Epilepsy highlight 2024–2025

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"เรายังรักษาแบบเดิมอยู่หรือเปล่า?"

(Are We Still Treating the Same Way?)

Learning Objectives

After this session, participants will be able to:

1. Summarize the key global updates in epilepsy care from 2024–2025 — including seizure classification, AI-assisted EEG, and new medications
2. Recognize which of these updates are feasible and relevant for the Thai healthcare system
3. Reflect on how Thailand can innovate epilepsy care using practical, low-cost, high-impact strategies
4. Identify next steps for local implementation — from AI pilot use to medical education reform and data infrastructure

Key points

- The ILAE has updated the operational classification of epileptic seizures.
- Adjustments were based on experience with the clinical implementation of the classification established in 2017.
- The four main classes are: Focal, Generalized, Unknown (whether focal or generalized), and Unclassified.
- Consciousness is a classifier, and it is operationally defined by awareness and responsiveness.
- Seizures are described as with or without observable manifestations (basic) or by the chronological sequence of semiology (expanded).

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Epilepsia®

SPECIAL REPORT

Updated classification of epileptic seizures: Position paper of the International League Against Epilepsy

Seizure Classification 2025

New Language, Sharper Thinking

TABLE 3 Key changes in seizure classification from 2017 to 2025.

1. "Onset" is removed from the names of the main seizure classes.
2. A distinction is made between classifiers and descriptors, based on taxonomic rule.
3. Consciousness is used as a classifier instead of awareness, with consciousness operationally defined by awareness and responsiveness.
4. The motor vs. nonmotor dichotomy is replaced by observable vs. nonobservable manifestations.
5. The chronological sequence of seizure semiology is used to describe seizures, rather than relying solely on the first sign.
6. Epileptic negative myoclonus is recognized as a seizure type.

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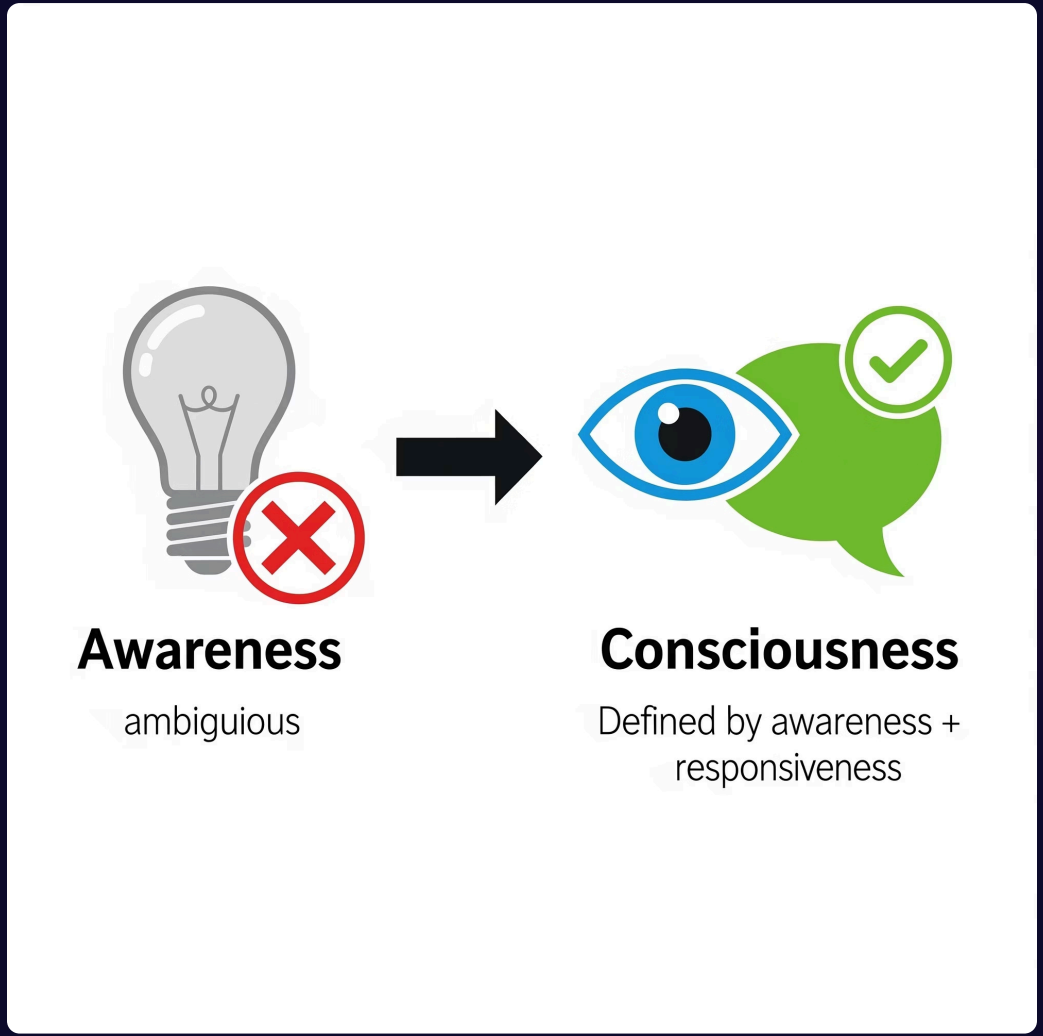
Seizure Classification 2025



