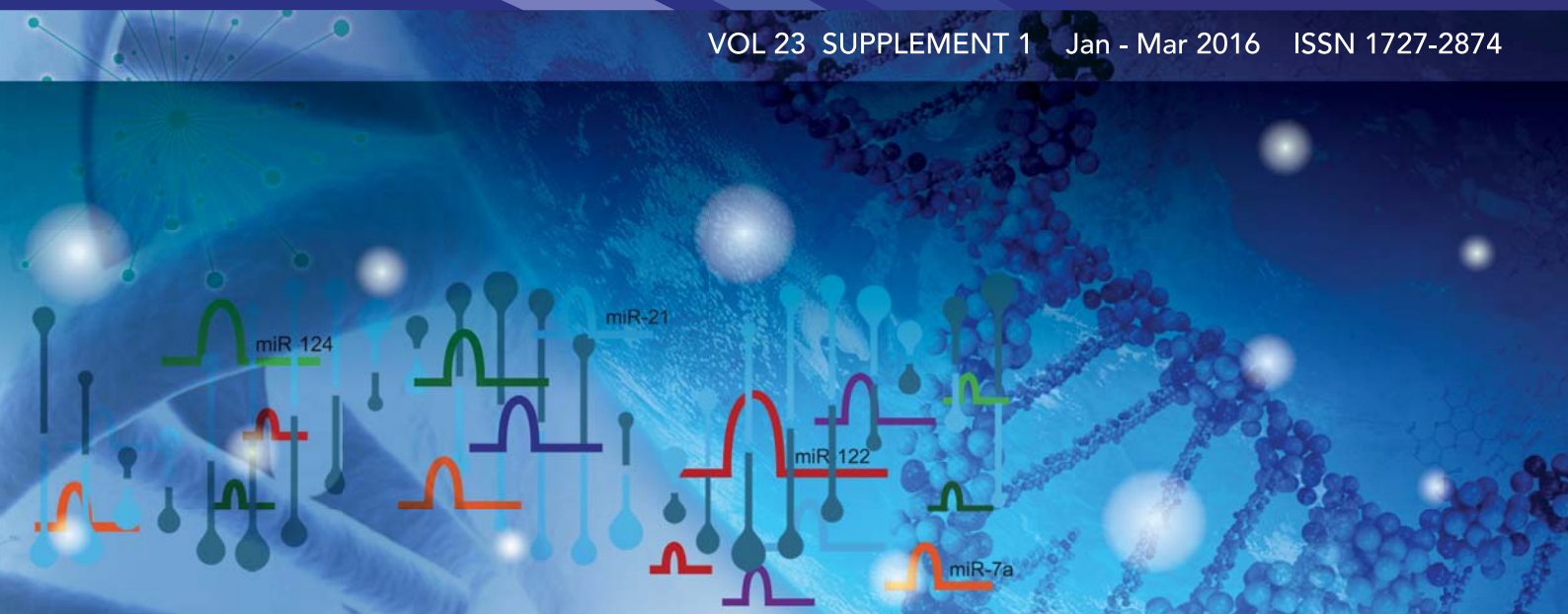
HONG KONG PHARMACEUTICAL JOURNAL

VOL 23 SUPPLEMENT 1 Jan - Mar 2016 ISSN 1727-2874



Hong Kong Pharmacy Conference 2016

February 27 - 28, 2016

The *Art* and SCIENCE of Integrated Pharmacy Practice

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. 23 Supplement 1
Jan - Mar 2016

Welcoming Message

Dear Delegates,

Welcome to the Hong Kong Pharmacy Conference 2016! This year's exciting technical program comprises a diverse spectrum of 22+ topics neatly distributed among three areas:

1. **Triumphs:** The latest notable achievements in treating cancer, high blood cholesterol, heart disease, infectious disease, and advanced Parkinson's disease;

2. **Game changers:** Promising advances in gene sequencing, nanotechnology, 3D printing, Big Data, wearables, and biosimilars, as well as promising developments in practice research for improving drug discovery efficiency and drug safety; and

3. **Hurdles/Opportunities:** The threat of skyrocketing prices of new drug products in denying the very patients who will benefit from access to life-saving medicine. This paradox has ramifications in the business of drug discovery, development, regulation and use. It also presents an opportunity for pharmacists to be innovative and entrepreneurial in sharpening the art of caring for their well-informed patients.

For the first time in the history of the Pharmacy Conference, time has been set aside for recent graduates in the two self-financed programs, pharmacy interns, and current postgraduate students to talk about their creative work. The two self-financed programs are Master of Clinical Pharmacy program and M.S. in Pharmaceutical Manufacturing and Quality program. I encourage you to attend these inaugural sessions, which have been scheduled right before the lunch symposium on the second day.

The final plenary session on "Pharmacy Council II: The Force Awakens" is a must attend event. The Task Force of Developing a Proposal in Establishing a Pharmacy Council in Hong Kong will update you on the current status. Since the adjournment of the 2015 Pharmacy Conference, the task force has formulated a preliminary framework; met with pharmacists at all practice sectors individually, and collected and analyzed all the comments and suggestions that pharmacists voiced at the consultation forums. The framework has been refined.

In addition to these exciting developments in the technical program, there are logistic innovations also. The pharmacy conference has joined the digital age. The entire program as well as evaluation of the presentations is accessible by mobile app. In addition, all invited and submitted abstracts are printed as a supplement of the *Hong Kong Pharmaceutical Journal*, so they can be cited formally. These innovations will not be possible, nor will the conference be able to invite 8 international expert speakers, without the generous support of 25 sponsors. Indeed, their exhibits are an integral part of the learning experience of the conference.

The second innovation concerns the partnership with Pfizer. Thus, the Conference is able to waive the registration fee of the entire graduating pharmacy class in the two universities, 75 in all. The enthusiastic response from these future pharmacists to the announcement of complimentary registration is reassuring. The annual pharmacy conference needs their continuing support, and they in turn need forums like the pharmacy conference to stay intellectually sharp and professionally innovative. After all, an effective pharmacist of the 21st century is not only up-to-date on drug product information, but more importantly is skilled at mobilizing the drug product knowledge relevant to the physician, care takers (such as the nurse), and the patient, thereby ensuring the right medicine is prescribed, administered, and monitored. This aspiration is precisely what the Conference theme, **"The Art and Science of Integrated Pharmacy Practice,"** is all about.

Once again, welcome and I hope you have an enjoyable conference.

Sincerely,

Vincent H.L. Lee
Chair, Organizing Committee
Hong Kong Pharmacy Conference 2016

Table of Contents

Invited Lectures

Oral Presentations 1 : Practice

Oral Presentations 2 : Free Paper

Table of Contents

Oral Presentations 3 : Regulatory

Poster Presentations

Keynote Address

FOK, Tai-fai
Pro-Vice-Chancellor
The Chinese University of Hong Kong

Science means change. This was the case 25 years ago when CUHK secured UGC funding to launch the first pharmacy program in Hong Kong. Today, the change brought about by science is more massive in scale and more rapid in pace, blurring not only scientific but also health disciplinary boundaries. The time is ripe for the various pharmacy organizations and Schools to collaborate with strategic planning with an aim to transform the pharmacy profession in Hong Kong and, in so doing, the health care infrastructure in Hong Kong. This is necessary in order to meet the healthcare needs of the rapidly expanding elderly population.

