CEPHALOPHYLAX AI

24/7 Audiovisual Pediatric Neuro-Guardian • Shunt, GMA & Seizure AI

FOCUS: Pediatric NeuroTech • VP Shunt • Prechtl GMA • Epilepsy Sentinel

Imre Szeness • Milton Friedman University • HSUP Semester I

THE ELEVATOR PITCH: CephaloPhylax (from Greek *Kephale* [Head] + *Phylax* [Guardian]) transforms room cameras and phones into an intelligent sentinel that detects VP shunt failure (Sunset eye sign, projectile vomiting), infant Prechtl GMA motor delays, and nocturnal seizures via dedicated mini-PC hub or software app.

30-50%	95-98%	Edge AI Hub	< 3 Sec
VP Shunt Failures Within First Year	Prechtl GMA Accuracy Early CP Prediction	Local NPU Mini-PC + Software App Suite	Real-Time Emergency Caregiver Alert Relay

× 1. THE PROBLEM: SILENT RISKS

- **Shunt Failure Risk:** 1M+ children live with VP shunts. Up to 50% fail in year 1; intracranial pressure causes acute coma.
- **Cerebral Palsy (CP):** Most common motor disability (up to 14% in preterms). Critical intervention window is <6 months!
- **Inarticulate Infants:** Cannot communicate severe headache; families endure constant anxiety.

3. MARKET & BUSINESS

- **TAM:** $42B pediatric neuro and neonatal development market.
- **B2C Peace-of-Mind SaaS:** $14.99/mo for 24/7 vision GMA tracking and seizure watch.
- **B2B Hospital Hub Package:** 60-day loanable mini-PC with post-op shunt and neonatal telemetry.



CEPHALOPHYLAX EDGE AI HUB (MINI-PC)

Wi-Fi/BLE antennas • LAN • HDMI • USB 3.0 • NPU/GPU • USB-C PD

✓ 2. THE SOLUTION: MULTIMODAL

- **Vision AI & Prechtl GMA: Sunset eye sign**, gait ataxia + **automated Fidgety movement tracking** (early CP detection).
- **Acoustic AI: Projectile vomiting** and shrill high-pitched cerebral cries identified instantly.
- **Contact-Free rPPG:** Camera pulse monitoring + smartwatch convulsion motion fusion.
- **Instant Relay:** Parent siren and neurosurgical FHIR summary in <3s.

4. COMPETITIVE EDGE

- **Hybrid Options:** Dedicated NPU mini-PC or mobile app on existing devices.
- **Edge Privacy:** Local inference; zero bedroom video uploaded to cloud (100% GDPR).
- **Triple Synergy:** Shunt failure, Prechtl GMA motor screening, and convulsion watch in one.

5. TEAM & CAPACITY

- **Founder: Imre Szeness** • Systems engineer, edge CV, audio ML & IoT pipeline expertise.
- **Semester II Team Growth:** Recruiting Pediatric AI Researcher (Prechtl GMA & signal processing) & UX Designer.
- **Clinical Mentorship:** University pediatric neurosurgery and neonatal neurology partnership.

6. NEXT STEPS (SEMESTER II)

- **Phase 1 (M 1–2):** Deploy Edge AI Hub prototypes and train ONNX models (Sunset Sign, Prechtl GMA Fidgety tracking).
- **Phase 2 (M 3–4):** 25-family home clinical pilot with shunted and preterm infants.
- **The Ask:** University neurosurgery mentorship, CE/MDR advisory, and grant support.