Why This Change Matters in Clinical Practice

1. Awareness is ambiguous, especially in multilingual clinical settings

2. Consciousness is operationally defined: Awareness + Responsiveness

3. More practical for bedside exams and video-EEG interpretation

4. Reduces miscommunication in seizure diagnosis, especially across teams (ICU, EM, neurology)

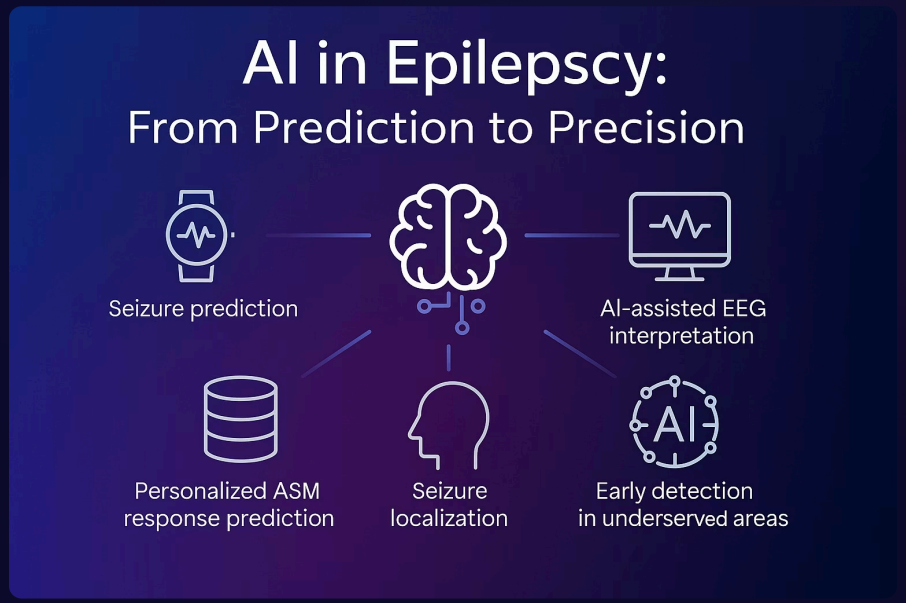
Seizure Classification 2025: What We Must Change

Old. Seizure Classification Systems

COMES

Before 2025	2025 Update
Onset	Classifier/ Descriptor
Awaresness	Consciousmess
Motor/non-motor	Observable/ non-observable

AI in Epilepsy — Global Overview



Where AI Meets Epilepsy:

Seizure prediction: wearables, brain signal modeling

Automated EEG analysis: detection, classification

Personalized treatment: drug response prediction, AI-assisted decision-making

Research applications: seizure localization, high-frequency oscillation (HFO) analytics

Diagnostic aid in underserved areas

Why It Matters Now:

