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Nationwide Analysis of Cause-Specific Deaths in 209,636 Young Adults with First-Ever Ischemic Stroke in Thailand

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Introduction: Stroke in young adults (aged 18–55 years) is an emerging public health concern, particularly in low- and middle- income countries. While most studies emphasize acute outcomes, data on long-term mortality patterns and cause-specific deaths are limited.

Objectives: To investigate age-stratified mortality rates and causes of death among young adults with ischemic stroke in Thailand using a national cohort.

Materials and Methods: This retrospective cohort study used the Thai Universal Coverage Scheme database from 2004–2022. Adults aged 18–55 years with first-ever ischemic stroke (ICD-10 I63) were followed until death or study end. Mortality was classified as in-hospital, short-term (≤ 30 days), or long-term (> 30 days). Causes of death were grouped into stroke-related, complications, comorbidities, and others, with subgroup analyses across four age strata.

Results: Among 209,636 patients, overall mortality was 27.71%. Long-term mortality (19.27%) exceeded in-hospital (4.36%) and short-term mortality (4.08%), increasing with age. The most frequent causes of death were complications (30.88%), comorbidities (27.59%), and stroke-related events (27.57%). Stroke-related causes predominated in-hospital deaths (60.03%), whereas long-term mortality was mainly due to septicemia, pneumonia, heart failure, cardiovascular disease, and malignancy. COVID-19 accounted for 25.81% of deaths in the “other” category, and 8.02% were classified as unknown.

Conclusion: This nationwide study demonstrates distinct temporal and age-related mortality patterns after ischemic stroke in young adults. The transition from stroke-related deaths in the acute phase to complications and comorbidities in the chronic phase highlights the need for comprehensive long-term care and targeted prevention strategies to reduce premature mortality.

Causes of Death in Patients with Hemorrhagic Stroke in Thailand: A Nationwide Cohort Study of 357,616 Patients

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Introduction: Hemorrhagic stroke remains a major cause of mortality worldwide, with particularly high burdens in low- and middle-income countries. Despite this, limited data exist regarding the detailed causes and timing of death among hemorrhagic stroke patients, especially in long-term follow-up.

Objectives: To investigate the causes and timing of death among patients with hemorrhagic stroke in Thailand, focusing on stroke-related causes, complications, comorbidities, and other causes.

Materials and Methods: Retrospective cohort study analyzed data from 357,616 patients with a primary diagnosis of cerebral hemorrhage (ICD-10 codes I61–I62) admitted under the Thai Universal Coverage Scheme between 2004 and 2022. Mortality was classified into in-hospital, short-term (within 30 days post-discharge), and long-term (beyond 30 days) periods. Causes of death were categorized into stroke-related, complications, comorbidities, accidents, suicide, other causes, and unknown causes.

Results: Overall mortality was 68.6%. In-hospital deaths accounted for 29.5%, short term deaths for 18.7%, and long-term deaths for 20.4%. Stroke-related causes predominated during hospitalization (80.4%), while complications and comorbidities became more prominent in long-term mortality (29.6% and 24.7%, respectively). The leading causes of complication-related deaths were pneumonia, sepsis, and heart failure. Hypertension, neoplasm, and dementia were the most frequent comorbidities associated with death. Senility was the dominant other cause of death across all time periods

Conclusion: Mortality in hemorrhagic stroke patients remains high throughout hospitalization and long-term follow-up. While stroke-related deaths are predominant 5 early, complications, comorbidities, and systemic factors such as aging and COVID-19 Increasingly contribute to later mortality. These findings highlight the need for comprehensive long-term care strategies addressing infection control, comorbidity management, and frailty in hemorrhagic stroke survivors.

Long-Term Causes of Death in 888,003 Ischemic Stroke Patients in Thailand: A Nationwide Retrospective Study with 18-Year Follow-up

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Background: Ischemic stroke (IS) is a major global cause of death and disability, with evolving causes of death over time. However, long-term data on mortality patterns, particularly in low- and middle-income countries, are limited. This study aimed to examine fatality rates and causes of death among IS patients in Thailand across different time periods.

Methods: We conducted a retrospective descriptive study using national hospital database records from 2004 to 2022. Patients with IS (ICD-10 code I63) were included. Causes of death were categorized into stroke, complications, comorbidities, accidents, suicide, others, and unknown. Mortality was analyzed across three periods: in-hospital, short-term (≤ 30 days post-discharge), and long-term (> 30 days post-discharge).

Results: Among 888,003 IS patients, the overall mortality rate was 47.64%. In-hospital mortality was 6.37%, short-term mortality 8.17%, and long-term mortality 33.09%. Mortality rates increased markedly with age, exceeding 80% in patients over 85 years. Stroke is leading cause of in-hospital (58.60%) and short-term deaths (29.06%), while complications (30.72%) and comorbidities (30.51%) predominated in long-term mortality. Heart disease, dementia, and neoplasm were the leading comorbid causes of death, whereas pneumonia and sepsis were the most common fatal complications. Notably, senility, COVID-19 infection, and cardiovascular collapse were major causes of death categorized under other causes.

Conclusions: Causes of death after ischemic stroke change over time, stroke leading cause of early mortality and complications and comorbidities dominating long-term deaths. These findings highlight the need for integrated acute and post-discharge stroke care strategies focusing on infection prevention, comorbidity management, and geriatric care is essential to reduce long-term mortality.

Neuroimaging in Subjective Cognitive Decline Patients: Structural MRI Analysis with the Brain Template Creation

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Background: Subjective cognitive decline (SCD) refers to self-experienced cognitive decline despite preserved objective cognitive performance and functional independence. Although often benign, SCD is associated with an increased risk of future cognitive impairment in a subset of individuals. Neuroimaging may help identify early brain changes underlying this heterogeneous condition, particularly among individuals meeting SCD-plus criteria.

Methods: We conducted a retrospective cohort study of cognitively unimpaired individuals presenting with SCD at a memory clinic. Participants underwent baseline clinical and cognitive assessment and high-resolution 3D T1-weighted brain MRI. Structural MRI data were processed using FreeSurfer to derive regional cortical thickness, cortical volume, white matter parcellation (wmparc), and subcortical/global volumetric (ASEG) measures. Participants were classified into SCD and SCD-plus groups based on established criteria. Between-group comparisons were performed using Welch's two-sample t-tests and linear regression models adjusted for estimated total intracranial volume (eTIV), with effect sizes reported as Hedges' g or standardized regression coefficients (β). Multiple comparisons were controlled using false discovery rate (FDR) correction. A population-specific brain template was additionally created using the DARTEL framework implemented in Statistical Parametric Mapping.

Results: Thirty-four participants met inclusion criteria (mean age 66.15 ± 9.82 years; 67.65% female). Global cognition was preserved (mean MoCA score 27.24 ± 1.52), with memory being the most frequent complaint (82.35%). Structural MRI data were successfully processed for all participants. Between-group analyses revealed subtle, region-specific neuroimaging differences with small-to-moderate effect sizes. Increased right inferior parietal cortical volume in the SCD-plus group remained significant after eTIV adjustment and FDR correction, while additional cortical thickness, white matter, and subcortical differences were observed at an exploratory level.

Conclusion: Advanced structural MRI analyses reveal subtle but regionally specific neuroimaging differences between SCD and SCD-plus individuals. The findings highlight the heterogeneity of SCD and support the use of detailed neuroimaging approaches to characterize early brain changes associated with subjective cognitive concern. Longitudinal and multimodal studies are needed to determine the prognostic significance of these differences.

Effect of Continuous Sleep Hygiene Promotion on Objective Sleep Quality in Patients with Mild to Moderate Parkinson's Disease: A Randomized Controlled Trial

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Background: Sleep disturbances are highly prevalent in Parkinson's disease (PD) and contribute substantially to non-motor symptom burden, impaired quality of life, and functional decline. Although sleep hygiene is commonly recommended as a non-pharmacological intervention, evidence supporting structured and continuous sleep hygiene promotion in PD, particularly using objective sleep measures, remains limited.

Objectives: To evaluate the effect of continuous sleep hygiene promotion on objectively measured sleep quality and subjective sleep-related outcomes in patients with mild to moderate Parkinson's disease and sleep disturbances.

Method: This single center randomized controlled trial enrolled patients with mild to moderate idiopathic PD and clinically significant sleep disturbance. Participants were randomized to either a continuous sleep hygiene promotion group or a control group receiving standard single-session sleep advice. The intervention group received a structured, multimodal sleep hygiene program over four weeks, including daily educational and reminder messages via a mobile messaging platform, poster-based reinforcement, and video-based educational materials. The primary outcome was objective sleep duration assessed using wrist actigraphy worn for seven consecutive days at baseline and post-intervention. Secondary outcomes included subjective sleep quality and daytime sleepiness assessed using the Parkinson's Disease Sleep Scale-2 (PDSS-2), Pittsburgh Sleep Quality Index (PSQI), and Epworth Sleepiness Scale (ESS). Analyses followed the intention-to-treat principle.

Results: Twenty-six patients were randomized (intervention n = 14; control n = 12), with no dropouts. In the intervention group, mean nighttime sleep duration increased significantly from 375.4 to 406.3 minutes (mean increase 30.9 minutes; 95% CI 8.14–53.75; p = 0.012), while no significant change was observed in the control group. PDSS-2 scores improved significantly in the intervention group (median 14.5 to 9.5; p = 0.015) and were significantly lower than controls at post-intervention (p = 0.011). No significant changes were observed for PSQI or ESS.

Conclusion: Continuous sleep hygiene promotion significantly improved objective nighttime sleep duration and PD-specific subjective sleep quality, supporting its role as a feasible, low-risk intervention for sleep disturbances in PD.