Theme Speech 1: Public Private Partnership

CHEUNG, Wai-lun Allen
Director (Cluster Services)
Hospital Authority
Hong Kong

Alike most developed countries, Hong Kong is facing the challenges of ageing population, rising medical costs and escalating demand for quality healthcare services. To ensure sustainability of the public health system, the Hospital Authority (HA), in line with the Government's healthcare reform stragegy, has been actively promoting public-private partnership (PPP) in healthcare. By leveraging the available capacity and capability in the private sector, we aim to manage demand for public services while enhancing patients' choice of and access to clinical care, thereby improving the overall health of the community through concerted efforts of both the public and the private healthcare sectors.

Chronic disease management and enhancement of primary care are two focus areas in our PPP initiatives. Drug management plays a key part and the collaboration of our stakeholders and service partners is crucial to the success of these programmes.

In the coming years, HA's service mode will undergo progressive evolvement and our PPP initiatives will be expanded along with service needs. Tens of thousands of patients will enter the PPP platform to receive seamless healthcare across the traditional public and private sector boundary. While success of individual programmes is determined by a multitude of factors, sustainability of our PPP initiative will count on the continued support of the Government and active participation of stakeholders, which include the pharmaceutical practitioners and the industry.

Theme Speech 2: Entrepreneurship as a 21st Century Skill for Pharmacist

CHARMAN, William
Dean
Faculty of Pharmacy and Pharmaceutical Sciences
Monash Institute of Pharmaceutical Science
Monash University
Australia

Pharmacy is fundamental to the advancement of healthcare to meet both individual and societal expectations – and innovation will be an essential element to achieving this goal. For example, we need to develop means to ensure access to high quality medicines, at affordable prices, to provide better treatment outcomes than are currently available, and to provide personalised professional advice in a patient-relevant manner. As a profession, I believe we need to become more entrepreneurial to achieve these outcomes.

This presentation will outline some future opportunities. It is often said that "change is the new constant", and I believe it is essential for our profession to actively engage in the design and development of new patient-relevant opportunities. Looking ahead, would it not be wonderful for entrepreneurship to be one of the defining attributes of a 21st century pharmacist?

Theme Speech 3: New Trends in Drug Pricing: A Threat or a Promise?

SCHWEITZER, Stuart
Department of Health Services
UCLA Fielding School of Public Health
USA

A new development in pharmaceuticals is the arrival of expensive "specialty drugs". This has produced substantial public out-cry, with public concern that either patients will no longer have access to new drug products, or that providing coverage will bankrupt health systems. How can health systems react to these new financial threats?

Expensive pharmaceuticals are a peculiar issue because, while the public is upset by a US$50 pill, it is totally unconcerned about the cost of a US$500 MRI or a US$5000 hospital stay! People have difficulty understanding that products that are so small may be "worth" substantial amounts of money! We have been used to drugs for which an episode costs far less than an average daily wage, and some drugs now are as costly as an entire year's income.

One explanation for the high cost of some drugs is that research costs are rising at a rapid rate – together with the financial riskiness of pharmaceutical research. While this is true, research costs are not the drivers of pharmaceutical prices. Ironically, the real driver is that many expensive drugs are actually *worth* very high prices. In some cases new drugs offer enormous gains in both quantity and quality of life. In a few cases, these new drugs actually *save* money.

The challenge to health systems is to know *when* a drug *is,* or *is not*, worth a high price. And then health systems must reimburse accordingly. This relationship is called Value-based Pricing. Value-based pricing will entail new roles for the pharmaceutical profession – in the areas of research, policy, and even retailing.

Theme Speech 4: Cancer Drug Development: From Chemotherapy to Immunotherapy

CHAN, Anthony
Associate Dean (External Affairs)
The Chinese University of Hong Kong
Hong Kong

An inter-departmental multi-disciplinary approach in clinical and translational cancer research at the Hong Kong Cancer Institute provides the platform for the practice-changing pivotal studies in Asian-prevalent cancers. The Sir YK Pao Centre for Cancer has been designated as a Partner State Key Laboratory in Oncology in South China, a Sister Institution of the MD Anderson Cancer Centre, accredited for NCI-CTEP sponsored studies and has been approved by the Chinese FDA for oncology trials. Pioneering studies using chemotherapy-radiotherapy, targeted therapies, immunotherapies and biomarker development will be presented.

Theme Speech 5: Coaching – Modern Pharmacy Management and Development

LANG, Charlie
Founder and Managing Partner of Progress-U Asia
Hong Kong

Pharmacists are regarded as 'drug experts' and are equipped with unique professional skills and knowledge. Therefore, they are often put forward to become a team leader to manage drug-related issues and operations. Pharmacists are required to manage a team consisting of colleagues with different backgrounds. However, the human resources components in management are often undervalued in the pharmacy education or in the continuous development in the workplace.

During the current expansion of the pharmaceutical industry, human resources are critical to maintain healthy growth. Employees are motivated when they believe their work is worthwhile, when they are in control of achieving their own goals and when they are recognized and appreciated for their efforts. People perform sub-optimally or leave their jobs when these elements are lacking. Actually, they often leave their managers rather than their companies.

'Coaching' is unique. People commonly think coaching, counseling or training are the same but coaching is not about focusing on problems or supervision. It is a cyclical process of enhancing ones' awareness of the current situation, guiding to choose responsibility for the action they take to achieve personal or professional goals, and helping them to evaluate the consequences of their actions and learn from them. When applied individually, it helps enhance one's strength and abilities to maximize performance.

The switching of pharmacists' role to patient-centered services gradually emphasizes the importance of leadership ability. This is significant to all the sectors in the local pharmaceutical industry. The trend of coaching as a leadership style is expected to be continually developed in the future. Therefore, understanding what it takes to conduct effective coaching to improve individual performance and ultimately the business performance, appears timely and necessary.

Pre-dinner Symposium
The Role of Aquaresis in Heart Failure

SIU, David
Clinical Associate Professor
The University of Hong Kong
Hong Kong

Over the past 2 decades, there have been significant improvements in management of chronic heart failure with improved morbidity and mortality, much less have been achieved in the management of acute decompensated heart failure. Tolvaptan, a vasopressin analogue, targets the final gate for water homeostasis may have important role in the acute management of acute heart failure.

Tolvaptan is a vasopressin V2-receptor antagonist and the first and only oral drug in its class, it has been shown in clinical trials to be an effective treatment for hypervolemic and euvolemic hyponatremia, especially for hyponatremia patients with heart failure. It prevents vasopressin-induced reabsorption of water, promoting aquaresis or electrolyte-free removal of water leading to an increase in urine volume with minimal change in concentration of electrolytes. Therefore it is classified as aquaretic, a new class which is different from the conventional diuretics. By blocking the V_2-receptors in the kidney cells, Tolvaptan increases urine water excretion, resulting in increased aquaresis (solute-free water clearance) and decreased urine osmolality, and, consequently, serum sodium concentrations are raised in a controlled manner. Unlike diuretics, tolvaptan does not significantly affect urine sodium or potassium excretion or serum potassium concentration.

Concurrent Session I: Dyslipidaemia
Guidelines Stand-off: Treating your Patients like Americans or Europeans?

