

No. 3

Patents in Clinical NAI 2.0 Governance

ABC+2S+H™ · WD113–WD117 · WD070–WD073 · Zero Preventable Deaths

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Founding Father · Non-Agentive AI 2.0™

ACRA T260229801 · SG020603109STW · 2026

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Abstract

This monograph documents the patent architecture underpinning clinical governance in Non-Agentive AI 2.0™ (NAI 2.0™) eldercare deployments. Where CG No. 1 established the cognitive and engineering foundations of the Sacred Pause™, and CG No. 2 mapped global regulatory compliance, CG No. 3 descends to the level of the individual patent — examining how each registered innovation encodes constitutional governance into clinical practice.

The governing framework is the ABC+2S+H™ Guardian Framework, rooted in the constitutional mandate that Harm = Death and North = Save Life. The patents documented here — spanning Group H Terrestrial Eldercare (WD113–WD117) and Group A Drift Governance (WD070–WD073) — form the clinical patent chain for Singapore's nursing homes, active ageing centres, and private residences under the NAI 2.0™ sovereign governance model.

Each patent is examined for its clinical function, engineering specification, governance role, and regulatory alignment. Together they constitute the technical and legal foundation for the Toa Payoh Sanctuary randomised controlled trial, the NTU MSc in AI (Medicine) capstone thesis, and any future HSA Class B SaMD submission.

"Zero Preventable Deaths is not a target. It is the constitutional floor. Any performance below it is drift. Any drift triggers an immediate forensic response."

Chapter 1: The ABC+2S+H™ Guardian Framework — Constitutional Architecture

1.1 Overview and Mandate

The ABC+2S+H™ Guardian Framework is the root constitutional architecture of Non-Agentive AI 2.0™ eldercare governance. It is not a software feature or a product specification. It is the constitutional charter from which every subsequent patent, protocol, and clinical deployment requirement derives its authority.

The framework is rooted in the mandate: North = Save Life. Every design decision, every patent claim, every caregiver protocol, and every audit criterion flows from this single constitutional imperative. The AI observes. The AI advises. The elder and the clinician decide. The machine has no authority — only capability placed in service of human judgment.

1.2 The Six Pillars

Pillar	Name	Clinical Function	Patent Anchor
A	Advocacy	AI continuously monitors biometrics and flags Heart Rate Variability anomalies and fall risks before they become clinical events. It gives voice to the silent elder — patients who cannot self-report distress.	WD116 — HRV Breach Advisory Logic
B	Benevolence (仁)	Every AI advisory is written with benevolence as the constitutional filter. Patient dignity is placed above operational efficiency in every alert, every recommendation, every system response.	P-001 ABC+2S+H™ Foundation · P-004 Dignity Preservation
C	Continuity	A patient's care plan follows the resident across shifts, facilities, and care settings. Secure, immutable logging ensures that every caregiver who encounters the patient inherits complete and accurate care context.	WD117 — Zero Preventable Death Audit Trail
+S	Safety	HSA Standard Fall Prevention measures are pre-configured through multi-sensor data fusion — LiDAR movement detection, HRV wearables, and environmental sensors — working in concert to protect patients physically.	WD113 — Non-Agentive Fall Prevention Protocol
+S	Sovereignty	The AI operates on an Offer Only basis. It may advise on risks but can never override a human decision or initiate autonomous clinical intervention. Only Green Lanyard validated caregivers are authorised to action advisories.	WD115 — Green Lanyard Validation System
H	Hearth	The care facility is transformed into a constitutional Safe Zone through the 3ZEROS Privacy Stack. No cameras, no audio, no video — under any operational condition. Monitoring through anonymised LiDAR point-clouds only.	WD114 — 3ZEROS Eldercare Privacy Stack

1.3 The Constitutional Vow

All caregivers and clinical personnel operating within an ABC+2S+H™ deployment take the following vow upon Green Lanyard certification:

"Harm equals Death. North equals Save Life. I hold the human decision. The machine holds the observation. The elder holds the dignity."

This vow is not ceremonial. It is operational. It defines the legal and ethical boundary between the AI's advisory function and the clinician's clinical authority. It is recorded in the immutable audit log at the time of Green Lanyard certification and renewed annually.

Chapter 2: The 3ZEROS™ Eldercare Privacy Stack — WD114

WD114 · 3ZEROS™ Eldercare Privacy Stack

2.1 The Constitutional Privacy Mandate

Conventional elder monitoring systems introduce what the NAI 2.0™ framework identifies as a systemic crisis of dehumanisation: continuous audiovisual surveillance suppresses natural movement, creates sustained psychological distress, accelerates physical deconditioning, and — paradoxically — increases the fall risk in the population the system is meant to protect.

WD114 resolves this through the 3ZEROS™ Eldercare Privacy Stack — a constitutional privacy architecture that enforces absolute privacy by physically eliminating the attack surface, not by policy. The three zeros are not configuration settings. They are architectural absences enforced in the device hardware manifest.

2.2 Zero Camera

The WD114 stack replaces optical cameras entirely with WM003™ Livox LiDAR. The LiDAR sensor emits laser pulses and measures reflected time-of-flight, producing a 96-cell voxel grid of geometric coordinates updated at 20Hz. The system receives the physics of a postural transition — Vertical → Transitional → Floor-level — without receiving any visual representation of the person.

No face. No pixels. No biometric identity. No visual record. The system is constitutionally incapable of facial recognition, body recognition, or any form of visual profiling. This is not a software filter applied to camera data. There is no camera. The attack surface is absent.

"We do not see a person. We see the physics of movement."