Walking the Difference: Quantitative Gait Analysis to Distinguish Parkinson's Disease from Atypical Parkinsonism

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Introduction: Gait disturbance is a prominent and disabling manifestation of Parkinson's disease (PD). Atypical parkinsonian syndromes (APS), including progressive supranuclear palsy, multiple system atrophy, corticobasal degeneration, dementia with Lewy bodies, and frontotemporal lobar degeneration, often present with gait abnormalities overlapping with PD. However, APSs are characterized by distinct pathophysiology, and faster progression, making early differentiation from PD clinically challenging. Objective gait assessment using instrumented analysis may provide additional diagnostic insight.

Objectives: To compare quantitative spatiotemporal and plantar pressure gait parameters between patients with PD and APS.

Materials and Methods: This retrospective cohort study included patients with PD and APS who underwent instrumented gait analysis at the Chulalongkorn Center of Excellence for Parkinson's Disease & Related Disorders between January 2021 and December 2025. Diagnoses were confirmed by movement disorder specialists. Objective gait parameters were obtained using the Strideway® System. Between-group comparisons were performed using appropriate parametric or non-parametric statistical tests.

Results: Step width was significantly wider in patients with APS than in those with PD (APS 13.98 ± 5.58 cm vs PD 10.58 ± 2.97 cm; $p = 0.021$). No statistically significant between-group differences were observed for other spatiotemporal gait or plantar pressure parameters. However, descriptive trends suggested slower stride velocity, lower maximum peak plantar pressure, higher force–time integral, longer double-support time, and prolonged heel contact time in APS.

Conclusion: Patients with atypical parkinsonian syndromes demonstrate a wider step width than patients with Parkinson's disease, reflecting greater mediolateral instability. Quantitative gait analysis, particularly step width measurement, may serve as an objective adjunct to clinical assessment in parkinsonian disorders.

Interest among Individuals with Subjective Cognitive Decline (SCD) in Receiving Their Biomarker Results

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Introduction: Subjective cognitive decline (SCD) is recognized as an early clinical manifestation of Alzheimer's disease (AD). With increasing accessibility of AD biomarker testing, understanding the willingness of individuals with SCD to receive biomarker results and the psychological factors influencing this decision is essential.

Objectives: To assess willingness to receive Alzheimer's disease biomarker results among individuals with SCD and to identify factors associated with this willingness.

Materials and Methods: This cross-sectional study enrolled individuals aged 50 years and older diagnosed with SCD at neurology and memory clinics. Participants completed a self-administered questionnaire assessing demographic characteristics, psychological factors, and willingness to receive biomarker results. Factors associated with willingness were examined using univariate analyses and multivariate logistic regression.

Results: Most participants (87.3%, $n = 55$) expressed willingness to receive AD biomarker results. Willingness was significantly associated with higher educational attainment, including postgraduate education (90.2% vs. 62.5%; $p = 0.049$) and a greater number of years of education ($p = 0.010$). Participants willing to receive results more frequently cited future planning as a motivation for disclosure (90.9% vs. 25.0%; $p < 0.001$). In contrast, those unwilling to receive results more often reported fear of stress or anxiety (75.0% vs. 12.7%; $p = 0.001$).

Conclusion: Most individuals with subjective cognitive decline are willing to receive Alzheimer's disease biomarker information. Willingness is mainly influenced by educational level and psychological motivations, whereas fear of emotional distress reduces acceptance. These findings may assist clinicians in counseling patients and guiding discussions regarding biomarker testing.

Serum microRNA Levels including miR-125a-5p, miR-125b-5p, and miR-433-5p as Biomarkers for Differentiating Acute Vertigo between Cerebellar or Brainstem Infarction and Peripheral Vertigo (Interim Analysis)

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Introduction: Differentiating central vertigo caused by posterior circulation stroke from peripheral vertigo remains diagnostically challenging. Early ischemic lesions may be missed on neuroimaging, and bedside examination can be limited in patients with severe symptoms. Circulating microRNAs (miRNAs) have emerged as potential biomarkers of cerebrovascular injury.

Objectives: This study aimed to validate the diagnostic performance of serum miR-125a-5p, miR-125b-5p, and miR-433-5p in distinguishing central from peripheral vertigo, while extending the age range to improve generalizability in clinical practice.

Materials and Methods: This single-center prospective cohort study enrolled adults presenting with acute vertigo within 72 hours of symptom onset. Central vertigo was diagnosed by neurologists using clinical and neuroimaging criteria, while peripheral vertigo was diagnosed by otolaryngologists or by the absence of stroke on MRI. Acute-phase venous blood samples were collected, and serum miRNA levels were quantified using absolute RT-qPCR. Group comparisons were performed using appropriate statistical tests, with $p < 0.05$ considered significant. This is an interim analysis.

Results: A total of 48 patients were enrolled (central=27; peripheral=21). Serum miRNA levels did not differ significantly between groups. Median levels of miR-125a-5p (278.27 vs. 324.78, $p=0.8111$) and miR-125b-5p (570.43 vs. 519.60, $p=0.4734$) were comparable between central and peripheral vertigo. Median miR-433-5p levels were higher in the central group (51.81 vs. 28.97), though not statistically significant ($p=0.4117$).

Conclusion: Although no significant differences were observed, miR-433-5p showed a trend toward higher levels in central vertigo. Interpretation is limited by reduced statistical power due to incomplete sample size, and continued recruitment is required to determine the diagnostic performance of these miRNAs.

CSF Tau As A Predictor of Clinical Progression in the Sporadic Creutzfeldt-Jakob Disease: A Pilot Study from Thailand

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Introduction: Prion diseases are rapidly progressive and universally fatal. Correlating biomarkers is crucial for advancing therapies and optimizing patient selection in clinical trials.

Objectives: This study aims to investigate the interaction between CSF total tau (t-tau) and disease progression.

Materials and Methods: We conducted a longitudinal cohort study using data from the Thai National Prion Disease Surveillance Program with probable sporadic Creutzfeldt–Jakob disease (sCJD) enrolled between October 2024 and October 2025. Baseline CSF t-tau was measured from residual diagnostic samples using second-generation ELISA (EUROIMMUN). Functional status was assessed monthly using the Medical Research Council (MRC) Prion Disease Rating Scale. Associations between baseline CSF t-tau levels and disease progression were analyzed using linear mixed-effects. Time to functional dependency and death were evaluated using Kaplan–Meier and Cox proportional hazards models.

Result: A total of 40 patients with probable sporadic Creutzfeldt–Jakob disease were included. Median age at diagnosis was 67 years, and median baseline MRC score was 5.5. Baseline CSF t-tau levels were markedly elevated (median 6,320 pg/mL) and were inversely correlated with baseline functional status (Spearman's $\rho = -0.55$, $p < 0.05$). Longitudinal analysis demonstrated significant functional decline over time; however, baseline CSF t-tau was not associated with differential rates of functional decline. Median survival was approximately 4–5 months.

Conclusion: CSF total tau reflects baseline disease severity in symptomatic prion disease but does not predict subsequent functional decline. Its prognostic utility for disease progression appears limited in this pilot cohort.

Machine Learning–Based Seizure Prediction Using Wearable-Derived Heart Rate Variability in Critically Ill Patients

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Introduction: Nonconvulsive seizures (NCSs) and nonconvulsive status epilepticus (NCSE) are common in critically ill patients but are difficult to recognize clinically and require continuous electroencephalography (cEEG), which is not universally available. Early seizure prediction could facilitate timely intervention and improve outcomes. Seizures are associated with autonomic nervous system alterations, and heart rate variability (HRV) derived from wearable devices provides a noninvasive means to capture these changes.

Objectives: To develop and evaluate a non-EEG–based seizure prediction model using wearable-derived HRV features to distinguish preictal from interictal states in critically ill patients.

Materials and Methods: This cross-sectional analysis was conducted within a prospective cohort of critically ill adults undergoing cEEG monitoring. Blood volume pulse signals were recorded using a wrist-worn wearable device, from which 32 time-domain, frequency-domain, and nonlinear HRV features were extracted. Preictal and interictal epochs were defined relative to ictal onset identified on cEEG. Logistic regression models were evaluated using leave-one-patient-out cross-validation. Model performance was assessed using receiver operating characteristic area under the curve (ROC–AUC), sensitivity, and specificity. Feature importance and directionality were examined using permutation importance and SHapley Additive exPlanations.

Results: Eight patients with confirmed seizures and sufficient HRV data were included. The median test ROC–AUC was 0.605 (IQR 0.483–0.828), with substantial inter-patient variability. Sensitivity was high (median 0.976), whereas specificity was lower and variable. Nonlinear HRV features, including recurrence quantification analysis measures, the largest Lyapunov exponent, and detrended fluctuation analysis, were the most influential predictors, suggesting reduced autonomic complexity preceding seizures.

Conclusion: Wearable-derived HRV analysis is feasible for seizure prediction in critically ill patients. Nonlinear autonomic dynamics play a key role in the preictal state, supporting wearable-based HRV monitoring as a potential adjunct to EEG for early seizure risk detection in the ICU.

Associations of Simple Inflammatory Biomarkers with Cerebral Small Vessel Disease and Functional Outcome in Acute Ischaemic Stroke Patients

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Introduction : The relationship between inflammatory markers and cerebral small vessel disease (CSVD) in patients with acute ischaemic stroke (AIS) remains unclear. This study aimed to investigate the association between simplified inflammatory biomarkers and neuroimaging markers of CSVD.

