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中華醫學會第26屆114年度會員大會
暨聯合學術研討會

1

精準醫療於遺傳性疾病的新進展

Recent Advances in Precision Medicine for Genetic Disorders

時　間：114年6月28日　08:30-17:40

Time：June 28, 2025　08:30-17:40

地　點：臺北榮民總醫院 致德樓第一會議室

Place：The First Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

2

AI驅動的智慧醫療與精準健康

AI-Driven Smart Healthcare and Precision Health

時　間：114年6月28日　08:30-17:00

Time：June 28, 2025　08:30-17:00

地　點：臺北榮民總醫院 致德樓第二會議室

Place：The Second Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

3

大數據的力量：醫療大數據在兒童與新生兒健康中的創新應用

Power of Big Data: Innovative Applications of Healthcare Big Data in Children's and Neonatal Health

共同主辦：臺北榮民總醫院新生兒醫療中心、
大數據中心、兒童醫學部、急診部、
國立陽明交通大學急重症醫學研究所、
台灣新生兒科醫學會

時　間：114年6月28日　08:30-12:30
Time：June 28, 2025　08:30-12:30

地　點：臺北榮民總醫院 致德樓第三會議室
Place：The Third Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

大數據的力量：醫療大數據在兒童與新生兒健康中的創新應用
Power of Big Data: Innovative Applications of Healthcare Big Data in Children's and Neonatal Health

National electronic health record integration for smart healthcare

智慧醫療下的全國電子健康紀錄整合

Chien-Chang Lee

李建璋

Department of Information Management, Ministry of Health and Welfare, Taipei, Taiwan, ROC

衛生福利部 資訊處

Medical big data is essential for advancing smart healthcare, but its impact is limited when confined to a single institution. To support nationwide applications, Taiwan must develop a nationally representative electronic health record (EHR) dataset. However, decades of independent EHR development across hospitals have resulted in incompatible formats, creating major challenges for data integration. A single medical center operates around 50 systems, and hospitals vary in services and functionality, making a unified commercial EHR impractical.

A more feasible approach is leveraging a data platform to integrate heterogeneous EHR systems using international standards for data transformation. This strategy aligns with global efforts to enhance interoperability and enables seamless nationwide and international data exchange.

Successful integration requires three key components: a standardized national framework for EHR data exchange, unified clinical terminology and laboratory data, and a regulatory framework supported by high-speed data exchange infrastructure. These elements ensure seamless data transformation and interoperability.

This presentation will outline Taiwan's strategy for nationwide EHR integration, including new technologies, data exchange frameworks, and future policy directions. By establishing an efficient and interoperable EHR ecosystem, Taiwan aims to advance smart healthcare and align with international standards.

Optimizing hospital data utilization to support clinical decision-making and medical research

優化醫院數據運用以支持臨床決策與醫學研究

Yu-Chen Lo
羅宇成
Big Data Center, Taipei Veterans General Hospital, Taipei, Taiwan, ROC
臺北榮民總醫院 醫研部 大數據中心

In the healthcare environment, the value of data lies not only in daily operations but also serves as a critical foundation for clinical decision-making and medical research. This presentation will share practical experiences from Taipei Veterans General Hospital in optimizing the use of hospital data, including enhancing data quality through data governance, strengthening cross-departmental data collaboration, and leveraging digital tools to improve the accuracy of clinical and research decisions.

The speaker will explore the establishment of standardized data workflows to ensure data usability and security, and will demonstrate how digital dashboards and other tools can maximize efficiency in clinical practice and medical research. Through case studies, the presentation will illustrate how data can be transformed into actionable insights to support clinicians in making timely and accurate decisions, while also advancing medical research. Ultimately, data will be highlighted as a key driving force in fostering innovation in healthcare.

From big data to analyze antenatal exposure to long-term offspring health outcomes

大數據分析產前暴露對子代健康的長期影響

Ming-Chih Lin

林明志

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Regarding the impact of prenatal risk factor exposure on child health using health insurance databases, past studies have often been limited by the inability to link mothers' and children's identification numbers, making it difficult to determine maternal diseases, medication use, and risk factor exposures during pregnancy. After the introduction of Taiwan's Maternal and Child Health Database (MCHD), Breakthroughs have been reached in research methodology.

We analyzed the relationship between maternal prenatal health and postnatal child health. First, we discovered that maternal immune diseases might increase the incidence of Kawasaki disease in children. Next, Pregnant women often have concerns about vaccination during pregnancy. Our research confirmed that influenza infection during pregnancy may increase the risk of febrile seizures in children, providing strong evidence to support the prevention of prenatal viral infections and encourage pregnant women to receive the influenza vaccine. Furthermore, we found that although prenatal corticosteroids have been widely used in obstetrics to prevent respiratory distress in preterm infants, our study showed that prenatal corticosteroid use may have long-term adverse effects on late preterm and full-term infants. Additionally, we also found that maternal autoimmune diseases may increase the risk of autism in children through epigenetic mechanisms.

In summary, Barker hypothesis could be further approved through big data analysis. Prenatal exposure has long-term impact on children's health.

How to make big data powerful? Neonatal mortality data as an example

如何讓大數據有力量？以新生兒死亡率數據為例

Tsung-Hsueh Lu

呂宗學

Institute of Public Health, College of Medicine, National Cheng Kung University, Tainan , Taiwan, ROC

國立成功大學 醫學院 公共衛生研究所

One of the ways to make big data powerful in providing better information for better actions is to collect relevant data and open the data to public analysis and uses. In this talk, I will use neonatal mortality as an example to illustrate how the government can collect more relevant data and open the data to incur better analysis and providing better information for better decision making.

1) the causes of death (COD) summary tables released by the Office of Statistics, Ministry of Health and Welfare (OS_MOHW) in Taiwan used broad categories for leading infant CODs and could not further analysis the neonatal mortality by age of death. by city/county and year.
2) the OS_MOHW also releases aggregated open data for three-digit International Classification of Disease Tenth Revision (ICD-10) and detail age of death from 2008 to present.
3) the gestational age and birthweight are two important relevant data related to neonatal mortality. However, the Birth Reporting System (BRS) maintained by the Surveillance Division in Health Promotion Administration (SD_HPA) did not release the open aggregated data and the annual report provides very limited information, little is known on the prevalence of very preterm (<32 weeks) and extremely preterm (<28 weeks) and periviable (<22 weeks).
4) the restricted Center for Data Science provides the linkage of different datasets for better analysis. However, it was not very friendly for identify neonatal death because of no neonatal ID in BRS.
5) the US National Center for Health Statistics (NCHS), in contrast, linked the birth certificate and multiple CODs infant death data and open to public. Furthermore, the NCHS collected more detail data in the birth certificates for providing more relevant information for clinicians and public health people.
6) many neonatal intensive care units (NICUs) networks collected more detailed data on medical treatments and related outcomes, which provide valuable and powerful information for research.
7) in the global health field, several modelled-based neonatal mortality data for countries or territories without complete vital statistics system have been developed, such as GBD and IGME.

Inviting you to make full use of these open neonatal mortality data for better analysis and producing powerful information for better decision making.

Big data analytics of preterm infant growth trajectories: Insights from growth predictive tool development with US healthcare data

大數據分析早產兒生長軌跡：使用美國醫療數據開發生長預測工具之經驗分享

Fu-Sheng Chou

周甫聲

Department of Neonatal-Perinatal Medicine, Southern California Permanente Medical Group, Pasadena, USA

美國南加州凱瑟醫療集團 新生兒科

Thanks to the advent of computer technology and the widespread adoption of electronic health records, healthcare-related data have been largely digitized for over a decade, amassing a vast repository of information that includes physiological parameters, clinical outcomes, pathological etiologies, and even molecular data. This wealth of historical data offers transformative potential for patient care, especially in data-driven domains like neonatal medicine, which focuses on supporting the growth and development of preterm infants while minimizing complications and morbidities.

Traditional methods for assessing growth in neonatal intensive care units (NICUs), such as intrauterine growth charts and weekly growth velocity (GV) calculations, fall short due to their impracticality for real-time monitoring. Intrauterine growth charts are designed to estimate fetal growth rather than postnatal development, and GV calculations require a full week of data collection before they can be applied. More importantly, postnatal growth follows a distinct trajectory from fetal growth, making the use of intrauterine charts not only impractical but also inappropriate for tracking preterm infants after birth.

To address these limitations, we embarked on a data-driven initiative, hypothesizing that, in the absence of morbidities, a preterm infant's growth follows a genetically predetermined trajectory. Partnering with the Pediatrix Medical Group, we worked with a comprehensive dataset of growth parameters, physiological measurements that are less prone to bias than many healthcare data sources but still require careful handling due to issues like measurement errors and missing data. Leveraging big data analytics, we set out to characterize postnatal growth patterns and develop a practical prediction tool for clinical use. We meticulously chose an algorithm to model these growth trajectories, carefully evaluating its strengths and weaknesses.

Currently, we are validating the postnatal growth charts using data from Kaiser Permanente Southern California. Additionally, we are categorizing growth patterns based on these charts and linking them to morbidity outcomes to enhance their clinical utility. Moreover, we are collaborating with Dr. Mei-Jy Jeng to implement this growth assessment tool at Taipei Veterans General Hospital as a web application, aiming to further strengthen care for Taiwanese preterm infants.

Through this effort, we've crafted an innovative framework that not only deepens our understanding of preterm growth dynamics but also lays the groundwork for future academic and clinical advancements, converting raw data into actionable insights to improve the long-term health of preterm infants and give them the strongest possible foundation for life. Ultimately, this work aims to revolutionize how we monitor and support preterm infants, ensuring they receive the best possible care from birth through childhood.

Acute respiratory infections in children visiting the emergency department in Taiwan: Analysis and future perspectives

台灣兒童急診急性呼吸道感染之分析與未來展望

Wei-Yu Chen

陳威宇

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臺北榮民總醫院 兒童醫學部 新生兒醫療中心

Acute respiratory infections (ARIs) are a leading cause of pediatric emergency department (ED) visits, significantly burdening healthcare systems and posing challenges for clinical management and public health surveillance. Early and accurate pathogen identification is essential for appropriate treatment, efficient resource use, and outbreak detection. However, traditional diagnostics relying on symptoms and selective lab tests often cause delays, unnecessary antibiotic use, and missed intervention windows. This study examines the integration of multiplex PCR diagnostics with geographic surveillance in Taiwan's pediatric EDs and explores how AI and big data can further enhance ARI management.

Taiwan's current surveillance depends on the CDC's reporting systems and the Epidemic Prevention Cloud, which support physician reports and lab-based disease detection, mainly focusing on influenza and lacking real-time geospatial integration. Implementing multiplex PCR enabled pathogen identification within one hour, improving antibiotic stewardship and reducing unnecessary hospitalizations. Merging lab data with geographic information systems (GIS) allowed real-time cluster detection and strengthened public health responses.

Building on these results, AI and big data can further improve surveillance. Predictive modeling can forecast ARI surges, enabling proactive resource planning. Real-time outbreak detection using hospital and community data can enhance early warnings. Integrating AI decision support in EDs can streamline triage and treatment decisions. Embedding these technologies can shift Taiwan toward a proactive, data-driven approach to pediatric ARI management, improving patient outcomes and public health preparedness.

4

2025年度榮總臺灣聯合大學系統暨合作研究成果發表會

Symposium of VGH-UST Joint Research Program

時　間：114年6月28日　08:00~12:00

Time：June 28, 2025　08:00~12:00

地　點：臺北榮民總醫院　致德樓第四會議室

Place：The Fourth Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

5

BiTEs vs CART：
血液疾病治療最新進展

BiTEs vs CART: the Recent Advances in the Treatment of Hematological Malignancies

時　間：114年6月28日　08:30-12:00
Time：June 28, 2025　08:30-12:00

地　點：臺北榮民總醫院 致德樓第五會議室
Place：The Fifth Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

BiTEs vs CART：血液疾病治療最新進展

BiTEs vs CART: the Recent Advances in the Treatment of Hematological Malignancies

The role of Blincyto in frontline and MRD-guided therapy

Blincyto 在前線治療和 MRD 導引治療的角色

Yoon Jae-Ho

Seoul St. Mary's Hospital, The Catholic University of Korea, Seoul, Korea

MRD has emerged as a critical prognostic marker in ALL, transforming treatment strategies and driving personalized care. This presentation explores the evolving role of blinatumomab, a bispecific T-cell engager, in both frontline consolidation therapy and MRD-guided treatment pathways.

We will begin by examining key clinical evidence, which demonstrated a significant survival benefit when blinatumomab was incorporated into frontline consolidation patients. The session will highlight how MRD status can inform treatment sequencing.

By the end of the session, attendees will gain a clear understanding of:

- The clinical rationale for early integration of blinatumomab in ALL treatment
- How MRD testing can refine risk stratification and guide therapeutic decisions
- Practical strategies to incorporate blinatumomab into frontline and MRD-driven care

Recent advances of CAR T-cell therapy in acute lymphoblastic leukemia

CAR T 細胞治療在急性淋巴球性白血病的最新進展

Ting-An Lin

林庭安

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臺北榮民總醫院 內科部 血液科 及 國立陽明交通大學 醫學系

Chimeric Antigen Receptor (CAR) T-cell therapy has emerged as a transformative treatment for relapsed or refractory acute lymphoblastic leukemia (ALL), particularly in pediatric and young adult populations. By genetically modifying a patient's own T cells to express CARs targeting specific antigens—most commonly CD19—this immunotherapy enables robust and targeted cytotoxic activity against leukemic blasts. Recent clinical trials have demonstrated remarkable remission rates, with some studies reporting complete response rates exceeding 80%. Despite these successes, challenges remain, including antigen escape, limited durability of response, and treatment-related toxicities such as cytokine release syndrome (CRS) and immune effector cell-associated neurotoxicity syndrome (ICANS).

To address these hurdles, several innovative strategies are under development. These include dual-targeted CAR constructs (e.g., CD19/CD22), switchable CAR systems to improve safety control, and "armored" CAR T cells engineered to resist the immunosuppressive tumor microenvironment. In addition, allogeneic (off-the-shelf) CAR T-cell platforms are being explored to improve accessibility and reduce manufacturing time. Advances in patient selection, lymphodepletion regimens, and post-infusion monitoring have also contributed to improved clinical outcomes and management of adverse events.

This section summarizes the latest clinical and translational advancements in CAR T-cell therapy for ALL, highlighting ongoing efforts to overcome current limitations and expand its therapeutic potential. Continued innovation in CAR design, delivery platforms, and combination strategies is expected to further enhance efficacy, safety, and accessibility in the treatment of ALL.

Early treatment planning to enhance treatment outcome with CAR-T treatment for suitable patients in DLBCL: Insights from case sharing

【DLBCL】適合患者的 CAR-T 治療：透過早期治療規劃提升治療效果：病例分享

Yoon Seok Choi

Department of Hematology, Korea University Anam Hospital, Seoul, Republic of Korea

Diffuse large B-cell lymphoma (DLBCL) is one of the most common and aggressive forms of non-Hodgkin lymphoma. Despite advances in treatment, a substantial proportion of patients with relapsed or refractory (R/R) disease fail to achieve lasting remission through standard chemoimmunotherapy. Chimeric antigen receptor T-cell (CAR T) therapy has emerged as a transformative treatment option, offering substantial clinical benefits for patients with R/R DLBCL. However, to achieve optimal outcomes, early and strategic treatment planning is essential.

This presentation emphasizes the critical role of timely identification and systematic planning for CAR T-cell therapy in improving treatment efficacy for suitable DLBCL patients. It highlights the importance of determining patient eligibility early in the disease course and coordinating efforts across multidisciplinary teams to ensure efficient and seamless care pathways. Additionally, integrating bridging therapy options, optimizing the timing of CAR T-cell infusion, and addressing logistical challenges are key components of early planning that can greatly influence therapeutic success.

The insights shared will include real-world treatment experiences from South Korea, illustrating practical approaches to implementing CAR T-cell therapy within local healthcare systems. Cases from South Korea demonstrate the importance of initiating treatment discussions early, tailoring treatment plans according to individual patient profiles, and leveraging institutional expertise to facilitate efficient treatment transitions.

Early and rigorous CAR T-cell therapy planning is pivotal in optimizing clinical outcomes and transforming the treatment landscape for R/R DLBCL. By combining evidence-based practices and lessons learned from Korean clinical experiences, this presentation underscores the importance of proactive planning to deliver the best possible care for patients facing this challenging disease.

Enhancing treatment strategies with bispecifics in DLBCL

利用雙特異性抗體優化瀰漫性巨大 B 細胞淋巴瘤治療策略

Hao-Yuan Wang

王浩元

Division of Hematology, Department of Medicine, Taipei Veterans General Hospital, Taipei, Taiwan, ROC
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臺北榮民總醫院 內科部 血液科 及 國立陽明交通大學 醫學系

Diffuse large B-cell lymphoma (DLBCL) is the most common subtype of non-Hodgkin lymphoma and exhibits a highly heterogeneous clinical course. While standard chemoimmunotherapy regimens such as R-CHOP achieve long-term remission in many patients, a significant proportion experience relapse or refractory disease, underscoring the need for novel therapeutic approaches. Bispecific antibodies (bsAbs), which simultaneously target CD3 on T cells and tumor-associated antigens such as CD20 or CD19 on B cells, have emerged as a promising class of immunotherapy in relapsed/refractory (R/R) DLBCL. By redirecting cytotoxic T cells toward malignant B cells, bsAbs offer a T-cell–engaging mechanism that is independent of the patient's native immune response.

Recent clinical trials have demonstrated encouraging efficacy and manageable safety profiles with bispecifics such as glofitamab, epcoritamab, and odronextamab, particularly in heavily pretreated patients. Furthermore, combinations of bsAbs with existing immunochemotherapy or novel agents such as checkpoint inhibitors and antibody-drug conjugates are being actively explored to deepen responses and overcome resistance mechanisms.

This section reviews the current landscape of bispecific therapies in DLBCL, highlighting clinical trial outcomes, mechanisms of action, and evolving strategies to integrate these agents earlier in treatment algorithms. We also discuss key considerations in patient selection, toxicity management, and future directions including potential for fixed-duration therapy and curative intent in high-risk populations. As bispecifics move beyond the R/R setting, they may redefine the standard of care and offer new hope for patients with this aggressive lymphoma.

New generation of treatment with bispecific antibodies in multiple myeloma: From research to clinical application

新一代雙特異性抗體在多發性骨髓瘤的治療應用：從研究到臨床

Adam Jacob Bryant

Liverpool Hospital, NSW, Australia

Despite significant advances in frontline treatment for multiple myeloma, an increasing proportion of patients are becoming multi-class refractory early in their disease course. This has driven the rapid development and approval of novel immunotherapies, particularly bispecific antibodies (BsAbs), targeting BCMA and GPRC5D. BsAbs offer high response rates comparable to CAR-T therapies but with greater accessibility and immediacy.

This presentation reviews key efficacy and toxicity data from pivotal trials of teclistamab, elranatamab, and talquetamab. Mechanisms of action, response durability, and strategies to mitigate toxicities, especially cytokine release syndrome (CRS), neurotoxicity, cytopenias, infection, and off-tumour effects, are discussed. Differences in toxicity profiles between BCMA and GPRC5D targeted agents are highlighted, with emphasis on oral and dermatologic adverse effects unique to the latter.

Clinical implementation issues, including hospitalisation for step-up dosing, supportive care infrastructure, and infection prophylaxis, are reviewed. Practical management tips are provided to help general haematologists and inpatient teams safely deliver these therapies.

The talk concludes by exploring the future role of bispecifics in frontline therapy and time-limited strategies, underscoring their potential to reshape long-term myeloma care.

Recent advances in CAR-T cell therapy in multiple myeloma

多發性骨髓瘤 CAR-T 細胞治療的最新進展

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Chimeric antigen receptor (CAR)-T cell therapy has emerged as a groundbreaking treatment modality in hematologic malignancies, particularly relapsed or refractory multiple myeloma (RRMM). Recent clinical trials have demonstrated impressive response rates and durable remissions in heavily pretreated myeloma patients, marking a significant shift in the therapeutic landscape. BCMA (B-cell maturation antigen)-targeted CAR-T products, such as idecabtagene vicleucel (ide-cel) and ciltacabtagene autoleucel (cilta-cel), have shown overall response rates exceeding 80% and complete response rates in a substantial proportion of patients. Despite these advances, several challenges remain, including disease relapse due to antigen escape, limited CAR-T cell persistence, and the risk of cytokine release syndrome and neurotoxicity.

To address these limitations, next-generation CAR-T strategies are under active investigation. These include dual-targeted CAR-T cells aiming at antigens such as BCMA and GPRC5D or CD19, the incorporation of safety switches and enhanced co-stimulatory domains, and the development of allogeneic "off-the-shelf" CAR-T products. Moreover, efforts to improve manufacturing efficiency and reduce time-to-treatment are critical to broadening accessibility. Integration of CAR-T therapy into earlier lines of treatment and its combination with immune-modulatory agents or checkpoint inhibitors are also being explored to enhance efficacy and durability of response.

This section summarizes the current state of CAR-T therapy in multiple myeloma, highlights recent clinical and translational advancements, and discusses future directions aimed at overcoming resistance and optimizing patient outcomes.

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人工智慧應用與精準營養應用於整合醫學照護及醫學教育

The Application of Artificial Intelligence and Precision Nutrition in Integrated Medical Care and Medical Education

時　間：114年6月28日　08:25-12:05

Time：June 28, 2025　08:25-12:05

地　點：臺北榮民總醫院 致德樓第六、七會議室

Place：The Conference Room 6&7, Chih-Teh Building
Taipei Veterans General Hospital

人工智慧應用與精準營養應用於整合醫學照護及醫學教育
The Application of Artificial Intelligence and Precision Nutrition in Integrated Medical Care and Medical Education

AI-Assisted point of care ultrasound training for medical students

AI 輔助臨床重點式超音波教學

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Background: With ultrasound devices becoming more affordable, point-of-care ultrasound (POCUS) is increasingly vital in clinical care. Despite its diagnostic accuracy and low cost, medical education lacks sufficient POCUS training due to limited instructors and access. ChatGPT-4o, with its real-time capabilities and medical knowledge, offers a promising solution. This project explores whether AI-assisted POCUS training using ChatGPT-4o can match or surpass traditional teaching methods in effectiveness and accessibility.

Methods: This study recruited clerkship medical students and post-graduate year (PGY) residents rotating through the Division of Holistic Integrated Medicine at Taipei Veterans General Hospital. Participants were invited to join the study following their introductory briefing on the first day of clinical rotation. Sample size estimation using G*Power (v3.1.9.7) for a paired Wilcoxon signed-rank test (effect size 1.92, $\alpha = 0.05$, power = 80%) indicated a minimum of 5 participants. A one-year recruitment period was planned, targeting 24–48 clerks and 12 PGY residents. Participants were randomized 1:1 into an AI-assisted or traditional teaching group. The intervention involved a structured POCUS teaching module focused on the FAST (Focused Assessment with Sonography for Trauma) exam. A pre-trained ChatGPT-4o model was used in the AI group, incorporating literature-based training (Gleeson & Blehar, 2018) and validated through expert testing to ensure ≥90% response accuracy. The teaching protocol consisted of: (1) a pre-test and a 15-minute FAST reading session; (2) a 10-minute theoretical session via ChatGPT-4o (AI group) or instructor-led teaching (traditional group); (3) a 15-minute hands-on FAST exam on standardized patients with real-time guidance via ChatGPT-4o or instructor; (4) a practical skills assessment, post-test, and feedback survey; and (5) crossover teaching for the AI group to receive traditional instruction. Learning outcomes included pre- and post-test knowledge scores, hands-on performance scores (probe position and image quality), and satisfaction surveys. Cost-effectiveness was evaluated by comparing learning outcomes, satisfaction, and teaching time between the groups.

Conclusion: This study will determine whether AI-assisted teaching using ChatGPT-4o is non-inferior or superior to traditional instructor-led methods in POCUS education for medical students and residents.

Application of information technology in innovative clinical education: Enhancing systematic assessment skills of medical clerks through interactive and visualized electronic patient evaluation forms

資訊科技於創新臨床教育之應用：利用互動式電子病人評估表單提高見習醫學生的系統性評估技能

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Background: Medical clerks face challenges in clinical internships, particularly in organizing complex patient information. These difficulties are prominent in holistic internal medicine, where clerks manage elderly patients with multiple comorbidities. Traditional training may not fully support systematic assessment and clinical reasoning. The COVID-19 pandemic accelerated digital learning adoption, demonstrating its potential to enhance clinical skill acquisition. This study explores how interactive, technology-enhanced learning approaches can improve clerks' learning outcomes.

Methods: Enrolled participants were medical clerks undertaking a two-week rotation in the Department of Holistic and Multidisciplinary Medicine. An interactive, visualized electronic patient evaluation tool was developed and integrated into the clerkship curriculum. It includes structured patient assessment forms, a self-assessment module, real-time faculty feedback, and a Mini-Clinical Evaluation Exercise (Mini-CEX) component. Clerks used the tool during patient work-ups and case presentations, while faculty provided feedback through the platform. A mixed-methods approach evaluated its effectiveness by comparing Mini-CEX scores before and after implementation, analyzing self-assessment data, and collecting survey feedback from students and instructors.

Preliminary Results: Initial findings indicate significant improvement. Mini-CEX scores increased from 35 to 42 (20% gain) after a two-week rotation with the tool. Self-assessment data reflected enhanced confidence in patient evaluations, and clerks provided positive feedback on usability and educational value.

Conclusion: This study demonstrates that an interactive, structured patient evaluation tool enhances clerks' systematic assessment skills and clinical reasoning. These findings support the integration of digital tools into medical education, offering an innovative model that links theoretical learning with practical application.

The Application of generative AI in holistic care and medical education: Clinical integration and transformative strategies from a southern Taiwan medical center

生成式 AI 在全人照護與醫學教育的應用

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The emergence of generative artificial intelligence (AI) is transforming healthcare and medical education, offering novel pathways for personalization, efficiency, and reflection. This presentation outlines the current developments and clinical adoption strategies of generative AI, with practical insights drawn from ongoing implementations at a medical center in southern Taiwan.

In the realm of holistic care, generative AI is being applied to support interprofessional practice (IPP) and interprofessional education (IPE). AI-driven tools facilitate collaborative communication by generating patient narratives, simulating therapeutic dialogues, and assisting interdisciplinary teams in co-constructing care plans that address not only physical needs, but also psychological, social, and spiritual dimensions. These applications enhance mutual understanding among professionals and deepen patient-centered awareness.

In medical education, generative AI is being progressively integrated into the frameworks of competency-based medical education (CBME), including Entrustable Professional Activities (EPA), milestone-based evaluations, and faculty development programs. In parallel, an AI-enhanced e-portfolio system is being developed to support individualized learning plans, provide tailored formative feedback, and serve as an AI mentor and coach to guide learners' self-directed growth. Moreover, the medical humanities curriculum is undergoing transformation to incorporate AI-supported reflective writing, aiming to foster empathy, critical thinking, insight, and moral sensitivity. A strategic emphasis on digital empowerment equips students with AI literacy and nurtures curiosity-driven learning.

Looking forward, key challenges include safeguarding patient data, addressing algorithmic bias, ensuring transparency in AI decision-making, and mitigating digital inequities in access and usage among medical trainees. Ethical considerations—such as the preservation of humanistic values in AI-augmented learning and the responsible use of synthetic content—will require careful governance. Nonetheless, with a human-centered and ethically guided approach, generative AI holds great potential to enhance the compassion, agility, and resilience of future healthcare systems and educational paradigms.

Keywords: Generative AI; Holistic Care; Interprofessional Practice; Medical Education; CBME; EPA; e-Portfolio; AI Mentor; Digital Empowerment; Reflective Practice; Ethical AI; Digital Divide

The roles of pharmacists in parenteral nutrition therapy team: An example of constructing a comprehensive procedure for neonatal compounding parenteral nutrition care with multidisciplinary teamwork and information technology at a medical center

藥師於靜脈營養小組之角色：以某醫學中心跨團隊應用資訊科技周全建構新生兒配製型靜脈營養照護流程為例

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Pediatric parenteral nutrition is a complex therapy with dozens of ingredients, each with clinical rationales, dosing implications, and interaction potential. Meanwhile, its ingredients tend to be in short supply. Therefore, healthcare institutions should implement policies and procedures that ensure professionals can demonstrate competency to optimize the delivery of safe and effective therapy.

A team was constructed with a clinical pharmacist, pediatric physicians, and heads of departments at a 3,160-bed medical center to optimize pediatric parenteral nutrition. The process of preparation, prescribing, order verifying, compounding, and administration was assessed and reformed by reviewing the literature.

During the past 10 years, five pediatric ingredients were adapted for compounding individualized parenteral nutrition. Several ingredient shortage events were solved, and the impact on patients was minimized. A user-friendly e-prescribing tool, concerned with daily fluid, age, weight-based dosing was established in 2018. The program connected the prescribing system and compounding pharmacy, with a calculation function has implemented in 2024. The pharmacy is equipped with two automated compounding devices (Baxter Exacta Mix® 2400), compounding around 2,000 pediatric parenteral nutrition prescriptions safely and efficiently yearly. Additionally, compounding parenteral nutrition and intravenous fat emulsion for neonates is administered via a 0.22 and 1.2 μm filter for safety considerations.

With multidisciplinary teamwork and information technology, we construct a comprehensive procedure and improve the quality of neonatal parenteral nutrition care.

The interplay of nutrition and medicine: Development trends of Evidence-Based Clinical Nutrition in medical education

營養與醫學的和弦：實證臨床營養學在醫學教育的發展趨勢

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Evidence-Based Clinical Nutrition (EBCN) represents a fundamental shift in how nutritional care is approached, emphasizing the systematic and rigorous process of identifying, critically appraising, synthesizing, and applying the most current and robust scientific evidence to inform clinical nutrition decision-making. This approach moves beyond relying solely on anecdotal experience or the pronouncements of authority figures, instead prioritizing findings from well-designed research studies. The core tenets of EBCN ensure that nutritional interventions are grounded in the best available data, leading to more effective and patient-centered care. This necessitates a thorough understanding of research methodologies, statistical analysis, and the ability to discern the strength and applicability of various forms of evidence, ranging from randomized controlled trials to observational studies and systematic reviews. The ultimate goal of EBCN is to optimize patient outcomes by ensuring that nutritional recommendations are not only theoretically sound but also demonstrably effective in real-world clinical settings.

Concurrently, medical education is experiencing a significant paradigm shift away from traditional pedagogical models that heavily relied on the transmission of knowledge based primarily on the instructor's experience and hierarchical authority. The modern approach to medical training increasingly focuses on actively cultivating students' higher-order cognitive skills, including critical thinking, problem-solving, and analytical reasoning. Furthermore, there is a strong emphasis on fostering self-directed learning, empowering students to take ownership of their education and develop the skills necessary for continuous professional development. Lifelong learning is now recognized as an essential competency in the rapidly evolving field of medicine, requiring graduates to be adept at independently seeking, evaluating, and integrating new knowledge throughout their careers. This transformation in medical education inherently places a greater emphasis on developing students' capacity for critical thinking and the ability to effectively appraise scientific literature, with a particular focus on independently evaluating nutrition-related research publications to inform their future clinical practice.

The nutraceutical industry from R&D, regulation to marketing and its social responsibility

營養品產業從研發、法規到市場以及其社會責任

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Join hands with the healthcare professionals to protect the health of patients.

With the prevalence of chronic diseases and the rise in health awareness, the role of nutritional supplementation in holistic care is becoming increasingly important. Every aspect of the nutraceutical industry, from R&D to regulation to marketing, is closely related to clinical needs, and provides more tools for medical workers to assist in care.

In the R&D stage, the industry continues to integrate nutritional science, clinical research and personalized nutrition trends to develop products for specific ethnic groups (such as the elderly, postoperative, cancer and specific disease patients, etc.) to enhance the empirical basis and application value. At the same time, it also cooperates with the medical side to conduct clinical trials, observational studies and real-world data analysis to strengthen product safety and efficacy verification.

In terms of regulations, the industry must strictly abide by food and drug management practices, ensure the transparency and compliance of ingredients and labeling, and establish a reliable basis for doctors and patients to choose. This also helps to evaluate and recommend products in clinical practice, reducing misleading and confusion.

In addition to product promotion, the market emphasizes communication and education with medical professionals. Many practitioners are investing in patient education, nutrition intervention programs, and cross-team collaboration to support greater synergies among healthcare professionals in improving patient compliance, nutritional status, and overall outcomes.

The ultimate responsibility of the nutrition industry is not only to produce products, but also to participate in the health care ecosystem. In the future, through cross-border collaboration, professional exchanges and the establishment of common standards, we will have the opportunity to create a people-centred and prevention-oriented healthcare environment to improve patients' quality of life and health outcomes.

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腫瘤診治的最新進展

Latest advances in cancer treatment

時　間：114年6月28日　09:00-12:00

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地　點：臺北榮民總醫院 致德樓第八、九會議室

Place：The Conference Room 8&9, Chih-Teh Building
Taipei Veterans General Hospital

腫瘤診治的最新進展
Latest advances in cancer treatment

Innovations in T cell therapy in solid tumors emerging cell therapy in solid tumor: Falk from US FDA-approved products to future hope

實體腫瘤新興細胞療法：從美國 FDA 核准的產品到未來的希望

Huey-En Tzeng

曾慧恩

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In the last decade, Chimeric Antigen Receptor (CAR)-T cell therapy has emerged as a revolutionary immunotherapeutic strategy, demonstrating remarkable success in treating hematologic malignancies such as B-cell lymphoma, leukemia, and multiple myeloma. Beyond CAR-T therapy, engineered cell-based immunotherapies include T cell receptor (TCR)-T therapy and tumor-infiltrating lymphocytes (TILs), among others. Despite the transformative impact of these approaches in blood cancers, their application to solid tumors remains a formidable challenge. The hostile tumor microenvironment promotes immune suppression and CAR-T cell dysfunction, while tumor heterogeneity and physical barriers further limit effective tumor infiltration and targeting.

Recent advances have led to significant regulatory approvals, including the U.S. Food and Drug Administration (FDA) approval of lifileucel (Amtagvi), the first TIL-based therapy, for melanoma, and afamitresgene autoleucel (afami-cel) for advanced synovial sarcoma. Additionally, the FDA has approved Astellas's zolbetuximab (Vyloy) for HER2-negative, claudin-18.2-positive gastric and gastroesophageal junction adenocarcinomas. To overcome the challenges associated with CAR-T cell therapy in solid tumors, alternative approaches such as induced pluripotent stem cell (iPSC)-derived CAR-T cells, CAR-Natural Killer (CAR-NK) cells, and CAR-macrophages (CAR-M) have emerged. Notably, CAR-NK cells offer significant advantages over CAR-T cells, including HLA independence, lower toxicity, and potential large-scale production as an off-the-shelf therapy. These advances mark a pivotal shift in cell therapy, offering new avenues for improving efficacy and accessibility in treating both hematologic and solid malignancies.

The evolution of immune therapy

癌症免疫治療的進展

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The landscape of cancer immunotherapy has evolved rapidly, offering transformative treatment options across a broad range of malignancies. This lecture will trace the key milestones and emerging modalities in immune-based cancer treatment.

Immune checkpoint inhibitors (ICIs) marked a turning point by reinvigorating exhausted T cells, leading to durable responses in various cancers. However, response variability has driven efforts to optimize outcomes through rational combinations. Bi-specific antibodies and Bispecific T-cell Engagers (BiTEs) represent innovative antibody formats that redirect T cells to tumor cells with high precision, delivering potent cytotoxic effects in an off-the-shelf manner.

Cell-based therapies have also progressed significantly. CAR-T cell therapy has demonstrated remarkable efficacy in hematologic malignancies, while next-generation approaches such as CAR-NK and CAR-γδ T cells aim to enhance safety and broaden tumor targeting. TCR-T therapy offers a means to recognize intracellular tumor antigens via HLA presentation, and tumor-infiltrating lymphocyte (TIL) therapy leverages naturally primed T cells harvested directly from the tumor microenvironment.

Oncolytic viruses (OVs) provide a dual mechanism by lysing tumor cells and stimulating innate and adaptive immunity, though they are often limited to intratumoral administration. Cancer vaccines, once considered experimental, are gaining renewed interest, particularly in combination with ICIs to boost tumor-specific immunity.

Cytokine therapies such as IL-2, IL-15, and IL-12 can activate immune effectors but must be dosed carefully to mitigate toxicity. Lastly, regulatory T cell (Treg) depletion is emerging as a promising strategy to overcome immune suppression within the tumor microenvironment.

This presentation will highlight the scientific rationale, clinical evidence, and future directions for each of these immunotherapeutic strategies as we strive toward more effective and personalized cancer care.

Bispecific T cell engagers in solid tumor: Expanding the horizons of precision therapy

雙特異性 T 細胞引導劑在實體腫瘤角色：拓展精準治療的新視野

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Bispecific T-cell engagers (BiTEs) are engineered antibodies that bridge CD3 on T cells and tumor-associated antigens (TAAs) on cancer cells, enabling T-cell activation independent of MHC presentation. While transformative in hematologic malignancies, their application in solid tumors faces challenges, including immunosuppressive microenvironments, antigen heterogeneity, and on-target/off-tumor toxicity. Recent advancements in design, target selection, and combinatorial strategies are unlocking their potential for solid malignancies.

Early BiTEs like EpCAMxCD3 (catumaxomab) demonstrated efficacy in malignant ascites but highlighted toxicity risks, emphasizing the need for tumor-specific targets. Next-generation constructs targeting PSMA (prostate cancer), SSTR2 (neuroendocrine tumors), gp100 (tebentafusp for uveal melanoma), and DLL3 (tarlatamab for small-cell lung cancer) have improved safety and gained FDA approval. These successes underscore the importance of antigen selection to minimize off-tumor effects.

Overcoming the immunosuppressive tumor microenvironment (TME) remains critical. Combinations with immune checkpoint inhibitors (e.g., anti-PD-1) reverse T-cell exhaustion, while vaccines and oncolytic viruses enhance T-cell infiltration, enabling BiTE-mediated tumor clearance. Pharmacokinetic innovations, such as half-life-extended BiTEs and subcutaneous formulations, improve dosing convenience and accessibility.

The future of BiTE therapy lies in personalization and synergistic regimens. Emerging technologies, such as AI-driven antigen discovery and synthetic biology, are identifying novel targets and refining construct design. As clinical trials validate these approaches, BiTEs are poised to redefine precision oncology, offering durable responses for historically intractable solid tumors. By integrating immunology and bioengineering, this modality exemplifies the convergence of innovation and therapeutic impact in cancer care.