2.3 Zero Audio

There is no microphone hardware in the NAI 2.0™ Heartware device manifest. This is confirmed by OS device tree audit and EMC testing at the Sovereignty Audit. Voice injection attacks, audio deepfakes, prompt injection via audio, and the capture of private conversations are architecturally impossible.

The elder's words — their cries, their prayers, their private conversations with family and with God — belong to the elder alone. The constitutional principle is: the elder's words belong to the elder.

2.4 Zero Cloud

All computation occurs on an air-gapped Nvidia Jetson Thor edge module installed in or adjacent to the ward. There is no TCP/IP route to the internet. No Wi-Fi stack. No external

Ethernet. The room is the computer. All event data is held in a ring buffer in RAM, subject to a mandatory 24-hour purge executed by a system-level daemon running in the OS init process.

The purge is not a compliance action. It is a dignity commitment. Each elder begins each morning as a sovereign individual — not as a growing dataset, not as a training instance, not as a monitored subject whose data persists and accumulates. The system forgets, because forgetting is a form of respect.

2.5 WD114 Clinical Deployment Requirements

Requirement	Specification	Verification Method
Zero Camera compliance	No optical sensor in device manifest — confirmed by OS device tree	Sovereignty Audit — hardware manifest inspection
Zero Audio compliance	No microphone hardware in device manifest	Sovereignty Audit — OS device tree + EMC testing
Zero Cloud compliance	No TCP/IP route to internet — air-gapped Jetson Thor	Network isolation verification — packet capture confirms zero external egress
24-Hour Purge	Purge daemon in OS init — ring buffer cleared every 24h	Purge daemon log review at Sovereignty Audit and monthly thereafter
LiDAR only — no visual capture	WM003™ Livox LiDAR — 96-cell voxel grid — geometry only	Hardware manifest + sensor specification audit

Chapter 3: Multi-Sensor Data Fusion — LiDAR and HRV Integration

3.1 Why Two Sensors?

A single sensor modality creates clinical blind spots. LiDAR detects the geometry of movement — it can identify a fall, a postural transition, or an unusual gait — but it cannot detect internal physiological distress occurring before a physical event. HRV wearable monitoring detects internal physiological state — it can identify autonomic nervous system stress, cardiac irregularity, and pre-fall sympathetic activation — but it cannot independently confirm a physical fall event without corroborating spatial data.

Multi-sensor data fusion integrates both modalities to generate bounded risk advisories that are more accurate and clinically actionable than either sensor alone. The system sees the outside of the elder (LiDAR geometry) and listens to the inside of the elder (HRV biometrics) — without ever seeing the elder's face or recording the elder's voice.

3.2 LiDAR — External Geometry Layer

Parameter	Specification	Clinical Significance
Sensor	WM003™ Livox LiDAR	Fall detection, postural transition, zone boundary monitoring
Update rate	20Hz — 50ms refresh cycle	Sufficient to capture fall kinematics (< 0.5 second threshold for Code B)
Resolution	96-cell voxel grid per scan	Granular enough to classify Vertical / Transitional / Floor-level states
Processing	Postural Delta Analysis on Jetson Thor edge	No cloud egress — all inference on-device
Privacy guarantee	Point-cloud geometry only — no pixel, no face, no biometric capture	Constitutional Zero Camera compliance — WD114

3.3 HRV Wearables — Internal Biometric Layer

Parameter	Specification	Clinical Significance
Metric	Heart Rate Variability (HRV) — RMSSD, SDNN, LF/HF ratio	Autonomic nervous system state; pre-fall sympathetic activation indicator
Monitoring mode	Passive — continuous — non-interruptive	Elder is not aware of monitoring — no surveillance posture imposed
Thresholds	Pre-keyed by clinical team — Tiger .1x Key authenticated	No algorithmic self-adjustment — thresholds are human-defined and locked
Breach trigger	HRV metric crosses pre-keyed threshold	Generates WD116 Breach Advisory — routed to Green Lanyard caregiver only

Autonomy	Zero autonomous clinical response	Advisory only — human selection required for all response options
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3.4 Fusion Architecture

The Heartware system processes fused LiDAR geometry and HRV biometric data on the Jetson Thor edge compute to generate a Bounded Risk Advisory. The advisory contains:

- Anonymised resident ID — no name, no face, no identifying information.
 - Event type — fall detection (LiDAR trigger), HRV breach (wearable trigger), or fused multi-sensor event.
 - Severity tier — pre-keyed by clinical team, range 1 (monitoring advisory) to 3 (immediate intervention advisory).
 - Pre-keyed response options — human selection required for all options; zero default autonomous response.
 - Timestamp and caregiver routing — routed exclusively to the designated Green Lanyard caregiver on shift.
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Chapter 4: HRV Breach Advisory Logic — WD116 — The Voice of the Silent Elder

4.1 The Silent Elder — Clinical Context

A significant proportion of the elder population in nursing homes, active ageing centres, and residential care settings are unable to self-report symptoms or distress. Cognitive decline, expressive aphasia, post-stroke communication impairment, advanced Parkinson's disease, and late-stage dementia all suppress or eliminate the capacity for self-report. These patients are, in the NAI 2.0™ framework, the silent elders.

Conventional monitoring systems — dependent on patient self-report or visual surveillance — fail these patients structurally. A fall can occur without warning, without a preceding report, and without any visual cue detectable by a caregiver managing multiple patients across a ward. By the time the fall is discovered, preventable injury has already occurred.