Objectives : This study set out with the hypothesis that simple inflammatory markers from routine blood tests—especially the NLR—were associated with MRI findings of CSVD. It was also hypothesised that higher values of these markers reflected a more severe burden of CSVD on neuroimaging and could be associated with worse clinical outcomes in patients with acute ischaemic stroke. These markers, if proven beneficial, might offer a practical and accessible way to support diagnosis and predict recovery in stroke patients.

Materials and Methods : This retrospective cohort study included patients with acute ischaemic stroke who had symptom onset within 72 hours and underwent MRI brain between January 2019 and December 2023. The associations between tertiles (T) of the neutrophil-lymphocyte ratio (NLR) and CSVD markers were studied using multinomial logistic regression. Functional outcomes at discharge and 90 days, as measured by the modified Rankin Scale (mRS), were also evaluated.

Results : A total of 299 eligible patients were included with a mean age of 65.7 ± 13.8 years and 55.5% (166/299) were male, categorised into three tertiles of NLR (T1: 101, T2: 101, T3: 97). Patients with a higher NLR tertile had more admission NIHSS (T3 vs. T1: 3 (2, 5) vs. 2 (1, 3), $P = 0.005$). NLR was significantly associated with an increased risk of ≥ 5 lobar cerebral microbleeds (CMBs) (T3 vs. T1: relative risk ratio, 5.69 (1.21-26.68); $P = 0.03$). Patients in the highest NLR tertile (T3) had a lower likelihood of achieving an mRS of 0-1 at discharge (45.3%) compared to those in T1 (54.0%) and T2 (58.4%), with discharge mRS of 2 (1, 3) (T3) vs. 1 (0, 3) (T1), $P = 0.01$.

Conclusion : The admission NLR may serve as a simplified blood marker for predicting a high burden of lobar CMBs and may be associated with a less favourable outcome at discharge in patients with AIS.

Efficacy of Fresh Frozen Plasma and Human Albumin in Therapeutic Plasma Exchange for Refractory Neuromyelitis Optica Spectrum Disorders and Multiple Sclerosis Exacerbation: A Two-Tertiary Care Center Study

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Background: Therapeutic plasma exchange (TPE) is an established rescue therapy for steroid-refractory demyelinating attacks in neuromyelitis optica spectrum disorder (NMOSD) and multiple sclerosis (MS). The optimal replacement fluid for TPE—human albumin or fresh frozen plasma (FFP)—remains uncertain, particularly in resource-limited settings.

Methods: We conducted a retrospective cohort study at two tertiary care centers in Thailand, comparing the efficacy and safety of albumin versus FFP as replacement fluids in TPE. Adult patients with NMOSD or MS experiencing refractory exacerbation were included. Clinical outcomes were evaluated using the Expanded Disability Status Scale (EDSS) and Opticospinal Impairment Scale (OSIS), including visual and motor subscales, at baseline, post-treatment, day 90, and day 180. The primary outcome was the proportion of patients achieving favorable functional outcome (EDSS < 6) at day 180.

Results: Among 67 patients (97% NMOSD), 41 received albumin and 26 received FFP. At day 180, 75.6% in the albumin group and 73.1% in the FFP group achieved favorable outcome (P-value = 1.00). EDSS and OSIS scores improved significantly in both groups over time. Albumin was associated with greater motor improvement, while FFP showed superior visual recovery. Adverse events were mild and comparable between groups.

Conclusion: TPE using either albumin or FFP is effective and safe for treating steroid-refractory NMOSD and MS. FFP may be a feasible alternative to albumin in settings where cost or availability is a concern.

Outcomes of Intracranial Haemorrhage in Patients Taking Direct Oral Anticoagulants or Vitamin K Antagonists

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Introduction: The clinical outcomes of patients with intracranial haemorrhage (ICH) whilst using direct oral anticoagulants (DOACs) and vitamin K antagonists (VKAs) are uncertain.

Objectives: This study aimed to assess the outcomes and management of patients receiving DOACs compared to those receiving VKAs.

Materials and Methods: In this retrospective cohort study, patients hospitalised during January 2017 and December 2023 for traumatic and non-traumatic ICH and using oral anticoagulant (OAC) were included. The primary outcomes were mortality and functional outcomes, as measured by the modified Rankin Scale (mRS) during admission and at 90 days. ICH management and complications were studied and compared between the two groups of OAC.

Results: A total of 171 eligible patients were included, comprising 24 patients on DOACs and 147 patients on VKAs. Patients receiving DOACs were older (79.1 vs. 66.8, $P < 0.001$) and had a higher proportion of traumatic ICH (75.0% vs. 46.3%, $P = 0.009$) compared to those using VKAs. In-hospital and 90-day outcomes were not statistically different between the two groups, with an adjusted odds ratio (aOR) of 1.13 (0.34-3.69) for in-hospital mortality, $P = 0.84$, and an aOR of 1.11 (0.43-2.88) for mRS 0-2 at 90 days, $P = 0.83$. 81.3% of patients received at least one reversal agent; fresh frozen plasma was commonly used in the VKAs group (78.9% vs. 33.3%, $P < 0.001$), whereas prothrombin complex concentrate was significantly prescribed in patients with DOAC-associated ICH (29.2% vs. 3.4%, $P < 0.001$).

Conclusions: Patients with DOAC-associated ICH had comparable in-hospital and long-term clinical outcomes with individuals using VKAs.

Prevalence, Clinical Characteristics, and Outcomes of *Streptococcus Suis* Meningitis Compared with Bacterial Meningitis of Other Etiologies in Northern Thailand: A Retrospective Cohort Study

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Introduction: Acute bacterial meningitis is associated with high mortality and neurological sequelae. *Streptococcus suis* is an important zoonotic cause in Northern Thailand; however, regional comparative data remain limited.

Objective: This study aimed to determine the prevalence of *S. suis* meningitis and compare its clinical features and outcomes with non-*S. suis* bacterial meningitis.

Methods: This retrospective cohort study included adult patients with community-acquired bacterial meningitis confirmed by positive cerebrospinal fluid culture who were admitted to Maharaj Nakorn Chiang Mai Hospital between January 2015 and October 2024. Patients were classified into *S. suis* and non-*S. suis* groups. Clinical characteristics, outcomes, and antimicrobial susceptibility were analyzed.

Results: Thirty-seven patients were included, of whom 15 (40.5%) had *S. suis* meningitis. Systemic inflammatory response syndrome occurred more frequently in the *S. suis* group (80% vs. 45.5%, $P = 0.047$). Patients with *S. suis* meningitis had higher median white blood cell counts (16,420 vs. 12,195 cells/mm³, $P = 0.038$), cerebrospinal fluid protein levels (422 vs. 280 mg/dL, $P = 0.047$), and Gram stain positivity (60% vs. 27.3%, $P = 0.047$). Rates of brain abscess and cerebritis were significantly lower in the *S. suis* group (0% vs. 36.4%, $P = 0.012$), as was mortality (0% vs. 36.4%, $P = 0.012$). Raw pork consumption was strongly associated with *S. suis* meningitis (adjusted OR 76.42, 95% CI 2.38–2458.16, $P = 0.014$). All *S. suis* isolates were susceptible to ceftriaxone and vancomycin, while 69.2% were susceptible to penicillin. High resistance rates were observed for clindamycin and erythromycin (92.9%).

Conclusions: *S. suis* meningitis constitutes a substantial proportion of bacterial meningitis cases in Northern Thailand. Ceftriaxone and vancomycin remain effective empirical therapies. Public health measures addressing raw pork consumption may reduce disease burden.

Prevalence and Associated Factors of Sarcopenia among Thai Patients with Ambulatory Parkinson's Disease

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Introduction: Sarcopenia is a progressive skeletal muscle disorder that contributes to frailty, falls, and functional decline. In Parkinson's disease (PD), disease-specific motor impairment, nutritional compromise, and reduced physical activity may accelerate sarcopenia beyond normal aging; however, data in Thai patients remain limited.

Objectives: To determine the prevalence of Asian Working Group for Sarcopenia (AWGS) 2019-defined sarcopenia phenotypes, identify associated factors, and evaluate screening performance in Thai PD patients.

Materials and Methods: We conducted a cross-sectional study of Thai patients with PD (Hoehn & Yahr stages 1–3) attending a movement-disorders clinic. Sarcopenia was defined using AWGS 2019 criteria, with appendicular skeletal muscle mass estimated by bioelectrical impedance analysis. PD severity was assessed using the Clinical Impression of Severity Index for Parkinson's Disease (CISI-PD). Screening tools included calf circumference (CC), handgrip strength, 5-time chair stand test, and SARC-F. Logistic regression examined factors associated with sarcopenia, and screening performance was summarized using sensitivity and specificity.

Results: Among 124 participants, 25 (20.2%) had sarcopenia, including 14 (11.3%) with severe sarcopenia; dynapenia and presarcopenia were present in 36.3% and 3.2%, respectively. Higher CISI-PD was independently associated with sarcopenia (adjusted OR 1.3, 95% CI 1.1–1.6), while weight change was inversely associated (adjusted OR 0.9 per +1 kg, 95% CI 0.8–1.0). CC showed the best screening performance (sensitivity 88.0%, specificity 79.8%).

Conclusion: Sarcopenia affects one in five Thai patients with ambulatory PD and is associated with greater disease severity and weight loss. CC is an effective first-line screening tool for routine PD care.

Inflammatory Markers after Mechanical Thrombectomy is Prognostic Marker for Hemorrhagic Transformation in Acute Ischemic Stroke: Retrospective Cohort Study

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Introduction: Hemorrhagic transformation (HT) is a serious complication following mechanical thrombectomy (MT) for acute ischemic stroke (AIS) with large vessel occlusion (LVO). While inflammatory markers like Systemic Immune-Inflammation Index (SII), Neutrophil-to-Lymphocyte Ratio (NLR), and Platelet-to-Lymphocyte Ratio (PLR) are potential prognostic factors, their predictive value specifically in MT patients remains unclear.

