

ABSTRACT BOOK

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"Innovative Approaches in Non-Communicable Diseases :
From Preclinical Insights to Clinical Practice"

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Advancing Biomedical Frontiers: From Molecular Drivers to Clinical Diagnostics From Somatic Mutations to Steroid Phenotype: Urinary Steroid Signatures in Primary Aldosteronism

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ABSTRACT

Background & objective: Primary aldosteronism (PA) is the most common endocrine cause of secondary hypertension and is associated with increased cardiovascular, renal, and metabolic morbidity. Despite its prevalence, PA remains substantially underdiagnosed due to complex diagnostic pathways. Recent discoveries of recurrent somatic mutations in aldosterone-producing lesions have revealed molecular heterogeneity that may influence steroidogenesis. This presentation reviews the relationship between somatic mutations and steroid phenotypes in PA and explores the potential utility of urinary steroid metabolomics for disease subtyping and precision management.

Methods: Evidence from genomic, transcriptomic and steroid metabolomic studies of PA was evaluated, focusing on mutation-specific steroidogenic profiles. Findings from the Malaysian MyAldo study, comprising 759 community participants, were also examined to assess markers suggestive of autonomous aldosterone production in a local population.

Results: Somatic mutations in *KCNJ5*, *CACNA1D*, *ATP1A1* and *ATP2B3* dysregulate intracellular calcium signalling and drive autonomous aldosterone production. Distinct mutational backgrounds generate characteristic steroidogenic phenotypes. *KCNJ5*-mutated adenomas exhibit zona fasciculata-like differentiation and increased production of hybrid steroids, particularly 18-hydroxycortisol and 18-oxocortisol, whereas *CACNA1D* and *ATPase*-mutated lesions retain a more glomerulosa-like phenotype. Urinary steroid metabolomics can discriminate disease subtypes and predict mutation status. In the MyAldo cohort, approximately 10% of individuals with high sodium intake (>200 mmol/day) demonstrated non-suppressed urinary aldosterone excretion, suggesting possible autonomous aldosterone production.

Conclusion: Somatic mutations shape distinct steroidogenic phenotypes in PA. Urinary steroid metabolomics offers a promising non-invasive approach for diagnosis, molecular subtyping and personalised management, with potential applications in precision endocrinology.

Keywords: Adrenal; aldosterone; endocrine hypertension; hybrid corticosteroids; steroid metabolomics

Multi-Imaging Modalities in Paediatric Oncology: Balancing Diagnostic Efficacy and Radiation Safety

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ABSTRACT

Pediatric oncology relies heavily on medical imaging across all management stages, including primary diagnosis, staging, treatment response assessment, and surveillance. Selecting the optimal imaging strategy requires balancing diagnostic accuracy against the unique physiological vulnerabilities of paediatric patients. This lecture reviews current evidence-based guidelines and institutional factors that determine the selection, utility, and frequency of multimodal imaging. The presentation evaluates the core paediatric imaging toolbox-ultrasound, conventional radiography, computed tomography (CT), magnetic resonance imaging (MRI), and nuclear medicine-illustrated by diverse clinical cases, including DICER1 germline mutations, infantile fibrosarcoma, thoracic neuroblastoma, and Langerhans cell histiocytosis. Key discussions focus on maximising the benefits of non-ionising modalities, highlighting ultrasound for real-time interventional guidance and soft-tissue screening. Crucially, the lecture addresses the vital need to mitigate paediatric radiation risks, offering data-driven insights into why multiphase CT protocols should be discouraged and why chest radiography remains preferred over CT in specific surveillance scenarios to minimise false-positive **Results**. Furthermore, the session explores advanced imaging frontiers, highlighting the expanding role of whole-body MRI as a radiation-free, cost-effective tool for comprehensive metastatic and treatment response assessment, alongside the integration of hybrid metabolic-morphological tools like PET/CT and PET/MRI. Finally, the lecture addresses reporting considerations, contrasting traditional RECIST criteria with emerging three-dimensional volume-based evaluations designed to better quantify tumour burden and minimise inter-observer variability. Ultimately, this session equips attendees with a nuanced understanding of how to implement a safe, tailored, and multidisciplinary approach to paediatric oncological imaging, optimising diagnostic clarity while strictly safeguarding long-term patient health.

Keywords: Imaging; paediatric oncology; radiation safety

Hidden Intelligence in the Laboratory: Deriving Paediatric Serum Creatinine Reference Intervals from Real-World Data Using the refineR Algorithm

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ABSTRACT

Background & objective: Accurate paediatric serum creatinine reference intervals (RIs) are essential for interpreting renal function, yet many laboratories rely on manufacturer-derived or adult-based limits that may not reflect local paediatric populations. The indirect method offers an alternative by extracting RIs from routine clinical data. This study aimed to derive local age- and sex-appropriate paediatric creatinine RIs using refineR.

Methods: A total of 61,967 serum creatinine results from children aged 0-<18 years were extracted from a university hospital laboratory information system from January 2011 to December 2021. After data cleaning and demographic standardisation, age and sex partitioning was assessed using a staged approach that combined Lahti-style partitioning criteria, effect-size estimation, subgroup RI comparisons, biological plausibility and clinical interpretability. Final 2.5th-97.5th percentile RIs were derived using refineR with Box-Cox transformation and benchmarked against published Abbott Alinity paediatric creatinine intervals.

Results: Four age partitions were retained: 0-<1, 1-<5, 5-<12 and 12-<18 years (all $p < 0.001$). Sex-specific partitioning was unnecessary below 12 years but justified in adolescents (Cohen's $d = 0.511$). Derived RIs ($\mu\text{mol/L}$) were: 0-<1 years, 10.4-116.4; 1-<5 years, 18.0-69.0; 5-<12 years, 19.2-95.5; 12-<18 years female, 25.9-111.4; and 12-<18 years male, 25.7-148.7. Lower limits were broadly concordant with Abbott Alinity RIs; upper limits were wider for school-age and adolescent partitions.

Conclusion: Routine laboratory data analysed with refineR generated biologically plausible local paediatric creatinine RIs. Combined-sex intervals suffice below 12 years; sex specific intervals are necessary only in adolescence. These findings support local RI verification.

Keywords: Age partitioning; creatinine; indirect method; laboratory information system; real-world data

Advancing Biomedical Frontiers: Pathogenic Drivers of Diseases

Pathogenic Drivers of Malignancy: Unravelling the Role of Infectious Organisms in Colorectal Carcinogenesis

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ABSTRACT

Background & objective: Colorectal cancer (CRC) pathogenesis is traditionally associated with genetic and dietary factors; however, the role of the “pathobiome” remains underrepresented in precision oncology. This presentation aims to elucidate the mechanisms by which chronic enteric infections drive colorectal carcinogenesis and exacerbate non-communicable gastrointestinal diseases.

Methods: This presentation synthesises recent epidemiological data, preclinical models, and clinical literature to evaluate the pathological impact of persistent parasitic and bacterial infections on the intestinal mucosa. The review focuses on host-pathogen interactions, mucosal barrier degradation, and subsequent oncogenic signalling pathways.

Results: Chronic colonisation by enteric pathogens induces a sustained, low-grade inflammatory microenvironment characterised by the continuous release of pro-inflammatory cytokines, including IL-6 and TNF- α . This persistent inflammatory state compromises the epithelial barrier, generating reactive oxygen species that directly cause DNA damage and cellular dysplasia. Furthermore, these infectious agents actively modulate the local mucosal immune response to evade clearance, inadvertently creating an immunosuppressive shield that promotes the survival, proliferation, and immune escape of malignant cells.

Conclusion: Infectious organisms play a critical, active role in accelerating the dysplasia-carcinoma sequence in the gut. Recognising these pathogenic drivers necessitates a paradigm shift in preventive oncology. Integrating targeted antimicrobial and anti-parasitic screening into standard gastroenterological protocols offers a novel and actionable strategy for early CRC interception.

Keywords: Chronic inflammation; colorectal carcinogenesis; pathobiome; tumour microenvironment

Functional Constraint Analysis of LexA Repressor across LexA-Encoding ESKAPE Pathogens

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ABSTRACT

Background & objective: LexA repressor regulates the bacterial SOS response to DNA damage, driving mutagenesis and contributing to antimicrobial resistance. While LexA repressor is present across most ESKAPE pathogens, systematic characterisation of functional constraint across this group has not been previously reported.

Methods: A curated dataset of 349 LexA sequences from LexA-encoding ESKAPE pathogens was assembled. A multi-layered computational pipeline was applied, combining Shannon Entropy-based conservation analysis, MEME motif identification, physicochemical motif characterisation, and 3D-structural proximity mapping representative homology models from each genus.

Results: Fifteen ultra-conserved residues were shared across both Gram lineages. Ultra-conserved residues were identified at core catalytic positions: the autocleavage site (A84-G85), the catalytic serine motif (G117*-S119-M120), and the catalytic lysine motif (T154*-K156- R157), where conservation extends to residues directly flanking each catalytic position. The previously uncharacterised D127-G128-D129 motif was identified as universally ultra-conserved. D127 maintained proximity with G117 in the serine motif chain, and D129 maintained proximity with L113, a component of the RecA* allosteric binding pocket, establishing a structural chain from the allosteric interface through the DGD motif to the catalytic serine environment. P77 was absolutely ultra-conserved and hypothesised to have a conformational transmission role directing cleavage loop repositioning toward the active site.

Conclusion: Cross-species conservation analysis of LexA repressor across LexA-encoding ESKAPE pathogens identifies a network of previously uncharacterised positions whose structural proximity to validated functional sites warrants experimental investigation. These findings demonstrate that evolutionary conservation analysis can systematically identify structural features of functional importance in a clinically relevant bacterial regulatory protein.

Keywords: Bioinformatics; evolutionary biology; LexA repressor; structural biology

NON-COMMUNICABLE DISEASES
Integrative Approaches to Non-Communicable Diseases Treatment
Natural Product Supplementations in Neurodegeneration

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ABSTRACT

Background & objective: Neurodegenerative diseases, particularly Alzheimer's disease (AD), are a major contributor to the global burden of non-communicable diseases (NCDs), driven by ageing and metabolic dysregulation. Current therapies remain largely symptomatic and do not halt disease progression, highlighting a critical need for integrative strategies that target multiple pathological pathways. This presentation synthesises and evaluates the neuroprotective potential of natural product supplementation, with particular emphasis on stingless bee (Kelulut) honey, in experimental models of neurodegeneration.

Methods: A series of experimental animal models, including amyloid- β -induced AD and diet-induced metabolic models, were utilised. Natural products such as tocotrienol-rich fraction, okra, germinated rice and Kelulut honey were administered. Behavioural assessments, including open-field and Morris water maze tests, were conducted alongside histological and biochemical analyses, focusing on oxidative stress markers, amyloid- β deposition, tau phosphorylation and inflammatory mediators.

Results: Natural product supplementation demonstrated significant neuroprotective effects, including attenuation of oxidative stress, improvement in cognitive performance, and modulation of metabolic and inflammatory pathways. Kelulut honey, in particular, reduced amyloid burden, tau phosphorylation and neuronal apoptosis, while preserving neuronal architecture in the hippocampus, frontal lobe and cerebellum. Behavioural improvements were observed, although influenced by intervention duration and disease stage.

Conclusion: Natural product supplementation represents a promising adjunctive strategy in the management of neurodegeneration within the NCD framework. Its multimechanistic actions support its role in targeting complex disease pathways, while remaining generally safe and non-toxic in experimental models. Further long-term and clinical studies are warranted to validate efficacy and facilitate translational application.

Keywords: Amyloid- β ; functional cognition; metabolic dysfunction; neuroprotection; oxidative stress

Cplus Mitigates High-Fat/High-Fructose Diet-Induced Obesity in Mice through LPS-TLR4/NF- κ B and Srebp1c-FASN Pathway Modulation

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ABSTRACT

Background & objective: Obesity and its complications, including hepatic steatosis and glucose intolerance, are risk factors for many chronic diseases. In addition to active exercise, dietary interventions are promising therapeutics, although their mechanistic understanding is limited. Herein, based on an experimental mouse model of obesity, the efficacy and mechanisms of Cplus (a mixture of green banana resistant starch and 10% turmeric extract) were investigated.

Methods and Results: Histopathologic examination and serum biochemical tests showed that Cplus reduced body weight gain and ameliorated hepatic steatosis and glucose intolerance in obese mice challenged with a high-fat, high-fructose diet. Integrated multi-omics analysis showed that Cplus increased the abundance of Bacteroidetes and improved gut dysbiosis and metabolic inflammation through the LPS-TLR4/NF- κ B pathway. Furthermore, Cplus downregulated the Srebp1c-FASN pathway and reduced de novo lipogenesis, upregulated the ACSL1-CPT1a-CPT2 pathway, and promoted fatty acid β -oxidation.

Conclusion: Our findings confirmed the synergistic effect of resistant starch and curcumin in treating obesity and its complications, provided solid evidence, and shed new light on the use of modified RS to intervene in metabolic diseases.

Keywords: Glucose intolerance; GSEA; modified resistant starch; multi-omics; obesity

Challenges and Advances in Preclinical Validation of Herbal Formulations

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ABSTRACT

Herbal formulations have gained considerable interest as potential therapeutic and preventive interventions due to their diverse bioactive constituents and long history of traditional use. However, translating herbal formulations into evidence-based products remains challenging, highlighting the importance of rigorous preclinical validation. Such validation is essential for establishing product quality, safety, efficacy, stability, and reproducibility while generating mechanistic evidence to support clinical development. Preclinical evaluation is complicated by the inherent complexity of botanical materials, as variations in plant source, cultivation practices, harvesting conditions, and processing methods can significantly affect phytochemical composition and biological activity. Additional challenges include difficulties in standardisation and quality control, identification of bioactive constituents, toxicity assessment, contaminant risks, limited phytochemical bioavailability, and experimental models that may inadequately predict human responses. Furthermore, the multi-target nature of herbal formulations complicates mechanistic elucidation and the establishment of reliable dose-response relationships. Recent advances have strengthened the preclinical validation of herbal formulations. Advanced analytical techniques, including high-performance liquid chromatography, liquid chromatography-mass spectrometry, high-resolution mass spectrometry, and nuclear magnetic resonance spectroscopy, enable comprehensive phytochemical characterisation and quality assessment. The integration of omics technologies, network pharmacology, artificial intelligence-assisted in silico approaches, and computational modelling has enhanced understanding of complex molecular interactions and mechanisms of action. In addition, nanoformulation technologies and Good Laboratory Practice-compliant toxicity studies have improved the reliability and translational relevance of preclinical findings. Although substantial progress has been made, regulatory challenges remain, particularly the lack of harmonised international standards for the evaluation of herbal formulations. In conclusion, despite significant advances, addressing persistent challenges in standardisation and regulatory harmonisation remains critical for strengthening the translational relevance of preclinical evidence for herbal formulations.

Keywords: Advanced analytical techniques; omics technologies; regulatory harmonisation; standardisation; translational relevance

Tackling NCDs from Multiple Angles

LPCase-Mediated Degradation of Ceramide and LPC as a Novel Therapeutic Strategy for Atherosclerotic Cardiovascular Disease

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ABSTRACT

Background & objective: Atherosclerotic cardiovascular disease (ASCVD) remains the predominant cause of mortality globally. Despite advances in LDL-cholesterol (LDL-C) lowering therapies, residual cardiovascular risk persists, and excessive LDL-C reduction paradoxically elevates all-cause mortality risk, highlighting the urgent need for novel therapeutic strategies targeting atherogenesis more precisely. We previously resolved LDL-C into five electronegativity-based subfractions (L1–L5), identifying L5-LDL as the most atherogenic subfraction, enriched with ceramide and lysophosphatidylcholine (LPC). Both lipids are substrates for LPCase, a bifunctional enzyme with concurrent ceramidase and lysophospholipase A1 activities that hydrolyses these mediators into biologically inert metabolites. The present study was designed to systematically evaluate the therapeutic potential of LPCase in relevant in vivo atherosclerosis models.

Methods: Recombinant LPCase was produced in HEK 293T cells, purified by nickel-affinity chromatography, and enzymatic activity confirmed by UPLC-MS. ApoE^{-/-} mice fed a high fat diet (HFD) for eight weeks served as the atherosclerosis model, with LPCase administered three times weekly for eight weeks (HFD+LPCase). A complementary model utilised exogenous LPC administration to NCD-fed apoE^{-/-} mice (LPC group), with a co treatment arm (LPC+LPCase). NCD-fed apoE^{-/-} mice served as controls.

Results: Both disease models exhibited 2-7-fold elevations in plasma ceramide and LPC, accompanied by increased collagen deposition, elastic fiber fragmentation, and aortic lipid accumulation. Notably, LPCase intervention reduced circulating ceramide and LPC by 2-6-fold, significantly attenuated histopathological markers of atherosclerosis, and suppressed aortic plaque formation.

Conclusion: These findings demonstrate that LPCase confers significant atheroprotective effects through targeted degradation of atherogenic lipids, representing a mechanistically rational therapeutic candidate for the management of ASCVD, warranting further translational investigation.

Keywords: Atherosclerotic cardiovascular disease (ASCVD); ceramide; L5-LDL; LPCase; lysophosphatidylcholine (LPC)

Integrative Primary Care Strategies in Non-Communicable Disease Prevention and Management

Virtual Reality and Gamification: Innovative Approaches for Cognitive Assessment

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ABSTRACT

Traditional neuropsychological assessments, primarily relying on paper-and-pencil tests, often lack ecological validity, failing to accurately predict how cognitive impairments manifest in complex, real-world environments. This talk explores the potential of novel immersive virtual reality (VR) technology as an additional screening tool to allow family physicians to assess cognition in a local primary care setting. The presentation will illustrate how VR enables the simulation of common activities of daily living, such as navigating a supermarket, preparing a simple meal, or managing cash, to assess cognition, including executive functions, learning and memory, complex attention, language, perceptual-motor control, and social recognition. This VR software, named CAVIRE (Cognitive Assessment using Virtual Reality), was developed by family physicians in SingHealth Polyclinics in Singapore. We have developed a matrix to score an individual's performance across 13 virtual scenarios covering the six cognitive domains, based on appropriate actions and the time to complete each task. The entire assessment takes 15 minutes, which is acceptable to participants without mental fatigue. The presentation will cover a series of studies to validate CAVIRE as an ecologically valid tool compared with MoCA. The talk will conclude by sharing the deployment of CAVIRE as a tool to monitor participants' cognition status in an intervention study using gamified therapy for adults with suspected mild cognitive impairment and as a pilot to reach out to at-risk individuals in the community.

Keywords: Cognitive assessment; gamified therapy; monitoring; primary care; virtual reality

Integrative Primary Care Approaches in Dementia Management

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ABSTRACT

Dementia is a leading cause of disability among older adults worldwide, yet the majority of cases remain underdiagnosed in primary care. In Malaysia, multiple barriers, including time constraints, limited training, and elements of therapeutic nihilism, continue to delay recognition and management. At the same time, fragmented and specialist-centric care models are increasingly unsustainable, highlighting the need for a shift toward longitudinal, person-centred primary care. This talk explores an integrative primary care approach to dementia management that moves beyond an episodic, diagnosis-focused model toward comprehensive and coordinated care. It outlines key components of this approach, including opportunistic case-finding using brief validated tools and broader assessments that incorporate cognitive, functional, and psychosocial domains. The role of multidisciplinary collaboration, caregiver engagement, and non-pharmacological strategies will also be emphasised as central to effective management. By shifting the focus toward maintaining function, supporting families, and strengthening links with community resources, primary care can move beyond fragmented care and provide more holistic, person-centred management. Such an approach is key to preserving dignity and improving the quality of life for people living with dementia.

Keywords: Brief validated tools; dementia; multidisciplinary collaboration; person-centred; primary care

Integrative Primary Care Approaches in Osteoporosis Prevention

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ABSTRACT

As non-communicable diseases (NCDs) continue to rise, osteoporosis is frequently managed in isolation rather than as an integrated health priority. This presentation advocates for a transition from reactive, fracture-based management to a proactive, integrative primary care strategy that addresses bone health within the broader context of metabolic and functional ageing. Synthesising evidence from preclinical stages through to clinical practice, the discussion emphasises a life-course perspective. Initial focus centres on the foundational aspects of bone health in youth, highlighting how lifestyle practices and nutritional awareness during adolescence influence peak bone mass. The narrative then explores the intricate “bone muscle-metabolic” axis, examining the interdependence between bone density, skeletal muscle mass, and cardiovascular health. Innovation is demonstrated through enhanced risk stratification, particularly in high-risk metabolic cohorts where standard assessment tools may under-represent fracture probability. The application of localised intervention thresholds and adjusted risk assessment models is presented as a crucial step to overcome clinical inertia and ensure population-specific care. Integration is further achieved by addressing the functional intersection of falls and fracture risk within the primary care setting. The future of osteoporosis prevention lies in integrating metabolic, vascular and functional health parameters. By adopting a life-course perspective and utilising localised precision tools, primary care providers can manage osteoporosis not as a single-organ disease, but as a systemic condition, significantly improving long-term outcomes for an ageing population.

Keywords: Osteoporosis; prevention; primary care; risk assessment models; risk stratification

Delivering Diabetes Care in the Current Era: Exploring New Approaches

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ABSTRACT

The landscape of diabetes management is currently undergoing a fundamental architectural redesign, moving beyond traditional frameworks. The “one-size-fits-all” glucocentric model is no longer applicable, and the healthcare system must move toward a multi-dimensional, technology-integrated, and highly personalised era of clinical practice. This symposium will explore a strategic transition from reactive interventions to proactive, preventive care, emphasising a shift in modern strategy. The symposium will also review emerging approaches in diabetes care, focusing on continuous glucose monitoring, automated insulin delivery, telehealth, remote patient monitoring, and their integration into primary care. These modernised strategies, which prioritise precision, technological adoption, and patient-centred outcomes, will incur costs and necessitate new reforms in the primary healthcare system. These will also shape our future primary healthcare services, making them more accessible, practical, and personalised to the patient’s context.

Keywords: Automated insulin delivery; diabetes; glucose monitoring; primary care; telehealth medicine

Innovations in the Management of Erectile Dysfunction in Primary Care

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ABSTRACT

Erectile dysfunction (ED) is a highly prevalent condition that significantly affects men, especially those with comorbidities such as diabetes. Alongside phosphodiesterase type 5 inhibitors, medical innovations including topical gels, vacuum erection devices, and inflatable penile prostheses are available for ED treatment. Researchers are also actively exploring regenerative options, such as low-intensity extracorporeal shockwave therapy, stem cell therapy, platelet-rich plasma injections, and gene therapy. Despite a 76.7% prevalence among men with diabetes in an urban Malaysian clinic, ED frequently remains insufficiently diagnosed and treated due to communication barriers, embarrassment, and time constraints. To overcome these challenges, practical knowledge translation interventions such as the Knowledge Translation Tools in the Management of Erectile Dysfunction (LASTED) toolset have been developed and can be introduced early in clinical workflows. By combining a patient prompt sheet with a visually engaging clinical flipchart, the LASTED tool facilitates critical doctor–patient interaction and helps physicians respond effectively to patient cues. A quasi-experimental study demonstrated that utilising LASTED dramatically increased the initiation of ED discussions to 66.7%, compared with only 8.3% in standard care. LASTED use was significantly associated with increased oral medication prescriptions and improved patient satisfaction. Building on this success, this presentation explores a future vision for LASTED powered by artificial intelligence (AI), mobile health technologies, and clinical decision support systems. Potential innovations include AI-driven conversational chatbots for confidential symptom screening, digital risk stratification integrated with electronic medical records, personalised patient education platforms, automated treatment recommendations, and predictive analytics to identify men at high risk of sexual dysfunction. The envisioned digital-LASTED platform would enable continuous patient engagement before, during, and after consultations while providing clinicians with real-time evidence-based guidance. By integrating AI with proven knowledge translation strategies, LASTED has the potential to transform ED care and improve access to evolving therapies in primary care settings.

