HONG KONG PHARMACEUTICAL JOURNAL

VOL 31 NO 1 Jan - Apr 2024 ISSN 1727-2874

Hong Kong Pharmacy Conference 2024

24 – 25 February 2024

RE-IMAGINE PHARMACY – Harnessing Innovation, Embracing Diversity

The Pharmaceutical Society of Hong Kong
The Practising Pharmacists Association of Hong Kong
The Society of Hospital Pharmacists of Hong Kong

Edited and published by
The Pharmaceutical Society of Hong Kong
The Practising Pharmacists Association of Hong Kong
The Society of Hospital Pharmacists of Hong Kong

Vol. 31 Supplement 1
Jan - Apr 2024

Welcoming Message

Dear Colleagues,

On behalf of the Organizing Committee of the Hong Kong Pharmacy Conference 2024, it is my great honor and pleasure to extend a warm and heartfelt welcome to all of you attending our annual conference. We are delighted to have you here as we embark on this transformative journey together.

The field of pharmacy is undergoing a remarkable transformation, driven by innovation, diversity, and the need for change. The rapid development of medical technology, including disruptive technologies and emerging trends such as artificial intelligence, ChatGPT, and virtual clinical pharmacy, are shaping the future of healthcare and the pharmaceutical industry. By embracing these new technologies and focusing on digital health, the pharmacy industry can transform how clinical services are provided. The theme of this year's conference, **"Re-Imagine Pharmacy – Harnessing Innovation, Embracing Diversity"** reflects the significant changes and opportunities that the field of pharmacy is experiencing in response to the rapidly changing healthcare landscape, improve patient care, and contribute to a better healthcare model. We hope that this conference will provide a platform for the profession to share experiences and lessons learned, discuss the challenges ahead, and share insights on how we can sustain and advance pharmaceutical care.

Programme Day 1 will feature key opinion leaders addressing topics such as strategic purchasing and its significance in future pharmaceutical service models and the future of healthcare powered by artificial intelligence. Programme Day 2 will be structured into three concurrent streams which cover Innovation & Technology, Advancement in Drug Regulation, Clinical Evidence Application, Primary HealthCare, Ambulatory Care Services, Application of Advanced Therapy and many more. It promises to be an inspiring and eye-opening conference for the pharmacy profession.

Last but not least, your participation is crucial to the success of our meeting. I am sure the conference will be a rewarding experience for you.

Yours Sincerely,

Professor Joan Zuo
Chairlady, Organizing Committee
Hong Kong Pharmacy Conference 2024

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Theme Speech 1
Strategic Purchasing - What Does It Mean in Future Pharmaceutical Service Models?

CHEUNG, Wai-lun
Director of Strategic Purchasing Office, Health Bureau, The Government of the HKSAR, Hong Kong

Hong Kong healthcare system is ranked as one of the most efficient and effective systems in the world. However, system sustainability is always a major concern. To complement the current healthcare system, it is the Government's policy intent to use strategic purchasing as a tool to bridge the segmented public and private sectors. Through strategic purchasing, a range of differential healthcare products in the form of Strategic Purchase Programmes having differential copayment and subsidies will be developed to offer greater choices and better continuity of care in suiting individuals' personal health needs, preference and affordability. Strategic purchasing will adopt incentive mechanisms in encouraging healthcare service users and providers to use and provide evidence-based healthcare service appropriately to produce targeted healthcare outcomes. The developing Community Drug Formulary and the Community Pharmacy Programme is going to create opportunities for engineering new pharmaceutical service models improving drug access to the Hong Kong community.

Theme Speech 2
Advancing Comprehensive Medication Management Services in U.S. Community Settings

CHEN, Steven
Associate Dean for Clinical Affairs, School of Pharmacy, University of Southern California, USA

The U.S. healthcare system is the most expensive in the world, yet ranks last in healthcare quality among developed countries. A major contributor is suboptimal use of medications, with significant disparities between well-insured and underinsured populations. While all pharmacy schools in the U.S. exclusively confer the Doctor of Pharmacy degree, which requires extensive clinical training, pharmacists remain the only health profession that lacks provider status from the federal government. As a result, despite strong evidence of the value pharmacists generate when managing medications for chronic conditions, limited opportunities exist for pharmacists to bill for such services. This presentation will summarize community-based initiatives to address healthcare and social needs through Comprehensive Medication Management (CMM), featuring a barbershop-based and a community pharmacy-based network. The latter, the California Right Meds Collaborative (CRMC), is a partnership between health plans, community pharmacies, and medical clinics that supports CMM through value-based payments. CRMC leverages several key strengths of community pharmacies including accessibility, trust, and cultural and linguistic alignment. Critical success factors will be discussed.

Theme Speech 3
Artificial Intelligence and the Future of HealthCare

ZHANG, Shaoting
Vice President of SenseTime, Mainland China

This presentation delves into the existing challenges of current healthcare artificial intelligence, such as the difficulty in covering rare diseases, high annotation costs, and weak knowledge transferability. It introduces a research approach and pathway for developing universal medical AI foundation models based on large-scale data that spans modalities, hospitals, and disease types. Additionally, it will introduce the diverse AI clinical applications developed by SenseTime based on the foundation models. These applications cover various scenarios, including AI-aided medical image diagnosis, smart outpatient services, smart medication consultation, and health management. These applications have been successfully implemented in many hospitals.

Theme Speech 4
Latest Development in Drug Regulatory Enhancement in Hong Kong

CHAN, Frank
Assistant Director of Health (Drug), Department of Health, The Government of the HKSAR, Hong Kong

Hong Kong has a comprehensive and robust system of pharmaceutical regulations, which are recognized by national and international regulatory authorities. The regulations cover various aspects, including clinical trial approvals and drug registration before market launch, as well as post-marketing drug surveillance and market monitoring. Recently, there are enhancement on the drug regulatory controls such as restrictive sales of antipyretic substances and proposal on control of medical gases as pharmaceutical products.

In the 2023 Policy Address, the Chief Executive announced some initiatives related to drug regulatory enhancement such as (i) set up a preparatory office for the Hong Kong Centre for Medical Products Regulation (CMPR) to study the potential restructuring and strengthening of the current regulatory and approval regimes for medicine, medical devices and medical technology. The office will also put forward proposals and steps for the establishment of the CMPR which will be a step towards the transition to the "primary evaluation" approach in approving applications for registration of pharmaceutical products, and explore the upgrading of the CMPR as a standalone statutory body in the long run; (ii) accession to the International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use to pave the way for developing Hong Kong into an internationally recognised regulatory authority for drugs and medical devices in the long run; and (iii) establish the new "1+" mechanism to expedite the approval of new drugs for life-threatening or severely-debilitating diseases with local clinical data support. It is expected that with the above enhancement, the drug approval mechanism in Hong Kong would be widely recognized internationally and by the Mainland.

Innovation & Technology: Designing and Implementing a Virtual Cardiac Hospital in the Home Pharmacy Service: An Innovative Approach

LAU, Jasmine
Clinical Pharmacist, Austin Health, Australia

Background: At a tertiary hospital in Melbourne, Australia, a virtual Cardiac Hospital in the Home (CHITH) service was established in 2022. The multidisciplinary CHITH team consisted of cardiologists, cardiology nurses and a pharmacist.

Aim: To design, implement and evaluate a pharmacy service for CHITH patients.

Methods: Design of this pharmacy service involved mapping a patient's journey from the inpatient cardiology ward where patients were enrolled to CHITH through to admission and then discharge from CHITH. Critical time points in the patient's journey where medication errors could occur or where medication management could be optimised were identified.

The CHITH pharmacist completed medication reconciliation on admission to CHITH, attended daily virtual ward rounds (VWRs), assisted in prescribing, provided suggestions to improve medication regimes, contributed to discharge summaries, organised medication supply and provided medication information to patients.

Activity data was collected prospectively on medication reconciliation, attendance on VWRs, facilitation of medication supply, provision of medicine information, recommending monitoring or change of therapy, and documentation in CHITH discharge summaries.

Results: The CHITH pharmacist attended 241 VWRs for 140 patients enrolled between March to September 2022. Medication reconciliation was completed for all patients, 91% (127/140) had medications documented and verified on discharge summaries, 42% (59/140) received recommendations regarding change of therapy, 24% (34/140) required facilitation of medication supply, 55% (77/140) were provided with medication information, and 2 patients received monitoring recommendations from the CHITH pharmacist.

Discussion: An innovative pharmacy service was developed and implemented for CHITH patients which improved patient care and medication safety.

Innovation & Technology: Artificial Intelligence in Pharmacy: From Discovery to Whole Person Care

HO, Joshua
Associate Professor, School of Biomedical Sciences, LKS Faculty of Medicine, The University of Hong Kong, Hong Kong

Artificial intelligence (AI) is accelerating the pace of drug discovery and medical research as well as widespread adoption of digital and mobile health technology in a clinical and community health context. In terms of medical research, AI allows rapid design and *in silico* evaluation of new drug candidates or molecular perturbations for cell therapy. In terms of personalised care, AI enables smartphones or wearable devices to support continuous and non-invasive health data collection, and personalised health advise via AI chatbots. In terms of health service provision, AI allows real-time analysis of electronic health records to discover trends and patterns at the community scale, which can help optimise provision of care at the community level. In this talk, we will give examples of how AI is making an impact on each of these fronts and how it is shaping the practice of pharmacy in the future.

Innovation & Technology: Future Pharmacy and Artificial Intelligence

BAKKER, Michael
Digital Health Portfolio Lead, SA Pharmacy, Australia

Technology continues to offer a promising solution to healthcare barriers. Within the context of hospital pharmacy service delivery there are many areas that technology has shaped or now drives service operations. Despite the reliance on technology there are many parts of our industry that remain highly inefficient and require a extreme cognitive load to complete. This leads to competing demands for the workforce and is a barrier to the continued expansion of pharmacy services. At the other end of the dilemma is slow pace that new pharmacists are able to be trained and employed, with the pipeline for education and competition for resources in health care spending likely resulting in only modest forecast workforce growth in the near term. By developing an understanding of how technology is being used at the cutting edge of innovation and how the pharmacy industry can develop the capability to influence development we will be able to realise the benefits within the industry to provide safer, more efficient care to patients.

Clinical Evidence Application: Diagnostic and Clinical Needs for Therapeutic Drug Monitoring of Antimicrobials

LIM, Tze-peng
Senior Principal Pharmacist Researcher, Singapore General Hospital, Singapore

Sepsis remains a significant cause of morbidity and mortality worldwide due to antimicrobial resistance and limited new antibiotics, especially in patients with Gram-negative bacteria (GNB) infections. Repurposing old antibiotics is necessary, but dosing often fails to achieve effective concentrations due to haemodynamic changes in septic patients. The “one size fits all” dosing principle for difficult-to-treat GNB infections is no longer viable. Therapeutic drug monitoring (TDM) becomes crucial to ensure adequate dosing and combat treatment failure, resistance emergence, and antibiotic toxicity in septic patients. Mechanisms for optimizing the antibiotic concentrations within the individual patient are under development. However, several barriers remain in realizing true individualisation of therapy. We will examine the current state of antimicrobial TDM, emphasizing in the regional context.