TSE, Hung-fat
Chair Professor of Cardiovascular Medicine
Department of Medicine
The University of Hong Kong
Hong Kong

The 2013 American College of Cardiology (ACC)/American Heart Association (AHA) guideline on the treatment of blood cholesterol recommends moderate- to high-intensity statins for high risk patients for atherosclerotic cardiovascular diseases but departs from the conventional treat-to-target approach as advocated by the European Society of Cardiology and the European Atherosclerosis Society (ESC/EAS). The ESC/EAS guideline recommends therapies based on different lipid disorders with clinically or scientifically documented effectiveness. On the other hand, ACC/AHA guideline focuses exclusively on evidences based on randomized controlled trials for statins, but provides no advice for those lipid disorders that fall outside the evidences from randomized trials, and ignores other alternative or additive treatment options, such as fibrates, ezetimibe, bile acid sequestrants, or omega-3-fatty acids that are also required in daily practice. Whether 50% low-density lipoprotein cholesterol (LDL-C) reduction (ACC/AHA guideline) or attained LDL-C levels to 1.8mmol/l (ESC/EAS) have similar or different clinical outcomes for prevention of atherosclerotic cardiovascular diseases is not known. Nevertheless, the best approach should be 'the earlier – the better' for primary prevention rather than aim at 'the lower – the better' for secondary and tertiary prevention.

Concurrent Session I: Dyslipidaemia
Statins Intolerance – Evidence, Mechanism, Management. What's More to Say?

TOMLINSON, Brian
Adjunct Professor
Department of Medicine and Therapeutics
The Chinese University of Hong Kong
Hong Kong

Statin intolerance is the condition when patients are unable to continue long term treatment with statin drugs because of symptoms or abnormalities of biomarkers which are attributed to the initiation of statin treatment or an increase in the dosage. This can be complete with intolerance to all statins at any dose or partial being intolerant to some statins at some doses. The major manifestations are statin associated muscle symptoms (SAMS), which may present as myalgia or sometimes as muscle tenderness, cramps or weakness during exertion. There is a marked discrepancy between the frequency of muscle symptoms recorded in observational studies or registries and that recorded in controlled clinical trials. Some observational studies report the frequency of muscle symptoms without elevation of serum creatine kinase leading to treatment discontinuation occurring in 10 to 20% of patients but in the clinical trials the frequency of muscle symptoms with statin treatment has usually been similar to that with placebo[1]. Moreover, the majority of patients who stop statin treatment because of an adverse event appear to be able to tolerate a statin if they are re-challenged[2].

There are several potential mechanisms by which statins may interfere with muscle function including reduction of the intermediates of cholesterol biosynthesis such as isoprenoid compounds which are involved in many important cellular functions, impaired mitochondrial function and reduction of membrane cholesterol content. SAMS are more likely to be noticed in patients undertaking strenuous physical activity. It is important to identify and try to overcome the problem because discontinuation of statin therapy is associated with an increase in cardiovascular events[3].

1. Stroes ES, et al. Statin-associated muscle symptoms: impact on statin therapy-European Atherosclerosis Society Consensus Panel Statement on Assessment, Aetiology and Management. Eur Heart J 2015;36:1012-22.
2. Tobert JA, Newman CB. Statin tolerability: In defence of placebo-controlled trials. Eur J Prev Cardiol. 2015 Aug 28. pii: 2047487315602861.
3. Nielsen SF, Nordestgaard BG. Negative statin-related news stories decrease statin persistence and increase myocardial infarction and cardiovascular mortality: a nationwide prospective cohort study. Eur Heart J 2015 Dec 1. pii: ehv641.

Concurrent Session I: Dyslipidaemia
PCSK9-targeted Agents in an Era without Treatment Targets

KIM, Hyun-ho
Regional Senior Medical Advisor
Korea

Proprotein convertase subtilisin/kexin type 9 (PCSK9) plays an important role in the regulation of cholesterol homeostasis. By binding to hepatic low-density lipoprotein (LDL) receptors and promoting their lysosomal degradation, PCSK9 reduces LDL uptake, leading to an increase in LDL cholesterol concentrations. Gain-of-function mutations in PCSK9 associated with high LDL cholesterol and premature cardiovascular disease have been causally implicated in the pathophysiology of autosomal-dominant familial hypercholesterolemia. In contrast, the more commonly expressed loss-of-function mutations in PCSK9 are associated with reduced LDL cholesterol and cardiovascular disease risk. The development of therapeutic approaches that inhibit PCSK9 function has therefore attracted considerable attention from clinicians and the pharmaceutical industry for the management of hypercholesterolemia and its associated cardiovascular disease risk.

The effects of PCSK9 on hepatic and intestinal lipid metabolism and the more recently explored functions of PCSK9 in extrahepatic tissues have been demonstrated. Therapeutic approaches that prevent interaction of PCSK9 with hepatic LDL receptors (monoclonal antibodies, mimetic peptides), inhibit PCSK9 synthesis in the endoplasmic reticulum (antisense oligonucleotides, siRNAs), and interfere with PCSK9 function (small molecules) are also evaluated.

Concurrent Session II: Emerging Therapeutics
Next Generation Sequencing to Help Drug Choice

LUI, Vivian
Assistant Professor
Department of Pharmacology and Pharmacy
The University of Hong Kong
Hong Kong

To date, an increasing number of targeted therapies has been approved by the US FDA for the treatment of cancer based on tumor-specific genetic alterations. These "gene-matching drugs" have unprecedentedly extended patient survival, even for advanced and metastatic diseases. In the US, multi-gene sequencing, using next-generation sequencing (NGS) technology, has been incorporated into clinical practice, clinical trial design, and of course, translational research studies. Genomics of exceptional responders have been examined to identify mutational events that are likely to contribute to good clinical responses in patients. Despite these clinical promises, the obstacles and challenges in Asia will be discussed, with the hope to bridge the gap for patient treatment based on genomics between Asia and the Western world.

Concurrent Session II: Emerging Therapeutics
Nanotechnology-based Therapeutics: Advances and Applications

HUI, Ho-wah
Director of Formulations R&D
Celgene Corporation
USA

Nanotechnology is a multidisciplinary arena, covering a diverse and wide range of applications. Typically, the nano-sized particles have dimensions smaller than 100 nanometers. They can be functional by themselves or a part of larger devices consisting of other objects. Nanotechnology has been applied in various fields, such as biosciences, optics, material sciences and information technology. In the last three decades, there are progressive advances and accomplishments in the area of medicine. In the diagnostic front, there are leading approaches for the early detection of precancerous lesions from biological fluids. It has a great potential to fundamentally transform how we diagnose and cure cancer. Nanotechnology can also provide the capacity to prepare unique and effective therapeutic dosages to treat cancer and other diseases. Traditional chemotherapy utilizes active pharmaceutical ingredients to kill cancer cells. However, these drugs also kill healthy cells and this leads to unwanted side effects, such as nausea & vomiting, hair loss, fatigue and weakened immune function. Nanotechnology-based medicine can impart advantages over traditional chemotherapy. It can increase the half-lives of drug circulation times in the body, improve the retention and targeting efficiency, protect drug moieties from being metabolized before reaching the target cells, optimize the penetration of drugs into cancer cells and reduce the interaction of drugs with healthy cells. Nanotechnology-based therapeutics are still mostly in the development stage. Nevertheless, several nanotechnology-based drugs have been approved by regulatory authorities and many more are being tested in clinical trials.

Concurrent Session II: Emerging Therapeutics
Advanced Parkinson's Disease Treatment Update – Pharmacotherapy and Surgical Interventions

MOK, Vincent
Assistant Dean (Admission)
Department of Medicine and Therapeutics
The Chinese University of Hong Kong
Hong Kong

Parkinson's disease (PD) is the second most common neurodegenerative disease worldwide. Despite curative or neuroprotective therapy is still not available, effective symptomatic pharmacological and surgical treatments are available to provide substantial symptoms relief for patients at different stages of the disease. Despite levodopa is the most potent symptomatic pharmacological treatment, it is commonly reserved for more disabling symptoms because of its association with motor complications. Several newer non-ergot dopamine agonists (DAs) (e.g. pramipexole, ropinirole, rotigotine patch) have now largely replaced bromocriptine (ergot compound). These newer DAs can be used as monotherapy, or as adjunct therapy with levodopa in more advanced stage of the disease. Apart from nausea or dizziness, impulse control disorders or other behavioral disorders (hallucinations, delusions) may occasionally be associated with use of DAs. Solution form of DA, namely apomorphine is also available recently in Hong Kong for use as "rescue" therapy, or in form of continuous infusion. COMT inhibitor and monoamine oxidase B inhibitors (MAOB Is) (selegiline and recently, rasagiline) can be used as adjunct therapy with levodopa to prolong action of levodopa. The MAOB I can also be used as monotherapy given its mild symptomatic effect.