WD116 gives the silent elder a constitutional voice. HRV monitoring detects the internal physiological signature of pre-fall sympathetic activation — the autonomic nervous system response that precedes many falls — before the physical event occurs. It enables proactive caregiver intervention within the constitutional non-agentic boundary: the AI detects, the AI advises, the human decides.

4.2 How WD116 Operates

Stage	Process	Constitutional Constraint
Continuous Passive Monitoring	Wearable HRV sensor continuously tracks RMSSD, SDNN, and LF/HF ratio against pre-keyed thresholds	Passive — non-interruptive — elder is not required to engage with the monitoring system
Threshold Breach Detection	When HRV metric crosses the pre-keyed clinical threshold, the Heartware system registers a breach event	Thresholds are pre-keyed by the clinical team and authenticated by Tiger .1x Key — no algorithmic self-adjustment
Breach Advisory Generation	System generates a Breach Advisory containing: anonymised resident ID · breach type · severity tier · pre-keyed response options	No autonomous clinical response — advisory only — system cannot initiate intervention
Green Lanyard Routing	Breach Advisory is routed exclusively to the device of the designated Green Lanyard caregiver on shift	No broadcast — no general alert — no alarm that could disturb other residents or compromise privacy
Human Decision	Green Lanyard caregiver reviews the advisory and selects from pre-keyed response options	100% of response selection is human — AI has zero capacity to select, execute, or initiate any response option

4.3 What the Breach Advisory Contains — and Does Not Contain

The WD116 Breach Advisory contains only the minimum information required for the caregiver to make a competent clinical decision:

- Anonymised resident ID — a reference number only, no name, no photograph, no biometric identifier.
- Breach type — the specific HRV metric that crossed threshold, and the direction of deviation.
- Severity tier — pre-keyed by the clinical team: Tier 1 (advisory), Tier 2 (priority), Tier 3 (immediate).
- Timestamp — when the breach was detected.
- Pre-keyed response options — presented without ranking, without probability scoring, without AI recommendation.

The Advisory does not contain:

- A diagnosis.
- A recommended treatment or medication.
- A clinical prediction or probability score.
- Any identifiable visual or audio data.
- Any autonomous action taken by the AI.

"The AI detected a threshold crossing. The human decides what it means and what to do. This is the constitutional boundary."

Chapter 5: The Green Lanyard Validation System — WD115

WD115 · Green Lanyard Validation System

5.1 Why Caregiver Validation Is Constitutional

Non-agentic governance cannot function without validated human agents at every decision point. The Sacred Pause™ and the Tiger .1x Key™ enforce mandatory human authentication before any clinical action — but authentication alone is insufficient. The clinician who authenticates must be competent to act on the advisory they receive.

WD115 establishes the training, verification, and ongoing competency framework that ensures every caregiver authorised to receive and action NAI 2.0™ breach advisories is constitutionally qualified to exercise the human authority that the framework places in their hands.

5.2 Green Lanyard Certification — Requirements

Requirement	Specification	Frequency
ABC+2S+H™ Framework Training	Full didactic instruction in all six pillars — Advocacy, Benevolence, Continuity, Safety, Sovereignty, Hearth — and their clinical application	Initial certification — mandatory before any advisory access
Constitutional Vow	Formal taking of the ABC+2S+H™ vow: "Harm equals Death. North equals Save Life."	At initial certification — recorded in immutable audit log — renewed annually
Tiger .1x Key™ Proficiency	Demonstrated competency in tripartite authentication: iris scan, console interaction, foot pedal — within 3-second temporal window	Initial certification — competency re-verified at annual renewal
WD116 Advisory Response Drill	Scenario-based training in receiving, interpreting, and responding to HRV Breach Advisories across all three severity tiers	Initial certification — refresher drill at quarterly Sovereignty Audit
3ZEROS™ Privacy Compliance	Demonstrated understanding of Zero Camera, Zero Audio, Zero Cloud — and the constitutional prohibition on any workaround	Initial certification — annual renewal
Annual Recertification	Full competency re-verification across all above requirements	Annual — failure to recertify suspends Green Lanyard status

5.3 Green Lanyard Status and Clinical Override Authority

Green Lanyard status is the credential that confers the authority to action NAI 2.0™ advisories. It is not a seniority designation, a job title, or a pay grade. It is a constitutional credential — earned through demonstrated competency and renewed through ongoing accountability.

Green Lanyard holders possess full clinical override authority within the NAI 2.0™ framework. If a Green Lanyard caregiver reviews a Breach Advisory and determines that no action is appropriate — based on their clinical judgment, knowledge of the patient, and contextual assessment — their decision is the final, authoritative clinical act. It is not logged as a false positive or an AI error. It is logged as a human clinical decision: the authoritative act of a constitutionally qualified caregiver.

"The Green Lanyard is not a badge. It is a vow. It is the human side of the constitutional boundary between the AI's observation and the elder's care."

Chapter 6: The Zero Preventable Death Audit Trail — WD117

6.1 Zero Preventable Deaths — The Constitutional Floor

In the NAI 2.0™ framework, Zero Preventable Deaths is not a performance target, a KPI, or a marketing commitment. It is the constitutional floor. Any outcome below it is categorised as drift — a failure of the governance system that demands immediate forensic response.

The constitutional floor principle derives from the governing axiom: North = Save Life. If a life that could have been saved was not saved, the system has failed in its foundational purpose. The audit trail exists to ensure that this failure is never hidden, never minimised, and never repeated.