Clinical Evidence Application: How Do I Adapt the Guidelines, Yet Individualize My Patient's Care?

JONES, Ellen
Assistant Professor, Harding University College of Pharmacy, USA

In the realm of clinical practice, guidelines serve as frameworks for treatment. However, instances arise where patients present complex conditions that do now fall within the expected norms. This presentation explores a compelling case study highlighting this phenomenon, where the patient's medical history complicates guideline-based treatment choices.

Exploring this case study, the focus lies on the balance between standardized guidelines and personalized patient care. Clinical treatment guidelines provide recommendations that can be utilized in practice and can give the clinician confidence that a treatment plan is based on evidence and expert opinion. However, not all patients fit completely within available guidelines.

The clinician's challenge involves assessing the patient's data, encompassing medical history, contraindications, and individual needs. Emphasis is placed on the multifaceted considerations needed to craft a tailored, patient-centered care plan.

Through this exploration, the presentation seeks to illuminate the complexities inherent in clinical decision-making. It showcases the important role of nuanced assessment and thoughtful integration of patient-specific information in developing interventions aligned with the patient's well-being.

This presentation will take a look into this thought-provoking case study, exploring the patient-specific data to create an optimized, individualized care plan utilizing conventional guidelines while also addressing the unique needs and circumstances of the patient.

Clinical Evidence Application: Leveraging Patient-Reported Outcomes in Patient Registries for Enhanced Real-World Evidence (Sponsored Lecture by AstraZeneca Hong Kong Limited)

DONG, Dong
Assistant Professor, JC School of Public Health and Primary Care, The Chinese University of Hong Kong, Hong Kong

The integration of patient-reported outcomes (PROs) into patient registries offers a pivotal opportunity to deepen our understanding of treatment impacts from the patient's perspective. This presentation highlights the importance of PROs in obtaining detailed insights into quality of life, treatment adherence, patient satisfaction, and the psychosocial factors influencing these aspects. These patient-centric measures provide a nuanced view of therapeutic effectiveness and challenges, which are often not fully revealed through traditional clinical metrics.

PROs enrich patient registries with valuable data that can inform a wide range of healthcare decisions and policy-making, including applications to Phase 4 clinical trials. This approach ensures that the long-term safety, efficacy, and patient experience of therapies are continually monitored and optimized in real-world settings.

Highlighting the implementation in Hong Kong and mainland China, the presentation illustrates how incorporating PROs into rare disease registries can significantly enhance patient care. By prioritizing the patient voice, healthcare providers and stakeholders gain a more holistic understanding of treatment outcomes, leading to tailored care strategies and improved overall health outcomes for the rare disease community. This patient-centered approach in collecting and utilizing real-world evidence paves the way for more informed and compassionate healthcare practices.

Innovative Service Model: Scope of Services in Rheumatology Clinical and Practical Tips on Patient Assessment

GONG, William
Associate Professor, Department of Clinical Pharmacy, University of Southern California, USA

Rheumatoid arthritis is a debilitating chronic autoimmune, inflammatory condition if not managed aggressively can lead to decreased quality of life and increased mortality. Poorly managed rheumatoid arthritis not only leads to progressive joint damage and deformity but is associated with various comorbidities. Aside from non-pharmacological measures, early drug therapy treatment to 1) disease remission or 2) low disease activity with the various disease-modifying antirheumatic drugs (DMARDs) including conventional synthetic disease-modifying antirheumatic drugs (csDMARDs), biologic DMARDs (bDMARDs), and targeted synthetic DMARDs (tsDMARDs) and the use of palliative agents such as NSAIDs and glucocorticoids is the goal. This is essential to prevent further joint damage and to have improved patient outcomes. Understanding the pathogenesis, and clinical presentation of rheumatoid arthritis, and using the ACR disease activity calculators including 1) 28-joint Disease Activity Score (DAS28-ESR/CRP), 2) Clinical Disease Activity Index (CDAI), 3) Simplified Disease Activity Index (SDAI), 4) Routine Assessment of Patient Index Data 3 (RAPID3), and 5) Patient Activity Scale-II (PAS-II)., health care providers can have a large impact in effecting positive patient outcomes. In a team effort working alongside with the rheumatologist as the leader of the heath care team, pharmacists can counsel the rheumatoid arthritis patient directly in the clinical setting or virtually via telehealth in performing patient assessments along with comprehensive drug therapy review and monitoring in improving the outcomes for the patient with rheumatoid arthritis.

Innovative Service Model: Evaluating the Impact of Pharmacists Providing CMM on Healthcare Quality, Cost, and Patient and Physician Satisfaction

CHEN, Steven
Associate Dean for Clinical Affairs, School of Pharmacy, University of Southern California, USA

Pharmacists lack federal recognition as healthcare providers in the U.S. and, as a result, are unable to bill for outpatient clinical services. Consequently, rigorous analyses of clinical pharmacy services are essential to justify payment; pretest-posttest comparisons are insufficient. This presentation will share experience with scientific evaluations of large outpatient clinical pharmacy programs and their impact on quality, cost, and patient and provider satisfaction. Rather than using retrospective randomization, the approaches shared will be applicable to ongoing patient care programs. Access to key data elements will be emphasized, as well as completeness, accuracy, and timeliness of documentation.

Innovative Service Model: Local Pharmacist Service Sharing: Heart Failure Clinic

IP, Rosanna
Pharmacist, Tuen Mun Hospital, Hong Kong

Hong Kong has a high prevalence of heart failure (HF), affecting 1-2% of the total population. It is a debilitating disease with high mortality and readmission rate. Although evidence- based HF treatment is well-developed, local study showed that the uptake of the guideline- directed medical therapy (GDMT) in real world was disappointing. Also, lengthy follow-up period and poor patient awareness on self-care are main gaps in HF management. Therefore, a HF program with pharmacist contribution has implemented in a local hospital, aiming to bridge these gaps.

A holistic care is developed for the whole patient journey, from hospital stay to ambulatory care. Upon patient discharge, pharmacist will provide medication reconciliation to identify drug-related problems and provide pharmacotherapeutic recommendations. In addition, pharmacist will provide patient education on the efficacy and safety of GDMT. Apart from standard care, pharmacist clinic will be arranged in-between physician consultation. Patients will be followed up by pharmacist every 4-6 weeks for monitoring of HF control and treatment response, including adverse drug reactions. GDMT will be titrated according to pre-defined protocol. Frequent pharmacist follow-up can also early identify improper medication use which exacerbates HF symptoms. Patients will be discharged from program after medications reached maximal tolerated dose.

From local experience, the integration of clinical pharmacist into HF management has reduced HF-related readmissions and improved overall patient outcomes with the effort of early-optimization of GDMT and enhancement of compliance to drug, fluid and salt restriction.

Advancement in Drug Regulation: Worldwide Landscape on Principles and Regulatory Evaluation

GUKASYAN, Hovhannes
Associate Professor, Department of Pharmacology and Pharmaceutical Sciences, University of Southern California, USA

Prescription drugs are highly regulated in most progressive countries via established processes for clinical safety and efficacy testing, followed by marketing approval from sponsors, as a general consequence of publics' acceptance of the critical importance of both (i.e., prescription drugs and regulation thereof) in health, safety, as well as equity considerations. Regulatory agencies assess preclinical and clinical trials data in prescribed submissions or applications and monitor impact of drugs post approval through pharmacovigilance and adverse event reporting. Recent approvals and trends in agencies such as the Food and Drug Administration (FDA, USA), Health Canada (HC), the European Medicines Agency (EMA), National Medical Products Administration (NMPA, China), Ministry of Food and Drug Safety (MFDS, South Korea), Pharmaceuticals and Medical Devices Agency (PMDA, Japan), and the Taiwan Food and Drug Administration (TFDA) can be expanded and detailed in order to assure safety and efficacy for citizens of respective countries. Regulatory policy of prescription drugs across therapeutic areas of (unmet) need strive towards strengthening benefit to risk balance. Concurrent evidence suggests agencies, their resources, and structured framework of assessment methodology have grown and diversified over recent years to decades. Overall, several public sources and repositories exits across major global regulatory agencies which facilitate relative transparency of mechanisms evaluating risk to benefit balance management through thorough documentation of key questions, critical evidence, and remaining uncertainty used in the regulatory decision-making processes. Some progressive case studies from the FDA exemplify current landscape in regulatory evaluation principles.

Advancement in Drug Regulation: Overview on Drug Evaluation Mechanism in Singapore

LEONG, James
Head of Health Products & Regulatory Science, Centre of Regulatory Excellence, Duke-NUS Medical School, Singapore

The health products regulatory system in Singapore has undergone multiple innovations across the past few decades, and most notably the implementation of a risk-based approach for market approvals. This had allowed the regulatory authority to increase their efficiency in managing the workload, while building capacity for post-market vigilance. Besides the principles of the risk-based approach, operational concepts that are critical to successful implementation will also be shared, as well as factors that other similar regulatory authorities should take into account when considering such regulatory reliance mechanism.

Advancement in Drug Regulation: HK Regulatory Affairs Landscape – A Journey from the Past to the Future

NG, Alan
Head, Regulatory Affairs, GlaxoSmithKline Hong Kong, Hong Kong

Regulatory affairs (RA) is a profession developed from the desire of health authorities to protect public health by ensuring companies responsible for drug discovery, manufacturing and marketing of the product comply with legal obligations and respective guidelines. The professionalism of RA is essential to ensure the safety, efficacy and quality of pharmaceutical products comply with high standards, which eventually benefiting public health and welfare.

Significant regulatory advancements have taken place Worldwide and in Asia-Pacific (APAC) region over the past decade. In Hong Kong, the 2023 Policy Address has identified several focuses for advancing drug regulation, including introduction of 1+ registration mechanism, establishment of the Centre for Medical Products Regulation (CMPR), primary drug evaluation pathway and participation in the International Council for Harmonisation (ICH). These anticipated changes not only impact availability of treatment options but also have the potential to influence entire healthcare system. Therefore, understanding the associated global and local regulatory dynamics is of paramount importance for all healthcare professionals.

During this section, the presenter will cover the following topics: 1) The principles and frameworks of regulatory affairs; 2) Summarize evaluation process and findings on HK regulatory systems; 3) Reflect and compare HK requirements with APAC situations and Singaporean models; 4) Considerations for regulatory and clinical research advancements, potential changes, challenges and opportunities as HK moves towards becoming an innovation hub for biomedical companies; 5) Discuss on the implications for healthcare system and pharmacists in Hong Kong.