As disease further advances, pharmacological treatments may not be able to provide satisfactory relief of symptoms, and surgery (deep brain stimulation, targeting subthalamic nucleus or globus pallidus) may be indicated in subjects whose symptoms are not controlled well with pharmacological treatments and are still considered fit to undergo brain surgery. In general, substantial reduction (~50%) of medications is possible after deep brain stimulation.

Concurrent Session III: Coaching
Coaching – Practical Exercises, Discussion and Case Examples

LANG, Charlie
Founder and Managing Partner of Progress-U Asia
Hong Kong

Abstract is not available

Concurrent Session IV: Infectious Disease and Practice
Treatment for MERS-CoV: International and Local Perspectives

CHOI, Kin-wing
Deputy Chief of Service
Department of Medicine
Alice Ho Miu Ling Nethersole Hospital
Hong Kong

Middle East respiratory syndrome (MERS) is a lethal respiratory disease caused by a novel coronavirus (MERS-CoV). The virus was first isolated from a patient who died from a severe respiratory illness in Saudi Arabia in June 2012. As of 1st Oct 2015, 1593 laboratory-confirmed cases have been reported to World Health Organisation (WHO), and this resulted in 568 deaths (35.7% mortality).

Given the high rate of mortality and practical difficulties in harvesting convalescent plasma from survivors, there is a pressing need on the development of effective antiviral treatment for MERS. Group 1 interferon and ribavirin have been tested *in vitro* against MERS-CoV and used to treat infected persons on compassionate ground. The combination of interferon alpha-2b and ribavirin exhibited synergistic effects against MERS-CoV *in vitro* and improved clinical outcomes in animal experiments. However, the efficacy of this combination regimen in humans remains uncertain, and is potentially limited by the high 50% effective concentrations (EC_{50}) against MERS-CoV of these agents relative to the peak serum concentration achievable with dosages used in usual clinical settings. Among the agents identified through screening of chemical libraries, lopinavir is a potential drug to be explored in clinical trials. At concentrations readily achievable in serum with its recommended dosage (in the form of lopinavir-ritonavir combination), this drug has been shown to inhibit MERS-CoV *in vitro*. In the long run, development of antiviral agents with specific targets on the MERS-CoV shall provide the best solution to this therapeutic challenge. Examples of novel agents under development include monoclonal antibodies against the spike protein, and inhibitors of viral proteases and helicase.

Concurrent Session IV: Infectious Disease and Practice
The State of Novel Antibiotics Discovery

MAK, Raymond
Pharmacy Department
Queen Mary Hospital, Hospital Authority
Hong Kong

For many decades since the first discovery of antibiotic, humans have enjoyed a therapeutic edge in their incessant battles against pathogenic microorganisms. This situation was fortuitously maintained for a substantial period of time. This is until the emergence in recent years of highly resistant or multi-resistant microorganisms, such as vancomycin-resistant Enterococcus in the 80's and multi-drug resistant Pseudomonas species and Acinetobacter species just past the millennium year. In light of the mounting resistance from pathogens, clinicians have had to resort to strategies such as using broad-spectrum antibiotics sooner, or resurrect older antibiotics into clinical use.

In this concurrent session, the speaker aims to provide an update on the current state of novel antibiotics discovery, to see if the rate of discovery is keeping pace with the emergence of resistance. The session will also highlight what recent novel antibiotics are available, whether or not they are helping and whether they are associated with any drawbacks. The session will also touch on what therapeutic gaps remain, if any.

Finally, the speaker will discuss what strategies have been proposed in the fight against the threats of increasing bacterial resistance, especially how we as pharmacist can possibly contribute towards it.

Concurrent Session V: Public Private Interface
Role of Comprehensive Quality Assurance in Medication Safety – a Public Hospital Perspective

XU, Xue-dong
Medical Affairs Department
Peking University Third Hospital
China

通过构建完善的医院三级质量安全保障体系，理顺质量安全管理部门、临床科室与药学部门的相互协作、服务、指导、规范和支持关系。在此过程中，逐渐建立和持续改进规章制度和指南、规范，借助信息系统加强处方点评和促进合理用药行为，辅以绩效考核，充分发挥临床药师的积极性等多种措施来强化药学服务与指导，提高患者和临床医护人员满意度。通过重点专科建设项目多年的建设，从发药自动化到实验室建设、人才培养等多方面持续加强药剂科能力发展，不断提升药学在医院服务过程中的重要性。

Concurrent Session V: Public Private Interface
PPI Service at the OAH – The Innovative Way!

CHIANG, Sau-chu
Director
Hong Kong Pharmaceutical Care Foundation
Hong Kong

Medication management has always been a chronic problem in the Old Aged Homes in Hong Kong. With the ageing population and high institutionalization of 6.8% of population aged 60 and above, it is expected that more and more elderly will be living in these homes in the coming decades. How do we, pharmacists take up the role of improving the medication management problem at these homes? How do we deal with the increased risk of medication related problems for these elderly population to minimize their re admissions to hospitals?

Apart from the medication review service performed by the visiting pharmacists which helps to bridge the communication gap between the hospitals and the Homes to achieve the effects of medication reconciliations, there is an increasing need for an effective IT system to support the clinical work of the visiting pharmacists to enable them to build up the medication profiles at the Homes.

This presentation will illustrate the journey on how the entire IT system was developed and piloted at one Old Aged Home and how this system has interfaced to automated dispensing system to provide unit dose packages to relieve the nursing home staff from the tedious manual picking and packing processes for the residents' medications rounds. The system does not stop here but has made use of innovative technology approach to extend the process to electronically supporting medication administration rounds with drug image and patient image verifications.

Concurrent Session VI: Advanced Practice
Medical 3D Printing to Individualize Dosing: The New Era that may Truly Enhance Adherence

GAISFORD, Simon
Head of the Department of Pharmaceutics
UCL School of Pharmacy
United Kingdom

The development of ink-jet and 3D printing technologies for fabricating medicines heralds a new era of pharmaceutical manufacturing, in which small production runs of dosage forms can be made. In addition, the versatility of printing technology means it is feasible to manufacture medicines personalised to the patient, potentially at the point of dispensing. In this talk, printing technology will be discussed, highlighted by the latest results in printed medicines, and the role of printing medicines in changing approaches to personalising treatments will be discussed.

Lunch Symposium
Updated Treatment for Asthma and COPD in 2016

LAM, Siu-pui
Specialist in Respiratory Medicine
Department of Rehabilitation and Extended Care Unit
Wong Tai Sin Hospital

Both asthma and chronic obstructive pulmonary disease (COPD) are common and potentially serious chronic diseases and impose substantial burdens on patients, families and the communities. They cause respiratory symptoms, impose limitation on activities of daily living and exacerbations that sometimes require urgent health care and may be fatal.