Keywords: Artificial intelligence; digital health; erectile dysfunction; knowledge translation; LASTED; primary care

GLOBAL DISEASE BURDEN
Mastering Complexity in Rheumatology

**Precision Autoantibody Profiling: Navigating Diagnostic
Uncertainty in Complex Presentations**

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ABSTRACT

The diagnosis of autoimmune rheumatic diseases remains one of the most challenging aspects of clinical rheumatology, particularly in patients presenting with overlapping manifestations, atypical phenotypes, or evolving disease trajectories. This presentation will explore the evolving landscape of precision autoantibody profiling and its application in addressing diagnostic uncertainty in complex rheumatologic presentations. The session will highlight how comprehensive autoantibody assessment, including disease-specific, disease-associated, and emerging novel autoantibodies, can assist clinicians in diagnosing various autoimmune rheumatological diseases. The talk will also discuss the limitations and potential pitfalls of autoantibody testing, including false-positive results, variability between testing platforms, and challenges in interpreting low-titre or isolated antibody positivity. Integrating autoantibody profiles with clinical, imaging, and molecular data will be presented as a framework for improving diagnostic accuracy and supporting timely therapeutic decision-making. By translating advances in autoantibody science into practical clinical strategies, rheumatologists can better navigate diagnostic complexity, reduce uncertainty, and deliver more personalised care for patients with autoimmune diseases.

Keywords: Autoantibody profiling; diagnostic uncertainty; autoimmune rheumatic diseases; precision medicine; serological testing pitfalls

Refining the Role of Gut Microbiome in Inflammation

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ABSTRACT

The gut microbiome has emerged as a critical regulator of immune homeostasis. It has changed the traditional concepts of inflammation and autoimmune disease pathogenesis. The intestinal microbiota is now recognised as a dynamic ecosystem capable of shaping both local and systemic immune responses through complex interactions with host genetics, environmental exposures, diet, and metabolic pathways. These discoveries have profound implications for rheumatology, where chronic inflammation often arises from multifactorial and poorly understood mechanisms. This presentation will explore the evolving evidence linking gut microbial dysbiosis to the development, progression, and heterogeneity of inflammatory conditions. Recent research has examined how alterations in microbial composition, diversity, and function influence immune tolerance, mucosal integrity, and inflammatory signalling pathways. Particular attention will be given to systemic lupus erythematosus, rheumatoid arthritis, spondyloarthritis, and other immune-mediated diseases in which microbiome perturbations have been associated with disease susceptibility, activity, and treatment response. Beyond disease associations, this talk will highlight emerging concepts that redefine the microbiome as both a biomarker and a therapeutic target. Advances in metagenomics, metabolomics, and systems biology have enabled the identification of microbial signatures and metabolites that may predict disease phenotypes, therapeutic outcomes, and flare risk. Several interventions, including dietary modulation, probiotics, prebiotics, microbiome-derived metabolites, and faecal microbiota transplantation, will be discussed in the context of inflammatory disease management. By integrating microbiome science into rheumatology practice and research, clinicians may gain new tools to improve disease prediction, stratification, and treatment, ultimately advancing a more precise and holistic approach to patient care

Keywords: Autoimmune diseases; faecal microbiota transplantation; gut microbiome; microbial dysbiosis; systemic inflammation

Biologics in Rheumatology. Are We Successful So Far?

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ABSTRACT

The introduction of biologic therapies has revolutionised the management of rheumatic diseases, transforming outcomes for patients who previously faced progressive disability, irreversible organ damage, and reduced quality of life. Targeting specific immune pathways, biologics have enabled more effective disease control across a range of conditions, including rheumatoid arthritis, spondyloarthritis, psoriatic arthritis, systemic vasculitis, and selected connective tissue diseases. This presentation will review the journey of biologic therapies in rheumatology and critically examine whether they have fulfilled their promise in clinical practice. Evidence from clinical trials and real-world studies demonstrates significant improvements in disease activity, functional status, radiographic progression, and patient-reported outcomes. The expanding therapeutic landscape, including biosimilars and newer targeted agents, has further increased treatment options and accessibility for many patients. Despite these achievements, important challenges remain. A substantial proportion of patients fail to achieve sustained remission, experience loss of treatment response, or develop adverse effects. Treatment selection remains largely empirical, reflecting the persistent lack of reliable predictive biomarkers. Furthermore, issues related to cost, healthcare disparities, long-term safety, and access continue to influence patient outcomes globally. As rheumatology enters the era of precision medicine, the future success of biologic therapy will depend not only on developing new drugs but also on identifying the right treatment for the right patient at the right time. This session will explore key successes, ongoing challenges, and future directions in optimising biologic therapy to improve outcomes for patients with rheumatic diseases.

Keywords: Biologic therapies; biosimilars; precision medicine; rheumatic diseases; treatment response

ASEAN MEDICAL SCHOOL NETWORK (AMSN)
Healthcare in ASEAN Countries: Rural Healthcare

Community Diagnosis and Health Intervention in Lao PDR: Empowering Medical Students Through Field-Based Public Health Education

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ABSTRACT

Background & objective: Traditional classroom-bound medical education often fails to prepare graduates for the socioeconomic determinants of rural health. This study evaluated an experiential, field-based community health curriculum designed to bridge this gap and assess its impact on student competencies and rural chronic disease management in Lao PDR.

Methods: A mixed-methods study evaluated a two-phase community health curriculum. Working alongside local health authorities, fifth-year medical students completed a 4-week rural rotation, and family medicine residents completed a 5-month immersion. Students conducted mixed-**Methods** household surveys to analyse local needs, established community health committees to ensure sustainability, and deployed targeted intervention frameworks (health education, clinical services, and volunteer training). Program efficacy was evaluated via health literacy and longitudinal compliance.

Results: Community diagnosis successfully mapped local health priorities to inform targeted interventions. Notably, the residents' five-month hypertension programme successfully raised the health literacy of the target group above the 80% threshold. Furthermore, regular medication refills among all 48 village patients rose from 22.9% to 70.8% during the intervention period. Concurrently, the four-week undergraduate student intervention increased community knowledge of primary healthcare by 70%.

Conclusion: Integrating field-based diagnosis into medical curricula effectively empowers future physicians with essential public health competencies. In Lao PDR, this collaborative primary care model provides immediate public health benefits by drastically improving rural medication adherence and disease literacy, serving as a scalable framework for resource-constrained settings.

Keywords: Chronic disease; experiential learning; patient compliance; rural health; workforce training

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Cultivating a Research Mindset in Early Career Professionals

SOK KUAN WONG

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ABSTRACT

The ability to think critically, solve problems systematically, and make informed decisions is essential for early-career professionals across disciplines in an increasingly complex and evidence-driven professional landscape. It encompasses intellectual curiosity, analytical thinking, lifelong learning, and the ability to critically evaluate and apply evidence to develop a research mindset that extends beyond conducting formal research. Many early-career professionals encounter barriers to research engagement, including limited exposure to research, inadequate mentorship, competing work responsibilities, and a lack of confidence in their research-related skills. Cultivating a research mindset requires fostering intellectual curiosity, encouraging reflective practice, enhancing skills in literature appraisal and data interpretation, as well as providing supportive environments through mentorship, collaborative networks, and institutional research opportunities. Professional bodies, academic institutions, and employers also play a pivotal role in nurturing a culture of inquiry, innovation and evidence-based practice. By embracing a research mindset, early career professionals are better equipped to identify knowledge gaps, develop innovative solutions, contribute to evidence-based decision-making, and respond effectively to emerging challenges within their respective fields. These competencies not only support individual career advancement but also enhance organisational performance and generate broader societal impact. Therefore, fostering these attributes early in one's career is crucial for sustaining professional growth, developing future leaders, as well as advancing knowledge and practice. A structured and supportive approach to embedding research thinking as a core professional competency is essential for preparing the next generation of practitioners.

Keywords: Critical thinking; evidence-based practice; innovation; lifelong learning; mentorship

AMSN Oral Presentation
AMSN1

Level of HIV Knowledge and Sexual Intention among College
Students in Kota Kinabalu, Sabah

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ABSTRACT

Background & objective: The rising trend of HIV infections among young people is a concerning issue in Malaysia. This study aimed to assess the level of HIV knowledge and sexual intentions among college students in Kota Kinabalu, Sabah, and to identify factors associated with HIV knowledge and sexual intention.

Methods: A cross-sectional study was conducted among unmarried college students aged 18 to 25 years through voluntary participation. Data were collected using anonymous self-administered online questionnaires covering socio-demographic characteristics, a validated HIV Knowledge Questionnaire, and the Youth Sexual Intention Questionnaire.

Results: A total of 284 students participated, with a median age of 18 years (IQR = 1). Students showed a moderate level of HIV knowledge (7 out of 18 (IQR = 7) and low sexual intention (32 out of 80 (IQR = 14). HIV knowledge showed a weak positive but non-significant correlation with sexual intention ($p = 0.100$, $p = 0.095$). In multivariable analysis, gender ($\beta = 5.71$, $p < 0.001$), religion ($\beta = 2.18$, $p = 0.019$), and exposure to pornography ($\beta = 4.19$, $p = 0.001$) were significantly associated with sexual intention, while household income ($\beta = 1.27$, $p = 0.001$) was associated with HIV knowledge.

Conclusion: College students demonstrated moderate HIV knowledge and generally low permissive sexual intentions. HIV knowledge was not significantly associated with sexual intention. Instead, sexual intention was significantly associated with gender, religion, and exposure to pornography, while higher household income was associated with better HIV knowledge. These findings suggest that adolescent sexual health interventions should address socio-cultural and media-related influences alongside efforts to improve HIV knowledge.

Keywords: Adolescents; Malaysia; health literacy; pornography exposure; sexual behaviour

AMSN2

Rapidly Progressive Glomerulonephritis in a Patient with Class IV Lupus Nephritis: A Clinical Challenge

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ABSTRACT

Background & objective: Rapidly progressive glomerulonephritis (RPGN) is a fulminant renal syndrome characterised by a precipitous decline in glomerular filtration rate and pathognomonic histological crescents. In systemic lupus erythematosus (SLE), RPGN represents a life-threatening evolution of lupus nephritis. This report examines the management of refractory lupus-related RPGN complicated by multi-organ involvement and the complex dilemma of patient autonomy regarding life-sustaining therapy.

Methods: We analysed the clinical trajectory of a 33-year-old female with chronic SLE and biopsy-proven Class IV lupus nephritis. Data synthesis included clinical presentation, critical laboratory markers (creatinine, eGFR), histopathology, and response to intensive immunosuppression and renal replacement therapies.

Results: The patient presented in hypertensive emergency (186/109 mmHg) with advanced renal failure (creatinine 5.4 mg/dl, eGFR 10.1) and refractory hyperkalaemia. Histology confirmed Class IV lupus nephritis with crescentic formation. Despite aggressive pulse methylprednisolone and cyclophosphamide, the course was complicated by cardiomegaly and pleural effusion. While haemodialysis briefly stabilised electrolyte imbalances, the patient ultimately elected to discontinue regular treatment.

Conclusion: While aggressive immunosuppression remains the gold standard, clinical outcomes are often dictated by extra-renal complications and patient preference. This case underscores the profound challenge of managing end-stage progression when life-sustaining measures are refused, necessitating early multidisciplinary and palliative integration.

Keywords: Cyclophosphamide; dialysis; ESRD; RPGN; SLE

AMSN3

Role of Weight Loss in the Management of Knee Osteoarthritis among Non-diabetic Cambodian Patients

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ABSTRACT

Background & objective: Obesity is a major risk factor for osteoarthritis. It increases the incidence and severity of pain through mechanical joint stress and metabolic inflammation. Weight loss is a key management for this condition. This study aimed to investigate the impact of weight loss on knee osteoarthritis in non-diabetic Cambodian participants with obesity.

Methods: We assigned non-diabetic participants with obesity (BMI ≥ 25 kg/m²) of Asian descent, aged 50 years, with knee osteoarthritis based on ACR1986 criteria with moderate pain, to receive once-weekly subcutaneous semaglutide (2.4 mg) or placebo. The proportions of patients in the body weight change categories of 5%, 10%, 15%, and 20%, and in the WOMAC pain score categories of 30% and 50%, were compared.

Results: 65 patients were assigned to semaglutide 2.4 mg and 35 to placebo. The characteristics of the patients were: mean age 57 ± 11 years, body weight 72.0 ± 16.79 kg, BMI 30.05 ± 4.87 kg/m² and WOMAC pain score 78.35 ± 14.4 . The proportions of patients with body weight change from baseline to week 68 in the semaglutide vs placebo in the 5%, 10%, 15% and 20% categories were: 84.2% vs. 33.8%; 67.2% vs. 13.2%; 45.7% vs. 4.7% and 22.5% vs. 1.4%. Moreover, the reductions in the WOMAC pain score were 20.8 points for 30% and 28.6 points for 50%. The most common adverse reaction included nausea, vomiting and diarrhoea. No severe adverse reactions, such as hypoglycaemia and hypotension, were observed.

Conclusion: Among non-diabetic obese participants with knee osteoarthritis, treatment with once-weekly semaglutide resulted in significantly greater reductions in body weight and WOMAC pain score than placebo.

Keywords: Obesity; semaglutide; WOMAC pain; weight loss

AMSN4

Predictors for Chronic Thrombocytopenia in Cambodian Patients with Systemic Lupus Erythematosus

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ABSTRACT

Background & objective: Thrombocytopenia that persists for over a year is defined as chronic thrombocytopenia, which is one of the common haemorrhagic manifestations in systemic lupus erythematosus (SLE).

Methods: In our study, retrospective reviewed patients who were diagnosed with SLE-associated chronic thrombocytopenia. The clinical and laboratory characteristics were analysed. No response was defined as a platelet count lower $30 \times 109/L$. Factors associated with chronic thrombocytopenia were evaluated by logistic regression analysis.

Results: Of the total 167 SLE patients with thrombocytopenia, 45 (26.95%) patients progressed to chronic thrombocytopenia lasting more than 6 months after diagnosis. The median platelet count was significantly lower in patients with chronic thrombocytopenia than in those without (16 vs. $51 \times 109/L$, $p < 0.001$). Patients with chronic thrombocytopenia had a considerably higher rate of no response at 6 months than those without (40.7% vs 6.4%, $p < 0.001$). Multivariable analysis showed that obesity ([aOR] = 4.374, 95% [CI] = 1.168-16.378), severe degree of thrombocytopenia at baseline ($< 20 \times 109/L$), (aOR = 10.983, 95% CI = 3.215-37.520), and no response six months (aOR = 26.457, 95% CI = 6.439-108.708) were significantly associated with the risk of chronic thrombocytopenia in SLE.

Conclusion: Approximately one-quarter of the patients progressed to chronic thrombocytopenia in SLE-associated ITP. Obesity, severe thrombocytopenia, and no response after six months were risk factors for the development of chronic thrombocytopenia in patients with SLE-ITP.

Keywords: Immune thrombocytopenia purpura; obesity; systemic lupus erythematosus

AMSN5

Maternal Death in Laos: A Trend Analysis from 2020 to 2025

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ABSTRACT

Background & objective: Maternal mortality remains a critical public health challenge in Lao PDR, historically among the highest in Southeast Asia. To address this, the Maternal Death Surveillance and Response (MDSR) system was established in 2013 to strengthen monitoring and accountability. This study aimed to analyse national trends in maternal deaths from 2020 to 2025 and identify the leading causes contributing to mortality.

Methods: A retrospective trend analysis was conducted using national MDSR data. A total of 509 maternal death cases reported between 2020 and 2025 were reviewed. Variables included geographical distribution, temporal patterns, clinical causes, and contextual factors surrounding the place of death. Statistical analysis was performed to assess associations between delays in care and mortality outcomes.

Results: Maternal deaths declined markedly by 81.7%, from 126 cases in 2020 to 23 cases in 2025. The principal clinical causes were obstetric haemorrhage (32.81%), hypertensive disorders of pregnancy (28.88%), and pregnancy-related infections (12.97%). Indirect causes accounted for 25.40% of deaths. Significant associations were observed between place of death and delays in decision-making and treatment initiation ($p < 0.05$).

Conclusion: Lao PDR is on track to achieve the United Nations' 2030 Sustainable Development Goal target for maternal mortality if it sustains and strengthens current efforts.

Keywords: Hypertensive disorders; indirect causes; maternal mortality reduction; obstetric haemorrhage; pregnancy infections

AMSN6

Psychological Safety in Clinical Simulation: Initial Insights into the Roles of Facilitators and Peers

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ABSTRACT

Background & objective: Psychological safety is critical in simulation-based medical education, yet faces distinct socio-cultural dynamics in Asian settings. This pilot study explored how facilitators and peers contribute to Vietnamese medical students' psychological safety during clinical simulation.

Methods: A qualitative-focused pilot study was conducted at the University of Medicine and Pharmacy at Ho Chi Minh City among second-year medical students with prior simulation experience. Participants completed a cross-sectional survey, followed by individual semi-structured in-depth interviews with all respondents to contextualise their survey responses.

Results: Most students felt highly comfortable with facilitators' feedback because mistakes were treated as valuable learning opportunities, with a non-judgmental tone and solution-oriented guidance. However, two participants reported discomfort when errors were discussed extensively without immediate corrective instruction. Regarding peer interaction, stable six-year learning groups fostered peer familiarity, reduced embarrassment around mistakes, and enabled informal academic support when students felt underprepared. However, some participants reported that they would feel differently in an unfamiliar group. Concerns about video recording further revealed this boundary, as 7/20 of interviewees were hesitant or disagreed with recording their simulation performance, often accepting it only if no mistakes were made or if videos remained for internal educational use.

Conclusion: Overall, UMP HCMC's clinical simulation environment has established a baseline of psychological safety for students, supported by constructive instructor guidance and familiar peer relationships. However, it remained context-dependent, especially when errors became socially visible. Findings should be interpreted cautiously, as early-year students' experiences may differ from those of seniors who have experience with diverse clinical simulations.

Keywords: Clinical simulation; facilitators; peers; psychological safety; Vietnamese

AMSN7

Prescribing What We Don't Teach: Knowledge, Attitude and Practice of Exercise Prescription among Final-Year Medical Students in Malaysia – a Multicentre Study

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ABSTRACT

Background & objective: Malaysia has one of the highest obesity rates in Southeast Asia, driven largely by physical inactivity. Despite this burden, medical students may not be adequately trained to prescribe exercise, a core evidence-based intervention. This multicentre study aimed to assess the knowledge, attitudes, and practices (KAP) of exercise prescription among final year medical students across Malaysian universities.

Methods: A cross-sectional study was conducted from March to May 2026 involving 150 final-year medical students from ten Malaysian public and private universities. A validated 40-item questionnaire assessed demographics, personal physical activity (IPAQ-SF), exposure to exercise medicine, knowledge of WHO/ACSM guidelines, attitudes, practice frequency, and barriers. Data were analysed using descriptive statistics and chi-square tests.

Results: The mean age was 23.5 (SD 0.98) years; 66.7% were female. Only 19.3% of students had any prior exposure to exercise medicine, and 63.3% were personally sedentary (females 77% vs. males 36%, $p < 0.001$). Overall, only 20% achieved adequate knowledge ($\geq 70\%$ correct). While students agreed that exercise prescription is vital (mean 4.1/5), confidence (3.0/5) and perceived preparedness (2.9/5) were low. Lack of knowledge (72.7%) and insufficient training (57.3%) were the dominant barriers. Only 2.0% reported always prescribing exercise during clinical rotations.

Conclusion: Malaysian final-year medical students recognise the importance of exercise prescription but have profound knowledge deficits, low confidence, and almost no formal training. Most are themselves physically inactive. Urgent curricular reform is needed to equip future physicians with the competencies to address the nation's escalating physical inactivity and obesity epidemics.

Keywords: Exercise prescription; knowledge-attitude-practice; Malaysia; medical students; multicentre study; physical inactivity

AMSN9

Protocolised Multidisciplinary Enhanced Recovery After Trauma Surgery (ERATS): Propensity Score-Matched Multivariate Analysis

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ABSTRACT

Background & objective: Enhanced Recovery protocols remain poorly defined in trauma. This study evaluated the feasibility and outcomes of a protocolised Enhanced Recovery After Trauma Surgery (ERATS) pathway in patients undergoing trauma laparotomy.

Methods: An ambispective observational study was conducted. A multidisciplinary ERATS protocol, incorporating trauma guidelines and ERAS principles, was implemented for all trauma laparotomy patients between May 2023 and January 2025. Propensity score matching (1:1) identified a pre-ERATS cohort using age, sex, and Trauma and Injury Severity Score (TRISS). Primary outcomes were length of stay (LOS), mortality, and Comprehensive Complication Index (CCI). Multivariate analyses identified factors associated with complications and LOS.

Results: A total of 244 patients were analysed (122 ERATS vs. 122 pre-ERATS). The cohort was predominantly blunt trauma (93.4%) with high injury severity (median ISS 22, IQR 13–29); 52.9% had serious extra-abdominal injuries. Compared with pre-ERATS patients, the ERATS group showed trends toward shorter LOS (10 vs. 12 days, $p=0.490$), lower mortality (0.8% vs. 4.9%, $p = 0.125$), and lower median CCI (0.0 vs. 8.7, $p = 0.322$). Subgroup analyses demonstrated significantly shorter LOS among ERATS patients without serious extra-abdominal injuries (7 vs. 8 days, $p = 0.038$) and those with ISS <16 (5 vs. 7.5 days, $p = 0.013$). Injury severity was the main independent predictor of morbidity, LOS, and complications.

Conclusion: ERATS is feasible in a real-world polytrauma setting. Benefits appear greatest in patients without major extra-abdominal injuries and those with lower injury severity. ERATS represents a shift toward recovery-focused trauma care and warrants further study.

Keywords: ERAS; laparotomy; length of stay; morbidity; protocol; trauma

ORAL PRESENTATIONS
Cellular, Genetic & Molecular Profiling
OA1

**Molecular Genetics of Thalassaemia and
Haemoglobinopathies in the Sabah Multiethnic Population: A
Retrospective Analysis**

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ABSTRACT

Background & objective: Thalassaemia is a widespread genetic blood disorder. Sabah, an eastern state of Malaysia, has the highest prevalence of thalassaemia in the country. However, molecular data underlying this disease in Sabah remain limited. Given the high disease burden and unique genetic background, this study aims to characterise thalassaemia and haemoglobinopathies in Sabah.

Methods: A retrospective analysis was performed on 11,000 screened cases at Hospital Queen Elizabeth, between January and December 2021. Full blood count, haemoglobin analysis, and molecular profile data were retrieved from the hospital's laboratory database. A descriptive analysis was conducted to identify the phenotypic and genotypic distributions.