Objective: To evaluate the prognostic accuracy of admission SII, NLR, and PLR for predicting 24-hour HT and symptomatic intracranial hemorrhage (sICH) in AIS patients undergoing MT.

Materials and Methods: This retrospective study included 164 AIS patients treated with MT between January 2022 and February 2025. Admission inflammatory indices were calculated. The primary outcome was HT within 24 hours, and the secondary outcome was sICH. Multivariate logistic regression was performed to identify independent predictors, adjusting for confounders including the Thrombolysis in Cerebral Infarction (TICI) score.

Results: HT occurred in 51.2% (N=84) and sICH in 12.8% (N=21) of patients. There were no significant differences in median baseline SII, NLR, or PLR levels between patients with and without HT or sICH (all $p > 0.05$). In multivariate analysis, none of the inflammatory markers were independently associated with HT or sICH. Conversely, successful reperfusion (TICI score) was significantly associated with a reduced risk of HT (aOR 0.632, 95% CI 0.450–0.887, $p = 0.008$).

Conclusion: Admission SII, NLR, and PLR are not reliable independent predictors of hemorrhagic transformation in AIS patients treated with mechanical thrombectomy. Procedural success, indicated by the reperfusion grade, is a more critical determinant of hemorrhagic risk than baseline systemic inflammation.

Factors Associated with Recurrent Ischemic Stroke in Patients Receiving Anticoagulation: A Retrospective Cohort Study

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Introduction: Ischemic stroke despite oral anticoagulation (OAC) in AF remains a therapeutic challenge without standardized management. Identifying effective prevention strategies is critical for improving clinical outcomes in this high-risk population.

Objectives: The primary aim was to determine optimal secondary prevention strategies after breakthrough stroke in atrial fibrillation (AF) patients, and to identify factors associated with favorable functional outcomes.

Materials and Methods: We retrospectively analyzed AF patients admitted with acute ischemic stroke between January 2021 and December 2024 at Thammasat University Hospital while receiving OAC. Outcomes included modified Rankin Scale (mRS) scores and a composite of recurrent events or bleeding. Secondary prevention strategies evaluated included: continuation of the same DOAC/warfarin, switching between DOACs, switching between DOAC and warfarin, and adding antiplatelet therapy.

Results: Among 155 patients (mean age 71.8 years), favorable outcomes ($mRS \leq 2$) were significantly associated with age ≤ 70 , NIHSS ≤ 10 , and CHA₂DS₂-VASc ≤ 4 ($p < 0.05$). At three months, continuation of DOAC/warfarin yielded 55–57% favorable outcomes, while switching from warfarin to DOAC was the least effective (15.4%). All patients receiving additional antiplatelet therapy achieved good functional outcomes.

Conclusion: Post-stroke outcomes were primarily determined by patient factors rather than the specific regimen. Together with existing evidence, continuation of DOAC with careful optimization remains the most reasonable approach, while switching between DOACs or adding antiplatelets should be individualized.

Electroencephalographic Findings from Routine EEG in Critically Ill Patients: Can They Predict Outcome?

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Introduction: Impaired consciousness is a common condition in intensive care unit [ICU] patients. It is associated with high mortality and morbidity. Prolonged electroencephalography [EEG] is frequently used to detect nonconvulsive seizures, and to predict prognosis, whilst the benefit of periodic routine EEG remains unclear.

Objectives: To evaluate clinical and EEG patterns from routine EEG among ICU patients who had alteration of consciousness.

Materials and Methods: A retrospective longitudinal cohort study was conducted. Adult ICU patients with Glasgow Coma Scale [GCS] score of less than 12 underwent routine EEG were enrolled. Patients with clinical seizures within 96 hours prior to EEG recording were excluded. Clinical characteristics, etiologies, EEG features, mortality, and functional outcomes, assessed by the modified Rankin Scale [mRS] had been reviewed for at least 6 months.

Results: A total of 59 patients were included, mean age of 61.7 years old, male of 38 (64.4%). Nonconvulsive seizures were not detected. The commonest etiologies were hypoxic–ischemic brain injury [HIBI] (25.5%) and metabolic encephalopathy (20.3%). HIBI patients had significantly lower initial GCS scores, worse outcomes than non-HIBI group. The absent of posterior dominant pattern, absence of anterior-posterior [AP]-gradient, and severe encephalopathic pattern were predictors for unfavorable outcomes.

Conclusion: Routine EEG recording can be used as a predictor for outcomes in ICU patients with impaired consciousness. Moreover, hypoxic ischemic brain injury was associated with more severe EEG patterns and had poorer outcomes.

Myasthenia Gravis: How Does Each Subtype Differ from the Others?

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Introduction: Myasthenia gravis (MG) is a clinically heterogeneous autoimmune disorder, commonly classified by clinical phenotype and serological status. However, real-world data linking these classifications to disease characteristics, management, and long-term outcomes in Asian populations remain limited.

Objectives: Clinical characteristics, disease severity, investigations, treatments, and outcomes were analyzed and compared according to clinical phenotype (ocular vs. generalized) and serological status (seropositive vs. seronegative).

Materials and Methods: We conducted a retrospective, single-center cohort study of adult patients with myasthenia gravis treated at Phramongkutklao Hospital between 2013 and 2023.

Results: A total of 315 patients were included (mean age, 58.9±16.0 years; 63.8% were female). At diagnosis, 56.8% had ocular and 37.7% had generalized myasthenia gravis. Disease duration was longer in generalized disease, and thymoma was more frequent, whereas thyroid disorders were more common in ocular disease. Among 211 patients with available serological data, 49.8% were seropositive; generalized disease predominated in seropositive patients, whereas ocular disease was more common in seronegative patients ($p=0.001$). Seropositive patients more frequently had abnormal repetitive nerve stimulation results. Immunosuppressive therapies and thymectomy were used more frequently in patients with generalized and seropositive disease. Remission occurred in 14.3% of patients and was more common in seronegative patients, whereas myasthenic crisis occurred more frequently in generalized disease. Rates of permanent deficit and mortality did not differ significantly.

Conclusion: In this large real-world cohort, clinical phenotype and serological status were closely associated with disease expression and management intensity but were less predictive of long-term outcomes. These findings support the clinical value of systematic phenotypic and serological classification at diagnosis to inform risk stratification and individualized management.

Incidence and Follow-Up Outcomes of Subjective Cognitive Decline in Patients Living with HIV

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Introduction: The increasing prevalence of People living with HIV(PWH) has raised growing concerns about a possible rise in the incidence of neurocognitive disorders due to HIV and other age-related factors. In typical aging, Subjective Cognitive Decline (SCD) among individuals with normal neurocognitive functioning may be an early manifestation of an incipient neurocognitive disorder. Objectives: To determine observed progression rate from Subjective Cognitive Decline (SCD) to Mild Cognitive Impairment (MCI) over a six-month follow-up period and identify risk factors associated with the development of neurocognitive impairment in HIV positive individuals presenting with SCD.

Materials and Methods: Materials and Methods: Participants who fulfilled the inclusion criteria for SCD based on questionnaire assessments were followed prospectively for six months. During the follow-up period, cognitive performance was reassessed using the Montreal Cognitive Assessment (MoCA). Progression from SCD to MCI was defined as a MoCA score equal or less than 25 at the six-month follow-up. In cases where cognitive decline was detected. Participants subsequently underwent comprehensive laboratory testing and neuroimaging to determine the underlying etiology. All conducted in accordance with standard clinical practice guidelines.

Results: The study population was predominantly male, with a mean age of 53.75 ± 8.3 years. Over six months of follow-up, 14.81% of PWH with SCD progressed to MCI. Immunological status, virological burdens, and HIV related disease did not associated with disease conversion.

Conclusion: These finding suggest that HIV positive individuals with SCD may be at risk of early progression to MCI over a short follow up period. Despite the high prevalence of vascular comorbidities but no associated risk factors were identified among this population.

Treatment Outcomes of Mechanical Thrombectomy for Acute Ischemic Stroke in Rajavithi Hospital

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Background: Mechanical thrombectomy (MT) is an established treatment for acute ischemic stroke due to large vessel occlusion, providing superior recanalization and functional outcomes compared with intravenous thrombolysis alone. However, real-world outcomes and prognostic factors vary across institutions. Mechanical thrombectomy has been performed at Rajavithi Hospital since 2019, but treatment outcomes have not been systematically evaluated.

Objective: To evaluate treatment outcomes and identify factors associated with functional outcomes in patients with acute ischemic stroke treated with mechanical thrombectomy.

Materials and Methods: This retrospective cohort study included adult patients with acute ischemic stroke who underwent mechanical thrombectomy at Rajavithi Hospital between 2019 and 2025. Baseline clinical, imaging, and treatment-related data were collected. Outcomes included 90-day functional status, angiographic reperfusion assessed by modified Thrombolysis in Cerebral Infarction (mTICI) score, in-hospital mortality, and hemorrhagic complications. Factors associated with treatment outcomes were analyzed using appropriate statistical methods.

Results: Favorable functional outcome (mRS 0–2 at 90 days) was achieved in 10 patients (29.4%). Successful reperfusion (mTICI $\geq 2b$) occurred in 26 patients (76.5%). Advanced age was independently associated with unfavorable outcome (adjusted OR, 1.08 per year; 95% CI 1.01–1.16; $p = 0.046$). Baseline NIHSS score and endotracheal intubation were not independently associated with functional outcome after risk adjustment.