Inhaled therapy is the mainstay of treatment in patients with asthma and COPD. In order for pharmacotherapy to be effective, pharmacists often play an important role in educating patients on their inhalation techniques and identifying any incorrect use of medication to reinforce patient compliance. A thorough understanding of the disease state, updated knowledge of therapies, and current guidelines are the necessary tools required for the management of such rapidly growing health concerns.

At the advent of new therapeutic options available for treating both asthma and COPD, particularly long-acting bronchodilators and anti-inflammatory agents in monotherapy or in combination, what are the current recommendations and clinical evidence behind new treatment regimens? What are the opportunities and challenges for pharmacists to ensure better patient outcomes?

Concurrent Session VII: Practice Research
Practice-based Research – The Search for Best Practice that Brings Reliable Results

KUO, Grace
Professor of Clinical Pharmacy
Family Medicine and Public Health
University of California San Diego
USA

Background: Practice-based research translates evidence into best practice in the clinical settings through collaborative efforts with stakeholders (e.g., patients, clinicians, healthcare administrators). Research questions are generated from clinical practice; research findings are applied back to the clinical setting to improve the effectiveness, quality, safety, equity, and efficiency of patient care.

Methods: We will review (1) Methods for establishing practice-based research "laboratory" networks; (2) Study designs suitable for practice-based research such as observational, cluster randomized, and quasi-experimental designs; and (3) Quantitative and qualitative methods used to collect practice-based research data.

Discussions: Experience of establishing PBRNs will be shared. Examples of practice-based research projects will also be discussed, including (1) Medication errors reported by physicians and pharmacists; (2) The effects of electronic medical records compared with paper medical records on medication counseling in primary care clinics; and (3) Physician-pharmacist collaborative management of patients with hypertension.

Conclusions: Practice-based research influences patient care management and provides evidence for continuous quality improvement efforts.

Concurrent Session VII: Practice Research
Big Data Decision Analytics

MENG, Helen
Chairman
Department of Systems Engineering and Engineering Management
The Chinese University of Hong Kong
Hong Kong

The era of Big Data is upon us. Technologies in mobility, Internet of Things, client-cloud architectures, affordable massive data storage, broadband networks and heterogeneous data, etc. are pervasive and create an unprecedented explosion in data known as "Big Data". Big Data is characterized by its "Volume", "Velocity", "Variety" and "Veracity". Deriving "Value" from Big Data leads us to the field of "Analytics", which is aimed at understanding the data and deriving intelligence to make evidence-based, optimized and insightful decisions. The Chinese University of Hong Kong (CUHK) has recently embarked on the interdisciplinary pursuit of Big Data Decision Analytics. This talk will introduce our work covering such areas as Public Health such as analyzing cancer incidence across regions based on WHO data, Digital Learning such as computer-aided pronunciation training, Knowledge Engineering such as topic modeling and analytics based on conference publications, etc.

Concurrent Session VII: Practice Research
Research on Medication Safety: How Could the Impact of Medicine Safety Policy and Practice be Evaluated?

WONG, Ian
Head
Research Department of Practice and Policy
UCL School of Pharmacy
United Kingdom

The majority of published research in medication safety is on the epidemiology and causes of adverse reactions or medication errors. Medication research can use quantitative, qualitative or mixed methods. However, research examining the effects of policy and practice on medication safety is limited.

In this lecture, I will use some real-life examples in the United Kingdom and Hong Kong to demonstrate the application of research methods in the evaluation of medication safety policy and practice. Examples will include (1) Committee on Safety of Medicines' warning on the use selective serotonin reuptake inhibitors in children and adolescents in the United Kingdom (2) Effects of HLA-B*15:02 screening policy on antiepileptic drug use and severe skin reactions in Hong Kong.

The lecture will also introduce various clinical databases such as the Clinical Data Analysis Reporting System (CDARS) in Hong Kong and Clinical Practice Research Datalink in the United Kingdom. These clinical databases can be used by practicing pharmacists and clinicians to evaluate medication safety policy and practice.

This lecture is particularly aimed at practicing pharmacists with little experience in research.

Concurrent Session VIII: Drug Formulation and Pharmacokinetics
A Scientific and Practical Review of Modified Release Formulations – Splittable, Breakable, Crushable?

CHARMAN, William
Dean
Faculty of Pharmacy and Pharmaceutical Sciences
Monash Institute of Pharmaceutical Science
Monash University
Australia

Modified release formulations offer many patient-relevant and clinical-outcome advantages. The various technologies supporting such formulations, administered via numerous routes of delivery, have evolved significantly over the past 40 years. However, one feature of all such formulations is that they must ***only*** be administered intact and that they are never split, broken or crushed prior to administration.

This presentation will outline the basis for the design of modified release formulations, the pharmaceutical and clinical rationale for their use, and the essential professional knowledge every pharmacist must have when dispensing and providing patient counselling for modified release medicines.

Concurrent Session VIII: Drug Formulation and Pharmacokinetics
Missing Doses and Wrong Times: Do They Matter? – Application of Clinical Pharmacokinetics and Pharmacodynamics Concepts

LAM, Teddy
School of Pharmacy
The Chinese University of Hong Kong
Hong Kong

Despite our best effort in educating our patients about adhering to medication regimens, practicing pharmacists routinely encounter practical questions when the patient's medication adherence is less than ideal: missing dose, wrong time with respect to food/meals, BD (Q8H) versus Q12H etc. Does it matter? And if so, what should be done? Well-controlled studies designed to answer these questions are rare, and clinicians usually rely on practice experience in answering these questions. This presentation aims to give an analysis from the clinical pharmacokinetic and pharmacodynamic perspective, and to provide a rational framework for managing these situations. Cases will be used for illustration. Clinicians should first assess the patient and his immediate medical need or potential adverse consequences, and provide care accordingly. The next step is to establish the dose-exposure-response relationship and assess the likely changes in therapeutic response; this requires knowledge of the pharmacology and the disease state. Then, basic pharmacokinetic calculations can evaluate the expected changes in drug exposure and therefore inform decisions about subsequent dosing adjustments. Finally, risk management strategies can be applied to minimize future untoward events due to medication nonadherance.

Concurrent Session VIII: Drug Formulation and Pharmacokinetics
Therapeutic Drug Monitoring in Clinical Setting

NG, Tsz-ming Kitty
Pharmacist
Department of Pharmacy
Queen Elizabeth Hospital
Hong Kong

Therapeutic Drug Monitoring (TDM) is both an art and a science that seeks to translate a drug's pharmacokinetic (PK) and pharmacodynamic (PD) profiles into clinical practice in order to maximize its therapeutic effect. It is essential for drugs with narrow therapeutic range or with high individual variability to ensure the efficacy while preventing toxicities. TDM is one of the most unique areas where pharmacists can differentiate one's expertise from other health professionals.

The interactions between host, antimicrobials and pathogens make PK and PD particularly important in formulating the most appropriate antimicrobial dosage regimen for individual patients with different kinds of infections. Vancomycin and aminoglycosides TDM are commonly seen in the hospital setting. In recent years, antifungals TDM has been advocated for transplant or hematology patients.

Different guidelines, protocols, nomograms and softwares for drug dosing and monitoring have been developed. Since they were developed with different assumptions and for different populations, careful evaluation and selection is required to enable their application to service provision in the local setting. Some practical issues should also be considered when implementing the TDM service.

This session will present the scientific basis of TDM, how it has been applied in clinical practice settings and the practical issues one may face when conducting TDM services involving antimicrobials.

Concurrent Session IX: Biosimilars
Biosimilars: Changes in Global Economic and Local Prescribing Landscape

HUI, Colin
Head of Medical and Pharmaceutical Program
Procurement Division
Australia

Health Purchasing Victoria (HPV) is an independent statutory authority reporting to the Minister for Health, working collaboratively with the Victorian health sector to find best value outcomes in procurement.