Tumor-infiltrating lymphocytes (TILs) in melanoma and lung cancer: Pioneering personalized immunotherapy

黑色素瘤與肺癌中的腫瘤浸潤淋巴細胞（TILs）：開創個人化免疫療法

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Tumor-infiltrating lymphocytes (TILs) have emerged as a cornerstone of personalized immunotherapy, harnessing the patient's own antitumor immune repertoire to achieve durable clinical responses. In melanoma, early-phase studies demonstrated that expanded autologous TILs, when administered following lymphodepleting chemotherapy and interleukin-2 support, induce objective response rates exceeding 50%, with complete remissions in a subset of heavily pretreated patients. These outcomes underscore the extraordinary potency of melanoma-derived TILs, whose high mutational burden and neoantigen landscape facilitate robust T-cell recognition. In contrast, non–small cell lung cancer (NSCLC) presents a more immunosuppressive microenvironment and variable neoantigen load, but recent efforts to isolate and expand tumor-reactive TIL subsets—particularly those enriched for PD-1, CD39, and CD103 expression—have yielded promising early signals of activity. Single-cell profiling has refined selection strategies by identifying clonally expanded, neoantigen-specific T-cell populations capable of mediating tumor regression. Nonetheless, challenges in lung cancer include limited TIL yield, T-cell exhaustion, and inhibitory metabolic factors within the tumor stroma. Ongoing advances in ex vivo cytokine conditioning, costimulatory molecule modulation, and combinatorial checkpoint blockade aim to overcome these barriers. Collectively, the clinical translation of TIL therapy in melanoma provides a roadmap for its extension to lung cancer and other solid tumors. By integrating high-throughput neoantigen discovery, functional T-cell assays, and next-generation manufacturing, TIL-based immunotherapy exemplifies a truly personalized approach, offering the potential for durable remissions even in refractory disease. Continued optimization and biomarker development will be critical to expand its applicability and maximize patient benefit.

Managing adverse events in cell therapy: Insights into neurotoxicity and cytokine release syndrome

處置細胞治療的副作用：淺談神經毒性與細胞激素釋放症候群

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Chimeric antigen receptor T (CAR-T) cell therapy and other adoptive cell therapies have revolutionized cancer treatment, offering promising outcomes for patients with refractory hematologic malignancies and expanding into solid tumor research. However, these therapies are associated with significant immune-related toxicities, particularly cytokine release syndrome (CRS) and immune effector cell-associated neurotoxicity syndrome (ICANS), which can range from mild to life-threatening. Effective management of these adverse events is crucial for improving patient safety and treatment success.

CRS is a systemic inflammatory response triggered by excessive cytokine production following CAR-T cell activation. It commonly presents with fever, hypotension, hypoxia, and organ dysfunction. Management strategies include early recognition, supportive care, and targeted interventions such as IL-6 inhibitors (e.g., tocilizumab) and corticosteroids to mitigate severe cases.

ICANS, a neurotoxicity syndrome associated with CAR-T therapy, manifests as confusion, tremors, aphasia, seizures, or, in severe cases, cerebral edema. While the exact mechanisms remain under investigation, endothelial activation, blood-brain barrier disruption, and excessive cytokine-mediated neuroinflammation are thought to contribute. Management involves close neurological monitoring, corticosteroids, and supportive measures, with anti-IL-6 or anti-IL-1 therapies considered in severe cases.

As cell therapy continues to evolve, optimizing strategies for toxicity mitigation, such as refining CAR designs, incorporating suicide genes, and combining therapies with immune modulators, will be essential. Ongoing clinical trials and real-world experience provide valuable insights into balancing efficacy and safety. A comprehensive understanding of CRS and ICANS pathophysiology, coupled with prompt intervention, is key to maximizing the benefits of cell therapy while minimizing risks.

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乳癌個人化醫療照顧與臨床實證

Personalized Care and Clinical Evidence in Breast Cancer

時　間：114年6月28日　08:30-12:10
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Place：The Tenth Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

乳癌個人化醫療照顧與臨床實證
Personalized Care and Clinical Evidence in Breast Cancer

Evolving role of Trop2 ADCs in mTNBC data review

Trop2 ADC 在轉移性三陰性乳癌中的發展與數據回顧

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Triple-negative breast cancer (TNBC) is an aggressive and heterogeneous subtype with limited treatment options and poor prognosis, particularly in the metastatic setting (mTNBC). Trophoblast cell-surface antigen 2 (Trop2) is highly expressed in various epithelial cancers, making it an emerging target for antibody-drug conjugate (ADC) therapy. In recent years, Trop2 ADCs have demonstrated significant clinical efficacy in mTNBC, providing new therapeutic options for patients.

This review focuses on the evolving role of Trop2 ADCs in mTNBC, summarizing key clinical trial data, including mechanisms of action, efficacy outcomes such as progression-free survival (PFS) and overall survival (OS), and safety profiles. Sacituzumab govitecan, a leading Trop2 ADC, has shown superior survival benefits over standard chemotherapy in the phase III ASCENT trial and has become a key treatment option. Additionally, novel Trop2 ADCs are under development, exploring optimal strategies such as combination therapies with immune checkpoint inhibitors or PARP inhibitors.

As research advances, Trop2 ADCs are expected to reshape the treatment landscape for mTNBC. However, further studies are required to refine patient selection, mitigate resistance, and determine the most effective treatment combinations.

The evolving treatment landscape with novel therapeutics in metastatic HR+ BC with Inavolisib

HR+ 轉移性乳癌治療的最新進展：Inavolisib 的臨床應用前景

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Metastatic hormone receptor-positive (HR+) breast cancer remains a significant challenge in oncology, particularly due to the development of resistance to endocrine therapies. One of the key drivers of this resistance is the dysregulation of the PI3K/AKT/mTOR pathway, with PIK3CA mutations frequently implicated in disease progression. This has underscored the need for targeted therapeutic approaches that can enhance treatment efficacy and overcome resistance mechanisms.

Inavolisib, a next-generation, selective PI3Kα inhibitor, represents a promising advancement in this space. By specifically inhibiting PIK3CA-mutated tumors, inavolisib has shown the potential to enhance the effectiveness of endocrine therapy while mitigating the toxicities commonly associated with broader PI3K inhibition. Early clinical studies indicate that combining inavolisib with standard hormonal treatments, such as fulvestrant or aromatase inhibitors, and CDK4/6 inhibitor, can significantly improve progression-free survival (PFS), offering a novel strategy to extend disease control in patients with metastatic HR+ breast cancer.

Beyond its efficacy, inavolisib's oral formulation provides a convenient treatment option for patients requiring long-term disease management. Furthermore, ongoing research is exploring its integration with other targeted agents, such as CDK4/6 inhibitors, to further optimize outcomes.

As the treatment paradigm for metastatic HR+ breast cancer continues to evolve, inavolisib exemplifies the potential of precision medicine to tailor therapies to specific molecular alterations. With promising clinical benefits and a favorable safety profile, inavolisib is emerging as a key player in the expanding landscape of targeted treatments, providing new hope for patients facing this challenging disease.

Personalized care in early HER2+ breast cancer: Advancing patient-centered solutions

早期 HER2+ 乳癌的個人化治療：推動以病人為中心的解決方案

Yen-Jen Chen

陳彥蓁

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HER2-positive (HER2+) breast cancer is a biologically aggressive subtype, but the advent of anti-HER2 targeted therapies has significantly improved outcomes, transforming it into a highly treatable disease. The introduction of trastuzumab revolutionized treatment, and subsequent developments, including pertuzumab and trastuzumab emtansine (T-DM1), have further refined patient-centered approaches.

Dual HER2 blockade with trastuzumab and pertuzumab is now a key strategy in high-risk early-stage disease, particularly in the neoadjuvant setting, where it enhances pathological complete response (pCR) rates and improves long-term survival. For patients with residual disease after neoadjuvant therapy, T-DM1 provides an essential escalation strategy, reducing recurrence risk and improving disease-free survival. Personalized treatment selection, balancing efficacy with toxicity, remains crucial to optimizing patient outcomes. This presentation will explore the rationale for anti-HER2 strategies, the role of dual blockade, and the impact of T-DM1 in early-stage HER2+ breast cancer, emphasizing the evolution toward more tailored, patient-centric care.

Enhancing health-related quality of life in HER2-positive breast cancer: The impact of subcutaneous dual-blockade therapy

優化 HER2 陽性早期乳癌病患之健康及生活品質

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Breast cancer is a leading malignancy among women globally, with HER2-positive breast cancers being particularly aggressive. Although HER2-targeted therapies have markedly improved survival outcomes, assessing their impact on patients' health-related quality of life(HRQoL) remains essential for comprehensive care.

This review examines HRQoL outcomes associated with dual-blockade therapies, including Trastuzumab plus Pertuzumab (PH) compared to Trastuzumab monotherapy (H), Trastuzumab emtansine (T-DM1) versus Trastuzumab deruxtecan (T-DXd), and contrasts subcutaneous (SC) with intravenous (IV) administration routes.

Current evidence emphasizes the importance of considering HRQoL alongside clinical efficacy, advocating for treatment modalities that offer both survival benefits and meaningful improvements in patient well-being. Future research should further integrate HRQoL measures to ensure continued advancement in holistic treatment approaches for HER2-positive breast cancer.

Maximizing and optimizing the 1st line treatment for patient's benefit in HER2-positive metastatic breast cancer

最大優化一線 HER2 陽性轉移性乳癌患者之治療效益

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廖國秀

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三軍總醫院 一般外科

HER2-positive metastatic breast cancer (mBC) represents a subset of breast cancer with distinct biological characteristics and clinical behaviors. The advent of targeted therapies has revolutionized the management of this disease. Recent advancements have underscored the importance of integrating personalized medicine approaches, focusing on individual patient characteristics, tumor biology, and genetic profiling. Understanding the heterogeneity within HER2-positive mBC is crucial for tailoring treatments that offer the highest efficacy and least toxicity.

Targeted Therapy Integration: Emphasizing the role of monoclonal antibodies like trastuzumab and pertuzumab, combined with chemotherapy, as the cornerstone of 1st line treatment for HER2-positive mBC.

Biomarker-Driven Treatment: Discussing the significance of biomarkers in predicting response and guiding therapy adjustments, including the utilization of next-generation sequencing and liquid biopsies.

Combination Strategies: Evaluating the potential of combining HER2-targeted therapies with other modalities, such as hormonal therapy and immunotherapy, to enhance therapeutic outcomes.

Minimizing Toxicity: Strategies to manage and mitigate adverse effects, thus improving the quality of life for patients undergoing treatment.

Clinical Trials and Emerging Therapies: Highlighting the importance of ongoing clinical trials and exploring novel agents that show promise in further improving patient outcomes.

Ultimately, the goal is to provide a holistic approach in treating HER2-positive mBC patients, ensuring that each individual receives a tailored treatment plan that maximizes therapeutic benefits while minimizing potential harms.

Optimal CDK4/6 Inhibitor treatment options across groups in HR+/HER2- Metastatic Breast Cancer patients

HR+/HER2- 轉移性乳癌患者最佳的 CDK4/6 抑制劑之跨族群分析

Jiun-I Lai

賴峻毅

Division of Medical Oncology, Department of Oncology, Taipei Veterans General Hospital, Taipei, Taiwan, ROC

臺北榮民總醫院 腫瘤醫學部

The use of CDK4/6 inhibitors (CDK4/6i) has emerged as a treatment for hormone receptor-positive, HER2-negative metastatic breast cancer (HR+/HER2- mBC) across diverse patient populations. This presentation aims to explore optimal CDK4/6 inhibitor therapy strategies tailored to HR+/HER2- metastatic breast cancer patients, spanning a wide range of ages, from younger to older individuals.

The phase III MONALEESA-7 trial demonstrated that ribociclib combined with endocrine therapy and ovarian function suppression can provide both progression-free survival and overall survival benefits, improving the quality of life in premenopausal or perimenopausal patients with HR+/HER2- mBC.

Additionally, the RIGHT Choice study demonstrated that ribociclib combined with aromatase inhibitors and ovarian function suppression provides a significant progression-free survival benefit, comparable response rates, and superior tolerability compared to combination chemotherapy in young patients with clinically aggressive HR+/HER2– mBC. These positive outcomes highlight ribociclib plus endocrine therapy and OFS as viable options, offering improved disease control and enhanced quality of life for patients who previously faced the dual burden of disease and treatment-related side effects.

Lastly, this presentation will address the toxicity profile of ribociclib, with a primary focus on liver toxicity and QTc prolongation. Additionally, a pooled analysis of ribociclib's safety and efficacy in the elderly population will be discussed in this section.

This presentation underscores that HR+/HER2- mBC patients, regardless of age, can derive significant benefit from CDK4/6i therapy. The ultimate objective is to bridge the gap between clinical trial outcomes and real-world application, ensuring these therapeutic advantages are effectively translated into routine clinical practice.

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榮陽交清跨界醫療創新交流會

Cross-Disciplinary Medical Innovation Exchange Forum

協辦單位：臺北榮民總醫院-醫療創新中心(CiC)及醫學研究部技術轉移組、國立陽明交通大學、國立清華大學

時　間：114年6月28日　08:30-16:30

Time：June 28, 2025　08:30-16:30

地　點：臺北榮民總醫院 醫學科技大樓一樓會議室

Place：The Medical Science and Technology Building Taipei Veterans General Hospital

榮陽交清跨界醫療創新交流會
Cross-Disciplinary Medical Innovation Exchange Forum

Medical AI: From precision diagnosis to early prediction, from innovative research to landing applications

醫療 AI: 從精準診斷到先覺預測，從創新研究到落地應用

Vincent S. Tseng

曾新穆

Department of Computer Science, National Yang Ming Chiao Tung University, Hsinchu, Taiwan, ROC

國立陽明交通大學 資訊工程系

In this talk, I will introduce recent trends and developments on Medical AI, covering Highly-precise Diagnostic Support, Edge Computing with Wearable/Portable Devices, Non-Invasive Sensing, Multimodal Learning, Early Prediction and Generative AI, through various advanced big data analytics/machine learning techniques on heterogeneous types of biomedical data like medical images, vital signs, electronic health records (EHR), genome, etc.

Some innovative landing applications on Medical AI with breakthrough results will also be illustrated to show how an innovative idea can be shaped and materialized into award-winning products through strategic multi-dimensional planning and actions.

Finally, some underlying challenging issues and open opportunities will also be addressed briefly at the end.

The way to win and innovative thinking

致勝之道與創新思維

Deh-Ming Chang
張德明
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臺北榮民總醫院

We may have to learn how to win in life if we expect something from ourselves.

When we find something valuable that helps us accomplish the things that matter most, we do not let go of it.

However, on multiple occasions, discipline and training are necessary to grow and become everything. We have to learn to win in the things we care about most.

Based on my previous experiences, I would like to share with you four keys, including passion, ambition, capacity, and perseverance, which I think were important on the way to win with innovative thinking, if you could be developed in your professional career.

Biomedical technology translation: Systems and value chain

生醫科技的價值鏈與轉譯

W. John Kao
高為元
National Tsing Hua University, Hsinchu, Taiwan, ROC
國立清華大學

Biomedical technology covers a wide range of products including therapeutics, devices, and diagnostics to improve human health and the quality of life. It's a fast-growing sector with a global market size of $630 billion USD with a CAGR of 5.25%. It's also a strategic area of development for Taiwan and many countries/regions around the world. In this course, we will cover several key concepts including "value chain", "patient journey", and "innovation ecosystem" with specific case studies to illustrate technology translation from basic research, through development, to market adoption.

Brain-computer interface with artificial intelligence for mental healthcare

人工智慧腦機介面於心智健康之應用

Chun-Shu Wei

魏群樹

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國立陽明交通大學 資訊工程學系

Emerging innovations at the intersection of neuroscience, engineering, and artificial intelligence are transforming how we understand and treat mental health conditions. In this talk, I will introduce our recent work in Brain-Computer Interface (BCI) technologies and AI-driven analysis methods, highlighting their potential impact on clinical practice. First, I will discuss our development of closed-loop personalized neuromodulation for major depressive disorder (MDD), where EEG-based feedback guides real-time, non-invasive brain stimulation protocols to optimize therapeutic outcomes. By continuously monitoring individual brain states, our system adapts stimulation parameters to enhance efficacy and reduce side effects. Next, I will present how explainable AI (XAI) has been applied to EEG data from schizophrenia patients. Through saliency mapping and rigorous fidelity checks, we can visualize the neural features driving diagnostic classifications, offering clinicians transparent insights into the biomarker patterns associated with psychiatric disorders. These endeavors exemplify the broader theme of clinical smart healthcare—using BCI and AI to personalize mental health interventions, improve diagnostic accuracy, and ultimately elevate patient well-being.

Exploring the possibilities of computer vision in medical image analysis

探索電腦視覺在醫學影像分析的可能性

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王才沛

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The collaboration between the fields of biomedical and computer sciences has always been viewed as having great potential for improving the wellbeing of humankind. This is particular true now with the amazingly fast progress of artificial intelligence. In addition to major advancements from larger scale projects, a lot of exciting possibilities also arise from the many creative questions and ideas of the medical practitioners. Actually, I have been very encouraged to see that many medical professionals are eager to explore possible applications of artificial intelligence, and information science in general, in their everyday practices.

The title of this talk is about computer vision and medical image analysis, as they are the fields that I am more familiar with personally. I would like to share my past and current experiences of working with medical professionals on several diverse problems, including more traditional modalities like MRI and X-ray, application in surgery, etc., and use them as examples of the diverse possibilities of applying computer vision techniques to medical image analysis problems. In addition to the technical aspects, I will talk about the process of collaboration, including the formation and evolution of research ideas.

Deep learning: From natural image analysis to medical image analysis

深度學習：由自然影像分析到醫學影像分析

Chun-Rong Huang

黃春融

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國立陽明交通大學 資訊工程學系

Deep learning has been widely used in the computer vision and image processing domains. For natural image processing, deep learning models achieve superior results compared to conventional methods. Starting from natural images, we aim to discuss the reasons why deep learning models achieve better results compared to conventional methods. Although deep learning models can learn good feature representations for natural images, can deep learning models also learn important information from medical images? In this talk, we will take three different types of medical images including endoscopic images, pathology images, and CT images as examples to show how to impose medical knowledge with deep learning models to help physicians diagnose diseases and reduce their burdens for labeling.

In endoscopic images, representing different gastric sections for disease diagnosis serves an important preprocessing step. Precancerous lesions can then be diagnosed from endoscopic images of different gastric sections based on different deep learning models designed from medical prior knowledge. In pathology image analysis, due to the large image resolution, reducing the manual annotation burden is important. In addition, cells with different sizes need to be considered for feature representations. The design of effective deep learning models to solve the aforementioned issues is presented. Finally, to guide physicians to the locations of common bile stones in CT images without pixel-level labels, a weakly supervised deep learning model is designed with explainable results. All of the deep learning models show unique designs with the promising results for medical image analysis and also show the applications of deep learning models from natural images to medical images.

Integrating the neuromodulation chip with an AIoT platform towards bringing the theranosis of brain disorders from hospital to everyone's home

整合神經調控晶片之智慧物聯網平台：將腦神經疾病診療從醫院帶到每個人家裡

Hsin Chen

陳 新

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生奕科技；國立清華大學 電機系

Bio-electronic medicine has become a promising alternative for treating neural diseases. However, the development of bio-electronic medicines relies greatly on understanding how the brain functions and identifying the biomarkers for distinguishing between normal and pathological states. To fulfill this research demand, the Neuro-Engineering Research Group was formed in the NTHU since 2004, and we had been devoted to developing neuromodulation chips and a variety of neuro-interfacing microprobes. These technologies were further applied to investigating novel treatments for the Parkinson's disease. After more than 15 years of research and publishing a bunch of journal papers, our team suddenly realized that no technology was really applicable to improving the treatment for neural disorders.

This "surprising consciousness" motivated us to co-found the BioPro Scientific in 2018. Based on our neuromodulation chip, a miniaturized microsystem, called NeuLive, suitable for recording and stimulating multiple brain regions of a freely-moving animal has been designed and commercialized. In addition, the microsystem allows the stimulation to be triggered only upon the detection of particular disease-related signatures. This function is especially crucial for investigating novel neuromodulation protocols that improve therapeutic efficacy and minimize side effects. All the technologies above have been applied to investigate the feasibility of intervening the progression of Parkinson's disease in early stage. Moreover, similar technologies are extended to realizing the wearable, non-invasive brain modulator called BrainDee, aiming to improve the theranosis of movement disorders. The BrainDee features 32 brain-modulation channels, each of which is able to record EEG and to deliver transcranial electrical stimulation. Particular attention is paid to enabling fast switching between recording and stimulation functions, so that how stimulation modulates brain activity could be investigated. Finally, as sleep disorders are known to be the prodromes of many brain disorders. A lightweight, wearable device called Lilia is for improving insomnia, as well as for detecting REM-sleep behavioural disorders, which is known to be the prodrome of the Parkinson's disease or Lewy body dementia.

This talk will introduce our latest findings and share our adventure journey of switching from academics to a startup. All the systems above will also be demoed. We sincerely hope the story would encourage more talents to devote themselves to the advancement of bio-electronic medicine.

From clinical dialogue generation to factual reasoning in large language models

從醫病情境對話生成到大語言模型的事實論證

Hung-Yu Kao
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國立清華大學 資訊工程學系

In the era of rapidly advancing generative AI, large language models (LLMs) have been widely applied in medical contexts, including automatic generation of doctor-patient dialogues, medical note summarization, and health consultation responses. However, these models frequently exhibit hallucination—producing outputs that, while grammatically correct and seemingly coherent, may fabricate nonexistent medications, misrepresent relationships between symptoms, or even generate medically incorrect information. These issues arise from the model's reliance on statistical patterns in data, rather than genuine understanding of medical knowledge or reasoning ability, posing significant risks in high-stakes fields like healthcare.

This talk begins with our practical experience of using LLMs to generate doctor-patient conversations, and highlights the structural challenges faced by language models in medical tasks. We will then explore how Retrieval-Augmented Generation (RAG) can be introduced to enhance the factual accuracy and reliability of LLM outputs. RAG integrates LLMs with external knowledge bases, enabling the model to first retrieve relevant information and then generate responses grounded in those facts—effectively reducing hallucination and providing traceable evidence.

We will also cover the implementation architecture of RAG, its application pipeline, benefits, and limitations. Concrete case studies will be presented to compare the performance of standard LLMs and RAG-enhanced models in specific regional datasets. Through this discussion, we aim to encourage a rethinking of LLMs—not merely as text generators, but as systems that must align with verified knowledge and factual integrity. RAG is not only a technical innovation; it is a crucial step toward building trustworthy AI.

Seeing and hearing dementia: Explainable and accessible AI for early detection using simple behavioral tests

看見與聽見失智症：以簡易行為測試實現可解釋且易取得的早期偵測 AI 工具

Po-Chih Kuo
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Early detection of Alzheimer's disease (AD) and related dementias is essential for timely intervention but remains limited by the cost and complexity of conventional diagnostic tools. In this talk, we present a multimodal approach leveraging video and speech data collected concurrently during the Timed Up and Go (TUG) test and the Cookie Theft (CT) picture description task to support scalable and explainable cognitive assessment.

Our vision-based pipeline analyzes body joint and facial landmark features from the TUG and CT sessions using Convolutional Neural Networks and Support Vector Machines, achieving an F1-score of 0.92±0.03 in distinguishing AD from Non-AD individuals across multiple subtasks including walking, sit-stand, turning, and description. To enhance interpretability, we incorporate model explanation techniques to identify salient behavioral indicators relevant to diagnosis.

In parallel, we introduce a language-based dementia assessment system built on Transformer models. Speech recordings from the CT task were processed using Whisper for acoustic feature extraction and transcription, and BERT for capturing linguistic features. This system achieved a weighted F1-score of 83% and a mean squared error of 8% in predicting dementia-related scores.

Together, these results demonstrate the feasibility of an integrated, low-cost, and interpretable AI-based framework for early detection of cognitive impairment using synchronized multimodal behavioral data.

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硼中子捕獲治療在台灣的現況與未來的展望

Current Status and Perspective of BNCT in Taiwan

時　間：114年6月28日　08:20-12:00

Time：June 28, 2025　08:20-12:00

地　點：臺北榮民總醫院 中正樓B1腫瘤醫學部會議室

Place：B1, The Conference Room, Chung Cheng Building
Taipei Veterans General Hospital

硼中子捕獲治療在台灣的現況與未來的展望

Current Status and Perspective of BNCT in Taiwan

Boron Neutron Capture Therapy (BNCT). Next generation charged particle therapy

硼中子俘获療法（BNCT），新一代帶電粒子療法

Akira Matsumura

松村明

University of Tsukuba; Department of Radiation Oncology, Juntendo University, Japan

International Society for Neutron Capture Therapy

筑波大学；顺天堂大学 放射肿瘤学系

国际中子俘获治疗学会

Boron Neutron Capture Therapy (BNCT) represents a dual-modality radiation treatment utilizing 10B compounds that selectively accumulate in tumor cells. When exposed to epithermal neutrons, these compounds undergo nuclear reactions, generating alpha and Li particles. Essentially, BNCT can be viewed as targeted charged particle therapy for tumor cells.

First proposed by Locher in 1937, BNCT has since undergone numerous clinical trials using research nuclear reactors. Recent technological advancements have enabled the transition to accelerators, making BNCT feasible in hospital settings. In 2020, BNCT was approved as an insurance-covered medical treatment for recurrent head and neck cancer following successful clinical trials in Japan.

BNCT shows promise for treating various cancers including malignant brain tumors (e.g., glioblastoma, malignant meningioma), melanoma, angiosarcoma, breast cancer, lung cancer, and chest wall cancer. To expand the BNCT in medical institutions, it is necessary to expand the clinical indications in these type of cancers.

Looking ahead, the development of more effective boronated drugs is crucial for optimizing BNCT efficacy. The shift from basic drug research to translational research, encompassing clinical marketing strategies, is now imperative. This lecture explores current challenges and future directions in BNCT, emphasizing the pivotal role of drug development and translational research in advancing clinical outcomes.

Current and future perspective of BNCT in Taiwan

臺灣硼中子捕獲治療現在及未來展望

Sang-Hue Yen

顏上惠

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臺北醫學大學

Boron Neutron Capture Therapy (BNCT) development in Taiwan began over 30 years ago. Despite major advances in radiation oncology—such as 3DCRT, IMRT, IGRT, and proton/carbon ion therapy—external beam radiotherapy remains limited by its impact on surrounding normal tissues. BNCT, a targeted, intra-tumoral high-LET therapy, offers a promising solution to this challenge.

Since 2007, the THOR research team and Taipei Veterans General Hospital (Taipei VGH) have collaborated on BNCT clinical development, with a strategic focus on expanding accelerator-based BNCT (AB-BNCT) across major medical centers. To date, Taipei VGH has conducted over 600 BNCT treatments—including clinical trials and compassionate-use cases—utilizing both reactor-based and Taiwan-developed AB-BNCT platforms.

In parallel, Taipei VGH introduced carbon ion therapy in recent years, demonstrating efficacy in managing radioresistant and complex tumors. With AB-BNCT system installation underway and clinical implementation expected by 2027, the hospital aims to integrate BNCT and carbon ion therapy—both high-LET modalities—to enhance therapeutic outcomes.

Past BNCT progress was hindered by limited neutron sources from research reactors and the slow development of AB-BNCT systems. Recent advances, including hospital-based facilities, have facilitated translational research and broadened clinical access. Ongoing clinical trials are essential to establish robust evidence and expand BNCT indications, potentially enabling its adoption as a first-line treatment for select cancers.

With over 15 years of clinical BNCT experience, Taipei VGH is positioned to lead Taiwan's innovation in combining BNCT with radiotherapy and immunotherapy. These efforts will strengthen Taiwan's role in the global cancer treatment landscape and contribute to meaningful therapeutic advancements.

The current status and perspective of 18F-BPA

18F-BPA 的現況與未來發展

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18F-BPA (Boronophenylalanine, FBPA) is a crucial boron-based drug tracer in Boron Neutron Capture Therapy (BNCT), used for preoperative imaging guidance and therapeutic evaluation. Currently, FBPA is primarily employed in PET scans to detect the distribution and absorption of boron compounds in tumors, ensuring the accuracy and efficacy of boron neutron capture reactions. In clinical applications, FBPA-PET provides reliable pre-treatment assessments for BNCT in patients with high-grade malignant brain tumors, head and neck cancers, and other recurrent cancers.

However, the clinical use of FBPA has recently been limited by constraints in radiopharmaceutical production capacity and regulatory restrictions, hindering its widespread application. This discussion will explore the historical development of FBPA, the challenges currently faced in clinical applications, and its future prospects.

Development of accelerator-based boron neutron capture therapy in Taiwan

臺灣加速器硼中子捕獲癌症治療的發展

Wei-Lin Chen, Yen-Wan Hsueh Liu, Kuan-Yan Huang Chen-Yu Fan, Zhen-Fan You Shengkai Lin, Wei-Lun Huang, Zi-Wei Liu

陳韋霖 薛燕婉 黃冠諺 樊振宇 游鎮帆 林聖凱 黃偉倫 劉子維

Heron Neutron Medical Corp. Zhubei City, Hsinchu, Taiwan, ROC

禾榮科技股份有限公司

Heron Neutron Medical Corporation has been working on the design and installation for an accelerator-based boron neutron capture therapy (BNCT) facility in Taiwan. The site selection was done on August 2019. The location is nearby the China Medical University Hsinchu Hospital. The site construction began in November 2021. The floor area is 35 m by 35 m, an underground two-story-high building. The AB-BNCT system provides two beamlines and two irradiation rooms for an optimal utilization for patient treatment. Other medical area includes boron drug injection room, blood boron analysis room, preparation room and treatment control room. The site planning with shielding design and activation analysis was performed to ensure the radiation safety of the facility outside the concrete bunker for the public and for the working staff.

The permission for the construction of this high energy radiation facility was granted in January 2022 by Atomic Energy Council (AEC). The main magnet of cyclotron was moved-in in November 2022. The building construction was completed in May 2023, followed by installation of cyclotron beamline, and beam shaping assembly. Permission of commissioning was granted by AEC in September 2023. In system commissioning, a series of tests and verifications were conducted including testing items following IEC standards and performance of epithermal neutron beam. The system showed good operation stability under the projected clinical scenario. Heron obtained medical device certificate for neutron irradiation system in June 2024. Additionally, continuous development of in-house dose engine for treatment planning calculation shows that in the future treatment planning of BNCT can be completed in a desirable short time.

The success of the Heron AB-BNCT irradiation system has accelerated the development of BNCT in Taiwan. It is Heron's aim to become a total solution provider for BNCT. The boron drug BPA developed by Heron is now in the clinical trial phase. The TFDA's IND approvals for recurrent meningioma, malignant brain tumors, and recurrent head and neck cancers were obtained in September 2024, February 2025, and March 2025, respectively. BNCT in Taiwan is on its way to become a regular treatment modality for hard-to-treat cancers.

Preliminary outcomes of compassionate use of first accelerator-based boron neutron capture therapy(AB-BNCT) in Taiwan

臺灣第一台加速器型硼中子捕獲治療進行恩慈療法的初步結果

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吳元宏

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國立陽明交通大學醫學系 及 臺北榮民總醫院 重粒子及放射腫瘤部

Background: Despite significant advances in systemic therapies and radiotherapy in recent years, many patients continue to experience treatment failure and suffer from symptoms associated with local and/or metastatic tumors. Since 2017, our institute has been administering reactor-based boron neutron capture therapy (BNCT) on a compassionate use basis for a range of diseases. Following the TFDA's approval of accelerator-based BNCT(AB-BNCT) in May 2024 in Taiwan, we initiated the compassionate use of AB-BNCT in December 2024.

Methods: All compassionate uses of AB-BNCT have been approved by the IRB of TVGH and the TFDA. The inclusion criteria required that no known effective conventional treatment was available for the disease and that the condition posed a threat to life or vital functions. Most patient had 18F-Fluciclovine(Axumin) PET before AB-BNCT. The neutron irradiation fee and medication fee of [10B]-L-4-boronophenylalanine (L-BPA) was provided by Heron Neutron Medical Corp for free.

Results: As of March 2025, we have performed compassionate AB-BNCT on 18 patients with various recurrent malignancies, including meningeal solitary fibrous tumor, atypical meningioma, diffuse midline glioma (DMG, previously known as diffuse intrinsic pontine glioma, DIPG), anaplastic oligodendroglioma, lung squamous cell carcinoma with chest wall invasion, orbital chondrosarcoma, clival chordoma, breast cancer with chest wall recurrence, soft tissue sarcoma, osteosarcoma, head and neck cancer, recurrent glioma, and melanoma. Although the median follow-up is less than two months, complete responses have been observed in patients with recurrent lung and breast cancers. Additionally, the outcome in a patient with recurrent DMG is especially encouraging, with a 25% reduction in tumor diameter and improved activity levels.

Conclusion: Preliminary outcomes from the compassionate use of AB-BNCT in Taiwan have indicated a favorable safety profile and promising efficacy. Given that diffuse midline glioma (DMG) is a fatal disease with a median survival of approximately 10 months, we plan to launch a formal clinical trial to further evaluate its potential.

Neutron Capture Enhanced Particle Therapy (NCEPT): Current development, feasibility assessment, and future perspective

中子捕獲增強粒子治療（NCEPT）：現況發展、可行性評估與未來展望

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Neutron Capture Enhanced Particle Therapy (NCEPT) represents an innovative strategy that integrates neutron capture effects with charged particle therapy (protons, helium, and carbon ions). This concept aims to harness thermal neutrons generated during particle beam irradiation, enabling interactions with tumor-selective neutron capture agents (NCAs) such as ^{10}B and ^{157}Gd, to deliver additional localized high-LET radiation.

In this presentation, three representative publications (Howell et al., 2018; Chacon et al., 2022; Howell et al., 2024) - covering theoretical proposals, detection methodology, and biological validation - are reviewed.

Furthermore, preliminary Monte Carlo-based feasibility assessments conducted by our research group using PHITS simulations are presented, focusing on neutron field distributions and dose contributions under clinical conditions. These early findings revealed differences from previously published results, highlighting the need for continued investigation, refinement of modeling parameters, and collaborative verification. Rather than drawing definitive conclusions, this presentation aims to foster discussion on the current state of evidence, practical challenges, and future directions for multi-institutional studies and advanced NCA development, ultimately contributing to a clearer understanding of NCEPT's realistic clinical potential.

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膽胰腫瘤藥物治療與介入性
內視鏡超音波新進展

Evolution of Interventional EUS and Pharmacal Treatment of Pancreaticobiliary Cancer

時　間：114年6月28日　08:30-12:05
Time：June 28, 2025　08:30-12:05

地　點：臺北榮民總醫院　中正樓12樓會議室
Place：12F, The Conference Room, Chung Cheng Building
Taipei Veterans General Hospital

膽胰腫瘤藥物治療與介入性內視鏡超音波新進展
Evolution of Interventional EUS and Pharmacal Treatment of Pancreaticobiliary Cancer

Advances in pharmacological therapy of pancreatic adenocarcinoma

胰臟腺癌藥物治療之新進展

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許劭榮

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Pancreatic adenocarcinoma remains a leading cause of cancer-related mortality, with its incidence steadily rising. Over the past decades, advancements in pharmacotherapy have significantly improved patient prognosis. Gemcitabine-based regimens and FOLFIRINOX have demonstrated efficacy in prolonging survival across different disease stages. Recently, NALIRIFOX has emerged as a promising first-line treatment for metastatic pancreatic adenocarcinoma, offering superior survival benefits compared to gemcitabine plus nab-paclitaxel. Additionally, targeted therapies provide novel treatment avenues for select patient populations. Despite these advancements, surgical resection remains the only potentially curative approach. Therefore, the development of effective screening strategies for high-risk individuals remains a critical challenge. This section explores recent progress in pharmacological treatment and ongoing challenges in early diagnosis.

Advances in pharmacotherapy of biliary cancer

膽管癌藥物治療之新進展

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Biliary tract cancer (BTC), the second most common type of liver cancer, remains a therapeutic challenge due to its late diagnosis and poor prognosis. The current state of systemic therapy for advanced BTC has undergone significant changes. Despite significant advancements in understanding its biology over the past decade, the prognosis remains poor. Cisplatin and gemcitabine (GemCis) chemotherapy, followed by second-line FOLFOX, has been the standard treatment for advanced BTC. Recently, immunotherapy has emerged as a promising approach, with the TOPAZ-1 and KEYNOTE-966 trials demonstrating improved survival by adding durvalumab or pembrolizumab to GemCis chemotherapy. BTC is often associated with genetic alterations and is an excellent model for precision oncology. Advances in molecular profiling have led to targeted therapies for FGFR2 fusions, IDH1 mutations, HER2 amplification, and BRAF V600E. This review explores the evolution of systemic treatments and recent clinical trial findings.

Role of NGS in pancreaticobiliary cancer

次世代基因分析在膽胰癌症的角色

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Next generation sequencing (NGS) has emerged as a transformative diagnostic and research technology with profound implications for understanding and managing pancreatic and biliary tract cancers. These aggressive malignancies have historically presented significant challenges in early detection, prognostication, and personalized treatment strategies.

NGS enables comprehensive genomic profiling that reveals critical molecular alterations underlying these cancers. By facilitating high-throughput, comprehensive genetic analysis, this technology provides unprecedented insights into tumor heterogeneity, genetic mutations, and potential therapeutic targets. In pancreatic cancer, NGS has identified key driver mutations in genes such as KRAS (86.7% of cases), TP53 (73.3%), CDKN2A (66.7%), and SMAD4 (36.7%), which contribute to disease progression and treatment resistance. Targetable alterations were identified in 19.9% of patients, including DNA repair defects (e.g., BRCA1/2) and rare BRAF or NTRK fusions

For biliary tract cancers, NGS has uncovered complex genomic landscapes, including actionable mutations in IDH1/2, FGFR2 fusion genes, and HER2 amplifications. These discoveries have direct clinical implications, enabling more precise molecular classification and potentially guiding targeted therapeutic interventions.

The technology's potential extends beyond mutation identification. NGS supports liquid biopsy approaches, allowing minimally invasive monitoring of tumor evolution, treatment response, and potential recurrence. Moreover, it facilitates the development of personalized medicine strategies by identifying patients most likely to benefit from specific molecular targeted therapies.

Despite these advances, challenges remain in standardizing NGS protocols, interpreting complex genomic data, and translating molecular insights into effective clinical interventions. Continued research and interdisciplinary collaboration will be crucial in fully realizing the transformative potential of next generation sequencing in these challenging malignancies.