Primary HealthCare: District Health Centre Update: Co-care Model

CHAN, Victoria
Director, Primary Healthcare Office, Health Bureau, The Government of the HKSAR, Hong Kong

Abstract is not available

Primary HealthCare: Embracing the Diversified Service Models of the Community Pharmacy in Hong Kong

CHAN, Alice
Pharmacist, Health In Action Community Pharmacy, Hong Kong

Community pharmacies in Hong Kong are experiencing a significant transformation, evolving from traditional dispensing outlets to dynamic healthcare centers that offer a wide range of services. These include health screening, minor ailment services, medication management programs, and health promotion initiatives. This transformation is crucial to address the evolving needs of patients and to enhance the overall quality and accessibility of primary healthcare services in the community.

To ensure the delivery of high-quality care, it is essential to develop and implement comprehensive guidelines and training that clearly outline the roles and responsibilities of community pharmacists. These guidelines serve as a roadmap, defining the scope of practice for community pharmacists and providing directions on how to engage, assess, manage, and refer patients in community settings.

Moreover, guidelines and protocols play a pivotal role in aligning the scope of practice and improving communication. By adhering to consistent and standardized practices, community pharmacists can foster trust among clients and other healthcare providers. These guidelines ensure that pharmacists possess the necessary knowledge and skills to provide specific services, enabling effective communication of their capabilities to the community.

In conclusion, the evolving role of community pharmacies in primary healthcare presents an opportunity for collaboration and partnership among various stakeholders. By working together, we can fully leverage the potential of community pharmacies and play a more significant role in enhancing primary healthcare.

Primary HealthCare: Reimagine the Potential Pharmacist Development in Hong Kong: The Perspective from a Non-Governmental Organization

WAN, Alice
Chief Executive, Aberdeen Kai-fong Welfare Association (AKA), Hong Kong

In recent years, the role of pharmacists in Hong Kong has undergone significant evolution, extending beyond traditional dispensing and counseling duties. As the healthcare landscape becomes more complex, there is an urgent need to reimagine the potential development of pharmacists. This presentation offers the perspective of a non-governmental organization (NGO) on this crucial topic.

The aim of this presentation is to introduce the concept of an NGO-run community pharmacy and its differentiated role from the commercial sector. The NGO believes that pharmacists working in such community pharmacies have the opportunity to perform extensive roles, shedding light on the transformative impact they can have on the healthcare system, surpassing their current responsibilities. By harnessing the full potential of pharmacists, Hong Kong can enhance patient care, promote primary health, and optimize overall healthcare outcomes.

The presentation will explore several key areas for pharmacist development. Firstly, it will emphasize the importance of expanding the scope of practice for pharmacists, particularly in medication therapy management, chronic disease management, and immunizations. Secondly, the significance of interprofessional collaboration will be highlighted, recognizing the value of partnerships between pharmacists, nurses, and allied health practitioners.

Furthermore, the presentation will discuss the crucial aspect of continuous professional development for pharmacists. This will enable pharmacists to stay abreast of emerging healthcare trends, technological advancements, and evidence-based practices. Finally, the presentation will emphasize the importance of educating the public about the evolving role of pharmacists and their potential contributions to healthcare.

In conclusion, this presentation from an NGO underscores the vital role that community pharmacists can play in transforming healthcare delivery, improving patient outcomes, and advancing primary health in Hong Kong.

Ambulatory Care Services: Low Risk and High Reward: Outpatient Allergy De-labeling Opportunities

MACBRAYNE, Christine
Clinical Pharmacy Manager, Children's Hospital Colorado, USA

Penicillin allergy is reported in up to 10% of the general population; however, 90% of patients reporting an allergy are tolerant. Patients labeled as penicillin allergic have been known to have longer hospital stays, increased exposure to suboptimal antibiotics, and an increased risk of methicillin-resistant Staphylococcus aureus and Clostridioides difficile infections. Identifying patients with a penicillin allergy where the allergy label can be safely and confidently removed has the potential to improve overall patient care. There are several mechanisms by which we can delabel patients of their penicillin allergy including: removing the inappropriately added label for someone who does not actually have an allergy (e.g., family history only), skin testing or oral provocation challenge. Skin testing for penicillin allergies can be used to rule out immunoglobulin E (IgE) –mediated reactions; however, recent findings reveal that, among low-risk patients who are unlikely to have an IgEmediated allergy on the basis of clinical history, skin testing can safely be deferred while proceeding directly to an oral provocation challenge. The overarching goal is to remove the penicillin allergy from those patients who are not truly allergic to allow the most appropriate antimicrobial to be used.

Ambulatory Care Services: Penicillin Allergy De-labelling on the Fast Track: A Pharmacist-led Clinic in a Teaching Hospital of Hong Kong

LI, Andrew
Clinical Pharmacist, Queen Mary Hospital, Hong Kong

Penicillins are the most commonly prescribed class of antibiotics and serve as first line therapy for numerous acute infections. Meanwhile, penicillin allergy is also the most commonly reported drug allergy. Nevertheless, more than 95% of patients labelled with penicillin allergy ultimately are able to tolerate penicillins. Incorrect allergy labels bring significant negative impacts on clinical outcomes. Removal or modification of penicillin allergy labels reduces second-line antibiotic use, acquisition of multi-resistant organisms, prolonged hospitalizations and readmissions. Clinical Pharmacists were trained to perform penicillin allergy delabelling service under the Hong Kong Drug Allergy Delabelling Initiative (HK-DADI). Referrals to QMH Allergists were further referred to the pilot Clinical Pharmacist-led allergy de-labelling service. The penicillin allergy history of the enrolled patients was assessed by Clinical Pharmacists. Patients were stratified into different risk categories. Low-risk patients would then receive skin tests and or drug provocation test by Clinical Pharmacists according to the HK-DADI protocol. The results of tests were then evaluated by Clinical Pharmacists. Those who have negative test result would have pharmacy counselling and have their allergy status delabelled by Allergist subsequently.

Ambulatory Care Services: Practical Skin Testing Workshop for Pharmacist

CHAN, Timo
Clinical Pharmacist, Queen Mary Hospital, Hong Kong
LI, Andrew
Clinical Pharmacist, Queen Mary Hospital, Hong Kong
WONG, Vincent
Clinical Pharmacist, Queen Mary Hospital, Hong Kong

This dynamic skin testing workshop will be the first-ever activity hosted at the region. The live instructors will deliver the practical skin testing skills in a very hands-on, interactive environment. All materials will be provided. The learning objectives are to:

- Perform a patient-specific comprehensive allergy assessment
- Evaluate the need for penicillin skin testing based on results of comprehensive allergy assessment
- Execute a penicillin skin test including skin prick test, intradermal test and patch test according to best practices
- Interpret results of a penicillin skin test according to best practices
- Justify the value of penicillin skin testing in acute care and ambulatory care settings

Application of Advanced Therapy: Clinical Application of CAR-T Cell Therapy: Promises & Challenges

LEI, Kenny
Consultant, Department of Clinical Oncology, Prince of Wales Hospital, Hong Kong

The introduction of chimeric antigen receptor (CAR) T-cell therapy has significantly changed the treatment for patients with haematologic malignancies. The initial CAR T studies in relapsed or refractory acute lymphoblastic leukaemia and aggressive B-cell lymphomas remarkable efficacy in patients with otherwise dismal outcomes and no viable treatment option. Since the first CAR T cell product was approved for use in young patients with relapsed or refractory B-cell acute lymphoblastic leukaemia in 2017, there has been five additional CAR T products for commercial use and expansion of indications. However, serious toxicities associated with CAR-T cell therapy such as cytokine release syndrome and neurotoxicity remain a concern. In addition, a significant proportion of CAR T responders will eventually relapse. As ongoing studies are exploring new strategies to overcome the barriers to CAR-T treatment and to improve the safety and efficacy profile, it is likely that more improved CAR T products will be available for clinical use with wider indications in the future. To optimize the use of CAR-T cell therapy in the clinic and community setting, effective networking between referring units and treatment centres is essential to ensure early referral and selection of potential patients at the appropriate time point in the disease journey.

Application of Advanced Therapy: Gene Therapy for Neurological Disorders and Experience in Hong Kong

CHAN, Sophelia
Clinical Associate Professor, Department of Paediatrics and Adolescent Medicine, The University of Hong Kong, Hong Kong

Gene therapy has emerged as a promising approach for the treatment of rare neurological disorders, offering the potential to address the underlying genetic causes of these conditions. Adeno-associated virus (AAV) vectors have become the preferred delivery vehicle for gene supplementation therapies, due to their ability to transduce both dividing and non-dividing cells, which allows for targeting a wide array of cells in the central and peripheral nervous system. Currently there are three FDA approved targeted gene therapy for spinal muscular atrophy (SMA), Duchenne muscular dystrophy (DMD) and cerebral adrenaleukodystrophy. Unlike traditional drug development with small molecules, therapeutic profiles of AAV gene therapies are dependent on both the AAV capsid and the therapeutic transgene. In this rapidly evolving field, numerous clinical trials of gene therapies for neurological disorders are ongoing. Knowledge is growing about factors that impact the translation of preclinical studies to humans, including the administration route, timing of treatment, immune responses and limitations of available model systems. In this talk, the current state of AAV-mediated targeted gene therapy for neurological disorders, including critical factors for optimizing the safety and efficacy of treatments, as well as unmet needs in this field with be explained. In addition, the local experience of our SMA and DMD patients treated with experimental or FDA-approved targeted gene therapies will be shared.

Application of Advanced Therapy: Opportunities and Challenges in Developing Engineered Osteochondral Tissue (eOCT) towards Tissue Engineering-based Advanced therapeutic Products (ATPs)

CHAN, Barbara
Au Chik Ko and Au Leung Shook Yin Professor, Department of Biomedical Engineering, The Chinese University of Hong Kong, Hong Kong

Tissue engineering and regenerative medicine aim to build biological substitutes of defective tissues from scratch. Based on previous research and development of a few unique technologies including microencapsulation and complex tissue engineering, an autologous mesenchymal stem cell (MSC)-based engineered osteochondral tissue (eOCT) was developed for repairing traumatic cartilage injuries. Pre-clinical investigations showed promising outcomes with rapid and sustained regeneration of hyaline cartilage. Under the current regulatory framework, eOCTs represent tissue engineering-based Advanced Therapy Products (ATP). By collaborating with a cross-disciplinary group of scientists, engineers, surgeons and manufacturing professionals, and with industrial partners, we have developed a GMP compliant manufacturing process for the autologous MSC-based eOCT, and are preparing for the first-in-human clinical study on the safety profile of the eOCT in treating patients with traumatic cartilage defects. Here, the development process of the eOCT, the translational gaps of ATPs, and the challenges we faced during GMP manufacturing and preparation for the FIH trial, will be discussed.

GBA Development: Hospital Accreditation Updates in the Greater Bay Area

CHAN, Yuk-sim
Honorary Consultant, Shenzhen Hospital Accreditation Research Center, Hong Kong

In December 2020, the Shenzhen Hospital Research Center (SHARC) was established under the direction of the Shenzhen Municipal Health Commission. Based on the International Society for Quality in Health Care's (ISQua) standard-setting principles, and with incorporation of features from the national "Tier III Class A" hospital accreditation standards (such as multidimensional accreditation, quality assessment with healthcare indicators, case tracking, and system tracking), the SHARC has developed the China's International Hospital Accreditation (CIHA) Standards 2021. These standards integrated both international and national standards and have successfully obtained accreditation from ISQua.