The global biosimilar market is rapidly growing. IMS reports that by 2015, sales of biosimilars are estimated to reach between US$1.9-2.6 billion, increasing from US$378 million in 2011[1]. It's expected that many biologics will lose patent protection by 2020, potentially creating an estimated market for $79 billion of biosimilar competition. The race has begun for suppliers to build new capability and capacity to develop biosimilars, as has the race for government regulatory bodies to develop a registration pathway for this emerging market.

Unlike small molecules and generic copies, biosimilars are 'similar' but not the same as the reference biologic. Their differences can include manufacturing, government requirements and pathways, economic impact, and interchangeability and immunological responses. However, biosimilars are so 'similar' that they can be registered under the same name, demonstrate similar clinical outcomes, use the same dosing regimen, and undergo the same therapeutic monitoring requirements.

The Council of Australian Therapeutic Advisory Groups has recently released a principle document outlining guidelines for clinicians and pharmacists on how to effectively manage the prescribing of biosimilars, however, clinical pharmacists must be equipped to manage the changing landscape of the biologic market.

At HPV, we have already developed a framework for biosimilar sourcing which involves collaboration with senior clinicians to drive a state biopharmaceutical Invitation to Supply (ITS) process. This presentation will cover HPV's experience with biosimilar G-CSF and the clinical and regulatory considerations emerging from HPV's current work on biosimilar infliximab in Victoria Australia.

Conflict of interest: Both authors have no conflict of interest

Concurrent Session IX: Biosimilars
Regulatory and Therapeutic Prospects of Biosimilars

CHAN, Clive
Senior Pharmacist
Department of Health Drug Office, Drug Registration Unit
Hong Kong

In Hong Kong, all pharmaceutical products must satisfy the criteria of safety, quality and efficacy, and must be registered with the Pharmacy and Poisons Board before they can be sold in the market. Pharmaceutical products may contain chemical or biological materials as active ingredients.

Biological products (i.e. pharmaceutical products containing biological materials as active ingredients) are distinguished from chemical products by being derived from living organisms and frequently having complex molecular structures. They require special quality consideration because of the biological nature of the starting materials, the manufacturing processes, and/or the test methods needed to characterize batches of the products.

The expirations of patent and/or data protection of the originator biological products have led, or will lead, to the development of copy versions of these products. In light of the special quality consideration with biological products, these copy versions cannot be considered as identical, but merely similar, to the originator products because of the inevitable differences in molecular structures and quality attributes arising from their different manufacturing processes. These copy versions of the originator products are commonly referred as biosimilar products.

In line with international practice and scientific consensus, the registration of biosimilar products cannot use the same approach of generics for chemical products, i.e. cannot reply on bioequivalence and quality data only. Safety and efficacy data in comparison with the originator products are also necessary. These requirements are included in the Guidance Notes for Registration of Biosimilar Products available on the Department of Health Drug Office website.

Concurrent Session IX: Biosimilars
Safety and Efficacy of Biosimilars / Patient Perspective on Resource Allocation

Abstract is not available

Plenary Session: Update from Pre-Pharmacy Council Task Force

Establishing a pharmacy council is a powerful public statement of the coming of age of the pharmacy profession — a healthcare profession that is ready to set high standards and self-regulate. The council serves as a bridge to other health related councils in our collective commitment to improve the efficiency of our health-care system. By speaking out on pharmacist manpower and pharmaceutical care, the council is our only hope of making an impact in enhancing job satisfaction for pharmacists and the care we are capable of delivering. Our profession will continue to be ignored in policy decisions affecting our future were we reluctant to step outside our professional comfort zone.

Given the generally favorable sentiment for the pharmacy council at the 2015 Hong Kong Pharmacy Conference Plenary Session, the Task Force on Preparation of a Proposal for Establishing a Pharmacy Council, led by CUHK and PSHK, moved forward in stride to the next phase. The strategic tasks set out to be completed in this phase include:

a. to sharpen the vision and mission statements of the proposed Pharmacy Council Frameworks document;
b. to expand the breadth and depth of grassroots, peer to peer, and governmental support;
c. to determine the optimal membership of the council, terms of reference, and by-laws;
d. to determine the infrastructure, personnel, budget, and revenue streams required to launch and sustain the HK PC;
e. to establish teams and time-lines; and
f. to conduct open forums and collect feedbacks regarding the proposed framework of the Pharmacy Council

The Task Force core members would like to provide an update at this 2016 pharmacy conference on the action plans articulated above.

Plenary Session Agenda:
- The proposed framework and responsibilities of the future Hong Kong Pharmacy Council
- The feedback that has been collected from open forums
- The Task Force's response and follow-up actions to the feedbacks
- Roadmap - the way forward
- Open discussion

Ab11

Clinical Implications of Pharmacist Interventions on Drug Administration for Geriatric Patients with Dysphagia

CHANG, MY[1,2]; LI, SGY[1,2]; SO, WY[1]; LEE, VWY[2]; IP, LF[3]; CHENG, YL[3]; LAI, WK[1]
[1] Department of Pharmacy, Alice Ho Miu Ling Nethersole Hospital (AHNH), Hong Kong
[2] School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong
[3] Department of Medicine, Alice Ho Miu Ling Nethersole Hospital, Hong Kong

Background: Dysphagia is common in elderly which could lead to drug administration related problems. A previous pilot study in Alice Ho Miu Ling Nethersole Hospital (AHNH) has proven that clinical pharmacist was effective in the management of drug-related problems (DRPs) via a multidisciplinary approach in hospitalized geriatric patients.

Objectives: To investigate in-depth the DRPs associated with drug administration in dysphagic patients for future development of geriatric clinical pharmacy service.

Methods: Patients either presented with dysphagia requiring crushing of medications or undergoing enteral tube feeding was recruited prospectively during the routine multidisciplinary geriatric round. Pharmacists identified any DRPs of recruited subjects and recommended interventions to case physicians and nurses during pharmacy ward rounds. Clinical recommendations, the corresponding outcomes and reasons for non-acceptance were documented for data analysis. Chi-square test and logistic regression test were used to compare categorical variables and continuous data respectively.

Results: From Aug 2014 to Mar 2015, a total of 304 patients were recruited. 147 patients (48.4%) were intervened during pharmacy ward rounds, with 212 DRPs identified being drug administration related, which corresponded to an average of 1.44 DRPs/patients. 131 DRPs (61.83%) were accepted by the geriatric parent care team. 'Extended-release (ER)/Sustained-release (SR) formulation' ranked the highest (70, 33.0%) of the DRPs identified. Of the 131 DRPs being accepted, 'Antibiotics' ranked the lowest rate of acceptance (47.8%). Patients with enteral tube was found to be significantly less likely to be intervened ($p<0.001$). Patients with higher number of oral medications at screening were also found to be significantly associated with increased intervention rate ($p<0.001$). Physicians did not usually specify the reasons for not accepting the interventions (29, 35.8%). Other than that, cost and well-controlled were the most common reasons for non-acceptance (both 18, 22.2%).

Conclusions: Pharmacists demonstrated clinical roles in identifying and resolving DRPs in geriatric patients with dysphagia. A number of future directions were identified for development of geriatric clinical pharmacy service.

Ab12

A Study on the Impact of a Pharmacist-led Neurology Refill Clinic: Experience of a Local Hospital in Hong Kong

FONG, TS[1]; SUEN, KW[1]; CHAN, WYM[1]; LEE, CP[2]
[1] Department of Pharmacy, Tseung Kwan O Hospital, Hong Kong
[2] School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong

Objectives: To investigate the impact of the Pharmacist-led Neurology Refill Clinic in Tseung Kwan O Hospital and describe the role of pharmacist in the management of neurological medications.