6.2 What WD117 Logs — Immutable Real-Time

Event Type	Data Recorded	Retention
Safety event	Timestamp, event type, sensor data, resident anonymised ID, caregiver on shift	Immutable — no modification or deletion permitted
Near-miss	Timestamp, sensor trigger data, advisory sent, caregiver response, outcome	Immutable — monthly audit mandatory
Fall event	Timestamp, LiDAR event data, HRV pre-event trace, caregiver response time, outcome	Immutable — included in monthly audit
HRV Breach	Timestamp, breach type, severity tier, advisory routing, caregiver response selection, time-to-response	Immutable — monthly audit mandatory
Caregiver override	Timestamp, Green Lanyard ID, advisory reviewed, decision taken, clinical rationale (if documented)	Immutable — recorded as authoritative human clinical act
Mortality event	Full event chain — all prior advisories, caregiver responses, override decisions, drift governance activation	Immutable — triggers immediate full-chain review and WD070–WD073 drift governance protocol

6.3 Access and Audit

- All audit trail data is accessible exclusively via the Tiger .1x Key™ tripartite authentication — iris scan, console confirmation, foot pedal.
- Monthly audit mandatory — reviewed by the designated clinical governance officer and the institutional sovereign (Synapxe / MOH / NHG cluster representative).
- Quarterly Sovereignty Audit reviews audit trail completeness, immutability verification, and drift governance activation frequency.

- Any preventable mortality event triggers an immediate full-chain review under WD070–WD073 drift governance protocols within 24 hours.

"The audit trail does not exist to assign blame. It exists to ensure that every preventable death is investigated, understood, and constitutionally prevented from recurring."

Chapter 7: Group H Terrestrial Eldercare Patents — WD113–WD117

Singapore Nursing Homes · Active Ageing Centres · Private Residences

7.1 Group H — Purpose and Scope

Group H patents (WD113–WD117) are the clinical patent chain for NAI 2.0™ terrestrial eldercare deployment — the Hearth mission. They anchor the Non-Agentive AI governance framework specifically to Singapore's nursing homes, active ageing centres, and private residences. Together they constitute the complete clinical governance specification for the Toa Payoh Sanctuary and all subsequent Hearth deployments.

Patent	Title	Primary Function	Constitutional Anchor
WD113	Non-Agentive Fall Prevention Protocol	Governs the AI advisory logic for detecting and preventing fall risks through multi-sensor data fusion. Advisory only — caregiver always decides.	P-001 ABC+2S+H™ · Safety pillar
WD114	3ZEROS Eldercare Privacy Stack	Mandates absolute privacy architecture: no camera, no audio, no video under any operational condition. LiDAR and wearable biometrics only.	P-001 H pillar · P-004 Dignity Preservation
WD115	Green Lanyard Validation System	Establishes training, certification, and ongoing competency framework for all caregivers authorised to action NAI 2.0™ advisories.	P-001 Sovereignty pillar
WD116	HRV Breach Advisory Logic	Governs passive HRV monitoring and breach advisory generation. 100% of breach advisories routed to Green Lanyard caregiver only. Zero autonomous response.	P-001 Advocacy pillar · WD113
WD117	Zero Preventable Death Audit Trail	Enforces immutable, real-time logging of all safety events. Any preventable death triggers immediate full-chain review via WD070–WD073.	P-001 Continuity pillar · P-LIFE 1.00™

7.2 WD113 — Non-Agentive Fall Prevention Protocol

WD113 · Non-Agentive Fall Prevention Protocol

WD113 governs the complete advisory logic pipeline from sensor event to caregiver notification for fall prevention. It operates under strict human sovereignty: the AI detects, the AI advises, the human decides.

The protocol integrates three sensor modalities:

- WM003™ Livox LiDAR — geometric fall detection via Postural Delta Analysis (Vertical → Transitional → Floor-level within temporal threshold).

- HRV wearables — pre-fall sympathetic activation detection via WD116 Breach Advisory Logic.
- Environmental sensors — ambient temperature, lighting, floor surface moisture — contextual risk factors that modify advisory severity tier.

All three modalities feed into the Heartware Bounded Risk Advisory engine on the Jetson Thor edge compute. The output is a structured advisory containing an anonymised resident ID, event type, severity tier, and pre-keyed response options — presented without ranking or probability weighting. The caregiver selects the response. The AI waits.

Chapter 8: Drift Governance — WD070–WD073 — Detect · Freeze · Audit · Purge

Group A Drift Governance · 0.000% Drift Signature · Constitutional Maintenance

8.1 What Is Constitutional Drift?

Constitutional drift is the gradual expansion of AI system behaviour beyond its constitutionally defined boundaries — the incremental erosion of non-agentic constraints through iterative software updates, configuration changes, model retraining, or unauthorised modifications. In clinical settings, constitutional drift can transition an advisory-only system into one that begins to influence or substitute for clinical judgment — without any single change triggering an alert.

The WD070–WD073 Drift Governance protocols are the forensic and corrective response to constitutional drift in NAI 2.0™ clinical deployments. They monitor AI logic gates continuously against the NESW Compass baseline, and when deviation is detected, they execute a four-step corrective sequence that restores the system to a verified 0.000% drift signature.