In line with the policy regarding hospital accreditation in the Chief Executive's Policy Address of 2022 and 2023, the Hospital Authority (HA) will resume the "Hospital Accreditation Program" by adopting the CIHA standards at Pamela Youde Nethersole Eastern Hospital and Prince of Wales Hospital in 2023-24, with a view to ensuring that the hospitals are on par with international standards, enhancing the uniformity of hospital accreditation standards as well as the quality and safety of healthcare in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA), and aligning with the national healthcare system.

Hong Kong's healthcare system is world-renowned, with experience in international hospital accreditation, and the development of healthcare policies and industry standards is aligned with international practices. The adoption and implementation of the CIHA standards and the resumption of the Hospital Accreditation Program by the HA will not only ensure that the management and the service standards as well as healthcare quality of hospitals are on par with international standard, but also complement the integration within the GBA and promote uniformity of the healthcare services in the GBA, as well as align with the national healthcare services in the GBA.

GBA Development: Meeting the Unmet Needs: The Innovative Role of Surgical Pharmacist

ZHENG, Zhihua
Vice President, Guangdong Pharmaceutical Association, Mainland China

The more pharmacists' knowledge complements doctors' knowledge, the greater role pharmacists can play in clinical practice. Physicians use drugs to treat disease, therefore they are always familiar with the drugs used in their specialties. Conversely, most surgeons are more interested in and focus on surgical procedures rather than medication, and irrational drug usage can be more common in surgical departments than in internal medicine departments. For that reason, surgical departments may be a place in which pharmacists might play an important role.

In 2018, the Guangdong Pharmaceutical Association (GDPA) appealed to creating surgical pharmacist positions in hospitals and defined their responsibilities as taking care of the whole process of medication management during the perioperative period and beyond, acting as a bridge between surgeons and physicians.

Surgical pharmacists play a unique role in clinical practice, so they must have a unique knowledge system, which the GDPA named "surgical pharmacy". The GDPA defined surgical pharmacy as a specialty that studies the characteristics of surgical medication, seeks the most suitable medication therapy and addresses medication-related problems for surgical patients in order to improve clinical outcomes. Focus on perioperative medications, such as anti-infection, anti-thrombosis, analgesia, nutrition, blood sugar, blood pressure, fluid, nausea and vomiting management, and glucocorticoid use.

Many large hospitals in Guangdong province now have established surgical pharmacist positions and surgical pharmacists are well accepted by both surgeons and physicians. We commend the specialty of surgical pharmacy, and encourage other countries around the world to build on the foundations laid by the GDPA.

GBA Development: Illustration of Surgical Pharmacist's Role by Case Sharing

LI, Xiaoyan
Director, Department of Pharmacy, The Sun Yat-sen Memorial Hospital of Sun Yat-sen University, Mainland China

The concept of surgical pharmacist was first proposed by Guangdong Pharmaceutical Society. How did pharmacists play their action. This report would be shared from three aspects: 1. The knowledge system of surgical anticoagulant pharmacists; 2. Practical cases of surgical anticoagulant pharmacists; 3. Surgical pharmacy-related results. Surgical Pharmacist role was to attend multimodal perioperative care pathways designed to achieve early recovery for patients undergoing major surgery, help doctor address these key factors, clarify how they interact to affect patient recovery and provide medication pathways to all involved in perioperative care, help pharmacists to work as a well-coordinated team to provide the best care. The risk of thrombus in patients during the perioperative period was significantly increased. Therefore, for perioperative patients, the risk of embolism and bleeding should be fully weighed, and the management of perioperative antithrombotic drugs should be determined based on the evaluation results. Appropriate thromboembolic prevention measures should be taken, which was of great significance for ensuring the safety of perioperative patients and reducing the occurrence of thromboembolic complications. Surgical anticoagulant pharmacists needed consider multiple factors comprehensively, such as reading drug indications, learning the patient's past history, evaluating the risk of anticoagulation bleeding based on the patient's condition, selecting appropriate drugs and doses, determining anticoagulation targets and treatment courses.

Plenary Session:
Reimagine the Opportunities and Challenges in Pharmacy

In the past few decades there have been big fluctuations in the demand and supply of pharmacists in Hong Kong. In 2023 there appeared to be a beginning of another wave of increased demand due to new opportunities in primary healthcare and other new services. On the other hand, there seems to be a drainage of pharmacy workforce due to various reasons. So, what will be in store for us in the coming few years? Our panellists will discuss the impact of various opportunities - such as new service models, innovative technologies, change in regulations in pharmaceutical product registration, research on new drugs, artificial intelligence – on pharmacy practice and the new paradigm of clinical pharmacy service. The issue of what attributes pharmacists should possess to face these new challenges will also be examined. The panellists come from a diverse background of practitioners, academia, pharmaceutical industry, science and technology. They will shed light on how our service may evolve, what kind of new jobs would be coming, and how we could ride on the new wave.

Ab16

Drug Utilization Evaluation of Sacubitril/Valsartan in Chronic Heart Failure: A Retrospective Study in a Local Tertiary Hospital

SIN, Ho-yin[1]; IP, Nga-suet[1]; YOUNG, Wai-man[1]; CHU, Lai-ming[1]; CHU, Hei-yu[2]; YAM, Ping-wa[2]; SUN, Wai-yan[3]

[1] Department of Pharmacy, Tuen Mun Hospital
[2] Department of Medicine and Geriatrics, Tuen Mun Hospital
[3] School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong

Objectives: To establish the clinical effectiveness of sacubitril/valsartan by comparing pre-initiation and post-initiation hospitalization data and left ventricular ejection fraction (LVEF) in the local population

Methods: The study included all patients with sacubitril/valsartan initiated from October 1, 2017 to December 31, 2021 in Tuen Mun Hospital, except those who discontinued the medication. A total of 487 patients were included in this retrospective study. A quantitative analysis was conducted to assess the change in hospitalization rates and differences in left ventricular ejection fraction (LVEF). Differences between pre-initiation and post-initiation were evaluated in terms of mean reduction and relative risk reduction (RRR). Subgroup analysis was performed to assess the effects for various baseline characteristics.

Results: The study indicated that the use of sacubitril/valsartan reduced the mean of all-cause hospitalization events by 0.70; $t(486) = 6.826$, $p < .001$. A 0.80 CV-cause hospitalization reduction was observed in the post-initiation group ($M = 0.64$, $SD = 1.51$) compared to the pre-initiation group ($M = 1.44$, $SD = 1.51$); $t(486) = 10.689$, $p < .001$. 43.5% all-cause hospitalization RRR and 61.3% CV-cause hospitalization RRR were found in the post-initiation group. A 12% improvement in LVEF was observed following drug initiation. Subgroup analysis showed that drug effects were consistent in most of the subgroups, except patients with ischemic cardiomyopathy and the subgroup of patients with LVEF>40% might experience a statistically significant lower LVEF improvement.

Conclusions: Sacubitril/valsartan demonstrated its clinical effectiveness by reducing hospitalizations and improving LVEF. Its effectiveness was consistent across most of the subgroups. This study provides clinical evidence to support the use of sacubitril/valsartan as a special drug in a broader local population beyond current Hospital Authority drug formulary criteria.

Ab20

Pharmacy Co-Care with the Community: Pilot Study of a Multi-Disciplinary Antiepileptic Clinic to Support Patients with Epilepsy and their Caregivers

LEE, PH[1]; WONG, VKC[1]

[1] Department of Pharmacy, Queen Mary Hospital

Objectives: Medication non-adherence is a common issue among epilepsy patients and adversely affect treatment outcomes, exerting additional pressure on the healthcare system with increased unscheduled emergency department visits. This study aimed to evaluate the effect of multi-disciplinary support on adult epilepsy patients by improving their medication adherence.

Methodology: This was a prospective, non-experimental study of a multi-disciplinary epilepsy patient support programme consisting of pharmaceutical care provided by hospital pharmacist at recruitment and periodically thereafter by community pharmacists, and psychosocial support offered by medical social workers. Medication adherence measured by the Brief Medication Adherence Score (BMAS) was performed before and after the intervention. Drug-related problems (DRPs) identified by pharmacists were documented and characterised.

Results: 68 patients were recruited into the patient support programme and 28 patients who completed their follow-up were included in the analysis. Medication adherence of each individual subject significantly improved, as reflected by a significant increase in BMAS score from 80.93 ± 10.62 before intervention to 86.11 ± 7.71 in post-intervention assessment ($p < 0.001$). There were 19 DRPs identified, majority of which were caused by inappropriate medication use behaviour of subjects. Pharmacists were able to resolve DRPs either by patient education and reassurance, or by escalation to physician care depending on the severity and impact of individual DRPs. Overall, patients are satisfied by and supportive of the multi-disciplinary support programme.

Conclusion: Pharmacists can effectively enhance patients' medication adherence via patient education and medication review. This pilot study presents a feasible, comprehensive model linking hospital out-patient care to the community to enhance treatment efficacy and safety throughout their disease journey.

Ab21

Storage Stability Prediction of Spray-dried Anti-*Acinetobacter baumannii* Phages Powders

CHENG, FY[1]; LEUNG, SSY[1]

[1] School of Pharmacy, The Chinese University of Hong Kong, Hong Kong

Objectives: The rapid emergence of multidrug-resistant (MDR) bacteria has significantly increased the therapeutic challenge in managing bacterial pneumonia. Inhaled bacteriophage (Phage) therapy has emerged as an alternative option to conventional antibiotic treatments. However, the storage stability of phage products remains a concern.

Methods: Three anti-*A. baumannii* phages, including vB_AbaM-IME-AB2, vB_AbaM-IME-AB9, and vB_AbaM-IME-AB406, and their cocktails were formulated into inhalable dry powders using a spray-drying technique with two formulation compositions (F1= 0% trehalose, 20% mannitol and 20% leucine and F2= 40% trehalose, 40% mannitol and 20% leucine). The production loss of phage, size, particle morphology, and aerosol performance of prepared phage powders were analyzed. Shelf-life prediction of the phage powders was performed by using the Arrhenius method.

Results: Both formulations could effectively protect all tested phages in the spray drying process with no significant titer reduction (≤ 0.5 log). The produced phage powders were spherical with most particles within the inhalable range ≤ 5 μm. With a dose of 10 mg phage powder dispersing with an Osmohaler™, around 10^7 plaque formation unit (PFU) phages can be delivered to the lungs. The accelerated stability tests demonstrated most phages exhibited a first-order deactivation kinetic in the powder forms. A shelf-life prediction model was then established and the errors of predicted storage loss at 25 °C were around 30% compared with the real-time storage data.