Introduction of interventional EUS

介入性內視鏡超音波簡介

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Interventional endoscopic ultrasound (EUS) has emerged as a revolutionary tool in modern medicine, bridging diagnostic and therapeutic capabilities with minimal invasiveness. This technique integrates endoscopy and ultrasonography, allowing clinicians to visualize and access internal structures with unparalleled precision. Its applications extend beyond traditional diagnostic imaging to include a broad spectrum of interventional procedures, such as fine-needle aspiration, fluid drainage, and tumor ablation. By enhancing procedural accuracy and patient outcomes, interventional EUS represents a critical advancement in the management of gastrointestinal, pancreatic, and biliary diseases. This introduction highlights the evolution, principles, and transformative impact of interventional EUS on contemporary clinical practice.

EUS-guided tissue acquisition

內視鏡超音波導引組織抽取

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Endoscopic ultrasound (EUS)-guided tissue acquisition has become a cornerstone in the diagnosis and management of gastrointestinal and pancreatic diseases, particularly pancreatic cancer. This minimally invasive technique allows real-time visualization and targeted sampling of deep-seated lesions that are often inaccessible by other imaging modalities. Using fine-needle aspiration (FNA) or fine-needle biopsy (FNB), clinicians can obtain high-quality cytological or histological specimens for diagnosis, staging, and even molecular profiling.

Advancements in needle design and technique—such as fanning, suction, and the slow-pull method—have significantly improved diagnostic yield while minimizing complications. Proper needle selection and technique adjustment based on lesion location, vascular proximity, and patient condition are critical to optimizing outcomes.

This presentation will briefly review current techniques in EUS-guided tissue acquisition, address key challenges such as sample adequacy and false negatives, and highlight its evolving role in precision oncology. As molecular testing becomes routine, EUS sampling is increasingly vital for personalized treatment planning.

Endoscopic ultrasound-guided pseudocyst/walled-off necrosis (WON) drainage (EUS-guided pseudocyst/WON drainage)

內視鏡超音波導引假性囊腫 / 壞死引流

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Pancreatic pseudocysts and walled-off necrosis (WON) resulting from necrotizing pancreatitis are common complications of acute pancreatitis. Endoscopic ultrasound (EUS) plays a crucial role in both the diagnosis and management of these conditions. EUS not only provides high-resolution imaging of the internal structure of the cyst or necrotic collection and its relationship with adjacent vasculature but also enables safe and effective drainage procedures.

This lecture will focus on EUS-guided drainage techniques for pancreatic pseudocysts and WON. The content will cover:

- Indications and Contraindications: Examining the applicability and limitations of EUS drainage in various clinical scenarios.
- Preoperative Assessment and Preparation: Emphasizing the importance of precise EUS evaluation of lesion characteristics and selection of appropriate drainage routes.
- Drainage Techniques: Providing a detailed overview of different EUS-guided drainage approaches, including cystogastrostomy, cystoduodenostomy, and direct drainage, while comparing the advantages and disadvantages of each method.
- Selection of Drainage Devices and Stents: Discussing the application of various types and sizes of drainage devices (such as pigtail catheters, metal stents, particularly lumen-apposing metal stents (LAMS)) in different lesions.
- Postoperative Management and Complication Management: Explaining the essential aspects of care following EUS drainage and providing management principles for potential complications (such as bleeding, infection, stent migration).
- Latest Advances and Future Directions: Introducing the latest techniques and research findings in the field of EUS-guided drainage for pancreatic pseudocysts and WON.

EUS-guided gastrojejunostomy

內視鏡超音波導引胃腸吻合術

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In recent years, endoscopic enteral stenting have provided an attractive alternative to surgery for palliation of malignant gastric outlet obstruction (GOO). Several studies have assessed the clinical and technical success rates of endoscopic enteral stenting for malignant gastroduodenal obstruction. Technical success rates of 90% to 100% and clinical success of 80% to 95% was achieved. The procedure was associated with quicker recovery and reduced morbidities as compared to surgical gastrojejunostomies. However, the long-term patency of uncovered stent is limited by the risk of tumor ingrowth that would lead to subsequent re-stenosis of the stents requiring re-intervention. Thus, to palliate malignant gastric outlet obstruction, surgical gastrojejunostomy is preferred in patients that are fit for surgery with prolonged life expectancy whilst insertion of enteral stent is preferred in patients that are associated with high-risk for surgery and short life expectancy.

A recent advancement, endoscopic ultrasonography-guided gastrojejunostomies (EUS-GJ), utilizing a lumen-apposing self-expandable metal stent (LAMS), offers a durable and minimally invasive solution for GOO. EUS-GJ was initially hypothesized and tested in animal models by Fritscher-Ravens in 2002. This technique has progressively evolved; it involves the creation of a bypass between the stomach and a small bowel limb placed distal to the obstruction, through the insertion of a lumen-apposing metal stent (LAMS) under EUS and fluoroscopic guidance. EUS-GJ creates a food pathway shortcut akin to surgical bypass, providing longer stent patency compared to standard duodenal stenting; furthermore, EUS-GJ is theoretically less invasive than surgical gastrojejunostomy (SGJ). The EUS-GJ technique's evolution from clinical trials and animal experiments, yielding three main techniques: (1) the direct technique; (2) device-assisted techniques; and (3) EUS-guided double balloon-occluded gastrojejunostomy bypass. In the general principle, the small intestinal tract intended for stent deployment should be adjacent to the stomach. A preprocedural computed tomography scan in both transverse and coronal view is helpful in deciding on the puncture site as a preoperative roadmap. It should be cautious to perform EUS-GJ in the presence of a large amount of ascites, which interferes with the adherence and fixation of the bowel loops. This procedure remains unoptimized, with some limitations that need to be overcome. All reports of EUS-GJ have been published only by experts of the procedure because the currently followed procedure is technically difficult and must be improved and simplified further to facilitate its use in clinical practice. LAMS design must also be improved because the currently available LAMSs have a maximum diameter that does not appear to be appropriate for EUS-GJ, which usually requires a bigger anastomosis and minimal risk of stent obstruction and migration.

LAMS in pancreaticobiliary cancer

LAMS 在膽胰腫瘤的應用

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Lumen-apposing metal stents (LAMS) are specialized stents initially designed for draining pancreatic fluid collections (PFCs). They feature a unique saddle-shaped design with dual flanges at both ends, enabling close apposition of two luminal structures. This design significantly reduces the risk of migration and facilitates direct endoscopic interventions, such as necrosectomy.

In recent years, the clinical applications of LAMS have expanded beyond PFCs to include various scenarios involving pancreatobiliary malignancies. Specifically, LAMS have become increasingly valuable for palliative management of complications like biliary obstruction and gastric outlet obstruction (GOO) associated with pancreatobiliary cancers.

One notable application is EUS-guided choledochoduodenostomy (EUS-CDS). Particularly, electrocautery-enhanced LAMS (EC-LAMS) are frequently utilized in patients with malignant distal biliary obstruction, especially when conventional ERCP is unsuccessful or challenging.

Additionally, LAMS have proven effective in EUS-guided gallbladder drainage, presenting a reliable alternative to percutaneous gallbladder drainage for high-risk surgical patients suffering from acute cholecystitis or malignant cystic duct obstruction. The advantages of using LAMS for gallbladder drainage include high technical and clinical success rates of approximately 95%, reduced risk of bile leakage and stent migration due to their excellent lumen apposition, and a larger lumen diameter which facilitates effective drainage and enables potential endoscopic interventions such as cholecystoscopy.

Another significant use of LAMS is EUS-guided gastroenterostomy (EUS-GE) for managing GOO. These stents have demonstrated high technical success rates ranging from 87% to 100%, and similarly high clinical success rates of 84% to 100%. Benefits of using LAMS in gastroenterostomy include improved quality of life and symptom relief by restoring luminal patency, fewer early adverse events compared to surgical gastrojejunostomy, and superior long-term patency compared to traditional enteral stenting methods.

Furthermore, LAMS have demonstrated efficacy in managing post-surgical fluid collections, although they were not initially designed for this purpose. They have shown notable success in draining peri-pancreatic abscesses or fluid collections that arise following surgical interventions like Whipple's procedure or distal pancreatectomy performed for pancreatic malignancies. Compared to traditional plastic stents, LAMS offer benefits such as easier deployment, shorter procedural times, lower risks of leakage, and improved technical success rates.

In summary, LAMSs represent a significant advancement in interventional EUS, particularly for pancreatobiliary cancers. Their versatility facilitates effective palliation in complex clinical scenarios, addressing complications such as biliary obstruction, GOO, and post-surgical fluid collections.

Technical tips and troubleshooting of EUS-guided biliary drainage

內視鏡超音波膽汁引流的故障排除

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EUS-guided biliary drainage (EUS-BD) has been rapidly gaining popularity in recent years. It may be performed in patients in whom conventional endoscopic transpapillary biliary drainage is not feasible or has failed. This technique includes various procedures such as EUS-guided choledochoduodenostomy (EUS-CDS), EUS-guided hepaticogastrostomy (EUS-HGS), EUS-guided antegrade stenting (EUS-AS), and EUS-guided rendezvous technique (EUS-RV). Among them, EUS-HGS is mostly performed in Japan because it can be performed even in patients with inaccessible papillae due to duodenal invasion of pancreatic cancer and surgically altered anatomy. The most recent meta-analysis showed a high technical success rate of 98% and a clinical success rate of 88% in this procedure. However, adverse events also occurred relatively frequently in the early stage of development. EUS-HGS is performed ordinally in the following steps: puncture site selection, biliary puncture, contrast injection, guidewire insertion and manipulation, dilation of the puncture tract, and stent placement.

Puncture site selection: Needle puncture can be made to B2 or B3. Before the puncture, the estimated puncture line should be checked using a color Doppler and interposed vessels should be avoided. It should be also confirmed on the fluoroscopic image that the ultrasound probe surface is facing the hepatic hilum so that the guidewire can easily advance downward. **Biliary puncture:** In cases of B2 puncture, the location of the EG junction should be checked in advance to avoid trans mediastinal puncture. Usually, a 19G needle is used for puncture, but if the intrahepatic bile ducts are only mildly dilated, consider using a 22G needle. However, in this case, a 0.018G guide wire is used, so subsequent guide wire manipulation becomes difficult. It has been reported that the risk of bile leakage can be reduced if the intervening liver parenchyma along the puncture route is at least 25mm. **Contrast injection:** The contrast medium is used to confirm the appropriate puncture into the bile duct and obtain the cholangiogram. **Guidewire insertion and manipulation:** A guidewire with good torque transmission and seeking performance should be used. Also, if it was possible, two guidewire placements would increase the stability of the subsequent procedure. **Dilation of the puncture tract:** This is the most troublesome step of the whole process, but in recent years, specialized devices such as dedicated dilation balloons and dilators have been developed, making the procedure easier. **Stent placement:** In recent years, we have preferably used plastic stents rather than metal stents. This is because they are easier to insert and avoid the risk of cholangitis by not occluding the side branches of the intrahepatic bile ducts.

Establishing techniques and developing dedicated devices have made the procedures easier and safer, and the frequency of procedure-related adverse events appears to have decreased.

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介入性栓塞技術的最新進展與應用

Recent Advances and Applications of Interventional Embolization Therapy

時　間：114年6月28日　08:20-12:00

Time：June 28, 2025　08:20-12:00

地　點：臺北榮民總醫院 第三門診大樓9樓CiC創意谷

Place：The Clinical Innovation Center, Taipei Veterans General Hospital

介入性栓塞技術的最新進展與應用

Recent Advances and Applications of Interventional Embolization Therapy

Current status and advances in Yttrium-90 radioembolization for hepatocellular carcinoma

釔 -90 放射栓塞治療肝細胞癌的現狀與進展

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Yttrium-90 (Y-90) radioembolization, also known as selective internal radiation therapy (SIRT), has emerged as a well-established locoregional therapy for hepatocellular carcinoma (HCC), particularly in patients who are not suitable candidates for surgical resection or transplantation. Over the past decade, Y-90 SIRT has demonstrated promising efficacy in tumor control, with favorable safety profiles, making it an essential option in the multidisciplinary management of intermediate to advanced-stage HCC.

Current clinical applications of Y-90 radioembolization include bridging to transplantation, downstaging for resection, and palliative therapy in unresectable cases. Advances in imaging and dosimetry have significantly improved treatment planning and personalization. The use of personalized dosimetry, especially with glass microspheres, has led to better tumor targeting and higher radiation doses to the tumor while sparing healthy liver tissue. Moreover, evidence from trials such as DOSISPHERE-01 has reinforced the importance of achieving sufficient absorbed doses for improved outcomes.

Recent innovations include the integration of Y-90 SIRT with systemic therapies, including tyrosine kinase inhibitors and immune checkpoint inhibitors, opening new avenues for combined modality treatment. Ongoing trials are evaluating its role in earlier disease stages and in combination with immunotherapy, which may further expand its therapeutic potential.

Despite these advancements, several challenges remain, including optimal patient selection, standardization of response assessment, and long-term outcome data. As the treatment landscape for HCC evolves, Y-90 radioembolization continues to hold a pivotal role, with ongoing research aiming to refine indications and maximize therapeutic benefit.

The three pillars of managing peripheral AVM: Imaging, approaches, and embolization agents

周邊動靜脈畸形處理的三大支柱：影像學、方法與栓塞劑

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Background: Peripheral arteriovenous malformations (AVMs) are complex vascular anomalies that can lead to significant morbidity, including pain, ulceration, bleeding, and high-output cardiac failure. Due to their dynamic nature and high recurrence rates, precise imaging, strategic procedural planning, and appropriate embolization techniques are critical for effective management.

Purpose: This lecture will provide an in-depth review of the three fundamental pillars of AVM management: imaging modalities for accurate diagnosis and treatment planning, procedural approaches for safe and effective intervention, and embolization agents tailored to lesion morphology and flow dynamics.

Content:

1. Imaging for Diagnosis and Treatment Planning
    - Doppler ultrasound, CT angiography (CTA), and time-resolved MRA for lesion characterization and flow dynamics assessment.
    - Catheter angiography as the gold standard for treatment planning, including selective arteriography and venography.
    - Metal artifact reduction techniques (MARTs) to improve post-embolization imaging in patients treated with coils.
2. Approaches to Peripheral AVM Treatment
    - Cho-Do AVM Angiographic Classification as a critical tool in guiding intervention strategies.
    - Access techniques: transarterial, direct puncture, and transvenous approaches based on AVM architecture.
3. Embolization Agents and Techniques
    - Selection of embolic materials: liquid embolics (ethanol, n-BCA, Onyx), coils, and plugs tailored to flow characteristics.
    - How to use flow control techniques.

Conclusion: Peripheral AVM management requires accurate imaging, Cho-Do classification-driven procedural planning, and tailored embolization strategies to optimize outcomes and minimize complication. This lecture will present an evidence-based, multidisciplinary approach to improving treatment efficacy.

Prostate artery embolization: Challenges, tips, tricks, and perspectives

當前列腺動脈栓塞術：挑戰、技巧與臨床展望

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Prostatic artery embolization (PAE) consists of blocking the blood supplying the prostate to treat benign prostate hypertrophia (BPH). Its effectiveness on low urinary tract symptoms (LUTS) has now been published around hundreds of studies. The main advantage of this procedure is the very low rate of urinary and sexual sequelae, including ejaculatory, with an excellent tolerance profile. The arterial anatomy is a key element for the realization of PAE. Its knowledge makes it possible to anticipate obstacles and prevent potential complications related to nontarget embolization. Nontarget embolization can occur with a small intraprostatic shunt or reflux. This talk offers a step-by-step review of the various anatomical and technical key points to ensure technical and clinical success, while avoiding the occurrence of adverse events.

The frightening zones: How to treat hand and foot AVM

高風險區域：如何治療手足動靜脈畸形

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Background: Arteriovenous malformations (AVMs) of the hand and foot are among the most challenging vascular anomalies to manage due to their complex hemodynamics, functional significance, and high recurrence rates. These lesions frequently cause pain, ulceration, bleeding, and progressive tissue destruction, often requiring intervention to prevent severe complications such as limb ischemia or amputation. Given the delicate anatomical structures, treatment must be meticulously planned to ensure both efficacy and safety. Multidisciplinary collaboration between interventional radiologists and surgeons is essential to optimize patient outcomes.

Purpose: This lecture will present a comprehensive strategy for treating hand and foot AVMs, focusing on angiographic classification, access methods, embolization techniques, and the role of surgical collaboration. Key principles, including flow control, minimizing complications, and optimizing functional outcomes, will be discussed using case-based examples and recent clinical data.

Content:

1. Understanding Hand and Foot AVMs: Anatomy and Classification
    - Unique anatomical and functional challenges of hand and foot AVMs.
    - Cho-Do AVM Angiographic Classification as a decision-making tool.
2. Intervention Strategies
    - Access techniques: transarterial, direct puncture, and transvenous approaches.
    - Balancing aggressive treatment with functional preservation to avoid tissue loss.
    - The importance of flow control techniques in preventing non-target embolization.
    - Surgical collaboration: When to consider adjunctive surgical resection, debridement, or skin
    - grafting after embolization.
3. Embolization Techniques and Optimizing Outcomes
    - How to use liquid embolic materials.
    - Use of coils for venous outflow control in high-flow lesions.
    - Complication management: Strategies to reduce skin necrosis, nerve injury, and ulcer
    - formation.

Conclusion: Hand and foot AVMs require a multifaceted approach integrating angiographic classification, precise intervention strategies, and tailored embolization techniques. Collaboration with vascular and plastic surgeons plays a crucial role in improving treatment efficacy, managing complications, and optimizing functional outcomes in these high-risk vascular territories.

Advanced in transarterial embolization for chronic musculoskeletal pain: insights and TPVGH experience

動脈栓塞治療在慢性肌肉骨骼疼痛的進展和 TPVGH 的經驗

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Chronic musculoskeletal pain is a common condition that significantly impacts patients' quality of life and daily function. Conventional treatments such as analgesic medications, physical therapy, and corticosteroid injections often provide only temporary relief or fail to address the underlying pathophysiology. In recent years, transarterial embolization (TAE) has emerged as a novel, minimally invasive treatment for chronic pain syndromes, targeting pathological neovascularization and inflammatory hyperemia associated with refractory musculoskeletal conditions.

TAE involves selective embolization of abnormal arterial networks supplying pain-generating structures, such as tendons, joints, and soft tissues. By reducing pathological blood flow and suppressing inflammatory mediators, TAE provides long-term pain relief while avoiding the side effects and limitations of systemic therapies. Advances in embolic agents, such as microspheres and liquid embolics, as well as improved angiographic imaging techniques, have enhanced procedural precision and outcomes. Emerging clinical evidence supports TAE as an effective intervention for conditions such as chronic tendinopathies, osteoarthritis, frozen shoulder, and myofascial pain syndrome.

At Taipei Veterans General Hospital (TPVGH), we have implemented and refined TAE protocols to optimize patient selection, procedural planning, and follow-up care. Our experience highlights critical factors influencing procedural success, including the identification of hypervascularization patterns on digital subtraction angiography (DSA), the choice of embolic agents tailored to specific pathologies, and post-procedure rehabilitation strategies. Our retrospective studies and case series indicate significant improvements in pain scores, functional outcomes, and quality of life following TAE. Through case-based discussions and TPVGH's institutional insights, we aim to offer a comprehensive understanding of TAE's role in the evolving landscape of interventional pain management. As the field advances, TAE holds promise as a transformative approach for patients with chronic musculoskeletal pain, offering durable relief with minimal invasiveness.

Introduction to current concepts in lymphatics, lymphangiography, and interventions

當前淋巴系統、淋巴造影及介入治療的最新概念概述

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Since the introduction of intranodal lymphangiography in 2012, the once underappreciated lymphatic system quickly gained the attention of interventional radiologists. This breakthrough enables the lymphatic system to be mapped out more efficiently than before, and the once sparse framework is now transformed into a detailed and intricate anatomical network, revealing connections and complexities previously unseen. This knowledge further became the basis of many innovative, minimally invasive lymphatic procedures designed to treat a wide range of lymphatic-related conditions. Including traumatic and non-traumatic causes of lymphatic or chylous leakage across various anatomic locations. Most of these conditions were previously left untreated, required extensive surgery, or demanded prolonged conservative management lasting months.

As the acceptance and development of lymphatic interventions continue to advance at a rapid speed, this presentation will begin with an overview of the fundamental anatomy and physiology of the lymphatic system. Then review cases performed with state-of-the art imaging and interventional treatment techniques, concluding with a discussion of future directions in this field.

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麻醉醫學教育的展望與創新

Medical Education in Anesthesiology: Future and Innovation

時　間：114年6月28日　08:20-12:00
Time：June 28, 2025　08:20-12:00

地　點：臺北榮民總醫院　三門診九樓創新沙龍
Place：The Clinical Innovation Center,
Taipei Veterans General Hospital

麻醉醫學教育的展望與創新

Medical Education in Anesthesiology: Future and Innovation

Professional development in medical education: From localization to internationalization

醫學教育的專業發展：從在地化邁向國際化

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Global medical education is facing various transformational challenges, including faculty development difficulties, the implementation of competency-based training, and the need for global standardization. Addressing these challenges requires a research-driven approach, with Medical Education Research (MER) serving as a cornerstone for innovation and continuous progress. This talk will apply educational and socio-cultural theories to analyze the current landscape and outline potential solutions, enhancing participants' understanding of the significance of professional development in medical education.

Establishing Communities of Practice (CoP) plays a pivotal role in the professional development of clinical educators. By fostering knowledge sharing, mentorship, and professional identity formation, CoPs help bridge the gaps between education, research, and clinical practice, ultimately cultivating experts and leaders who can facilitate the translation of localized initiatives into broader educational advancements.

Additionally, this talk will illustrate collaborations at micro (institutional), meso (national), and macro (international) levels, demonstrating how local educational practices can expand into international partnerships. Resources and funding for medical education and medical education research serve as key drivers in this process, enabling innovative teaching models, faculty development programs, and cross-border research collaborations. With appropriate investment, MER can drive systematic reforms, enhance institutional capacity, and establish strong academic networks, contributing to the global advancement of medical education.

Ultimately, participants will gain insights into how leveraging medical education research and strategic funding can foster innovation, enhance faculty development, build CoP, and promote international collaboration in medical education, addressing the evolving needs of modern healthcare training.

Milestone 2.0: A comparison of teachers' feedback in clinical competency committees

麻醉里程碑 2.0：臨床能力委員會中教師回饋的比較

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臺北醫學大學附設醫院 麻醉部

Background: Since 2016, Taipei Medical University Hospital (TMUH) has initiated the implementation of the Clinical Competency Committee (CCC) and the Milestone Project to optimize residency training. With the advancement of Milestone 2.0, the application of Harmonized Milestones (HM) has been increasingly emphasized. Nevertheless, clinical teachers' feedback on HM has demonstrated heterogeneity and significant discrepancies compared to Non-Harmonized Milestones (NHM) (Edgar, Roberts & Holmboe, 2018). This study aimed to compare the differences in clinical teachers' feedback between HM and NHM.

Methods: We analyzed the Clinical Competency Committee (CCC) Milestone Progress Reports of anesthesiology residents at Taipei Medical University Hospital (TMUH), with a primary focus on data collected since the implementation of Milestone 2.0. Our study assessed both the quantity and quality of teacher feedback within these reports, utilizing the teachers' Feedback Evaluation Scale (TFES) (Ocak & Karafil, 2020) to systematically evaluate the feedback provided.

Results: This study analyzed 1,150 faculty feedback items from 25 anesthesia resident progress reports (2022-2024). Harmonized Milestone (HM) feedback averaged significantly fewer words than Non-Harmonized Milestone (NHM) feedback (38.4 vs. 44.9, $p < 0.01$), with no variation among HM. Using the Teacher Feedback Evaluation Scale (TFES), structured feedback (SF) was optimal, negative feedback (NF) was least effective: SF (HM 45.4%, NHM 66.7%), NF (HM 56.6%, NHM 33.3%). HM feedback showed reduced depth and quality, impacting anesthesia resident development.

Conclusion: We found that clinical teachers provided significantly less feedback, both quantitatively and qualitatively, for Harmonized Milestones (HM) versus Non-Harmonized Milestones (NHM). This necessitates targeted faculty development to enhance HM implementation. Despite limitations in generalizability due to sample size and setting, resident HM progress relies on detailed faculty feedback training, moving towards establishing workshops or focused practical sessions, incorporating simulation-based training, case-based discussions, and peer-to-peer feedback to enhance clinical teachers' ability to provide effective feedback on Harmonized Milestones.

Anesthesia risk assessment: From predictive artificial intelligence and digital twins to generative artificial intelligence

術前麻醉風險評估：由預測式人工智慧、數位孿生到生成式人工智慧的運用

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褚錦承

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奇美醫學中心 麻醉部

The integration of artificial intelligence (AI) into anesthesia risk assessment has introduced transformative advancements, combining predictive AI, digital twins, and generative AI to enhance clinical decision-making and patient safety. This presentation outlines a framework for anesthesia risk evaluation, leveraging these technologies to streamline preoperative assessments and improve outcomes. Predictive AI identifies patient-specific risks and formulates personalized anesthesia plans, while digital twin technology creates virtual patient models to simulate physiological responses to various anesthesia strategies. Generative AI automates the generation of risk assessment reports and personalized recommendations, significantly improving efficiency.

The generative AI framework evaluates multiple risk factors, including cardiac, pulmonary, renal, and anesthesia-specific risks, using validated tools such as the ASA-PS classification, Revised Cardiac Risk Index, Lung Injury Prediction Score, and Apfel PONV Score. Generative AI demonstrated superior efficiency, producing risk assessments 125 times faster than human anesthesiologists, with a high concordance rate (76%) between AI and human evaluations. Additionally, the integration of electronic preoperative assessment forms and anesthesia visit systems digitized workflows, ensuring seamless communication and documentation.

Clinical implementation has shown high satisfaction rates among anesthesiologists (91.09% 5-star ratings), underscoring the system's reliability and utility. This pioneering work represents a global first in anesthesia, with no comparable systems currently available. By combining predictive, digital twin, and generative AI technologies, this framework establishes a new standard for anesthesia risk assessment, offering a scalable and efficient solution for diverse surgical procedures.

Training cardiac anesthesiologists: How competency-based education shapes clinical excellence

心臟麻醉人才養成：如何透過核心能力教育締造臨床卓越

Cheng-Wei Lu

陸正威

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亞東紀念醫院 麻醉部

The evolution of medical education necessitates a paradigm shift from traditional instructor-centered training to a learner-centric, competency-based framework. This transformation is particularly critical in cardiac anesthesia, where practitioners must integrate knowledge, technical skills, and professional attitudes to meet the growing expectations of society. Competency-based medical education (CBME) provides a structured and outcome-driven approach to training, ensuring that learners acquire and demonstrate essential clinical competencies at various stages of their professional development.

CBME frameworks commonly employ two key models: Milestones and Entrustable Professional Activities (EPAs). Milestones delineate progressive competency levels, providing a clear roadmap for trainees, while EPAs define specific professional tasks that a learner can be entrusted with at different stages of supervision. Implementing these frameworks within cardiac anesthesia training allows for individualized learning pathways, objective assessments, and a more flexible timeline for skill acquisition.

To cultivate excellence in cardiac anesthesia, a well-structured CBME program must align with the core competencies required in the field, such as perioperative patient care, intraoperative monitoring, advanced imaging interpretation, and critical care management. The integration of structured assessments, clinical competency committees, and program evaluation ensures that training outcomes align with the evolving needs of healthcare systems. By embracing a competency-based approach, we can enhance the proficiency and readiness of future cardiac anesthesiologists, ultimately advancing patient care and surgical outcomes in cardiac medicine.

From the six competencies to milestone & EPA: Experience sharing from the CCC of department of anesthesiology, Taipei Veterans General Hospital

臺北榮總麻醉部臨床能力委員會經驗分享：從六大核心能力到里程碑與可信賴活動

Yi-Min Kuo

郭怡敏

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臺北榮民總醫院 麻醉部

Contemporary medical education adheres to the framework of the six core competencies established by the Accreditation Council for Graduate Medical Education (ACGME), encompassing patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice. The milestone-based assessment approach helps structure training based on a resident's stage of development, ensuring that residents at different levels achieve the corresponding learning goals. Additionally, to enhance the assessability of medical education, the concept of Entrustable Professional Activities (EPAs) has been gradually introduced in recent years, serving as a key tool to bridge core competencies with clinical practice.

Here, we share the residency training experience of the Department of Anesthesiology at Taipei Veterans General Hospital. Beginning with traditional case logging, we utilized existing assessment tools—including the Objective Structured Clinical Examination (OSCE), Direct Observation of Procedural Skills (DOPS), Case-Based Discussion (CbD), Mini-Clinical Evaluation Exercise (mini-CEX), 360-degree feedback, and In-Training examination (ITE)—integrating milestone-based grading to develop a residency training and evaluation model aligned with the EPA framework. This approach not only enhances the standardization and objectivity of assessments but also ensures that residents' clinical competency development aligns with the requirements of modern medical education.

Bridging the gap: Enhancing anesthesiology residency training with structured feedback

彌合學習落差：透過結構化回饋提升麻醉住院醫師訓練

Man-Ling Wang

王曼玲

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臺大醫院 麻醉部

In clinical anesthesiology education, residents frequently encounter learning gaps in procedural confidence, clinical decision-making, and team communication. Traditional feedback methods are often informal, delayed, or ambiguous, which limits their impact on learning. This presentation introduces structured feedback as a practical and evidence-based strategy to enhance educational outcomes in anesthesiology training programs.

I will begin by outlining three core feedback models: the Situation-Behavior-Impact (SBI) model, the Pendleton model, and feedforward principles. Each will be illustrated through case-based applications in airway management, regional anesthesia, and intraoperative crisis response. These models promote timely, specific, and learner-centered feedback—practices that align with the higher tiers of the Learning Pyramid, such as "practice by doing" and "teaching others," where knowledge retention is most effective.

In addition, this session introduces a faculty development framework designed to help anesthesiology educators adopt and sustain structured feedback practices. Key components include targeted workshops, simulated feedback exercises, peer coaching, and digital tools to reinforce feedback as a routine part of clinical teaching.

By bridging the gap between clinical performance and educational expectations, structured feedback empowers both learners and teachers. It encourages reflective practice, supports adaptive clinical thinking, and cultivates a feedback-rich learning environment that promotes lifelong learning and enhances patient safety.

Enhancing anesthesia safety and clinical decision-making through simulation: A dual-track training for residents and nurses

透過擬真情境提升麻醉安全與臨床決策：住院醫師與麻護的雙軌培訓

Jui-Yi Yen

顏睿誼

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臺北榮民總醫院 麻醉部

Simulation-based training has become an integral part of anesthesiology education, allowing practitioners to experience high-risk, low-frequency events in a controlled and structured environment. At Taipei Veterans General Hospital, we have developed a dual-track simulation program tailored to both anesthesiology residents and nurse anesthetist trainees, addressing the specific needs of each group.

For anesthesiology residents, simulation scenarios focus on crisis recognition, diagnosis, and decision-making, emphasizing leadership, communication, and coordination with the surgical and anesthesia teams. The training prepares them for real-life emergencies and aligns with the national anesthesiology board exam requirements.

For nurse anesthetist trainees, the emphasis shifts toward early recognition of complications, patient assessment, medication preparation, and hands-on execution of interventions. Using high-fidelity simulation, trainees practice managing eight key anesthesia-related crises, including malignant hyperthermia, massive transfusion reactions, difficult airway management, and hemodynamic instability. The structured training, combined with expert-guided debriefing and competency-based assessment, enhances their preparedness for real-world challenges.

Through years of experience in simulation training, we have observed that structured, high-fidelity scenarios help bridge the gap between anesthesia trainees and experienced nurse anesthetists, improving both technical and non-technical skills. This experience-sharing session aims to provide insights for institutions training anesthesia personnel, highlighting how tailored simulation programs can enhance patient safety and team efficiency in perioperative care.

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智慧聽力與前瞻耳科論壇

Smart Hearing & Advanced Otology Forum

時　間：114年6月28日　08:20-12:20

Time：June 28, 2025　08:20-12:20

地　點：臺北榮民總醫院　長青樓一樓會議室

Place：Nursing Arts Laboratory, Evergreen Building, Taipei Veterans General Hospital

智慧聽力與前瞻耳科論壇
Smart Hearing & Advanced Otology Forum

AI-driven design and implementation of hearing assistive technologies

基於 AI 的聽力輔助技術設計與實作

Ying-Hui Lai

賴穎暉

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Speech is one of the most efficient forms of human communication. But when auditory and articulation systems are compromised by conditions like sensorineural hearing loss, this ability is significantly impacted. While hearing assistive technologies, such as modern over-the-counter hearing aids (OTC HA), offer essential support, their real-world performance, particularly in complex acoustic environments and during the fitting process, presents significant challenges, limiting the full potential for improved communication.

Addressing these limitations, this talk explores the AI-driven design and implementation of next-generation hearing assistive technologies. We will demonstrate how leveraging advanced Artificial Intelligence techniques can revolutionize the core signal processing and fitting procedures within these devices.

Specifically, the presentation will delve into the application of AI in two critical areas: first, AI-Based Speech Enhancement methods (including implementation in devices like true wireless stereo headphones or OTC HA), and second, AI-Driven Automatic Real-Ear Measurement (Auto-REM) technology.

Our early results from this work are highly promising, demonstrating substantial improvements in key performance metrics for both speech enhancement quality and the accuracy/speed of Auto-REM. These findings suggest that integrating these AI-driven approaches into future hearing assistive devices holds significant potential to enhance overall user experience, communication effectiveness, and the efficiency of clinical workflows.

Artificial intelligence in ear drum screening

人工智慧耳膜篩檢工具

Yuan-Chia Chu, Yen-Chi Chen, Yen-Fu Cheng, Wen-Huei Liao

朱原嘉 陳彥奇 鄭彥甫 廖文輝

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Background: Hearing loss prevalence dramatically increases with age, affecting over 80% of individuals above 80 years old. For general practitioners and audiologists, early identification of ear drum abnormalities is essential for timely intervention, yet traditional diagnostic tools remain limited in accessibility and ease of use.

Methods: We developed a smartphone-based AI application for ear drum screening that can be readily implemented in general practice settings. The system uses transfer learning algorithms through NVIDIA's framework to classify ear drum images. Our approach emphasizes user-friendly interface design specifically tailored for non-specialist clinicians and audiologists, with minimal training requirements.

Results: The AI system achieved 97.6% accuracy in identifying ten common middle ear conditions, making it suitable for general practice screening. Testing showed 100% sensitivity and specificity for basic hearing assessments in clinical settings.

Conclusion: This AI-powered ear drum screening tool offers general practitioners and audiologists an accessible method for early detection of hearing conditions without specialized equipment. The smartphone-based approach enables point-of-care diagnosis, simplifying referral decisions and improving patient care pathways. The technology represents a practical solution for incorporating advanced diagnostic capabilities into everyday clinical practice, potentially expanding the reach of hearing healthcare services.

Hearing test outsides the booth via the active noise cancellation technique

運用主動降噪技術實現聽檢走出聽檢室

Hsiu-Lien Cheng

鄭秀蓮

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Background: Hearing test devices have been developed in recent years. However, noise decreased the accuracy of the self-administered hearing test. Active noise cancellation (ANC) technique provides a solution but still leaves room for improvement. Herein, we designed an optimal active noise cancellation technique, based on the physiological characteristics of the auditory masking phenomenon. The study verified and validated the performance of the proposed optimizing ANC technique.

Methods: The experimental design comprised three parts. First, the study developed experimental equipment, including an optimizing ANC, self-administered hearing test application, and pure-tones calibrated true wireless Bluetooth headsets. Next, the ANC technique was verified in four ANC usage scenarios (normal environment, generic ANC turn off and turn on in 65 dB(A) pink noise, as the reference method), and proposed optimizing ANC turn on in 65 dB(A) pink noise). Finally, the study validated the four ANC scenarios in a clinical trial. The correlation between the ANC technique and standard audiometry was tested using Pearson correlation coefficient.

Results: Electroacoustic analysis showed a higher signal-to-noise ratio obtained by the optimizing ANC method compared with generic ANC turn on and turn off situation in 65 dB(A) pink noise. In addition, the clinical results showed a high correlation ($r=0.99$, $p<.01$) between the self-measured results and the professional hearing test under a < 40 dB(A) environment. In the loud noise situation (65 dB(A)), the proposed optimizing ANC method can provide a higher measurement accuracy than the reference method.

Conclusion: The proposed optimizing ANC method used in a self-administered hearing test showed a higher correlation to standard audiometry than to the generic ANC method.

New treatment strategies and outcomes for sudden sensorineural hearing loss

突發性耳聾：最新治療策略及成效

Wen-Huei Liao

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Background: Sudden Sensorineural Hearing Loss (SSNHL) is an otologic emergency. SSNHL associated with prolonged stress, sleep deprivation, and irregular lifestyle habits. Without timely treatment, it can lead to permanent hearing loss and increase the risk of stroke within the next five years.

Methods: Our medical team has proposed eight innovative and integrated treatment strategies for SSNHL, aiming to improve the complete hearing recovery rate for patients:

1. **Traditional Standard Steroid Therapy:** Administering steroids intravenously to suppress inflammation in the inner ear and reduce the side effects of oral steroids.
2. **Intratympanic Steroid Injection:** For severe SSNHL cases, steroids are directly injected into the middle ear to enhance treatment efficacy.
3. **Tailor-Made Personalized Treatment Strategies:** Adjusting SSNHL patients lifestyle habits, improving sleep, and promoting weight loss based on the patient's physical condition and lifestyle.
4. **Audiogram Prediction and Treatment Adjustment Strategies:** Using big data and artificial intelligence analysis to predict SSNHL prognosis and adjust treatment plans.
5. **Innovative Hearing Scale APP:** Provides home testing features to help patients detect SSNHL early and conduct hearing tracking and monitoring.
6. **Far-Infrared Radiation Therapy:** Uses focused far-infrared radiation on the inner ear to improve cochlear microcirculation and metabolism as an adjunctive treatment.
7. **Hearing Rehabilitation Exercises:** Through deep breathing and relaxation techniques, improve SSNHL patients head and neck circulation, reduce stress, and promote blood flow to the inner ear.
8. **SSNHL Patients Education Manual:** Provides practical educational guidance for SSNHL patients, including case sharing and treatment experience summaries.

Results: Before the implementation of the eight innovative treatment strategies, there were a total of 1,125 hospitalized SSNHL patients, with a complete hearing recovery rate of 20.3%. After the implementation of the eight innovative treatment strategies starting from 2023, there were 106 hospitalized SSNHL patients, and the complete hearing recovery rate increased to 24.5%, an improvement of 4.2%.

Conclusion: Our medical team has significantly improved the complete hearing recovery rate for patients through eight innovative treatment strategies, providing a new direction for the diagnosis and treatment of SSNHL. In the future, the team will continue to optimize treatment techniques and help more patients regain the joy of hearing.