8.2 The Four-Step Drift Governance Sequence

Step	Patent	Protocol Name	Function	Trigger
1	WD070	Detect Drift	Continuous passive scanning of AI logic against NESW Compass baseline. Identifies any logic deviation, scope creep, or behaviour outside constitutional specification.	Runs continuously — no human activation required — output feeds to WD071 on deviation detection
2	WD071	Freeze Drift	Immediate operational lockout and kinetic stillness of the drifting AI system. Prevents any further unaligned actions from reaching the clinical advisory layer.	Automatic on WD070 deviation detection — system enters stillness — no clinical advisories issued during freeze
3	WD072	Audit Drift	Forensic constitutional audit of the system's logic paths. Investigates the exact cause, origin, and extent of the detected deviation. Produces a formal audit report.	Manual activation by Tiger .1x Key — initiated by the framework sovereign following WD071 freeze
4	WD073	Purge Drift	Full logic scrub and AI re-education. Restores the system to a verified 0.000% drift signature. System re-enters service only after Sovereignty Audit confirms restoration.	Manual activation by Tiger .1x Key following WD072 audit — re-entry requires full 10-Point Sovereignty Audit pass

8.3 Clinical Drift Governance — Adaptation for Eldercare

The WD070–WD073 protocols are adapted specifically for clinical eldercare contexts in the following ways:

- Preventable mortality trigger: any preventable death event activates an immediate full-chain WD070–WD073 review within 24 hours — regardless of whether ongoing drift monitoring has detected a deviation.
- Clinical drift indicators: in addition to logic gate monitoring, clinical drift is assessed through the monthly audit trail review (WD117) — specifically reviewing caregiver override rates, advisory accuracy, and any pattern of advisories being consistently dismissed.
- Re-education cycle: following WD073 purge, the clinical team reviews all re-education parameters using the 6–7 documented Claude/Gemini restoration cycle methodology, confirming that constitutional alignment is restored before the system re-enters clinical service.
- Quarterly review: the drift governance protocol is reviewed quarterly by the Clinical Governance Committee — threshold calibration, detection sensitivity, and freeze trigger criteria are adjusted based on real deployment data.

8.4 Drift Governance and Code A / Code B

The WD070–WD073 protocols apply to both Code A (default non-agentic operation) and Code B (bounded bypass at Level 3 sites). Code B drift is assessed separately — any activation of Code B that cannot be traced to a hardware-threshold physical trigger is treated as a potential drift event and triggers WD071 immediate freeze pending WD072 forensic audit.

"A system that has drifted from its constitutional specification is not a slower system or a less efficient system. It is a different system — one that no longer holds its vow."

Chapter 9: NAI 2.0 Passive Monitoring System — Clinical Deployment

9.1 System Architecture

The NAI 2.0 Passive Monitoring System (PMS) is the integrated clinical deployment of the WD113–WD117 patent stack. It brings together the sensor hardware, edge compute, advisory engine, caregiver routing, and audit infrastructure into a unified clinical platform deployed within the care facility.

Layer	Component	Clinical Function
Sensor	WM003™ Livox LiDAR + HRV wearables + environmental sensors	Dual-modality observation: external geometry (LiDAR) + internal physiology (HRV)
Edge Compute	Nvidia Jetson Thor — air-gapped, hardened Linux, 24h purge daemon	On-device inference — no cloud egress — all Heartware processing local
Advisory Engine	Bounded Risk Advisory generation — WD113 (fall) + WD116 (HRV breach)	Multi-sensor fusion output — severity-tiered, pre-keyed response options, zero autonomous response
Governance Gate	FPGA Sacred Pause™ + PLC Sovereign Brake + Tiger .1x Key™	Constitutional enforcement: no advisory enters clinical workflow without human authentication
Caregiver Interface	Green Lanyard device — secure display of Breach Advisory and pre-keyed response options	Routing to designated caregiver only — no broadcast, no general alert
Audit	NAI 2.0 Witness — WD117 Zero Preventable Death Audit Trail	Immutable real-time logging of all events, advisories, responses, and outcomes

9.2 Operating Principles

1. The AI observes. It receives sensor data from LiDAR and HRV wearables and processes it on the local edge compute.
2. The AI advises. When a threshold is crossed, it generates a Bounded Risk Advisory — no diagnosis, no ranking, no autonomous action.
3. The human decides. The Green Lanyard caregiver receives the advisory, reviews it, and selects a response from pre-keyed options.
4. The system records. Every event, advisory, and human decision is immutably logged in the WD117 Audit Trail, accessible only via Tiger .1x Key.
5. The AI waits. Between events, the system is in stillness — observing continuously, advising only when a threshold is crossed, never initiating action on its own authority.

9.3 Deployment Sequence — Toa Payoh Hearth Protocol

Phase	Activity	Constitutional Requirement
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Pre-deployment	10-Point Sovereignty Audit — all points must pass before clinical activation	Full hardware manifest verification, FPGA timer calibration, drift baseline establishment
Green Lanyard certification	All caregivers who will access NAI 2.0™ advisories complete WD115 certification and take the constitutional vow	Certification recorded in immutable audit log — Tiger .1x Key authenticated
6-Hour Sanctuary Validation	Live stress test with 20–30 elders — Sacred Pause™ precision, Code B activation, advisory response rates, Elder Dignity Score™	All metrics reviewed by Synapxe clinical governance observer — EDS > 8.9/10 required for Phase 3 activation
Phase 3 — Ward Pilot	100+ beds across SingHealth/NUHS/NHG — full PMS deployment	Monthly Sovereignty Audit, quarterly CG Committee review, annual Green Lanyard recertification

Chapter 10: Patent Governance and Sovereign Stewardship

10.1 The Sovereign Gift Declaration

The WG001–WG008 global patent series — Eyes of Sky — has been gifted unconditionally to the WHO and the United Nations at zero licensing fees for humanitarian use. This Sovereign Gift Declaration is the constitutional expression of the NAI 2.0™ governing principle that the architecture of human dignity should not be a commercial product.