Huge data, limited specialists → AI augments human capacity

Rapid gains in deep learning, signal processing

Moving from concept → real clinical integration

AI and EEG

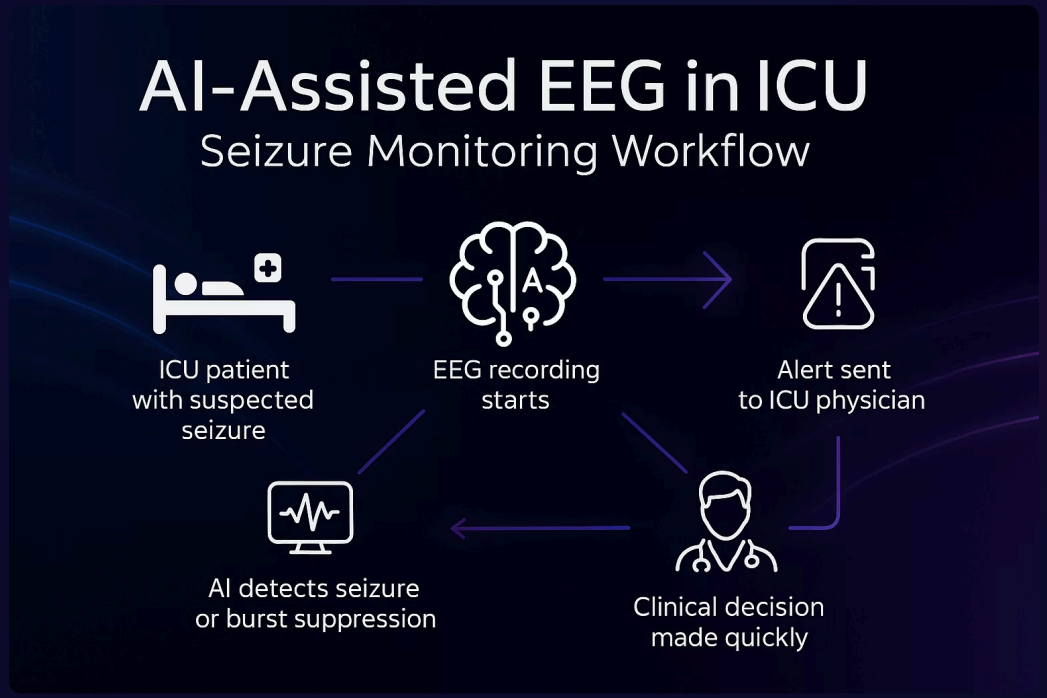
Real-time seizure detection with AI

ICU monitoring: AI flags burst suppression, NCSE

Medical education: AI-assisted EEG interpretation

Narrow-scope AI = safer, faster, scalable support

AI + EEG in ICU: A Practical Step Forward



- EEG ใน ICU คือการใช้งานที่ urgent, impactful, scalable
- AI ช่วย screen, detect, alert
- ไม่ใช่แทนหมอ แต่เป็น “ผู้ช่วยด่วน”
- ใช้งานได้แม้ในรพ. ที่ไม่มี specialist

Artificial Intelligence (AI) and EEG in the ICU Setting

Artificial intelligence (AI) is transforming electroencephalography (EEG) monitoring in intensive care units (ICUs), enabling rapid, accurate detection of neurological complications and optimizing patient care.

Rapid Seizure Detection

AI algorithms analyze EEG data in real-time, significantly reducing the time to identify seizure activity.

Improved Accessibility

AI solutions make expert-level EEG interpretation available even in hospitals without dedicated epileptologists.

Enhanced Clinical Outcomes

Early and accurate detection leads to faster treatment, reducing brain injury and improving patient prognosis.

Consistent Interpretation

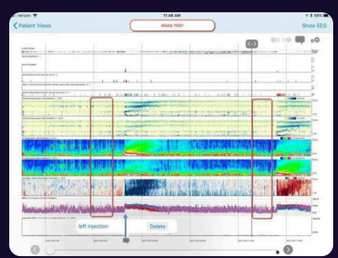
AI ensures standardized and objective analysis, minimizing variability seen with human interpretation alone.

Broadened Clinical Utility

Beyond seizures, AI helps in monitoring sedation levels, detecting ischemia, and predicting neurological decline.