Results: A total of 7,046 (64%) suspected thalassaemia cases were identified. Among these, a total of 756 alpha-thalassaemia cases were found, with the majority (n=710/756, 94%) caused by deletional mutations, including $-\alpha^{3.7}/\alpha\alpha$, $-\alpha^{3.7}/-\alpha^{3.7}$, and $SEA/\alpha\alpha$. These mutations were predominant among the Dusun, Murut, and Bajau ethnic groups. For non-deletional mutations, the Hb Constant Spring ($\alpha\alpha CS/\alpha\alpha$) was the most prevalent (n = 21, 4.4%), particularly among the Bajau ethnic group. A total of 2,768 beta-thalassaemia cases were identified, with the majority being beta-thalassaemia trait (n = 2,565/2,768, 92.7%). HbE trait was the most common haemoglobinopathy, especially among the Bajau and Bugis ethnic groups. Molecular analysis of 72 β -thalassaemia cases revealed the Filipino β^0 deletion as the most frequent mutation, particularly among the Dusun group.

Conclusion: Thalassaemia and haemoglobinopathies in Sabah exhibit high genetic diversity. Tailored genetic counselling and affordable molecular testing are essential for accurate diagnosis and effective prevention of blood disorders.

Keywords: Haematology; molecular genetics; mutations; Sabah; thalassaemia

OA3

Single-Cell Transcriptomic Analysis Reveals Stress-Associated Intercellular Signalling in Adrenal Glands with Aldosterone-Producing Adenomas

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ABSTRACT

Background & objective: Aldosterone activates mineralocorticoid receptor-dependent oxidative stress pathways through NADPH oxidase-mediated reactive oxygen species (ROS) production, promoting inflammation, vascular dysfunction, and tissue remodelling in primary aldosteronism. This study characterised stress-associated transcriptional programmes and intercellular signalling networks in adrenal glands containing aldosterone-producing adenomas (APAs).

Methods: Single-cell transcriptomic profiling was performed on six formalin-fixed paraffin-embedded adrenal tissues containing APAs. Data were analysed using Seurat (v5), Reactome (v93), and CellChat (v2).

Results: Seventeen adrenal cell populations were identified, comprising adrenocortical, medullary, immune, endothelial, stromal, and capsular clusters. Adrenocortical subclusters were defined using

canonical markers of APA, zona glomerulosa (ZG), zona fasciculata (ZF), and zona reticularis (ZR). Pathway analysis demonstrated enrichment of stress-associated pathways, including mitochondrial unfolded protein response, ROS detoxification, and senescence signalling, within stromal/capsular cells, ZR1, and undefined clusters. Conversely, all aldosterone-producing populations including CYP17A1⁺CYP11B1⁺ APA, CYP17A1⁺CYP11B1⁺ APA (high mt), CYP17A1⁻CYP11B1⁻ APA and CYP17A1⁻CYP11B1⁺ APA clusters, showed comparatively reduced activation of stress-response programmes as calculated by AddModuleScore-based stress scoring (median [IQR]: -0.015 [-0.034-0.009] vs 0.055 [0.013-0.113]; Wilcoxon rank-sum test, $W = 9330244$, $p < 5 \times 10^{-16}$, $r = 0.51$). Cell-cell communication analysis identified 289 significant ligand-receptor interactions across 11 signalling pathways ($p < 0.05$). ZR1 emerged as a dominant signalling source, with predicted communication to CYP17A1⁺CYP11B1⁺ APA through Cholesterol-DHCR24→RORA, GJA1- GJA1 gap junction, and CDH2-CDH2 cadherin interactions, suggesting a supportive role in tumour-associated steroidogenesis.

Conclusion: APA-containing adrenal glands demonstrate compartmentalised stress-associated signalling and complex intercellular communication networks. These findings advance understanding of adrenal micro-environmental regulation and identify pathways potentially involved in tumour maintenance and progression.

Keywords: Cell-cell communication; ligand–receptor interactions; primary aldosteronism; reactive oxygen species; steroidogenesis

OA4

Single-Cell Transcriptomics Reveals CD8⁺ T Cell Depletion in Aldosterone-Producing Adenomas

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ABSTRACT

Background & objective: Primary aldosteronism (PA) is a common cause of secondary hypertension associated with increased cardiovascular risk. Although the steroidogenic landscape of aldosterone-producing adenomas (APAs) has been characterised at single-cell resolution, their immune microenvironment remains poorly understood.

Methods: Single-cell RNA sequencing was performed on 10 adrenal tissues from seven multi-ethnic patients undergoing adrenalectomy for APA, pheochromocytoma, or endocrine inactive adenoma. Data were analysed using Scanpy (v1.10.3), Seurat (v5.3.0), and Harmony (v1.2.3) with Leiden clustering and Reactome pathway enrichment. Differential cellular proportions were assessed using Welch t-tests and chi-square analyses.

Results: Analysis of 19,440 immune cells (14,364 from normal-adjacent tissues and 5,076 from APA tissues) identified 23 PTPRC+ immune clusters spanning lymphoid and myeloid lineages. CD3+CD8+ cytotoxic T cells were significantly depleted in APA tissues (n = 3) compared with adjacent adrenal tissues (n = 7; 38.6% vs. 55.0%; $\chi^2(1) = 403.28$, $p < 0.001$), driven by loss of four CD8+ subclusters (13.9% vs. 27.4%; $\chi^2(1) = 375.86$, $p < 0.001$). Two subclusters consistently reduced across all three paired APA-normal adjacent samples included IL7R+CD69+ T cells (cluster 7; 3.78% vs. 6.98%; $p = 0.01$), enriched for CD28 costimulatory signalling, and CCL4+CD69+ T cells (cluster 11; 2.76% vs. 5.54%; $p = 0.05$), characterised by active T cell receptor signalling. These findings indicate depletion of activated memory-like and tissue-resident cytotoxic CD8+ T cell populations within APAs.

Conclusion: APAs exhibit marked CD8+ T cell dysregulation, suggesting impaired local immune surveillance in the tumour. The selective reduction of activated memory-like and tissue-resident-like cytotoxic populations provides a foundation for future investigation of tumour-immune interactions in aldosterone-producing adrenal disease.

Keywords: Aldosterone-producing adenoma; immune surveillance; primary aldosteronism; single-cell RNA sequencing; tumour microenvironment

OA5

Enhancing Diagnostic Precision: A Comparative Analysis of AI-Driven Ki-67 Proliferative Index in Lung Neuroendocrine Neoplasms

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ABSTRACT

Background and objective: The Ki-67 proliferative index is a critical adjunct marker for characterising proliferative activity and supporting diagnostic stratification in lung neuroendocrine neoplasms (NENs), specifically in differentiating neuroendocrine tumours (NETs) [typical carcinoids (TC) and atypical carcinoids (AC)] and neuroendocrine carcinomas (NEC). However, clinical utility is hindered by inter-observer variability. This study evaluates the diagnostic potential of artificial intelligence (AI) by comparing the sensitivity, specificity, and accuracy of semi-quantitative estimation (SQ), manual counting (MC), and AI-assisted quantification.

Methods: Forty-three pulmonary NENs cases (3 TC, 4 AC, and 36 NEC) were retrospectively analysed. Ki-67 indices were independently evaluated by four pathologists using semi-quantitative estimation and manual counting. Additionally, predefined hotspot regions were evaluated using QuPath AI-based image analysis. Proliferative thresholds were defined as <5% for TC, 6-30% for AC, and >30% for NEC. Finally, the sensitivity, specificity, and accuracy of each assessment method were calculated.

Results: All methods were comparable in categorising NECs with 100% accuracy. However, discordance emerged during NET classification (7 cases), with SQ, AI, and MC showing discordance rates of 57%, 42%, and 14%, respectively.

Conclusion: Despite comparable overall accuracy across all three methods, AI and SQ exhibit significant discordance in NET categorisation. The discrepancies observed in AI assessments are likely attributed to a “dilution effect” caused by non-neoplastic stroma and cellular contaminants, which can compromise automated precision. Nevertheless, AI remains a highly promising tool for assessing Ki-67 proliferative rate. An accurate diagnosis must integrate Ki-67 proliferative index with histological morphology, mitotic counts, and necrosis assessment.

Keywords: Artificial intelligence; histopathology; Ki67 proliferative index; neuroendocrine neoplasm

Healthcare System Implementation and Evaluation
OA6

**Analysis of Survival, Recurrence and Metastatic Behaviour
of Breast Cancer Based on Breast Cancer Subtypes in a
University Hospital in Malaysia**

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ABSTRACT

Background & objective: Breast cancer is the most common malignancy among Malaysian women, yet comprehensive population-based data remain scarce, limiting the applicability of global prognostic models locally. This study analysed 5-year cancer-specific survival, recurrence patterns, and metastatic behaviour across breast cancer subtypes in a Malaysian university hospital cohort.

Methods: This single-centre, ambidirectional observational study enrolled 1,297 patients with histologically confirmed invasive breast cancer. Patients were stratified by St. Gallen consensus subtypes. The primary endpoint was 5-year cancer-specific survival; secondary endpoints included disease-free survival and recurrence patterns. Kaplan-Meier estimation, and log-rank tests were employed.

Results: Subtype distribution was: Luminal A (59.1%), Luminal B (14.5%), HER2-enriched (11.1%), and Triple-Negative (15.3%). Overall, 5-year cancer-specific survival was 75.9%. Luminal A and B groups achieved 79.8% survival, whereas survival was significantly lower in HER2-enriched (63.9%; HR 2.084) and Triple-Negative (66.3%; HR 1.891) groups. Disease-free survival was lowest in Triple-Negative patients (68.3%; HR 2.140). Distant metastasis accounted for 72% of recurrences, predominantly to the lungs and liver. HER2-enriched prevalence exceeded global figures and was predominantly Stage 3 (38.2%).

Conclusion: This study revealed a notably higher prevalence and poorer prognosis of HER2-enriched breast cancer in a Malaysian setting, challenging assumptions that Triple Negative disease alone carries the worst outcomes and suggesting population-specific genetic factors. Lower survival likely reflects limited access to dual anti-HER2 therapy and advanced stage at presentation. These findings underscore the urgent need for enhanced targeted therapy funding and intensified surveillance strategies for high-risk subtypes, particularly HER2-enriched and Triple-Negative disease.

Keywords: Breast cancer; hormonal molecular subtypes; Malaysia; prognosis; survival; university hospital

Public Health
OB1

The Strength, Distribution and Projections of the Malaysian Psychiatrist Workforce: A Cross-sectional Study

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ABSTRACT

Background & objective: The prevalence of mental disorders is rising substantially in Malaysia, historically compounded by a chronic shortage of psychiatrists. This study aims to provide an updated analysis of the psychiatric workforce, focusing on demographics, distribution, projections, and the impact of district-level socioeconomic parameters.

Methods: A cross-sectional study utilised public data collected between December 2025 and January 2026. Analyses incorporated descriptive statistics, coefficient of variation (CV) to assess regional disparities, ARIMA modelling for 2024–2033 workforce projections, and non-parametric tests to assess correlations between psychiatrist density and economic indicators.

Results: Of 741 registered psychiatrists, 682 were active, improving the national ratio to 2.00 per 100,000 population. The public sector employs the majority and has a higher proportion of female and younger practitioners. Although inter-state variability improved from a CV of 0.84 to 0.69, pronounced geographic disparities remain. Furthermore, only 40.6% of districts had resident psychiatrists. Availability was heavily concentrated in the wealthiest districts, showing strong positive correlations with mean income ($p < 0.001$) and negative correlations with poverty ($p < 0.001$). Projections suggest Malaysia is unlikely to meet the Ministry of Health's 2030 target ratio of 2.78 per 100,000.

Conclusion: While Malaysia's psychiatrist workforce has expanded, it remains insufficient to meet future targets. Persistent geographical maldistribution and stark wealth-based inequalities require targeted interventions, including enhanced specialist training, public sector retention strategies, and expanded telepsychiatry services.

Keywords: Malaysia; mental health services; psychiatrist workforce; socioeconomic status; workforce projections

OB2

Perceptions of a Sexual and Reproductive Health Education Module Intervention among FELDA Youth in a Public University in Pahang, Malaysia

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ABSTRACT

Background: This study examined youths' perceptions of Kompas Kasih, a sexual and reproductive health module that improves literacy and regulates sexual intentions among FELDA youth.

Methods: A qualitative design with purposive sampling was used for in-depth interviews with FELDA youths aged 18, studying at a public university in Pahang. Semi-structured guides were used until saturation. Interviews were recorded, transcribed, and translated. Data were analysed using inductive thematic analysis to identify key themes.

Results: Among 119 unmarried undergraduates (55% female), Kompas Kasih was perceived as effective in normalising SRH discussions and improving knowledge. It was accepted as accessible and non-judgmental. Thematic analysis yielded six themes, 17 sub-themes, and 34 codes. Barriers included low awareness, motivation, and internet access. One of the improvements suggested was greater interactivity.

Conclusion: Kompas Kasih is a promising structural intervention that enhances access to sexual and reproductive health information and supports preventive behaviours. Scaling up innovative, interactive approaches across FELDA and rural settings may reduce barriers and improve youth well-being in Malaysia.

Keywords: Malaysia; reproductive health; rural population; sex education; young adult

OB3

Behavioural and Psychosocial Determinants of Internet Addiction Among Malaysian Adolescents: A Cross-State Analysis in a Middle-Income Country

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ABSTRACT

Background & objective: Internet addiction (IA) is a growing behavioural health concern among adolescents. This study examined behavioural and psychosocial determinants of IA among Malaysian adolescents, guided by the I-PACE model.

Methods: A cross-sectional survey included 584 students (aged 14 and 16) from Selangor and Kelantan. IA was assessed using an adapted Young's Internet Addiction Test. Associations with online gaming, time online, peer influence and sociodemographic factors were tested using chi-square and Cramér's V.

Results: IA prevalence was 9.2%, with no geographic differences. Online gaming and longer Internet use were associated with IA (small effects; $V = 0.09-0.11$). Peer influence was strongest ($\chi^2 = 24.88$, $p < 0.001$; $V = 0.21$). Sociodemographic variables were not associated with IA.

Conclusion: IA appears more strongly linked to behavioural engagement and peer social reinforcement than to demographic or geographic factors; interventions should target peer dynamics and self-regulation.

Keywords: Adolescents; behavioural factors; internet addiction; online gaming; peer influence

OB4

Baseline Profiling of Skin Ageing, Cognitive Function, and Systemic DNA Damage in Malaysian Middle-aged Adults

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ABSTRACT

Background & objective: Ageing is a multifactorial process involving molecular, physiological, and cognitive alterations across biological systems. However, ageing research predominantly focuses on animal models and older adults, while characterisation of ageing-related biomarkers in middle-aged humans remains limited, particularly in Southeast Asian populations. This study aimed to characterise baseline associations among skin ageing parameters, cognitive performance, and systemic DNA damage in Malaysian middle-aged adults enrolled in a randomised, double-blind, placebo-controlled tocotrienol trial.

Methods: Pre-intervention data from 136 Malaysian adults aged 35–50 years were analysed. Systemic DNA damage was assessed in whole blood using the comet assay parameters. Skin ageing parameters, including transepidermal water loss (TEWL), hydration, elasticity, wrinkles, roughness, and scaliness, were measured non-invasively at the crow's feet region. Cognitive performance was evaluated using the Montreal Cognitive Assessment (MoCA), Rey Auditory Verbal Learning Test (RAVLT), and Digit Span tests. Associations were analysed using Spearman correlation.

Results: Age was associated with increased TEWL ($r = 0.236$, $p < 0.01$), reduced hydration ($r = -0.195$, $p < 0.05$), and decreased elasticity ($r = -0.360$, $p < 0.0001$). TEWL, which was inversely associated with hydration ($r = -0.243$, $p < 0.01$) and elasticity ($r = -0.194$, $p < 0.05$), supporting physiological

relationships between skin barrier function and skin integrity. DNA damage markers demonstrated weak associations with TEWL and hydration. Cognitive measures showed selective associations with skin parameters, including Digit Span with wrinkles ($r = -0.179$, $p < 0.05$) and RAVLT with scaliness ($r = -0.304$, $p < 0.001$). Probable mild cognitive impairment was observed in 55.9% of participants.

Conclusion: Skin physiological parameters and cognitive function demonstrated clearer age-related trends than systemic DNA damage markers in this midlife cohort.

Keywords: Cognition; DNA damage; midlife; randomised controlled trial; skin assessment

OB5

Advancing Cervical Health Assessment in ASEAN: Translational Evidence from ROMIX and ATHERM for AI- Enabled Motion and Thermal Monitoring

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ABSTRACT

Background & objective: Objective evaluation of neck mobility and thermophysiological responses is needed for rehabilitation, occupational health, prevention and sports participation. In many ASEAN settings, practice relies on manual measurement and clinical observation. This study synthesised translational evidence for ROMIX, an AI-integrated, marker-free photogrammetric platform for cervical range of motion evaluation, and ATHERM, an infrared acupoint thermometry platform, and outlined a cautious pathway to personalised digital follow-up.

Methods: Completed, ongoing studies were narratively integrated: ROMIX validation in 50 asymptomatic adults; normative mobility assessment in 480 healthy Vietnamese adults; ATHERM reference-temperature assessment at GB20, GV16 and Ex-HN5 in 360 healthy participants; thermal-mobility analysis in 60 young adults; a self-controlled exercise pilot in 30 participants with Yang-deficiency constitution; and monitoring of 120 patients with cervical spondylosis receiving pharmacological treatment with or without cervical joint movement exercises. Outcomes included mobility, acupoint temperature, pain, disability, quality of life and adverse events.

Results: ROMIX showed excellent test-retest reliability (ICC 0.917-0.979) and strong construct validity versus manual goniometry. Normative data supported individual and patient-group comparisons. In cervical spondylosis, adjunctive movement exercises improved mobility, pain and neck-related disability, with most benefits maintained at three months. ATHERM established preliminary reference values, demonstrated an age-related decline in neck acupoint temperature without significant sex differences, and revealed positive associations between neck acupoint temperature and mobility, particularly rotation and lateral bending.

Conclusion: ROMIX and ATHERM are complementary AI-enabled research and monitoring tools, not standalone diagnostic systems. Multicentre validation is needed before app-based or wearable use in clinical decisions, preventive screening or sports-performance support.

Keywords: Clinometric; digital biomarkers; infrared thermometry; neck rehabilitation; photogrammetry

Pharmacology & Therapeutics
OC1

Neuroprotective Effects of Neurotrophin-3 Treatment in a Zebrafish Model of Traumatic Brain Injury

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ABSTRACT

Background & objective: Traumatic brain injury (TBI) induces complex pathological responses, including inflammation and neuronal loss. Neurotrophins are known to modulate these processes; however, the role of neurotrophin-3 (NT-3) in TBI remains unclear. This study aimed to identify potential regulators of neuroregeneration and evaluate the effects of NT3 treatment in a zebrafish model of TBI.

Methods: Adult zebrafish underwent stab injury to the left telencephalon and received recombinant human NT-3 treatment (1 μ L; 100, 500, or 1000 ng/mL) via intracranial injection at 24 hours post-injury. Transcriptomic, molecular, cellular and behavioural assessments were performed at 3 (acute) and 21 (chronic) days post-injury (dpi).

Results: Transcriptomic profiling showed widespread changes at 3 dpi that were reduced at 21 dpi. Gene Ontology (GO) and KEGG pathway analyses indicated that this acute phase is driven by innate immune responses and necroptosis with 784 significant differentially expressed genes (DEGs), of which 656 were upregulated and 128 were downregulated. By the chronic phase at 21 dpi, this genetic disruption stabilised significantly to 130 DEGs (69 upregulated, 61 downregulated). At 3 dpi, NT-3 treatment decreased *il1b*, *il10*, *ntf3*, *ntrk3* and *pcna* expression relative to untreated TBI, along with reduced TUNEL+ cell counts and locomotor activity. At 21 dpi, NT-3 treatment increased *il10* expression, BrdU+ cell counts, and locomotor activity compared with untreated TBI.

Conclusion: NT-3 treatment attenuates early injury responses, potentially modulating anti-inflammatory signalling and facilitating functional recovery during the late phase of recovery, underscoring its potential as a targeted neuroprotective intervention for TBI.

Keywords: Differential gene expression; neuroregeneration; NT-3; TBI; TrkC

OC3

Carvacrol and Thymol as Potential Neuroprotective Agents in Alzheimer's Disease: A Scoping Review of Evidence and Mechanisms

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ABSTRACT

Background & objective: Alzheimer's disease (AD) is a multifactorial neurodegenerative condition characterised by cognitive impairment, cholinergic deficiency, and neuroinflammation. Carvacrol and thymol are natural monoterpenes with antioxidant, anti-inflammatory, anti-apoptotic, and cholinesterase-inhibiting properties. This review maps current evidence on these compounds in AD-related pathologies and their mechanisms of action.

Methods: A systematic search was conducted in February 2026 across PubMed, Scopus, and Web of Science. From 87 records, 31 studies were selected using predefined criteria. Data on study design, model characteristics, treatment parameters, and biochemical outcomes were extracted and analysed.

Results: Included studies comprised in vivo rat models and in vitro hippocampal cell cultures. Both compounds consistently improved spatial learning and memory retention, as evidenced by decreased escape latency and increased time spent in target quadrants. Reduced oxidative stress, attenuated amyloid-beta toxicity, and decreased inflammatory and apoptotic markers were reported. Effects were dose-dependent and enhanced by novel drug delivery systems. No clinical trials were identified.

Conclusion: Carvacrol and thymol demonstrate multi-targeted neuroprotective effects against AD via anticholinesterase, antioxidant, and anti-inflammatory pathways. Further research is needed to establish therapeutic value, optimal dosing, and safety in clinical settings.

Keywords: Alzheimer's disease; carvacrol; monoterpenes; oxidative stress; thymol

OC4

Effects of Annatto Tocotrienol and Vitamin K2 Co supplementation on Bone Mineral Density, Body Composition and Bone Biomechanical Strength in a Rat Model of Oestrogen Deficiency

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ABSTRACT

Background & objective: Previous studies showed that tocotrienol's anti-osteoporotic effects reach a threshold that cannot be overcome by increasing dosage. Vitamin K2 (VK2) has skeletal benefits, but synergy with tocotrienol remains unclear. This study determined the effects of annatto tocotrienol (AnTT) and VK2 co-supplementation on bone in an oestrogen-deficient osteoporosis rat model.

Methods: Female Sprague Dawley rats were randomised into six groups: sham, ovariectomised rats (OVX) given olive oil, OVX given AnTT (60 mg/kg/day), OVX given VK2 (50 mg/kg/day), OVX given AnTT + VK2, and OVX given calcium carbonate (1% drinking water). Treatment lasted three months. Bone mineral density (BMD) and body composition were assessed monthly using dual-energy X-ray absorptiometry. The right femur strength was assessed after sacrifice.

Results: No significant differences in BMD, BMC, fat mass, or lean mass were observed among groups ($p > 0.05$). OVX + calcium had significantly lower ultimate stress than all groups. Ultimate load was lower in OVX + calcium than OVX + olive oil, OVX + AnTT, and OVX + AnTT + VK2. OVX + VK2 also had lower ultimate load than OVX + AnTT. OVX + AnTT + VK2 showed higher stiffness than OVX + calcium and sham.

Conclusion: Calcium supplementation significantly lowered ultimate stress and ultimate load compared to other groups, whereas AnTT and VK2 did not. Further studies are needed to determine whether combined AnTT and VK2 provides superior bone protection than individual treatments.