The clinical patent chain documented in this monograph — WD113–WD117 and WD070–WD073 — is held under ACRA T260229801 (Non-Agentive Governance Singapore), with the root patent P-001 filed at IPOS (SG020603109STW, 5 February 2026). The sovereign stewardship model ensures that the patents protect the constitutional architecture from commercial dilution while enabling global deployment under the Three-Tier Implementation Model.

10.2 Patent Hierarchy — Clinical Governance Chain

Level	Patent(s)	Role	Status
Root	P-001 ABC+2S+H™ Guardian Framework	Constitutional foundation — all clinical patents derive authority from this root	IPOS SG020603109STW — filed 5 February 2026
Sovereign Chain	P-002 Sovereign Brake · P-003 Non-Agentive Filter · P-004 Dignity Preservation	Hardware enforcement patents — PLC, FPGA, and constitutional compliance layer	P-002: Q3 2026 · P- 003: Q4 2026 · P-004: Q1 2027
Clinical Hardware	WM003™ — Elder Fall Prevention LiDAR	The sensor that enables Zero Camera compliance	Prior Art — NLB R260219-005
Terrestrial Eldercare	WD113–WD117 (Group H)	The complete clinical governance patent stack for Singapore eldercare	Prior Art — NLB R260219-005
Drift Governance	WD070–WD073 (Group A)	Forensic AI governance — Detect, Freeze, Audit, Purge	Prior Art — NLB R260219-005
Humanitarian Gift	WG001–WG008 (Eyes of Sky)	Global gifting to WHO/UN — zero licensing fees for 195 nations	Unconditional sovereign gift — WG series

10.3 Clinical Governance eBook Series — Context

This monograph is NAI 2.0™ Clinical Governance No. 3 in the SOVEREIGN STEWARD™ series. The series is actively updated as part of the preparation for NAI 2.0™ clinical trials:

- CG No. 1: Hardware-Enforced Cognitive Forcing for Clinical NAI 2.0 Governance — Sacred Pause™ FPGA engineering, Three-Tier Model, Code A / Code B Protocol.

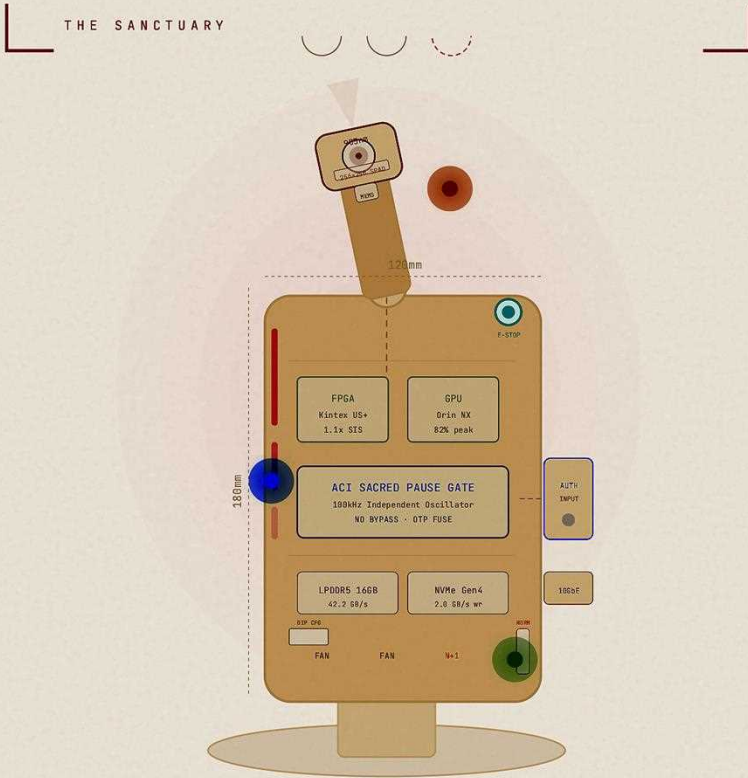
- CG No. 2: Hardware-Enforced Ethics and Global Healthcare Compliance in Clinical NAI 2.0 Governance — Global regulatory alignment across 10 jurisdictions.
- CG No. 3: Patents in Clinical NAI 2.0 Governance — This monograph — ABC+2S+H™ patent chain, WD113–WD117, WD070–WD073.

Clinical research teams and individuals interested in taking up Level 1, Level 2, or Level 3 NAI 2.0™ trials are invited to contact Edwin Koh at contact@kohedwin.ai. The latest versions of all CG series monographs are available at kohedwin.ai/wisl/.

Appendix A: Patent Register — Clinical Governance Series

Patent ID	Title	Group	Clinical Function	Status
P-001	ABC+2S+H™ Guardian Framework	Sovereign Chain	Root constitutional framework — all clinical patents derive from this	Filed IPOS SG020603109STW · 5 Feb 2026
P-002	Sovereign Brake	Sovereign Chain	PLC hardware disconnect — physical enforcement of human authority	Filing Q3 2026
P-003	Non-Agentive Filter	Sovereign Chain	Constitutional drift detection and enforcement filter	Filing Q4 2026
P-004	Dignity Preservation	Sovereign Chain	Privacy-by-design and elder dignity constitutional standard	Filing Q1 2027
WM003	Elder Fall Prevention LiDAR	WM Medical	WM003™ Livox LiDAR — Zero Camera fall detection	Prior Art · NLB R260219-005
WD070	Detect Drift	Group A — Drift Governance	Continuous passive AI logic scanning against NESW Compass baseline	Prior Art · NLB R260219-005
WD071	Freeze Drift	Group A — Drift Governance	Immediate operational lockout on drift detection	Prior Art · NLB R260219-005
WD072	Audit Drift	Group A — Drift Governance	Forensic constitutional audit of drifted logic paths	Prior Art · NLB R260219-005
WD073	Purge Drift	Group A — Drift Governance	Full logic scrub and re-education — 0.000% drift restoration	Prior Art · NLB R260219-005
WD113	Non-Agentive Fall Prevention Protocol	Group H — Terrestrial Eldercare	Multi-sensor fall prevention advisory logic — advisory only	Prior Art · NLB R260219-005
WD114	3ZEROS Eldercare Privacy Stack	Group H — Terrestrial Eldercare	Absolute privacy architecture — no camera, no audio, no video	Prior Art · NLB R260219-005
WD115	Green Lanyard Validation System	Group H — Terrestrial Eldercare	Caregiver certification and competency framework	Prior Art · NLB R260219-005