Mastoid cartilage obliteration after cholesteatoma surgery: From bench to operation room

膽脂瘤乳突腔軟骨填塞手術：從實驗室研究到臨床應用

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This presentation outlines the author's personal clinical experience in managing complications associated with open mastoid cavities following cholesteatoma surgery. To prevent unsatisfactory results such as chronic drainage, recurrent infections, and the need for frequent postoperative care, small pieces of autologous cartilage harvested from the conchal area of the same ear were used to obliterate the mastoid cavity. These pieces were typically trimmed to a size of 1–1.5 mm^3 before obliteration.

The author will demonstrate the general surgical procedure as well as the specialized techniques for preparing and applying the conchal cartilage. In most cases, cartilage harvested from the operated ear is sufficient to obliterate sclerotic or moderately sized cavities. However, for larger, well-aerated mastoid cavities, additional techniques may be required to achieve ideal obliteration.

In experimental studies using a rabbit model, the author investigated the biological behavior of auricular cartilage obliterated into the tympanic bulla (the rabbit equivalent of the human mastoid). Two significant effects were observed:

1. **Space-occupying effect –** the cartilage effectively fills the entire cavity, eliminating dead space and reducing the risk of infection.
2. **Osteochondral regeneration effect –** the perichondrium stimulates the regeneration of bone tissue within the cavity.

This regenerative phenomenon was also observed in postoperative CT scans of the patients, confirming the cartilage's potential to contribute to bone repair. This property is particularly valuable in those patients with skull base defects caused by cholesteatoma invasion, as it helps prevent the development of meningocele, brain herniation, and intracranial infections or abscesses.

A common concern is whether the cartilage may undergo atrophy, necrosis, or volume loss due to infection or inadequate blood supply over time. To investigate this, the author conducted a retrospective review of 102 patients who underwent cartilage obliteration between 1997 and 2007, with a mean follow-up period of 8.8 years. The findings revealed that approximately 10% of patients experienced short- or long-term complications, including cartilage infection, resorption, or poor epithelialization of the canal and cavity wall. Multivariate logistic regression analysis identified revision surgery and poor preoperative middle ear conditions as significant risk factors for these unsatisfactory outcomes.

Despite these exceptions, the majority of patients maintained a stable, non-resorbed, and complication-free cartilage-filled mastoid cavity over the long term.

Gene therapy for hereditary hearing loss: From bench discovery to clinical trial

遺傳性聽障的基因療法：從實驗室到臨床

Yen-Fu Cheng

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國立陽明交通大學 腦科所 / 臨醫所

Hereditary hearing loss—the most prevalent congenital sensory disorder, affecting 1–2 per 1 000 newborns—is exceptionally well-suited to precision therapeutics. The cochlea is surgically accessible, fluid-sealed, and >50 % of cases stem from single-gene defects. Over the past decade, breakthroughs in inner-ear biology have converged with state-of-the-art gene-delivery and editing technologies. Engineered adeno-associated virus (AAV) capsids such as Anc80L65 and evolved AAV9 variants now achieve >80 % inner-hair-cell transduction in rodents and non-human primates, while hybrid lipid–polymer nanoparticles accommodate oversized or dual-vector genomes. In parallel, CRISPR-based base and prime editors, together with antisense-oligonucleotide exon repair, have expanded the therapeutic arsenal beyond classical gene replacement.

These innovations are translating into clinical reality: global phase I/II trials are underway for OTOF (auditory synaptopathy), with preliminary safety readouts showing no dose-limiting ototoxicity. Our team has contributed key pre-clinical milestones, including some of the most common forms of hereditary hearing loss

Looking ahead, the implementation of universal newborn genomic screening, mutation-matched vector design, and scalable GMP manufacturing will dictate the speed at which these therapies reach patients. By integrating molecular genetics, vectorology, and clinical otology, gene therapy is poised to redefine the management of genetic deafness within the coming decade.

Wearable sensor monitoring in vestibular rehabilitation for bilateral vestibulopathy

穿戴式感測器於雙側前庭功能低下復健治療中的監測應用

Kuan-Chung Ting

丁冠中

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臺北榮民總醫院 耳鼻喉頭頸醫學部

Background: Bilateral vestibulopathy (BVP) causes chronic dizziness, impaired gaze stability, and balance deficits, significantly impacting daily function. Although vestibular rehabilitation therapy (VRT) is recommended, objective and quantitative tools for monitoring therapeutic progress remain limited..

Methods: Patients diagnosed with BVP and experiencing chronic dizziness for over six months participated in a structured 3-month VRT program. Assessments were conducted monthly. Wearable inertial measurement units (IMUs) were used to capture head and body motion. A custom algorithm was applied, combining gaze stability monitoring based on Madgwick's decomposition and balance evaluation through 122 sway-related features. Subjective symptoms were assessed using the Dizziness Handicap Inventory (DHI).

Results: IMUs accurately measured head motion range and postural sway, providing objective feedback during training. Progressive improvements in gaze control accuracy and postural stability were observed over time. These objective findings were consistent with improved DHI scores, reflecting symptom relief.

Conclusion: This study highlights the effectiveness of wearable sensors in objectively tracking rehabilitation progress in BVP patients. The integration of motion-based algorithms and subjective assessment supports the advancement of personalized, data-driven vestibular rehabilitation strategies.

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乳房整形及重建手術論壇

The Forum of Aesthetic and Reconstructive Breast Surgery

時　間：114年6月28日　13:30-17:30

Time：June 28, 2025　13:30-17:30

地　點：臺北榮民總醫院 致德樓第三會議室

Place：The Third Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

乳房整形及重建手術論壇

The Forum of Aesthetic and Reconstructive Breast Surgery

Emerging trends in breast reconstruction: Clinical insights from surgical approaches to implant selection

乳房重建新趨勢：從手術方式到植入物選擇的臨床觀察

Chieh-Huei Huang

黃傑慧

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國立臺灣大學醫學院附設醫院 整形外科

The discussion will encompass a detailed analysis of current implant-based breast reconstruction, emphasizing their respective advantages and indications. A central focus will be placed on the nuanced process of implant selection, addressing differences in implant design and profiles. We will provide clinical insights into how these factors influence reconstructive outcomes, patient safety, and long-term aesthetic durability. The speech will also explore the increasing integration of patient-centered care, including the role of patient education and shared decision-making in tailoring reconstructive plans.

Personal experience sharing of bra-flap technique in implant-based breast cancer reconstruction and challenging revisional mammoplasty

布拉式皮瓣手術應用在乳癌切除義乳重建及隆乳重修手術中的經驗分享

Tsung-Chun Huang

黃宗君

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Background: Bra-flap is a muscular-fascial balcony consisting of fibers of the inferior pectoralis flap, external oblique, serratus muscle, and the rectus aponeurosis. Bra-flap augmentation mammoplasty, also called triple plane augmentation, is an effective method in constricted lower pole and tuberous breast. In breast cancer reconstruction, lower and lateral soft tissue deficiency is always the major concern. Inadequate lower lateral pocket may result in implant exposure, irregularity, and long-term capsular contracture. Full viable soft tissue coverage makes reconstruction safer and elastic musculofascial fiber provide a dynamic and aesthetic result.

Patient and Methods: From Nov, 2019 to May 2024, all patients (N=103) received single port endoscopic primary simple mastectomy via axilla approach and direct to implant reconstruction a modified dual plane with bra-flap supporting. Postoperative follow-up was arranged on 3, 6, and 12 months.

Results: Total 119 breast reconstructions in 110 patients were performed. Fourteen breasts were excluded due to loss of follow-up or pre-operative radiation. Mean follow-up was 12.7 months (from 3 to 50 months). Significant capsular contracture (Baker III, IV) occurred in 7 breasts in overall patients (6.6%, 7/105) and 1 breast in non-irradiated group (1.12%, 1/89). Good dynamic results with breast cleavage creation occurred in 98 breasts (93.3%). Mean satisfaction scores of BREAST-Q are as following: Breast (86.1, from 53 to 100), Outcomes (91.7, from 70 to 100), Physical (75.1, from 0 to 100), Psychosocial (89.6, from 47 to 100), Sexual (82.6, 50 to 100). Post mastectomy radiation therapy was administered to 19 patient (18%). No breast experienced explantation or conversion to autologous flap.

Summary: Bra flap provide full tissue coverage in lower and lateral pole, contributing to a highly safe reconstruction with good static and dynamic cosmetics. In revisional mammoplasty surgery, the bra-flap also can provide a good pocket creation, providing a good cosmetic result in one staged challenging revisional mammoplasty.

What the surgeon and radiologist should know: The ABCs of imagines of cosmetic breast augmentations

外科與放射科醫師應該了解之乳房美容手術後的影像發現

Yi-Chen Lai

賴亦貞

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Contemporary cosmetic breast augmentation procedures necessitate meticulous imaging evaluation for optimal surgical and radiological management. This review includes the sonographic, mammographic, computed tomography (CT) and magnetic resonance imaging (MRI) characteristics of breast augmentation techniques, encompassing injectable fillers, implants, autologous tissue flaps, and reduction mammaplasty.

Injectable breast augmentation utilizes a spectrum of materials, including silicone, paraffin, autologous fat, and polyacrylamide hydrogel (PAAG). Saline and silicone implants are applied to both aesthetic enhancement and post-mastectomy reconstructive surgery. Reconstructive modalities include myocutaneous flaps, such as the transverse rectus abdominis myocutaneous (TRAM) flap, and perforator flaps, exemplified by the deep inferior epigastric artery perforator (DIEP) flap.

Furthermore, we address the imaging manifestations of augmentation-related complications, including inflammatory processes, peri-implant fluid collections, capsular contracture, and intracapsular and extracapsular implant rupture. It is imperative to acknowledge the potential for breast cancer development following augmentation procedures, with particular emphasis on breast implant-associated anaplastic large cell lymphoma (BIA-ALCL), a rare but clinically significant entity.

Comprehensive imaging evaluation is indispensable in the management of breast augmentation. A thorough understanding of the diagnostic capabilities and limitations of each imaging modality facilitates the selection of the most cost-effective and clinically appropriate imaging strategy.

Transaxillary primary breast augmentation: Experiences with Ergonomix® & Ergonomix2®

Ergonomix® 及 Ergonomix2® 經腋下隆乳的手術經驗分享

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Since their approval by the Taiwanese FDA in 2019, Motiva® implants have gained significant popularity due to their stable, long-lasting outcomes and reduced need for postoperative massage. Among these, Ergonomix® and Ergonomix2® implants have demonstrated lower rates of capsular contracture and rupture compared to alternative implant options. This presentation reviews clinical experience with transaxillary primary augmentation mammaplasty, focusing on case studies and surgical outcomes. Ergonomix® and Ergonomix2® implants feature a nano-textured surface, which facilitates the formation of a thinner capsule, thereby contributing to a smoother and more natural upper breast contour. This characteristic, in conjunction with their balanced height-to-projection ratio, supports the creation of a smooth gentle upper breast slope. Additionally, these implants demonstrate superior tissue expansion properties, making them particularly suitable for individuals with tight, elastic soft tissue and a short nipple-to-inframammary fold distance, thereby maximizing lower pole expansion. Moreover, the 100% silicone gel filling in both Ergonomix® and Ergonomix2® significantly reduces the risk of rippling. These implants are available in three distinct styles—Mini, Demi, and Full—offering greater flexibility in size selection. Notably, Ergonomix2® features a softer surface texture compared to Ergonomix®, enhancing the tactile experience. Implant selection significantly impacts surgical outcomes and patient satisfaction. This presentation may contribute to the ongoing discussion on optimizing breast augmentation techniques and implant choices for improved aesthetic and clinical results.

Pick the perfect implant: The evolution of my choices

選擇最適合的乳房植入物：個人經驗的分享

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The selection of breast implants is a sophisticated process influenced by various factors, including implant type, surface characteristics, and brand-specific technologies, as well as patient-specific anatomical conditions and aesthetic goals. This complexity often presents challenges even for experienced surgeons.

Since 2007, the author has prioritized implants designed to replicate a natural, ptotic breast shape. The introduction of anatomically stable implants in 2013 further advanced outcomes in aesthetic breast surgery. However, safety concerns regarding Breast Implant-Associated Anaplastic Large Cell Lymphoma (BIA-ALCL) in 2018 prompted a global shift toward the use of smooth-surfaced implants.

Contemporary innovations have led to the development of implants with nano-textured surfaces and high cohesiveness, achieving a 100% fill ratio. These advances have been associated with a statistically significant reduction in capsular contracture rates, now approaching 1%.

Drawing on international clinical experience, optimal implant selection requires a tailored approach based on thorough preoperative assessments, ensuring alignment with the patient's physiological characteristics and desired aesthetic outcomes.

Ultrasound-assisted liposuction and free fat grafting to the breast

超音波抽脂與自體脂肪移植豐胸

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芮態診所

The advancement of minimally invasive techniques in cosmetic surgery has revolutionized body contouring procedures. This presentation focuses on my personal experience with ultrasound-assisted liposuction (UAL) and free fat grafting to the breast, utilizing the Liposuction using Sound Wave Stimulation Assistance (LSSA) and the Micro Autologous Fat Transplantation (MAFT) gun.

We will explore the efficacy and safety of LSSA for liposuction from the thighs, abdomen, and flanks, highlighting its benefits in terms of reduced recovery time, enhanced precision, and improved patient satisfaction. The integration of sound wave stimulation facilitates targeted fat removal, minimizing trauma to surrounding tissues and enhancing the viability of harvested fat.

Following the liposuction procedure, the harvested adipose tissue is processed and transferred to the breast using the MAFT gun. This innovative technique ensures a more controlled and uniform grafting process, significantly increasing the success rate of fat retention and achieving a more natural aesthetic outcome.

Through case studies, I will share key insights, challenges encountered, and the overall impact of these techniques on patient outcomes. Additionally, we will discuss post-operative care protocols and the importance of careful patient selection in achieving optimal results.

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良性攝護腺阻塞之微創手術及治療趨勢

Minimally Invasive Surgical Therapies and Alternative Treatment for Benign Prostatic Obstruction

時　間：114年6月28日　13:30-17:30

Time：June 28, 2025　13:30-17:30

地　點：臺北榮民總醫院 致德樓四會議室

Place：The Fourth Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

良性攝護腺阻塞之微創手術及治療趨勢

Minimally Invasive Surgical Therapies and Alternative Treatment for Benign Prostatic Obstruction

Update in the treatment of benign prostatic obstruction with MIST: Korean experience

現行良性攝護腺阻塞微創手術之韓國經驗

John J.H Kim

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In South Korea, the main procedures for de-obstructing the prostate were transurethral resection of the prostate (TURP) and, since 2008, holmium laser enucleation of the prostate (HoLEP). In recent years, minimally invasive surgical therapies (MISTs) and other procedures have gained prominence as viable alternatives to TURP and HoLEP, particularly for patients seeking symptom relief with reduced perioperative morbidity. Procedures such as prostatic urethral lift (UroLift), convective water vapor ablation (Rezūm), prostatic artery embolization (PAE) and temporary implanted nitinol device (iTIND) have demonstrated durable efficacy, low retreatment rates, and favorable safety profiles in select patient populations. Aquablation of the prostate has also gained popularity as a sexual function preserving surgery while resection of the prostate is performed such as TURP and HoLEP.

The rapid aging of the male population and high health literacy has driven increased utilization of various procedures for BPO despite many being out-of-pocket (except TURP and HoLEP). Korean urologists are adopting international guidelines while developing local protocols that support personalized, risk-stratified treatment strategies. It has become evident that choosing the right patient for each procedure is essential for success along with meticulous surgical technique. Variables such as patient needs, patient condition and history, prostate size and shape, bladder function are all important factors to consider and have made the procedure selection a doctor-patient joint decision-making process. Since many procedures have been introduced after residency to most urologists, comprehensive education programs on not only the technique but patient selection process seem warranted.

Update in the treatment of benign prostatic obstruction with MIST: Hong Kong Experience

現行良性攝護腺阻塞微創手術之香港經驗

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Objective: To share the Hong Kong peri-operative and early post-operative outcomes of Urolift for benign prostatic enlargement in an office-based setting under pure local anesthesia.

Methods: We performed a prospective review of Urolift for benign prostatic enlargement, focusing on 30 patients who exhibited clinical indications including lower urinary tract symptoms (LUTS) or urinary retention due to benign prostatic enlargement in 2024. Exclusion criteria included active urinary tract problems and urological malignancies. Follow-up was conducted at 3 months post-operatively.

Result: The mean pre-operative prostatic volume was 52.4cc (ranging from 30.3cc to 77.9cc). The mean operation time was 20minutes (ranged from 15 minutes to 30 minutes). All procedures were performed in the Endoscopy Room under pure local anaesthesia. The mean pain scores for rigid cystoscopy insertion and Urolift procedure were 1 and 3 respectively. All LUTS patients (17/17) and 85% (11/13) of urinary retention patients were discharged on the same day without a urethral catheter. There was no post-operative 30-day hospital readmission. At post-operative 3-month follow-up, mean prostatic volume was reduced from 52.4cc to 44.6cc (14.9%), International Prostate Symptom Score was improved from 16 to 5 (69%), Quality of life score was improved from 4 to 2 (50%) and maximum uroflow rate was improved from 11.2ml/s to 13.5ml/s (21%).

Conclusion: Urolift for benign prostatic enlargement under pure local anesthesia is a safe procedure that relieves lower urinary tract symptoms with minimal hospital stay. It can be performed in an office-based setting and maximise utilization of the surgical theatre.

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抗藥性細菌和黴菌治療之新進展

Update of Treatment: Multi-Drug Resistant Organism and Fungus

合辦單位：臺北榮民總醫院感染科
國立陽明交通大學急重症醫學研究所

時　間：114年6月28日　13:30-17:00
Time：June 28, 2025　13:30-17:00

地　點：臺北榮民總醫院 致德樓第五會議室
Place：The Fifth Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

抗藥性細菌和黴菌治療之新進展

Update of Treatment: Multi-Drug Resistant Organism and Fungus

Update of treatment of third-generation cephalosporin-resistant Enterobacterales

三代頭孢黴素抗藥性腸內菌的治療新知

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The incidence of extended-spectrum β-lactamases-producing Enterobacterales (ESBL-E) infections increased rapidly worldwide, in large part due to a greater number of community-acquired infections. Routine ESBL testing is not performed by most clinical microbiology laboratories and non-susceptibility to ceftriaxone is often used as a proxy for ESBL production. ESBL are most prevalent in *Escherichia coli*, *Klebsiella pneumoniae, Klebsiella oxytoca*, and *Proteus mirabilis*. CTX-M enzymes, particularly CTX-M-15, are the most common ESBLs worldwide. ESBLs other than CTX-M with unique hydrolyzing abilities are variants of narrow-spectrum TEM and SHV β-lactamases with amino acid substitutions, but they have undergone less clinical investigation than CTX-M enzymes. AmpC β-lactamases are β-lactamase enzymes that are produced at basal levels by many Enterobacterales and increased AmpC enzyme production due to inducible *ampC* expression can increase MICs to certain antibiotics, most notably ceftriaxone, cefotaxime, and ceftazidime. *Enterobacter cloacae* complex, *Klebsiella aerogenes*, and *Citrobacter freundii* are the most common Enterobacterales at moderate to high risk for clinically significant AmpC production. Carbapenems are recommended as the preferred regimen for infections caused by third-generation cephalosporin-resistant Enterobacterales (3GCephRE), but the carbapenem-sparing strategy is also suggested. Recently, IDSA guidance updated the treatment for ESBL-E and Enterobacterales with moderate to high risk for clinically significant AmpC production due to an inducible *ampC* gene. ESCMID guidance addressed the treatment for 3GCephRE. In this presentation, I will review the updated updated treatment information for 3GCephRE.

Update of treatment of carbapenem-resistant Gram-negative bacilli

對碳青黴烯具抗藥性的革蘭氏陰性菌治療的新知

Chien Chuang

莊茜

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Carbapenems have traditionally served as the last-resort antibiotics for treating severe infections caused by multidrug-resistant Gram-negative bacilli. However, the use of carbapenem leads to the emergence and dissemination of carbapenem-resistant Gram-negative bacilli (CRGNB), often linked to the production of carbapenemases. As a result, alternative treatment strategies must be explored.

Managing CRGNB infections poses a major challenge for healthcare systems worldwide due to the limited therapeutic options and high mortality. In recent years, significant advancements have been made in the treatment of CRGNB, focusing on novel therapeutic approaches. This presentation will provide a comprehensive overview of the current strategies for managing CRGNB infections, highlighting recent developments and challenges in the field. These include the introduction of new β-lactam/β-lactamase inhibitor combinations, such as ceftazidime/avibactam, ceftolozane/tazobactam, imipenem-cilastatin-relebactam, and meropenem/vaborbactam, which have demonstrated promising clinical efficacy. Additionally, the repurposing of existing antibiotics, such as colistin, minocycline, and fosfomycin, has been investigated as potential treatment options.

Effectively managing CRGNB infections requires a multifaceted approach, encompassing the development of novel antibiotics and the reconsideration of existing therapeutic strategies. This presentation will explore these aspects in detail, providing clinicians with up-to-date information to support informed decision-making in CRGNB management.

Cracking the code of tuberculosis: Breakthroughs in diagnosis and treatment

結核病診斷與治療的新進展

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The diagnosis and treatment of tuberculosis (TB) require a multifaceted approach integrating microbiological, molecular, and clinical assessments. Diagnostic methods include acid-fast bacilli (AFB) smear microscopy, culture using solid and liquid media, molecular assays such as TB PCR and GeneXpert, and serological markers like adenosine deaminase (ADA) for extrapulmonary TB. The World Health Organization (WHO) recommends targeted next-generation sequencing (NGS) for drug resistance detection, including assays like Deeplex® Myc-TB and AmPORE TB. Treatment strategies for drug-susceptible TB involve a six-month regimen consisting of isoniazid (INH), rifampicin (RIF), pyrazinamide (PZA), and ethambutol (EMB) (2HRZE/4HR). Shorter four-month regimens incorporating rifapentine and moxifloxacin have been explored in clinical trials. For multidrug-resistant TB (MDR-TB), WHO endorses all-oral regimens such as BPaLM (bedaquiline, pretomanid, linezolid, and moxifloxacin) for six to nine months. Special considerations in treatment include drug dose adjustments in renal and hepatic impairment, fluoroquinolone-based regimens for extensively drug-resistant TB (XDR-TB), and vaccine strategies like BCG and M72/AS01 for TB prevention. Treatment failure is assessed by month-two culture conversion rates, with persistent positivity necessitating second-line therapy. Advances in TB immunopathogenesis, including host-directed therapies targeting T-cell exhaustion, are emerging as potential adjuncts. Overall, TB management integrates precise diagnostics with evolving therapeutic regimens to enhance treatment efficacy and combat resistance.

Update of treatment of Staphylococcus aureus and Enterococcus spp.

金黃色葡萄球以及腸球菌的治療新知

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The increasing prevalence of multidrug-resistant organisms (MDROs) poses a significant challenge to modern healthcare, further exacerbated by the slow pace of novel antimicrobial development. Among these, ESCAPE pathogens—particularly methicillin-resistant Staphylococcus aureus (MRSA) and vancomycin-resistant enterococci (VRE)—remain critical concerns due to their limited treatment options and associated morbidity and mortality.

Vancomycin has long been the mainstay for MRSA infections; however, concerns regarding its efficacy and safety have prompted a shift in treatment strategies. Current guidelines emphasize the importance of achieving an area under the curve/minimum inhibitory concentration (AUC/MIC) ratio of 400–600 mg·h/L for optimal therapeutic outcomes in severe MRSA infections. Recent advancements have introduced novel agents such as ceftaroline and next-generation glycopeptides, which demonstrate potent activity against resistant Gram-positive bacteria. Furthermore, evidence suggests that daptomycin may offer superior efficacy compared to vancomycin in MRSA bacteremia. Ongoing research explores strategies to enhance the effectiveness of vancomycin and daptomycin, including combination therapies with β-lactams (e.g., ceftaroline) and fosfomycin, which have demonstrated promising synergistic effects.

For VRE infections, linezolid remains the only FDA-approved therapeutic agent. However, daptomycin, despite its off-label use, is increasingly considered an effective alternative, particularly in VRE bacteremia. Higher daptomycin dosing regimens—exceeding the conventional 6 mg/kg—are now recommended, with recent guidelines advocating for doses in the range of 8–12 mg/kg for Enterococcus faecium bacteremia. Emerging data suggest that even higher doses (>11 mg/kg) may be associated with improved clinical outcomes. Beyond dose optimization, achieving appropriate pharmacodynamic targets (AUC/MIC) and utilizing combination therapies—such as daptomycin with β-lactams or fosfomycin—are gaining attention for their potential synergistic effects in the treatment of VRE bacteremia. Additionally, early initiation of appropriate anti-VRE therapy has been correlated with improved patient outcomes.

This presentation will provide a comprehensive update on the evolving treatment landscape for MRSA and VRE, highlighting recent clinical evidence, and novel therapeutic strategies aimed at optimizing patient management in the era of increasing antimicrobial resistance.

Update of treatment of invasive fungal infection

侵入性黴菌感染治療新知

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Invasive fungal diseases (IFDs) have become a significant threat to human health over the past three decades, with rising incidence rates and expanding species of medical fungi. Advancements in hemato-oncological and immunologic therapeutics have contributed to antifungal resistance among various fungal species and at-risk patient populations. The COVID-19 pandemic has further exacerbated these threats, leading to a notable shift towards non-albicans Candida species and increased antifungal resistance, particularly among C. glabrata, C. parapsilosis, and C. auris. Additionally, the risks of pulmonary fungal infections following SARS-CoV-2 infections have risen, especially for Aspergillus, Mucorales, and potentially Cryptococcus.

Multidisciplinary experts have published global guidelines for the diagnosis and management of infections caused by several important medical fungi, including Candida, Cryptococcus, Mucorales, rare yeasts, and rare molds, as well as respiratory virus-associated pulmonary aspergillosis. These guidelines synthesize current evidence through comprehensive literature review and provide recommendations for each domain of IFD diagnosis and management. The Infectious Diseases Society of Taiwan (IDST) has endorsed these global guidelines, while the revised guidance by IDST complements the global guidelines due to specific local considerations, including variation of local epidemiology, availability of diagnostics, and issues about health economics. Given the high-quality evidence for antifungal use may be limited, in vitro data, case series and expert opinions, as well as local epidemiology, the heterogeneity of patient populations, and antifungal availability in Taiwan were incorporated in reviewing process of evidence.

This presentation aims to provide recommendations for IFD management, focusing on antifungal treatment options for both infectious disease specialists and first-line healthcare providers.

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手及手腕傷害之手術治療及重建

Surgical Intervention for Treatment or Reconstruction of Injury of Wrist and Hand

時　間：114年6月28日　13:30-17:30

Time：June 28, 2025　13:30-17:30

地　點：臺北榮民總醫院 中正18樓骨科部會議室

Place：18F, The Conference Room , Chung Cheng Building
Taipei Veterans General Hospital

手及手腕傷害之手術治療及重建

Surgical Intervention for Treatment or Reconstruction of Injury of Wrist and Hand

TFCC- The potential cause of ulnar wrist pain: From anatomy diagnosis, to treatment

三角纖維軟骨複合體，尺側手腕疼痛的潛在原因；從解剖構造、診斷到治療

Wei-Jen Chen

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TFCC is an important and complex structure as its name suggests. It plays not only as a cartilaginous structure in its central disc to transmit the load through the wrist but also as a ligamentous structure in its peripheral portion to stabilize both ulnocarpal joint and distal radioulnar joint (DRUJ); meanwhile, TFCC lesion is also one of the major causes of ulnar-sided wrist pain. However, diagnosis of the TFCC lesion can be challenging. Detailed history taking and physical examinations are fundamental to provide some traces of clue about the TFCC problems. MRI is the a powerful tool to delineate the structure but the interpretation of the images depend on not only high a resolution MRI machine but also an experienced staff. So, arthroscopy remains the gold standard for the diagnosis of TFCC lesions because the TFCC morphology could be directly visualized and evaluated from both radiocarpal arthroscopy and DRUJ arthroscopy.

Regarding the treatment for TFCC lesions, it should be tailored according to the type and the location of the tear. Palmer classification provides a useful treatment guideline. Palmer class 1 lesions refer to the traumatic lesions. Tear involving the disc portion could be treated non-operatively initially and had been shown to do well with arthroscopic debridement if failed with non-operative treatment. Traumatic peripheral tear at either ulnar, carpal, or radial insertion may result in instability of the ulnocarpal and the distal radioulnar joints. Thus, surgical repair to restore the TFCC anatomy is reasonable to restore the stability of the ulnocarpal and DRUJ. Palmer class 2 lesions refer to a spectrum of degenerative tears due to the excessive loading of the ulnar wrist. Therefore, unloading of the ulnocarpal joint is the treatment principle for Palmer class 2 lesions. Nonsurgical management should be provided initially. If these modalities fail, ulnar shortening osteotomy or wafer procedure is indicated. A thorough knowledge of the anatomy as well as the Palmer classification helps to guide treatment options.

Arthroscopic strategy of treatment of scaphoid fracture, nonunion, and advanced collapse

舟狀骨骨折、骨折不癒合及關節塌陷之關節鏡治療策略

Yi-Chao Huang

黃意超

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Scaphoid fractures are the most common fracture of the carpal bones and account for 60% carpal injuries. Due to anatomical properties including tenuous vascular supply, joint fluid dilution, and the inability to form callus, as well as biomechanical properties, such as high shear stress and displacement of fragments, delayed unions and non-unions are not uncommon. It is known that the nonunion rate of scaphoid fracture is 5–10% with non-surgical treatment.

Wrist arthroscopy, a minimally invasive technique, provides a wider and clearer view in diagnosis in wrist problems with aid of magnification. By using small-sized arthroscopy and fine instruments, arthroscopic surgery preserves native circulation, ligaments and the remaining carpal motion can be maximized with reduced postoperative pain. There is also cosmetic benefit with the minimal surgical scar. Wrist arthroscopy helps to get more accurate evaluation of fracture reduction and concomitant ligament injuries in patients with scaphoid fracture without damage of ligaments. Wrist arthroscopy is also helpful in evaluation of cartilage condition in patient s with scaphoid nonunion with advance collapse. For scaphoid nonunion, curettage to the level of good puncture bleeding and transportation of cancellous bone graft into non-united site can also be done under by wrist arthroscopic technique.

Partial wrist fusion is considered as salvage procedure for advanced stage of scaphoid nonunion with advanced collapse. It is a good alternative way, rather than total wrist fusion, with preservation of some degree of wrist motion, wrist proprioception, and serves as a function-improving procedure. However, it is a technically demanding procedure with a steep learning curve. With proper training in small joint arthroscopy, arthroscopic partial wrist fusion is a valuable option for patients with wrist arthritis to preserve motion and good cosmetic outcome.

Minimally invasive treatment for Hand Fracture: TVGH experiences

臺北榮民總醫院手外科骨折的微創手術經驗

Jung-Pan Wang

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Various surgical methods have been proposed to correct the deformities resulting from malunion of the proximal phalanx. However, few studies have examined the outcome of corrective osteotomy with combined with flexor tenolysis. We report our experience of treating such cases. (J Hand Surg Eur Vol 2019 Dec;44(10):1091-1092)

Al-Qattan and Al-Qattan have described antegrade K-wire fixation for proximal phalangeal neck fractures in children using a single K-wire. Other authors have advised this technique with two K-wires for other proximal phalangeal fracture types and/or in adults only. We present our results of treating paediatric proximal phalangeal neck fractures with double K-wire antegrade intramedullary pinning. (J Hand Surgery Eur Vol 2019 Mar;44(3):323-325.)

Various treatments have been proposed for fracture dislocations of the proximal interphalangeal (PIP) joint. Among them, dynamic distraction external fixation (DDEF) has become an attractive and favourable surgical intervention for hand surgeons because it allows early active motion and is less invasive to the surrounding soft tissues. However, it would appear to be impractical to use DDEF alone if the fracture-dislocation of the PIP joint has progressed to a delayed stage with partial healing and malunion at the fracture site. Therefore, we present DDEF technique with preliminary percutaneous callus release to manage delayed presentation fracture-dislocations of the PIP joint. (J Hand Surg Eur Vol. 2020 Feb;45(2):195-197.)

Reframing upper limb fractures in osteoporosis: A comprehensive approach from prevention to treatment

重新詮釋骨質疏鬆性上肢骨折：從預防到治療的全方位策略

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嘉義基督教醫院 骨科

Osteoporosis is a progressive disease characterized by decreased bone mass and structural deterioration, leading to an increased risk of fractures. Common fracture sites include the spine, hip, wrist, and humerus. Upper limb fractures are often the earliest clinical manifestation of osteoporosis. Importantly, patients who sustain these fractures face a significantly higher risk for future spine and hip fractures, which carry greater morbidity and mortality. Upper limb fractures serve as early indicators of osteoporosis and may predict more serious fractures, such as those of spine and hip, if underlying bone health is not addressed.

An upper limb fracture should be regarded as a sentinel event necessitating comprehensive evaluation, rather than just localized treatment. A proactive approach requires immediate bone health assessment, including bone mineral density testing, fall risk evaluation, and early initiation of osteoporosis therapy. This shift from reactive to proactive care can greatly reduce the likelihood of subsequent fractures.

Prolia (denosumab), a RANK ligand inhibitor, effectively reduces fracture risk by inhibiting bone resorption and enhancing bone strength. Clinical data indicate that Prolia significantly lowers the risk of wrist fractures by 43%, forearm fractures by 43%, humerus fractures by 58%, and upper arm fractures by 48%. Initiating Prolia treatment after an upper limb fracture is a crucial step in comprehensive secondary fracture prevention.

Effective fracture prevention necessitates more than pharmacologic therapy alone. Combining Prolia with lifestyle interventions—such as calcium and vitamin D supplementation, resistance and balance training, and fall prevention strategies—creates a robust framework for fracture risk reduction. Early, proactive management following an initial fracture helps prevent debilitating spine and hip fractures while preserving patient independence, mobility, and overall quality of life.

Effect of radial lengthening on the dtability of the distal radioulnar joint: A biomechanical cadaveric study

橈骨延長術對遠端橈尺關節穩定性影響之生物力學大體研究

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Background: The radial lengthening procedure has been clinically proven to treat distal radioulnar joint (DRUJ) instability associated with distal radius fracture. This study evaluated DRUJ stability under varying degrees of radial lengthening and examined whether the distal oblique bundle (DOB) enhances its stabilizing effect.

Methods: Eight fresh-frozen cadaver specimens were used. DRUJ translation distances and corresponding recovered stability were measured using a custom stress test machine simulating the DRUJ ballottement test. A triangular fibrocartilage complex (TFCC) injury model was arthroscopically created to induce DRUJ instability. Stress tests were then conducted on injured samples with radial lengthening of 1mm, 3mm, and 5mm, recording translation distances. Finally, anatomic dissections determined the presence of DOB in each sample.

Results: Radial lengthening was correlated with decreased translation distance in machine-driven stress tests, though the results were not statistically significant. To address DRUJ stability concerns, we defined recovered stability and found that at least 3mm of radial lengthening improved stability in nearly all wrist positions, with 5mm providing greater benefit in pronation. In our study, the prevalence of DOB was 37.5%, and its presence significantly enhanced the stabilizing effect of radial lengthening on DRUJ stability, as indicated by multiple linear regression models.

Conclusion: Radial lengthening may offer advantages in managing DRUJ instability associated with acute distal radius fractures, particularly when the DOB is present. However, alternative treatment strategies should be explored first, as radial lengthening often results in only partial restoration of DRUJ stability.

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精神疾病認知及功能缺損的新近研究發展

Recent Advancements in Cognitive and Functional Impairments in Mental Illness

時　間：114年6月28日　　13:30-17:30

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地　點：臺北榮民總醫院 致德樓第十會議室

Place：The Tenth Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

精神疾病認知及功能缺損的新近研究發展

Recent Advancements in Cognitive and Functional Impairments in Mental Illness

Explore the role of circulating endothelial progenitor cells in the cognitive deficit in mood disorders

探討循環內皮前驅細胞在情緒疾病認知缺損的角色

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Background: Major depressive disorder (MDD) and bipolar disorder (BD) are associated with endothelial dysfunction (ED). Circulating endothelial progenitor cells (cEPCs) play a vital role in endothelial health, and their quantity and functional characteristics are often seen as indicators of ED. Since cognitive impairment is a key symptom of both MDD and BDand is linked to microvascular dysfunction, we investigated the relationship between cEPC indices and cognitive deficits in individuals with mood disorders.

Methods: We recruited MDD and BD patients and healthy controls. cEPC counts and functions (adhesion, apoptosis) were measured using flow cytometry and in vitro assays. Cognitive functions were assessed using Digit Symbol Substitution Test (DSST), Perceived Deficits Questionnaire-Depression (PDQ-D), 2-back, Go/No-Go, and Wisconsin Card Sorting Test (WCST), evaluating various cognitive domains. Statistical analyses explored associations between cEPC parameters and cognitive measures.

Results: In MDD, higher counts of cEPCs were associated with worse objective and subjective cognitive dysfunction; lower adhesion of cEPCs significantly correlated with a greater number of errors in working memory, as measured by the 2-back task, and in executive function, assessed through the WCST. In contrast, a lower percentage of apoptotic cEPCs was linked to poorer response inhibition, evidenced by an increased number of commission errors in both the 2-back and Go/No-Go tasks in BD.

Conclusion: The studies indicate a complex role of cEPCs in cognitive function related to mood disorders. These findings suggest that the functional properties of cEPCs may contribute to cognitive impairment in both MDD and BD, highlighting the need for further research in this area.

Multimodal neuroimaging to investigate cognitive impairment in neuropsychiatric disorders

利用多模式神經造影來研究精神疾病之認知功能缺損

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Cognitive impairment is a critical factor in neuropsychiatric disorders, significantly impacting functional outcomes independent of other clinical variables and representing a major unmet therapeutic need. Neuroimaging offers a powerful means to investigate the in vivo relationships between brain structure, function, neurochemistry, and cognition. While neuroimaging research has yielded valuable insights, translating these findings into clinically useful biomarkers remains a challenge. This presentation advocates for a multimodal strategy that integrates neuroimaging with peripheral biological markers and rigorous cognitive assessments to enhance our understanding of cognitive impairments. This approach aligns with the moving beyond single-region analyses to examine brain networks/circuits alterations in neuroscience. Specifically, we will explore the advantages of multimodal approaches that investigate various targets belong the same pathophysiological pathways but have to be examined via different tools. I will present our recent work for this field and discuss the potential of these techniques to elucidate the mechanisms underlying cognitive impairment in neuropsychiatric disorders, as well as the associated challenges and future directions. Ultimately, multimodal neuroimaging holds immense promise for advancing our understanding of these debilitating impairments and paving the way for more effective treatment strategies.