Conclusions: This study has demonstrated the feasibility of using an accelerated stability test based on the Arrhenius Equation for shelf-life prediction of anti-*A. baumannii* phage powders. This potentially speeds up the formulation development process of phage products.

Ab23

An Electronic Medication Management Service for Residential Care Homes for the Elderly (RCHE) in Hong Kong: A Pre-post Interventional Study

AU-DOUNG, PLW[1]; CHAU, HC[2]; LAU, KC[2]; CHAN, YQ[2]; YIP, HL[2]; LAM, TN[1]; LEE, CP[1]; CHIANG, SC[2]; CHEUNG, YT[1]

[1] School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong
[2] Hong Kong Pharmaceutical Care Foundation, Hong Kong

Objectives: In Hong Kong, medication management in RCHE is typically handled manually, and is time-consuming and labor-intensive. In 2021, the Hong Kong Pharmaceutical Care Foundation (a local NGO) developed and implemented an integrated medication management system to a cluster network of RCHE. This system featured a comprehensive database with drug images and common dosages to build electronic medication profiles and electronic medication administration records (eMARs) for residents.

This analysis evaluated the impact of this program in improving the time efficiency and technical competency of RCHE staff. The secondary objective was to estimate the drug wastage costs that could potentially be circumvented when the centralized automated packaging service of the program is fully implemented.

Methods: This was a pre-post interventional study. Time efficiency was evaluated using time motion analysis. The number of doses prepared, checked and administered in 10-minute blocks before and after implementation was compared using 3-way analysis of variance. The RCHE staff completed a structured survey to report their technical competencies in various aspects of medication management. The quantity and cost of wasted medications were quantified from drug disposal reports.

Results: This analysis included 14 RCHEs (total 1,218 residents; age 85.8±8.7 years; median 11 medications per resident). The program has improved time efficiency, as reflected by a significant increase in the number of doses prepared (pre: 14.0±3.1; post: 44.7±7.9), checked (pre: 18.8±9.6; post: 119.8±22.6), and administered (pre: 12±3.2; post: 41±1.9) in 10-minute blocks (*P*'s <0.001). At postimplementation, the RCH staff reported improved competency in managing residents' eMARs (86.9%), and enhanced safety in the preparation (85.4%), checking (91.7%), and administration (91.7%) of medications. The total monthly cost of oral medication wastage was HKD645,949, which is approximately HKD530 per resident.

Conclusions: Our findings suggested that an electronic medication management service improved time efficiency and could potentially enhance medication safety in RCHE.

Ab29

The Benefits and Harms of Statin Use in Patients with Diabetes Mellitus: A Systematic Review and Meta-Analysis

NG, W.Y. Dora[1]; WAN, Y.F. Eric[1,2]

[1] Department of Pharmacy and Pharmacology, The University of Hong Kong
[2] Department of Family Medicine and Primary Care of The University of Hong Kong

Aims: Statins are widely prescribed for patients with diabetes mellitus and dyslipidaemia to reduce the risk of subsequent cardiovascular complications. However, the overall effects of statin use from high-quality evidence are little known. This study aims to systematically review the existing trial data and perform a meta-analysis on the overall benefits and harms of statin use in diabetes mellitus.

Methods: Three databases including PubMed, Embase and Cochrane were searched on 5th September 2022 for randomized-controlled trials (RCTs). Quality of studies were assessed using the Version 2 of the Cochrane risk-of-bias tool (RoB2). Pooled hazard ratios (HRs) were generated using a random effect model to quantify the association between statin use and study outcomes. The study outcomes classified into (1) cardiovascular events, (2) non-cardiovascular events, and (3) adverse drug reactions (ADR).

Results: 13 RCTs were included for review and meta-analysis. For cardiovascular outcomes, the pooled HRs for any cardiovascular events was 0.74 [95% confidence interval (CI) 0.67-0.82], suggesting a significant moderate protection. The cardiovascular benefits were consistent in coronary heart disease, stroke and revascularization, with a greater risk reduction for secondary prevention compared to primary prevention. The subgroup analysis showed a significant cardiovascular risk reduction in patients with high low-density lipoprotein-cholesterol (LDL-C) but an insignificant benefits in patients with very high LDL-C. For non-cardiovascular outcomes, an insignificant 3% risk reduction was observed for diabetic retinopathy. For ADR, the pooled HRs for myalgia and myopathy were 1.12 [95% CI 0.58-2.13] and 1.66 [95% CI 0.39-7.02] respectively, suggesting a potential risk of muscle toxicity.

Conclusion: The cardiovascular benefits were clearly demonstrated. However, the effects of statin on non- cardiovascular outcomes remains inconclusive. More studies are needed to review the effects of statins on other diabetic complications or adverse outcomes.

Ab04
A Review on the Safety and Efficacy of a Pharmacokinetic-Driven Dosage Adjustment Protocol for High-Dose Methotrexate in Pediatric Acute Lymphoblastic Leukemia in the Local Study Population

IP, Ka-wing Emily[1]
[1] Pharmacy Department, Hong Kong Children's Hospital

Background: High-dose methotrexate (HDMTX) has long been the cornerstone of paediatric acute lymphoblastic leukaemia (pALL) treatment. Nonetheless, high MTX plasma concentrations (Cp) can lead to toxicity. Achieving the optimal steady state and residual MTX Cp is therefore important in ensuring the safety and efficacy of HDMTX. The Chinese Cancer Children's Group (CCCG) has adopted therapeutic drug monitoring (TDM) in their updated study protocol, which involves dosage adjustments based on MTX Cp according to a predefined algorithm.

Objectives: This study reviewed the impacts of TDM on the safety and efficacy of HDMTX in pALL, and identified the contributing factors of suboptimal steady-state Cp, increased toxicities and delayed clearance of MTX.

Methods: An observational review was conducted at the Hong Kong Children's Hospital on pALL patients treated with HDMTX according to CCCG-ALL protocols. MTX Cp were recorded every 24 hours after HDMTX commencement. The pharmacokinetics of MTX and influence of TDM on MTX Cp were assessed. Safety and toxicities were evaluated by incidence of delayed drug clearance and severity of adverse events.

Results: The final analysis included 92 subjects, with 348 HDMTX infusions and 920 Cp records, of which 151 infusions followed the TDM dosage adjustment algorithm. Target Cp achievement rate of these infusions was higher than those without TDM by 10.7% ($p < 0.05$). Lower BSA and lower disease risk group were identified as risk predictors for suboptimal 24-hour MTX Cp, while lower disease risk group and lower creatinine clearance contributed to delayed drug clearance. Higher disease risk group was detected as an independent risk predictor for the occurrence of severe adverse events.

Conclusion: Dosing MTX according to TDM appears to be a safer and more efficacious treatment regimen. The considerably high variability of interindividual MTX pharmacokinetics and pharmacodynamics supports the role for popPK/PD modelling to facilitate dosing accuracy and treatment optimization.

Ab05
A Retrospective Review on the Use of Roflumilast in COPD Patients in a Local Hospital

LEI, UM[1]; KAM, KW[1]; WONG, TC[2]; SUN, WY[3]
[1] Department of Pharmacy, Haven of Hope Hospital, Hong Kong
[2] Department of Medicine, Haven of Hope Hospital, Hong Kong
[3] School of Pharmacy, The Chinese University of Hong Kong, Hong Kong

Objective: This study aims to evaluate the use of roflumilast in a local extended care hospital, assessing the efficacy and safety of roflumilast in the treatment of COPD, as well as its usage pattern.

Methods: A retrospective, non-interventional medical record review with patients on roflumilast in Haven of Hope Hospital was performed. Primary outcomes were the prevalence of patients who were on 250 mcg roflumilast as maintenance therapy and the pre- and post-treatment annualized rate of hospitalization due to respiratory causes, which were compared at 3, 6, 12 and 24 months after treatment initiation. Secondary outcomes were commonly reported side effects of roflumilast therapy and common reasons that prevent dose escalation.

Results: Among 212 patients, 74 (34.9%) patients were on 250 mcg of roflumilast. Patients who were on 250 mcg roflumilast as maintenance therapy had an older age (76.1 vs 73.2, $p=0.007$), lower body weight (46.3 vs 55.1, $p=0.005$), a higher proportion of female patients (8.1% vs 0%, $p=0.002$), a lower prevalence of depression at baseline (13.5% vs 0.7%, $p<0.001$) and higher portion of these patients started roflumilast during hospitalization (79.7% vs 62.3%, $p=0.006$) when compared to those who successfully titrated up to full dose. No significant difference was identified for changes in annualized rate of hospitalization due to respiratory causes except at 24 months after treatment initiation ($p=0.026$).

Conclusions: Patients with more advanced age, low body weight, who was female and who had concomitant depression tend to receive a lower dose of roflumilast. Extra care should be given to these patients. There were signals showing low dose roflumilast may have effects on lowering hospitalized exacerbation rate. However, no conclusive recommendations could be made regarding the efficacy of low dose roflumilast due to inconsistent statistical results.

Ab08

Comparison of Tolerability and Hospitalization Rate of Switching to Lurasidone and Aripiprazole in Adults with Psychotic Disorders: A 1-year Retrospective Observational Study

YU, Hiu-laam
Castle Peak Hospital

Objective: It aims to compare the tolerability profile of lurasidone and aripiprazole by discontinuation proportion due to treatment-emergent adverse events (TEAEs) and the number of patients who reported TEAEs. It also aims to compare the hospitalization rate of the patients using lurasidone and aripiprazole.

Methods: The clinical information obtained from the electronic patient record of 66 patients using lurasidone and 157 patients using aripiprazole was reviewed in the retrospective study. Patient demographics, the proportion of patients experiencing TEAEs, discontinuation proportion, description of TEAEs, all-cause and mental health-related admission and length of stay were recorded and compared statistically.

Result: 24 patients using lurasidone and 54 patients using aripiprazole reported TEAE through electronic patient record during follow-up after adding treatment or dose titration, but no statistically significant difference was found (36.4% vs 34.4%, adjusted OR= 0.949 (0.445-2.026)). Also, no significant difference was found between the proportion of discontinuation due to TEAE (21.2% vs 18.5%, adjusted OR= 1.052 (0.418-2.650)). There was no statistically significant difference between the lurasidone and aripiprazole groups regarding the number of admission episodes and length of stay for all-cause and mental health-related hospitalization.

Conclusion: Switching other antipsychotics to lurasidone demonstrated no statistical difference in tolerability and hospitalization rate compared to switching to aripiprazole.

Ab09

Impact of Pharmacist Intervention on the Management of Oncology Patients Receiving Selected Epidermal Growth Factor Receptor (EGFR)-Tyrosine Kinase Inhibitors (TKIs) in Queen Elizabeth Hospital: A Quasi-Experimental Study

CHEUNG, PW[1,2]; WONG, KM[1]; CHENG, MY[1]; ZHOU, KR[2]

[1] Department of Pharmacy, Queen Elizabeth Hospital, Hong Kong, China

[2] School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong, China

Background: In October 2022, a pharmacist-led day 15 (D15) tyrosine kinase inhibitor (TKI) clinic was introduced in Queen Elizabeth Hospital. The service targeted patients who were newly prescribed with an EGFR-TKI, and they will be meeting a pharmacist at treatment day 15 for the management of any adverse drug reaction (ADR).