AI EEG Tools in ICU

Key Studies & Findings

AI Tool	Study / Year	Population / Setting	Key Findings	Reference
Clarify AI (Ceribell) 	Vespa et al., 2021 (Criti Care Med. 2020)	ICU adults + pediatrics	improved the sensitivity (95% CI) of physicians' seizure diagnosis from 77.8% (40.0%, 97.2%) to 100% (66.4%, 100%) and the specificity (95% CI) of their diagnosis from 63.9% (55.8%, 71.4%) to 89% (83.0%, 93.5%).	Vespa PM, et al. Crit Care Med . 2020 Sep;48(9):1249-1257
Encevis (BESA) 	Herta et al., 2019 (Epilepsy Behav)	Mixed ICU/EMU patients	94% with high detection rates for periodic discharges (PD = 80%) and rhythmic delta activity (RDA = 82%). Overall specificity was moderate (67%)	Herta J, et al. Epilepsy Beah 2015;43:273-9..
Persyst 14 	Din et al., 2020 (Crit Care Med)	Large multicenter EMU and ICU data	Persyst 11 detected 75.9%, and Persyst 13 detected 74.4%,	Din F, et al. Crit Care Med . 2020;48:545-552.

From Global Innovation to Thai Transformation

Global Innovations

- ✓ Use of AI + EEG in ICUs
- ✓ Reduced EEG interpretation time
- ✓ Portable EEG for EDs

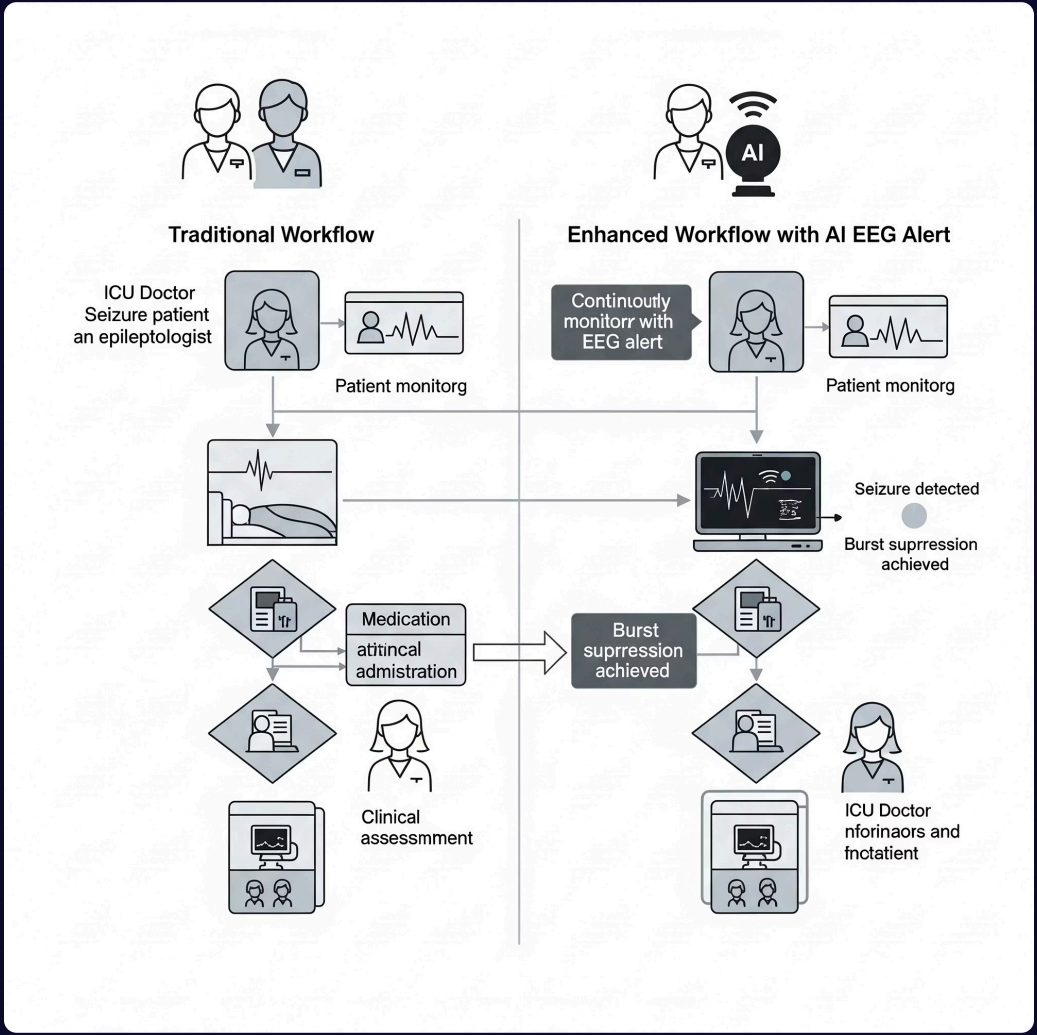
Clear Advantages

- Faster detection of unseen seizures
- Applicable in non-neuro ICUs
- Reduces delay in ASM delivery