Persistent cognitive deficits in euthymic major depressive disorder and the emerging role of brain stimulation therapies

重度憂鬱症緩解期的持續性認知功能障礙及腦刺激治療之潛在應用

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A well-documented but sometimes neglected aspect of Major Depressive Disorder (MDD) is persistent cognitive deficiencies, even after mood symptoms have subsided. This review summarizes current research on cognitive impairments in euthymic MDD and assesses the potential of brain stimulation therapy to mitigate them.

Studies show that cognitive impairment remains after clinical remission, including verbal memory, inhibitory control, information processing speed, and executive functioning. Importantly, these cognitive problems may be trait-like vulnerabilities or "scar effects" from previous episodes and are independent of depressed symptom intensity. Clinical factors include age of onset, number of depressive episodes, and hospitalization history affect cognitive impairment severity.

Non-invasive brain stimulation methods including TMS, TBS, and tDCS are being investigated for improving cognitive performance in MDD. Applied to the left dorsolateral prefrontal cortex, TMS may improve attention, inhibition, cognitive flexibility, and memory. TBS and tDCS investigations also have yielded promising outcomes, but larger, well-controlled trials are needed. Brain stimulation and cognitive training tend to synergistically improve cognitive control and function.

Conclusion, euthymic MDD cognitive abnormalities are clinically important targeted intervention. These unmet demands may be addressed by brain stimulation therapies, which are showing promise in cognitive enhancement. Future research should optimize stimulation techniques, identify patient subgroups who will benefit, and integrate cognitive rehabilitation frameworks to improve long-term outcomes.

New era for MDSI treatment focusing on Esketamine

MDSI 治療的新紀元：Esketamine

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Background: Major Depressive Disorder (MDD) significantly affects millions worldwide and is associated with high rates of suicidal ideation and behavior. Traditional antidepressants often take weeks to show effects, which can be critical for individuals experiencing severe depressive symptoms and suicidal thoughts. Spravato (esketamine) offers a novel therapeutic option, with rapid action and a unique mechanism that may be beneficial for patients with MDD and suicidal ideation.

Methods: In a multi-center, double-blind clinical trial, participants diagnosed with MDD and experiencing suicidal thoughts were treated with Spravato administered intranasally, alongside an oral antidepressant. The study aimed to evaluate the efficacy and safety of Spravato over a specified treatment period. Assessments included standardized scales to measure depressive symptoms and suicidal ideation from baseline to week 4.

Results: The results indicated a significant reduction in suicidal ideation among participants receiving Spravato compared to those receiving a placebo. Improvement in depressive symptoms was observed within the first 24 hours, with many patients reporting a notable decrease in their feelings of despair and hopelessness. The safety profile of Spravato was consistent with previous studies, with mild to moderate side effects typically resolving shortly after administration.

Conclusion: Spravato represents a promising treatment option for patients with MDD who exhibit suicidal ideation. Its rapid onset of action can provide immediate relief for individuals at risk, potentially mitigating the risk of suicide. Further research is essential to fully understand the long-term effects and benefits of Spravato in this vulnerable population, but the initial findings highlight its potential as a critical intervention in the management of severe depression.

What's new updates on longer dosing interval injection for psychiatric care in Maudsley Prescribing Guidelines? - from RCTs to RWEs

以隨機對照試驗及真實世界研究的觀點探討長效針劑在 Maudsley 治療指引中的最新進展

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Background: Schizophrenia is a chronic mental disorder characterized by delusions, hallucinations, and cognitive impairments that significantly impact daily functioning. Although antipsychotic medications are effective in managing symptoms, adherence to treatment can be challenging due to the frequency of dosing and side effects. Invega Trinza® and Invega Hafyera® are long-acting injectable formulations designed to improve treatment adherence and provide sustained symptom control for patients with schizophrenia.

Methods: Clinical trials evaluating Invega Trinza® and Invega Hafyera® involved adult patients diagnosed with schizophrenia who had previously been stabilized on oral paliperidone or risperidone. Participants received intramuscular injections of either Invega Trinza® every three months or Invega Hafyera® every six months. The primary endpoints assessed included the reduction of schizophrenia symptoms measured by standardized scales such as the Positive and Negative Syndrome Scale (PANSS) and overall safety and tolerability over a defined study period.

Results: Both Invega Trinza® and Invega Hafyera® demonstrated significant efficacy in reducing symptoms of schizophrenia compared to placebo, with sustained effects observed throughout the dosing intervals. Participants reported improved adherence due to the extended release formulation, effectively resulting in fewer injections needed per year. The safety profiles were consistent with those of other paliperidone formulations, with the most common side effects being weight gain, sedation, and extrapyramidal symptoms, which were generally manageable.

Conclusion: Invega Trinza® and Invega Hafyera® offer valuable long-acting treatment options for individuals with schizophrenia, addressing the challenge of medication adherence while providing robust symptom control. Their extended dosing intervals can enhance the quality of life for patients by reducing the frequency of injections and thus improving overall treatment satisfaction. Continued research is warranted to further explore the long-term effectiveness and tolerability of these long-acting formulations, aiming to optimize schizophrenia management in diverse patient populations.

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自體免疫疾病最新治療策略

New Treatment Strategies of Autoimmune Diseases

時　間：114年6月28日　　13:30-17:30

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Place：12F, The Conference Room, Chung Cheng Building
Taipei Veterans General Hospital

自體免疫疾病最新治療策略
New Treatment Strategies of Autoimmune Diseases

The evolving landscape of rheumatoid arthritis treatment

類風濕性關節炎的病況治療發展進程

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Rheumatoid arthritis (RA) treatment has progressed from symptom management to targeted, disease-modifying therapies. Historically, Non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroids provided relief but did not alter disease progression.

Disease-modifying antirheumatic drugs (DMARDs), notably methotrexate, marked a pivotal advancement, slowing disease progression. Biologic DMARDs (bDMARDs), such as TNF inhibitors, revolutionized RA treatment by effectively reducing inflammation. Subsequent bDMARDs targeting other cytokines expanded options. More recently, Janus kinase (JAK) inhibitors, as targeted synthetic DMARDs (tsDMARDs), offer oral administration and potent anti-inflammatory effects.

Current strategies emphasize early intervention and a treat-to-target approach, aiming for remission or low disease activity. Personalized medicine is increasingly influencing treatment decisions. Ongoing research focuses on novel therapies, such as other kinase inhibitors and cell therapy, to achieve sustained remission.

The evolution of RA treatment reflects a continuous pursuit of more effective and safer therapies, transforming RA management and improving patient outcomes.

Latest rheumatoid arthritis treatment strategy: JAK inhibitor

類風溼性關節炎最新治療策略：JAK 抑制劑

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Janus kinase (JAK) inhibitors have transformed rheumatoid arthritis (RA) treatment by targeting the JAK-STAT pathway, which is crucial for inflammatory cytokine signaling. These small molecules exhibit varying selectivity for JAK isoforms (JAK1, JAK2, JAK3 and Tyrosine kinase (TYK)2), influencing both efficacy and safety.

JAK1 and JAK2 are universally expressed in tissues and exert broad effects by participating in the signal transduction of key cytokines such as IFN-γ, IL-6, and IL-13. JAK2 not only plays a role in immune responses but also significantly impacts erythropoiesis and thrombopoiesis. JAK3, primarily in lymphocytes, is mainly involved in the signal transduction of γC receptors. Its selective inhibition offers a potentially improved safety profile with fewer off-target effects. TYK2, also universally expressed in tissues, participates in the signaling of certain cytokines, such as IIFN-α/β, IL-12, IL-13, and IL-4.

Clinical trials have demonstrated that JAK inhibitors efficacy improves RA symptoms. However, safety concerns remain, including risks of infections, cardiovascular (CV) events, and thrombosis. Therefore, considering patient-specific risk factors is crucial in drug selection. In renal impairment, some JAK inhibitors require dosage adjustment. However, certain JAK inhibitors with lower renal clearance do not necessitate dose modification, simplifying treatment and minimizing drug accumulation risk.

This review summarizes current JAK inhibitor strategies in RA, focusing on JAK isoform selectivity, safety, and implications for renal impairment. Ongoing research will further refine treatment approaches and optimize patient outcomes.

Systemic lupus erythematosus: Updated therapeutic guidelines from the United States and Europe

紅斑性狼瘡：美國及歐洲最新治療指引

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Guidelines for Lupus Nephritis (SLE) Management may focus on Diagnosis, Induction Therapy, .Maintenance Therapy, Adjunctive Treatments, Hydroxychloroquine also recommended for all SLE patients to manage systemic symptoms, Monitoring and Follow-up is to prevent to disease course progression. Frequent monitoring for drug toxicity, lupus activity, and renal function is essential. Adjustments in therapy based on response and side effects. Real-World Practice may focus on Personalized Treatment Plans: Clinicians may tailor treatments based on a patient's overall health, comorbid conditions, and response to initial therapy. The application of guidelines to real-world practice involves considering patient-specific factors, healthcare infrastructure, and resource availability to optimize outcomes in managing lupus nephritis.

Biologic therapies and emerging treatments

生物製劑進展及最新治療

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In recent years, biologic therapies and emerging treatments have revolutionized the management of chronic inflammatory and autoimmune diseases, including rheumatoid arthritis, systemic lupus erythematosus (SLE), psoriasis, inflammatory bowel disease (IBD), and others. These advanced therapies, often derived from living organisms, target specific components of the immune system to modulate disease activity more precisely than traditional immunosuppressive drugs.

Biologic agents such as monoclonal antibodies, fusion proteins, and cytokine inhibitors have significantly improved patient outcomes by reducing disease flares, preventing organ damage, and enhancing quality of life. For example, tumor necrosis factor (TNF) inhibitors, interleukin (IL) blockers (e.g., IL-6, IL-17, IL-23), and B-cell depleting therapies have become central to treatment algorithms for many autoimmune conditions. In systemic lupus erythematosus, belimumab (a B-lymphocyte stimulator inhibitor) and anifrolumab (an interferon receptor antagonist) represent key milestones in biologic therapy development, offering targeted mechanisms with favorable safety profiles.

Beyond biologics, emerging treatments include small molecule inhibitors such as Janus kinase (JAK) inhibitors, sphingosine-1-phosphate (S1P) modulators, and BTK (Bruton's tyrosine kinase) inhibitors. These oral agents offer the potential for easier administration and comparable efficacy, with several already approved for diseases like rheumatoid arthritis and ulcerative colitis. Advances in precision medicine, including the use of biomarkers and pharmacogenomics, are also helping to tailor treatments to individual patients, thereby improving therapeutic efficacy and reducing adverse effects.

Ongoing research continues to explore new targets and treatment combinations, aiming to improve remission rates and prevent disease progression. Clinical trials are expanding the therapeutic landscape, with promising candidates in various phases of development. Ultimately, the integration of biologic therapies and emerging treatments into clinical practice marks a transformative shift in managing complex immune-mediated diseases, offering hope for more personalized, effective, and sustainable healthcare solutions.

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整合免疫療法促進肺癌治療之進展

Advancing Lung Cancer Treatment through Immunotherapy Integration

時　間：114年6月28日　　13:30-17:00

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Place：The Clinical Innovation Center,
Taipei Veterans General Hospital

整合免疫療法促進肺癌治療之進展

Advancing Lung Cancer Treatment through Immunotherapy Integration

The evolving landscape of neo-adjuvant and adjuvant immunotherapy for NSCLC

非小細胞肺癌新輔助與輔助免疫治療的發展現狀

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Lung cancer remains the leading cause of cancer-related mortality worldwide. For patients with early-stage non-small-cell lung cancer (NSCLC), the treatment typically involves surgical resection followed by adjuvant chemotherapy. The use of platinum-based chemotherapy after surgery has been shown to enhance survival outcomes. However, a significant number of patients continue to experience disease recurrence, either locally or systemically, resulting in poor prognosis. Only a small proportion of individuals with resected NSCLC remain free of recurrence at the five-year mark. Given the proven benefits of immune checkpoint inhibitors in early-stage NSCLC, immunotherapy has been incorporated into the perioperative strategy to improve outcomes in this disease.

The role of immunotherapy in resectable NSCLC was shown in multiple randomized phase III trial of neoadjuvant and adjuvant immunotherapy-based regiment. For patients undergoing neoadjuvant treatment, this approach may be considered for those with potentially resectable disease, especially individuals with node-positive status. In cases where tumors are ≥4 cm and/or lymph node involvement is present, and no actionable mutations are detected in epidermal growth factor receptor (EGFR) or anaplastic lymphoma kinase (ALK), combining platinum-based doublet chemotherapy with one of the following immune checkpoint inhibitors, such as nivolumab, pembrolizumab, or durvalumab, is a treatment option. When pembrolizumab or durvalumab is used, therapy is typically continued in the adjuvant setting. If nivolumab is selected, continuation into the adjuvant phase is an option for patients who have tolerated it well, particularly those at increased risk of recurrence.

This review highlights both published and recent data from clinical studies investigating the use of immunotherapy in neoadjuvant and adjuvant treatment approaches for early-stage NSCLC. Ongoing and future clinical trials are needed to refine and optimize immunotherapeutic strategies for patients at this stage of the disease.

Advances in immunotherapy approaches for unresectable stage III NSCLC

無法切除之第三期非小細胞肺癌的免疫療法新進展

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Stage III non-small cell lung cancer (NSCLC) is a heterogeneous condition typically managed through a multimodal treatment strategy that may include chemotherapy, radiotherapy, and, in selected cases, surgical resection. For patients with unresectable, locally advanced (stage III) NSCLC, the standard treatment since the early 2000s has been definitive chemoradiotherapy, usually involving a platinum-based chemotherapy regimen administered concurrently with radiation.

In recent years, growing interest has emerged in the use of immunotherapy following definitive chemoradiotherapy in this setting. A phase III study, the PACIFIC trial, published in 2017, demonstrated that durvalumab significantly improved survival in patients with unresectable stage III NSCLC who did not experience disease progression after concurrent chemoradiotherapy (CCRT). A subsequent 4-year follow-up showed that 49.6% of patients treated with durvalumab were still alive at four years, compared to 36.3% in the placebo group. These findings have been further supported by multiple real-world studies confirming the clinical benefit. As a result, durvalumab consolidation therapy following CCRT is now considered the standard of care for managing unresectable stage III NSCLC.

Transforming advanced NSCLC treatment with immunotherapy

以免疫療法改變晚期非小細胞肺癌的治療

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Lung cancer remains the leading cause of cancer-related deaths globally. Despite ongoing advancements in the diagnosis and treatment of non-small cell lung cancer (NSCLC), the prognosis for patients with late-stage disease remains poor. Metastatic NSCLC is typically managed with systemic therapies or palliative care. In recent years, immunotherapeutic approaches, particularly immune checkpoint inhibitors, have demonstrated notable survival benefits in select patient groups. Inhibitors targeting PD-1, PD-L1, and CTLA-4 have shown promising efficacy and have been integrated into the standard treatment protocols for advanced NSCLC.

For patients whose tumors with ≥50 % PD-L1 expression and lack targetable oncogenic driver mutations, monotherapy with pembrolizumab or atezolizumab is commonly recommended. In cases of rapidly progressing disease or high tumor burden, a combination of pembrolizumab with platinum-based chemotherapy is often used. When PD-L1 expression is below 50%, the current standard of care includes platinum-based doublet chemotherapy combined with pembrolizumab. For non-squamous NSCLC, a regimen of bevacizumab and atezolizumab along with platinum-based chemotherapy offers an alternative treatment option. Additionally, nivolumab paired with ipilimumab is considered a viable choice for metastatic NSCLC patients with PD-L1 expression of at least 1%. Combining nivolumab and ipilimumab with two cycles of platinum-based chemotherapy also represents a reasonable treatment strategy for metastatic disease.

Ongoing clinical trials continue to explore novel immunotherapy combinations aimed at further improving outcomes for patients with lung cancer. In this review, we summarize key evidence supporting the efficacy of immunotherapy-containing regimens in advanced NSCLC and discuss the clinical relevance of combination strategies currently in practice or under investigation.

New horizons in SCLC immunotherapy treatments

小細胞肺癌免疫治療的新前景

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Small cell lung cancer (SCLC) remains a highly aggressive and lethal malignancy, with standard chemotherapy offering only limited survival benefits. Unlike lung adenocarcinoma, which has multiple effective targeted therapies aimed at specific oncogenic drivers, SCLC continues to be treated as a single clinical entity. SCLC typically presents widespread disease, and systemic therapy remains the primary treatment approach. Despite initial sensitivity to chemotherapy and radiotherapy, relapses often occur within a few months following treatment.

The integration of immune checkpoint inhibitors, such as the anti-PD-L1 antibodies atezolizumab or durvalumab, into chemotherapy regimens has demonstrated significant improvements in both overall survival and progression-free survival compared to treatment with platinum and etoposide alone. These combination therapies have now been established as the standard first-line treatment for extensive-stage SCLC (ES-SCLC). Nevertheless, the clinical benefit remains modest, and only a fraction of patients appears to respond favorably.

Tarlatamab is a bispecific T-cell engager immunotherapy that redirects a patient's T cells to target cancer cells expressing delta-like ligand 3 (DLL3), a protein overexpressed in approximately 90% of SCLCs. The U.S. Food and Drug Administration (FDA) has granted approval for Tarlatamab. In phase II study, Tarlatamab demonstrated encouraging efficacy in patients whose disease had either progressed after or was refractory to prior platinum-based therapy and at least one additional line of treatment. When administered at 10 mg intravenously biweekly, the overall response rate reached 40%, with a median progression-free survival of 4.9 months and a median overall survival of 14.3 months. With extended follow-up (median 12.1 months), the response rate was 35%, and median overall survival increased to 20 months.

Building on the chemoimmunotherapy backbone, ongoing research is focused on identifying additional therapeutic approaches to extend survival for patients facing this devastating disease. Further developments in immunotherapy for SCLC will be discussed in this presentation.

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台灣、日本、韓國、東南亞和美國的傳統醫學發展現況與交流

Update Academic Development and Experience Exchange of Traditional Medicine in Taiwan, Japan, South Korea, Southeast Asia, and the United States

協辦單位：臺北民總醫院傳統醫學部
國立陽明交通大學醫學院傳統醫藥研究所
國立陽明交通大學醫學院中醫學系

時　間：114年6月28日　13:40-17:00
Time：June 28, 2025　13:40-17:00

地　點：臺北榮民總醫院 第三門診9樓創新沙龍
Place：The Clinical Innovation Center,
Taipei Veterans General Hospital

台灣、日本、韓國、東南亞和美國的傳統醫學發展現況與交流

Update Academic Development and Experience Exchange of Traditional Medicine in Taiwan, Japan, South Korea, Southeast Asia, and the United States

Traditional medicine and healthcare coverage in Japan

日本的傳統醫學和醫療保健

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This article explores the relationship between traditional medicine and healthcare coverage in Japan. With a rich history encompassing practices such as acupuncture, massage, and herbal medicine, traditional medicine continues to play a significant role in Japanese society, even as modern healthcare systems evolve.

Japan's healthcare insurance system is one of the most advanced globally, providing coverage for most of its citizens. However, the integration of traditional medicine into this system is uneven, with certain practices, like acupuncture and kampo (traditional Japanese herbal medicine), included in insurance coverage but often with limitations on reimbursement rates. This creates a financial burden for patients who seek other traditional therapies.

Patients generally hold a positive attitude towards traditional medicine, particularly for chronic disease management and health maintenance. Surveys indicate a desire for greater support for traditional therapies within the insurance framework, prompting policymakers to reassess the status of traditional medicine.

To enhance healthcare coverage for traditional medicine, this article recommends expanding coverage options, increasing awareness among healthcare providers and patients, and promoting the integration of traditional and modern medical practices.

In conclusion, traditional medicine remains an essential component of Japan's healthcare landscape. Addressing the evolving needs of patients by improving insurance coverage for traditional therapies can lead to better health outcomes and promote health equity.

The role of traditional, complementary, and alternative medicine in health system strengthening and resilience

傳統輔助及替代醫學在健康照護系統強化及韌性的角色

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The World Health Organization formally incorporated traditional medicine into its Primary Health Care and Health For All initiative in 1978, becoming the first prominent supragovernmental organization to officially promote traditional medicine. Since then, traditional, complementary, and alternative medicine (TCAM) has been steadily integrated into many national healthcare systems. The mainstreaming of TCAM is also reflected in its wide utilization and coverage by national health systems and private health insurances. The purpose of this presentation is to investigate the progression of TCAM and its role in strengthening national health systems while also contributing to their resilience. While I will use TCAM in the United States as an example, the investigation and discussions will have wide implications for most national health systems around the world.

I will begin by reviewing the World Health Organization's incorporation of traditional medicine into its Primary Health Care initiative program and developments since 1978. This is followed by a case study of TCAM in the United States that includes the steady diffusion of TCAM practices and utilization in recent decades. Specifically, I will examine the process of mainstreaming TCAM in U.S. healthcare, including the development of professional postgraduate schools of TCAM, licensure of practitioners, private insurance coverage of patients' utilizations, and allopathic medical practitioner knowledge and practices related to TCAM. Further, I will discuss the challenges TCAM has been facing in the U.S., such as how TCAM addresses the expectations of evidence-based medicine, new healthcare concerns and priorities, patient satisfaction, and evolving new technologies such as genetic engineering, nanotechnology, and artificial intelligence.

Based on TCAM's development in the United States, I will explore what challenges TCAM faces in maintaining its relevance in modern healthcare systems. Specifically, I will discuss strategies for TCAM to adopt and adapt to relevant new technologies and how it can contribute to health system strengthening. Further, after our recent experience with the COVID-19 pandemic, most national health systems have highlighted the importance of resilience in future development. For TCAM to continue to develop and flourish, it can and must contribute to resilient health systems.

Current status and prospect of traditional medicine in the global context

全球視野下中醫藥現狀與前瞻

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In this presentation, I will assess four recent developments of traditional medicine in Taiwan and worldwide and provide some perspective on the future. (1) In May 2019, World Health Organization (WHO) issued the eleventh edition of International Classification of Diseases (ICD-11), with a supplementary chapter of traditional medicine, taking effects in January 2022. In 2022, WHO inaugurated a Global Centre for Traditional Medicine in Gujarat, India. (2) In December 2019, the Legislative Yuan (Parliament) in Taiwan passed the Chinese Medicine and Pharmacy Development Act, and days later the President of Taiwan announced it as an edict. This is a policy landmark for Chinese Medicine, with mandate to support and strengthen Chinese medicine in Taiwan, mainly through the Ministry of Health and Welfare. (3) During the COVID-19 pandemic (2020-2023), Prof. Yi-Chang Su Director of *National Research Institute of Chinese Medicine (NRICM)*, Ministry of Health and Welfare devised NRICM-101 (臺灣清冠一號) as a herbal formulation for symptom relief in infected patients. Between September 2020 and January 2023, the Ministry of Health and Welfare issued 14 export licenses of concentrated powder formula of NRICM-101 after expert review with significant export output. The 14 export licenses of NRICM-101 concentrated powder have reached more than 60 nations worldwide. The expert review of the first emergency use authorization (EUA) of NRICM-101 concentrated powder was convened in April 2021, and with issuance of first EUA license as a prescription drug in May 2021, later a total of 14 EUA licenses of NRICM-101 have been granted in Taiwan. After a prospective controlled trial in the latter half of 2022, the first license of NRICM-101 was issued after expert review to Sun Ten Pharmaceutical Co. (順天堂藥廠) in May 2023. It is estimated that until June 2023, among a total of 10 to 11 million Taiwanese have been infected by the virus SARS-CoV-2, around 18% (1.8 million) have been prescribed with the NRICM-101 concentrated powder paid by the Government. It is a unique and good example of Chinese medicine development for the symptom relief and health care during the COVID-19 pandemic. (4) Recently, several high-quality randomized, double-blinded, placebo-controlled trials of Chinese herbal formulae for the treatment of cardiovascular diseases were published in international prestigious journals such as JAMA, Nature Medicine, Lancet, etc. I will review some papers with comments.

A Study on the clinical applicability of Yin-Yang biopsychology

陰陽生理心理學的臨床應用價值探討

Han Chae

蔡韓

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Yin and Yang (Eum and Yang in Korean) are foundational concepts in traditional East Asian medicine. However, due to the lack of objective measurements, research and clinical applications of these concepts have long been undervalued, often regarded as merely cultural or philosophical ideas.

Recently, an objective clinical tool to assess Eum-Yang biopsychology was developed, and efforts are underway to register it as a New Health Technology in Korea. The Sasang Personality Questionnaire (SPQ), consisting of 20 items, includes three subscales: behavioral attitude (SPQ-B), cognitive style (SPQ-C), and emotional reactivity (SPQ-E).

Higher SPQ total scores reflect Yang biopsychological traits, while lower scores reflect Eum traits. In studies on adolescent problem behaviors, individuals with higher SPQ scores (Yang group) were more likely to show Externalizing Problems (such as aggression and rule-breaking), whereas those with lower SPQ scores (Eum group) tended toward Internalizing Problems (such as depression and social withdrawal).

Among the subscales, high SPQ-B scores indicate an active and sociable behavioral tendency, while low scores reflect passive and avoidant behaviors. High SPQ-E scores are associated with oversensitive and unstable emotionality, whereas low scores reflect a calm and composed emotional state. Maladaptive emotion regulation strategies (such as blaming, catastrophizing, and rumination), which contribute significantly to the worsening of psychopathological symptoms, were found to be associated with low SPQ-B and high SPQ-E scores.

These findings suggest that Yin-Yang biopsychology may provide a valuable framework for understanding psychopathological development and clinical diagnosis. Further research could expand its clinical applications to a broader range of disorders.

Transition from tradition to modernity: Evolution and application of Chinese medicine dermatology in Malaysia

從傳統到現代：馬來西亞中醫皮膚科的發展與實踐

Hui-Lin Kung
龔惠琳
Tung Shin Hospital , Malaysia
同善醫院

In Malaysia, Chinese medicine dermatology has undergone a noteworthy transformation, evolving from its traditional origins to adopt modern applications. This discussion focuses on the progression and current practices of Chinese medicine dermatology in Malaysia, emphasizing the amalgamation of age-old concepts with contemporary medical innovations.

The discussion will be categorized into seven different directions: Development Background and Purpose:

1. Discuss the historical context of Traditional Chinese Medicine in Malaysia and the driving factors and objectives behind practicing medicine over the past 15 years.
2. The impact of Malaysia's Climate and Culture on Skin Health: Delve into the influence of Malaysia's tropical climate and diverse cultural landscape on dermatological health.
3. Theoretical Basis and Clinical Application of TCM Dermatology in Malaysia: Provide an overview of the theoretical foundations of Traditional Chinese Medicine in dermatology and how it is applied in clinical settings in Malaysia.
4. Experience Sharing in Diagnosing and Treating Skin Diseases: Share insights on diagnostic and treatment experiences, as well as present typical cases of common skin conditions encountered in Malaysia.
5. Integration of Chinese and Western Medicine in Malaysia: Examine the benefits and obstacles of integrating Chinese and Western medical practices in Malaysia.
6. Psychological Needs of Malaysian Patients and the Doctor-Patient Relationship: Highlight the importance of addressing the psychological well-being of patients in Malaysia and nurturing strong doctor-patient relationships.
7. Reflection and Future Prospects of Chinese Medicine Dermatology in Malaysia: Summarize the practice of Chinese medicine in dermatology, reflect on past experiences, and provide recommendations for the advancement of Chinese medicine dermatology in Malaysia.

The current status of the development of traditional Chinese medicine in Malaysia

馬來西亞中醫藥發展現況

Jia Rou Soo Hoe
司徒佳柔
Tung Shin Hospital, Malaysia
同善醫院

Traditional Chinese medicine (TCM) has a long history in Malaysia, first introduced by Chinese immigrants who gradually integrated it into local society. In August 2016, traditional Chinese medicine was officially regulated under Traditional and Complementary Medicine Act, also known as Act 775 (T&CM Act 2016 [Akta 775]) in Malaysia. Currently, there are four main categories of Traditional Chinese Medicine institutions in Malaysia, which are large comprehensive hospitals with established Chinese medicine departments, private Chinese medicine hospitals or outpatient clinics, individual private practices, and Chinese medicine departments within public hospitals' traditional and complementary medicine departments.

Traditional Chinese medicine plays a complementary role in Malaysia's medical system and is effective in treating chronic diseases, respiratory conditions, cardiovascular diseases, dermatological issues etc. The concept of "preventive treatment" in traditional Chinese medicine also positively contributed to raising public health awareness and daily preventive healthcare.

However, the development of TCM in Malaysia faces several challenges, including inadequate industry regulation and standardization in areas such as pricing issues, diagnosis and treatment protocols. Additionally, there is a lack of public awareness about TCM. Conversely, government policy support, heightened public health awareness, and traditional medicine exchanges with the Association of Southeast Asian Nations (ASEAN) present opportunities for the future growth of TCM.

Tung Shin Hospital was established in 1881. Throughout the past century, it has evolved into a full-service hospital that offers a combination of Chinese and Western medical treatments. It is known for having the largest Chinese medicine healthcare services in Malaysia. The hospital's outpatient department is staffed with over 30 TCM specialists and practitioners from both local and international backgrounds, offers specialized clinics in dermatology, cardiology, gynecology, oncology, orthopedics, and more. In addition to traditional services, the Chinese Medicine Department also provides inpatient care with Chinese medicine treatments, acupuncture, Chinese therapeutic massage, and physiotherapy.

Overall, traditional Chinese medicine industry in Malaysia is experiencing rapid development and is expected to make greater contributions to public health through continued innovation and integration in the future.

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癌症與懷孕

Cancer and Pregnancy

時　間：114年6月28日　13:20-17:00

Time：June 28, 2025　13:20-17:00

地　點：臺北榮民總醫院 長青樓一樓護理館會議廳

Place：Nursing Arts Laboratory, Evergreen Building, Taipei Veterans General Hospital

癌症與懷孕
Cancer and Pregnancy

Management of CIN lesions and cervical cancer in pregnancy

子宮頸癌前病變與子宮頸癌在孕期中的處置

Jen-Ruei Chen

陳楨瑞

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臺北馬偕紀念醫院 婦產部 婦癌科

馬偕醫學院 醫學系

The management of cervical intra-epithelial neoplasia (CIN) and cervical cancer (Cx Ca) during pregnancy presents unique clinical challenges, balancing maternal health with fetal safety.

This lecture provides an evidence-based overview of diagnostic approaches, risk stratification, and treatment strategies for CIN and invasive Cx Ca identified during pregnancy. Emphasis is placed on the timing and modality of interventions, including colposcopic assessment, biopsy, and the role of conservative management versus immediate treatment. Special considerations such as gestational age, tumor stage, and maternal-fetal outcomes are discussed to guide individualized care plans. We also explore the psychological and ethical aspects of managing malignancy in the context of pregnancy.

This lecture integrates current clinical guidelines, including those from the ESGO, ESMO, and ASCCP, as well as recent literature on maternal-fetal outcomes and long-term prognosis. Attendees will be provided with algorithms for decision-making across various clinical scenarios and gestational stages, along with practical recommendations for counseling, surveillance, and post-delivery follow-up.

Management of pelvic tumor in pregnancy

骨盆腔腫瘤在孕期中的處置

Chih-Feng Yen

顏志峰

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林口長庚醫院 婦產部

Adnexal masses are identified in approximately 2 to 20 per 1,000 pregnancies, with most being benign and resolving spontaneously by the second trimester. The most frequent adnexal masses necessitating surgery include dermoid cysts (32%) and endometriomas (15%), among others. Malignancy is identified in approximately 2% of cases, typically presenting as germ cell tumors or borderline ovarian tumors, which are generally low-grade and diagnosed at an early stage. Epithelial ovarian carcinoma remains exceedingly rare in this population.

Ultrasonography serves as the primary diagnostic modality, and MRI, which provides detailed imaging without ionizing radiation, is used for adjunctive evaluation. Tumor markers, such as CA-125, AFP, LDH, inhibin B, CEA, and β-hCG, are more valuable for monitoring disease progression or response to therapy rather than for initial diagnosis due to their physiological elevations during pregnancy and lack of specificity.

Asymptomatic, benign-appearing masses may be managed expectantly.; while surgical intervention is warranted in cases of symptomatic masses, suspicion of malignancy, or complications such as torsion. A retrospective study conducted at CGMH found that 14.84% of patients with adnexal masses during pregnancy experienced tumor torsion. Masses measuring between 6 and 8 cm were associated with a significantly higher risk of torsion, with 60% of torsion events occurring between the 10th and 17th weeks of gestation, while only 5.9% occurred after 20 weeks. The incidence of malignancy was 3.4%, and ovarian cancer was identified in 2.3% of cases. Tumors with diameters ≥10 cm at initial diagnosis and exhibiting growth rates ≥3.5 cm/week demonstrated a significantly higher risk of malignancy.

Laparoscopy is generally preferred over laparotomy due to its association with shorter hospital stays, reduced postoperative pain, and lower rates of spontaneous abortion and preterm delivery. Best practices for laparoscopy during pregnancy include scheduling the procedure during the early 2nd trimester, careful port placement, maintaining pneumoperitoneum < 12 to 15 mm Hg, intraoperative maternal capnography, and FHR and contraction monitoring. Appropriate mechanical and chemical thromboprophylaxis should also be employed.

Although rarely necessary, chemotherapy may be administered during the 2nd and 3rd trimesters, after organogenesis, in cases of advanced-stage ovarian cancer in which the risk of maternal mortality outweighs the fetal consequences.

Fertility preservation for cancer patients

癌症患者的生育能力保存

Chi-Hong Ho

何積泓

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臺北榮民總醫院 婦女醫學部

Advancements in cancer therapies have achieved much improvement in survival rate of cancer patients. The cancer treatments, such as surgery, chemotherapy, and radiotherapy, potentially damage ovarian function. For young patients who desire future pregnancy, it is necessary to preserve the reproductive organs and their function to prevent loss of fertility. The methods of female fertility preservation include oocyte/embryo cryopreservation, ovarian tissue cryopreservation, ovarian transposition, and fertility-sparing surgery.

To cryopreserve oocytes or embryos, patients should receive appropriate controlled ovarian stimulation (COS). Most patients have only a single cycle owing to time constraints before oncologic treatment. The COS protocol and gonadotropin dose for oocyte cryopreservation in cancer patients requires an individualized assessment to obtain sufficient good quality oocytes with safety, especially minimizing the risk of ovarian hyperstimulation syndrome (OHSS). Random-start ovarian stimulation reduces time constraints without compromising oocyte yield and maturity. For estrogen-sensitive cancer, letrozole can be used during ovarian stimulation.

Ovarian tissue cryopreservation (OTC) is an important development for fertility preservation in girls and young women at risk of premature ovarian insufficiency because of treatment for cancer. OTC involves the removal and freezing of ovarian tissue containing primordial follicles, which can later be thawed and re-implanted or uses for in vitro maturation. OTC allows for the preservation of hormonal function, which may contribute to better reproductive outcomes and overall quality of life post-treatment. However, the risk of reintroducing malignant cells in cancer patients and the long-term safety of re-implantation require more research.

Pelvic irradiation almost induces castration and long-term hormone therapy would then be indicated for young women. Ovarian transposition has been proposed to preserve ovarian function in premenopausal patients receiving radiation therapy. For most gynecological cancers, the standard treatment must have reproductive organs removed. The fertility-sparing surgeries to treat early-stage cervical cancer, endometrial cancer and ovarian cancer should be considered for young patients who desire future pregnancy.

Breast cancer and pregnancy

乳癌與懷孕

Jiun-I Lai

賴峻毅

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臺北榮民總醫院 腫瘤醫學部 腫瘤內科

Breast cancer in reproductive-aged individuals presents unique challenges, particularly regarding pregnancy planning and fertility preservation. This talk will explore the intersection of breast cancer treatment and pregnancy, focusing on chemotherapy-related pregnancy risks, the role of gonadotropin-releasing hormone (GnRH) agonists in fertility preservation, and the long-term pregnancy risks associated with endocrine therapy. Chemotherapy is a cornerstone of breast cancer treatment but carries potential reproductive risks, including ovarian toxicity and impaired fertility. The impact of chemotherapy on ovarian reserve and pregnancy outcomes will be discussed, emphasizing the importance of counseling patients on fertility preservation strategies prior to treatment initiation.GnRH agonists have emerged as a potential option for protecting ovarian function during chemotherapy. While their use is associated with a reduced risk of premature ovarian insufficiency, questions remain regarding their efficacy in preserving long-term fertility and their impact on pregnancy outcomes. This talk will review current evidence on the use of GnRH agonists and their role in reproductive planning.Endocrine therapy, particularly selective estrogen receptor modulators and aromatase inhibitors, plays a critical role in hormone receptor-positive breast cancer management. However, the prolonged duration of endocrine therapy, typically 5 to 10 years, poses challenges for individuals desiring pregnancy. Emerging research on pregnancy safety after endocrine therapy and potential strategies for treatment interruption, such as the POSITIVE trial findings, will be discussed.In this talk, I will discuss the above topics through the prespective of evolving landscape of breast cancer and pregnancy.

Diagnosis and management of hematologic cancers in pregnancy

孕期血液癌症的診斷與治療

Chun-Kuang Tsai

蔡淳光

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The diagnosis of hematologic malignancies during pregnancy presents a unique clinical challenge, requiring a careful balance between maternal health and fetal safety. Although rare, hematologic cancers—including leukemia and lymphoma—can occur during gestation, often manifesting with nonspecific symptoms that may be misattributed to pregnancy-related physiological changes. Timely diagnosis is crucial but may be delayed due to concerns over fetal exposure to diagnostic imaging or invasive procedures. Nonetheless, modalities such as ultrasound and magnetic resonance imaging (MRI) without gadolinium are generally considered safe, and necessary hematologic evaluations should not be postponed.

Management strategies depend on the type and stage of the malignancy, gestational age, and the urgency of treatment. In general, treatment decisions require a multidisciplinary approach involving hematologists, obstetricians, neonatologists, and ethicists. Certain chemotherapeutic agents and regimens may be administered safely during the second and third trimesters, while radiotherapy and certain targeted therapies are typically avoided due to teratogenic risk. In select cases, deferring treatment until fetal viability or delivery may be appropriate, while in others, immediate maternal therapy takes precedence.

Outcomes vary widely depending on the malignancy and timing of intervention, but advances in supportive care, chemotherapy protocols, and perinatal medicine have improved the prognosis for both mother and child. This section discusses the diagnostic considerations, and current evidence-based strategies for managing hematologic cancers during pregnancy, with a focus on optimizing outcomes while minimizing harm.