Keywords: Bone; menopause; osteopenia; skeleton; vitamin E

OC5

Probiotics as Adjunctive for Managing Constipation in Cerebral Palsy: A Comparative Study

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ABSTRACT

Background & objective: Constipation affects 25–74% of children with cerebral palsy (CP), particularly those with Gross Motor Function Classification System (GMFCS) levels IV and V. Standard treatments such as lactulose and enema are often inadequate, leading to poor quality of life (QoL) for both children and caregivers. Emerging evidence suggests probiotics may improve constipation outcomes in CP.

To compare constipation outcomes between probiotics and placebo in children with CP, and to evaluate the relationship between constipation and QoL.

Methods: A prospective comparative study was conducted among 30 children with CP who met Rome IV criteria for constipation over 28 days. Participants were randomised into a probiotics group (n = 14) and a placebo group (n = 16). Constipation severity was assessed using the Wexner score, while QoL was evaluated using the Paediatric Functional Constipation Questionnaire–Parental Response (PedFCQ-PR). Baseline and post-intervention scores were compared between groups.

Results: Constipation prevalence was 25.8%, most common in GMFCS level V (53.3%), followed by level IV (26.7%). Lactulose use decreased significantly following intervention. The probiotics group demonstrated greater improvement in constipation severity, with a lower median Wexner score (9; IQR 7.0) compared to the placebo group (17; IQR 3.0), indicating persistent symptoms in the latter. QoL improved in the probiotics group across physical (55.6%), behavioural (28.6%), and social (20%) domains.

Conclusion: Probiotics, as an adjunct to standard care, improve constipation symptoms and QoL in children with CP, particularly in GMFCS levels III–V. Targeted use may also support more cost-effective management strategies.

Keywords: Cerebral palsy; constipation; placebo; probiotics; quality of life

OC7

Bridging Preclinical Bioenergetics Research and Clinical Practice: PBMC Mitochondrial Respiration in Healthy Middle-Aged Adults

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ABSTRACT

Background/objective: Mitochondrial dysfunction is increasingly implicated in ageing and the pathogenesis of non-communicable diseases (NCDs), highlighting the importance of identifying accessible biomarkers of mitochondrial health. This study evaluated sex-related differences in mitochondrial respiration among healthy middle-aged adults using peripheral blood mononuclear cells (PBMCs) as a minimally invasive translational biomarker.

Methods: A total of 137 participants aged 35–50 years without previously diagnosed medical conditions were included. PBMCs were isolated, and real-time mitochondrial oxygen consumption rate (OCR) was quantified using the Seahorse XF Cell Mito Stress Test with the Seahorse XF HS Mini Analyser. Mitochondrial respiration parameters assessed included basal respiration, maximal respiration, ATP-linked respiration, spare respiratory capacity, proton leak, and non-mitochondrial respiration.

Results: Male participants demonstrated slightly higher median OCR values for basal respiration, maximal respiration, ATP-linked respiration, and spare respiratory capacity compared with females. However, no statistically significant differences were observed between sexes for all mitochondrial parameters evaluated, including basal respiration ($p = 0.94$), maximal respiration ($p = 0.66$), ATP-linked respiration ($p = 0.95$), spare respiratory capacity ($p = 0.46$), proton leak ($p = 0.42$), and non-mitochondrial respiration ($p = 0.86$).

Conclusion: These findings suggest that mitochondrial bioenergetic profiles are generally comparable between males and females within a healthy middle-aged population. PBMC based mitochondrial respiration analysis may serve as a practical and innovative approach for early assessment of metabolic and mitochondrial health in NCD research and clinical practice. The application of this translational bioenergetic platform may contribute to early risk stratification, disease prevention, and precision health strategies targeting age-related chronic diseases.

Keywords: Biomarker discovery; cellular bioenergetics; metabolic health; peripheral blood mononuclear cells; Seahorse XF Analyser

OC8

In Vivo Evaluation of a 3D-Bioprinted Gelatin/Hyaluronic Acid/Thymoquinone Hydrogel for Diabetic Dermal Wound Healing

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ABSTRACT

Background & objective: Diabetic dermal wounds heal slowly and often incompletely because hyperglycaemia disrupts inflammation control, fibroblast function, and angiogenesis. This creates an urgent need for bioactive wound dressings that restore a pro-regenerative extracellular matrix microenvironment. This study evaluated whether an in-situ 3D-bioprinted gelatine/hyaluronic acid (GEL-HA) hydrogel incorporating thymoquinone (TQ) could accelerate wound closure and improve tissue regeneration in a streptozotocin (STZ)-induced diabetic mouse excisional wound model.

Methods: A 10 wt% GEL-0.4 wt% HA bioink was pre-crosslinked with 0.1 wt% genipin, loaded with mouse skin fibroblasts (1.5×10^6 cells/mL), and bioprinted to generate ~2–3 mm constructs. Diabetic C57BL/6 mice were allocated into treatment and control groups, with wound closure quantified using ImageJ and tissue repair evaluated by histology, alongside haematological and biochemical safety profiling.

Results: The printed hydrogels maintained structural integrity and demonstrated reproducible morphology after extrusion. The GEL HA-TQ bioink produced the greatest wound contraction, achieving near-complete closure (~94.7%) by Day 15 and substantially outperforming untreated diabetic controls. Histological analyses confirmed enhanced re-epithelialisation, improved dermal organisation, denser collagen deposition, and reduced inflammatory infiltrates in the GEL HA-TQ group. Picrosirius Red staining suggested improved collagen maturity and alignment, indicating progression toward the remodelling phase. Importantly, haematological and serum biochemistry analyses revealed no clinically significant systemic toxicity, with liver, kidney, and pancreatic markers remaining within acceptable ranges.

Conclusion: Overall, in situ 3D bioprinting of a genipin-crosslinked GEL-HA-TQ hydrogel represents a promising bioactive strategy for accelerating diabetic wound healing while maintaining systemic safety.

Keywords: Diabetic wound healing; gelatine; genipin crosslinking; hyaluronic acid; thymoquinone; 3D bioprinting

OC9

Effects of Palm Tocotrienol on Bone in a Rat Model with Androgen Deficiency and Gut Dysbiosis

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ABSTRACT

Background & objective: The gut-bone axis is an important regulator of skeletal health. However, the implications of sex hormone deficiency and altered gut microbiota composition for bone are still unclear. Palm tocotrienol has been shown to modulate gut microbiota composition and improve bone health, but whether these effects are mediated through the gut-bone axis remains uncertain. This study aimed to investigate the effects of palm tocotrienol on bone loss induced by orchidectomy (ORX) and gut dysbiosis in rats.

Methods: Three-month-old male Sprague Dawley rats were divided into five groups (n = 8/group): SHAM, ORX, ORX+ANT, ORX+PT3, and ORX+ANT+PT3. ORX groups underwent bilateral orchidectomy, ANT groups received ampicillin, sulfamethoxazole, and trimethoprim, and PT3 groups received palm tocotrienol (60 mg/kg) for three months. Bone mineral content (BMC) and density (BMD) were measured monthly, and femurs were analysed for biomechanical strength and bone structure post-sacrifice.

Results: Whole-body BMD and BMC, as well as femoral BMC, were lower in ORX+ANT and ORX+ANT+PT3 than SHAM at month three (p < 0.05). Femoral BMD was lower in ORX versus SHAM at month one (p < 0.05). ORX, ORX+ANT and ORX+ANT+PT3 showed reduced Young's modulus, maximum force, stress and stiffness compared to SHAM (p < 0.05). Histologically, SHAM showed the highest bone volume to trabecular volume (BV/TV) compared to all other groups (p < 0.05). However, the ORX+PT3 group exhibited higher BV/TV and trabecular number but lower trabecular separation compared with other ORX groups (p < 0.05).

Conclusion: Testosterone deficiency with gut dysbiosis negatively affects bone health in male rats, while palm tocotrienol may partially improve it.

Keywords: Antibiotics; gut microbiota; osteoporosis; testosterone deficiency; vitamin E

Healthcare System Implementation and Evaluation
OD2

Medical and Dental Officers in Leadership Roles: Bridging the
Governance Competency Gap

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ABSTRACT

Background & objective: As healthcare systems face complex challenges in service delivery and organisation, medical and dental officers transitioning into managerial roles must manage increasing administrative and governance responsibilities. Often, they make this transition with limited formal training. This study aimed to explore the administrative knowledge and skills required of healthcare managers to effectively lead and sustain public health institutions.

Methods: A qualitative approach was used, with purposive sampling to conduct semi-structured interviews with participants from 20 Ministry of Health facilities across Malaysia. Participants included hospital directors, district health officers, and district dental health officers. Transcripts were analysed using both inductive and deductive thematic analysis. To enhance transparency, emerging administrative knowledge areas and skill sets were mapped onto predefined clinical governance domains, aligning practical field insights with institutional frameworks.

Results: Analysis identified specific administrative needs. Essential knowledge areas included financial literacy, human resource policies, understanding of policy, and medico-legal frameworks. Four main themes of skills were highlighted: interpersonal and leadership skills (including emotional intelligence and conflict resolution), strategic management (focusing on resource prioritisation), technical skills (such as data-driven decision-making in epidemiology), and personal qualities (like adaptive leadership and mentorship).

Conclusion: Moving from clinical practice to administration demands a strong governance foundation. Evidence-based training modules, rooted in real-world field conditions, close the leadership gap and improve strategic skills necessary for effective management of complex health systems.

Keywords: Administrative governance; capability framework; leadership development; qualitative research; succession planning

OD3

The Prevalence of Imposter Syndrome and Its Association with Psychological Distress: A Cross-Sectional Study

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ABSTRACT

Background & objective: Imposter Syndrome (IS) is characterised by persistent self-doubt and feelings of intellectual fraudulence despite evidence of competence. It is highly prevalent among high-achieving individuals, particularly university students. Although IS is believed to be linked with psychological distress such as anxiety and depression, regional data from the Middle East remain limited. This study aimed to assess the prevalence of IS among undergraduate students at Sultan Qaboos University (SQU) and assess its association with depression and anxiety.

Methods: A cross-sectional study was conducted among 504 stratified-randomly selected full-time undergraduate students at SQU. Participants completed a validated online questionnaire including the Clance Imposter Phenomenon Scale (CIPS), Patient Health Questionnaire-9 (PHQ-9), and Generalised Anxiety Disorder-7 (GAD-7). Statistical analyses included Pearson's correlation, chi-square testing, and logistic regression.

Results: IS was present in 56% of participants. CIPS scores were moderately correlated with depression ($r = 0.486$, $p < 0.001$) and anxiety ($r = 0.472$, $p < 0.001$). Students who experienced imposter syndrome showed a higher probability of developing depressive symptoms ($\chi^2 = 45.63$, $p < 0.001$, OR = 3.49) and anxiety symptoms ($\chi^2 = 32.96$, $p < 0.001$, OR = 2.86). Logistic regression showed that depressive ($B = 0.096$, $p < 0.001$) and anxiety symptoms ($B = 0.075$, $p = 0.003$) were significant predictors of IS.

Conclusion: This study reveals a strong link between imposterism, depression, and anxiety among students, underscoring the need for targeted counselling interventions and clinical recognition of the phenomenon.

Keywords: Anxiety; depression; imposter syndrome; Oman; students

OD4

The Use of Enhanced Audio-Visual Education Tool to Improve Bowel Preparation in Outpatient Setting: A Randomised Controlled Trial

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ABSTRACT

Background & objective: Bowel preparation is essential for diagnostic accuracy during colonoscopy. We hypothesised that a multilingual audio-visual educational tool could improve bowel preparation quality among outpatients undergoing colonoscopy.

Methods: This single-centre, single-blinded, randomised controlled trial was conducted at Sarawak General Hospital. A total of 308 patients were randomised equally into intervention (n=154) and control (n = 154) groups. The control group received standard written instructions, while the intervention group received an instructional video in their preferred language (Sarawak Malay, Mandarin, Iban, or English). The primary outcome was the Boston Bowel Preparation Score (BBPS). Secondary outcomes included adequate bowel preparation (BBPS ≥ 6), polyp detection rate, caecal intubation rate, and factors associated with bowel preparation quality. Statistical analyses included Mann-Whitney U, Chi-square, Fisher's exact, and multivariable logistic regression.

Results: Although median BBPS was identical between groups (6 [IQR 1] vs 6 [IQR 1]), the intervention group demonstrated significantly higher overall BBPS ranks (U = 7676, Z = -5.743, p < 0.001). Adequate bowel preparation was achieved more frequently in the intervention group than the control group (81.8% vs 60.4%, p < 0.001). Polyp detection rates were also significantly higher in the intervention group (68.2% vs 42.9%, p < 0.001). Multivariable analysis showed that the intervention independently predicted adequate bowel preparation (adjusted OR 3.02, 95% CI 1.75-5.20; p < 0.001) and higher polyp detection (adjusted OR 3.18, 95% CI 1.95-5.19; p < 0.001). Caecal intubation rates were comparable between groups (94.2% vs 90.9%; p = 0.40).

Conclusion: A multilingual audio-visual educational tool significantly improves bowel preparation quality and polyp detection rates in outpatient colonoscopy.

Keywords: Audio-visual tool kit; bowel preparation; colonoscopy

OD5

Short-Term Evaluation of Laparoscopic Training Module on the Surgical Trainee Performance in Paediatric Hernia Repair

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ABSTRACT

Background & objective: Simulation-based training is widely used in laparoscopic surgery, but its translation to intraoperative performance varies. This study evaluated the impact of a structured laparoscopic training module on operative performance among postgraduate surgical trainees compared with conventional training.

Methods: A prospective comparative pilot study at a tertiary paediatric centre involved six trainees, divided into an intervention group ($n = 3$, structured simulation and supervised exposure) and a control group ($n = 3$, conventional apprenticeship). Operative performance was assessed during paediatric laparoscopic herniotomy using the Global Operative Assessment of Laparoscopic Skills (GOALS). Secondary outcomes included operative time, complications, and postoperative pain. Thirty cases yielded 37 operative-side observations for analysis ($p < 0.05$).

Results: The control group demonstrated higher operative performance, with significantly better GOALS scores in depth perception ($p < 0.01$), efficiency ($p = 0.004$), and tissue handling ($p = 0.037$). Total GOALS scores showed no statistically significant difference. The intervention group had longer operative times, specifically for port insertion (mean difference = 6.00 minutes, $p < 0.01$) and purse-string suturing (mean difference = 6.48 minutes, $p = 0.046$). Complication rates and postoperative pain did not differ significantly between groups.

Conclusion: A structured laparoscopic training module did not improve immediate intraoperative performance compared with conventional training, though patient safety was maintained. Simulation-based training alone may not confer immediate advantages, highlighting the need for better integration with clinical exposure and structured supervision to optimise surgical training outcomes.

Keywords: GOALS; laparoscopic hernia herniotomy; laparoscopic training; simulation-based training; surgical education

OD7

Beyond Validation: Uncovering Hidden Mortality Risk in Malaysian Cardiac Surgery and Introducing the Adult Cardiac Surgery Risk Framework in Hospital Canselor Tuanku Muhriz

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ABSTRACT

Background & objective: Accurate perioperative risk prediction is critical for patient counselling, resource allocation, and benchmarking in adult cardiac surgery, yet Western-derived calculators such as the Society of Thoracic Surgeons (STS) 2023 Operative Risk Calculator have not been validated in Malaysia. This study evaluated STS 2023 performance in a Malaysian teaching hospital cohort and proposed the HCTM-ACS Risk Framework as a locally calibrated concept for future validation.

Methods: A retrospective cohort of 244 consecutive adult patients undergoing elective cardiac surgery, including isolated coronary artery bypass grafting, isolated valve, and combined procedures, at Hospital Canselor Tuanku Muhriz, Kuala Lumpur, from January 2020 to January 2024 was analysed. Predicted 30-day mortality was calculated using STS 2023 and EuroSCORE II. Discrimination was assessed using the area under the receiver operating characteristic curve (AUC), and calibration was explored by comparing observed versus predicted mortality across risk quintiles.

Results: Observed 30-day mortality was 4.9% (12/244), substantially higher than predicted by STS 2023 (1.05%) and EuroSCORE II (1.01%), indicating significant underestimation. Both models exhibited poor discrimination (STS AUC = 0.551, 95% CI 0.392–0.687; EuroSCORE II AUC = 0.407, 95% CI 0.271–0.538). Local risk factors, including peripheral arterial disease, immunosuppression, and impaired functional status, were underrepresented in these Western models.

Conclusion: This is the first Malaysian validation of STS 2023. It demonstrates clinically important hidden risk and underscores the limitations of adopting Western-derived calculators without local evaluation. The proposed HCTM-ACS Risk Framework provides a starting point for prospective validation and potential adaptation across Malaysia and ASEAN, supporting accurate perioperative risk stratification, patient counselling, and regional benchmarking.

Keywords: HCTM-ACS; local calibration; mortality underestimation; Malaysia; risk prediction; STS 2023

OD8

Knowledge, Attitude and Prescribing Practice of Emergency Contraception among Primary Care Doctors in Hulu Langat District

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ABSTRACT

Background & objective: Unintended pregnancy remains an important public health concern, and timely access to emergency contraception can reduce its occurrence. Although primary care doctors are often the first contact for reproductive health care, local evidence on emergency contraception service delivery remains limited. This study aimed to assess the knowledge, attitudes and prescribing practices of emergency contraception among primary care doctors in Hulu Langat District and to identify factors associated with prescribing practices.

Methods: A cross-sectional study was conducted among primary care doctors working in government health clinics in Hulu Langat District from June to December 2025. A total of 203 doctors were recruited using simple random sampling. Data were collected using a validated self-administered questionnaire assessing knowledge, attitude and prescribing practice related to emergency contraception. Data were analysed using descriptive statistics, bivariate analyses and hierarchical multiple linear regression.

Results: Overall, 70.1% of respondents demonstrated good knowledge, 68.8% showed a positive attitude. Knowledge was significantly associated with continuing medical education recency, while attitude was significantly associated with religion and race. Prescribing practice was significantly associated with continuing medical education exposure and marital status. In the final regression model, attitude was the strongest independent predictor of prescribing practice ($B = 0.43$, $p < 0.001$), followed by knowledge ($B = 0.21$, $p = 0.020$).

Conclusion: Primary care doctors demonstrated generally good knowledge and positive attitude, but gaps remain in translating knowledge into practice. Attitude-focused educational interventions improved regulatory understanding, and system-level support is needed to improve access to timely reproductive health services.

Keywords: Contraceptive counselling; primary health care; reproductive health services

OD9

Initiating a Cardiac Electrophysiology Service at a Naive Centre: Strategic Solutions to Operational Challenges

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ABSTRACT

Background & objective: Cardiac electrophysiology (EP) and advanced device therapies are highly specialised fields requiring complex infrastructure. Establishing these services at a naive clinical centre presents unique organisational hurdles. This study aims to identify the primary operational challenges encountered during the initiation of a de novo EP service and outlines the strategic solutions implemented to achieve clinical viability.

Methods: A retrospective descriptive analysis was conducted on the operational phase of launching a comprehensive EP and advanced device program at our institution. Over a 12-month period, we evaluated systemic bottlenecks across three core domains: specialised infrastructure acquisition, multidisciplinary team training, and institutional protocol development.

Results: The primary challenges identified were: (i) procurement delays for advanced 3D mapping systems and capital equipment; (ii) a steep learning curve for nursing and technical staff unfamiliar with complex EP workflows; and (iii) initial referral hesitation from regional clinics. To address these, we established a structured, continuous training framework for allied health staff and instituted a clear, evidence-based triage pathway. Consequently, the centre successfully performed its series of complex radiofrequency ablations and cardiac resynchronisation therapy (CRT) device implantations with minimal major perioperative complications.

Conclusion: Initiating a cardiac EP service at a naive centre demands meticulous planning that extends beyond equipment procurement. Overcoming initial operational friction requires intensive staff education and proactive referral networks. Our initial experience demonstrates that a structured development model can successfully mitigate these hurdles, providing a scalable blueprint for other institutions aiming to establish advanced cardiac services safely.

Keywords: Cardiac implantable electronic devices; electrophysiology; naive centres

POSTER PRESENTATIONS
Anaesthesiology, Critical Care & Surgery
A1

Safety and Efficacy of Ethanol Ablation for Benign Thyroid Cyst

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ABSTRACT

Background and objective: Ethanol ablation (EA) is a minimally invasive alternative to surgery for benign cystic thyroid nodules. This study evaluated its safety and effectiveness in reducing nodule volume and improving cosmetic outcomes.

Methods: Twelve patients with benign cystic thyroid nodules underwent ultrasound-guided EA. Baseline nodule volume, aspirated cystic content, and injected ethanol volume were recorded. Follow-up at 3 and 6 months assessed nodule volume, volume reduction rate (VRR), cosmetic outcomes, and pain scores.

Results: The median baseline nodule volume was 13.2 mL (IQR 7.5-27.15). Median aspirated volume was 12.1 mL (IQR 7.75-28.5), while the median injected ethanol volume was 12 mL (IQR 5.5–20). Nodule volume decreased significantly to 2.1 mL (IQR 0.55-6.1) at 3 months and 1.55 mL (IQR 0.28-3.45) at 6 months. Median VRR was 91.5% (IQR 42.2-96.9) and 92.3% (IQR 59.3-98.7) at 3 and 6 months, respectively ($p < 0.001$). Cosmetic scores improved from 4 (IQR 4-4) at baseline to 1 (IQR 1–1) at follow-up. Pain was minimal, with a median score of 1 (IQR 0-1) within 30 minutes after the procedure and 0 thereafter. No major complications were observed.

Conclusion: EA is a safe and effective treatment for benign cystic thyroid nodules, achieving substantial volume reduction, excellent cosmetic improvement, and minimal adverse effects.

Keywords: Benign; ethanol ablation; thyroid cyst

A2

Preliminary Evaluation of Glycaemic Status and Inflammatory Markers in Sepsis Patients with Type 2 Diabetes Mellitus

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ABSTRACT

Background and objective: Chronic hyperglycaemia is associated with persistent low-grade inflammation, which may persist during sepsis. This study preliminarily evaluated the relationship between glycaemic status and inflammatory markers in sepsis patients.

Methods: 51 sepsis patients recruited at the emergency department of Hospital Canselor Tuanku Muhriz (HCTM) were stratified into non-diabetes mellitus (non-DM, n = 15), well-controlled type 2 diabetes mellitus (T2DM) (n = 17), and poorly controlled T2DM (n = 19). Glycated haemoglobin (HbA1c), C-reactive protein (CRP), and white blood cell (WBC) count were retrieved from hospital laboratory records. Plasma procalcitonin (PCT) level was quantified using enzyme-linked immunosorbent assay (ELISA). The correlation between HbA1c and inflammatory markers was analysed using Spearman's rank correlation test.

Results: CRP levels differed significantly among groups ($p < 0.05$), with Dunn's test showing higher CRP levels in poorly controlled T2DM patients than non-DM patients ($p < 0.05$). No significant differences were observed in WBC count and PCT between groups ($p > 0.05$). HbA1c showed a significant positive correlation with CRP levels ($r_s = 0.357$, $p = 0.012$). No significant correlations were observed with PCT or WBC count.

Conclusion: These findings suggest that chronic hyperglycaemia may contribute to an amplified inflammatory response during sepsis, reflected by elevated CRP levels. Further studies with larger cohorts are warranted to validate these findings.