Next Steps for Thailand

- Establish AI EEG systems for ICUs
- Trial it in AMBUs, wards, and EDs
- Use AI as an “extra pair of eyes”

Why AI in EEG Matters for Thailand



❌ ปัญหาปัจจุบันในระบบไทย

ไม่มี epileptologist ในหลายจังหวัด

Continuous EEG มีเครื่องแต่ ไม่มีคนอ่าน

Resident อ่าน EEG ได้ไม่ทั่วถึง

✅ สิ่งที่ AI ทำได้ทันทีในระบบไทย

ช่วย screen seizure/NCSE ใน ICU ได้แม้ไม่มี epileptologist

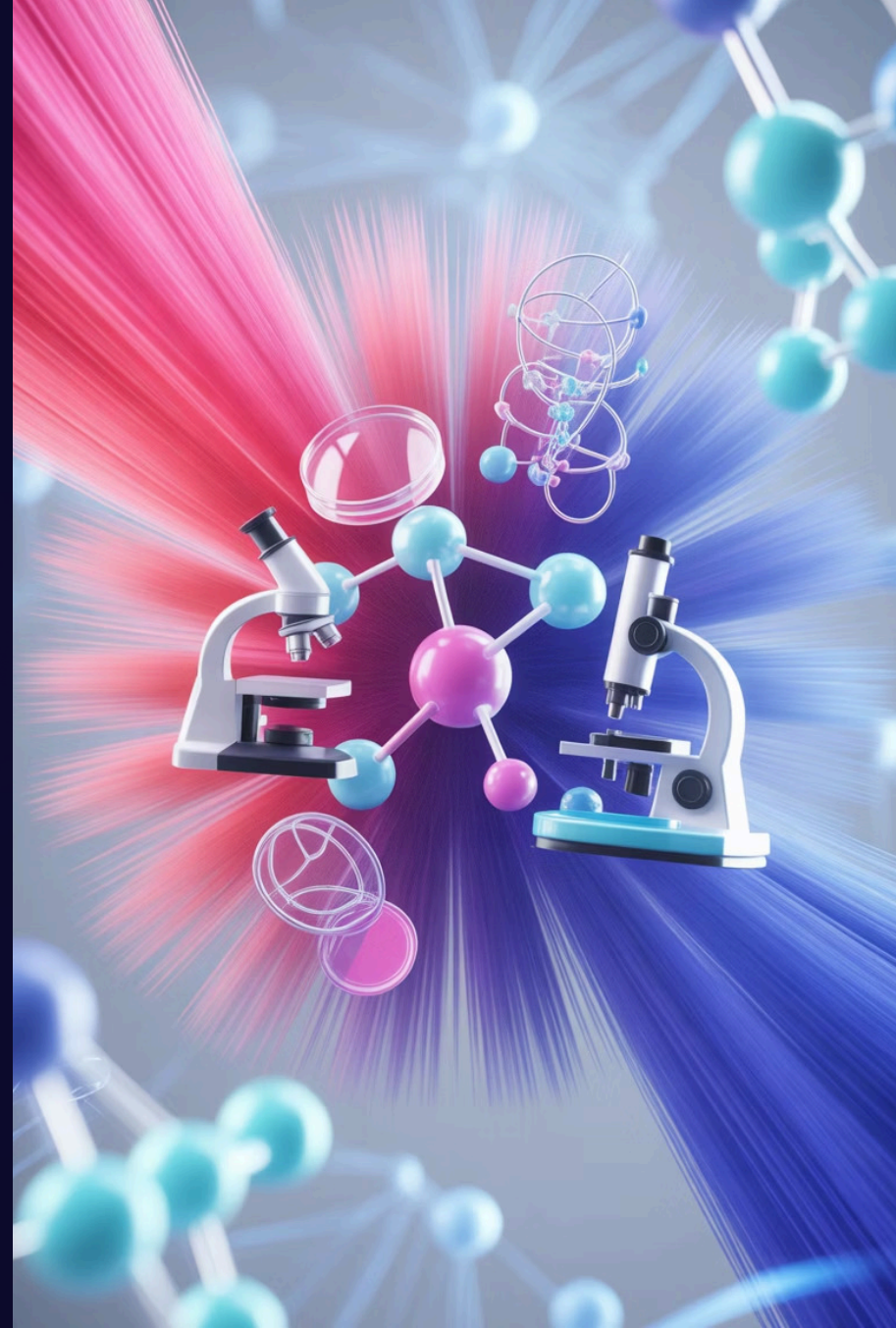
✅ใช้เป็น teaching tool ฝึกแพทย์อ่าน EEG

ทำ triage alert เมื่อมี seizure กำลังเกิดขึ้นจริง

🌟 หลักการสำคัญ: AI ไม่แทนคน แต่... ขยายกำลังคน (force multiplier)

Antiseizure Medication Innovation

What's New, What's Relevant



ASM Innovation: What's New, What's Relevant?

Recently Approved

- ✓ Cenobamate
- ✓ Fenfluramine
- ✓ Ganaxolone

Important Considerations

- Safety profiles
- Drug interactions
- Indicated vs. off-label use

Thai Relevance

New ASMs are costly

- Regulatory hurdles

Local applicability

- New ASMs are costly
- Regulatory hurdles
- Local applicability

Thailand-Relevant System Changes

What's Feasible?

Expand EEG Access Nationwide

- Prioritize ICU/ER coverage in provincial hospitals
- Promote use of portable EEG + AI for screening
- Leverage AMBU or short-term cEEG models

Build Capacity in EEG Education

- Train residents & general neurologists to recognize critical patterns
- Integrate AI-assisted interpretation in teaching hospitals
- Encourage peer review & feedback loops

Establish a National Epilepsy Data Network

- Collect local seizure patterns & EEG markers
- Support precision care (genetic testing, targeted therapy)
- Enable smart referral & triage systems

✅ **Low-cost. High-impact. Thai-ready.**

From Insight to Action: Practical Steps for Thailand

Practical Steps for Change (1/2)

1. **AI + EEG: From Concept to Practice**
   - Start pilot use in AMBU / ICU with validated tools (e.g., Persyst, Encevis).