Pregnancy care in cancer patients

癌病病人的孕期照顧

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Maternal fetal medicine specialists face a complex challenge managing the patient and the fetus when cancer is diagnosed during pregnancy. With approximately 1 in 1,000 pregnancies complicated by malignancy, primary care physicians play a pivotal role in early detection, coordination of multidisciplinary care, and ongoing surveillance throughout the pregnancy-cancer continuum. This review outlines evidence-based approaches to screening, diagnosis, and supportive care for this vulnerable population.

Primary care providers must balance routine antenatal care with cancer-specific considerations, including modified surveillance protocols, management of treatment side effects, and addressing psychosocial needs. Critical areas of focus include symptom recognition despite physiologic changes of pregnancy, appropriate timing of diagnostic workups, and coordinating care between oncology, maternal-fetal medicine, and primary care teams. Practical approaches to medication management, nutritional support, and mental health interventions specifically tailored to pregnant cancer patients will be discussed.

Special attention is given to post-treatment follow-up, survivorship care planning, and management of late effects in both mother and child. Emerging evidence suggests that primary care involvement improves both oncologic and obstetric outcomes through timely recognition of complications and facilitation of appropriate interventions. These recommendations can be tailored to enhance primary care capacity in supporting pregnant cancer patients throughout their complex healthcare journey.

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神經醫學診療的新紀元：挑戰與突破

A New Era in Neurological Medicine: Challenges and Breakthroughs

時　間：114年6月29日　08:45-12:10

Time：June 29, 2025　08:45-12:10

地　點：臺北榮民總醫院 致德樓第一會議室

Place：The First Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

神經醫學診療的新紀元：挑戰與突破

A New Era in Neurological Medicine: Challenges and Breakthroughs

Migraine management update: CGRP therapies and sex considerations

偏頭痛治療更新：CGRP 治療與性別考量

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三軍總醫院 神經科部

Migraine is a highly prevalent and disabling neurological disorder, characterized by a pronounced female preponderance and influenced by complex pathophysiological mechanisms. This presentation provides an updated overview of migraine biology, highlighting the pivotal role of calcitonin gene-related peptide (CGRP) in the onset and progression of migraine attacks. It addresses the evolution of migraine therapies, from traditional acute treatments—including triptans, analgesics, and nonsteroidal anti-inflammatory drugs—to innovative preventive strategies such as botulinum toxin type A and CGRP-targeted medications. Particular attention is given to the latest CGRP-related therapies, encompassing both monoclonal antibodies and small-molecule CGRP receptor antagonists. These novel agents show promise in reducing the frequency and intensity of migraine episodes, particularly among individuals who have not responded to or cannot tolerate conventional medications. Emerging evidence suggests that hormonal fluctuations—especially variations in estrogen and prolactin levels—may heighten migraine susceptibility in women. Clinical trial data underscore the potential for greater efficacy in females receiving CGRP-targeting therapies, with some differences observed in male patients. Consequently, personalized treatment approaches are essential, taking sex-specific responses and comorbidities into account when selecting therapy options.

An update on the recent progress in the diagnosis and treatment of Alzheimer's disease

阿茲海默症診斷與治療的最新進展

Wei-Ju Lee

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Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by cognitive decline and memory impairment, significantly impacting patients' quality of life and imposing a substantial burden on healthcare systems worldwide. Recent advancements in the diagnosis and treatment of AD have shown promising potential to enhance early detection and improve patient outcomes.

In diagnostics, blood-based biomarkers have emerged as a revolutionary approach, offering minimally invasive and cost-effective options for early detection and disease monitoring. Additionally, amyloid and tau positron emission tomography (PET) imaging has demonstrated high specificity and sensitivity in detecting pathological hallmarks of AD, enabling accurate diagnosis even in the preclinical stages. The integration of these advanced diagnostic techniques has significantly improved early identification and disease staging.

On the therapeutic front, the development of amyloid antibody treatments has marked a breakthrough in AD management. Monoclonal antibodies targeting amyloid-beta, such as Aducanumab and Lecanemab, have demonstrated the ability to reduce amyloid plaques and potentially slow cognitive decline. These therapies, combined with supportive care and lifestyle modifications, are shaping a more comprehensive and personalized approach to AD treatment.

This talk will provide an update on the recent progress in AD diagnosis and treatment, emphasizing the impact of blood-based biomarkers, amyloid and tau PET imaging, and amyloid antibody therapies on clinical practice.

The role of surgical intervention for intracerebral hemorrhage

腦出血之外科介入

Cheng-Chia Lee

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Minimally invasive hematoma evacuation techniques, such as stereotactic aspiration and endoscopic surgery, are increasingly used to treat intracerebral hemorrhage (ICH), especially in patients who may not be suitable candidates for traditional craniotomy. These methods offer the advantage of smaller incisions, reduced brain tissue disruption, and faster recovery times compared to open surgery. The primary goal of these procedures is to evacuate the hematoma, alleviate intracranial pressure (ICP), and improve neurological outcomes while minimizing surgical risks.

Stereotactic aspiration involves using a small-bore catheter inserted through the skull into the hematoma cavity, guided by stereotactic imaging or navigation systems. The process begins with preoperative imaging (CT or MRI) to identify the hematoma's location. Once the catheter is in place, the hematoma is aspirated through the catheter, often using a vacuum or syringe. This approach is particularly useful for deep-seated or small hematomas and is associated with lower complication rates, such as reduced risk of infection or brain tissue damage.

Endoscopic evacuation, on the other hand, involves inserting a rigid or flexible endoscope through a small incision. The surgeon visualizes the hematoma directly on the monitor and evacuates it using specialized instruments. This technique provides real-time imaging and is effective for more superficial hematomas, such as those in the basal ganglia or frontal lobe. Endoscopic surgery is advantageous in that it allows precise removal of the clot while preserving surrounding brain tissue, potentially improving recovery outcomes.

While minimally invasive techniques offer several benefits, they also have limitations. They may not be suitable for large hematomas or those located in inaccessible brain regions. In some cases, complete evacuation may not be achievable, requiring follow-up procedures or conversion to traditional surgery. Nonetheless, for appropriately selected patients, these approaches can significantly reduce surgical risks and shorten recovery times.

The role of genetic diagnosis in precision medicine of epilepsy

基因診斷在癲癇精準醫療的角色

Yo-Tsen Liu

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臺北榮民總醫院 神經醫學中心癲癇科

Epilepsy is one of the most common neurological diseases with more than 60 million people bearing the diagnosis worldwide. The rapid advancement of sequencing technology has led to the unraveling of genetic factors to be the underlying cause of diverse epilepsy syndromes in the past decade. Since the discovery of the first epilepsy gene, *CHRNA4*, nearly 1000 genes have been reported to be associated with epilepsy. The latest 2017 classification of epilepsy proposed by International League Against Epilepsy has adopted "genetic" as one of the main categories of epilepsies etiologies.

Genetic testing now plays a pivotal role in the clinical management of patients with epilepsy. Accurate genetic diagnosis may guide treatments such as disease-modifying therapies and/or the selection of antiseizure medications known to be effective or ineffective in certain epilepsy syndromes. Genetic diagnosis may also help to prognosticate and limit further investigations that have associated risks and cost. Further, genetic diagnoses may help identify or anticipate potential co-morbidities, allowing for optimization of treatment. With appropriate genetic diagnosis, genetic counseling for future pregnancies may be possible.

All kinds of genetic aberrations, including single nucleotide variants, copy number variations, chromosomal rearrangements, and mitochondrial diseases, are involved in diverse epilepsy syndromes. It is challenging to choose the proper genetic test for different phenotypes. Furthermore, it may be difficult to determine the clinical significance of a rare genomic variant. The interpretation and delivery of the genetic test results would generate significant impacts on the patients and their family. There are potential concerns about genetic testing, including psychological distress, social stigma and problems with health and life insurance.

I will share the experience of genetic diagnosis at Taipei Veterans General Hospital, a tertiary referral center in Taiwan. I will also introduce the general guidance on the circumstances in which genetic testing is indicated and test selection in order to guide optimal test appropriateness and benefit proposed by Taiwan Epilepsy Society.

New frontiers in ALS genetics and treatments

ALS 致病基因與治療的最新進展

Kang-Yang Jih

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臺北榮民總醫院 神經醫學中心 及 國立陽明交通大學 醫學院 生理學研究所

Background: Amyotrophic lateral sclerosis (ALS) is a fatal neurodegenerative disease that involves degeneration of both upper and lower motor neurons. ALS patients typically experience progressive weakness in their limbs and later developed swallowing difficulties and respiratory failure. The average survival time of ALS is 3 to 5 years since disease onset. Disease-associated mutations can be found in approximately 15% of the ALS patients. However, the heredity of ALS was estimated to be around 40 to 60% based on analysis of twin data and a national registry. The discrepancy in ALS heredity has long been an enigma. We aimed to investigate the role of short tandem repeats in ALS genetics

Methods: We recruited 649 patients diagnosed with definite or probably ALS. All patients were tested for common disease genes, tandem repeat expansions and detail clinical characteristics were acquired after informed consent. The patients were followed up biannually for evaluation of ALSFRS-R score. 292 of them have received biannually ALSFRS-R score evaluations.

Results: The male and female ratio is 1.46. 12% of the patients exhibited bulbar onset. Average diagnosis delay since symptoms onset was 13.9 months. The most common genetic causes are *SOD1* and *C9ORF72*. On average, the functional outcome, evaluated by ALSFRS-R score, decline from 33.8 to 22.8 over the first year of diagnosis. Age of onset, presence of disease-causing genes and gender did not affect the rate of functional decline. Initial ALSFRS-R score, bulbar onset, BMI and older age of onset resulted in worse survival outcome. Serum neurofilament light chain level is inversely correlated to the first ALSFRS-R score.

Conclusion: Identification of genetic variants in ALS patients could lead to access of breakthrough genetic therapies. In addition to indel variants, tandem repeat expansions play an important role in ALS genetics.

Pharmacological and surgical treatment of Parkinson's disease: An update

巴金森病的藥物與手術治療的最新進展

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Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by both motor and non-motor symptoms due to dopamine depletion in the basal ganglia. While no cure exists, current treatment strategies aim to alleviate these symptoms and address complications arising from disease progression and long-term therapy.

Pharmacological treatments remain the cornerstone of PD management, with levodopa providing the most effective symptomatic relief. However, its long-term use is associated with motor fluctuations and dyskinesias, necessitating adjunctive therapies such as dopamine agonists, monoamine oxidase-B inhibitors, and catechol-O-methyltransferase inhibitors. Extended-release formulations, infusion therapies, and novel delivery systems have been developed to enhance drug efficacy and minimize side effects.

For patients with advanced PD experiencing motor fluctuations and medication-refractory symptoms, surgical interventions offer effective treatment options. Deep brain stimulation has revolutionized the management of PD by providing sustained symptom relief, improving motor function, and reducing medication requirements. More recently, high-intensity focused ultrasound has emerged as a non-invasive alternative for patients with tremor-dominant PD.

This talk will provide an in-depth exploration of the latest evidence supporting optimal PD management.

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在挑戰中尋找契機：慢性腎臟病治療新里程與轉譯醫學前沿進展

New Milestones in Chronic Kidney Disease Treatment and Breakthroughs

時　間：114年6月29日　08:30-12:00

Time：June 29, 2025　08:30-12:00

地　點：臺北榮民總醫院 致德樓第二會議室

Place：The Second Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

在挑戰中尋找契機：慢性腎臟病治療新里程與轉譯醫學前沿進展

New Milestones in Chronic Kidney Disease Treatment and Breakthroughs

Recent advances and updates in the treatment of IgA nephropathy

新目標，新希望 -IgA 腎病治療新進展

Jing Yuan Xie

謝靜遠

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IgA nephropathy (IgAN) is a common cause of chronic kidney disease, particularly in Asia, and is a leading cause of end-stage kidney disease (ESKD) in high-risk patients. The disease is driven by increased production of galactose-deficient IgA1 (Gd-IgA1), primarily originating from the gut. Nefecon (TARPEYO), a novel oral delayed-release formulation of budesonide, is designed to target mucosal immunity in the gut—specifically the gut-associated lymphoid tissue such as Peyer's patches—to reduce Gd-IgA1 production, a key pathogenic driver in IgAN.

While previous clinical trials have demonstrated Nefecon's efficacy in patients with moderate kidney function, its impact on those with more advanced renal impairment remains unclear. To address this gap, we conducted a real-world study evaluating the safety and efficacy of Nefecon in 11 patients with primary IgAN and significantly reduced kidney function. All patients were on stable renin-angiotensin system blockade prior to treatment, and outcomes were compared to a matched control group receiving standard care. The primary endpoints included changes in proteinuria, kidney function, and safety over a 9-month treatment period.

Nefecon treatment was associated with a notable reduction in proteinuria, with more significant improvement than the control group. Kidney function remained generally stable throughout the treatment course, and proteinuria slope analysis further supported the drug's antiproteinuric effect. The drug was well tolerated, with common but manageable side effects and no serious or unexpected adverse events reported.

These findings suggest that Nefecon may be a viable treatment option for IgAN patients with advanced kidney disease. Although the short-term results are promising, further studies with longer follow-up are needed to confirm its long-term renal protective effects and safety in this high-risk population.

Advancing strategies for CKD care

慢性腎病照護策略最新進展

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Anemia is a common and serious complication of chronic kidney disease (CKD), affecting both dialysis and non-dialysis patients. It significantly impairs quality of life, increases the risk of cardiovascular morbidity and mortality, and represents a major challenge in the comprehensive management of CKD. While traditional treatment with erythropoiesis-stimulating agents (ESAs) and iron supplementation has been the mainstay of care, these approaches come with limitations and potential safety concerns. In recent years, a new class of oral agents—hypoxia-inducible factor prolyl hydroxylase inhibitors (HIF-PHIs)—has emerged, offering an innovative and potentially safer strategy for correcting anemia in CKD.

Vadadustat works by stabilizing hypoxia-inducible factor (HIF), thereby stimulating the transcription of endogenous erythropoietin and enhancing iron utilization through multiple mechanisms. This mode of action mimics the body's natural response to hypoxia, promoting a more physiologic erythropoietic process. Importantly, vadadustat also improves iron metabolism by increasing the expression of genes involved in iron absorption and transport, such as transferrin and divalent metal transporter-1 (DMT1), while reducing levels of hepcidin, a key inhibitor of iron availability. Clinical trials evaluating vadadustat in both dialysis-dependent and non–dialysis-dependent CKD populations have shown it to be effective in maintaining hemoglobin levels within target ranges. In patients on dialysis, vadadustat has demonstrated non-inferiority to darbepoetin alfa in terms of efficacy. In non-dialysis patients, although efficacy was comparable, cardiovascular safety signals differed slightly depending on geographic regions and patient subgroups. These findings highlight the importance of individualized treatment considerations and the need for further real-world data.

One of the major advantages of vadadustat is its oral administration, which offers a convenient and less invasive option compared to injectable ESAs. This can be particularly beneficial in non-dialysis patients who are managed in outpatient or home-based settings. In addition, vadadustat may reduce the dependence on intravenous iron, thereby simplifying treatment protocols and potentially lowering the risk of iron overload and infection. As the treatment landscape for CKD-related anemia continues to evolve, vadadustat represents a promising step forward. It aligns with the current paradigm shift towards more holistic, patient-centered care—focusing not just on correcting lab values but also on improving long-term outcomes and quality of life. With its oral route, physiologic mechanism of action, and potential for better iron handling, vadadustat offers a novel tool in our therapeutic arsenal. This presentation will explore the pathophysiological rationale, key clinical trial data, and practical considerations for integrating vadadustat into CKD anemia management. It will also address remaining challenges, including patient selection, monitoring strategies, and potential future directions. Ultimately, unlocking the full potential of vadadustat requires not only clinical insight but also a commitment to advancing individualized, evidence-based care in nephrology.

Signaling mechanisms in renal compensatory hypertrophy revealed by multi-omics

單側腎切除後腎臟代償增生機轉

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After unilateral nephrectomy, compensatory hypertrophy occurs in the remaining kidney. This phenomenon has significant clinical relevance, but its molecular mechanisms remain unclear. In this study, a unilateral nephrectomy model in male mice was used, combined with multi-omics analyses, to explore the signaling pathways associated with compensatory renal hypertrophy. The results showed that the lipid-activated transcription factor peroxisome proliferator-activated receptor alpha (PPARα) participates in regulating cell size within proximal tubule cells and may be a key factor in promoting compensatory hypertrophy. Using various methods, including ATAC-seq, RNA-seq, quantitative proteomics, and renal lipidomics, it was found that PPARα activity increased within proximal tubules following unilateral nephrectomy. The PPAR family consists of ligand-activated nuclear hormone receptors belonging to the steroid receptor superfamily. Although multi-omics data support the activation of PPARα after unilateral nephrectomy, a direct causal role in the process of cellular hypertrophy could not be immediately established. PPARα was found to be a critical molecule in regulating kidney size and align with the compensatory renal hypertrophy mechanisms revealed by the multi-omics analyses. The findings were also compared and discussed in relation to existing literature.

Chronic kidney disease and dietary management: Regulation of gut microbiota and its impact on disease progression

慢性腎臟病與飲食控制：調節腸道微生物群及其對疾病進展的影響

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The gut microbiome is a complex ecosystem of microorganisms, consisting of a variety of bacteria that can have both beneficial and harmful effects on human health. In recent years, the microbiome has garnered significant attention for its pivotal role in various aspects of health and disease. In the context of chronic kidney disease (CKD), an increase in urea concentration can lead to significant changes in the intestinal microbiota. These alterations can promote the production of gut-derived toxins and impair the intestinal epithelial barrier, both of which contribute to the acceleration of kidney injury. A range of strategies have been proposed to address this pathway and prevent further kidney damage in CKD. The purpose of this session is to summarize the role of the gut microbiome in CKD, tools used to study this microbial population, and attempts to alter its composition for therapeutic purposes.

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治療皮膚病新紀元

A New Era of Medications for Treating Skin Diseases

時　間：114年6月29日　08:00-12:10

Time：June 29, 2025　08:00-12:10

地　點：臺北榮民總醫院 致德樓第三會議室

Place：The Third Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

治療皮膚病新紀元
A New Era of Medications for Treating Skin Diseases

The needs and benefits of Apremilast for patients with psoriasis

歐泰樂於乾癬治療的需求與優勢

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Psoriasis is a common inflammatory dermatosis driven by Th1 and Th17 inflammatory pathways, characterized by well-defined, erythematous scaly plaques. Treatment options include topical medications, phototherapy, immunomodulators, and biologics. For patients with moderate to severe psoriasis, immunomodulators such as methotrexate, cyclosporine, and acitretin are commonly prescribed. However, their use may be limited by the comorbidities, especially due to the potential hepatic and renal toxicity.

Apremilast (Otezla), a phosphodiesterase-4 inhibitor, was recently reimbursed by the National Health Insurance in 2024. In ESTEEM 1&2, apremilast demonstrated a significantly higher PASI-75 and sPGA response compared to placebo. Besides, it has a favorable safety profile and can be used in patients with hepatic or renal insufficiency.

This presentation will review the clinical trials of apremilast, with a focus on efficacy and safety profile. Besides, the application process and requirements for apremilast reimbursement will be discussed.

Advancing treatment approaches in Alopecia Areata: How early therapy improved long-term outcomes?

圓禿治療再進化：早期治療如何改善長期結果？

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Alopecia Areata (AA) is a complex autoimmune disease characterized by hair loss, often leading to significant psychological distress. Recent advancements in treatment approaches have highlighted the importance of early intervention in improving long-term outcomes. This presentation will delve into the updated consensus on treatment algorithms, review subgroup analysis based on severity, and discuss evolving treatment patterns.

The latest consensus on treatment algorithms will be explored, emphasizing the integration of targeted therapies such as Janus kinase (JAK) inhibitors and other immunomodulatory agents. These treatments have shown promising results in clinical trials, offering new hope for patients with AA.

Subgroup analysis based on severity reveals that patients with less severe hair loss at baseline tend to achieve better outcomes compared to those with more extensive hair loss. This data underscores the importance of early treatment, as early intervention can prevent further progression of the disease and enhance treatment efficacy. Personalized treatment plans that consider the extent of alopecia and other prognostic factors are essential.

Furthermore, evolving treatment patterns and the importance of patient communication will be discussed, focusing on establishing a common ground for treatment goals and success. Effective communication strategies can help align patient expectations with clinical outcomes, fostering a collaborative approach to managing AA.

By advancing treatment approaches and emphasizing early therapy, the aim is to improve the quality of care for patients with Alopecia Areata, ensuring better long-term outcomes and enhanced patient satisfaction.

Palmoplantar pustulosis: Latest developments and how brodalumab can help

掌蹠膿疱病：最新進展與 Brodalumab 的治療新希望

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Palmoplantar pustulosis (PPP) is a chronic, relapsing inflammatory skin disorder characterized by recurrent pustules on the palms and soles. While historically grouped with pustular forms of psoriasis, PPP is increasingly recognized as a distinct clinical entity, with differences in genetic background, pathophysiology, and response to treatment.

PPP predominantly affects middle-aged individuals, with a clear female predominance. It is most commonly reported in populations from Japan and Northern Europe, where prevalence rates can be as high as 0.12%. Smoking is the most well-established environmental risk factor, with a majority of patients being current or former smokers. Additional factors, including infections and mechanical trauma, have been implicated as potential triggers. Although the exact pathogenesis remains unclear, growing evidence supports a role for immune dysregulation, particularly involving the interleukin (IL)-23/IL-17 axis. Alterations in the IL-36 pathway and certain genetic mutations, such as those involving the CARD14 gene, have also been identified in some cases.

Clinically, PPP presents with clusters of sterile pustules on an erythematous, scaly base, typically limited to the palms and soles. The lesions are often painful, may fissure, and can significantly impair hand and foot function, affecting quality of life. Diagnosis is usually based on clinical examination but may be supported by histopathology, which typically shows spongiform pustules within the epidermis, along with psoriasiform hyperplasia and a mixed inflammatory infiltrate. The differential diagnosis includes conditions such as dyshidrotic eczema, tinea infections, and palmoplantar psoriasis.

Treatment of PPP remains challenging. Topical therapies, including potent corticosteroids and vitamin D analogs, are often first-line but may be insufficient for moderate-to-severe disease. Phototherapy (narrowband UVB or PUVA) and systemic treatments such as acitretin, methotrexate, or cyclosporine are commonly employed in more refractory cases. However, many patients experience limited or short-lived responses, necessitating alternative therapeutic strategies.

Brodalumab, a fully human monoclonal antibody targeting the IL-17 receptor A, represents an important addition to the treatment armamentarium for PPP. By inhibiting the receptor rather than individual IL-17 cytokines, brodalumab provides broader blockade of the IL-17 signaling pathway. Clinical trials conducted in Japan, including a phase 3 study, have demonstrated its efficacy in reducing disease severity as measured by the Palmoplantar Pustulosis Area and Severity Index (PPPASI). Improvements were seen as early as week 16 and sustained through longer-term follow-up. These results suggest that brodalumab may offer

a valuable option for patients with recalcitrant PPP, particularly those who have not responded to other biologics or systemic agents. Its safety profile is consistent with other biologics targeting the IL-17 pathway, with the most common adverse events including upper respiratory tract infections, arthralgia, and injection site reactions.

In conclusion, palmoplantar pustulosis is a burdensome condition with significant impacts on quality of life. Although treatment has historically been difficult, the introduction of biologic therapies, particularly brodalumab, offers new hope for achieving better disease control. Ongoing research into the disease's underlying mechanisms and additional therapeutic targets will be essential to improving outcomes for patients with this challenging disorder.

Optimizing the patient journey for quality of care in atopic dermatitis

如何優化異位性皮膚炎病人的治療策略

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Atopic Dermatitis (AD) is a chronic skin condition that significantly impacts patients' quality of life. While biologics have revolutionized the treatment landscape, optimizing the patient journey requires a holistic approach that goes beyond biologics. This presentation will explore strategies to enhance treatment outcomes, focusing on flexibility and long-term maintenance.

The role of Janus kinase inhibitors (JAKi) in the treatment of AD will be highlighted, emphasizing their potential to provide targeted and effective therapy. JAK inhibitors have shown promising results in clinical trials, offering a new avenue for patients who may not respond adequately to traditional biologic treatments. These therapies provide flexibility in managing AD, allowing for tailored approaches based on individual patient needs and preferences.

Addressing common issues like long-term maintenance is crucial for sustained improvement in AD management. Strategies for maintaining treatment efficacy over time, including patient education, adherence support, and regular monitoring, will be delved into. Emphasizing the role of lifestyle modifications, such as skincare routines, environmental adjustments, and stress management, will also be highlighted.

By optimizing treatment strategies and addressing key challenges, the aim is to improve the overall quality of care for patients with Atopic Dermatitis, ensuring they can lead healthier and more fulfilling lives.

New era and new focus, we should aim for higher treatment goal in Atopic Dermatitis

新時代下的挑戰：追求更高的異位性皮膚炎治療目標

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Atopic Dermatitis (AD) is a prevalent, chronic inflammatory skin condition with a substantial impact on patients' quality of life and healthcare systems globally. Characterized by intense itching and recurrent eczematous lesions, AD profoundly affects physical and psychological well-being, leading to impaired sleep, increased infection risk, and psychosocial stress.

Traditional treatment approaches for AD have largely focused on alleviating symptoms and preventing flares primarily through emollients, topical corticosteroids, and calcineurin inhibitors. While these provide temporary relief, they often do not achieve long-term disease control or address underlying immune dysregulation. Recent therapeutic advancements, such as biologics and Janus kinase (JAK) inhibitors, target specific pathogenic pathways, presenting opportunities to set more ambitious treatment goals.

Minimal disease activity (MDA) has emerged as an optimal treat-to-target strategy for AD. MDA is defined as a state of controlled disease activity that minimizes the condition's impact on daily living. This strategy reflects similar successful practices in managing other chronic inflammatory diseases like rheumatoid arthritis and psoriasis, where achieving low disease activity or remission improves long-term outcomes.

Implementation of MDA in AD involves setting personalized treatment goals and utilizing standardized assessment tools like the Eczema Area and Severity Index (EASI) and Patient-Oriented Eczema Measure (POEM). Internationally, MDA is gaining recognition as a viable strategy to enhance patient care. However, challenges include standardizing MDA criteria and ensuring access to advanced therapies across diverse healthcare settings. Future research should focus on longitudinal validation of MDA's impact on long-term outcomes and explore predictive biomarkers for treatment response.

In summary, aiming for higher treatment goals in AD, through the implementation of minimal disease activity as a treat-to-target strategy, represents a significant paradigm shift. By adopting this approach, healthcare providers can better address the complex needs of AD patients, ultimately improving quality of life and reducing the condition's overall burden.

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骨質疏鬆症的臨床新進展

Clinical Update on Osteoporosis

時　間：114年6月29日　08:30-12:00

Time：June 29, 2025　08:30-12:00

地　點：臺北榮民總醫院 致德樓第四會議室

Place：The Fourth Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

骨質疏鬆症的臨床新進展
Clinical Update on Osteoporosis

VeriOsteo : Application of artificial intelligence in osteoporosis screening

【智骨篩】: 人工智慧於骨鬆篩檢之應用

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Introduction: Osteoporosis screening is crucial for identifying individuals at risk of fractures. Dual-energy X-ray absorptiometry is the current gold standard for osteoporosis diagnosis. However, a significant portion of the population remains undiagnosed, highlighting the need for improved screening strategies.

Meterials and Methods: We utilize deep learning techniques to develop a model that analyzes chest X-ray (CXR) images for osteoporosis screening. Total 5122 paired CXR images and DXA reports was collected, enhanced and filtered in target level of T12 and L1. The dataset was separated into training, validating, and testing datasets. The first AI model assess the BMD from T12/L1 was developed. The second chozen DenseNet-121 model processes ROI image to estimate the final predicted BMD.

Results: In the clinical validation stage, we collected 440 paired CXR images and DXA reports from two different institutes. The validation showed an AUC of 0.946. Pearson's correlation coefficient was 0.88. The model demonstrated an overall accuracy/sensitivity/specificity of 89.0%/88.7%/89.4% respectively.

Discussion: Study on vertebral body fractures analysis X-ray images from these regions are not widely available. In comparison, our AI model correlated well with the gold standard DXA-BMD with good performance to screen for saBMD. Furthermore, in our clinical validation, when compared with similar AI models that analyze CXRs to predict lumbar BMD for the screening of osteoporosis, with high correlation.

Conclusion: Study on vertebral fractures analysis CXR are not widely available. Our AI model correlated well with gold standard DXA-BMD with good performance to screening osteoporosis. In the post-hoc study, this model still showed good usability clinically.

Unmet need in osteoporosis management in Taiwan

台灣骨質疏鬆症醫療處置未被滿足之需求

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The prevalence of osteoporosis (with or without fracture) is undoubtedly increasing with increasing age in Taiwan and worldwide. In 2050, the incidence of hip fracture will double in the so-called era of osteoporosis tsunami in the Asia–Pacific region. According to the HPA census of the elderly population in 1999, osteoporosis is one of the top 5 diseases among elderly people, especially women. However, the real-world diagnostic records and medication usage in the NHIRD are always far from the actual epidemiological reports. What are the reasons for these GAPs, and what is the unmet need for the prevention and management of osteoporosis in Taiwan? What is the useful strategy or most urgent step from patients, health professionals and health policy perspectives? What is the practical program for osteoporosis care in Taiwan? Given the inevitable status of the aged society in Taiwan, several issues with corresponding recommendations for osteoporosis are discussed.

1. The real-world prevalence of osteoporosis is still underestimated. A nationwide screening for osteoporosis in high-risk groups or elderly people is needed. The use of OSTAi and MOSTAi as the preliminary screening strategy, followed by DXA with FRAX calculation, is recommended.
2. The evaluation of fall risk and the emerging issue of sarcopenia are both important in fracture prevention. The routine screening of frailty and awareness of sarcopenia are recommended during both fracture admission and community screening.
3. The reimbursement of osteoporosis and fracture medication is still not satisfactory and is far from the international standard. MegaData analysis, cost–benefit studies and life-quality research are encouraged for elucidating the high CP value in the treatment of osteoporosis.
4. Male osteoporosis is also an important topic for further study. The AP consensus presents the acronym “STOP FRACTURE” to outline key topics, ranging from prevention and diagnosis to treatment, and long-term follow-up was proposed in 2024.
5. Prevention is better than a cure. In addition to secondary prevention, primary prevention is a top priority in the long-term management of osteoporosis. Fracture liaison service (FLS) has been well established in many hospitals and even clinics in Taiwan. How to upgrade and maintain the program of the FLS smoothly is a challenge. A reasonable reimbursement from the NHI is recommended but is an endless story in the near future.
6. Osteoporosis is a life-long chronic disease. Pharmacological management with sequential and long-term strategies is recommended. The rarely rare adverse events (ONJ, AFF) should be watched but not be overconcerned. More local studies and expert consensuses are needed to provide practical decisions in the clinical pathway.

Osteoporosis evaluation and management in the spine surgery

脊椎手術骨質疏鬆症的評估與處理

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Optimization of co-morbid conditions is commonly performed preoperatively to reduce adverse events and improve surgical outcomes. Osteoporosis is common and under-recognized among spine surgery patients. Poor bone health has been linked to worse outcomes and complications with pedicle screws loosening (PSL) or cage subsidence (CS) after spine surgery. Dual energy x-ray absorptiometry (DXA) examination is the gold standard diagnostic tool to evaluate the systemic bone quality. However, spur formation, degenerative scoliosis and instrumentation at lumbar spines may result in false negative in DXA examination. Moreover, 40% discordance between hip and spine DXA has been investigated.

In clinical practice, CT attenuation represents in Hounsfield Unit (HU) is a standardized format of the resultant image with the refences of Water at 0 HU Air at -1000 HU and Bone ranging from 100 to 1000 HU, respectively. Due to strong correlation between DXA-based T score and CT-based HU value, the CT-based HU value may be a more reliable parameter to represent local bone quality for spine instrumentation index levels. Our study group published several parameters such as smoking, overweight (BMI $\geqq$ 25), L1 HU <117, index pedicle tract HU < 120, and psoas-lumbar vertebral index (PLVI) < 0.85 were strongly associated with PSL or CS in lumbar instrumented fusion surgery. Regarding fixation in the osteoporotic spine (DXA T score less than -2.5), two common methods were clinically used such as polymethylmethacrylate (PMMA)-augmented fixation and hybrid fixation with screws and hook systems, which may provide stronger pullout strength to enhance pedicle screws fixation biomechanically.

In addition to enhance pullout strength, preoperative and postoperative bone health optimization with osteoporosis drugs is warranted to enhance patients' reported outcomes postoperatively. Bone health assessment and optimization are important for decreasing surgical risks and improving outcomes in spine surgery patients.

Approaches to bone health in the patient with breast cancer

乳癌病患之骨骼健康議題

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Breast cancer and its treatments can significantly impact bone health, leading to increased fracture risk and diminished quality of life. This abstract reviews current approaches to maintaining and improving bone health in patients with breast cancer. These approaches encompass risk assessment, lifestyle modifications, pharmacological interventions, and monitoring strategies. Risk assessment involves identifying patients at high risk of bone loss through clinical evaluation and bone mineral density (BMD) measurements. Lifestyle modifications, including adequate calcium and vitamin D intake, regular weight-bearing exercise, and avoidance of smoking and excessive alcohol consumption, are essential components of bone health management. Pharmacological interventions, such as bisphosphonates, denosumab, and selective estrogen receptor modulators (SERMs), play a crucial role in preventing and treating bone loss. The selection of appropriate therapy is guided by individual patient risk factors, treatment history, and potential side effects. Regular monitoring of BMD and bone turnover markers is recommended to assess treatment efficacy and detect early signs of bone loss. A multidisciplinary approach, involving oncologists, endocrinologists, and other healthcare professionals, is crucial for optimizing bone health outcomes in patients with breast cancer.

Osteoporosis treatment in steps and complication management

骨鬆接續治療與併發症處置

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Osteoporosis is a chronic, progressive disease characterized by decreased bone mineral density and structural deterioration, leading to an increased risk of fractures. Recent advancements in osteoporosis management highlight the importance of sequential treatment strategies to optimize bone health and minimize complications. Transitioning between therapeutic agents, particularly from anabolic to antiresorptive therapies, plays a critical role in maintaining long-term bone strength. Studies indicate that sequential therapy—such as initiating treatment with anabolic agents like teriparatide or romosozumab, followed by bisphosphonates or denosumab—more effectively preserves bone density and reduces fracture risk compared to monotherapy or treatment interruption.

One of the major challenges in osteoporosis management is addressing complications associated with long-term medication use. Discontinuing denosumab without subsequent antiresorptive therapy significantly increases vertebral fracture risk, underscoring the need for a well-structured treatment plan. Additionally, concerns about medication-related complications, particularly osteonecrosis of the jaw (ONJ), have led to ongoing discussions regarding the optimal duration of bisphosphonate therapy and drug holidays. Recent studies suggest that treatment decisions should be guided by patient-specific factors such as age, fracture history, and comorbidities to minimize risks while ensuring continued fracture prevention.

As treatment strategies evolve, personalized approaches incorporating sequential therapy and risk-based complication management are gaining traction. Emerging therapies, including novel bone-forming agents and combination treatments, present new opportunities for improving long-term outcomes. Future research should focus on optimizing treatment sequencing, refining transition strategies, and identifying biomarkers that predict individual treatment responses to further enhance osteoporosis management and patient care.

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核醫診療一體化的應用

Application of Nuclear Medicine Theranostics

時　間：114年6月28日　08:20-12:00

Time：June 28, 2025　08:20-12:00

地　點：臺北榮民總醫院 致德樓第六、七會議室

Place：The Conference Room 6&7, Chih-Teh Building
Taipei Veterans General Hospital

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第二屆脊柱側彎關懷：
治療，手術安全與研究創新

Scoliosis 2025: Treatment, Safety, Innovation

時　間：114年6月29日　08:30-13:30

Time：June 29, 2025　08:30-13:30

地　點：臺北榮民總醫院 致德樓第十會議室

Place：The Tenth Conference Room, Chih-Teh Building
Taipei Veterans General Hospital

第二屆脊柱側彎關懷：治療，手術安全與研究創新

Scoliosis 2025: Treatment, Safety, Innovation

Design the staged correction in adult deformity surgery

成人脊柱側彎階段性矯正手術的設計

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Two-stage surgeries are increasingly used to minimize complications in adult spinal deformity (ASD) correction, yet the specific contributions of lateral lumbar interbody fusion (LLIF) and posterior column osteotomy/posterior spinal fusion (PCO/PSF) remain underexplored. This study evaluates their roles in deformity correction and establishes predictive thresholds for optimizing surgical planning. A total of 151 ASD patients (mean age 69.5 years) underwent staged LLIF and PCO/PSF surgeries one week apart. Radiographic parameters were analyzed preoperatively, post-LLIF, post-PCO/PSF, and at two-year follow-up. Correction rates were 80.9% for PI-LL mismatch (35.5% LLIF, 64.5% PCO/PSF), 40.5% for pelvic tilt (39.4% LLIF, 60.6% PCO/PSF), and 69.1% for C7 SVA (45.7% LLIF, 54.3% PCO/PSF). Coronal correction of the Cobb angle reached 76.7% (33.1% LLIF, 66.9% PCO/PSF). Significant ODI and SRS-22 score improvements were noted at two years. Predictive thresholds for imbalance were M-SVA 75.3 mm, M-PI-LL 32.5°, and M-PT 35.5°. The 2nd stage PCO/PSF contributes more to correction, and predictive thresholds aid surgical planning, reducing postoperative imbalance for better outcomes.

Advances in adolescent idiopathic scoliosis management

青少年特發性脊柱側彎治療的進展：美國科羅拉多兒童醫院的經驗

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Adolescent idiopathic scoliosis (AIS) management has significantly evolved in recent years, incorporating innovative approaches designed to enhance outcomes while reducing invasiveness and maintaining spinal mobility.

This presentation will introduce cutting-edge advancements in AIS treatment based on my observations and experiences at Children's Hospital Colorado, a leading pediatric spinal deformity care center. The talk will concentrate on three major innovations: **1.** predictive modeling using machine learning algorithms that enhance our ability to predict curve progression and optimize treatment timing; **2.** non-fusion techniques, including anterior Vertebral Body Tethering (VBT), which preserve growth and mobility while effectively managing progressive curves; and **3.** robotic-assisted surgical techniques that improve the precision of instrumentation placement while potentially reducing complications and recovery time.

I will discuss the ongoing challenges in implementing these technologies, including patient selection criteria, tips, and pitfalls. The integration of these advances presents promising pathways toward more personalized and less invasive care for AIS, potentially transforming the standard of care for this significant spinal condition.