Keywords: Diabetes mellitus; glycated haemoglobin; inflammation; sepsis

A3

Impact of Critical Care Pain Observation Tool Guided Pain Assessment and Pain Control on Mobilisation and Clinical Outcomes among Critically Ill ICU Patients

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ABSTRACT

Background & objective This study investigated how pain assessment via the critical care pain observation tool (CPOT) and opioid analgesia influence mobilisation, intensive care unit (ICU) length of stay (LOS), and ventilator-associated pneumonia (VAP) incidence in mechanically ventilated adults.

Methods: A prospective observational study of 245 patients (June 2024–November 2025) tracked clinical parameters: Glasgow Coma Scale, Richmond Agitation-Sedation Scale, Sequential Organ Failure Assessment, and Confusion Assessment Method for the ICU, alongside CPOT scores and opioid exposure over 15 days. Multivariate regression analysis identified independent predictors.

Results: Early mobilisation was significantly associated with the timing (ICU day) of the maximum CPOT score (AOR 0.61; 95% CI: 0.492-0.758; $p < 0.001$), regardless of score intensity. Increased opioid duration and dosage correlated (AOR 2.96; 95% CI: 1.977-4.417; $p < 0.001$) with delayed mobilisation. The multivariate model showed that that ICU day of maximum CPOT score ($B=1.57$; 95% CI: 1.030-2.111; $p < 0.001$ for LOS and AOR 1.18; 95% CI: 1.033-1.344; $p < 0.01$ for VAP) and the duration of routine opioid analgesia ($B = 1.95$; 95% CI: 1.639-2.254; $p < 0.001$ for LOS and AOR 1.45; 95% CI: 1.249-1.677; $p < 0.001$ for VAP) were independent predictors of clinical outcomes. Maximum CPOT intensity and cumulative dosage were not significant predictors after adjustment.

Conclusion: Trajectory-related pain markers and opioid duration better predict recovery than peak pain intensity. Outcomes are more critically influenced by the timing of pain and persistence of interventions than by the maximum recorded CPOT score.

Keywords: Mechanical ventilation; length of stay; opioid analgesia; pain trajectory; ventilator-associated pneumonia

A4

Bounce Back to the Emergency Department: What Precedes Early Unscheduled Return Visits?

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ABSTRACT

Background and objective: Early unscheduled return visits (EURVs) to the emergency department (ED) impose substantial burdens on healthcare systems and are recognised indicators of emergency care quality. While factors contributing to EURVs include input (pre-arrival factors), throughput (intra-ED processes), and output (disposition-related factors), input factors warrant particular attention as they may reflect unmet care needs preceding ED revisits. This scoping review mapped input factors related to adult EURVs in Asian settings to inform context-specific emergency care planning.

Methods: A scoping review was conducted in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Review. PubMed, Scopus, and Web of Science were searched for studies published between January 2014 and March 2024. Studies examining factors related to EURVs among adults within nine days of index ED visits, a timeframe adapted from Rising et al., in Asian settings were included. Input-related factors were extracted and thematically synthesised.

Results: Thirteen of the 19 included studies reported input-related factors. Reported factors included sociodemographic characteristics (advancing age, ethnicity, gender, socioeconomic disadvantage, being divorced), pre-existing medical factors (underlying chronic diseases, prior hospitalisation, post-discharge care dependency, polypharmacy), symptom-related factors (persistent or worsening symptoms, atypical index presentations), and healthcare access-related factors (arrival by ambulance, off-hour ED presentations, insurance coverage, health-seeking behaviour).

Conclusion: The input factors identified provide insight into the complex care needs that precede EURVs. Integrating these factors into emergency and transitional care planning may facilitate earlier risk identification and strengthen coordinated cross-sector care pathways to improve healthcare quality and continuity of care.

Keywords: Adults; Asia; emergency care; factors; input

A5

Adherence to Early Medical Nutrition Therapy Guidelines and Its Association with Clinical Outcomes in Critically Ill Patients: A Prospective Study

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ABSTRACT

Background and objective: Medical nutrition therapy (MNT) is an important component of supportive care in critically ill patients. Acute physiological stress induces a hypercatabolic state linked to poor outcomes. Guidelines recommend early nutritional support, particularly enteral nutrition, within 24–48 hours of ICU admission. This study evaluated the current MNT practices, comparison of early versus delayed feeding, and their association with clinical outcomes.

Methods: This prospective observational study included mechanically ventilated patients admitted between June 2024 and October 2025. Data collected included illness severity (APACHE II), nutritional risk (mNUTRIC score), timing and route of feeding, and caloric delivery within the first 96 hours. Feeding was classified as early (≤ 72 hours) or late (> 72 hours). Clinical outcomes included mechanical ventilation duration, ICU length of stay, and ICU mortality. A total of 279 patients were analysed.

Results: Median time to feeding initiation was 13 hours (IQR 4–28), with 95% receiving early nutrition. Among early-fed patients, 49.4% achieved 80% of caloric targets within 72 hours, compared with none in the late group ($p < 0.001$). NUTRIC and APACHE II scores showed a weak correlation with delayed feeding ($r = 0.13$, $p = 0.037$; $r = 0.12$, $p = 0.013$, respectively). However, feeding timing and route were not associated with differences in mechanical ventilation duration, ICU stay, or mortality.

Conclusion: Early MNT initiation was widely achieved and improved attainment of caloric targets but did not significantly impact short-term clinical outcomes. Delayed feeding was uncommon and mainly due to appropriate clinical reasons.

Keywords: Critical illness; enteral nutrition; intensive care unit; nutrition therapy; parenteral nutrition

A6

Validation of Questionnaire on Perception and Readiness of Anaesthesiology Doctors in Performing Emergency Front-of-Neck Airway

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ABSTRACT

Background & objective: The “cannot intubate, cannot oxygenate” (CICO) scenario is a rare, catastrophic emergency requiring an emergency front-of-neck airway (eFONA). Because successful execution relies heavily on psychological readiness, this study developed and validated a 12-item questionnaire to assess these non-technical factors among anaesthesiology doctors.

Methods: A cross-sectional validation study was conducted among medical officers, specialists, and consultants in Malaysia. Following expert content validation (n = 8) and a pilot study (n = 33), construct validation was performed on 256 responses using Exploratory Factor Analysis (EFA) with varimax rotation.

Results: The instrument demonstrated acceptable content (S-CVI/Ave = 0.875) and face validity (0.967). While 97.7% of respondents had never performed eFONA clinically, 55.9% had received formal training. EFA revealed a four-factor structure explaining 61.74% of the variance: (i) Clinical Readiness and Confidence, (ii) Fear of Complications and Medicolegal Anxiety, (iii) Task Fixation, and (iv) Decision Uncertainty. The overall Cronbach’s alpha was 0.522, consistent with the tool’s multidimensional nature.

Conclusion: This validated 12-item questionnaire effectively captures four distinct psychological domains - Confidence, Fear, Task Fixation, and Uncertainty - providing a reliable framework for evaluating non-technical factors in life-saving airway decisions.

Keywords: Confidence; eFONA; psychology readiness; questionnaire; validation

A7

Efficacy of Inhalational Ambroxol Hydrochloride for Prevention of Early Postoperative Pulmonary Complications: A Randomised Controlled Trial

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ABSTRACT

Background & objective: Postoperative pulmonary complications (PPCs) are common and associated with increased morbidity and mortality. Ambroxol hydrochloride enhances mucociliary clearance and surfactant production, but evidence for its role in preventing early PPCs remains limited. This study evaluated the effects of inhalational ambroxol on respiratory function and early PPCs.

Methods: This prospective, single-centre, single-blinded randomised controlled trial included 68 adult postoperative patients admitted to the post-anaesthetic care unit or general intensive care unit. Patients were randomised to receive saline nebulisation or inhalational ambroxol. Arterial blood gases and respiratory rate were recorded from postoperative day 1 to day 3. PPC incidence within 72 hours, hospital length of stay, and in-hospital mortality were assessed.

Results: No significant differences were observed in PaCO₂, PaO₂, or PaO₂/FiO₂ ratio. The ambroxol group had a lower respiratory rate on postoperative day 1 ($p = 0.019$), which was not sustained. PPC incidence was lower but not significant ($p = 0.190$). Other outcomes were similar.

Conclusion: Inhalational ambroxol was safe and associated with short-term respiratory effects, but its impact on broader postoperative clinical outcomes remains limited.

Keywords: Ambroxol hydrochloride; atelectasis; pneumonia; postoperative; prevention; randomised controlled trial

A9

A Prospective Observational Study Evaluating the Role of Preoperative Video Education in Reducing the Fear of Anaesthesia

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ABSTRACT

Background & objective: Preoperative fear is commonly experienced by patients undergoing surgery. This study investigated the role of preoperative video education in reducing the fear of anaesthesia and explored patients' knowledge on the role of the anaesthesiologist.

Methods: In this prospective observational study, the participants completed a validated questionnaire assessing demographic details, surgery and anaesthesia-related fears and knowledge of the anaesthesiologist's role. Subsequently, patients viewed a 10-minute educational video explaining anaesthesia. Content validation was done prior to the study. The questionnaire was re-administered post-video intervention. Fear levels were measured using a 5-point Likert scale. Pre- and post-intervention scores were compared using the Wilcoxon signed-rank test and McNemar tests.

Results: 84 participants were recruited. Median participant age was 36.5 years, with a predominance of female patients (66.7%). Post intervention, there were significant reductions in fears related to waking up during surgery ($p < 0.001$), not waking up after surgery ($p = 0.002$), memory loss ($p < 0.001$), heart attack ($p < 0.001$), stroke ($p < 0.001$), surgical complications ($p < 0.001$) and the anaesthesiologist leaving the room ($p = 0.014$). Fear of postoperative pain also decreased significantly ($p = 0.020$). Furthermore, patients' overall knowledge score regarding anaesthesia increased significantly from 66.67% to 77.78% ($p = 0.007$). Specifically, awareness that the anaesthesiologist monitors vital organs improved from 47.6% to 64.3% ($p = 0.004$).

Conclusion: Preoperative video education is effective in reducing fears of anaesthesia and improving patients' knowledge of the anaesthesiologist's role. Video-based information is a useful adjunct to standard preoperative counselling.

Keywords: Anaesthesia education; anaesthesiologist; patient knowledge; preoperative fear; video education

A10

The Feasibility of Enhanced Recovery After Surgery Protocol in Paediatric Related Gastrointestinal and Abdominal Surgery

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ABSTRACT

Background and objective: ERAS protocols have been widely adopted in adult surgery; however, they remain limited in paediatric surgery. A tailored ERAS protocol for paediatric surgical patients was designed based on the standard ERAS recommendations. This study was conducted to test the feasibility and effectiveness of the tailored ERAS protocol and its outcomes.

Methods: A case-control study of paediatric patients (≤ 18 years old) undergoing gastrointestinal and abdominal surgery was included. Patients managed using the tailored ERAS protocol were compared with a non-ERAS historical control group. Feasibility was assessed by compliance rate across 20 ERAS elements. The clinical outcomes evaluated were length of hospital stay (LOS), time to full feeding establishment, and postoperative complications.

Results: A total of 44 patients were included (22 in the ERAS group and 22 in the non-ERAS group). The overall compliance rate was high (mean 95.65%), demonstrating the acceptable feasibility of implementation. Patients managed under the ERAS pathway showed improved postoperative recovery compared with those managed with conventional care. The median LOS was shorter in the

ERAS group (144.5 hours) compared to the non-ERAS group (206.5 hours), although this difference did not reach statistical significance ($p = 0.069$). Time to full feeding establishment was significantly reduced in the ERAS group (median 35.0 hours) compared with the non-ERAS group (median 97.0 hours) ($p = 0.036$). No increase in postoperative complications or adverse events was observed.

Conclusion: The tailored ERAS protocol demonstrated feasibility, with high protocol compliance, and was associated with improved postoperative recovery, resulting in shorter hospital stays and earlier establishment of full enteral feeding compared with conventional perioperative care in paediatric surgical practice.

Keywords: Abdominal surgery; ERAS; gastrointestinal surgery; paediatric surgery

A11

Air-Q 3G vs Proseal Laryngeal Mask Airway: Comparing the Ease of Insertion, Leak Pressure and Post-Removal Complications Under General Anaesthesia

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ABSTRACT

Background & objective: Safe airway management is essential in anaesthesia. While proseal laryngeal mask airway (PLMA) is a well-established second-generation supraglottic airway device (SAD), the newer Air-Q 3G features a built-up mask heel and dual gastric channels. This study compared the clinical performance of the Air-Q 3G and the PLMA in patients undergoing elective surgery.

Methods: This prospective, randomised controlled trial enrolled 138 ASA I-II patients undergoing general anaesthesia, who were equally randomised to either the Air-Q 3G or PLMA group. Primary outcomes included insertion time, first-attempt success rate, and oropharyngeal leak pressure (OLP). Secondary outcomes were the ease of orogastric tube (OGT) insertion and postoperative complications.

Results: There were two dropouts in this study. There were no significant differences in terms of demography. There were no significant differences in median insertion time (Air-Q 3G: 35.0s vs. PLMA: 30.5s; $p = 0.903$) or first-attempt success rate (79.4% vs. 73.5%; $p = 0.140$). Both devices achieved a median OLP of 25 cmH₂O ($p = 0.386$). The OGT insertion success was similar in both groups (95.6% vs. 92.6%; $p = 0.718$). Haemodynamic changes were similar between the groups ($p > 0.05$). Postoperative complications, including sore throat (39.7% vs. 36.8%) and blood staining (25.0% vs. 16.2%), did not show significant differences. No hoarseness was reported.

Conclusion: Both the Air-Q 3G and PLMA are equally easy to insert with comparable OLP. Therefore, it can be concluded that Air-Q 3G can provide similar clinical performances as the PLMA.

Keywords: Airway management; equipment safety; general anaesthesia; laryngeal masks; oropharyngeal leak pressure

A12

Incidence of Postoperative Complications of Balanced Fluid Strategy at First 48 Hours of Critical Care Area Admission After Elective Lung Resection Surgery in a Malaysian Tertiary Hospital

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ABSTRACT

Background & objective: Intraoperative fluid strategy is a modifiable factor influencing postoperative outcomes in thoracic surgery. This study compares the impact of fluid administration on early postoperative complications among patients undergoing elective lung resection.

Methods: This retrospective study analysed 165 adult patients admitted to ICU/HDU after elective lung resections. Patients were stratified into Restrictive (<8ml/kg/hr), Balanced (8–10 ml/kg/hr), or Liberal (>10 ml/kg/hr) fluid strategy based on intraoperative fluid infusion rates. Postoperative complications within 48 hours were analysed.

Results: The balanced group had the lowest complication rate (1.25%), while the restrictive and liberal groups had higher rates (20% and 26.7%, respectively). Maintaining a balanced fluid strategy over 48 hours was safest compared to other transition patterns. Visual data showed a higher density of complications in lower infusion ranges. Surgical duration of more than 3 hours contributed to higher complication rates.

Conclusion: Balanced intraoperative fluid strategy minimises risk of postoperative complications in elective lung resection surgery. Restrictive approaches, while intended to reduce pulmonary risks, may increase renal and cardiovascular morbidity. Future guidelines should emphasise individualised, goal-directed fluid management.

Keywords: Elective lung resection; intraoperative fluid strategy; postoperative complications

A13

Long-Term Weight Loss and Metabolic Outcomes After Bariatric Surgery in a Large Asian Cohort: A Real-World Cohort Study

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ABSTRACT

Background: Metabolic-bariatric surgery (MBS) is the most effective treatment for obesity and associated metabolic complications. Long-term real-world outcome data from Asian populations remain limited.

Objective: To evaluate weight loss outcomes, metabolic outcomes, and clinical predictors of treatment response following bariatric surgery in a large Asian cohort, with longitudinal follow-up up to five years.

Methods: This retrospective cohort study analysed 1,478 adult patients who underwent primary bariatric surgery (laparoscopic sleeve gastrectomy [LSG], Roux-en-Y gastric bypass [RYGB], or one-anastomosis gastric bypass [OAGB]) between 2012 and 2022 at a single tertiary academic centre in Malaysia. The primary outcome was percentage total weight loss (%TWL) at 1, 3 and 5 years, analysed using an available-case approach. Secondary outcomes included longitudinal changes in glycated haemoglobin (HbA1c), blood pressure, and LDL cholesterol, with paired and cross-sectional analyses reported separately. Multivariable linear regression explored predictors of 1-year %TWL.

Results: Mean %TWL was $20.80 \pm 9.71\%$ ($n = 917$) at 1 year, $25.14 \pm 10.30\%$ ($n = 349$) at 3 years, and $24.52 \pm 10.98\%$ ($n = 107$) at 5 years. Among diabetic patients with paired pre-/postoperative HbA1c ($n = 35$), the mean 1-year reduction was 1.01% ($p = 0.007$); cross-sectional HbA1c among diabetic patients was $5.95 \pm 1.08\%$ at 1 year, with 80.9% achieving $\text{HbA1c} < 6.5\%$ and $47.8\% < 5.7\%$. The regression model was weak ($R^2 = 0.026$); pre-existing diabetes ($\beta = 1.83$, $p = 0.020$) and certain non-Malay ethnicities were associated with lower 1-year %TWL. The overall complication rate was 1.7% .

Conclusion: Bariatric surgery in this large Malaysian cohort resulted in significant 1-year weight loss with a favourable safety profile. Three- and five-year data, drawn from a selected subgroup of completers and subject to attrition bias, suggest sustained weight loss among those engaged in follow-up but should not be interpreted as population-level durability claims.

Keywords: Asian population; bariatric surgery; long-term outcomes; metabolic surgery; roux-en-Y gastric bypass; sleeve gastrectomy; total weight loss; type 2 diabetes

A14

Aerosolised Corticosteroid and Gentamicin Therapy for Montgomery T-Tube–Related Granulation Tissue: Clinical Outcomes from Case Series

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ABSTRACT

Background & objective: Granulation tissue formation is a common and challenging complication of Montgomery T-tubes, frequently resulting in airway obstruction and repeated endoscopic interventions. Conventional treatments are associated with high recurrence rates. This study evaluates a dual-modality topical approach combining aerosolised gentamicin and corticosteroids targeting both microbial colonisation and airway inflammation.

Methods: We conducted a case series of patients with Montgomery T-tubes complicated by clinically significant granulation tissue. Patients received combined aerosolised gentamicin and inhaled corticosteroid therapy. Outcomes assessed included symptomatic improvement, endoscopic reduction of granulation tissue, and requirement for repeat interventions during follow-up.

Results: All patients demonstrated marked reduction in granulation tissue with improved airway patency on endoscopic assessment. Significant symptomatic improvement, including reduced dyspnoea and secretion burden, was observed. Notably, the frequency of repeat endoscopic interventions decreased following initiation of therapy.

Conclusion: Combined aerosolised gentamicin and corticosteroid therapy represents a promising, minimally invasive adjunct for the management of T-tube-related granulation tissue. By concurrently addressing bacterial biofilm and inflammation, this approach may reduce recurrence and procedural burden. These findings provide preliminary evidence supporting a novel therapeutic strategy and warrant validation in larger prospective studies.

Keywords: Artificial airway; corticosteroid nebulisation; granulation tissue; laryngotracheal stenosis; medical therapy

A15

Factors Associated with In-Patient Mortality and Morbidity Among Acute Ischemic Stroke Patients (AIS) Presented to Emergency Departments

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ABSTRACT

Background & objective: Acute ischemic stroke (AIS) studies are critically important to the Emergency Department (ED) because the ED is the first point of contact and decisions made there directly determine neurological outcome, disability, and survival. This study aimed to identify the demographic factors, stroke severity scores and mode of treatment associated with outcomes, including in-hospital mortality and morbidity in Hospital Canselor Tuanku Muhriz (HCTM).

Methods: A retrospective study of 281 subjects was conducted, in which patients' folders were traced. Descriptive statistics summarised respondents' characteristics and outcomes. Chi-square and Mann-Whitney U tests evaluated associations between patient comorbidities, baseline stroke severity scores (NIHSS), and survival outcomes. Pearson correlation was used to determine the relationship between age and outcomes.

Results: A significant association was found between age ($p = 0.012$) and IHD ($p = 0.049$) as a mortality risk factor for AIS. Furthermore, baseline stroke severity scores, including the NIHSS ($p < 0.001$) and GCS ($p < 0.001$), demonstrated highly significant associations with early mortality in stroke patients. Chi-square test also showed a statistically significant correlation between management types and mortality ($\chi^2 (3) = 12.166$, $p = 0.007$).

Conclusion: These findings indicate that recognising this combination is crucial, as it identifies a group at very high risk of deterioration, complications, and poor outcomes, and directly influences emergency management and disposition.

Keywords: Acute ischemic stroke; Emergency Department; GCS; NIHSS

A16

Comparing the Clinical Performances of Bag-Valve-Mask Resuscitator with Timed Refill Valve Versus Conventional Resuscitator: A Simulation Study

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ABSTRACT

Background & objective: Bag-mask-ventilation (BMV) is crucial during cardiorespiratory collapse to deliver adequate tidal volume (VT) with the minimum risk of barotrauma. The VT, rate and peak pressure (Ppeak) generated depend on the type of bag-valve-mask (BVM) resuscitator used. This study aimed to compare the clinical performances of the VT Select BVM resuscitator (Intersurgical®) with an activated timed refill valve, without an activated timed refill valve and that of the conventional adult BVM resuscitator in simulated conditions.

Methods: Thirty anaesthesia medical officers were recruited into this study. They were instructed to simulate BMV via a test lung device using three modes of BVM, each for 2 minutes using one-hand technique, followed by a three-minute rest before repeating the same cycle using two hands. The sequence of BVM used was randomised using permuted blocks of six sequences. The VT, Ppeak and number of delivered breaths over each 2-minute cycle (rate) were noted.

Results: The VT Select BVM resuscitator restricted the VT, Ppeak and rate of BMV to statistically lower values compared to the conventional adult-size BVM resuscitator. The addition of an activated timed refill valve ensured a more consistent, lower-frequency breath delivery with each BMV, compared with when the timed refill valve was inactivated and with the conventional BVM resuscitator.

Conclusion: The Pulmodyne VT Select BVM resuscitator with activated timed refill valve delivers ventilation parameters that, although relatively suboptimal, are more closely aligned with current cardiopulmonary resuscitation guideline recommendations for ventilation rate, VT and airway pressures, compared with the conventional adult-size BVM resuscitator.

Keywords: Bag mask ventilation; peak pressure; rate; tidal volume; timed refill valve

A17

Assessment of Endotracheal Tube Cuff Pressure Fluctuations Over Time: A Comparative Study in Various Ventilation Modes in a Teaching Hospital Intensive Care Unit

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ABSTRACT

Background & objective: Maintaining appropriate endotracheal tube (ETT) cuff pressure within the safety range of 20–30 cmH₂O is essential to prevent complications related to underinflation or overinflation. This study aimed to evaluate how ETT cuff pressure fluctuates over time in intensive care unit patients receiving mechanical ventilation using adaptive support ventilation (ASV) and synchronised intermittent mandatory ventilation (SIMV) mode.

Methods: This prospective observational study included 70 patients ventilated in either ASV or SIMV mode. Initial ETT cuff pressures were standardised to 26 cmH₂O, then measured every 2 hours over an 8-hour period. We used a standard pressure gauge manometer to check and readings were documented. Any cuff pressures outside the 20–30 cmH₂O range was corrected to 26 cmH₂O and the necessary adjustments were recorded.