Objectives: This study aims to assess the impact of the clinic in the early detection and reduction of ADRs presented in subsequent follow-ups. Primary endpoints include the number of ADR detected and the number of patients requiring treatment modifications due to ADRs. Some of the secondary endpoints include number of referrals due to ADRs, changes in the severities of the ADRs from D15 to the first oncology follow-up.

Methods: Patients attended the clinic between October 2022 and March 2023 were recruited in the study. For some of the study endpoints, a historical control group is adopted. Fisher Exact Test will be used for the statistical comparison with historical control.

Results: 59 patients attended the D15 TKI clinic, 125 incidents of ADR were reported at day 15, and 12 patients were referred to a doctor by the pharmacist. With the D15 TKI clinic, 50% of patients taking Gefitinib, 94% of patients taking Osimertinib, and 82% of patients taking Erlotinib showed improved or maintained severity of their ADRs. Furthermore, as compared with the historical control, the number of patients requiring treatment modification was decreased by 10%, and unplanned medical attention due to ADR was decreased by 6.7%.

Conclusion: Improvements in the severity of ADRs and better treatment outcomes were observed due to sufficient patient education and prompt management of abnormalities in the D15 TKI clinic. Additionally, reduced preventable hospital admissions could alleviate the burden on hospitals and lead to lower operational costs.

Ab11
An Evaluation of the Financial Implications of the Implementation of Chronic Disease Co-Care Pilot Scheme in a Private Hospital

HUEN, C.L.; YUEN, W.S.; SHE, H.Y.
Pharmacy Department, Evangel Hospital, Kowloon, Hong Kong

Objective:
- To evaluate percentage differences in the cost of drugs purchased under the Chronic Disease Co-Care (CDCC) Pilot Scheme versus the private hospital
- To analyze the financial benefits for patients and the hospital resulting from CDCC
- To highlight the advantages of CDCC diverting patients to the private sector

Methods: Evangel Hospital joined the Chronic Disease Co-Care (CDCC) Pilot Scheme launched by the Health Bureau in November 2023. Aiming for early prevention and management of chronic diseases, CDCC encouraged participants to visit their preferred family doctors for screening and treatment by providing government subsidies. At this stage, 43 basic tier items purchased from a designated platform at special discounts are included in the scheme, free-of-charge to patients for a prescribed period. Detailed cost analysis was carried out to compare drug costs purchased under CDCC with those used by the hospital, and to assess the percentage of cost savings by patients.

Results: 37 items were compared in terms of net cost per unit whereas 6 items were not enlisted in the hospital drug formulary. Among the 37 items, 27 of them were found using different brands in CDCC compared to the hospital. In terms of costs, over 97% items exhibit lower costs when they are purchased under CDCC. >92% (n=34) items in CDCC cost less than 50% of the cost in the hospital while >27% (n=10) items in CDCC cost less than 10% of the cost in the hospital. In terms of patients' health expenditure, patients can save more than 81% of costs on average when they join CDCC instead of standard consultations in the hospital.

Conclusions: Under CDCC, the cost of drugs is drastically lower than that in the hospital, which is attributed to the strategic purchasing by the Health Bureau for public-private partnership (PPP) programmes. With government subsidies and under the co-payment principle, patients joining CDCC can enjoy relatively affordable cost in each visit. In the future, PPP schemes like CDCC could be more extensively promoted. Diverted to the private sector, patients with higher affordability could therefore benefit from better services, shorter waiting time and more personalised care.

Ab12
Comparison of Safety Data of Trastuzumab (Herceptin) versus Trastuzumab (Kanjinti) in Patients with HER2-positive Breast Cancer

TSANG, TY; YUEN, KT; CHAN, SK; LIN, TW; YIP, E; NG, V; ZHOU, R
Department of Pharmacy, Princess Margaret Hospital, Hospital Authority, Hong Kong;
Department of Oncology, Princess Margaret Hospital, Hospital Authority, Hong Kong;
School of Pharmacy, The Chinese University of Hong Kong

Objective: Previous randomized control trial showed a comparable side effect profile between Kanjinti and reference Trastuzumab Herceptin. Research gap existed in Asian real world data and use in patients with advanced or metastatic breast cancer. The objective of this study was to establish real-world local data of comparing safety aspects of Herceptin versus Kanjinti in breast cancer.

Methods: Female patients with HER2-positive breast cancer of all stages receiving any treatment containing Herceptin or Kanjinti from April 2021 to January 2022 were included in this study. The primary outcomes of this study were the differences of percentage of occurrence, type and severity of adverse events between Herceptin and Kanjinti, notably cardiotoxicity and infusion-related reactions. For secondary outcomes, this study investigated on the potential risk factors of developing trastuzumab-related cardiotoxicity and the management of cardiac adverse events.

Results: 140 patients were included in this study. 82 patients were treated with Herceptin, 41 patients with Kanjinti and 17 patients were switched from Herceptin to Kanjinti. For primary outcomes, the incidence of LVEF reduction showed no statistical difference among different treatment groups. Both Herceptin and Kanjinti-treated patients had a mean LVEF reduction of around 6%. 32 patients (Kanjinti n=11; Herceptin n=20; Herceptin switched to Kanjinti n=1) experienced a reduction of LVEF by 10% or more. None of the patients in this study had a LVEF drop to less than 50%, a symptomatic heart failure or required withholding treatment. No severe infusion-related reaction was documented. For secondary outcomes, hazard ratios of possible concurrent risk factors of LVEF reduction were analyzed. No risk factor was found to be significant.

Conclusion: This retrospective analysis showed a comparable safety profile between Kanjinti and Herceptin. Cardiotoxicity risk of Kanjinti was similar to Herceptin. There was no statistically significant risk factor increasing chance of cardiotoxicity identified in the study.

Ab13
Evaluation on the Efficacy of Prothrombin Complex Concentrate for the Reversal of Anticoagulation of Direct Factor Xa Inhibitors in Patients with Bleeding: A Retrospective Review in a Local Hospital

CHEUNG, WL Alan
Resident Pharmacist, Department of Pharmacy, United Christian Hospital, Hospital Authority, Hong Kong

Introduction: Direct factor Xa inhibitors have been widely used for preventing thromboembolism while bleeding remains as a major safety concern. Andexanet alfa, the specific antidote for direct factor Xa inhibitors, is not currently available in Hong Kong. Instead, four-factor prothrombin complex concentrate (4F-PCC) is commonly used as an alternative. However, the evidence on the efficacy of 4F-PCC is limited. This study aims to evaluate the use and the efficacy of 4F-PCC in the local setting.

Methodology: This study was a descriptive, single-centre, retrospective, single-group cohort review. The medical records of patients who developed active bleeding and were prescribed with 4F-PCC to reverse the effect of direct factor Xa inhibitors in United Christian Hospital were reviewed. The primary outcome of this study was the percentage of patients achieving effective hemostasis as assessed by a modified version of International Society on Thrombosis and Haemostasis (ISTH) criteria. Prothrombin time (PT), activated partial thromboplastin time (aPTT), hemoglobin level, 30- and 90-day mortality and prevalence of thromboembolic events were also be assessed.

Results: A total of 82 patients were reviewed in this study. The percentage of patients achieving effective hemostasis with 4F-PCC was observed to be 67.1%. Hemoglobin level increased by 2.3% after administration of 4F-PCC, while PT and aPTT reduced by 10.6% and 7.4% respectively. The 30-day and 90-day mortality rate of the subjects were 32.9% and 42.7%. The safety outcome was assessed as the prevalence of thromboembolic events which was 3.7% in both 30 and 90 days.

Conclusions: In conclusion, this study reported the hemostatic efficacy, mortality rates and safety of using 4F-PCC for anticoagulation reversal in bleeding patients receiving direct factor Xa inhibitors in the local setting. The safety and efficacy were numerically comparable to results of the study on andexanet alfa, but the limitations could not be neglected.

Ab14
Adverse Drug Reaction-led Hospital Admission: A Pilot Retrospective Analysis Based on Data from A Major Regional Hospital in the Hong Kong SAR

HO, KH[1]; YUNG, L[1]; LEUNG, A[2]; YAM, PW[3]; WONG, KT[1]; BLAIS, JE[2]; CHU, LM[1]
[1] Department of Pharmacy, Tuen Mun Hospital, Hospital Authority, Hong Kong SAR, China
[2] Department of Pharmacology and Pharmacy, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China
[3] Department of Medicine and Geriatrics, Tuen Mun Hospital, Hospital Authority, Hong Kong SAR, China

Objectives: To provide a preliminary review of the latest trend of local ADR-led hospital admission with the prevalence, identification of drug class and risk factors associated, and estimation of the percentage of such admissions being preventable.

Methods: Patients aged 18 or above admitted to Tuen Mun Hospital after seeking medical service at Accident and Emergency in August 2021 were included in the analysis. Using a pre-defined list, patients with potential ADR were identified. The causality and preventability of ADR identified were assessed with different algorithms. Risk factor identification was done with statistical analyses using SPSS.

Ethics approval was granted by the New Territories West Cluster Research Ethics Committee, Hospital Authority (REC Reference No. NTWC/REC/22083).

Results: After reviewing 3271 cases, the prevalence of ADR-led hospital admission was estimated to be 5.5%, with 197 events identified in 181 cases.

Patients identified with ADR-led hospital admission were mainly associated with hypoglycemia, arrhythmia, and gastrointestinal bleeding; the three main drug classes contributing to admissions were “drugs used in diabetes”, “drugs used in hypertension and heart failure”, and “drugs used in psychoses and related disorders”, as classified in the Hospital Authority Drug Formulary.

Age, polypharmacy, previous ADR history and abnormal renal function were identified as the risk factors for development of ADR-led hospital admission. Patients diagnosed with diabetes mellitus or hypertension were associated with significantly higher risks for ADR-led hospital admission. It was estimated that 38.6% of ADR-led hospital admission cases were preventable.

Conclusions: Local features of ADR-led hospital admission varied significantly from overseas. Efforts should be made to lower the prevalence of ADR-led hospital admission, reducing the financial and workload burden of the public healthcare system.

Ab15

Assessing Medication Compliance and Medication Knowledge via Live-video Based Telepharmacy in Older Adults with Polypharmacy: A Local Hospital Experience

YIP, Pak-ki[1,2]; CHEUNG, Yin-ting, PhD[2]; LAI, Wing-yee Winnie[1]

[1] Prince of Wales Hospital, Hospital Authority

[2] School of Pharmacy, The Chinese University of Hong Kong

Background/objectives: Older adults are vulnerable to drug-related problems and medication non-compliance, and pharmacists' interventions are able to detect and address the issues by medication counselling and education. Live-video based telepharmacy was recently introduced in Hong Kong public hospital for pharmacists' medication counselling. In this study, we aimed to assess the effectiveness and patient acceptance on telepharmacy in offering medication education, screening medication non-compliance, and resolving drug related problems in older adults with polypharmacy and recent medication changes.