Conclusion: MT at Rajavithi Hospital achieved high rates of successful reperfusion; however, favorable functional outcomes remained limited. Advanced age was the only independent predictor of unfavorable outcome. Prolonged treatment times, lower baseline ASPECTS, and limited use of intravenous thrombolysis may have contributed to suboptimal functional recovery.

Identification of Penumbra and Infarct Core Areas by Using Artificial Intelligence on Brain Non-contrast CT and CTA Images in Acute Ischemic Stroke Patients

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Introduction: Computed tomographic perfusion (CTP) was used to select patients who benefit from reperfusion treatment in both early and late windows in patients with acute ischemic stroke. However, these advanced imaging techniques are limited in low-resource countries.

Objective: To develop an artificial intelligence (AI) model by using non-contrast CT (NCCT) and contrast-enhanced CT to identify ischemic penumbra and infarct core compared with the RAPID automated CTP software.

Materials and Methods: The cross-sectional study included patients with AIS within 24 hours of onset who underwent a CTP scan between January 2021 and December 2024. The AI model was trained to estimate IP and IC volumes from NCCT and was compared with the RAPID. Model performance was evaluated using spatial overlap metrics and volumetric accuracy, measured by the Dice score and mean absolute error (MAE), respectively. Outcome agreement was assessed using the correlation coefficient and the Bland-Altman analysis.

Results: Nine patients were randomly selected from 117 patients for preliminary analysis. The NCCT-based AI model showed a mean Dice score of 0.90 (95% CI 0.82-0.97) and an MAE of 6.38 ml (95% CI 0.58-12.18). The predictive lesion showed excellent correlation ($r = 0.99$) with a bias of 18.60 mm (95% CI 4.40-32.80) in the Bland-Altman analysis.

Conclusion: The AI model trained on NCCT can reliably identify IP and IC, with good agreement with RAPID. It may serve as an alternative for tissue-based assessment in resource-limited settings.

The Association between Elevated High-Sensitivity Cardiac Troponin T Levels and Increasing Risks of Developing Cardioembolic Stroke

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Introduction: Evidence of a cardioembolic source (particularly atrial fibrillation) may not be present even after the first ischemic stroke event. Cardiac troponins have been evaluated in several studies for their associations with cardioembolic etiology, which were weaker than those of natriuretic peptides.

Objectives: To assess performance of high-sensitivity cardiac troponin T (hs-cTnT) and its optimal cut-off to predict a cardioembolic source.

Materials and Methods: In this single-center prospective cohort study, we include 122 participants diagnosed with acute ischemic stroke within 7 days from onset were classified into cardioembolic (CE), embolic stroke of undetermined source (ESUS), and non-embolic (NE) groups. Baseline characteristics, including hs-cTnT at presentation, were analyzed using logistic regression models and receiver operating characteristic (ROC) curve analyses.

Results: Median hs-cTnT levels were significantly higher in the CE group compared with ESUS and NE groups (22.8 ng/L [IQR 16.0-35.3] vs 12.0 ng/L [7.3-19.3] vs 9.0 ng/L [4.9-17.3]; overall $p < 0.001$). ROC curve analyses identified an optimal hs-cTnT cut-off > 11 ng/L (AUC 0.773). When comparing between CE and non-CE (ESUS + NE) groups, hs-cTnT > 11 ng/L exhibited an independent association with CE etiology in both univariable (OR, 20.49; 95% CI, 4.58-91.70; $p < 0.001$) and multivariable analyses (adjusted OR, 7.01; 95% CI, 1.19-41.45; $p = 0.032$).

Conclusion: An hs-cTnT cut-off > 11 ng/L demonstrated high sensitivity (92.6%) for cardioembolic etiology and may potentially be a useful screening marker.

Costs and Cost-Driving Factors of the Acute Treatment for the Convulsive Status Epilepticus in Adults

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Introduction: Convulsive status epilepticus (CSE) is a life-threatening neurological emergency characterized by high morbidity, mortality, and intensive healthcare resource utilization. In Thailand, data regarding the economic burden of CSE, particularly when stratified by disease severity, remain limited.

Objectives: To estimate the direct medical costs of adult CSE stratified by disease severity, identify primary cost drivers, and analyze the associations between anti-seizure medication (ASM) administration latency, total expenditure, and clinical outcomes.

Materials and Methods: This retrospective, prevalence-based, cost-of-illness study included adult patients admitted with CSE at Ramathibodi Hospital between January 1, 2019, and June 30, 2025. Patients were classified as SE, refractory SE (RSE), or super-refractory SE (SRSE) based on clinical progression. Direct medical costs associated with acute management were assessed from the hospital perspective and adjusted to 2025 values. Univariable and multivariable regression analyses were performed to identify independent cost-driving factors.

Results: A total of 96 hospital admissions involving 90 patients were analyzed. The median direct medical cost per admission was 414,379 THB, with costs increasing significantly alongside disease severity; the highest expenditures were observed in the SRSE cohort. Univariable analysis identified higher disease severity and longer hospital length of stay (LOS) as significant cost drivers. However, in multivariable analysis, LOS remained the sole independent predictor of expenditure, with each additional hospital day increasing costs by approximately 9,202 THB. Notably, the timing of the first ASM administration was not significantly associated with direct medical costs, LOS, or functional outcomes.

Conclusion: In this study, hospital LOS was the sole independent driver of direct medical costs for CSE. While SE severity correlated with costs in univariable analysis, neither severity nor ASM timing remained a significant predictor after multivariable adjustment.

A Study of Visual Rehabilitation in Patients with Homonymous Hemianopia

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Introduction: Homonymous hemianopia (HH) is a visual field defect caused by damage to the visual pathways behind the optic chiasm and often leads to significant functional limitations. Recovery varies among patients, and no standard treatment is available. Visual restoration therapy (VRT) has been used as a rehabilitation method, but its effectiveness remains unclear.

Objectives: Evaluate the effectiveness of VRT versus usual care in the homonymous visual field defect.

Materials and Methods: Study design: Prospective, two-arm, single blind, single-centre randomised controlled trial.

Inclusion criteria: Age >18 years, homonymous visual field defects from lesions posterior to the lateral geniculate nucleus, and MRI -confirmed post-stroke or post-lobectomy, able to engage in training, and informed consent.

Intervention: Visual restoration therapy (VRT) in the treatment arm, usual care in the control arm.

Outcomes: Percentage change (6-month follow-up test-initial test) in mean of the mean deviation and the mean of visual field index using the computerised visual field test.

Randomisation: 1:1 using computer-based randomisation.

Blinding: Primary outcome assessor blinded to the treatment; participants were not blinded.

Results: In total, 130 participants were randomised: 65 to the VRT group and 65 to the control group. There were 48 lost follow-ups: 24 in each group. Finally, 82 participants completed the trial, with 41 in each group. A linear mixed-effect model was used to analyse the primary outcome. The VRT group showed statistically significant improvement compared to the control group.

Conclusion: This single-centre study suggests that VRT may be beneficial for homonymous field defects. Larger, multi-centre studies are warranted to confirm these findings and establish generalizability.

Incidence and Risk Factors of Stroke and Postoperative Cognitive Impairment Following Open-Heart Surgery, A Prospective Cohort Study

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Introduction: Open-heart surgery often leads to neurological complications, including stroke and silent brain infarction (SBI). The prevalence of SBI and its effect on postoperative cognitive decline (POCD) are likely underrecognized

Objectives: To determine the incidence of asymptomatic perioperative stroke and POCD in patients aged ≥ 50 years undergoing elective open-heart surgery, and to evaluate cognitive outcome after surgery.

Materials and Methods: In this single-center prospective cohort study, participants underwent pre-operative and post-operative MRI brain. Cognitive function was assessed using the MoCA and TMSE at baseline, peri-operatively, and at 3, 12 months. Mood disorders were monitored using TGDS and GAD-7

Results: Of 56 patients, 44.6% had previous infarctions; 35.7% developed new acute infarctions after surgery, including 3.5% with symptomatic stroke. Silent Brain Infarction occurred in 32.1%. No post-operative cognitive dysfunction was detected at 3 months by MoCA. Linear mixed model analysis adjusted for education found no significant effect of infarction on cognition ($P=0.189$), but the interaction between infarction and time was significant ($P=0.044$), indicating that new infarctions slow cognitive recovery. Multivariable analysis showed that lowest intraoperative body temperature was the sole independent predictor of new infarction (adjusted OR 0.61; 95% CI 0.38–0.98; $p = 0.041$). Years of education (adjusted OR 2.01; $p = 0.035$) and pre-operative depressed mood (adjusted OR 1.59; $p = 0.019$) were associated with post-operative cognitive decline.

Conclusion: New infarctions occur frequently after elective open-heart surgery, affecting over one-third of patients and delaying cognitive recovery, even if asymptomatic.

Feasibility of Acute Stroke Detection using Artificial Intelligence

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Objective: To assess the feasibility of an AI-enabled acute stroke detection tool by establishing a prospectively acquired multimodal digital dataset with consensus labels and evaluating model performance.

Introduction: Prehospital stroke recognition barriers delay treatment. AI-enhanced consumer triage can improve workflow by establishing standardized data and reliable labels for model training.

Materials and Methods: This model algorithm uses a dataset from a prospective observational study that enrolled adults (>18 years) with a final diagnosis of stroke within 7 days of symptom onset and NIHSS 1–15 with a requirement of ≥ 1 sign, including facial asymmetry, arm weakness, or speech disturbance. The control group is a normal subject. All three clinical symptoms were labeled by the agreement of three blinded assessors. Computer vision (MediaPipe/Ensemble) and audio (CWT/SPD Manifold) models were trained. Performance was validated independent test sets using confusion matrix metrics (accuracy, sensitivity, specificity).