Methods: This was a retrospective case review study between September 2007 and 31st December 2014. Study population included patients with epilepsy, migraine, neuropathic pain, Parkinson's disease or dementia, who were newly started on or had dosage adjustments in their neurological medications. Primary outcomes were number, types and outcomes of drug-related problems (DRPs) identified and interventions performed by pharmacists. Secondary outcomes included (1) medication discontinuation rate at case close, self-discontinuation rate with the associated reasons and risk factors, (2) drug wastage reduction, and (3) patient satisfaction.

Results: Among the 285 cases referred to the clinic, 236 cases were recruited into the study. A total of 438 DRPs were identified in 204 cases (86.4%), and 302 interventions were performed in 140 cases (68.6% of the cases with DRPs detected). Regarding the outcomes, 48.4% of DRPs were either totally or partially solved. Medication discontinuation rate at case close was 15.7%. Self-discontinuation rate was 19.9%, among which 40.4% could continue back on the referred regimen or a modified regimen after pharmacist's interventions. The most common reason for self-discontinuation was side effects (63.8%), and multiple logistic regression analysis identified migraine as a risk factor for self-discontinuation. Refill was not dispensed in 26.3% of the cases, resulting in a drug wastage reduction which translated into HKD 71,531.53 (HKD 18,510.78 after excluding pharmacist cost). Patient questionnaire showed that the service was well-accepted by patients and effect of counseling was generally sustainable.

Conclusions: Pharmacists can contribute to the management of patients on neurological medications through identifying and managing DRPs. The Pharmacist-led Neurology Refill Clinic was also demonstrated to reduce self-discontinuation, result in drug wastage reduction, and was well-accepted by patients.

Ab13

Evaluation of the Prescribing Pattern and Efficacy of Antiemetic for Chemotherapy-induced Nausea and Vomiting in a Hong Kong Public Hospital

CHAN, YM[1,2]; CHAU, RYH[1,2]; WONG, KM[1]; LAM, TN[2]; LEUNG, WYS[1,2]; LAW, KM[1]; YIU, HY[3]; NGAN, RKC[3]
[1] Department of Pharmacy, Queen Elizabeth Hospital, Hong Kong
[2] School of Pharmacy, The Chinese University of Hong Kong, Hong Kong
[3] Department of Clinical Oncology, Queen Elizabeth Hospital, Hong Kong

Objectives: This study aimed to determine the antiemetic prescribing pattern and evaluate the control of chemotherapy-induced nausea and vomiting(CINV) in patients newly started on cisplatin-based, carboplatin-based or anthracycline-cyclophosphamide(AC) combination-based chemotherapy.

Methods: A prospective, observational study was conducted in Queen Elizabeth Hospital. Patient characteristics and treatment details for the first two cycles of chemotherapy were collected. CINV outcomes from days 1 to 7 or 8 were evaluated through self-reported emesis diary. Appropriateness of prescribing pattern, proportion of patients who achieved complete response(CR) or complete protection(CP) and who experienced emesis were determined.

Results: Eighty-seven subjects were enrolled over 8 weeks in early 2015. It was observed that antiemetic prescribing adhered more closely to international guidelines in the acute phase(59.4%) than the delayed phase(50.0%). All subjects on high emetic risk regimens were prescribed dexamethasone and serotonin antagonist on day 1, but not aprepitant(25.0% in cisplatin-based; 54.3% in AC-based regimens). Serotonin antagonist was not prescribed for acute CINV in 35.7% patients on moderate emetic risk regimens. Dexamethasone was prescribed for preventing delayed CINV in 23.7% patients on high emetic risk regimens and 50.0% patients on moderate emetic risk regimens, while serotonin antagonist was prescribed in less than 10% patients. CP and CR were higher on the day of chemotherapy(59.5%; 78.4%) than on subsequent days(17.6%; 36.5%) in 74 subjects included in efficacy analysis. Twenty-two(29.7%) patients vomited, five of whom added serotonin antagonist post-chemotherapy at second cycle but three still experienced emesis. Subgroup analysis showed that fewer subjects on AC-based chemotherapy prescribed with aprepitant experienced emesis (5.6% versus 58.3%, p=0.003).

Conclusions: With aprepitant becoming free for patients receiving high emetic risk chemotherapy, prescribing aprepitant for preventing acute and prolonged dexamethasone for delayed emesis in all such patients are recommended to strengthen CINV control. Improvement of emesis control is anticipated with improved adherence to international guidelines.

Ab14

A Retrospective Cohort Study Comparing Safety and Efficacy of Proprietary Filgrastim (Neupogen®) versus Biosimilar Filgrastim (Nivestim®) for Primary Prophylaxis of Neutropenia in Patients Receiving Adjuvant or Neo-adjuvant Chemotherapy Treatment for Breast Cancer in a Local Hospital

MA, FT Florence
Department of Pharmacy, Tuen Mun Hospital, Hong Kong

Background: Filgrastim is a biologic used in prevention and treatment of chemotherapy-induced neutropenia in high-risk patients. Biosimilars are highly similar to originator biologics, but are not identical. A biosimilar filgrastim was introduced into Hong Kong Hospital Authority in 2013. Local studies were needed to evaluate the clinical efficacy and safety of biosimilar filgrastim compared to proprietary filgrastim.

Aims and Objectives: This study aimed to review the safety and efficacy of biosimilar filgrastim compared to proprietary filgrastim for primary prophylaxis in of severe or febrile neutropenia in breast cancer patients receiving adjuvant and neo-adjuvant chemotherapy in Tuen Mun Hospital.

Methods: Patients who started their first cycle of adjuvant or neo-adjuvant chemotherapy for breast cancer from January 2013 to December 2014 in Tuen Mun Hospital were included. Patients were grouped according the brand of filgrastim used (Neupogen® , Nivestim® , Zarzio®). The Incidence of severe neutropenia (grade 3 or grade 4) and febrile neutropenia in first cycle and subsequent cycles of chemotherapy were evaluated according to the Common Terminology Criteria for Adverse Events v4.03. Cost of hospitalization due to febrile neutropenia, delay or dose reduction of chemotherapy, and side effects were also evaluated.

Results: A total of 97 cases were included in the analysis for incidence of severe or febrile neutropenia after first cycle chemotherapy; five patients had severe neutropenia, in which four cases had febrile neutropenia. 63 cases were included in subsequent cycle analyses; five patients had severe neutropenia, in which one case had febrile neutropenia. Twelve cases (19%) had a delay and eleven cases (17.5%) had dose reduction in at least one cycle of chemotherapy. There was no significant difference in the incidence of neutropenia and other secondary endpoints among different filgrastim groups.

Conclusion: Biosimilar filgrastim likely showed similar efficacy and safety profiles compared to proprietary filgrastim. Further studies with larger sample size would be needed.

Practice

Ab15

An Audit on the Management of Over-anticoagulation in Warfarinised Adult Patients in a Local Public Hospital

SUEN, Shing-yu
Department of Pharmacy, Pamela Youde Nethersole Eastern Hospital, Hong Kong
Department of Pharmacology and Pharmacy, The University of Hong Kong, Hong Kong

Introduction: Warfarin, one of the oldest anticoagulants, is still used extensively in indicated patients in public hospitals of Hong Kong. Patient who takes warfarin has to take blood samples regularly for measuring the International Normalised Ratio (INR) to monitor warfarin's anticoagulation effect. A raised INR could mean the patient is in increased risk of bleeding. In case of raised INR or bleeding events occur, patient can be managed according to the evidence-base guidelines.

