision, and acoustic models and all hardware control — no cloud dependency for sensing, sequencing, or safety interlocks. (Detailed design selects the accelerator tier; the Enkidu reference is the NVIDIA Jetson family used across the edge platforms.)
- Connectivity — Dual-band Wi-Fi 6 with LTE/5G failover; encrypted VPN tunnel to the provincial health network; Aegis hybrid-PQC key establishment (Section 9).
- Telemedicine — End-to-end encrypted HD video (1080p minimum, 4K optional); noise-cancelling microphone array; real-time captioning and sign-language overlay.
- UV-C sterilisation — 254 nm germicidal lamps at ceiling, floor, and sensor-arm joints; minimum 40 mJ/cm² dose; two-phase irradiation; per-lamp dosimetry and interlock.
- Chemical decontamination — 12 ceiling micro-atomising electrostatic nozzles; EPA-registered quaternary-ammonium mist; 10-litre reservoir (~200 cycles); HEPA-filtered exhaust flush.
- Cycle — ~2.5-minute total between-session protocol: clearance, two UV-C phases, chemical mist, HEPA flush, self-diagnostic (Section 4.3).

12. Conclusion

MedBooth is a hard case in the best sense: a system where software measures patients, hardware can harm them, and AI outputs sit one step from clinical and legal decisions. An architecture equal to it cannot merely list features — it must make the safety interlock structural, the legal obligation checkable, and the line between machine input and human determination impossible to cross by accident. The Tangram zone design does exactly that: two interlocked continuums, eleven zones with explicit contracts, three layers per zone, and one doctrine — no AI in the policy layer — that keeps the physician deciding and the machine measuring.

The Enkidu stack then makes that design defensible, durable, and operable at fleet scale. Origi turns the safety interlocks and the human seam into enforced trust-operation boundaries and writes the custody trail that serves three regulators at once. Aegis Defence protects a decade of health records against a threat that is already recording. Helios Grid runs a fleet of booths on signal alone, never patient data, with SaMD-disciplined model rollout and recovery that never compromises present-session safety. Together they carry MedBooth from a compelling concept to an accreditable clinical system.

The physician decides; the machine measures, assists, and proves what happened. Every zone in this architecture exists to keep those roles from trading places.

References

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[2] Enkidu Enterprises (2026). MedBooth Smart Health Kiosk — Tangram Zone Architecture Design Document. (Two continuums, eleven zones, three-layer zone structure, AI placement doctrine, continuum controller, zone-by-zone AI application inventory.)

[3] Enkidu Enterprises (2026). Tangram Overview: A Structured Framework for Operational Architecture, Governance, and AI-Augmented Service Delivery, v1.0.

[4] Enkidu Enterprises (2026). Trust Assurance Overview (Origi): A Policy-Based, Evidence-Backed Approach to Asserting and Measuring Trust in AI-Augmented Systems, v1.0.

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[8] Government of Alberta. Health Information Act (HIA), RSA 2000, c. H-5. (Lawful-basis collection, purpose limitation, permitted disclosures under s.35, retention, patient access.)

[9] College of Physicians and Surgeons of Alberta. Standard of Practice — Virtual Care; Advertising and Registration requirements. (Physician identification, licensure, scope of practice.)

[10] Health Canada. Medical Devices Regulations (SOR/98-282) and Guidance on Software as a Medical Device (SaMD), 2019/2024. (Medical Device Licence; clinical decision-support labelling.)

[11] Government of Alberta. Occupational Health and Safety Act; Public Health Act; Alberta Health Care Insurance Act and Schedule of Medical Benefits. (Occupancy interlock; reportable-disease notification; AHCIP coverage and billing.)