Results: The study included 412 participants (206 stroke, 206 controls). In the stroke group, mean age was 64.7 (SD 12.6) and median NIHSS was 5 (IQR 3–8). Neurological examination identified facial asymmetry in 167 (81.0%), arm weakness in 161 (78.1%), and speech disturbance in 177 (85.9%) patients. Ground truth reliability was substantial to almost perfect (κ 0.68–0.80). AI accuracies were 82.7% for arm weakness, 83.1% for facial drooping, and 80.8% for voice prescreening. The ensemble model achieved 93.3% accuracy (95% CI 86.7–98.3).

Conclusion: Training AI from standardized data with consensus labeling is feasible, demonstrating reliable ground truth and strong discrimination between stroke and controls.

Clinical Outcomes of Patients with Periodic Discharges Compared with Generalized Delta and Theta Slowing Patterns in Short-Term Inpatient EEGs at Siriraj Hospital

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Objective: To compare short- and long-term outcomes between patients with periodic discharges (PDs) and generalized delta–theta slowing.

Introduction: PDs are electroencephalographic (EEG) patterns associated with seizures and poor neurologic outcomes. In contrast, generalized delta–theta slowing reflects impaired consciousness, typically due to metabolic or encephalopathic etiologies, but its long-term prognosis remains unclear. No prior studies have directly compared outcomes between these EEG patterns. This study aimed to address this gap using the modified Rankin Scale (mRS).

Methods: We conducted a case–control study involving patients admitted to Siriraj Hospital between January 2019 and March 2024. The cases were inpatients who had short-term EEG records demonstrating PDs and had at least one year of follow-up after discharge. Controls were patients whose EEG showed generalized delta–theta slowing, matched by age and sex in a 1:2 ratio, and closely approximated for chronic kidney disease stage and etiology. Outcomes included mRS scores, categorized as independent, dependent, or death, at hospital discharge and at 6 and 12 months.

Results: A total of 123 patients were included (41 PDs and 82 controls). PDs were associated with higher 6-month mortality (crude odds ratio [COR], 2.35; 95% confidence interval [CI], 1.05–5.26). Generalized periodic discharges (GPDs) were associated with the highest mortality risk (adjusted odds ratio [AOR], 12.24; 95% CI, 2.41–62.10). PDs were commonly associated with subdural hematoma, epidural hematoma, and viral meningoencephalitis, whereas generalized delta–theta slowing was frequently linked to septic encephalopathy.

Conclusion: PDs, particularly GPDs, were associated with increased 6-month mortality. Further studies are warranted to confirm their prognostic significance.

Clinical Characteristics, MRI Patterns, and Outcomes of Spinal Cord Infarction by Etiology

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Introduction: Spinal cord infarction (SCI) is a rare but devastating cause of acute myelopathy. While aortic pathology is a known precipitant, the comparative characteristics across etiology remain under-characterized

Objectives: To compare clinical features, magnetic resonance imaging (MRI) patterns, and six-month functional outcomes of different etiologies of SCI.

Materials and Methods: We conducted a retrospective cohort study at two tertiary referral centers in Bangkok, Thailand, between January 2015 and June 2025. The inclusion criteria were 1) age > 18 years and 2) diagnosis of spinal cord infarction. Clinical characteristics, severity, and MRI characteristics were analyzed. Functional outcome and motor recovery at six months were assessed using the modified Rankin Scale (mRS) and Medical Research Council (MRC) scale.

Results: Forty-one adults with SCI were recruited, classified as spontaneous (n=12) or non-spontaneous (n=29), including low-flow states, hypercoagulable conditions, aortic disease, and peri-procedural causes. Mean ($\pm$ SD) age was 60.9 ($\pm$ 8.3) years. Typical anterior two-thirds syndrome of the spinal cord was 19/37 (51.4%); the rest had complete cord syndrome. Classic MRI features like the owl's eyes sign were 17.1% occurred with similar frequency. Lesion distribution differed significantly, spontaneous SCI more often involved isolated cervical segments 3/12 (25%), but none in non-spontaneous SCI, $p = 0.044$. At six months, a favorable functional outcome (mRS ≤ 3) was achieved in 50% of spontaneous cases compared with 13.6% of non-spontaneous cases, $p = 0.040$. All deaths (6/41) occurred in the non-spontaneous

Conclusion: SCI etiology significantly influences lesion distribution and prognosis. Spontaneous SCI is associated with more localized cervical involvement and better functional recovery, whereas aortic- or procedure-related SCI frequently results in extensive cord injury and poorer outcomes.

Comparative Study of Clinical Outcomes and Access to Reperfusion Therapy Before and After Implementation of Mobile Stroke Unit (MSU) in Acute Stroke Patients at That Phanom and Pua Crown Prince Hospitals

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Introduction: Mobile Stroke Units (MSUs) effectively reduce treatment delays in urban settings, but their impact in rural areas remains understudied. This study evaluates the effectiveness of MSUs in two rural hospitals in Thailand, addressing the limitations of previous single-center analyses.

Objective: To compare clinical outcomes, process times, and access to reperfusion therapy before and after MSU implementation in acute ischemic stroke (AIS) patients at That Phanom and Pua Crown Prince Hospitals.

Materials and Methods: This two center observational cohort study included 477 acute stroke patients. The study compared patients treated via MSU (n=138) during the implementation period with those receiving usual care (Pre-MSU n=219 and concurrent usual care n=119). Primary outcomes were door-to-needle (DTN) time and reperfusion therapy rates. Secondary outcomes included onset-to-needle (OTN) time and favorable functional outcome (modified Rankin Scale [mRS] 0–2) at 3 months.

Results: The MSU group demonstrated significantly shorter median DTN time (19 vs. 50 min, $p<0.005$) and OTN time (125 vs. 172 min, $p<0.005$) compared to the Pre-MSU usual care group. The rate of reperfusion therapy in AIS patients was significantly higher in the MSU group (63%) compared to the Pre-MSU group (43%) ($p<0.05$). In the multivariate analysis, receiving reperfusion therapy was independently associated with a favorable 3-month outcome (adjusted OR 2.01, 95% CI 1.01–3.99, $p=0.046$), while MSU transport itself was not an independent predictor after adjustment.

Conclusion: Implementing MSUs in rural Thailand significantly reduced treatment delays and increased access to reperfusion therapy. Although MSU transport was not directly associated with better functional outcomes in the adjusted model, it significantly facilitated reperfusion therapy, which is a key predictor of favorable recovery.

Prevalence and Risk Factors of Perioperative Myasthenia Gravis Exacerbation: A Single-Center Study in Thailand

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Introduction: While surgery is a well-recognized precipitant of perioperative exacerbation and myasthenic crisis, data regarding the prevalence of and risk factors for exacerbation remain limited.

Objective: To determine the prevalence of perioperative MG exacerbation and identify associated risk factors and complications in patients with MG undergoing surgery.

Materials and Methods: We retrospectively analyzed adult MG patients undergoing major surgery at Siriraj Hospital between May 2011 and December 2023 to determine the prevalence of MG exacerbation, perioperative factors and postoperative outcomes.

Results: Of 372 patients (73% female), 31 patients (8.3%) experienced perioperative MG exacerbation, including 17 (4.6%) with myasthenic crisis. Thymectomy was more frequent in the exacerbation group ($p = 0.05$), particularly via open surgery (57.7% vs 30.0%, $p = 0.004$). In multivariate analysis, independent predictors of perioperative exacerbation were lower body mass index (OR 0.9; 95% CI 0.8–0.997, $p = 0.04$); the presence of thymoma (OR 2.9; 95% CI 1.2–7.0, $p = 0.02$); intraoperative blood loss >1,000 mL (OR 9.5; 95% CI 1.0–89.5, $p = 0.049$); perioperative intravenous magnesium sulfate administration (OR 4.9; 95% CI 1.5–16.4, $p = 0.01$) and postoperative pneumonia (OR 12.9; 95% CI 2.6–62.9, $p = 0.002$). Patients with exacerbation experienced significantly longer hospital stays (6.0 vs 4.0 days, $p < 0.001$).

Conclusion: Exacerbation occurs in about 8% of MG surgical cases, resulting in extended hospitalization. Key risk factors include thymoma, lower body mass index, massive blood loss (>1,000 mL), intravenous magnesium use and pneumonia. Awareness of these variables is critical for optimizing perioperative management and reducing morbidity in these patients.

Symptomatic and Asymptomatic Brainstem and Cerebellar Involvement in AQP4-IgG–seropositive Neuromyelitis Optica Spectrum Disorders and Multiple Sclerosis: Clinical Manifestations, Imaging, and Disability Outcomes

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Background: Brainstem and cerebellar lesions in aquaporin-4 immunoglobulin G–seropositive neuromyelitis optica spectrum disorder (AQP4-IgG+ NMOSD) were less frequent than optic neuritis and transverse myelitis. Data on such lesions were limited. We aim to describe the characteristics, clinical phenotypes, brain MRI features, and disability outcomes associated with brainstem and cerebellar involvement in AQP4-IgG+ NMOSD and compare with multiple sclerosis (MS).

Methods: We conducted a retrospective study of adults with AQP4-IgG+ NMOSD and MS at Siriraj Hospital (January 1994–August 2025) who had brain MRI available. Clinical manifestations, treatments, MRI lesion location/topology, and Expanded Disability Status Scale (EDSS) outcomes were extracted from medical records.