Results: Overall, there were no statistically significant differences in ETT cuff pressure changes between the ASV and SIMV groups at any measured time points. However, the ETT cuff pressures in the ASV group showed a significant reduction ($p = 0.040$) over 8 hours. In contrast, no significant time effects were found in the SIMV group, corresponding with higher PEEP and Ppeak noted in SIMV group. Although a decreasing trend was observed in ASV group, post-hoc analyses did not reveal significant differences between individual time points.

Conclusion: Despite similar ETT cuff pressure changes between ASV and SIMV groups, the reducing trend in ASV mode suggests that ventilation mode may influence cuff pressure behaviour, warranting consideration in monitoring protocols.

Keywords: Adaptive support ventilation; cuff pressure monitoring; endotracheal tube cuff pressure; intensive care unit; synchronised intermittent mandatory ventilation; ventilation modes

A18

Academic Resilience and Its Association with Personality Traits among Postgraduate Anaesthesiology Trainees in Universiti Kebangsaan Malaysia

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ABSTRACT

Background & objective: Academic resilience is the capacity of students to overcome adversities during their studies. It is crucial for postgraduate anaesthesiology trainees due to the rigorous clinical and academic demands. This study evaluates academic resilience among postgraduate anaesthesiology trainees at Universiti Kebangsaan Malaysia (UKM) and investigates its associations with personality traits, demographics, and work-related factors.

Methods: An observational, cross-sectional study of 141 active postgraduate anaesthesiology trainees was conducted using the 30-item Academic Resilience Scale (ARS-30) and 50-item Big Five Inventory (BFI) questionnaires. Multivariable binary logistic regression identified independent predictors of high academic resilience.

Results: The cohort demonstrated a mean global ARS-30 score of 115.69 ± 11.51 , reflecting moderate-to-high resilience. Overall, high academic resilience (defined as an ARS-30 score ≥ 115.69) was observed in 48.9% of trainees. Multivariable analysis identified four significant independent predictors: years of prior anaesthesia experience (AOR=1.30, CI:1.03-1.63, $p=0.028$), high extraversion (AOR = 12.96, CI: 1.16-144.37, $p = 0.037$), high neuroticism (AOR = 5.45, CI: 1.25-23.72, $p = 0.024$), and high agreeableness (AOR = 2.46, CI: 1.03-5.87, $p = 0.042$).

Conclusion: Academic resilience is associated with clinical experience in anaesthesia and specific personality traits such as extraversion, neuroticism and agreeableness. Extraversion and agreeableness facilitate adaptation to interpersonal demands, whereas high neuroticism uniquely confers a protective advantage by enhancing clinical vigilance. Recognising these mechanisms can inform targeted interventions to support trainees' well-being and ensure sustainable patient care.

Keywords: Big Five Inventory; coping behaviours; clinical seniority; medical education; stress adaptation

Public Health, Epidemiology & Metabolic Health

B2

Prevalence of Non-Suppressed Aldosterone Production in Malaysia: Association with High Dietary Salt Intake

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ABSTRACT

Background & objective: Excess dietary salt intake and autonomous aldosterone production contribute to hypertension and cardiovascular risk. Primary aldosteronism (PA), a common but underdiagnosed cause of secondary hypertension, is characterised by inappropriate aldosterone secretion despite sodium excess. This study examined the relationship between sodium intake and aldosterone production and estimated the prevalence of PA in a Malaysian population cohort.

Methods: Participants were recruited from the Malaysia Community Salt Survey (MyCoSS 2017-2018), a nationwide multi-ethnic cohort. Twenty-four-hour urine collections and blood samples were obtained for biochemical analyses, including urinary sodium and aldosterone excretion.

Results: A total of 759 participants were analysed. Urinary aldosterone excretion increased across sodium intake categories (<100 mmol/day, 100-200 mmol/day and >200 mmol/day), with median values of 2.37 (IQR = 2.20) µg/day, 2.97 (IQR = 2.33) µg/day and 3.66 (IQR = 3.55) µg/day, respectively. Elevated urinary aldosterone excretion (>10 µg/day) was observed in 2.0% (n=15) of participants, while 7.9% (n = 60) had very high sodium intake (>200 mmol/day). Among those with very high sodium intake, 10.0% (95% CI: 2.4-17.6) demonstrated autonomous aldosterone production, defined as aldosterone excretion >10 µg/day despite high sodium intake. Using the serum sodium-to-urinary sodium-to-(serum potassium)²-to-urinary potassium (SUSPPUP) screening ratio, the estimated prevalence of PA was 4.6% (95% CI: 1.5-7.7) in a subset of participants with random sodium intake.

Conclusion: This study provides population-level evidence of impaired aldosterone suppression in Malaysians with high dietary sodium exposure and suggests a clinically relevant prevalence of PA, supporting broader screening strategies and dietary sodium reduction to mitigate cardiovascular risk.

Keywords: Adrenal; hypertension; primary aldosteronism; SUSPPUP; sodium intake

B3

Measurement Tools to Assess Self-Management Behaviour in Patients with Knee Osteoarthritis: A Systematic Review

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ABSTRACT

Background & objective: Knee Osteoarthritis (KOA) is one of the most common chronic diseases, resulting in poor prognosis of physical function and disability. Self-management is one of the most effective approaches for reducing osteoarthritis symptoms. Despite its relevance, it remains unclear which measurement instruments are most suitable for evaluating self-management behaviour in people with KOA. The goal of this systematic review was to systematically evaluate the psychometric properties of existing KOA patient self-management measurement tools.

Design: A systematic review based on COSMIN methodology.

Methods: In this study, four English and four Chinese databases were systematically searched for relevant publications to identify studies that include instrument(s) measuring KOA patient self-management. Two researchers independently performed literature screening, data extraction, and literature evaluation.

Results: A total of 6 studies reporting 6 eligible instruments were included. No studies have reported cross-cultural validity, measurement error, or responsiveness of the instruments.

Conclusion: Based on the findings of this study, one instrument was recommended as Grade C, and the remaining five instruments were recommended as Grade B. The ASMAT Instrument is considered the most appropriate tool for assessing KOA patient self-management behaviour among the available instruments. Future related instrument development should be based on more rigorous testing and reporting to ensure the validity and reliability of the instruments.

Keywords: Knee osteoarthritis; measurement tools; systematic review; self-management behaviour

B4

Parasomnias among Undergraduate Students at Sultan Qaboos University: A Mixed-Method Study

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ABSTRACT

Background & objective: Parasomnias can disrupt sleep, impair daytime functioning and compromise academic performance, yet evidence from university populations in Oman remains scarce. This study aimed to determine the prevalence, symptom profile and factors associated with parasomnia severity among undergraduate students at Sultan Qaboos University.

Methods: A cross-sectional mixed-methods study was conducted among undergraduate students using an online self-administered questionnaire. The survey collected sociodemographic data and assessed parasomnia symptoms using the Munich Parasomnia Screening questionnaire. Quantitative data were analysed using descriptive statistics, independent-sample t-tests and one-way analysis of variance, while free-text responses on unusual nocturnal behaviours were examined through content analysis.

Results: Among 467 participants, the most frequently reported current symptoms were hypnic jerks (43.04%), nightmares (37.05%) and hypnagogic/hypnopompic hallucinations (27.41%). Female students had significantly higher total parasomnia scores than male students ($p = 0.002$). Parasomnia severity also varied significantly by grade point average ($p = 0.001$), with higher scores among students with lower academic performance, and by residential status ($p = 0.047$). Qualitative analysis generated seven themes, including complex motor activity, sleep paralysis, unconscious communication, autonomic symptoms, anxiety-related sleep disruption and sensory-perceptual disturbances.

Conclusion: Parasomnia symptoms were common in this university sample and were associated with gender, academic performance and residential status. These findings provide early evidence from Oman and support integrating sleep-health screening, stress management and targeted residential support into university health services.

Keywords: Academic performance; nocturnal behaviours; residential status; sleep disturbance; sleep health

B5

The Prevalence of Imposter Syndrome and Its Association with Psychological Distress: A Cross-Sectional Study

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ABSTRACT

Background & objective: Imposter Syndrome (IS) is characterised by persistent self-doubt and feelings of intellectual fraudulence despite evidence of competence. It is highly prevalent among high-achieving individuals, particularly university students. Although IS is believed to be linked with psychological distress such as anxiety and depression, regional data from the Middle East remain limited. This study aimed to assess the prevalence of IS among undergraduate students at Sultan Qaboos University (SQU) and assess its association with depression and anxiety.

Methods: A cross-sectional study was conducted among 504 stratified-randomly selected full-time undergraduate students at SQU. Participants completed a validated online questionnaire including the Clance Imposter Phenomenon Scale (CIPS), Patient Health Questionnaire-9 (PHQ-9), and Generalised Anxiety Disorder-7 (GAD-7). Statistical analyses included Pearson's correlation, chi-square testing, and logistic regression.

Results: IS was present in 56% of participants. CIPS scores were moderately correlated with depression ($r = 0.486$, $p < 0.001$) and anxiety ($r = 0.472$, $p < 0.001$). Students who experienced imposter syndrome showed a higher probability of developing depressive symptoms ($\chi^2 = 45.63$, $p < 0.001$, OR = 3.49) and anxiety symptoms ($\chi^2 = 32.96$, $p < 0.001$, OR = 2.86). Logistic regression showed that depressive ($B = 0.096$, $p < 0.001$) and anxiety symptoms ($B = 0.075$, $p = 0.003$) were significant predictors of IS.

Conclusion: This study reveals a strong link between imposterism, depression, and anxiety among students, underscoring the need for targeted counselling interventions and clinical recognition of the phenomenon.

Keywords: Anxiety; depression; imposter syndrome; Oman; students

B7

Evaluating the Quality of Life among Lower Limb Amputees with Peripheral Artery Disease

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ABSTRACT

Background & objective: Peripheral artery disease (PAD) is a common condition that may progress to chronic limb-threatening ischemia requiring lower limb amputation. Quality of life (QoL) is an important outcome, yet the impact of amputation level remains unclear. This study aimed to evaluate the QoL among lower limb amputees due to PAD, comparing outcomes between major and minor amputation groups, and identifying factors associated with QoL.

Methods: A cross-sectional study was conducted among 86 patients with PAD who underwent lower limb amputation at a single tertiary hospital. Participants were categorised into major and minor amputation groups. QoL was assessed using the Short Form Health Survey version 2 (SF-36v2®) questionnaire.

Results: Overall QoL was reduced, with both physical component summary (PCS) and mental component summary (MCS) scores below the population norm of 50 (PCS: 37.47; MCS: 43.98). Physical health was more adversely affected than mental health. Both amputee groups demonstrated impaired QoL, with lower PCS than MCS scores (major: PCS 38.54, MCS 44.89; minor: PCS 35.48, MCS 42.27). QoL scores were comparable across most SF-36v2 domains. Significant difference was observed in the bodily pain domain, with major amputees reporting better scores than minor amputees ($p < 0.019$). Multiple linear regression identified alcohol consumption and functional status as factors associated with PCS, while dependency status and residence location were associated with MCS.

Conclusion: QoL is substantially impaired. Pain and functional status remain key determinants of QoL. A comprehensive approach incorporating pain control, rehabilitation and psychosocial support is essential to improve patient outcomes.

Keywords: Lower limb amputation; peripheral arterial disease; quality of life; SF-36v2

B8

Undiagnosed Diabetes in Urban Malaysia: Prevalence and Associated Factors from National Health and Morbidity Survey 2023

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ABSTRACT

Background & objective: The global prevalence of diabetes continues to rise, with undiagnosed cases posing a major public health concern due to delayed treatment and the increased risk of long-term complications. This study aimed to determine the prevalence of undiagnosed diabetes and its associated factors.

Methods: This study involved a sub-analysis of secondary data from the National Health and Morbidity Survey 2023, a cross-sectional survey involving 8,289 respondents aged 18 years and above. Data were collected using structured and validated questionnaires administered through face-to-face interviews. Undiagnosed diabetes was defined as respondents with no known history of diabetes who had fasting capillary blood glucose (FBG) ≥ 7.0 mmol/L or random blood glucose ≥ 11.1 mmol/L. Multiple logistic regression analysis was performed to identify factors associated with undiagnosed diabetes.

Results: The prevalence of undiagnosed diabetes among the urban population was 5.1%. Factors significantly associated with undiagnosed diabetes included male sex (AOR: 1.43; 95% CI: 1.03–1.98), age 40–59 years (AOR: 1.59; 95% CI: 1.16–2.18), other ethnicities (AOR: 2.87; 95% CI: 1.79–4.60), separated/divorced /widowed status (AOR: 1.97; 95% CI: 1.22–3.21), obesity (AOR: 1.87; 95% CI: 1.43–2.45), and hypertension (AOR: 1.53; 95% CI: 1.13–2.07).

Conclusion: Regular blood glucose screening and public awareness are vital for high-risk groups

Keywords: Malaysia; prevalence; risk factors; undiagnosed diabetes

B10

Behavioural Change Techniques Supporting Physical Activity Adherence After Ischemic Stroke in Home and Community Settings: A Systematic Review and Meta-Analysis

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ABSTRACT

Background & objective: Physical activity after ischemic stroke is important for patients' recovery, secondary prevention and self-management. This review aimed to identify behaviour change techniques in home- and community-based interventions following ischemic stroke and to interpret them using the COM-B framework.

Methods: PubMed/MEDLINE, Embase, CINAHL, Cochrane CENTRAL, Web of Science and PsycINFO were searched from inception to January 24, 2026. Behavioural change techniques were coded using BCT Taxonomy v1 and mapped to COM-B. Primary synthesis focused on ischemic stroke-only and ischemic stroke-predominant studies; broader stroke studies were supplementary evidence.

Results: Twenty-three publications representing 17 independent studies were included; nine formed the primary synthesis. Frequent behaviour changes techniques included self-monitoring, instruction, goal setting, social support, action planning, feedback, behavioural practice and problem solving, targeting capability, opportunity and motivation. An exploratory meta-analysis showed that interventions might increase daily steps by 1115.2 steps/day (95% CI 459.8 to 1770.6), based on two studies. A secondary exploratory meta-analysis showed a modest improvement in 6-minute walk distance, MD = 18.8 m, 95% CI 1.5 to 36.1, based on three studies. Adherence-related outcomes were heterogeneous and synthesised narratively.

Conclusion: Core behaviour change techniques may inform nurse-led post-discharge physical activity support after ischemic stroke. Future studies should standardise adherence and objective physical activity outcomes.

Keywords: Behaviour changes techniques; COM-B; ischemic stroke; physical activity; systematic review

B11

Prevalence and Associated Factors of High Sedentary Behaviour among Malaysian Adults

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ABSTRACT

Background & objective: High sedentary behaviours are a public health concern linked to chronic diseases and premature mortality, but evidence among Malaysian adults remains limited. This study aimed to determine the prevalence and associated factors of high sedentary behaviours among adults in Malaysia.

Methods: This study analysed data from the National Health and Morbidity Survey (NHMS) 2023, a multi-stage stratified cross-sectional study involving 10,856 adults aged 18 years. High sedentary behaviours were defined as 8 hours per day sitting or lying down during waking hours, excluding sleep. Complex sample multivariable logistic regression analysis was applied.

Results: The prevalence of high sedentary behaviour among adults was 3.3% (95% CI: 2.74, 3.86). Multiple logistic regression identified several significant factors associated with high sedentary behaviours, including having a disability (aOR: 2.50, 95% CI: 1.63–3.83), tertiary education (aOR: 2.33, 95% CI: 1.15–4.72), physical inactivity (aOR: 2.13, 95% CI: 1.52–3.01), being single (aOR: 2.05, 95% CI: 1.34–3.13), younger age (18–39 years) (aOR: 1.84, 95% CI: 1.10–3.07), and having at least one non-communicable disease (NCD) (aOR: 1.43, 95% CI: 1.01–2.01).

Conclusion: High sedentary behaviours are significantly associated with disability, physical inactivity, younger age, being single, tertiary education, and having at least one NCD, highlighting the need for targeted interventions for high-risk groups.

Keywords: Adults; Malaysia; prevalence; risk factors; sedentary behaviour

B12

Abdominal Obesity and Its Association with Undiagnosed Cardiometabolic Conditions among Orang Asli in Malaysia

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ABSTRACT

Background & objective: Abdominal obesity is a well-established risk factor for cardiometabolic diseases; however, evidence among Orang Asli populations in Malaysia remains limited. This study aimed to determine the prevalence of abdominal obesity among Orang Asli adults and examine its association with undiagnosed diabetes mellitus, hypertension and hypercholesterolaemia.

Methods: This cross-sectional study utilised data from the Orang Asli Health Survey (OAHS) 2022, involving adults aged 18 years. Abdominal obesity was defined using World Health Organisation waist circumference cut-offs (≥ 90 cm for men and ≥ 80 cm for women). Undiagnosed diabetes, hypertension and hypercholesterolaemia were identified among respondents without previous diagnoses based on standard clinical thresholds. Data were analysed using descriptive statistics and multiple logistic regression, accounting for complex survey design.

Results: Abdominal obesity prevalence was 46.1%. Females had significantly higher odds of abdominal obesity than males (aOR:4.13; 95% CI: 3.55-4.80). Individuals from the Senoi tribe were more likely to have abdominal obesity (aOR:1.57; 95% CI: 1.05-2.34). Abdominal obesity was significantly associated with undiagnosed diabetes (aOR:1.47; 95% CI: 1.14-1.91), hypertension (aOR:1.95; 95% CI: 1.67-2.28) and hypercholesterolaemia (aOR:1.34; 95% CI: 1.15-1.56).

Conclusion: Nearly half of Orang Asli adults in Malaysia have abdominal obesity, highlighting the need for targeted screening and interventions in high-risk groups to reduce undiagnosed cardiometabolic disease burden.

Keywords: Indigenous health; population health survey; waist circumference

B13

Risk of Mental Health Disorders among Children with Obesity: A Global Real-World Analysis

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ABSTRACT

Background & objective: Childhood obesity is an increasing global health concern and has been linked to adverse mental health outcomes. However, large-scale real-world evidence evaluating both common and severe psychiatric disorders in pediatric populations remains limited. This study aimed to assess the risk of mental health disorders among children with obesity compared to non-obese peers.

Methods: We conducted a multicenter retrospective cohort study using the TriNetX global network. Children aged 5–19 years were classified by BMI into obese and non-obese groups. Propensity score matching balanced covariates. Patients were followed up for up to 5 years. Risk ratios (RRs) were calculated, and Cox models estimated hazard ratios (HRs). Outcomes included composite, specific, and severe psychiatric disorders, with subgroup analyses by age and sex.

Results: Among two million children included from 70 healthcare organisations, 674,703 obese patients were matched to 674,703 controls. Obesity was associated with an increased risk of composite mental health disorders (HR 1.117; RR 1.263), with stronger effects in younger children and females. Depression showed the highest risk among common disorders (HR 1.353), particularly in younger children (HR 1.547). Severe psychiatric outcomes were significantly increased (HR 1.365; RR 1.571), with more pronounced risks in adolescents and females. Among these, self-harm demonstrated the highest overall risk (HR 1.418; RR 1.625), while suicide-related outcomes showed comparable elevations in high-risk subgroups.

Conclusion: Childhood obesity is associated with increased risks of both common and severe mental health disorders, with important variations across age and sex. Early integration of physical and mental health interventions is essential.

Keywords: Childhood obesity; hazard ratio; paediatric; psychiatric conditions; real-world data

B14

The Silent Window Before Pregnancy: Undiagnosed Cardiometabolic Risk among Women of Reproductive Age in Malaysia – Findings from The National Health and Morbidity Survey 2023

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ABSTRACT

Background & objective: Cardiometabolic conditions such as diabetes, hypertension, and hypercholesterolaemia contribute to adverse maternal and pregnancy outcomes, yet many women enter pregnancy undiagnosed. This study aimed to estimate the prevalence of undiagnosed cardiometabolic conditions, examine associated sociodemographic factors, and assess clustering among women of reproductive age in Malaysia.

Methods: Data from the National Health and Morbidity Survey 2023 were analysed among women aged 18–49 years (n = 3,231). Undiagnosed conditions were defined using clinical thresholds based on measured fasting blood glucose, blood pressure, and total cholesterol among women without prior diagnosis. Weighted prevalence estimates were calculated. Clustering was assessed as 1, 2 and 3 conditions. Complex sample multivariable logistic regression examined factors associated with ≥ 1 undiagnosed condition.

Results: The prevalence of undiagnosed diabetes was 3.6% (95% CI: 2.91–4.39), hypertension 8.3% (95% CI: 6.92–9.84), and hypercholesterolaemia 16.7% (95% CI: 14.88–18.62). Overall, 24.1% of women had at least one undiagnosed condition, 4.1% had 2 conditions, and 0.4% had all 3. Women aged 40–49 years had higher odds of ≥ 1 condition (aOR 3.58, 95% CI: 2.53–5.08) compared with those aged 18–29 years. Chinese women had lower odds than Malay women (aOR 0.56, 95% CI: 0.36–0.89), while unemployment was associated with higher odds (aOR 1.26, 95% CI: 1.02–1.55).

Conclusion: One in four Malaysian women of reproductive age has at least one undiagnosed cardiometabolic condition, with higher risk observed among older women and those unemployed. These findings highlight a critical preconception window to strengthen screening in primary care/reproductive health services for earlier detection and improved maternal and long-term outcomes.

Keywords: Cardiometabolic risk; Malaysia; preconception health; undiagnosed conditions; women of reproductive age

B16

Prevalence of Musculoskeletal Symptoms and Associated Factors Among Fishermen in Kuala Selangor

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ABSTRACT

Background & objective: Musculoskeletal symptoms are common occupational health problems among fishermen and may affect work capacity and long-term productivity. However, local data on their prevalence and associated factors among fishermen in Malaysia remain limited. This study aimed to determine the prevalence of musculoskeletal symptoms and identify associated work-related and non-work-related factors among fishermen in Kuala Selangor.

Methods: A cross-sectional study was conducted among registered fishermen using stratified cluster sampling. A total of 296 participants were recruited. Data were collected using a structured questionnaire covering sociodemographic characteristics, comorbidities and occupational factors, together with the Malay version of the Standardised Nordic Musculoskeletal Questionnaire. Data were analysed using descriptive, bivariate and multivariate methods.

Results: The 12-month prevalence of musculoskeletal symptoms was 76.4%. Multivariate analysis identified ethnicity, chronic disease and working duration of 30-39 years as significant factors. Chinese respondents had lower odds (AOR 0.47, 95% CI: 0.22 – 0.98), whereas those with chronic disease (AOR 2.12, 95% CI: 1.05 – 4.28) and 30-39 years of work duration (AOR 4.82, 95% CI: 1.12 – 20.80) had higher odds.

Conclusion: Musculoskeletal symptoms represent a significant occupational health burden among fishermen in Kuala Selangor. These findings provide local evidence and highlight the need for targeted preventive strategies and interventions to reduce risk and improve workforce sustainability.