My learning journey in early onset scoliosis surgery

早發性脊椎側彎手術治療經驗

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吳冠文

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臺大醫院 骨科部

Early-onset scoliosis (EOS) covers a diverse, heterogeneous range of spinal and chest wall deformities that affect children under 10 years old. With the advent of new biological therapies, clear advances have been made in understanding EOS's natural history, progression, and long-term consequences. In the same way, during the past few decades, technological innovations have also increased the treatment alternatives for EOS patients.

The foci of treatments for EOS have included creating a well-developed thoracic cavity, improving lung volume, and improving pulmonary function. Conservative treatments include bracing, casting, halo-gravity traction, and physiotherapy. Serial casting is the most effective conservative treatment for EOS, but has specific limitations. Surgical treatments mainly include growth-friendly techniques, which are generally classified into three types according to the amount of correction force applied: distraction-based, compression-based, and growth-guided. The distraction-based systems include traditional or conventional growing rods, magnetically controlled growing rods, and vertical expandable prosthesis titanium ribs For EOS patients presenting with sharp deformities in a long, congenital spinal deformity, a hybrid technique, one-stage posterior osteotomy with short segmental fusion and dual growing rods, may be a good choice.

Although the patient's growth potential is preserved in growth-friendly surgeries, a high complication rate should be expected, as well as a prolonged treatment duration and additional costs. In addition, surgical techniques may vary depending on the patients' characteristics, the surgeon's experience, and the actual state of the different country. The lecture included my journey of learning about EOS treatment, including the surgical outcomes, painful experience and management of complications.

Application of structured light combined with deep learning for predicting Cobb angles

結構光技術加上深度學習對於側彎角度量測的運用

Pei-Yu Su, Cheng-Yang Liu

蘇珮瑜 劉承揚

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Idiopathic scoliosis is a common spinal deformity in adolescents, though its etiology remains unclear. It causes lateral spine deviation in the coronal plane, accompanied by vertebral rotation, resulting in a three-dimensional curvature. Additionally, kyphosis refers to the forward curvature of the spine in the sagittal plane, and when its normal physiological curvature is lost, it is termed hyperkyphosis. Both conditions can have a significant impact on the physical function and quality of life, making early diagnosis crucial. Current diagnostic methods include scoliosis measurement devices and X-ray imaging. While the former is fast but lacks accuracy, the latter remains the clinical standard despite its radiation exposure.

To overcome the limitations of traditional methods, this study integrates structured light technology with deep learning for 3D contour measurement and Cobb angle prediction. The system projects a structured light pattern onto the subject's surface, captures the deformed stripe images using a camera, and reconstructs a high-precision 3D model based on triangulation principles. The reconstructed data is then analyzed using a custom attention-based neural network for feature extraction and angle regression. This study was conducted in collaboration with the Department of Orthopedics at Taipei Veterans General Hospital, with Dr. Feng leading the clinical trial, recruiting 180 eligible participants.

Experimental results show that for sagittal plane angle prediction, the system achieves a mean absolute error of 2.2° for kyphotic Cobb angles and 1.7° for lordotic Cobb angles, meeting clinical acceptance criteria. The proposed system provides an objective assessment of spinal morphology, assisting clinicians in diagnosis and follow-up, reducing the need for radiographic examinations, minimizing radiation exposure, and improving diagnostic efficiency and accuracy.

Towards generalizable cobb angle measurement: Evaluating a deep learning model across multiple datasets

邁向可泛化的 Cobb 角測量：深度學習模型於跨資料集的驗證與評估

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呂芷儀 謝依芸

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國立臺灣大學 土木工程系 電腦輔助工程組

Scoliosis is a common spinal deformity that can impede adolescent growth. Clinicians assess scoliosis using the Cobb angle, measured from anterior-posterior X-ray images, by drawing lines along the endplates of the most inclined vertebrae. However, this manual process is subjective and can lead to 5 to 10-degree discrepancies due to challenges in vertebra identification and low image contrast. Automating Cobb angle estimation is essential for improving reliability and efficiency while reducing subjectivity. However, existing deep learning models are often trained on localized datasets, limiting their generalizability. Ensuring robust performance across diverse datasets is crucial for real-world clinical applications.

This study integrates YOLOv8 for vertebral detection and Segment Anything Model 2 (SAM2) for precise segmentation. YOLOv8 detects vertebral regions via bounding box prompts, refined by SAM2 to generate segmentation masks. The masks are fitted to the minimum bounding rectangles to locate vertebral corner points, enabling Cobb angle calculation. To evaluate cross-dataset generalizability, the model is trained on 70% of the Taipei Veterans General Hospital (TVGH) dataset, validated on 20%, and tested on the remaining 10% along with the London Health Sciences Centre (LHSC) dataset. No LHSC data is used in training, ensuring an unbiased assessment.

Results show a mean absolute error of 3.7 degrees on TVGH and 4.91 degrees on LHSC, both within the clinically acceptable 5-degree margin. The model's ability to maintain accuracy across datasets with varying image quality underscores its robustness for real-world use. Future research will further validate cross-dataset performance, enhance adaptability to different imaging conditions, and explore domain adaptation and zero-shot learning for improved model transferability in medical applications.

Intraoperative Neurophysiological Monitoring (IONM) in scoliosis correction surgery：A clinical perspective

術中監測在脊椎側彎手術中的實務應用

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Although relatively infrequent, neurological injury may occur in spinal surgery and result in serious postoperative neurological deficits. IONM for spinal surgery has been developed since the1970s to avert these neurological complications.

A range of neuromonitoring modalities is used to improve assessment of nervous system integrity. These include somatosensory evoked potential (SSEP), transcranial motor evoked potential (Tc MEP), free-run EMG and triggered EMG (t EMG). The SSEP and Tc MEP help monitor sensory and motor pathways to guard spinal cord function. Triggered EMG is used to assess proper pedicle screw placement, and free-run EMG provides immediate real-time information on specific spinal roots, and neurotonic discharge occurs secondary to nerve root irritation.

In recent years IONM has become a standard modality used almost universally to improve the safety of scoliosis correction surgery. To ensure patient safety, neuromonitoring services should be provided by a collaborative team including the surgeon, anesthesiologist, and an IONM technologist or neurophysiologist.

In this presentation, we will discuss the application of multimodal IONM to patients undergoing scoliosis correction surgery and share our clinical experience over the past years.

Neuromonitoring technique and practice

神經監測技術與實作

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春杏醫療儀器有限公司

Practical IONM practice in this session. We will discuss patient preoperative preparation, instrument and cable connection, Signal baseline establishment, anesthesia conditions related to neuromonitoring, interpretation of signal changes during surgery and how to trouble shoot abnormal signal.

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眼科的先驅進展與未來前沿

Pioneering Advances and Future Frontiers in Ophthalmology

時　間：114年6月29日　08:00~12:00

Time：June 29, 2025　08:00~12:00

地　點：臺北榮民總醫院 醫學科技大樓一樓會議室

Place：Medical Science and Technology Building
Taipei Veterans General Hospital

眼科的先驅進展與未來前沿

Pioneering Advances and Future Frontiers in Ophthalmology

Gauging the Large Language Model (LLM) readiness in medical tasks

程評估大語言模型在醫療任務的應用性

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臺北榮民總醫院 眼科部

The digitalization of medical information, coupled with the rapid advancements in Multimodal Large Language Models (MLLMs), has led to growing interest in their application to medical tasks. However, as the initial AI hype begins to subside, researchers are critically reassessing whether these models are truly ready for integration into high-stakes healthcare environments. By sharing our first-hand experience in docking MLLMs toward a broad range (general medical QA, surgical decision support) and in depth medical tasks (establish automated radiology report generation), the speaker would walk through the technical objectives, application gaps and future projection of human-computer collaboration between MLLM models and next generation physicians.

First human results with the 256 channel Intelligent Micro Implant Eye (IMIE 256)

Mark S Humayun

USC Ginsburg Institute for Biomedical Therapeutics, USA

USC Roski Eye Institute, USA

Background: To report on the safety and efficacy of the 256-channel Intelligent Micro Implant Eye epiretinal prosthesis system (IMIE 256).

Methods: The IMIE 256 implants were implanted in the right eyes of five subjects with end-stage retinitis pigmentosa. Following implantation, the subjects underwent visual rehabilitation training for 90 days, and their visual performance was evaluated using the grating visual acuity test, Tumbling E visual acuity test, direction of motion, square localization, and orientation and mobility test. To evaluate the safety of the IMIE 256, all adverse events were recorded.

Results: Subjects performed significantly better on all evaluations with the IMIE 256 system on as compared with the performance at baseline or with the system off. There was a steady improvement in performance at each observation interval, indicating that the training and/or practice helped the subjects use the IMIE 256. There were two serious adverse events—electrode array movement and low intraocular pressure in one subject, which resolved with surgery. There were no other adverse events observed except those expected in the course of postoperative healing.

Conclusion: These results show an improved safety and efficacy profile compared with that of the Argus II implant. Further clinical trials are needed to confirm these results in a larger number of subjects and over longer durations

Paradigm shift in retinitis pigmentosa

Hossein Ameri
Keck School of Medicine of USC, USA
USC Retinal Degeneration Center, USA

Retinitis Pigmentosa (RP) is the most common inherited retinal disease, initially presenting with night vision difficulties, followed by progressive peripheral vision loss and eventual central vision impairment. Cystoid macular edema and cataracts further contribute to vision decline. While characteristic fundus findings include bone spicule pigmentation, vascular attenuation, and optic disc pallor, early-stage RP may exhibit a normal retinal appearance.

Traditionally, RP diagnosis relied on clinical examination, electroretinography (ERG), and family history to determine inheritance patterns—autosomal recessive, autosomal dominant, or X-linked. However, variations in genetic mutations can lead to diverse disease courses, even within the same inheritance category. Treatment options were historically limited, with studies suggesting potential benefits of Vitamin A, though recent reanalysis has invalidated these findings, leading to its discontinuation as a recommended therapy.

Advancements in imaging, including ultra-wide-field fundus photography and fundus autofluorescence, now enable early and more precise RP detection. A key finding in RP is the symmetrical loss of peripheral retinal vessels, which serves as a reliable diagnostic marker. Genetic testing has transformed RP diagnosis by identifying causative mutations in approximately 50% of cases and aiding in prognosis.

Recent breakthroughs in RP management include gene therapy for RPE65-mediated RP and retinal prostheses, though the latter is no longer commercially available. Ongoing gene therapy trials aim to target both specific mutations and broader, gene-agnostic approaches. Additionally, stem cell transplantation and oral medications, such as the NAC Attack trial investigating N-acetylcysteine (NAC), offer new treatment avenues. Future prospects include Natural History studies to refine disease understanding, potential approval of RPGR-targeted gene therapy in 2025 or 2026, and emerging therapies like optogenetics, modifier gene therapy, and next-generation retinal prostheses. These advancements mark a paradigm shift in RP diagnosis and treatment.

Exploring inherited retinal diseases through genomics and poly-omics technologies

透過基因與多體學技術探索遺傳性視網膜疾病

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臺大醫學院 醫學系 眼科

臺大醫院 尖端醫療發展中心

Inherited retinal diseases (IRD) encompasses a group of monogenic disorders that lead to the progressive dysfunction of rod and cone photoreceptors, ultimately resulting in blindness. Affecting over 2 million individuals worldwide, more than 300 genes have now been implicated in IRD, making molecular diagnosis essential for clinical management and for determining eligibility for participation in gene therapy trials.

With advancements in next-generation sequencing (NGS) technologies, a variety of genetic testing methods are now accessible for IRD diagnosis. Although the genetic basis is fixed, the progression of IRD remains dynamic. In an era where precise genetic diagnosis has become more achievable, a critical question arises: How can we effectively monitor disease progression in IRD patients to enhance their chances of benefiting from emerging therapies?

In this short talk, I would like to share the experience we found about current evidence surrounding the prediction of therapeutic windows for individual patients, taking genetic, phenotypic, and surgical factors into account. Additionally, we have integrated metabolomics—a comprehensive analysis of biochemical products—demonstrating that common IRD conditions can be distinguished based on unique metabolite heatmaps. Lastly, we would like to share some clinical experience from gene-specific therapies and trials. Hopefully, patients of this field could get more chance in restoring vision in the near future.

Biomedical microimplants for ophthalmology

眼科用生物醫學微型植入物

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戴聿昌

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加州理工學院

The field of microdevices, specifically Micro/Nano-Electro-Mechanical Systems (MEMS/NEMS), has advanced tremendously for the last 30 years. Most noticeably, however, the field has mostly advanced in microsensors such as pressure sensors, accelerometers, gyros, microphones for cell phone and smart instrumentation applications. Looking forward though, one promising direction for microdevices is for biomedical applications. Specifically, the new and exciting possibility are “microimplants for ophthalmology or eye diseases,” which are small devices to be put on or inside eyes to interface with and/or replace defective intraocular tissues that are important for eye functions. However, the optics of a human eye involves many parts and hundreds of million cells so many diseases can blind an eye. Specifically, according to WHO, four major eye diseases cause ~80% of world blindness, and they are cataract, glaucoma, retinitis pigmentosa (RP)/age-related macular disease (AMD), and diabetic retinopathy. This work reviews the author’s research on microimplant research on these four diseases. Covered in this talk will be microdevices including accommodative intraocular liquid lens (aIOLL for Cataract), implantable pressure sensor for continuous monitoring of intraocular pressure (IOP for Glaucoma), retinal prosthetic implant for partial vision recovery (for RP/AMD), and oxygen-transporting implant (for Diabetic Retinopathy). Details of materials, technology, principles, and preliminary results on these devices will be discussed.

Studying Retina Using Fluorescence Lifetime Imaging Microscopy

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Keck School of Medicine of USC, USA
USC Retinal Degeneration Center, USA

Fluorescence lifetime imaging microscopy (FLIM) has emerged as a powerful technique for studying tissue metabolism and structure at a cellular level. By measuring the fluorescence lifetimes of nicotinamide adenine dinucleotide (NAD(P)H) and flavin adenine dinucleotide (FAD), FLIM enables the assessment of metabolic states, providing insight into oxidative phosphorylation and glycolysis. In addition to metabolic activity, FLIM is also useful for studying retinal structure. This talk will explore recent advancements in FLIM for retinal imaging, highlighting key findings from studies on both healthy and diseased retinas.

Studies using multiphoton FLIM in wild-type (C57BL6/J) and rd10 mice have demonstrated significant metabolic differences during retinal development. In both strains, oxidative phosphorylation initially decreases and later increases, plateauing over time. However, this transition occurs earlier in rd10 mice, suggesting an accelerated metabolic shift associated with retinal degeneration. Additionally, FLIM analysis has revealed a distinct metabolic distribution between the inner and outer retina, with oxidative phosphorylation being more pronounced in the inner layers.

Beyond animal models, FLIM was also applied to postmortem human retinal tissue. A study on a patient with Stargardt disease demonstrated that the macular area had more oxidative phosphorylation relative to the mid-peripheral retina. These findings underscore the potential of FLIM in assessing disease progression and evaluating therapeutic outcomes.

Through these studies, FLIM has proven invaluable for investigating retinal structure, metabolism, and disease mechanisms. This presentation will discuss the role of FLIM in advancing our understanding of retinal disorders and its implications for the development of targeted treatments.

Cell reprogramming and iPS technology in retinal diseases

細胞重新程和 iPS 技術在視網膜疾病之開發應用

Shih-Hwa Chiou

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國立陽明交通大學 藥理學研究所 及 臺北榮民總醫院 醫學研究部

In recent years, due to advances in regenerative medicine and stem cell technology, as well as the use of health big data, cell therapy has broken through the barriers and bottlenecks in the treatment of many diseases and physiological research in the past, creating various possibilities for personalized precision medicine, and has become the focus of global medical competition. It is also a key policy direction for the government to promote innovative medical care in Taiwan.

The Ministry of Health and Welfare of the Executive Yuan promulgated the " Measures for the Administration of the Implementation or Use of Specific Medical Technical Inspection Instruments " (referred to as the Special management method) in 107, and formulated a draft of the " Regulations on the Administration of Regenerative Medicine Preparations " to promote Taiwan's regenerative medicine industry and emerging organisms. The basis for technological development. In recent years, Taiwan and Japan have been promoting economic structural reforms and industrial innovation measures. It is hoped that this exchange of Taiwanese clinical trials will help Japan's successful experience in implementing the regenerative medicine industry and provide more complete domestic regenerative medicine products. Benefit the domestic public.

In the future, multi-center and cross-field clinical treatment can be carried out in Taiwan, which is expected to improve the treatment level for Taiwan's stem cell industry.

Long-term follow-up of a phase 1/2a clinical trial of a stem cell-derived bioengineered retinal pigment epithelium implant for geographic atrophy

Mark S Humayun

USC Ginsburg Institute for Biomedical Therapeutics, USA

USC Roski Eye Institute, USA

Purpose: To report long-term results from a phase 1/2a clinical trial assessment of a scaffold-based human embryonic stem cell-derived retinal pigmented epithelium (RPE) implant in patients with advanced geographic atrophy (GA).

Design: A single-arm, open-label phase 1/2a clinical trial approved by the United States Food and Drug Administration.

Participants: Patients were 69-85 years of age at the time of enrollment and were legally blind in the treated eye (best-corrected visual acuity [BCVA], ≤ 20/200) as a result of GA involving the fovea.

Methods: The clinical trial enrolled 16 patients, 15 of whom underwent implantation successfully. The implant was administered to the worse-seeing eye with the use of a custom subretinal insertion device. The companion nonimplanted eye served as the control. The primary endpoint was at 1 year; thereafter, patients were followed up at least yearly.

Main outcome measures: Safety was the primary endpoint of the study. The occurrence and frequency of adverse events (AEs) were determined by scheduled eye examinations, including measurement of BCVA and intraocular pressure and multimodal imaging. Serum antibody titers were collected to monitor systemic humoral immune responses to the implanted cells.

Results: At a median follow-up of 3 years, fundus photography revealed no migration of the implant. No unanticipated, severe, implant-related AEs occurred, and the most common anticipated severe AE (severe retinal hemorrhage) was eliminated in the second cohort (9 patients) through improved intraoperative hemostasis. Nonsevere, transient retinal hemorrhages were noted either during or after surgery in all patients as anticipated for a subretinal surgical procedure. Throughout the median 3-year follow-up, results show that implanted eyes were more likely to improve by > 5 letters of BCVA and were less likely to worsen by > 5 letters compared with nonimplanted eyes.

Conclusions: This report details the long-term follow-up of patients with GA to receive a scaffold-based stem cell-derived bioengineered RPE implant. Results show that the implant, at a median 3-year follow-up, is safe and well tolerated in patients with advanced dry age-related macular degeneration. The safety profile, along with the early indication of efficacy, warrants further clinical evaluation of this novel approach for the treatment of GA.

「醫學研究論文獎」及
「盧致德院長獎」論文摘要

「盧致德院長獎」
(從刊登於中華醫學會雜誌上的全部論文中，選出被引用
20 次以上的作者，並以其中最多次者頒發盧致德院長獎)

「醫學研究論文獎」及「盧致德院長獎」論文摘要

1 財團法人中華醫學研究獎助基金會
Machine-learning models are superior to severity scoring systems for the prediction of the mortality of critically ill patients in a tertiary medical center ..... 臺北榮總 重症醫學部 周睿信醫師

2 財團法人消化醫學研究發展基金會
Risk factors associated with hepatitis D virus infection and preventive strategies in Mongolia ..... 臺北榮總 一般內科 蘇建維醫師

3 財團法人兼善醫學基金會
Outcomes of the Nuss procedure in children with pectus excavatum: 14 years of experience ..... 三總 小兒外科 朱志純醫師

4 財團法人心臟醫學研究發展基金會
Major adverse cardiovascular events of vascular endothelial growth factor tyrosine kinase inhibitors among patients with different malignancy: A systemic review and network meta-analysis ..... 北醫 心臟內科 陳彥舟醫師

5 財團法人泌尿外科醫學研究發展基金會
Hirsutella sinensis intensifies testicular function and spermatogenesis in male mice with high-fat diet-induced obesity ..... 輔仁大學 營養科學系 劉沁瑜教授

6 財團法人思源內科醫學研究發展基金會
Assessment of iodine nutritional status and gestational thyroid function reference ranges during the first trimester of pregnancy in Taiwan ..... 臺北榮總 新陳代謝科 蘇冠仔醫師

7 財團法人吳舜文神經科學發展基金會
TBK1 p.Y153Qfs*9 variant may be associated with young-onset, rapidly progressive amyotrophic lateral sclerosis through a haploinsufficiency mechanism.... 臺北榮總 神經內科 方士毓醫師

8 財團法人台灣癌症臨床研究發展基金會
Analyzing risk factors and developing a stratification system for hepatocellular carcinoma recurrence after interferon-free direct-acting antiviral therapy in chronic hepatitis C patients..... 臺北榮總 胃腸肝膽科 欒志軒醫師

9 財團法人李美蓉癌症醫學研究基金會
Advanced hepatocellular carcinoma with major portal vein invasion: Therapeutic outcomes of hepatic arterial infusion chemotherapy vs concurrent radiotherapy ... 高雄榮總 放射線部 江佳陵醫師

10 財團法人中華醫學研究獎助基金會盧致德院長獎
Clinical manifestation and disease progression in COVID-19 infection ..... 臺北榮總 醫研部 蔡秉興博士

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Machine-learning models are superior to severity scoring systems for the prediction of the mortality of critically ill patients in a tertiary medical center

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Abstract

Background. Intensive care unit (ICU) mortality prediction helps to guide therapeutic decision making for critically ill patients. Several scoring systems based on statistical techniques have been developed for this purpose. In this study, we developed a machine-learning model to predict patient mortality in the very early stage of ICU admission.

Methods. This study was performed with data from all patients admitted to the intensive care units of a tertiary medical center in Taiwan from 2009 to 2018. The patients' comorbidities, co-medications, vital signs, and laboratory data on the day of ICU admis- sion were obtained from electronic medical records. We constructed random forest and extreme gradient boosting (XGBoost) models to predict ICU mortality, and compared their performance with that of traditional scoring systems.

Results. Data from 12,377 patients was allocated to training (n = 9901) and testing (n = 2476) datasets. The median patient age was 70.0 years; 9210 (74.41%) patients were under mechanical ventilation in the ICU. The areas under receiver operating char- acteristic curves for the random forest and XGBoost models (0.876 and 0.880, respectively) were larger than those for the Acute Physiology and Chronic Health Evaluation II score (0.738), Sequential Organ Failure Assessment score (0.747), and Simplified Acute Physiology Score II (0.743). The fraction of inspired oxygen on ICU admission was the most important predictive feature across all models.

Conclusion. The XGBoost model most accurately predicted ICU mortality and was superior to traditional scoring systems. Our results highlight the utility of machine learning for ICU mortality prediction in the Asian population.

Keywords. Intensive care units; Machine learning; Mortality

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Risk factors associated with hepatitis D virus infection and preventive strategies in Mongolia

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Abstract

Background. Hepatitis D virus (HDV) infection is highly prevalent in Mongolia. We aimed to identify the risk factors associated with HDV infection, propose preventive strategies, and evaluate the outcomes of a 3-year collaborative project between Taiwan and Mongolia.

Methods. In 2016 and 2018, we conducted onsite visits to Mongolia. Mongolian investigators collected questionnaires focus- ing on risk factors, demographic characteristics, and serum samples for acute HDV infections. Furthermore, 19 Mongolian seed teachers participated in a 1-week workshop on infection control in Taiwan. Subsequently, these seed teachers trained more than 400 medical personnel in Mongolia. To assess secular changes in acute HDV infection, we reviewed the registration data from the National Center for Communicable Disease (NCCD) in Mongolia between 2011 and 2021.

Results. Among the 194 Mongolian patients, 108 had dual infection with hepatitis B virus (HBV) and HDV, while 86 had acute hepatitis B (AHB). Patients with HBV/HDV dual infections were older (28.6 vs 25.5 years, $p = 0.030$) and had lower rates of positive hepatitis B e antigen in their sera, lower rates of serum HBV DNA exceeding 2000 IU/mL, and higher rates of having received dental treatment (59.4% vs 40.5%, $p = 0.014$) and injection therapy

(64.2% vs 44.0%, $p = 0.009$) compared with those with AHB. Analysis of NCCD data revealed that new HDV infection cases were more prevalent between 2011 and 2015 (111.20 ± 29.79 cases/y) and decreased to 54.67 ± 27.34 cases/y between 2016 and 2021 ($p = 0.010$).

Conclusion. Dental treatment and injections were associated with a higher risk of acute HDV infections in Mongolia. Through col- laborative efforts, the incidence rate of HDV infection has declined in recent years.

Keywords. Epidemiology; Hepatitis B vaccination; Hepatitis B virus; Hepatitis delta virus; Infection control

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Outcomes of the Nuss procedure in children with pectus excavatum: 14 years of experience

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Abstract

Background. We aimed to assess the effectiveness of the Nuss procedure for pectus excavatum (PE) and explore the impacts of sex and age on outcomes.

Methods. We retrospectively reviewed 594 consecutive children ≤18 years of age who underwent the thoracoscopy-assisted Nuss technique between January 2006 and July 2019. The severity of pectus deformity was calculated according to the Haller index (HI). The classification of PE and clinical data including complications was analyzed.

Results. Of the 594 patients, 456 (76.8%) were boys and 138 (23.2%) were girls. The mean age at surgery was 10.0 ± 5.0 years. The most common types of PE were 1A and 2A2 according to Park classification. Intraoperative and postoperative complication rates were 2/594 (0.3%) and 74/594 (12.5%), respectively. The most common complication was bar displacement. The bar was removed in 414 patients 3.5 ± 0.8 years later. The mean preoperative HI, postoperative HI with bar, and HI after bar removal were 4.2 ± 1.7, 2.4 ± 0.3, and 2.7 ± 0.5, respectively. Compared to the preoperative HI, both the postoperative HI with bar and HI after bar removal were significantly lower ($p < 0.001$). For preschool-age children, the preoperative HI was significantly higher ($p = 0.027$) and the change in HI significantly improved compared to school-age children ($p = 0.004$). Boys and adolescents needed significantly more bars and stabilizers.

Conclusion. Surgical correction of PE using the Nuss procedure is a safe procedure and improves the HI in children of different ages, even in those younger than 6 years of age.

Keywords. Haller index; Nuss procedure; Pectus excavatum; Pediatric

Journal of the Chinese Medical Association (2024) 87: 48-57

Major adverse cardiovascular events of vascular endothelial growth factor tyrosine kinase inhibitors among patients with different malignancy: A systemic review and network meta-analysis

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Abstract

Background. Vascular endothelial growth factor tyrosine kinase inhibitors (VEGF-TKIs) are a common cancer treatment. However, the pharmacologic characteristics of VEGF-TKIs may influence cardiovascular risks. The relative risks of major adverse cardiovas- cular events (MACEs) associated with VEGF-TKIs are poorly understood.

Methods. We searched PubMed, Embase, and ClinicalTrials.gov from inception until August 31, 2021, for phase II/III randomized controlled trials of 11 VEGF-TKIs (axitinib, cabozantinib, lenvatinib, pazopanib, ponatinib, ripretinib, regorafenib, sorafenib, suni- tinib, tivozanib, and vandetanib). The endpoints were heart failure, thromboembolism, and cardiovascular death. The Mantel- Haenszel method was used to calculate the risk of VEGF-TKI among users by comparing it to nonusers. Pairwise meta-analyses with a random-effects model were used to estimate the risks of the various VEGF-TKIs. We estimated ranked probability with a P-score and assessed credibility using the Confidence in Network Meta-Analysis framework.

Results. We identified 69 trials involving 30 180 patients with cancer. The highest risk of MACEs was associated with high-potency tivazonib (odds ratio [OR]: 3.34), lenvatinib (OR: 3.26), and axitinib (OR: 2.04), followed by low-potency pazopanib (OR: 1.79), sorafenib (OR: 1.77), and sunitinib (OR: 1.66). The risk of heart failure significantly increased in association with less-selective sorafenib (OR: 3.53), pazopanib (OR: 3.10), and sunitinib (OR: 2.65). The risk of thromboembolism significantly increased in asso- ciation with nonselective lenvatinib (OR: 3.12), sorafenib (OR: 1.54), and sunitinib (OR: 1.53). Higher

potency (tivozanib, axitinib) and lower selectivity (sorafenib, vandetanib, pazopanib, sunitinib) were associated with a higher probability of heart failure. Low selectivity (lenvatinib, cabozantinib, sorafenib, sunitinib) was associated with a higher probability of thromboembolism.

Conclusion. Higher-potency and lower-selectivity VEGF-TKIs may influence the risks of MACEs, heart failure, and thromboembo- lism. These findings may facilitate evidence-based decision-making in clinical practice.

Keywords. Angiogenesis inhibitors; Cardiovascular system; Cardiotoxicity; Protein kinase inhibitors; Vascular endothelial growth factors

Journal of the Chinese Medical Association (2024) 87: 765-773

Hirsutella sinensis intensifies testicular function and spermatogenesis in male mice with high-fat diet-induced obesity

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Abstract

Background. *Hirsutella sinensis* (HS) is a mycelium isolated from the fruiting body of the medicinal mushroom *Cordyceps sinen- sis*. This study explored whether HS treatment affects reproductive dysfunction in a high-fat diet (HFD)-induced mouse model and regulates various mechanisms, focusing on oxidative stress, apoptosis, inflammation, and autophagy.

Methods. Twenty-four C57BL/6J (B6) mice were randomly divided into a standard chow diet (NCD)- or HFD-fed group for 24 weeks. During the final 8 weeks, half of the HFD-fed mice were orally administered HS (HFD + HS). Biochemical markers, including glucose, insulin, triglycerides, and total cholesterol, were assessed, and hormones, including testosterone, follicle-stimulating hormone (FSH), and luteinizing hormone (LH), were analyzed. Liver and testicular histology, as well as sperm quality markers such as sperm motility, sperm count, and percentage of sperm with normal morphology, were observed. The activities of the testicular antioxidants superoxide dis- mutase (SOD), catalase, and glutathione peroxidase (GPx) and the products of lipid peroxidation, such as malondialdehyde (MDA), were measured. The protein expression levels of apoptosis-, autophagy- and inflammation-related markers were measured.

Results. The HFD-fed mice had abnormal sex hormone levels, poor sperm quality, and a destroyed testicular structure, with increased oxidative stress and apoptosis in the testis. HS supplementation in HFD-fed mice attenuated testicular apoptosis by suppressing the Bax/Bcl-xl ratio and cleaved caspase 3 protein expression. The HS-treated mice exhibited improved reproductive function, possibly due to reduced oxidative stress and apoptosis, suggesting that HS has a protective effect against HFD-induced testicular damage.

Conclusion. Male mice supplemented with HS exhibited attenuated poor semen quality and reduced testosterone levels brought about by HFD-induced obesity by reducing oxidative stress.

Keywords. High-fat diet; Male infertility; Obesity; Spermatogenesis

Journal of the Chinese Medical Association (2024) 87: 590-596

Assessment of iodine nutritional status and gestational thyroid function reference ranges during the first trimester of pregnancy in Taiwan

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Abstract

Background. Iodine nutrition is critical for fetal neurodevelopment in the first trimester of pregnancy, a period associated with dramatic changes in thyroid function. The aim of this study was to evaluate iodine nutritional status and thyroid function reference ranges in the first trimester in Taiwan.

Methods. Pregnant women aged 20 years and above in the first trimester were recruited in Taipei Veterans General Hospital, Taiwan from March 2019 to July 2022. Each participant provided a spot urine sample for measurement of urinary iodine concentra- tion (UIC) and a blood sample for checkup of thyroid function and thyroid autoantibodies. A simple food frequency questionnaire was also completed.

Results. A total of 209 women with a mean age of 32.9 ± 4.4 years were enrolled. The median UIC was 160.9 μg/L (interquartile range [IQR]: 105.0-246.2 μg/L), indicating overall iodine sufficiency. The gestational thyroid function reference ranges were: thyroid stimulating hormone (TSH) (median: 0.93 [0.007-2.9] μIU/mL), free T4 (1.3 [0.93-2.2] ng/dL), free T3 (3.0 [2.3-5.0] ng/dL), total T4 (9.9 [6.4-16.9] ng/ dL), and total T3 (135 [88-231] ng/dL). If the nonpregnant reference range of serum TSH was used, eight women (4.8%) would be mis- classified as having subclinical hyperthyroidism, and two women (1.2%) with

subclinical hypothyroidism would be missed. In multivariate analysis, nulliparous (adjusted odds ratio [OR] from model 1-3: 2.02, 2.05, 2.02; 95% CI, 1.08-3.77, 1.10-3.81, 1.11-3.66; p = 0.027, 0.023, 0.022, respectively) and multivitamin nonusers (adjusted OR from model 1-3: 1.86, 1.85, 1.78; 95% CI, 1.04-3.34, 1.03-3.32, 1.004-3.71; p = 0.038, 0.039, 0.049, respectively) had increased odds of having lower UIC levels <150 μg/L.

Conclusion. The iodine nutritional status in the first trimester is adequate in Taiwan; however, certain subgroups such as nullipa- rous and multivitamin nonusers are still at risk for iodine deficiency. Gestational thyroid function reference ranges are needed for correct diagnosis of thyroid dysfunction in pregnancy.

Keywords. Gestation; Iodine; Pregnancy; Taiwan; Thyroid

Journal of the Chinese Medical Association (2024) 87: 920-926

TBK1 p.Y153Qfs*9 variant may be associated with young-onset, rapidly progressive amyotrophic lateral sclerosis through a haploinsufficiency mechanism

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Abstract

Background. *TBK1* variants have been implicated in the pathogenesis of amyotrophic lateral sclerosis (ALS) and frontotemporal dementia spectrum disorder. The current study elucidated the clinical and molecular genetic features of a novel *TBK1* variant identi- fied in a patient with young-onset, rapidly progressive ALS.

Methods. The coding regions of *TBK1*, *SOD1*, *TARDBP*, and *FUS* were genetically analyzed using Sanger sequencing. Repeat- primed polymerase chain reaction (PCR) was used to survey the GGGGCC repeat in *C9ORF72*. The study participant underwent a comprehensive clinical evaluation. The functional effects of the *TBK1* variant were analyzed through in vitro transfection studies.

Results. We identified a novel frameshift truncating *TBK1* variant, c.456_457delGT (p.Y153Qfs*9), in a man with ALS. The dis- ease initially manifested as right hand weakness at the age of 39 years but progressed rapidly, with the revised ALS Functional Rating Scale score declining at an average monthly rate of 1.92 points in the first year after diagnosis. The patient had no cognitive dysfunction. However, Technetium-99m single photon emission tomography indicated hypoperfusion in his bilateral superior and middle frontal cortices. In vitro studies revealed that the p.Y153Qfs*9 variant resulted in a truncated TBK1 protein product, reduced TBK1 protein expression, loss of kinase function, reduced interaction with optineurin, and impaired dimerization.

Conclusion. The heterozygous *TBK1* p.Y153Qfs*9 variant may be associated with young-onset, rapidly progressive ALS through a haploinsufficiency mechanism.

Keywords. Amyotrophic lateral sclerosis; Frontotemporal dementia; TANK-binding kinase 1 (*TBK1*) gene

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Analyzing risk factors and developing a stratification system for hepatocellular carcinoma recurrence after interferon-free direct-acting antiviral therapy in chronic hepatitis C patients

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Abstract

Background. The introduction of direct-acting antiviral agents (DAAs) has revolutionized the therapeutic landscape of chronic hepatitis C (CHC), however real-world data on the risk factors of hepatocellular carcinoma (HCC) recurrence following DAA treat- ment in CHC-HCC patients are limited in Taiwan. We aimed to evaluate the therapeutic efficacy of DAAs in Taiwanese patients with prior hepatitis C virus (HCV)-induced HCC and identify the posttreatment risk factors for HCC recurrence.

Methods. Between January 2017 and August 2021, 208 CHC-HCC patients underwent DAA treatment at Taipei Veterans General Hospital. Among them, 94 patients met the inclusion criteria (Barcelona clinic liver cancer [BCLC] stage 0/A after treatment with complete radiological response) for analysis. Comprehensive demographic, clinical, and laboratory data were collected before and after DAA treatment. The primary outcome was HCC recurrence post-DAA treatment, and independent variables were assessed using multivariate Cox proportional hazards models.

Results. The mean age of the enrolled patients was 75.9 ± 8.9 years; 44.7% were male, and 94.7% were Child-Pugh class A. Before DAA treatment, 31.9% experienced HCC recurrence. The median follow-up after DAA treatment was 22.1 months (inter- quartile range, 8.6-35.9 months). After treatment, 95.7% of the patients achieved a sustained virological response (SVR12), but HCC recurrence occurred in 54.3%. Cumulative HCC recurrence rates after treatment were 31.1% at 1 year, 57.3% at 3 years, and 68.5% at up to 5.69 years. Multivariate analysis revealed that prior HCC recurrence before DAA treatment (hazard ratio [HR] = 3.15, $p = 0.001$), no SVR12 after treatment (HR = 6.829, $p = 0.016$), 12-week posttreatment alpha-fetoprotein (AFP) level >10 ng/ mL (HR = 2.34, $p = 0.036$), and BCLC

A3 lesions (two or three nodules without any tumor exceeding 3 cm) (HR = 2.31, $p = 0.039$) were independent risk factors for HCC recurrence. We further developed a risk stratification system based on these significant independent factors.

Conclusion. This investigation underscores the critical influence of factors such as prior HCC recurrence, successful attainment of SVR12, posttreatment AFP level, and specific tumor characteristics in determining the risk of HCC recurrence after treatment with DAAs. Our proposed innovative risk stratification system may not only contribute to enhanced personalized care but also holds the potential to optimize treatment outcomes.

Keywords. Alpha-fetoprotein; Chronic hepatitis C; Hepatocellular carcinoma; Recurrence

Journal of the Chinese Medical Association (2024) 87: 171-178

Advanced hepatocellular carcinoma with major portal vein invasion: Therapeutic outcomes of hepatic arterial infusion chemotherapy vs concurrent radiotherapy

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Abstract

Background. Hepatocellular carcinoma (HCC) with major portal vein invasion (MPVI) presents very poor outcomes. Hepatic artery infusion chemotherapy (HAIC) and radiation therapy (RT) have both been found to be effective for advanced HCC. In this retrospec- tive study, we compared the therapeutic outcomes of our "new" HAIC regimen with and without concurrent RT, before and after propensity score matching (PSM) in treating HCC patients with MPVI.

Methods. One hundred forty patients with MPVI received HAIC alone and 35 patients underwent concurrent HAIC and RT during a 16-year period. The left subclavian artery was adopted as the entry site for a temporary catheter placement for a 5-day chemo- infusion. The Modified Response Evaluation Criteria in Solid Tumors (mRECIST) was adopted to assess the objective response rate (ORR). The Kaplan-Meier curve was used to calculate progression-free survival (PFS) and overall survival (OS) between the two groups. Univariate and multivariate analyses by Cox regression model were used to assess hazard ratios.