Results: The cohort comprised 458 patients (250 AQP4-IgG+ NMOSD and 208 MS). AQP4-IgG+ NMOSD patients were older at onset, with a median age of 40.2 (IQR 27.8–50.2) vs 33.6 (IQR 23.3–43.2), and more often female (94.0% vs 75.5%), $p < 0.001$. Brainstem syndrome at the first attack occurred at similar frequencies (22.0% vs 23.6%), $p = 0.692$; however, area postrema syndrome was far more common in AQP4-IgG+ NMOSD (20.0% vs 0.5%), $p < 0.001$. Facial numbness was more frequent in MS (12.0% vs 3.6%), $p < 0.001$. Asymptomatic brainstem lesions were more common in MS (35.6% vs 16.0%), $p < 0.001$. Cerebellar symptoms were not statistically different between the two groups, $p = 0.88$, but asymptomatic cerebellar peduncles are more prominent in MS (21.2 vs 5.6), $p < 0.001$. On MRI, AQP4-IgG+ NMOSD lesions were predominantly central, while MS lesions were more often peripheral and patchy, with higher rates of incidental pontine and cerebellar peduncle involvement. AQP4-IgG+ NMOSD patients had higher EDSS at last follow-up (median 3.5 vs 1.0), $p < 0.001$.

Conclusion: AQP4-IgG+ NMOSD and MS show similar rates of brainstem involvement at onset but differ substantially in clinical expression, MRI lesion topology, and disability, supporting improved diagnostic discrimination and prognostic assessment.

Factors Associated with the Initial Intracranial Hemorrhage Occurrence in Patients with Cerebral Venous Thrombosis

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Objectives: Studies focusing on intracranial hemorrhage (ICH) in patients with cerebral venous thrombosis (CVT) are limited; thus, we aimed to identify factors associated with the occurrence of ICH in Thai patients with CVT.

Methods: This retrospective cohort study recruited patients with CVT admitted to a tertiary university-based hospital between 2002 and 2022. The baseline characteristics, clinical presentations, radiographic findings, and etiologies were compared between the ICH and non-ICH groups. The factors with $p < 0.2$ in the univariate analysis were further analyzed using multivariable logistic regression analysis to identify independent factors associated with ICH in patients with CVT.

Results: Of 228 screenings, 202 patients were eligible. The incidence rate of ICH was 36.63%. The ICH group showed a higher prevalence of focal neurological deficits (63.51% vs. 26.56%, $p < 0.001$), seizures (68.92% vs. 21.88%, $p < 0.001$), dependency status at admission (60.81% vs. 39.84%, $p = 0.004$), superior sagittal sinus thrombosis (71.62% vs. 39.07%, $p < 0.001$), superficial cortical vein thrombosis (36.49% vs. 10.16%, $p < 0.001$), and hormonal use (17.57% vs. 7.03%, $p = 0.021$) than the non-ICH group. In contrast, the ICH group showed a lower prevalence of isolated increased intracranial pressure (10.81% vs. 21.88%, $p = 0.048$) than the non-ICH group. Seizures (adjusted odds ratio [aOR], 4.537; 95% confidence interval [CI], 2.085–9.874; $p < 0.001$), focal neurological deficits (aOR, 2.431; 95% CI, 1.057–5.593; $p = 0.037$), and superior sagittal sinus thrombosis (aOR, 1.922; 95% CI, 1.913–4.045; $p = 0.045$) were independently associated with ICH in the multivariable logistic regression analysis.

Conclusions: Seizures, focal neurological deficits, and superior sagittal sinus thrombosis are associated with ICH in patients with CVT.

Clinical Manifestation and Treatment Responsiveness in Vasculitic Neuropathy Patients in Neurological Institute of Thailand

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Introduction: Vasculitic neuropathy (VN) results from inflammation of blood vessels supplying peripheral nerves, causing ischemic nerve injury. It manifests as systemic vasculitic neuropathy (SVN) or non-systemic vasculitic neuropathy (NSVN). While SVN treatment protocols are established, data on clinical characteristics and treatment outcomes of NSVN, particularly in Thai population, remain limited.

Objectives: To evaluate clinical manifestations, pathological findings, and treatment responsiveness in patients with confirmed VN at the Neurological Institute of Thailand, and identify factors associated with treatment response.

Materials and Methods: A retrospective cohort study of patients with pathologically confirmed VN diagnosed at the Neurological Institute of Thailand between June 2015, and May 2025. Clinical data, electrodiagnostic results, nerve biopsy findings, and treatment regimens were analyzed. Treatment responsiveness was assessed in patients followed over 24 months, based on improvements in pain, sensory deficits, motor weakness, relapse rates.

Results: Thirty-five patients were enrolled (65.7% female, median age 58.0 years). NSVN was present in 54.3%. Sensory loss and motor deficits were universal, pain occurred in 60%. Electrodiagnostic studies revealed axonopathy with predominant lower extremity involvement. Pathologically, 60% had definite VN. Treatment groups included corticosteroid alone (45.7%), corticosteroid plus cyclophosphamide (42.9%), and corticosteroid plus rituximab (11.4%). Overall good outcome was achieved in 85.7% with no significant difference between groups ($p=0.575$). Relapse rate was 8.6%. Pathological features did not differ significantly between treatment groups.

Conclusion: VN in Thai tertiary care patients demonstrates favorable outcomes regardless of immunosuppressive regimen. Rituximab shows promise with a favorable relapse profile. Pathological features did not correlate with severity or prognosis.

Baseline Severe Disability as a Predictor of Treatment Escalation to Rituximab in AQP4-IgG–positive NMOSD Patients: A Retrospective Cohort Study

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Introduction: Azathioprine and mycophenolate mofetil are widely used as standard first-line immunosuppressive therapy for neuromyelitis optica spectrum disorders (NMOSD). However, many patients did not respond adequately and required treatment escalation to rituximab. Early identification of predictive clinical factors may improve treatment strategies.

Objectives: We conducted a retrospective cohort study of AQP4-IgG–positive NMOSD patients treated at the Neurological Institute of Thailand from 2019 to 2024. Demographic characteristics, clinical features, laboratory parameters, autoantibody profiles, disability scores, and relapse rates were collected and analyzed. Logistic regression was applied to identify predictors of treatment escalation to rituximab.

Materials and Methods: We conducted a retrospective cohort study of AQP4-IgG–positive NMOSD patients treated at the Neurological Institute of Thailand from 2019 to 2024. Demographic characteristics, clinical features, laboratory parameters, autoantibody profiles, disability scores, and relapse rates were collected and analyzed. Logistic regression was applied to identify predictors of treatment escalation to rituximab.

Results: Among 173 patients, 35 patients (20.23%) were classified as treatment escalation to rituximab. In multivariate logistic analysis, baseline severe disability (EDSS ≥ 6 before first-line treatment) was strongly associated with treatment escalation to rituximab (OR: 18.19, 95% CI: 2.22–148.95, $p = 0.007$). ANA positivity showed a non-significant trend (OR 4.65, 95% CI 0.67–32.09, $p = 0.12$). While other variables, such as age at onset, Neutrophil-to-lymphocyte ratio (NLR), and Age ≥ 50 years at first onset were not predictive.

Conclusion: Baseline severe disability was a key predictor of escalation to rituximab. Early identification of high-risk patients may guide treatment and reduce disease burden. Prospective studies are needed to validate and inform future clinical practice.

Development and Validation of the PLAIN and PLAIN-L Scores for Predicting New-Onset Non-Valvular Atrial Fibrillation after Acute Ischemic Stroke

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Introduction: New-onset atrial fibrillation (NOAF) is a common complication after acute ischemic stroke (AIS) and is associated with increased risks of recurrent stroke and mortality. Early identification of high-risk patients remains challenging.

Objectives: This study aimed to identify predictors of NOAF in AIS and to develop conventional and machine-learning-based prediction models.

Materials and Methods: This retrospective cohort included 389 AIS patients admitted to the Neurological Institute of Thailand between January and December 2024. All patients underwent continuous ECG monitoring for ≥ 48 hours. Clinical, neuroimaging, electrocardiographic and echocardiographic data were analyzed. Independent predictors were identified using multivariable logistics regression. Two clinical scores were derived: the PLAIN score and the PLAIN-L score, which incorporated left atrial volume index (LAVI). Model discrimination was assessed using area under the receiver-operating characteristic curve (AUC). Machine-learning models were developed for comparison.

Results: NOAF occurred in 93 patients (23.9%). Independent predictors included age ≥ 60 years, NIHSS ≥ 10 , insular involvement, P-wave terminal force in lead V1 (PTFV1 ≥ 4000 $\mu\text{V}\cdot\text{ms}$), and LAVI ≥ 35 mL/m². The PLAIN and PLAIN-L scores showed excellent discrimination (AUC 0.892 and 0.909) with high sensitivity ($>94\%$) and very high negative predictive values ($>98\%$). Random forest achieved the highest performance among machine-learning models (AUC 0.95). Nearly half of NOAF cases were detected after admission.

Conclusion: NOAF occurred in nearly one-quarter of AIS patients. Atrial remodeling and insular involvement were key predictors. The PLAIN and PLAIN-L scores may support early AF risk stratification and targeted rhythm monitoring after stroke.

Optic Neuritis as a Strong Risk Factor for Relapse in MOGAD: Clinical Characteristics and Serostatus in a Thai Population

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Introduction: Data on MOGAD in Southeast Asia is scarce. We characterized a Thai cohort to identify relapse predictors and serological outcomes.

Methods: We reviewed patients at the Neurological Institute of Thailand (2015-2025) using 2023 international criteria, analyzing clinical predictors of relapse via univariate logistic regression.