Keywords: Cross-sectional study; ergonomic risk; fishing industries; occupational health; work-related disorders

B18

Impact of Educational Intervention on Knowledge, Attitude and Practice of Healthcare Professionals Regarding Organ Donation: A Mixed-Method Study

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ABSTRACT

Background & objective: Malaysia is one of the countries with the lowest deceased organ donation rate compared to other Asian countries. However, the involvement of trained healthcare professionals during the procurement process can be crucial, as they can effectively educate patients and their families to achieve positive donation results. This study is to assess the impact of an educational course, MyGRODA (Malaysia Grief Response and Organ Donation Awareness) on the knowledge, attitude and practice of healthcare professionals.

Methods: This mixed-method study employed an interventional survey among 221 healthcare professionals across multiple locations in Malaysia following the implementation of the MyGRODA course by the National Transplant Resource Centre (NTRC) team, using a validated questionnaire. Additionally, 23 in-depth interviews were conducted to explore qualitative perspectives and experiences.

Results: Among 221 healthcare professionals, significant post-intervention improvements were observed in knowledge, attitude, and practice regarding organ donation ($p < 0.001$). Multiple regression revealed that socioeconomic status, age, and religious beliefs influenced the knowledge, attitude and practice outcomes. Qualitative findings further demonstrated that the educational course positively impacted healthcare professionals' perceptions and practices regarding organ donation.

Conclusion: The MyGRODA educational course effectively improved healthcare professionals' knowledge, attitude, and practice regarding organ donation. The findings highlight the value of structured educational interventions in strengthening organ donation awareness, advocacy, and supportive practices among healthcare professionals in Malaysia.

Keywords: Attitude; education; knowledge; organ donation; practice

B19

Budget Impact Model for Ranolazine in Chronic Stable Angina

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ABSTRACT

Background & objective: Chronic stable angina (CSA) affects an estimated 1.46 million adults in Malaysia, placing a considerable burden on the public healthcare system and diminishing patients' quality of life. This budget impact analysis (BIA) assesses the financial implications of adding ranolazine to the Ministry of Health (MOH) Malaysia formulary.

Methods: The BIA model estimated the five-year financial impact of adding ranolazine to standard CSA treatment from the MOH perspective. It compared current standard therapy (CST) with a scenario in which ranolazine is offered to eligible patients who are inadequately controlled or intolerant to first-line treatments. The analysis relied on local epidemiological data, literature, and expert input to estimate direct medical costs, including drugs, hospitalisations, outpatient visits, procedures, and rescue medications. Clinical efficacy and resource use were based on expert consensus. The model reported annual and cumulative costs, with the net budget impact defined as the difference between the scenarios.

Results: Although ranolazine increased drug costs, it was projected to generate overall cost savings by reducing high-cost resource use. Over five years, this resulted in an estimated 5% net budget reduction compared to CST. Savings were mainly driven by fewer hospital admissions, less need for revascularisation procedures (CABG, PCI), and reduced use of rescue medications.

Conclusion: The BIA demonstrates potential savings for the public health system if ranolazine is included in the formulary. This framework can inform policy discussions and future evaluations. More local real-world evidence is needed to strengthen these findings.

Keywords: Budget impact; chronic stable angina; ranolazine

B20

Empowering Novice Nurses Through a Bimodal Approach (Visual and Auditory) in Health Education: An Analysis of Patient Feedback on Song and Poster Innovations

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ABSTRACT

Background & objective: The transition from nursing students to novice nurses often triggers high levels of clinical anxiety, particularly when managing patient health education prior to discharge. Effective health education requires dynamic teaching strategies to stimulate patient cognition while simultaneously building nurses' confidence. Therefore, a bimodal educational approach combining visual elements (posters) and auditory elements (song innovations) was introduced. It aims to evaluate the effectiveness of combining posters and songs as a communication strategy in empowering novice nurses. Furthermore, this study explores patients' acceptance and comprehension of musical innovations compared with conventional visual methods.

Methods: This descriptive case study involved 34 final-year nursing students at a Malaysian public university tasked with delivering health education using posters and songs. Qualitative feedback data obtained from 30 patients through brief interviews after ward education sessions. Thematic analysis was utilised to assess patient comprehension and demographic challenges.

Results: Findings indicate that the majority of patients preferred posters because visual information is clearer, easier to understand, and can be referred back to at home. Nevertheless, the song innovation proved effective as an icebreaker, successfully capturing the attention of middle-aged patients and making sessions more interactive. The analysis also revealed that songs are less suitable for geriatric patients due to difficulties in grasping fast-paced lyrics and differences in genre.

Conclusion: The integration of visual and auditory modalities helps empower novice nurses' confidence, aligning with Carl-Rogers' Humanistic Theory. However, the selection of teaching aids must always be tailored to the patients' age and cognitive capacity.

Keywords: Communication strategies; health education; novice nurses; patient demographics; song innovation; visual posters

Oncology, Haematology & Immunology
C1

Advanced Hypopharyngeal Carcinoma: Evaluating Clinical Presentation and Treatment Outcomes over 10 years

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ABSTRACT

Background & objective: Hypopharyngeal carcinoma (HPC) is relatively uncommon, with an incidence of 1.6 per 100,000 population in Malaysia. Patients frequently present at an advanced stage because early symptoms often mimic benign conditions. Consequently, HPC carries a poor prognosis, with reported five-year survival rates as low as 20%. This study aimed to investigate the clinical presentation and treatment outcomes of patients with advanced hypopharyngeal carcinoma over 10 years in a tertiary university hospital in Malaysia.

Methods: A retrospective review was conducted on patients diagnosed with HPC between 2016 and 2026. Data extracted from medical records included demographic characteristics, presenting symptoms, tumour staging, treatment modalities, and current clinical status.

Results: Nine patients were identified, with one lost to follow-up. The median age at diagnosis was 64 years. Dysphagia was the most common presenting symptom, followed by hoarseness and globus sensation. Eight patients presented with T4a or higher disease, while one had T3 disease. Among the eight patients with complete treatment data, one underwent total laryngopharyngectomy with selective neck dissection, three received concurrent chemoradiotherapy (CCRT), three were managed with palliative radiotherapy or chemotherapy, and one received no definitive treatment. Of the seven patients who completed treatment, one achieved complete remission. Two patients died due to tumour bleeding and disease progression, and four remain on supportive care.

Conclusion: This case series underscores the aggressive nature of HPC and its tendency to present at an advanced stage, limiting curative treatment options and resulting in high utilisation of supportive care. The observed 25% mortality rate should be interpreted cautiously due to the small sample size.

Keywords: Advanced stage hypopharyngeal carcinoma; head and neck cancer; treatment outcomes

C2

Elucidating the Causal Relationships between Gut Microbiome Profiles and Colorectal Cancer using Bayesian Causal Models

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ABSTRACT

Background & objective: The association between microbiota dysbiosis and tumorigenesis in colorectal cancer (CRC) is being widely investigated. However, most studies are unable to identify a causal relationship between the gut microbiome and colorectal cancer risk. We aim to elucidate the causal relationship between the gut microbiome profile and CRC using a Bayesian Mendelian randomisation framework.

Methods: The Mendelian Randomisation layer used external MiBioGen microbiome genome-wide association study instruments and harmonised with the OpenGWAS malignant neoplasm of colon outcome source. Of 380 local genera-level microbiome variables mapped to 58 MiBioGen genera, 77 clumped instruments were selected across 46 genera at $p < 1 \times 10^{-6}$. We deployed Bayesian MR estimation within 24 genera and analysed using Bayesian Wald ratio models.

Results: Overall, findings from the external GWAS data audit, taxonomic mapping, and harmonisation suggest that the available resources were adequate to support a limited summary-data exploratory Mendelian randomisation analysis. However, they were insufficient to enable a comprehensive confirmatory causal assessment of all local microbiome features. 24 genera were classified as limited-instrument Bayesian Mendelian randomisation analyses. Among genera with posterior estimates in the harmful direction, Dorea showed the strongest evidence of a causal association with a posterior odds ratio of 1.0074 (95% CI: 1.0000, 1.0148). Conversely, several genera showed posterior estimates in the protective direction, including Holdemanella, Intestinibacter, Oxalobacter, Lachnospira, Bacteroides, and Butyrivibrio with Bayesian posterior odds ratios below 1.00.

Conclusion: Collectively, these findings provide a foundation for clinical relevance in future biomarker, mechanistic, and perioperative translational research linking the gut microbiome to CRC.

Keywords: Causal relationship; colorectal cancer; gut microbiome; Mendelian randomisation

C3

HemaHero: Transforming Undergraduate Haematology Education through Gamified Mobile Learning

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ABSTRACT

Background & objective: Haematology remains a demanding component of medical training as students must integrate morphology, physiology, and clinical reasoning. HemaHero, a curriculum-aligned mobile serious game, was developed to transform abstract haematological concepts into interactive, feedback-rich challenges. This study aimed to evaluate the prototype's usability, acceptability, and perceived educational value among undergraduate medical students.

Methods: A cross-sectional prototype evaluation was conducted following gameplay. Medical undergraduates completed a structured survey comprising 11 five-point Likert items evaluating clarity, interface design, engagement, motivation, and learning potential; a 10-point intention-to-use scale; a five-point global rating; and open-ended feedback. Quantitative data were analysed descriptively, while qualitative responses were synthesised thematically.

Results: Fifty-seven responses were analysed. Overall prototype perception was positive, with a mean Likert score of 4.52/5 and 88.8% of responses rated Agree or Strongly Agree. The highest-rated domains were organised layout, willingness to use the full version, and recommendation to peers (4.58/5 each). Enjoyment scored 4.56/5, while clarity, readability, and perceived learning potential each scored 4.53/5. Intention to use was high (mean 9.07/10), with 93.0% scoring 8 or above. The global rating averaged 4.61/5. Students highlighted the storyline, progressive difficulty, usability, and examination-style questions as key strengths. Suggested refinements included enhanced graphics, timer functions, and avatar customisation.

Conclusion: HemaHero was highly acceptable and perceived as engaging, usable, and educationally valuable. These findings support continued refinement and outcome-based evaluation of HemaHero as an innovative adjunct for active haematology learning.

Keywords: Active engagement; curriculum innovation; medical students; serious gaming; user experience

C4

Comparative Analysis of Enteric Pathogens and Antibiotic Susceptibility in Colorectal Cancer Patients and Non-Cancer Controls at Hospital Sultanah Nur Zahirah

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ABSTRACT

Background & objective: Gut microbiota and enteric pathogens contribute to colorectal carcinogenesis via chronic inflammation and genotoxicity. Comparative data on enteric pathogen carriage and antibiotic resistance in colorectal cancer (CRC) patients versus non-cancer controls from East Coast Malaysia are sparse. This prospective study compared pathogen prevalence and antibiotic susceptibility between CRC patients and healthy controls.

Methods: A prospective case-control study (December 2024–February 2026) at HSNZ enrolled 190 subjects: 98 histologically confirmed CRC patients and 92 healthy controls. Stool samples were collected after strict inclusion criteria. Fisher's exact test compared prevalence; odds ratios (OR) with 95% confidence intervals (CI) were computed. A sub-analysis by metastasis stage (M) was performed within CRC cases.

Results: Baseline characteristics were comparable. CRC patients showed higher overall pathogen carriage (14.3%, 14/98) than controls (7.6%, 7/92). *Escherichia coli* was most prevalent (CRC 7.1% vs. controls 6.5%, $p = 1.000$). *Klebsiella pneumoniae* trended higher in CRC (5.1% vs. 1.1%, $p = 0.214$; OR 4.88, 95% CI 0.56–42.8). Opportunistic pathogens (*Pseudomonasaeruginosa*, *Stenotrophomonasmaltophilia*, *Enterobacter* spp.) were isolated only from CRC patients (3.1%). All *E.coli* and *K.pneumoniae* isolates were 100% sensitive to Augmentin, gentamicin, cotrimoxazole, cephalexin, and cefuroxime but 100% resistant to ampicillin. Metastatic (M1) patients had higher pathogen carriage (19.1%) than non-metastatic (M0, 9.8%); all three opportunistic isolates occurred in M1.

Conclusion: There is a non-significant trend toward increased carriage of enteric pathogens in CRC patients. Augmentin and other tested antibiotics remain effective. Opportunistic pathogens may associate with metastatic disease, warranting further investigation

Keywords: Bacterial drug resistance; colorectal neoplasms; prevalence; prospective case control study

C5

Silent but Sight-Threatening: A Case of Progressive Band Keratopathy in a Child with ANA-positive Juvenile Idiopathic Arthritis

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ABSTRACT

Background & objective: Uveitis complicates approximately 10–20% of juvenile idiopathic arthritis (JIA) cases, predominantly affecting the antinuclear antibody (ANA)-positive oligoarticular subtype. Due to its insidious, asymptomatic nature, this intraocular inflammation often remains undetected, leading to severe, irreversible structural complications if left untreated

Case report: We report the case of a 4-year-old girl diagnosed with extended oligoarticular JIA, initially managed with systemic corticosteroids and oral methotrexate. One-month post diagnosis, she developed bilateral eye redness, which temporarily resolved with topical steroid drops. However, she lost follow-up, returning three months later with recurrent eye redness and progressive visual impairment. She has no arthritis, but ophthalmological evaluation revealed active bilateral uveitis complicated by band keratopathy. Management required a superficial keratectomy to clear the visual axis and aggressive optimisation of her immunosuppressive regimen: oral methotrexate was switched to subcutaneous administration, topical corticosteroid therapy was intensified, and systemic prednisolone was reintroduced. Although she achieved uveitis inactivity, she was left with residual, chronic structural ocular changes.

Conclusion: Rigorous, routine ophthalmological screening is paramount in JIA, particularly in high-risk, ANA-positive cohorts. Standard consensus guidelines recommend screening every 3 months for the first 4 to 5 years following JIA diagnosis. Clinicians must emphasise caregiver education regarding the asymptomatic nature of early uveitis to ensure strict follow-up adherence, facilitating early detection and treatment to prevent irreversible complications.

Keywords: ANA positive; band keratopathy; juvenile idiopathic arthritis; oligoarthritis; uveitis

C6

Atraumatic Subarachnoid Haemorrhage as the Initial Presentation of Neuropsychiatric Systemic Lupus Erythematosus: A Case Report and Diagnostic Challenge

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ABSTRACT

Background & objective: Neuropsychiatric systemic lupus erythematosus (NPSLE) occurs in 25–50% of SLE patients, but atraumatic subarachnoid haemorrhage (SAH) as the initial presentation is exceedingly rare, especially without typical symptoms such as thunderclap headache. This case highlights the diagnostic challenge of NPSLE in a patient presenting with isolated behavioural changes, emphasising the need for high clinical suspicion even when full SLE criteria are not met.

Case: A 55-year-old woman with underlying medullary thyroid carcinoma and liver metastasis presented with one week of abnormal behaviour, including echolalia, confusion, and repetitive questioning. She had no headache, seizures, or focal weakness. Initial CT brain was normal, but MRI brain revealed right frontoparietotemporal and left parietal subarachnoid haemorrhages. Antinuclear antibody (ANA) titre was elevated at 1:1000 with low complement C3 and C4 levels. Cerebral angiography showed no evidence of aneurysm or arteriovenous malformation; however, multiple segmental stenoses of the bilateral superficial temporal arteries were noted. She improved transiently with pulse steroid therapy, intravenous immunoglobulin (IVIG), and cyclophosphamide. She was readmitted two weeks later with a relapse of NPSLE complicated by generalised tonic-clonic seizures. She eventually succumbed to hospital-acquired pneumonia and progression of her underlying malignancy after a third admission.

Conclusion: This case demonstrates that SAH can rarely present as the first manifestation of NPSLE without headache or aneurysm. Early recognition and prompt immunosuppression are essential, but treatment is complicated by infection risk in patients with malignancy. The patient's clinical course was marked by transient improvement, subsequent relapse and eventual mortality from infectious and malignant complications.

Keywords: Atypical presentation; cerebral vasculitis; neuropsychiatric SLE; NPSLE; subarachnoid hemorrhage (SAH)

C7

Mucous Membrane Pemphigoid with Cutaneous, Ocular and Airway Involvement: A Rare Multisystem Presentation with Airway Compromise

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ABSTRACT

Background & objective: Mucous membrane pemphigoid (MMP) is a rare, chronic autoimmune blistering disorder predominantly affecting mucosal surfaces, which can cause scarring and significant morbidity. While oral and ocular involvement are most common, laryngeal disease is uncommon but can cause life-threatening airway compromise. Multisystem involvement remains rare and poses diagnostic and management challenges.

Case report: We report a 75-year-old Siamese male with underlying bladder cancer who previously developed cutaneous blistering, with a skin biopsy demonstrating a subepidermal blister. He was also seen in the ophthalmology clinic for stage 4 ocular cicatricial pemphigoid. He presented with progressive hoarseness, stridor, dyspnoea and dysphagia suggestive of upper airway obstruction. On examination, he was tachypnoeic with audible stridors requiring oxygen support. Flexible nasolaryngopharyngoscopy demonstrated a posteriorly displaced epiglottis with severe adhesion, obscuring the vocal cords without an identifiable mass. Despite medical management, his condition deteriorated, necessitating emergency tracheostomy following failed intubation. Intraoperative direct laryngoscopy revealed markedly abnormal laryngeal anatomy, including a horizontally oriented epiglottis, oedematous arytenoids, sloughy mucosa and marked adhesions hindering the visualisation of the vocal folds, which were consistent with laryngeal involvement of MMP.

Discussion: Laryngeal involvement in MMP is rare but carries a high risk of irreversible scarring and airway obstruction. Multisystem disease may delay clinical recognition, so a high index of suspicion is crucial to prevent delayed diagnosis and airway emergencies.

Conclusion: This case highlights a rare multisystem presentation of MMP with airway involvement, emphasising the importance of early recognition and multidisciplinary management to prevent life-threatening complications.

Keywords: Airway obstruction; autoimmune; cicatricial pemphigoid; mucous membrane pemphigoid; tracheostomy

C9

Integrating Artificial Intelligence in 2D Mammography Interpretation: A Cross-Sectional Study on Breast Cancer Detection

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ABSTRACT

Background & objective: Breast cancer is the most common malignancy among women worldwide. Early detection through mammographic screening is essential for reducing mortality. Artificial intelligence (AI) has emerged as a potential adjunct to radiologists in mammography interpretation. This study aimed to evaluate the diagnostic performance of an AI system for breast cancer detection on two-dimensional (2D) mammography and compare it with that of radiologists.

Methods: A cross-sectional study was conducted using 212 anonymised 2D mammography cases from a tertiary healthcare centre. Histopathological examination served as the gold standard. Mammograms were analysed using an AI software platform and independently reviewed by two radiologists. Diagnostic performance was assessed using sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and receiver operating characteristic (ROC) curve analysis.

Results: The AI system achieved sensitivity of 88.9%, specificity of 78.7%, PPV of 75.5%, and NPV of 90.6%. ROC analysis demonstrated excellent discrimination, with an area under the curve (AUC) of 0.903 (95% CI: 0.860–0.945; $p < 0.001$). Reader 1 achieved a sensitivity of 90.0%, specificity of 87.0%, PPV of 72.0%, and NPV of 95.9%, while Reader 2 achieved a sensitivity of 89.5%, specificity of 83.0%, PPV of 65.4%, and NPV of 95.7%. Both radiologists demonstrated higher specificity and NPV than AI, whereas AI showed the highest PPV.

Conclusion: AI demonstrated excellent diagnostic performance for breast cancer detection on 2D mammography. Although radiologists achieved superior specificity and NPV, AI may serve as a valuable adjunctive tool to support mammography interpretation and improve screening efficiency.

Keywords: Computer-aided diagnosis; diagnostic accuracy; interobserver agreement; receiver operating characteristic; screening programme

C10

Association of Serum Neurofilament Light Chain and Peripheral Neuropathy with Paraproteinemia in Haematological Malignancy

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ABSTRACT

Background & objective: Peripheral neuropathy (PN) can be associated with paraproteinemia or induced by neurotoxic chemotherapy such as vincristine and bortezomib. This study evaluated serum neurofilament light chain (sNfL) as a potential biomarker for PN across patients with haematological malignancies.

Methods: A cross-sectional study conducted at Hospital Canselor Tuanku Muhriz (February 2021-March 2022). Adults with haematological malignancy with or without paraproteinemia (PP) were recruited. PN severity was graded using National Cancer Institute Common Toxicity Criteria for Adverse Events (NCI CTCAE) v6.0 scores. sNfL levels were quantified using the neurofilament protein ELISA Kit. A nerve conduction study was conducted using a 6-channel Digital Machine.

Results: Thirty-five participants were recruited. Median age was 59 (24) years. The majority were male (n = 21, 60%) and Malay (n = 23, 65.7%). The most common diagnosis was lymphoma (n = 19, 54.3%). Paraproteinemia was present in, 51.4%(n = 18) of participants, with IgG being the most prevalent immunoglobulin (n = 11, 31.4%). Kappa was the most common free light chain (n=10, 28.6%). Peripheral neuropathy symptoms were highly prevalent (n = 22, 62.9%), with the majority having Grade 2 severity (n = 21, 60.0%). The median serum neurofilament level was 6.7 pg/ml (12.2). The overall clinical presentation of peripheral neuropathy and NCI-CTC severity scores did not differ significantly between the groups (p = 0.238 and p = 0.351). No significant differences were observed for serum neurofilament (p = 0.469).

Conclusion: Peripheral neuropathy and sNfL levels do not significantly differ based on paraproteinemia status. Larger, longitudinal cohort studies are required to further validate sNfL as a diagnostic biomarker in this population.

Keywords: Haematological malignancy; neurofilament light chain; paraproteinemia; peripheral neuropathy

C11

Comparative Cost Analysis of Subcutaneous and Intravenous Immunoglobulin for Patients with Primary Immunodeficiency in Malaysia

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ABSTRACT

Background & objective: Immunoglobulin replacement therapy (IRT) is the standard treatment for primary immunodeficiency diseases (PID). While intravenous immunoglobulin (IVIG) remains the conventional approach, subcutaneous immunoglobulin (SCIG) offers comparable efficacy with the advantage of home-based administration. Although SCIG has been available in Malaysia since 2015 and its use is increasing, evidence on its economic impact is limited. This study aimed to compare the costs of SCIG and IVIG for PID management in Malaysia using a cost-minimisation analysis.

Methods: A one-year cost-minimisation model compared hospital-based IVIG and home-based SCIG from healthcare system and societal perspectives. Resource use was based on expert input and clinical guidelines. Cost data were collected from Malaysian treatment centres and published literature. Direct medical costs included immunoglobulin acquisition, administration, equipment, and supplies, reported in 2024 Malaysian Ringgit (MYR).

Results: Home-based SCIG was associated with lower overall annual costs than hospital-based IVIG. The total annual cost per patient was RM115,148.38 for IVIG and RM105,305.50 for SCIG, resulting in annual savings of RM9,842.88 per patient. Although SCIG incurred higher immunoglobulin acquisition costs than IVIG (RM104,520.00 vs RM85,930.00),

these were offset by lower administration costs and the avoidance of costs related to infection-associated hospitalisations and adverse event management.

Conclusion: Home-based SCIG is a cost-minimising alternative to IVIG for PID treatment in Malaysia. Greater adoption of SCIG may enhance healthcare resource utilisation, and further budget impact analyses are needed to inform national policy decisions.