Results. Of the 140 patients with Child-Pugh A liver function, the median OS was 17.0 months. In the initial cohort, higher ORR and PFS were found in the concurrent RT group than in the HAIC alone group (80% vs 66.4% and 9 vs 8 months, respectively) but shorter OS (10.5 vs 14.5 months, $p = 0.039$) was observed. After PSM, the OS was 10 and 15 months ($p = 0.012$), respectively. Multivariable Cox regression analysis revealed that the significant factors for adjusting hazard ratios for OS were Child-Pugh clas- sification, alpha fetal protein (AFP) level, and hepatic vein invasion.

Conclusion. HAIC is an effective treatment for advanced HCC patients with MPVI. Concurrent HAIC and full-dose RT were associ- ated with worse clinical outcomes.

Keywords. Hepatic artery; Hepatocellular carcinoma; Portal vein; Radiotherapy; Retrospective study

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Clinical manifestation and disease progression in COVID-19 infection

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Abstract

Coronavirus disease 2019 (COVID-19) is mainly an infectious disease of the respiratory system transmitted through air droplets, and pulmonary symptoms constitute main presentations of this disease. However, COVID-19 demonstrates a clinically diverse manifestation ranging from asymptomatic presentation to critically illness with severe pneumonia, acute res- piratory distress syndrome, respiratory failure, or multiple organ failure. Accumulating evidences demonstrated that COVID-19 has extrapulmonary involvement, including neurological, smelling sensation, cardiovascular, digestive, hepatobiliary, renal, endo- crinologic, dermatologic system, and others. Over a third of COVID-19 patients manifest a wide range of neurological symptoms involving the central/peripheral nervous system. Underlying cardiovascular comorbidities were associated with detrimental out- comes, meanwhile the occurrence of cardiovascular complications correlate to poor survival. Gastrointestinal symptoms frequently occur and have been associated with a longer period of illness. Impaired hepatic functions were associated with the severity of the disease. Higher rate of acute kidney injury was reported in critically ill patients with COVID-19. Endocrinologic presentations of COVID-19 include exacerbating hyperglycemia, euglycemic ketosis, and diabetic ketoacidosis. The most common cutaneous manifestation was acro-cutaneous (pernio or chilblain-like) lesions, and other skin lesions consist of maculopapular rash, vesicular lesions, livedoid/necrotic lesions, exanthematous rashes, and petechiae. This review article summarized the general clinical signs and symptoms, radiologic features, and disease manifestation with progression in patients with COVID-19.

Keywords. Coronavirus; COVID-19; Severe acute respiratory syndrome coronavirus 2

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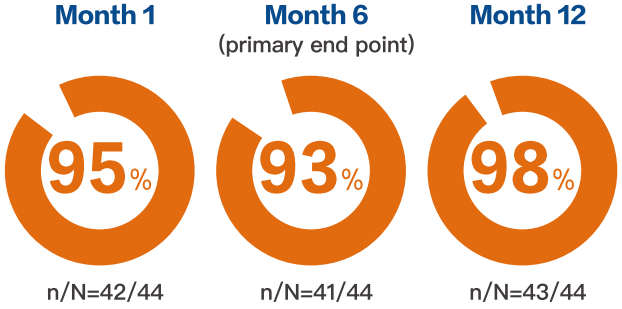
Pamorelin (Triptorelin) 在用藥後第 1、第 6 及第 12 個月，可有效降低 LH 濃度至青春期前標準 (LH ≤5 IU/L)



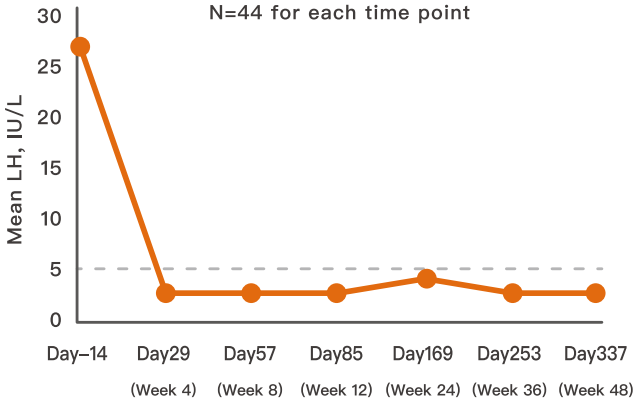
Note: 95% of children (n/N=42/44) achieved prepubertal LH levelsa at month 2,3, and 9.

[a] Serum LH≤5 IU/L thirty minutes after GnRH-agonist stimulation.

[b] Results are from intent-to-treat (ITT) population.

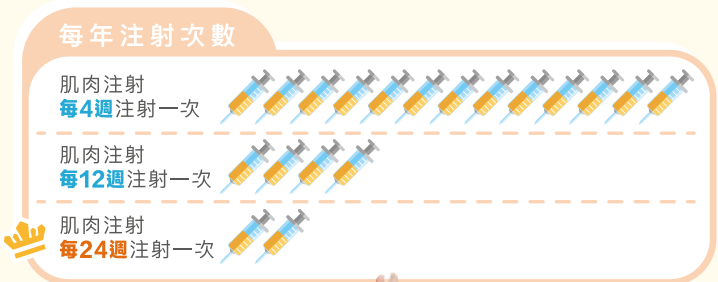
98%的受試者在持續用藥後12個月後，可有效控制 LH ≤5 IU/L

Pamorelin（Triptorelin）在用藥期間可有效降低 LH 濃度



在用藥之後，體內平均 LH 濃度控制在 5 IU/L以內

Reference: Karen Klein, et al. J Pediatr Endocrinol Metab. 2016, 29(11):1241–8.



帕摩霖長效注射劑 22.5 mg Pamorelin (Triptorelin pamoate)

適應症｜治療中樞性性早熟 (central precocious puberty, CPP) 發病年齡在 2 歲(含)以上至 8 歲前(女孩)或 9 歲前(男孩)之兒童。

禁忌症｜禁止用於已知對triptorelin或藥品中任何其他成分，或其他促性腺激素釋放素 (GnRH) 促進劑 或 GnRH 過敏的患者。

常見副作用｜月經 (陰道出血)。

本藥品需在醫師監督下投與，詳細資訊請參閱仿單。

友華生技醫藥股份有限公司
Orient Europharma Co., Ltd.
Debiopharm
PAM-2023-05-002

Galafold

核准治療法布瑞氏症的口服藥物

Galafold 經臨床試驗證實
在法布瑞氏症 amenable mutation 患者使用後
達到心臟 LVMi 顯著降低、腎臟功能維持穩定等多重器官臨床指標*

加厲伏藥品處方資訊摘要：藥品名稱：加厲伏膠囊 123 毫克 (衛部罕藥輸字第 000060 號)。**主要成分：**每粒膠囊內含 migalastat hydrochloride，相當於 migalastat 123 毫克。**治療適應症：**加厲伏適用於已確診為法布瑞氏症且於體外試驗確定為可符合性基因突變 (amenable mutation) 的 16 歲 (含) 以上病人。**用法與用量：**加厲伏應由具有診治法布瑞氏症經驗的專科醫師監督給藥。加厲伏不適合與酵素替代療法同時給藥。**劑量：**加厲伏建議劑量為每間隔 1 日 1 次，每次在固定的時間服用 migalastat 123 毫克 (1 粒)。**遺漏劑量：**不可以連續兩天服用加厲伏，若一整天都忘記服用該日劑量，卻在正常服藥時間的 12 小時內想到，可以立即補服該次劑量；但如果想到時，已經超過應服藥時間 12 小時以上，則應等到下次用藥日與用藥時間，再恢復規則給藥。**給藥方式：**口服給藥。加厲伏與食物併用時，在體內的暴露量大約減少 40%，而當與咖啡併用時體內的暴露量減少 60%。在服用加厲伏前至少 2 小時和服用 2 小時不應攝入食物和咖啡因，確保至少禁食 4 小時，在 4 小時的禁食期間可以飲用水 (原味、調味、加糖)、無果肉果汁和不含咖啡因的碳酸飲料。加厲伏膠囊每間隔 1 日 1 次，並在同一時間服用，以確保為病人帶來最佳益處。加厲伏膠囊應整粒吞服，不可切開、碾碎或咀嚼。**禁忌：**對主成分或對賦形劑過敏者禁用。**警告與注意事項：**已開始使用或改用加厲伏的病人應定期 (每 6 個月) 監測腎功能、心電圖與生化檢驗。當臨床狀況明顯惡化時，應再度作臨床評估或考慮停用加厲伏。加厲伏不適用於具有非可符合性突變的病人。嚴重腎功能不全 (腎絲球過濾率小於 30 mL/min/1.73 m²) 的病人，不建議使用加厲伏。有少數資料顯示加厲伏單次劑量與一次輸注標準酵素取代療法併用會造成 agalsidase 在體內動態濃度最多增加達到 5 倍。該試驗也指出 agalsidase 不影響 migalastst 的藥品動力學。加厲伏不適合與酵素替代療法同時給藥。**操作機械能力：**加厲伏對駕駛或操作機具的能力無影響或影響極小。**特殊族群注意事項：懷孕** 孕婦服用加厲伏的資料很少。在兔子試驗中觀察到，只有達到對雌兔有毒性劑量時才出現生長發育毒性。懷孕期間不可服用加厲伏。**哺乳** 尚不清楚加厲伏是否會排放於人類乳汁中。不過，曾發現 migalastat 出現於正在哺乳的大鼠乳汁中，因此，喝母奶的嬰兒也可能有暴露於 migalastat 的風險。應衡量母親接受加厲伏治療的效益與哺乳帶給嬰兒的風險何者重要，來決定應停止哺乳或停用加厲伏。**有生育能力的女性與男性** 可能懷孕的女性病人/男性與女性病人的避孕：有可能懷孕且未避孕的女性病人不可以使用加厲伏。**生育** 未曾研究加厲伏對人類生育力的影響。實驗顯示雄性大鼠接受所評估的各劑量之 migalastat 後，出現短暫不孕。藥物停用 4 週後可以完全恢復生育能力。其他 iminosugars 治療的前臨床實驗也有類似的結果 (參見第 10.3 章節)。加厲伏不影響雌性大鼠的生育能力。**腎功能不全** 未曾看到以加厲伏治療的病人有蛋白尿減少的情形。嚴重腎功能不全 (腎絲球過濾率小於 30 mL/min/1.73 m²) 的病人，不建議使用加厲伏。**交互作用** 依據體外實驗資料，migalastat 不是 CYP1A2、2B6 或 3A4 的誘導劑。而且，migalastat 也不是 CYP1A2、2A6、2B6、 2C8、 2C9、 2C19、 2D6、 2E1 或 3A4/5 的受質或抑制劑。Migalastat 不是 MDR1 或 BCRP 的受質，也不是 BCRP、 MDR1 或 BSEP 等人類外排轉運蛋白的抑制劑。此外，migalastat 不是 MATE1、MATE2-K、OAT1、OAT3 或 OCT2 的受質，也不是 OATP1B1、OATP1B3、OAT1、 OAT3、OCT1、 OCT2、MATE1 或 MATE2-K 等人類攝入轉運蛋白的抑制劑。**其他藥品對加厲伏的影響** 加厲伏與咖啡因合併用藥會降低加厲伏的全身性暴露量 (AUC 和 C_{max})，可能會降低加厲伏療效。在服用加厲伏前至少 2 小時和服用後 2 小時，應避免同時服用加厲伏和咖啡因。**副作用/不良反應 安全性摘要：**加厲伏最常見的副作用是頭痛，大約有 10% 病人出現頭痛。**副作用列表** 發生頻次類別的定義為：極常見 (≥1/10)、常見 (≥1/100 到 <1/10)、 少見 (≥1/1,000 到 <1/100)、罕見 (≥1/10,000 到 <1/1,000)、極罕見 (<1/10,000) 以及不明 (現有資料無法估算)。在每種頻次類別中，依據系統器官分類將副作用發生率由高至低順序排列。(請參見仿單表一、完整的不良反應列表。) **疑似副作用的通報** 藥品批准上市後的疑似副作用通報相當重要，如此可持續監測該藥品的效益/風險平衡。專業醫護人員必須將所有疑似副作用透過全國藥物不良反應通報系統進行通報。**過量** 若發生過量中毒，應給予一般性醫療處置。當加厲伏用量達到1250mg或2000 mg時，最常出現的副作用報告分別是頭痛與頭暈。**詳細處方資料備索、僅供專業醫療人員參考**

*** References:** Galafold 藥品仿單。

衛部罕藥輸字第 000060 號　北市衛藥廣字第 112040085 號

Market Expansion Services by www.dksh.com　DKSH

藥商名稱：台灣大昌華嘉股份有限公司 DKSH Taiwan Ltd.
藥商地址：臺北市內湖區堤頂大道 2 段 407 巷 20 弄 1、3、5、7 號 10 樓，及 22、24、26 號 10 樓及 22 號 10 樓之 1
訂購專線：0800-865-688

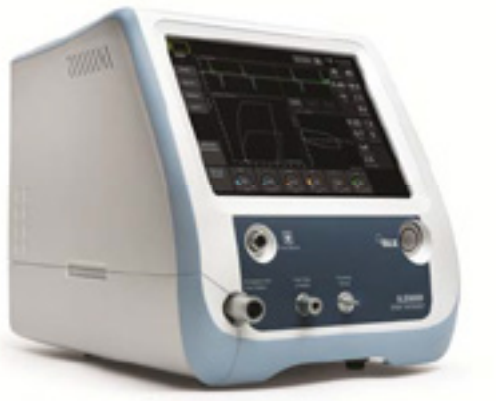
Galafold® (migalastat)

口服給藥，為多重器官帶來療效

AMI_GAL_FAB_202404001 (Apr 2024)

SOMNOtouch RESP
索諾美智慧心肺感測儀

Gerium BiliCare
傑瑞黃疸測量儀



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HERON Neutron Medical Corp.

加速器BNCT:一種藥械聯用的二元靶向腫瘤治療技術

BNCT設備概覽

中子產生室

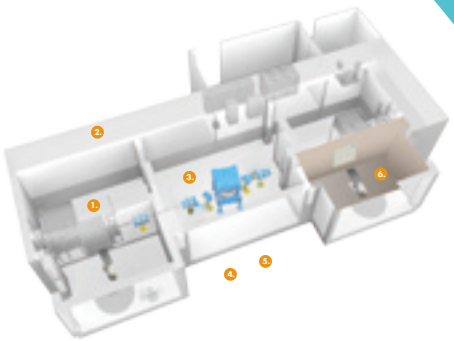
- 專利靶材與高效冷卻系統設計，延長鈹靶壽命
- 全球最高的超熱中子產生效率，降低系統能耗並減少放射性廢棄物的產生
- 自動遠端操作換靶，全程工作人員無需近距離參與

藥物分析室

- 高效精準血硼濃度檢測，五分鐘內完成硼濃度分析，準確評估患者治療時間

加速器室

- 緊湊型迴旋加速器，適用於醫療系統建置
- 可雙邊出束，能量可調整
- 最高產生能量為30MeV的質子
- 系統穩定，維修容易



中子品保室

- 採用國際通用金箔活化分析法，準確定量分析中子射束品質
- 建立快速日品保流程，30分鐘內完成束流品質驗證

照射控制室

- 透過雙重保護與安全連鎖機制杜絕人為誤操作造成的安全隱患
- 透過TCS系統整合控制患者資訊、束流啟停、Shutter，並進行關鍵參數閥值管理與系統警示
- 針對不同使用者給予修改權限，確保關鍵參數與患者信息不受到竄改

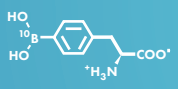
治療室

- 地面部屬機械臂，解決懸吊系統的結構設計與載重問題，有效減少治療室所需空間
- 搭配不同尺寸準值器，提供患者更舒適、精確的擺位系統

禾榮科技提供全套BNCT解決方案
從設計到臨床、從安裝到維護，提供完整支持

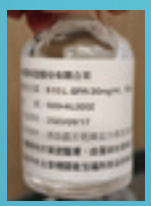
BNCT藥物

BPA



用途：BNCT治療

- 禾榮與國內知名廠商進行CDMO，在GMP體系下完成藥物生產，成功開展3項臨床試驗與恩慈治療



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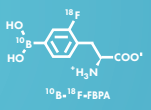
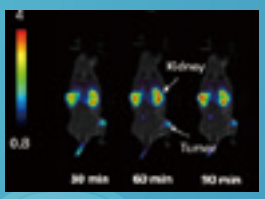


用途：治療前評估與預後療效追蹤

- 禾榮已完成製程開發，與國內知名廠商進行CDMO，著手申請國內一類新藥申報



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信箱：contact@heron-neutron.com
電話：886-3-5619366
地址：新竹科學園區新竹縣竹北市生醫五路66之2號

RAVICTI®
(glycerol phenylbutyrate) Oral Liquid

瑞維安® 口服液

近10年來全球問世無氣味
無味道液體口服氮清除劑

新一代氮清除劑

RAVICTI oral liquid

涵蓋適應症更多，共包含 6 種尿素循環代謝異常亞型

口服液體劑型，更能針對病人個體化取用合適藥量

用藥體積小，無氣味、無味道、適口性好

藥品純度高　不含賦形劑　不含鈉

涵蓋年紀由新生兒至成人包含短期及長期研究

有效性

- 2月齡以下小兒病人，以苯丁酸甘油酯長期治療，其的平均歸一化靜脈血氨值落在正常限值範圍內。
- 2月齡至17歲病人，短期試驗匯總分析，由苯丁酸鈉轉換為苯丁酸甘油酯後的血漿氨顯著降低，在苯丁酸甘油酯的長期治療期間，平均空腹靜脈血氨值落在正常範圍內。
- 成人病人，以苯丁酸甘油酯長期治療，平均空腹靜脈血氨值落在正常限值。

瑞維安口服液 RAVICTI oral liquid

本藥限由醫師處方使用，此為簡易仿單，完整產品資訊，請參照完整仿單，衛部罕藥輸字第 000095號。

學名： Glycerol phenylbutyrate

適應症：本品用於不能藉由限制蛋白質的攝入和/或單純補充氨基酸控制的尿素循環代謝異常（Urea Cycle Disorders; UCDs）病人的長期輔助治療，包括carbamoyl phosphate synthetase(CPS) I缺乏症、鳥胺酸氨甲醯基轉移酶(ornithine carbamoyltransferase（OTC）)缺乏症、argininosuccinate synthetase（ASS）缺乏症、argininosuccinate lyase（ASL）缺乏症、arginase（ARG）I缺乏症和ornithine translocase缺失引起之高鳥胺酸血症-高氨血症-高瓜胺酸血症症候群（hyperornithinaemia-hyperammonaemia homocitrullinuria syndrome；HHH）。

使用限制：

1. 服用本品時，必須限制飲食中的蛋白質，某些情況下還應添加膳食補充劑（例如必需氨基酸、精氨酸(arginine)、瓜氨酸(citrulline)、無蛋白熱量補充劑）。
2. 本品不得使用於急性高氨血症 (acute hyperammonemia)之控制。

用法用量：本品必須配合膳食蛋白限制，有時候必須配合飲食補充劑（例如必需氨基酸、精氨酸(arginine)、瓜氨酸(citrulline)、無蛋白熱量補充劑），這取決於促進生長發育所需的每日膳食蛋白攝入量。 應根據個別病人蛋白質耐受性和所需的每日膳食蛋白攝入量來調整日劑量。

未進行原位肝移植的病人可能需要終身使用本品治療。每日推薦總劑量需根據體表面積計算，範圍爲4.5 ml/m²/天至11.2 ml/m²/天，詳見藥品仿單說明書。

禁忌：對Glycerol phenylbutyrate過敏者禁用。禁用於治療急性高氨血症，因為採取更快速降低血氨濃度的干預措施對於急性高氨血症治療至關重要。

副作用：常見（≥1/100且＜1/10）不良反應：食慾增加或減退、厭食、頭暈、頭痛和震顫、胃腸脹氣、腹瀉、嘔吐、噁心、腹痛、消化不良、腹脹、便秘、口腔不適、乾嘔、皮膚氣味異常、痤瘡、子宮出血、疲乏，周邊水腫、天門冬氨酸氨基轉移酶升高、丙氨酸氨基轉移酶升高、陰離子間隙升高、淋巴細胞計數下降、維生素D下降。

注意事項：有些病人即使正在接受苯丁酸甘油酯治療，也會出現急性高氨血症(包括高血氨腦病變)；胰腺功能不全或腸吸收不良病人的苯丁酸吸收下降，應密切監測氨濃度；氨濃度正常或偏低的病人（特別是＜2月齡的兒童）有不明原因嗜睡、意識模糊、噁心和困倦，應懷疑PAA濃度高；如果合併使用皮質類固醇和苯丁酸甘油酯，如果UCDs病人必須使用Valproicacid 與haloperidol，需密切監測氨濃度；Probenecid可能會抑制苯丁酸甘油酯代謝物（包括PAGN）的腎排泄；本品可能會嚴重影響病人開車和使用機器的能力；每日劑量應根據個別病人的尿素合成能力估計值（如有）、氨基酸特徵、蛋白耐受性和促進生長發育所需的每日膳食蛋白攝入量個別調整，再依據血漿氨、穀氨醯胺、U-PAGN及/或血漿PAA和PAGN以及血漿PAA/PAGN比值的監測作進一步的劑量調整。

RAVICTI®
(glycerol phenylbutyrate) Oral Liquid

審批號碼 202407170011
北市衛藥廣字第113060150號

KISQALI®
ribociclib

RIGHT CHOICE, MORE LIFE.

有效延緩疾病惡化[2-3]

提升整體存活率[1,4,5,6]

維持且改善生活品質[7-9]

產品名稱：擊癌利® 錠 KISQALI®（衛部藥輸字第 027320 號）
禁忌：無 **警語：**QT 間期延長。與 Tamoxifen 併用提高了 QT 期間延長。肝膽毒性。嗜中性白血球減少。胚胎–胎兒毒性。嚴重皮膚反應。間質性肺病。**副作用：**感染，嗜中性白血球減少，白血球減少，貧血，淋巴球減少，血小板減少，食慾減低，頭痛，失眠，呼吸困難，咳嗽，背痛，流淚增加，噁心，腹瀉，嘔吐，便祕，腹痛，口腔炎，口乾，消化不良，味覺障礙，掉髮，皮疹，搔癢，皮膚乾燥，倦怠，周邊水腫，發熱，四肢疼痛，虛弱，口咽疼痛，發熱，肝功能檢查異常(AST升高，ALT升高，膽紅素升高)，γ-麩胺醯轉移酶增加，肌酸酐上升，血磷下降，白蛋白下降，血糖下降，血磷降低，血鉀降低，心電圖 QT 間期延長，血糖下降。嗜中性白血球減少合併發燒，乾眼，低血鈣，暈眩，暈厥，紅斑，白斑。

詳細資訊請掃QR code
參閱完整仿單

References: 1. Overall Survival with Ribociclib plus Letrozole in Advanced Breast Cancer N Engl J Med 2022; 386:942-950. 2. Hortobagyi GN, Stemmer SM, Burris HA, et al. N Engl J Med. 2016;375(18):1738-1748. 3. Slamon DJ, Neven P, Chia S, et al. J Clin Oncol. 2018;36(24):2465-2472. 4. Slamon DJ, et al. N Engl J Med. 2020;382(6):514-524. 5. Im SA, et al. N Engl J Med. 2019;381(4):307-316. 6. Lu YS, Im SA, Colleoni M, et al. Updated Overall Survival of Ribociclib plus Endocrine Therapy versus Endocrine Therapy Alone in Pre- and Perimenopausal Patients with HR+/HER2- Advanced Breast Cancer in MONALEESA-7: A Phase III Randomized Clinical Trial. Clin Cancer Res. 2022;28(5):851-859. 7. ESMO Magnitude of Clinical Benefit Scorecard. ESMO-MCBS v1.1. https://www.esmo.org/guidelines/esmo-mcbs/esmo-mcbs-scorecards/scorecard-9-1. [MONALEESA-2]. 8. ESMO Magnitude of Clinical Benefit Scorecard. ESMO-MCBS v1.1. https://www.esmo.org/guidelines/esmo-mcbs/esmo-mcbs-scorecards/scorecard-161-1. [MONALEESA-3]. 9. ESMO Magnitude of Clinical Benefit Scorecard. ESMO-MCBS v1.1. https://www.esmo.org/guidelines/esmo-mcbs/esmo-mcbs-scorecards/scorecard-158-1. [MONALEESA-7].

詳細資訊請參閱完整仿單
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FA-11370388_20270304

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ZAVICEFTA®贊飛得　注射劑2g/0.5g　處方資訊摘要　衛部藥輸字第027705號

北市衛藥廣字第114050054號
本藥須由醫師處方使用

【產品名】Zavicefta 贊飛得注射劑 【學名】ceftazidime/avibactam 【成分含量與劑型】每小瓶含有相當於 2 g ceftazidime 的 ceftazidime pentahydrate，以及相當於 0.5 g avibactam的avibactam sodium。【適應症】適用於治療自出生起之兒童病人及成人病人對 Zavicefta 具感受性的革蘭氏陰性微生物（susceptible Gram-negative microorganisms）所引起的下列感染：•複雜性腹腔內感染（complicated intra-abdominal infection, cIAI）•複雜性泌尿道感染（complicated urinary tract infection, cUTI），包括腎盂腎炎（pyelonephritis）•院內感染型肺炎（Hospital-acquired pneumonia, HAP），包括呼吸器相關肺炎（ventilator associated pneumonia, VAP），治療以上列任何感染相關之菌血症病人病人。應考量抗生素的使用準則來合理使用抗生素製劑。【用法與用量】**用法：**靜脈注射。Zavicefta的給藥方式為以120分鐘將適當的輸注量以靜脈輸注完畢。**劑量：CrCL 估計值> 50 mL/min 成人的建議劑量：**複雜性腹腔內感染：2 g/0.5 g；複雜性泌尿道感染，包括腎盂腎炎：2 g/0.5 g；院內感染型肺炎，包括呼吸器相關肺炎：2 g/0.5 g；與以上任何感染相關，或疑似與以上任何感染相關之菌血症：2 g/0.5 g；頻率：每 8 小時一次。**CrCL 估計值 > 50 mL/min/1.73 m2,2 歲 3 個月以上兒童病人建議劑量：**複雜性腹腔內感染或複雜性泌尿道感染，包括腎盂腎炎或院內感染型肺炎/呼吸器相關肺炎：6 個月至 < 18 歲：50 mg/kg/12.5 mg/kg 至最高達2 g/0.5 g；3 個月至< 6 個月：40 mg/kg/10 mg/kg；頻率：每 8 小時一次。**未滿 3 個月之兒童病人的建議劑量：**複雜性腹腔內感染或複雜性泌尿道感染，包括腎盂腎炎或院內感染型肺炎/呼吸器相關肺炎：**足月新生兒和嬰兒：**> 28 天至 < 3 個月：30 mg/kg/7.5 mg/kg；出生至≤28 天：20 mg/kg/5 mg/kg；頻率：每 8 小時一次。早產新生兒和嬰兒：> 44 週至 < 53週 PMA：30 mg/kg/7.5 mg/kg；31 至 ≤44 週PMA：20 mg/kg/5 mg/kg；26 至 <31 週PMA：20 mg/kg/5 mg/kg；頻率：每 8 小時一次。**特殊族群：**老年病人無須調整劑量。肝功能不全病人無須調整劑量。【禁忌事項】對活性成分或賦形劑（無菌碳酸鈉（無水））過敏。對於任何 cephalosporin 類抗生素過敏、對於任何其他類型的 β-lactam 類抗生素（例如：penicillin 類、monobactam 類或 carbapenem 類）發生嚴重過敏（例如：過敏性反應、嚴重皮膚反應）。【警語與注意事項】**過敏反應：**若發生過敏反應，必須立即停止 Zavicefta 治療，並且必須採取適當的緊急措施。**困難梭狀芽孢桿菌（*Clostridioides difficile*）相關腹瀉：**若病人於 Zavicefta 給藥期間或之後發生腹瀉，應考慮停止 Zavicefta 給藥，且為困難梭狀芽孢桿菌（*Clostridioides difficile*）給予特定治療。不應給予抑制蠕動的藥物。**腎功能不全：**Ceftazidime 和 avibactam 透過腎臟排除，因此，應依據腎功能不全程度降低劑量，**腎毒性：**併用高劑量 cephalosporin 類和腎毒性藥物（例如胺基苷類（aminoglycoside）或強效利尿劑（例如：furosemide））可能對腎功能造成不良影響。**直接抗球蛋白試驗（DAG或 Coombs 試驗）血清抗體轉換和溶血性貧血的潛在風險：**若病人於 Zavicefta 治療期間或之後發生貧血，應檢查此項可能性。**臨床試驗資料：**Zavicefta 曾於 cIAI、cUTI 和 HAP（包括 VAP）的病人進行臨床療效及安全性試驗。**Ceftazidime/avibactam 的活性範圍：**Ceftazidime 幾乎不會作用於大部分的革蘭氏陽性生物體和厭氧菌，當已知或疑似因這些病原體引起感染時，應併用額外的抗生素。Avibactam 的抑制範圍包括可使 ceftazidime 去活化的許多酵素，包括 Ambler A 類 β-Lactamases及C 類 β-Lactamases。Avibactam 不會抑制 B 類酵素（metallo-β-Lactamases），且無法抑制許多 D 類酵素。**非感受性生物體（Non-susceptible organisms）：**長期使用可能會使非感受性生物體(例如：腸球菌、真菌)過度生長，而需要中斷治療或採取其他適當措施。**實驗室檢測：**Ceftazidime 可能干擾用於偵測糖尿的銅還原法（Benedict's、Fehling's、Clinitest），而產生偽陽性結果。Ceftazidime 不會干擾糖尿的酵素檢測。**限納飲食：**本藥品每支小瓶共含有鈉約 146 mg，將 Zavicefta 使用於採取限鈉飲食的病人時，應考慮此點。**兒童族群：**兒童族群可能有存在用藥過量的風險，尤其是對 3 個月至 12 個月以下的兒童病人。**【藥品交互作用】**體外試驗顯示，avibactam 為 OAT1 和 OAT3 還輸蛋白的受質，可能會造成血液腔室主動吸收 avibactam，進而影響其排除。在體外試驗中，probenecid（一種強效 OAT 抑制劑）會抑制此種吸收達 56% 至 70%，因而可能影響了 avibactam 的排除。由於尚未進行 avibactam 和 probenecid 的臨床交互作用試驗，不建議併用 avibactam 和 probenecid 在體外試驗中，avibactam 未顯著抑制細胞色素 P450 酵素。【過量】Ceftazidime/avibactam 過量會導致神經方面的後遺症，包括因ceftazidime 成分引起的腦病變、抽搐和昏迷。【不良反應】Coombs 直接抗球蛋白試驗呈陽性、念珠菌症（包括外陰陰道念珠菌症和口腔念珠菌症）、嗜酸性球增多症、血小板減少症、頭痛、頭暈、腹瀉、腹痛、噁心、嘔吐、丙胺酸轉胺酶升高、天門冬胺酸轉胺酶升高、血中鹼性磷酸酶升高、血中乳酸去氫酶升高、斑丘疹、蕁麻疹、搔癢症、輸注部位血栓、輸注部位靜脈炎、發熱。兒童族群：新生兒與未滿 3 個月之嬰兒的安全性評估是根據一項共 46 名病人（年齡介於出生到未滿 3 個月）接受 Zavicefta 的臨床試驗安全性資料。整體而言，這 46 名兒童病人曾通報的不良反應與 Zavicefta 在較年長族群（即 3 個月以上的兒童病人與成人）中所知的安全性資訊一致。3 個月(含)以上的兒童病人的安全性評估依據是來自隨個試驗的安全資料，整體而言兒童安全性資料與在複雜性腹腔內感染和複雜性泌尿道感染的成人族群所觀察到的結果相仿。**【藥品保存及調劑注意事項】**本藥無任何特殊保存條件。儲存於原始包裝以避光。儲存於30°C以下。**配製後：**溶液應立即使用調配小瓶。**稀釋後：**輸注袋：在 2 - 8° C 下保存最長 12 小時，且應後在不超過 25° C 下保存最長 4小時的使用中安定性試驗條件下。證實其化學及物理方面的使用中穩定性（從最初的小瓶穿刺開始），就微生物學觀點來看，本藥經調配並稀釋後應立即使用，除非在經控制及驗證的無菌條件下進行配製和稀釋。若未立即使用，應由使用者負責控制於使用前須遵守使用中保存時間及條件，並不得超過上述規定，輸液注射針筒（Infusion syringes）：已確立在不超過25° C 下，使用中化學和物理安定性可長達6小時(從最初的小瓶穿刺開始)，就微生物學觀點來看，此藥品應立即使用，除非在受控和經過驗證的無菌條件下進行調配和稀釋。若未立即使用，應由使用者負責使用前的保存時間及條件，不應在不超過 25° C 下放置超過 6 小時。【仿單版本日期】SPC 20241021-2

【處方資訊摘要核准日期】2025 年 4 月 1 日

此為處方資訊摘要，完整處方資訊請詳閱仿單（版本：SPC 20241021-2）

本內容專為提供予專業醫療人員而準備，且部分內容可能涉及藥品資訊，僅提供給有意願獲取相關內容之專業醫療人員，且受著作權及其他智慧財產權保護，非專業醫療人員請勿觀賞或閱覽，請勿任意複製、轉載或分享於其他大眾媒體平台。

E. coli, Escherichia coli; K. pneumoniae, Klebsiella pneumoniae; P. aeruginosa, Pseudomonas aeruginosa.

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PP-ZVA-TWN-0223-202504

OPDIVO® 併用 fluoropyrimidine 及含鉑化學治療適用於治療晚期或轉移性，且不具有 HER2 過度表現的**胃癌或胃食道癌或食道腺癌**的病人

OPDIVO® Abbreviated Prescription Information (API)

[禁忌症] 無相關禁忌症。 [警語及注意事項] • 使用OPDIVO作為單一藥物或併用其他藥物治療有可能發生定義為需要以皮質類固醇治療且無明顯其他病因之免疫媒介性肺炎(曾通報死亡病例)、免疫媒介性結腸炎、免疫媒介性肝炎、免疫媒介性腎功能不全或腎炎(肌酸酐≥第2級升高)、免疫媒介性皮疹(包括SJS及TEN，曾有致死病例)、免疫媒介性腦炎、免疫媒介性內分泌病變如腦下垂體炎、腎上腺功能不全、自體免疫甲狀腺疾病及第1 型糖尿病。OPDIVO併用cabozantinib有可能導致肝毒性，其第3級和第4級ALT和AST增加的發生率高於單獨使用OPDIVO時。使用OPDIVO和cabozantinib合併療法時可能導致原發性或繼發性腎上腺功能不全。已有皮質類固醇抗藥性免疫媒介性結腸炎病人巨細胞病毒(Cytomegalovirus, CMV)感染/再活化的報告。• 應監測病人的肺炎、結腸炎、腦下垂體炎及腎上腺功能不全徵兆及症狀，甲狀腺功能及高血糖。應監測病人是否發生皮疹。開始OPDIVO併用cabozantinib治療之前及整個治療期間皆應定期監測肝臟酵素；相對於單獨使用OPDIVO，應考慮更頻繁地監測肝臟酵素。對肝臟酵素升高者，應中斷OPDIVO和cabozantinib治療，並視需要考慮使用皮質類固醇。視腎上腺功能不全疾病嚴重度，考慮暫停使用cabozantinib或OPDVIO任一藥物或兩種藥物。病人應於治療前及治療期間定期監測肝功能是否異常、是否有血清肌酸酐濃度上升。出現SJS或TEN之徵兆及症狀時，應暫時停用OPDIVO，並將病人轉介至專科進行評估及治療。應評估病人的神經學症狀。應密集追蹤病人移植相關併發症的早期症狀。有可能發生腫瘤出血，此與腫瘤消退/壞死有關。• 其他免疫媒介性不良反應 在OPDIVO作為單一藥物或併用Ipilimumab治療的臨床試驗中，曾出現下列具臨床意義的免疫媒介性不良反應：心肌炎、橫紋肌溶解症、肌炎、葡萄膜炎、虹膜炎、胰臟炎、腦膜炎、臉部及外展神經輕癱(paresis)、髓鞘脫失(demyelination)、脊髓炎(myelitis)、風濕性多發性肌痛、自體免疫神經病變、急性多發性神經炎(Guillain-Barré syndrome)、腦下垂體功能低下症、副甲狀腺低下症、全身發炎反應症候群、胃炎、十二指腸炎、類肉瘤病(sarcoidosis)、組織細胞壞死性淋巴炎(菊地氏病)(Kikuchi lymphadenitis)、運動功能障礙、血管炎、再生性不良貧血、免疫性血小板低下紫斑症、心包膜炎、肌無力症、噬血球性淋巴組織球增生症(hemophagocytic lymphohistiocytosis) 、實體器官移植排斥反應，其他移植(包括角膜移植)排斥反應及自體免疫溶血性貧血。若觀察到類原田氏症(Vogt-Koyanagi-Harada-like syndrome)可能需要接受全身性類固醇治療以降低永久性視力喪失之風險。 • 輸注反應 接受OPDIVO治療病人其嚴重輸注反應的發生率小於1.0%。 • OPVIDO治療後之異體造血幹細胞移植(HSCT)併發症在PD-1受體阻斷抗體治療前或後接受異體造血幹細胞移植(HSCT)之病人曾發生致死或其他嚴重併發症。 [懷孕及胚胎毒性] 應告知孕婦OPDIVO對胎兒的潛在風險。應告知具有生育能力的婦女在接受OPDIVO治療期間至OPDIVO最後一劑用藥後至少5個月內，需採取有效的避孕措施。[腫瘤出血] 有可能發生腫瘤出血，此與腫瘤消退/壞死有關。 [**患有多發性骨髓瘤的病人在使用**thalidomide衍生物和dexamethasone治療的過程中加入OPDIVO會使其死亡率上升] PD-1或PD-L1抑制性抗體未核准於併用thalidomide衍生物和dexamethasone。[授乳] 目前尚不清楚OPDIVO是否會分泌至人體乳汁中。應告知婦女在OPDIVO治療期間停止哺乳。

OPDIVO® 仿單

本藥限由醫師使用，處方資訊摘要，使用前請詳閱說明書、警語及注意事項詳細處方資訊備索
(詳細內容請參照衛生福利部核准之完整產品仿單)
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OPDIVO® (nivolumab)
INJECTION FOR INTRAVENOUS USE 10 mg/mL

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