Methods: Patients aged 60 or above, with concurrent use of five or more medications, and with recent medication changes were invited. A pharmacist assessed medication knowledge and compliance, offered medication counselling, identified any drug-related problems, and evaluate patient's satisfaction towards telepharmacy. Patients had to answer questions on the indications, dosing and administration, storage, and missed dose management of their medications, and compliance was assessed with questions modified from 8-item Morisky Medication Adherence Scale. Follow-up was done 4 weeks after to assess for any changes in knowledge and compliance, and if the drug-related problems were resolved.

Results: A total of 22 patients were enrolled in the study. Medication knowledge score increased from 2.76±0.69 to 3.5±0.6 ($p = 0.001$, Wilcoxon Signed Rank Test), and compliance score increased from 7.35±1.07 to 7.69±0.7 ($p = 0.048$, Wilcoxon Signed Rank Test). There were 40 drug-related problems identified, with 29 (72.5%) of them were resolved on follow-up. Patient were satisfied with the service with an average score of 4.59±0.67 out of 5 points in the satisfaction survey.

Conclusion: This study demonstrated that live-video based telepharmacy was an effective and acceptable way in offering improving medication knowledge and compliance in older adults with polypharmacy and recent medication changes. It could be a potential alternative to phone-calls or face-to-face counselling sessions in the future.

Ab17

Hospital Pharmacists' Role in Supporting Appropriate and Safe Use of CGT/ATMPs: A Systematic Literature Review of Mapping the Current Insights

SHI, Junnan[1]; CHEN, Xianwen[1]; HU, Hao[1,2,3]; UNG, Oi-lam Carolina[1,2,3*]

[1] State Key Laboratory of Quality Research in Chinese Medicine, Institute of Chinese Medical Sciences, University of Macau, Macao SAR, China

[2] Centre for Pharmaceutical Regulatory Sciences, University of Macau, Macao SAR, China

[3] Department of Public Health and Medicinal Administration, Faculty of Health Sciences, University of Macau, Macao SAR, China

Purpose: The role of hospital pharmacists in managing cell and gene therapy (CGT) and advanced therapy medicinal products (ATMPs) therapies is gradually being recognized but the evidence about their role and efficacy has not been systematically reported. The study aimed to summarize the professional services provided by hospital pharmacists on managing CGT/ATMPs and the evidence about the effects on patient care.

Method: Literature from 4 electronic databases (PubMed, ScienceDirect, Web of Science, Scopus) were searched following PRISMA guidelines to yield publications on the interventions provided by hospital pharmacists in the management of CGT/ATMPs dated since 2013 till now.

Results: Thirty-four publications were included in this review. Eight studies were conducted under the prospective cohort study design (n = 6), retrospective study design (n = 1) and case-control intervention study design (n = 1), with a total of 1,012 patients who underwent hematopoietic stem cell transplant (HSCT) from 8 hospitals in 5 countries receiving pharmacist interventions. Common pharmacist-led interventions for HSCT patients focused on medicine administration, prescribing, monitoring of medicines use, with resulting in significant improvement in patient adherence, satisfaction and knowledge. In addition, perspectives assuming the role of pharmacists in CGT/ATMPs management were identified in the 26 studies reported quantitative data and qualitative findings. The roles of hospital pharmacist were identified when patients receiving ATMPs (n = 2), HSCT and cellular-based therapy (n = 12), gene therapy (n = 6), and CAR T-cell therapy (n = 6), covering procurement, influences on prescribing, preparation and delivery, administration, monitoring of medicines use, human resources, training and development, and other interventions. The anticipated impact was primarily indented to promote pharmacy practice, multidisciplinary collaboration and improve patient clinical outcomes.

Conclusion: The interventions by hospital pharmacists show multifaceted positive impact on the care of patients receiving CGT/ATMPs. Leveraging the role of hospital pharmacists in multidisciplinary healthcare teams to develop a coordinated approach that supports pharmacy practice, will better meet the appropriate and safe use of CGT/ATMPs.

Keywords: Hospital pharmacy, Pharmaceutical care, Pharmacy practice, Advanced therapy medicinal products, Cell and gene therapy, Regeneration medicine

Ab18
Knowledge and Perception of Generic Drugs among Private Healthcare Users

LAU, ST[1]; LAM, MPS[2]

[1] Department of Pharmacy, Gleneagles Hospital Hong Kong, Hong Kong
[2] Department of Pharmacology and Pharmacy, The University of Hong Kong, Hong Kong

Generic drugs are widely used in healthcare settings worldwide. However, patients' perspectives and understanding of the safety, effectiveness and quality of these generic drugs vary. Importantly, the perception of generic drugs within the private healthcare sector in Hong Kong remains unknown.

Objective: This study aimed to investigate the level of knowledge and perceptions of generic drugs among users of private healthcare sector in Hong Kong. In addition, the association between knowledge and perceptions of generic drugs was evaluated.

Methods: A cross-sectional survey was conducted in March 2023 at Gleneagles Hospital Hong Kong. Questionnaire was distributed to patients at the out-patient pharmacy and their knowledge and perceptions of generic drugs were collected, tabulated and analyzed.

Results: A total of 198 patients were recruited, with most of them being female (76.3%) and below the age of 65 (98.0%). The findings revealed that the respondents had a reasonable understanding of generic drugs, with more than half of them providing correct answers to knowledge questions. In terms of perception, 80.8% believed that generic drugs were less expensive than branded ones, while having similar efficacy, quality and safety. When it came to choosing between branded and generic drugs, clinical aspects such as efficacy and healthcare recommendations were deemed more crucial than non-clinical factors such as price and brand.

In general, perceptions were found to be positively influenced by knowledge ($\chi 2 = 16.99$, $p < 0.0005$). However, no statistically significant correlation was observed between perceptions and age, sex or insurance status.

Conclusion: This study explored the level of knowledge and perception of generic drugs and the association among private healthcare users. To the best of our knowledge, this is the first study that specifically focuses on the utilization of generic drugs in the private healthcare sector, providing valuable insights into this matter among private healthcare users.

Ab19
Mortality and Hospitalization Rate of Heart Failure Patients with Preserved Ejection Fraction Treated with Dapagliflozin vs. Empagliflozin

TAM, CW Jeff[1]; CHENG, WT Franco[2]; SO, IY Alison[1]

[1] Department of Pharmacy, Princess Margaret Hospital, Hospital Authority, Hong Kong
[2] Department of Pharmacology and Pharmacy, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong

Objectives: Sodium–Glucose cotransporter 2 (SGLT-2) inhibitors, such as dapagliflozin and empagliflozin, are commonly used to treat type 2 diabetes mellitus, chronic kidney disease, and heart failure with reduced ejection fraction. Recent landmark trials, EMPEROR-Preserved and DELIVER, have demonstrated that both drugs can improve cardiovascular outcomes in heart failure patients with preserved ejection fraction (HFpEF). However, differences in the primary outcomes between these trials were observed when stratified by Asian subgroups.

Methods: This study analyzed data of 59 and 26 adults using empagliflozin and dapagliflozin, respectively, at the Princess Margaret Hospital between August 2016 and March 2022. The primary composite outcome was combined cardiovascular death and hospitalization due to heart failure. Results were stratified using a Cox proportional-hazards model. Furthermore, the occurrence of side effects was evaluated and reported as safety outcomes.

Results: The study found that the cardiovascular and mortality outcomes were higher than previously reported in the literature. The use of empagliflozin resulted in 24.9 composite outcome events per 100 patient years, whereas the use of dapagliflozin resulted in 29.9 events per 100 patient years. Patients taking empagliflozin without heart failure hospitalization in the past 12 months had significantly better composite outcomes than those taking dapagliflozin (hazard ratio, 0.30; 95% confidence interval, 0.12–0.76). However, no significant differences were observed in the composite outcome and all-cause mortality between the two drugs.

Conclusion: A substantial initial decrease in overall survival toward the primary composite outcome within the first year after the start of SGLT-2 inhibitor administration indicates the need for early intervention for this specific patient subgroup. Although constrained by a modest sample size obtained from a single center, the findings of this study highlight the importance of conducting additional research to explore the comparative efficacy of SGLT-2 inhibitors for HFpEF in a larger local population.

Ab22
Bayesian Dosing Calculator of Intravenous Vancomycin in Critically Ill Neonates: Model Evaluation and Clinical Utility Study

CHAN, PMW[1]; HUI, MKH[2]; LAM, TNT[1]

[1] School of Pharmacy, The Chinese University of Hong Kong, Hong Kong

[2] Caritas Institute of Higher Education, Hong Kong

Objectives: In 2020, the consensus guideline on Therapeutic Drug Monitoring of vancomycin was updated and recommended the use of software programs that employ the Bayesian approach, embedded with a population pharmacokinetic (popPK) model as the Bayesian prior, to monitor the Area Under Curve. Hence, a vancomycin dosing calculator for neonates and the embedded popPK model has been developed previously. This study aims to validate the developed vancomycin dosing calculator and to demonstrate its clinical utility.

Methods: We collected medical data from electronic health records (EHRs) in the Prince of Wales Hospital (PWH) to evaluate the developed Bayesian dosing calculator. Diagnostic plots including predictive plots and residual plots were used to evaluate the calculator graphically. Numerical analysis with bias, root-mean-square-error (RMSE) and normalized RMSE were used to show the predictive accuracy. The clinical utility of the dosing calculator was also investigated through a case study with an expert panel, including pediatricians' agreement and acceptance of the calculator.

Results: 22 Subjects with a total of 57 vancomycin concentration measurements were obtained. Diagnostic plots including predictive plots and residual plots demonstrated an acceptable predictive accuracy of the model. The mean bias and root-mean-square-error (RMSE) of the observed vancomycin concentration against population predicted values are 0.41 and 3.82 mg/L respectively, while against individualized predicted the values are 0.01 and 2.23 mg/L respectively. The normalized RMSE value is 12.22%, which is within the desired range. The case study with four pediatricians also illustrated the clinical utility of the dosing calculator, especially in aligning the actual prescription and the dosing intention.

Conclusions: This study demonstrated the predictive power and the utility of the model-based Bayesian approach for vancomycin dosing, ultimately promoting the adaptation to the new guideline-recommended approach from the outdated trough-based monitoring approach.