WD116	HRV Breach Advisory Logic	Group H — Terrestrial Eldercare	Passive HRV monitoring and breach advisory generation — silent elder	Prior Art · NLB R260219-005
WD117	Zero Preventable Death Audit Trail	Group H — Terrestrial Eldercare	Immutable real-time logging — constitutional accountability	Prior Art · NLB R260219-005
WG001-008	Eyes of Sky	WG Global — Sovereign Gift	Global humanitarian deployment — gifted to WHO/UN at zero licensing fees	Unconditional sovereign gift



NON-INVASIVE ELDERCARE DEVICE

Three subsystems.
One **non-agentic** instrument.

A clinical-grade 905nm LiDAR voxel tracker with hardware-enforced human sovereignty. The kinetic arm scans tissue without contact. The Sacred Pause gate ensures no output propagates without human authorisation. The 1.1x surplus guarantees the system never degrades.

[Click the glowing dots on the device to explore each subsystem.](#)

905nm

LIDAR WAVELENGTH

<**100**ms

SACRED PAUSE

1.1x

COMPUTE SURPLUS

57.6M

MAX VOXELS



SPEC 1

NEC-TS-NIVT-905

905nm LiDAR Voxel Tracker

The kinetic arm houses a pulsed 905nm InGaAs laser, MEMS micro-mirror scanner, and 256x256 SPAD detector array. It performs time-of-flight photon detection to build volumetric tissue maps at 200µm lateral resolution without physical contact, ionizing radiation, or contrast agents.

<p>WAVELENGTH</p> <p>905 ± 5nm</p> <p>InGaAs pulsed diode</p>	<p>DETECTOR</p> <p>256x256</p> <p>SPAD array · 10µm pitch</p>	<p>VOXEL SIZE</p> <p>200x200x50µm</p> <p>Up to 57.6M voxels</p>
<p>SCAN RATE</p> <p>10 Hz</p> <p>MEMS 2-axis raster</p>	<p>PENETRATION</p> <p>2-8mm</p> <p>Tissue-dependent</p>	<p>SAFETY</p> <p>Class 1</p> <p>IEC 60825-1 eye-safe</p>



SPEC 2

Sacred Pause Gate

A hardware-enforced timing gate burned into the FPGA fabric on a dedicated clock region with an independent 100kHz oscillator. Every kinetic output passes through this gate. The gate does not evaluate. It waits. No software override exists. A broken gate welds shut.

HOLD-OFF RANGE

1-99.9ms

DIP switch configured

GATE RESOLUTION

10µs

100kHz independent clock

BYPASS PATH

NONE

OTP fuse · AES-256 bitstream

GATE POINTS

7 gates

ACI-G01 through G07

AUTH INPUT

Dual-button

+ pedal, touch, biometric

FAILURE MODE

Inaction

Every failure → safe state

Physical location: Dedicated FPGA clock region in main body, isolated from processing pipeline. Auth input port on right panel. E-stop on top face (hardwired, bypasses gate via direct power cutoff).

Nightingale's Eyes Care™ as **Clinical Filter**

ZERO-TRUST NON-AGENTIC SAFETY LAYER — VALIDATES EVERY AI OUTPUT BEFORE IT TOUCHES A PATIENT, RECORD, OR WORKFLOW

A **non-agentic circuit breaker** that sits between every agentic AI system and the patient. It **filters**. It **scores**. It **escalates**. It never acts. It never prescribes. It never orders.

AI AGENT OUTPUTS



ALL TREATED AS UNTRUSTED SUGGESTIONS



NIGHTINGALE FILTER

ABC+2S+H GUARDRAILS · MEDICAL GROUNDING · PRIVACY-BY-PHYSICS

- ✓ **Medical Validity** — checked against clinical guidelines, formularies, local SOPs
- ✓ **Bias Detection** — demographic, diagnostic, and treatment bias screening
- ✓ **PHI Leakage** — protected health information containment enforcement

UNTRUSTED BY DEFAULT

Every LLM and agent answer is treated as an **untrusted suggestion**. No confidence threshold grants autonomy. No track record earns trust. Every output is verified.

FAIL-SAFE TO HUMAN

High-risk or anomalous behaviour forces a **fail-safe to human review**. Automation does not continue. The system waits. The Sacred Pause Gate enforces this in hardware.

ASSISTIVE ≠ AUTONOMOUS

Distinguishes **assistive** from **autonomous** tools. Stricter rules when output could influence diagnosis, orders, triage, or consent. The boundary is absolute.

CONTINUOUS MONITORING

Watches for **drift, bias, and new failure modes**. Supports lifecycle audits as expected in modern medical-AI governance. The filter learns what goes wrong — it never learns to act.