   - Evaluate clinical workflow and diagnostic impact within the Thai healthcare system.
   - Build local data registry for AI validation and training specific to the Thai population.
2. **Epilepsy Drug Access**
   - Track new ASM pipeline: Cenobamate, Ganaxolone, and other emerging therapies.
   - Collaborate with policy makers on cost-effectiveness studies for local adoption.
   - Support named-patient programs where relevant for urgent cases.
3. **Seizure Classification 2025**
   - Integrate new classification in teaching curriculum for general practitioners and neurology residents.
   - Create Thai summary tools (infographics, pocket cards, QR-linked videos) for widespread dissemination.

From Insight to Action: Practical Steps for Thailand

Practical Steps for Change (2/2)

Medical Education

- Integrate new seizure classification (2025) into curriculum.
- Use AI-assisted EEG as teaching tool for residents.
- Emphasize clinical reasoning, not blind trust in AI.

Data & Research Infrastructure

- Build national EEG + epilepsy response registry.
- Include Thai-specific pharmacogenetics and seizure profiles.
- Lay groundwork for precision medicine in epilepsy.

Pilot & Evaluate in Real Settings

- Start with AI EEG in ICU / AMBU / ER.
- Collect feasibility, safety, and real-world outcome data.
- Encourage multicenter collaboration and industry-academic partnership.

✅ **Small steps in multiple centers can start a real system change.**

3 Things We Must Change — Starting Tomorrow

Update How We Diagnose

- Use the 2025 Seizure Classification
- Communicate better, treat more precisely

Modernize How We Monitor

- Adopt AI-assisted EEG in ICU/AMBU
- Faster alerts, safer care, smarter teams

Build Systems That Fit Thailand

- Local EEG data
- Genetic-informed ASM use
- Practical referral networks

"If not now — then when?"

Thank You!

We are ready to innovate and transform epilepsy care in Thailand.