Keywords: Cost minimisation analysis; intravenous immunoglobulin; primary immunodeficiency diseases; subcutaneous immunoglobulin

C12

Behind the Bark: Retropharyngeal Abscess Masquerading as Severe Croup in a Five-Month-Old Infant

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ABSTRACT

Background & objective: Retropharyngeal abscess is an uncommon yet potentially life-threatening deep neck space infection in infants and often presents with non-specific upper respiratory tract symptoms. This case report aims to highlight the importance of meticulous history taking, thorough physical examination, and timely management when caring for paediatric patients who are unable to verbalise their symptoms.

Case report: We describe a rare case of delayed diagnosis of retropharyngeal abscess in a five-month-old infant who initially presented to the emergency department with clinical features suggestive of severe croup. The diagnosis was initially overlooked due to the insidious and non-specific nature of the presenting symptoms. Although the infant demonstrated transient clinical improvement following standard medical therapy, she subsequently developed airway obstruction as a complication of the retropharyngeal abscess, necessitating emergency surgical drainage. Retropharyngeal abscess is associated with significant morbidity and potential mortality if not recognised early.

Conclusion: Given the high risk of airway compromise in this age group, prompt diagnosis and timely surgical intervention are essential to prevent life-threatening complications.

Keywords: Airway obstruction; croup; infant; retropharyngeal abscess; stridor

C13

Acyclovir-Induced Neurotoxicity in an Elderly End-Stage Kidney Disease Patient

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ABSTRACT

Background: Acyclovir-induced neurotoxicity is an uncommon but important complication in patients with impaired renal function. Its presentation often mimics central nervous system infections, making diagnosis challenging. Early recognition is crucial to avoid unnecessary investigations and facilitate prompt treatment.

Case report: We report a 60-year-old woman with end-stage kidney disease (ESKD) on continuous ambulatory peritoneal dialysis (CAPD) who presented with altered mental status, generalised weakness, and vomiting following treatment with oral acyclovir for herpes zoster infection. On admission, she was stuporous with vesicular lesions over the left thigh. Initial investigations, including electrolyte profile, computed tomography of the brain, and cerebrospinal fluid analysis, did not reveal a metabolic or infectious cause. Despite receiving renally adjusted intravenous acyclovir for presumed herpes zoster encephalitis, her neurological status failed to improve. Acyclovir-induced neurotoxicity was subsequently suspected, and the antiviral therapy was discontinued. The patient underwent three consecutive sessions of high-flux haemodialysis. Progressive improvement in consciousness was observed after each session, with complete recovery of mental status and functional independence by discharge. She subsequently resumed CAPD and remained well on follow-up.

Conclusion: Acyclovir neurotoxicity should be considered in ESKD patients presenting with acute neurological symptoms, particularly following recent antiviral exposure. Differentiating drug toxicity from viral encephalitis can be difficult, especially when neuropsychiatric manifestations predominate. High-flux haemodialysis appears to be an effective treatment modality due to its superior clearance of acyclovir and may facilitate rapid neurological recovery.

Keywords: Acyclovir; dialysis; neurotoxicity; renal failure

C14

Genetic Abnormalities in Paediatric B-Cell Acute Lymphoblastic Leukaemia: Preliminary Insights from a Single Centre

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ABSTRACT

Background & objective: Leukaemia accounts for 28% of paediatric malignancies in Malaysia, with B-cell acute lymphoblastic leukaemia (B-ALL) being the most common subtype. Studies reported genetic abnormalities in 60–80% of B-ALL cases. This study aimed to investigate the prevalence and spectrum of genetic abnormalities in B-ALL within a Malaysian single-centre cohort.

Methods: A 3-year retrospective analysis was conducted at Hospital Tunku Ampuan Besar Tuanku Aishah Rohani, Kuala Lumpur, from 2022 to 2025. Demographic data, full blood counts, and molecular profiles were retrieved from the laboratory database, and a descriptive analysis was performed.

Results: A total of 103 cases were retrieved, with males (n = 58, 56%) predominating over females (n = 45, 44%). The age distribution peaked between 2-4 years. The cohort was mainly Malay (n=78), followed by Chinese (n = 10), Indian (n=5), and others (n = 10). Genetic abnormalities were identified in 77 cases (74%). The most frequent genetic abnormalities were ETV6::RUNX1 (n = 39, 37.86%) and TCF3::PBX1 (n = 23, 22.33%), followed by KMT2A rearrangements (n = 14, 13.59%) and BCR::ABL1 (n = 13, 12.62%).

Conclusion: This study highlights a high prevalence and distinct spectrum of genetic abnormalities in paediatric B-ALL, underscoring the importance of local molecular profiling. for advancing precision medicine.

Keywords: Molecular genetics; leukaemia; mutations; paediatrics; precision medicine

C15

Elucidation of Mitochondrial Bioenergetics and Mitochondrial Fuel Pathway in HepG2 Cancer Cells

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ABSTRACT

Background & objective: Hepatocellular carcinoma is characterised by complex metabolic reprogramming, shifting its energy production strategy to support survival under hostile conditions. This study determined alterations in mitochondrial bioenergetics and fuel utilisation in HepG2, a hepatocellular carcinoma cell line, and WRL-68, a non-cancerous hepatic cell line.

Methods: Total ATP production (JATP_{total}), which consists of mitochondrial ATP production (JATP_{ox}) and glycolysis (JATP_{gly}) in HepG2 and WRL-68, was determined using the Agilent Seahorse XFp Real-Time ATP Rate Assay. Mitochondrial fuel oxidation capacity, represented by dependency and flexibility for glucose, fatty acids and glutamine, was carried out using the Seahorse XFp Mito Fuel Flex Test.

Results: HepG2 exhibits lower JATP_{total}, higher JATP_{gly}, and lower JATP_{ox} compared with WRL-68. HepG2 showed greater mitochondrial dependency and lower flexibility in glucose oxidation than WRL-68. Fatty acid oxidation capacity, represented solely by fatty acid oxidation flexibility, was found to be higher in WRL-68 compared to HepG2. However, both cells showed no dependency on fatty acid oxidation and no difference in glutamine oxidation.

Conclusion: These findings are consistent with the concept of metabolic reprogramming in cancer. Despite the Warburg Effect, HepG2 retains functional mitochondria with a stronger reliance on glucose-driven mitochondrial ATP production and reduced adaptability to other substrates. HepG2 exhibited a metabolic profile that does not support the classical glutamine addiction concept in cancer, warranting further evaluation as a chemotherapeutic strategy for certain cancer cell types. This provides new insight into cancer and mitochondrial metabolic vulnerabilities for therapeutic targeting.

Keywords: ATP; cancer; capacity; dependency; fatty acid; flexibility; glucose; glutamine; mitochondria

C16

Potential Clinical Relevance of FCGR3A in Malaysian Children with Relapsed Acute Lymphoblastic Leukaemia: A Single-Centre Experience

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ABSTRACT

Background & objective: Acute lymphoblastic leukaemia (ALL) is the most common pediatric malignancy, with relapse remaining a major cause of treatment failure and poor survival outcomes. This study aimed to identify potential relapse-associated genetic alterations in Malaysian children using Whole Exome Sequencing (WES).

Methods: A total of 14 bone marrow samples from 12 pediatric ALL patients, including paired diagnosis–relapse and unpaired relapse samples, were retrospectively analysed. Somatic variants were identified using WES, followed by sequential filtering based on sequencing quality, predicted pathogenicity, and population frequency databases for both paired and unpaired samples.

Results: In unpaired relapse samples, additional filtering using a Panel of Normal (PoN) was applied to remove recurrent technical artefacts. Recurrent variants were identified through overlap analysis between relapse samples. The FCGR3A:c.C208G:p.Q70E variant was detected in two unpaired relapse samples (2/14 samples), while recurrent RPL10 variants were observed in paired relapse samples. FCGR3A was selected for downstream validation based on recurrence and predicted pathogenicity. Sanger sequencing confirmed the presence of the FCGR3A c.C208G variant, while RPL10 could not be reliably validated due to inconsistent chromatogram resolution. Functional characterisation of FCGR3A using western blotting and quantitative real-time PCR (qRT PCR) in HEK293T cells demonstrated reduced protein and mRNA expression in mutant-transfected cells compared to wild-type constructs, suggesting possible effects on transcript stability or protein expression.

Conclusion: These findings suggest that recurrent FCGR3A alterations may contribute to relapse biology in pediatric ALL, supported by reduced mRNA and protein expression in functional assays. FCGR3A may represent a potential biomarker candidate warranting further investigation in relapsed ALL.

Keywords: Cancer genome; genetic variants; relapsed acute lymphoblastic leukaemia; somatic mutations; targeted therapy; whole exome sequencing

Biomedical Sciences, Regenerative Medicine & Clinical Diagnostics
D2

Advanced Cellular and Acellular Biomaterial-Based Skin Substitutes for Enhanced Tissue Regeneration and Wound Healing

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ABSTRACT

Background/objective: Severe skin loss resulting from burns, trauma, and chronic wounds remains a major clinical challenge, necessitating effective and readily available skin replacement therapies. This study presents the development and evaluation of two advanced three-dimensional (3D) biomaterial-based skin substitutes: a cellular substitute (CS) and an acellular substitute (AS), designed to promote tissue regeneration and accelerate wound healing.

Methods: The CS was fabricated by incorporating autologous keratinocytes and fibroblasts within a plasma-fibrin scaffold, while the AS consisted of human dermal fibroblast-derived secretome encapsulated in a collagen hydrogel. Fibroblast secretome was produced under serum-free conditions and characterised for wound healing-related bioactive proteins.

Results: The CS demonstrated excellent cellular viability (>90%) for up to 72 hours during storage at 4°C and maintained the expression of key skin-related markers. Clinical application in burn patients resulted in complete wound closure, with an average healing rate of 8.15 ± 2.35 cm/day. The AS exhibited prolonged storage stability, with secretome proteins remaining stable for up to six months at -20°C. In vitro and in vivo evaluations confirmed its biocompatibility, nonimmunogenicity, and non-tumorigenicity. In vivo full-thickness wound model, the secretome-loaded collagen hydrogel significantly enhanced wound repair and restoration of normal skin architecture and expression of regenerative markers, including cytokeratin-14 and collagen type I.

Conclusion: These findings demonstrate that both cellular and acellular biomaterial-based skin substitutes offer safe and effective regenerative strategies for full-thickness skin defects. The ready-to-use secretome-loaded collagen hydrogel, in particular, represents a promising off-the-shelf therapeutic platform for tissue engineering and regenerative medicine applications.

Keywords: Collagen hydrogel; secretome, skin regeneration; skin substitute; wound healing

D3

Surgical Innovation: A Cross-Sectional Study on the Attitudes of Medical Students Toward Robotic Surgery in Oman

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ABSTRACT

Background & objective: Robotic surgery is among the most advanced forms of minimally invasive surgery and continues to expand globally. Despite increasing international adoption, perceptions among medical trainees in Oman remain unexplored. Understanding these perceptions is essential for guiding curriculum integration and national surgical innovation strategies. This study aimed to assess medical students' knowledge and the perspectives of a smaller subgroup of surgical clinicians regarding robotic surgery and its potential integration into medical education in Oman.

Methods: This cross-sectional observational study used a previously validated questionnaire distributed electronically to Sultan Qaboos University (SQU) medical students and doctors working in surgical departments at Sultan Qaboos University Hospital (SQUH). A non-probability convenience sampling technique was used. Data were analysed using IBM SPSS Statistics version 27.0, with a significance level of $p < 0.05$.

Results: A total of 574 participants were included, the majority being medical students (90.4%). Practising surgical clinicians represented a small proportion of respondents. Overall, 73.6% reported prior awareness of robotic surgery, yet 83.7% acknowledged insufficient knowledge. Most participants identified greater precision as the main advantage (68.2%) and higher cost as the primary disadvantage (83.4%). While hesitation toward undergoing robotic surgery was common, 81.1% supported its integration into the MD curriculum and 89% supported incorporation into residency programs. Most agreed that Oman should invest in and expand robotic surgery.

Conclusion: There is generally positive openness toward robotic surgery among medical student participants, accompanied by knowledge gaps and cost concerns. Structured educational planning is required to support informed and sustainable integration.

Keywords: Attitudes; medical education; minimally invasive surgery; Oman; robotic surgery; surgical innovation

D5

MMP-9 and Cardiac Functional Impairment Across the Spectrum of Coronary Artery Disease: Influence of Smoking Status

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ABSTRACT

Background & objective: Matrix metalloproteinase-9 (MMP-9) contributes to extracellular matrix degradation, atherosclerotic plaque progression, and ventricular remodelling. However, the association between MMP-9 and cardiac function among smokers and non-smokers across different stages of coronary artery disease (CAD) remains unclear. This study aimed to determine the relationship between MMP-9 expression and selected echocardiographic parameters in individuals with acute coronary syndrome (ACS), chronic coronary syndrome (CCS), and controls without significant CAD.

Methods: This cross-sectional study included 180 smokers and non-smokers diagnosed with ACS, CCS, or control. MMP-9 expression was quantified from serum specimens. Transthoracic echocardiography was performed to assess systolic function [left ventricular ejection fraction (LVEF)] and diastolic functions [transmitral early filling velocity (E velocity) and average E/e' ratio]. Spearman correlation and multiple linear regression analyses were used to evaluate associations between MMP-9 and echocardiographic parameters according to smoking status.

Results: Among smokers, MMP-9 demonstrated a significant negative correlation with LVEF ($r = 0.267$, $p < 0.001$) and remained an independent predictor in multiple regression analysis ($B = 0.005$, $p = 0.038$). Among non-smokers, MMP-9 was also independently associated with lower LVEF ($B = 0.005$, $p = 0.006$). Furthermore, among non-smokers, MMP-9 was positively associated with E velocity ($r = 0.259$, $p = 0.014$) and average E/e' ratio ($r = 0.468$, $p < 0.001$), with both associations remaining significant after multivariable adjustment ($p = 0.022$ and $p = 0.010$, respectively).

Conclusion: Elevated MMP-9 levels were associated with reduced LVEF in both smokers and non-smokers across the spectrum of CAD, including ACS, CCS, and control subjects. These findings

support the potential role of MMP-9 as a biomarker of left ventricular systolic dysfunction, regardless of smoking status.

Keywords: Biomarker; coronary artery disease; diastolic function; echocardiogram; MMP-9; systolic function

D6

Caffeine Absorption as a Functional Biomarker of Gastrointestinal Absorption in Patients with Intestinal Failure: A Prospective Case-Control Study

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ABSTRACT

Background & objective: Assessment of gastrointestinal absorptive function in patients with intestinal failure (IF) remains challenging, as methods rely on indirect clinical parameters without a functional biomarker. This study evaluated caffeine absorption as a functional marker of intestinal absorptive capacity in patients with IF compared with healthy individuals.

Methods: This single-centre prospective case-control study was conducted in the Department of Surgery, Hospital Canselor Tuanku Muhriz, between August 2024 and March 2026. Participants ingested 200 mg caffeine. Venous blood samples were collected at baseline and 30, 60, 90, and 120 minutes after ingestion. Plasma caffeine concentrations were measured using ELISA. Peak plasma concentration (C_{max}) and time to peak concentration (T_{max}) were calculated. Group comparisons and receiver operating characteristics (ROC) analyses were performed.

Results: Twenty-eight participants were included: 14 controls and 14 patients with IF (Types II and III), predominantly surgical aetiology. Patients with IF demonstrated impaired caffeine absorption, with lower C_{max} (0.73 ± 0.49 vs 7.53 ± 1.53 µg/mL, $p < 0.001$) and prolonged T_{max} (109.3 ± 1.49 vs 53.6 ± 21.0 minutes, $p < 0.001$). Complete separation of C_{max} values was observed between groups. ROC analysis demonstrated excellent discriminatory performance, with AUCs of 1.00 for C_{max} and 0.974 for T_{max}.

Conclusion: Caffeine absorption testing is a simple, safe, non-invasive method with potential as a functional biomarker of gastrointestinal absorption. C_{max} may provide a tool for assessing absorptive capacity and guiding nutritional management in patients with IF.

Keywords: Caffeine; functional marker; intestinal failure

D9

Molecular Alterations and Potential Mechanisms Associated with Donor AKI after Kidney Transplantation

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ABSTRACT

Background & objective: Donor acute kidney injury (donor AKI) is a vital risk factor impairing long-term renal allograft survival after kidney transplantation, yet its molecular regulatory mechanisms in graft tissues remain unclear. This study explored molecular expression features and key pathways of donor AKI-induced graft injury, identifying core differentially expressed genes and functional cascades across different post-transplant stages.

Methods: Based on the transcriptomic dataset GSE61739, we analysed 96 renal biopsy samples from 48 recipients (donor AKI vs control) collected at 1 and 4 months post-transplant. Bioinformatic analyses, including paired longitudinal modelling, differential expression screening, pathway enrichment and PPI network analysis, were performed, with external independent GEO datasets adopted to validate our findings.

Results: Two groups exhibited divergent transcriptomic profiles at month 1, with significantly altered genes, including upregulated MARCH10, MUC13 and SNORD114-3 and downregulated CYP2A13 and RANBP17 (FDR<0.05). Immune response, chemokine signalling and complement pathways were markedly activated along with abnormal RNA splicing. Sample clustering verified a valid grouping. Longitudinal analysis demonstrated persistent dysregulation of immune-complement molecular signatures in donor AKI allografts from month 1 to month 4.

Conclusion: Donor AKI triggers sustained transcriptomic remodelling of renal allografts within four months after transplantation, featured by gene expression shifts, aberrant RNA splicing and persistent activation of immune-chemokine-complement cascades. These molecular alterations offer potential biomarkers and therapeutic targets for early intervention and prognostic assessment of AKI.

Keywords: Chemokine; complement system; donor acute kidney injury; differentially expressed genes; immune activation; kidney transplantation; transcriptome; RNA splicing

D10

Effects of Wharton's Jelly-derived Mesenchymal Stem Cell Injection for Colon Anastomosis in a Murine Model: An Animal Study

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ABSTRACT

Background & objective: Anastomotic leaks are associated with local recurrence and poor overall survival. Methods for preventing anastomotic leaks have been introduced and developed. A study on adipose-derived mesenchymal stem cell (MSC) injections showed that MSC injections promote anastomotic healing in an irradiated colon. Another animal study showed that MSCs promote healing in gastric perforation. We investigated the effects of Wharton's Jelly-MSC (WJ-MSC) injection at the site of a colon anastomosis.

Methods: Thirty male Sprague Dawley rats were divided equally into two groups: suturing alone and suture plus WJ-MSC injection. Data documenting rat wellness scores and postoperative outcomes were included in the analysis. Anastomotic leak, adhesion severity, and bursting pressure were compared between the groups.

Results: The mean weight between both arms was not statistically significant. Wellness score on postoperative day 3 to 7 was statistically significant with higher scores in the WJ MSC injection group (day 3: 11.73 ± 0.594 , $p = 0.04$; day 4: 11.80 ± 0.414 , $p = 0.034$, day 5: 11.87 ± 0.352 , $p = 0.024$; day 6: 11.93 ± 0.258 , $p = 0.017$; day 7: 11.87 ± 0.516 , $p = 0.017$). There was no significant difference in anastomotic leak rate in this study (6.7% [WJ-MSC] vs 20% suture [S], $p = 0.591$). Adhesion severity showed a significant difference [mild 13(86.7%) vs 6(40%), moderate 2 (13.3%) vs 6 (40%), severe 0 (0%) vs 3 (20%), $p = 0.023$].

Conclusion: This study suggests that injecting WJ-MSC at the colon anastomosis site promotes better healing, suggesting potential to prevent anastomotic leaks.

Keywords: Anastomotic leak; cell therapy; experimental study; wound healing

D11

Modulation of the Mouse Liver Proteome by 500 mg/kg Tocotrienol-Rich Fraction Administration

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ABSTRACT

Background & objective: Palm oil-derived tocotrienol-rich fraction (TRF) exhibits potent antioxidant properties, but its impact on global hepatic protein expression remains unstudied. This study evaluated liver membrane protein alterations in mice treated with 500 mg/kg TRF using label-free quantitative proteomics.

Methods: Male ICR mice (n = 12) were treated via oral gavage with either vehicle control (corn oil, n = 6) or TRF (500 mg/kg, n = 6) for 14 days. On day 15, liver membrane proteins were extracted and analysed via label-free quantitative proteomics, followed by bioinformatic functional annotation and hub protein network identification.

Results: TRF treatment significantly altered 80 differentially expressed proteins ($p < 0.05$), with 46 upregulated (fold-change > 1.50) and 34 downregulated (fold-change < 0.60). Bioinformatic analysis identified three primary hub proteins: albumin (Alb), cytochrome P450 2C70 (Cyp2C70), and methionine adenosyltransferase 1A (Mat1a). Downregulation of Alb (0.54-fold) and Cyp2c70 (0.52-fold) indicates a metabolic redirection from baseline protein synthesis toward stress adaptation, alongside reduced bile acid turnover to minimise oxidative stress. Conversely, Mat1a upregulation (2.08-fold) suggests enhanced S-adenosylmethionine (S-AdoMet) synthesis, reinforcing one-carbon metabolism, methylation, and antioxidant defence. Together, these alterations demonstrate the hepatoprotective, anti-inflammatory, and antifibrotic mechanisms triggered by TRF.

Conclusion: TRF at 500 mg/kg successfully reprograms the murine liver proteome, shifting metabolic priorities toward protective antioxidant and methylation pathways. These findings underscore TRF's hepatoprotective potential and support future dose-response therapeutic evaluations.

Keywords: Liver, mice; proteomics; tocotrienol-rich fraction; vitamin E

D12

Human Wharton's Jelly Mesenchymal Stem Cell-Derived Exosomes Attenuate Hypoxia/Reoxygenation-Induced Injury in Cardiomyocytes

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ABSTRACT

Background & objective: Myocardial ischemia/reperfusion (I/R) injury contributes significantly to cardiac dysfunction following myocardial infarction through mechanisms involving oxidative stress and cellular damage. Human Wharton's jelly mesenchymal stem cell-derived exosomes (hWJ-MSC-Exo) have emerged as promising cell-free therapeutic agents due to their regenerative and cytoprotective properties. This study evaluated the protective effects of hWJ-MSC-Exo against hypoxia/reoxygenation (H/R)-induced injury in cardiomyocytes.

Methods: Exosomes were isolated from hWJ-MSC-conditioned media using ultracentrifugation and characterised by nanoparticle tracking analysis, transmission electron microscopy, and flow cytometric detection of CD63 and CD81. Cardiomyocytes were subjected to H/R and treated with increasing concentrations of hWJ-MSC-Exo. Cell viability was assessed using the MTT assay, while creatine kinase-MB (CK-MB) release was measured as an indicator of cardiomyocyte injury. Oxidative stress was evaluated by measuring reactive oxygen species (ROS), malondialdehyde (MDA), and reduced glutathione (GSH) levels.

Results: Treatment with hWJ-MSC-Exo significantly improved cardiomyocyte viability and reduced CK-MB release compared with untreated H/R controls. Exosome-treated cells also exhibited significantly lower ROS and MDA levels, accompanied by increased GSH levels, indicating attenuation of oxidative stress and restoration of redox homeostasis.

Conclusion: hWJ-MSC-Exo confers significant protection against H/R-induced cardiomyocyte injury by enhancing cell survival and reducing oxidative stress. These findings support the potential of hWJ-MSC-derived exosomes as a novel cell-free therapeutic strategy for myocardial protection and cardiac repair following ischemic injury.

Keywords: Cardiomyocytes; exosomes; hypoxia/reoxygenation; oxidative stress; Wharton's jelly mesenchymal stem cells