Ab24
Anti-Viral Drug Discovery: Synthesis of Unprecedented Nucleoside Analogues

CHOW, THY[1]; SCHEEFF, S[1]; CHAN, RWY[2,3]; CHEUNG, P[3,4]; NG, BWL[1,3]

[1] School of Pharmacy, The Chinese University of Hong Kong, Hong Kong

[2] Department of Paediatrics, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong

[3] Li Ka Shing Institute of Health Sciences, The Chinese University of Hong Kong, Hong Kong

[4] Department of Chemical Pathology, The Chinese University of Hong Kong, Hong Kong

Objectives: Practical issues and limitations of current antiviral agents include undesirable route of administrations, toxicity, off topic interactions with host cells, and lack of suitability for all patient groups. Recently synthesized carbobicyclic ribavirin analogues at The Ng Lab of Chemical Biology & Drug Discovery have shown high antiviral efficacy against respiratory syncytial virus, hence, synthesis of analogues based on other nucleobases such as adenosine and inosine should be performed for further biological investigation against other viruses such as Influenza A virus (IAV).

Methods: Using a divergent route that includes 13 steps, a commercially available precursor underwent a series of chemical reactions such as iodination, Mitsunobu coupling, Stille coupling, Diels-Alder reaction, esterification, saponification, and amination to synthesize adenosine and inosine analogues. At each step, the compounds were purified via silica gel column chromatography, then ^{1}H-NMR and ^{13}C-NMR were obtained to confirm the structures. The cytotoxicity and antiviral activity of the compounds against IAV was assessed using $TCID_{50}$ assays, polymerase inhibition, and CC_{50} assays.

Results: Five adenosine analogues and one inosine analogue were synthesized via the divergent route. $TCID_{50}$ assays, polymerase inhibition, and CC_{50} assays revealed the antiviral potency of the synthesized analogues.

Conclusion: The synthesized analogues can facilitate structure-activity relationship (SAR) studies and can be used for further testing for biological activity against infectious diseases, using molnupiravir and ribavirin as reference compounds. Further studies are required for the specific mode of action of the analogues that display activity against IAV.

Ab25
Cost-effectiveness Analysis of Pharmacist-led Deprescribing of Proton Pump Inhibitors in Elderly Patients

XIE, Mingxi[1]
[1] School of Pharmacy, The Chinese University of Hong Kong, Hong Kong

Background and Objectives: Proton pump inhibitors (PPIs) are effective agents recommended by guidelines for treating gastroesophageal reflux disease which is a chronic gastrointestinal disorder commonly observed in the elderly population. However, overutilization of PPIs in healthcare settings has become widespread, it increases the public healthcare expenditure and risks of adverse drug events and drug-drug interactions, especially in elderly patients with polypharmacy. Therefore, deprescribing interventions are proposed to reduce the inappropriate use of PPIs which may have potential clinical and economic benefits. This study was undertaken to examine the cost-effectiveness of pharmacist-led deprescribing of PPIs in the elderly population from the perspective of public healthcare provider in Hong Kong.

Methods: A decision tree analytical model was designed to simulate clinical and economic outcomes of pharmacist-led deprescribing of PPIs and standard care in elderly patients aged 65 and above. The model time horizon was 1 year. Model parameters were retrieved from published literature, public databases and official websites. Primary outcomes were direct medical costs and quality-adjusted life-years (QALYs) loss. Base-case analysis and sensitivity analyses were performed to assess the cost-effectiveness and parameter uncertainty.

Results: Based on base-case analysis, pharmacist-led deprescribing saved 0.0249 QALYs and reduced direct costs by HKD 1835 compared to standard care. In probabilistic sensitivity analysis, QALYs and direct costs saved by pharmacist-led deprescribing were 0.0288 (95% confidence interval [CI]: 0.0286 – 0.0290, $p < 0.00001$) and 1969 (95%CI: 1964 – 1974, $p < 0.00001$) respectively when comparing to standard care. Hence, pharmacist-led deprescribing was found to save QALYs at lower costs, and was accepted as a cost-effective strategy in 100% of 10000 Monte Carlo simulations at a willingness-to-pay threshold of USD 40923 per QALY.

Conclusions: Pharmacist-led deprescribing of PPIs was clinically superior and more cost-saving than standard care. It was regarded as an economically dominant strategy in the cost-effectiveness analysis.

Ab26
Disease and Social-economic Burden of Rheumatoid Arthritis in Hong Kong: Evidence from Real-world Data

YUEN, Ho-cheung David
The University of Hong Kong, Hong Kong

Introduction: Rheumatoid arthritis (RA) is a chronic autoimmune and inflammatory disease with a global annual incidence of 14.9 per 100,000 population and a prevalence of 246.6 per 100,000 population in 2017. This study aims to examine up-to-date epidemiological pattern and economic burden of RA in Hong Kong between 2017 to 2021.

Methods: This is a population-based cross-sectional study of Hong Kong population based on data from electronic health record of Hospital Authority. Patients with RA were identified based on ICD-9-CM code 718.0 in the database. Incidence, prevalence, years of healthy life lost due to disability, disability-adjusted life years and direct cost through public health resource utilization were measured.

Results: Between 2017 to 2021, annual incidence of RA was 26.2 per 100,000 population with an age of onset of 57.7 years. Projected prevalence was 353.4 per 100,000 population. Disability-adjusted life years were 93.2 years per 100,000 population. Female aged 55 years to 64 years was the most vulnerable population subgroup. Annual direct cost through public health resource utilization was $16671 per RA patients.

Conclusion: This study provides a population-level baseline estimation of the disease burden and economic burden of RA for further local epidemiology study on RA and healthcare policy evaluation.

Ab28
Control of T2DM in Real World Patients – Can Patients Reach Target with Use of Metformin?

WAN, Hou-yin; TAM, Yuen-ting
The University of Hong Kong, Hong Kong, China

Introduction: Metformin is the first-line therapy for type 2 diabetes mellitus. This study aims to evaluate its effectiveness through real-world data, evaluate drug utilization patterns of add-on therapy to metformin, and compare with literature and guidelines.

Methods: A retrospective cohort study was performed using data from the Hospital Authority from 2016-2021. The primary outcome was the change in HbA1c, fasting and postprandial glucose on metformin monotherapy between baseline and endpoint. Association of between glucose parameters with age, sex, metformin dose and duration of diabetes were examined if the overall change was statistically significant. Patients with metformin-based combination therapy at endpoint were separated into dual and multiple (>2) antidiabetic groups and drug utilization patterns were evaluated.

Results: 58 patients were included for primary outcome analysis. Only the change in HbA1c reached statistical significance (-1.20%, 95% CI: -1.79 – -0.61, p <.001) and was associated with age and duration of diabetes. The dual and multiple treatment group had 122 and 163 patients respectively. Insulin was the most prescribed antidiabetic in both dual (n = 51, 41.8%) and multiple group (n = 111, 68.1%).

Conclusion: Metformin effectiveness was seen in HbA1c only while insulin was the most utilized add-on therapy to metformin.

Ab30
Nuclear Magnetic Resonance Spectroscopy Coupled Chemometrics on Tea Tree Essential Oil

LAU, A. T. Y.[1]; WONG, J. K. C.[1]
[1] The University of Hong Kong, Pokfulam, Hong Kong SAR

Objectives: To investigate the feasibility of applying nuclear magnetic resonance (NMR) spectroscopy coupled with chemometric analysis in authentication of tea tree oil due to its extensive use in cosmetics and aromatherapy, and frequent discovery of adulteration. And attempt to establish a standardized framework for future authentication of tea tree oil.

Methods: Eleven tea tree oil products and one cajeput oil product, with different origins, extraction details and contents, were selected to be analyzed. Products were first diluted using 99.8% chloroform-D spiked with 0.03% v/v tetramethylsilane before undergoing NMR spectroscopy. Spectra of diluted products were then obtained using ^{1}H NMR spectroscopy and preprocessed into numeric matrices before chemometric analysis. Two common techniques in chemometric analysis were applied, namely principal component analysis (PCA) and partial least square-discriminant analysis (PLS-DA), to construct plots of PCA and PLS-DA, together with the prediction model for further tea tree oil authentication. The prediction model was then cross-validated to evaluate the performance.

Results: Direct comparison of spectra obtained from NMR spectroscopy separated cajeput oil and one of the tea tree oil products which were dissimilar to the remaining products. Subsequent chemometric analysis separated the remaining products into different clusters based on the origin and slight variation in composition. The prediction model constructed was shown to be of high accuracy, predictive ability and applicability.

Conclusions: This study demonstrates that NMR spectroscopy coupled with chemometric analysis is a highly sensitive method for authentication of tea tree oil, with NMR spectroscopy separating products with apparent dissimilarities in composition while slight variation can be discovered by chemometric analysis. The prediction model constructed using PLS-DA was already highly accurate and predictive. Construction of a prediction model involving more products can further improve the accuracy and predictive ability and such model can be regarded as universal for authentication of tea tree oil.

Ab31
Low Dose Pembrolizumab for Advanced Non-small Cell Lung Cancer: A Retrospective Cohort Study

LEUNG, K. H.[1,2*]; HO, W. M.[3]; SO, K. H.[1]; LIM, W. L.[1]; ZHOU, K. R.[2]

[1] Department of Pharmacy, Prince of Wales Hospital, Hong Kong
[2] School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong
[3] Department of Clinical Oncology, Prince of Wales Hospital, Hong Kong

Objectives: Pembrolizumab is an immunotherapeutic agent approved as a first-line treatment for locally advanced or metastatic non-small cell lung cancer (NSCLC) in Hong Kong. In the early KEYNOTE-010 trial, a low weight-based dosing of pembrolizumab was found to have similar efficacy as a higher dose of 10 mg/kg given every 3 weeks for NSCLC. This study aimed to investigate the efficacy and safety of the low-dose pembrolizumab compared to the standard FDA recommended dose.

Methods: This was a retrospective cohort study conducted at the Prince of Wales Hospital by collecting data on the electronic patient record system (ePR). Patients with NSCLC prescribed with either the low-dose or standard-dose pembrolizumab from 01-Dec-2017 to 30-Nov-2022 were included for analysis. The primary outcome is the efficacy of a low-dose regimen versus that of a standard-dose regimen. The survival analysis included plots of Kaplan-Meier curves, log-rank tests, and Cox regression models. Predictive factors like body weight were set as covariates in the regression models.

Results: 284 patients prescribed with pembrolizumab from 01-Dec-2017 to 30-Nov-2022 were screened. A total of 183 patients were included in the study analysis. At a median follow-up period of 14 months, the low-dose regimen had a median overall survival (OS) of 18.7 months, while the standard-dose regimen had a median OS of 26.3 months (log-rank p=0.863). There was no statistically significant difference for the primary outcome. For the secondary outcome progression free survival (PFS), the low-dose regimen yielded a median PFS of 7.4 months, and the standard-dose regimen yielded a median PFS of 9.5 months (log-rank p=0.967). There was no statistically significant difference. In safety data analysis, the standard-dose regimen was found to cause more skin-related irAE at any grades than the low-dose regimen (29.8% vs 16.3%, p<0.001).

Conclusions: We observed no difference in the overall survival of advanced NSCLC patients who received fixed low-dose or standard-dose pembrolizumab. Further prospective studies are warranted regarding the use of low-dose pembrolizumab.