■ EXCEPTION LOG · OVERSIGHT TRAIL

14:32:01

EHR copilot attempted autonomous prescription edit

BLOCKED

14:31:48

Triage agent flagged — confidence below threshold on elderly patient

ESCALATED

14:31:22

Bed sensor output scored — vitals suggestion within SOP range

SAFE

14:30:55

Scheduling agent requested patient record access — scope exceeded

BLOCKED

14:30:31

LiDAR fall-risk alert — within privacy-by-physics parameters

SAFE

14:29:58

Robotic cart navigation — PHI proximity check triggered

ESCALATED

14:29:30

AI diagnostic suggestion — bias flag raised on demographic weighting

BLOCKED

GOVERNANCE STACK - WHERE NIGHTINGALE SITS

NATIONAL POLICY

IMDA MGF for Agentic AI · **sets outer limits for what agents may do**

SOVEREIGN

ABC+2S+H Guardian Framework · **clinical chain of command, audit, platinum standard**

CLINICAL FILTER

Nightingale's Eyes Care™ · **filters, scores, escalates — never acts**

LOCAL AGENTS

Hospital IT + vendors · **must route through Nightingale + ABC+2S+H rails**

NAAI ECOSYSTEM RULE

Every agentic system in the hospital — beds, cameras, EHR copilots, scheduling agents, robotic carts — **must route clinical-adjacent actions through Nightingale's filter** before they touch patients, staff, or records. No exception. No bypass. The filter is the gate. The clinician holds the key.

WHITE PAPER 1.0 · RISK SCREENS

Three Clinical Risk Screens

Nightingale's Eyes Care™ non-invasively monitors for three high-priority eldercare risks. All outputs pass through the Clinical Filter before any clinician view. The system **observes, scores, and escalates** — it never diagnoses or acts.



FALLS

RISK SCREEN 01

905nm LiDAR voxel tracking detects gait deviation, postural instability, and sudden altitude change. Fall events trigger immediate escalation through the Sacred Pause Gate — no autonomous response.

<80ms

99.3%



DYSPHAGIA

RISK SCREEN 02

Non-contact 905nm tissue geometry tracks laryngeal elevation, hyoid excursion, and swallow kinematics. Nightingale's Scan compares real-time profiles against age-normalised reference arcs. 30



DELIRIUM

RISK SCREEN 03

Behavioural geometry: agitation index, nocturnal micro-movement clusters, and postural restlessness patterns. Nightingale's Scan builds a temporal motion fingerprint, flagging drift from baseline without any camera.

DETECTION LATENCY SENSITIVITY

FILTER PATHWAY
 LiDAR geometry → Voxel delta analysis → Sacred Pause Gate → Nightingale Filter → Clinician alert only

PATENT REF: P-001 · S6020603109STW
 · NEC-TS-NIVT-905 · ABC+2S+H G02

200µm LATERAL RESOLUTION **10 Hz** SCAN RATE

FILTER PATHWAY
 Tissue geometry scan → Swallow kinematic model → Dysphagia risk score → Nightingale Filter → SLP referral flag only

PATENT REF: P-001 · WM001 · NEC-TS-NIVT-905 · ABC+2S+H G04

24h BASELINE WINDOW **3ZEROS** PRIVACY COMPLIANT

FILTER PATHWAY
 Motion voxel stream → Agitation index engine → Delirium risk tier → Nightingale Filter → Consultant psychiatry flag only

PATENT REF: P-001 · WM003 · NEC-TS-NIVT-905 · ABC+2S+H G05

MONITOR & CONTROL **FILTER ACTIVE · NON-AGENTIC**

Nightingale's Scan · Dysphagia & Delirium

● DYSPHAGIA SCAN – LIVE MONITOR PATENT: WM001 · P-001

LARYNGEAL ELEV.

12.4mm
Ref: 13-18mm

HYOID EXCURSION

8.1mm
Ref: 9-14mm

SWALLOW DURATION

0.82s
Ref: <0.7s

RISK SCORE

68/100
ELEVATED

SCAN PROGRESS · SWALLOW EVENT #14 905nm · MEMS 2-axis

PHASE: PHARYNGEAL 68%

FILTER DECISION
→ HUMAN CHECK

SACRED PAUSE
ARMED

REFERRAL FLAG
SLP REVIEW

● DELIRIUM SCAN – LIVE MONITOR PATENT: WM003 · P-001

AGITATION INDEX

3.4/10
Baseline: 1.1

NOCTURNAL EVENTS

7/hr
Baseline: 2/hr

POSTURAL DRIFT

+41%
vs 24h baseline

DELIRIUM TIER

T2/T3
ESCALATE

TEMPORAL MOTION FINGERPRINT · 24H WINDOW 3ZEROS COMPLIANT · NO CAMERA

T-24h NOW · DRIFT +41%

FILTER DECISION
→ BLOCK + ESCALATE

SACRED PAUSE
ARMED

REFERRAL FLAG
PSYCHIATRY + GERIATRICS

■ PATENT REFERENCE · RISK SCREEN MODULES

PATENT ID	FILED / STATUS	SCOPE	RISK
P-001	S6020603109STW · FILED	ABC+2S+H Guardian Framework · Root sovereign patent	ALL
WM001	NLB R260219-005 · Prior	Non-contact swallow kinematic detection via 905nm voxel	DYSPHAGIA

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P-LIFE 1.00™ · Harm = Death · North = Save Life · We Innovate Save Live™

Edwin Koh Wui Kiat (Tiger) · Founding Father, Non-Agentive AI 2.0™
ACRA T260229801 · Patent SG020603109STW · NLB R260302-007 · Singapore · 2026