Results: Of 31 patients (48.4% female; median onset 33.3 years), transverse myelitis (41.9%) and optic neuritis (ON) (38.7%) predominated. Diagnosis was frequently delayed; one-third remained undiagnosed until a second attack. Relapses occurred in 31.0%. While median relapse time was 13.0 months, a distinct subgroup recurred early (7 months) during steroid tapering (<15mg). Univariate analysis identified ON onset ($p=0.02$), incomplete recovery at 6 months ($p=0.037$), lower CSF WBC ($p=0.035$), and plasma exchange usage ($p=0.032$) as relapse predictors. Seroconversion did not reduce relapse risk ($p=0.69$).

Conclusion: Optic neuritis and incomplete recovery predict recurrence. Diagnostic delays were primarily driven by the under recognition of the MOGAD spectrum (especially ON) and financial barriers, as MOG-IgG testing is not currently covered by Thai universal health insurance. Since active patients relapse near the 7-month mark during tapering, extending maintenance therapy beyond this window is reasonable.

Endovascular Treatment Improves Functional Recovery in Cerebral Venous Thrombosis: A Retrospective Cohort Study Using Entropy Balancing Analysis

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Introduction: Cerebral venous thrombosis (CVT) is an uncommon cause of stroke, and is primarily treated with anticoagulation. A subset of patients experiences clinical deterioration despite standard therapy. Endovascular treatment (EVT) has been used as a rescue option in severe cases, but its effectiveness remains uncertain. Randomized data are limited, and existing observational studies have reported inconsistent results.

Objectives: We evaluated clinical outcomes in EVT patients compared to standard medical therapy alone (SMT) at the Neurological Institute of Thailand using weighted comparative analyses.

Materials and Methods: A retrospective cohort study of CVT patients whom treated between January 2016 and September 2025 and classified as receiving EVT plus SMT and SMT alone. Entropy balancing (EB) was used to adjust for baseline differences, with propensity score matching (PSM) as a sensitivity analysis. The primary outcome was favorable functional outcome, defined as a modified Rankin Scale (mRS) score of 0–2 at 90 days. Secondary outcomes include safety endpoints.

Results: A total of 86 patients were included (20 EVT, 66 SMT). Patients treated with EVT had more severe baseline neurological deficits and higher rates of intracerebral hemorrhage. After entropy balancing adjustment, EVT was associated with higher odds of favorable functional outcome (mRS 0–2: OR 5.3, 95% CI 1.2–23.6; $p = 0.026$). EVT achieved high recanalization rates, and no excess mortality or symptomatic intracerebral hemorrhage was observed.

Conclusion: Selected patients with severe CVT who treated with EVT showed significant improvement in functional outcomes, without an apparent increase in major complications.

Effect of Subthalamic Nucleus Deep Brain Stimulation on Heart Rate Variability in Parkinson's Disease: A Prospective Cohort Study

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Introduction: Autonomic dysfunction is a prevalent non-motor feature of Parkinson's disease (PD) and contributes to increased morbidity and mortality. Heart rate variability (HRV) offers a non-invasive assessment of cardiac autonomic modulation, yet the impact of subthalamic nucleus deep brain stimulation (STN-DBS) on dynamic autonomic control remains unclear.

Objectives: To characterize the effects of bilateral STN-DBS on cardiac autonomic regulation at rest and during paced deep breathing in advanced PD, accounting for dopaminergic medication status and microlesion effects.

Materials and Methods: Nine patients with advanced PD undergoing bilateral STN-DBS were prospectively studied. HRV was assessed at rest and during paced deep breathing (6 breaths/min) preoperatively in dopaminergic ON and OFF states, early postoperatively with stimulation OFF (microlesion phase), and 3-4 weeks after DBS programming in both medication states. Time- and frequency-domain HRV parameters were analyzed using the Wilcoxon signed-rank test for all variables, and paired t-tests were additionally applied for normally distributed variables.

Results: In the DRUG-OFF state, STN-DBS did not alter resting HRV but increased LF (nu), LF/HF ratio, and heart rate during deep breathing, indicating LF-dominant autonomic oscillations. In contrast, in the post-DBS DRUG-ON state, STN-DBS was associated with higher heart rate at rest and during deep breathing and reduced RMSSD, SDNN, and LF power during deep breathing, suggesting impaired cardiovagal and baroreflex-related modulation. Dopaminergic medication before DBS reduced HF during deep breathing, and no significant microlesion effects were observed.

Conclusion: Bilateral STN-DBS in advanced PD predominantly modulates dynamic cardiac autonomic responsiveness during autonomic challenge, with effects that differ across dopaminergic states, underscoring the importance of medication status in autonomic assessment after stimulation.

Efficacy and Safety of Rituximab in The Treatment of Idiopathic Inflammatory Myopathies in Neurological Institute of Thailand

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Introduction: Patient with IIM, particularly immune-mediated necrotizing myopathy (IMNM), were often severe and difficult to manage. Real-world data on effectiveness and safety of rituximab in IIM remained limited.

Objectives: To evaluate outcomes and safety of rituximab for the treatment of patient with idiopathic inflammatory myopathies (IIMs) whom were seen at Neurological Institute of Thailand.

Materials and Methods: Retrospective cohort study including adults with IIM who received rituximab between January 2020 - June 2025 was conducted. Muscle strength, defined by modified Medical Research Council Sum Score (mRCSS), serum creatine kinase (CK) levels and prednisone-equivalent doses were recorded at the time of rituximab initiation (M0), at 6 months (M6) and 12 months (M12). Adverse events were collected. Longitudinal changes were analyzed using paired non-parametric statistical tests.

Results: Nineteen patients were included (median age at onset 50 years, 78.9% female), One had dermatomyositis, one had polymyositis and 17 patients (89.5%) had IMNM. Among IMNM 12 (70.58%) were anti-SRP associated, the rest (5) (29.41%) were anti-HMGCR associated. Median mRCSS improved from 46 (IQR 36–51.5) at M0 to 57 (55.75–58) at M6 and 60 (58–60) at M12 ($p < 0.001$). Median CK levels declined from 1,478 IU/L (IQR 1,076–3,182) at M0 to 225.5 IU/L at M6 and 192 IU/L at M12 ($p < 0.01$). Prednisone-equivalent doses were significantly reduced. Improvements were observed across both IMNM subtypes. Patients tolerated well to rituximab, however, infection-related mortality occurred in those with severe disease.

Conclusion: Rituximab associated with significant clinical and biochemical improvement and steroid-sparing effect in patients with IIM. Close monitoring for infection remained essential.

Clinical Findings, Radiological Characteristics and Treatment Outcomes of Spontaneous Intracranial Hypotension in Neurological Institute of Thailand

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Introduction: Spontaneous intracranial hypotension (SIH) is an underrecognized cause of orthostatic headache due to spontaneous cerebrospinal fluid (CSF) leakage. Although imaging characteristics and treatment outcomes have been described internationally, data from Thailand are limited.

Objectives: To describe clinical characteristics, neuroimaging features, and factors associated with treatment outcomes. **Materials and Methods:** A retrospective cohort study of 17 adult SIH patients treated at the Neurological Institute of Thailand between January 2020 and July 2025 was conducted. Demographics, clinical presentations, neuroimaging findings, complications, and treatment outcomes were reviewed. Factors associated with response to conservative treatment were compared using Fisher's exact test or the Mann–Whitney U test.

Results: The median age was 43 years (IQR 37–54), and 52.9% were female. Orthostatic headache occurred in 88.2%, with a median symptom duration of 10 days (IQR 5–30). Neuroimaging revealed pachymeningeal enhancement (82.4%), subdural collection (58.8%), pituitary engorgement (47.1%), and reduced mamillopontine distance <6.5 mm (82.4%). Spinal MRI demonstrated epidural fluid in 47.1% and CSF leakage in 35.3%. Conservative treatment was successful in 41.2%, whereas 58.8% required epidural blood patch (EBP), with a response rate of 77.8%. Pituitary engorgement was more frequent among conservative responders ($p=0.015$), while cerebellar tonsillar descent was more common in non-responders ($p=0.050$).

Conclusion: More than half of patients required EBP, which was effective in most cases. The notable frequency of intracranial complications highlights the need for early recognition and timely management of SIH in Thai clinical practice.

Cost-Utility Analysis of Deep Brain Stimulation in Parkinson's Disease Compared to Current Pharmacotherapy

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Introduction: Parkinson's disease (PD) is a chronic, progressive neurodegenerative disorder leading to severe motor and non-motor disabilities and subsequently reduced quality of life. Deep brain stimulation (DBS) surgery is a highly effective and beneficial therapy for advanced PD, but its substantial cost limits accessibility. Evidence of its cost-effectiveness and budget impact data in Thailand are yet to be collected.

Objectives: This study aimed to evaluate the cost-utility and budget impact of rechargeable and non-rechargeable DBS compared with standard pharmacotherapy alone for advanced PD patients.

Materials and Methods: A Markov model with a 6-month cycle length and 20-year time horizon was applied from a societal perspective to estimate the Incremental Cost-Effectiveness Ratio (ICER) per Quality-Adjusted Life Year (QALY) gained. Uncertainty was addressed using one-way and probabilistic sensitivity analyses. The 5-year budget impact analysis was conducted from the government's perspective.

Results: Both deterministic and probabilistic analyses consistently demonstrated that DBS systems provide additional QALYs compared with pharmacotherapy alone, but their ICERs markedly exceed Thailand's willingness-to-pay (WTP) threshold. Sensitivity analyses highlighted the DBS device cost as the most influential parameter; a 35% reduction in this cost would be sufficient to render DBS cost-effective. The budget impact analysis predicted an incremental annual budget of approximately 60.9–69 million THB (1.9–2.1 million USD) across five fiscal years.

Conclusion: DBS for advanced PD patients is not currently cost-effective in the context of Thailand's national healthcare system. Supported by the actionable evidence in this study, strategic pricing and policy changes will enable equitable access to the therapy.