Purposes of the Project: To identify to evaluate whether management of over-warfarinisation in a local public hospital adhered to selected international guidelines.

Method: This retrospective study was performed in a public hospital situated in Hong Kong, China. Patients who were admitted to the hospital from 1st Jan 2013 to 31st Dec 2013 were chosen for selection according to the inclusion and exclusion criteria. Two international guidelines were chosen to be the standard of this study. The primary endpoint is the percentage of episodes identified with reversal management adhered to selected guidelines.

Results: 247 out of 374 episodes (66.04%) were defined as adherence according to the selected guidelines. The most adhered subgroup belonged to the group of INR above target but less than 5 without bleeding, with the percentage of 97.41%. However, there was no episode in the INR >8 with minor bleeding group adhered to the guidelines. The vitamin K1-related causes of non-adherence accounted for 101 head counts while the fresh frozen plasma-related reasons accounted for 46 head counts. FFP was misused in all subgroups except in the major bleeding group. Among the 127 episodes of non-adherence, 84 episodes were being treated in medical ward.

Conclusions: The adherence rate is comparable to other overseas studies. An update of the local hospital guideline is required. Integration of quality improvement models have to be further promoted. Role of pharmacist in managing over-anticoagulated patients is worth exploring in view of the promising results of pharmacist-led warfarin clinic. Moreover it is worthwhile to evaluate whether a quality improvement programme involving pharmacists should be developed and implemented for this area to improve adherence to guideline.

Ab16

Impact of Pharmacist-conducted Discharge Counselling for Chronic Obstructive Pulmonary Disease (COPD) Patients: A Pilot Study

YUEN, YK[1]; YEUNG, KC[1]; LAM, JKW[2]; LEE, CP[3]; PHAN, TK[4]; FUNG, P[5]; WONG, ML[6]
[1] Resident Pharmacist, Department of Pharmacy, Caritas Medical Centre, Hong Kong
[2] Assistant Professor, Department of Pharmacology and Pharmacy, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong
[3] Senior Lecturer, School of Pharmacy, The Chinese University of Hong Kong, Hong Kong
[4] Department Manager, Department of Pharmacy, Caritas Medical Centre, Hong Kong
[5] Senior Pharmacist, Department of Pharmacy, Caritas Medical Centre, Hong Kong
[6] Chief of Service, Department of Medicine and Geriatrics, Caritas Medical Centre, Hong Kong

Background: COPD is one of the leading causes of mortality in Hong Kong. Despite the availability of many effective treatments, the treatment goals are often not achieved. COPD exacerbation remains common and exerts consistent burden on the healthcare system. Apart from smoking cessation, pharmaceutical care to target medication use for COPD patients in Hong Kong was limited. While regimen modification is often seen at discharge, patients may not be fully aware of the change, which may lead to preventable unscheduled re-admission or Accident and Emergency Department (AED) visit. By initiating a pilot pharmacist-conducted discharge counselling service, the study aimed to investigate and evaluate the impact of pharmacist care in COPD patients.

Methods: The study was carried out at Caritas Medical Centre (CMC), an acute general hospital under Hospital Authority (HA). A total of 83 COPD patients were assigned to intervention or control group according to their arrival time at Pharmacy for medication collection. For patients in the intervention group, an evaluation of baseline inhalation technique was first carried out, followed by a structured education about the correct inhalation technique and their discharge medications by the research pharmacist. The counselling session was ended with another assessment of the inhalation technique. Telephone follow-up was arranged at two-week since discharge to assess on compliance. Each patient was followed for 30-day since discharge for any unplanned re-admission and AED visit.

Results: Although the current study failed to illustrate significant reduction in re-admission and AED visit, the results indicated significant improvement in inhalation technique (P = 0.016) in intervention patients when compared with control group patients. The improvement occurred mainly in the coordination steps of using a metered-dose inhaler (MDI), which is likely to enhance drug deposition in the lung and thus disease control of these patients. Compliance was satisfactory after the counselling session, with more than a half of the patients able to follow all prescribed instructions correctly.

Conclusions: The enhanced patient outcomes as a result of the pilot service demonstrated the value of pharmacist care in COPD patients. Future study may focus on the subsequent impact on utilization of healthcare facilities, preferably with a cost-analysis to justify the need for service establishment.

Free Paper

Ab32

A Retrospective Study Investigating Effect of Dual versus Monotherapy Inhaled Corticosteroids on Outcomes of Pneumonia among COPD Patients

HO, KM; YEUNG, WC
Department of Pharmacy, North District Hospital, Hospital Authority, Hong Kong

Objectives: In North District Hospital (NDH), dual therapy of Inhaled Corticosteroids (ICS) in COPD patients is common but not a recommendation in 2015 GOLD guideline[1]. We wanted to study the effect of dual ICS on outcomes of pneumonia among COPD patients.

Methods: This was a retrospective study. Patients with diagnosis of COPD and pneumonia during the period from 01-01-2011 to 31-12-2013 in NDH were recruited. Patients with continuous use of 6 months ICS were included while those with concomitant diagnosis of asthma or use of systemic steroids within 4 weeks before admission were excluded. Each patient profile was accessed and relevant data were recorded. Relevant data were baseline characteristics, comorbidities, usage of medications, and outcome measurements which included 30-day, 90-day mortality as primary end-point, and use of mechanical ventilation as secondary end-point.

Results: 242 patients using monotherapy of ICS and 109 patients using dual therapy of ICS were included in this study. In 30-day mortality, more patients died in dual therapy group (monotherapy 11.6% vs dual ICS 16.5%; p-value=0.204). In 90-day mortality, more patients died in dual therapy group (monotherapy 7.0% vs dual ICS 13.8%; p-value=0.042) and this difference was statistically significant. In use of mechanical ventilation, there were more patients in dual therapy group. (monotherapy 5.8% vs dual therapy 18.3%; p-value<0.001) and this difference was statistically significant. After doing statistical adjustment using logistic regression analysis, only use of mechanical ventilation outcome reached statistical significance. (30-day mortality: OR: 2.264; 95%CI 0.931-5.507; p-value=0.072; 90-day mortality: OR: 2.744; 95%CI 0.992-7.594; p-value=0.052; Use of mechanical ventilation: OR: 5.55; 95%CI: 2.118-14.569; p-value<0.001)

Conclusions: Dual ICS therapy increases risk of worse pneumonia outcomes among COPD patients. Compliance to different inhalers is a problem to patients and if dual ICS therapy increases risk of worse pneumonia outcome, we should not recommend this practice.

Reference: 1. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: Revised 2015. Global Initiative for Chronic Obstructive Lung Disease (GOLD). www.goldcopd.org (Accessed on 7th July, 2015, 2015).

Ab35

Development of an Assessment Tool for the Clinical Significance of Pharmacy Interventions in Pediatric In-Patient Setting

TSANG, CS Rikki
Department of pharmacy, Prince of Wales Hospital, Hong Kong

Objective: Pharmacists are always accountable for their clinical interventions in delivering pharmaceutical care. The significance and importance of clinical pharmacy service shall be assessed and evaluated in an effective way.

The purpose of the project is to develop an effective tool that characterizes clinical significance of interventions and value of clinical pharmacy service in pediatric in-patient setting.

Method: Literature search was performed. A tool consisted with severity of error and value of service had been used in different clinical pharmacy services. Improvements and adjustments were made for the use of pediatric in-patient setting. The edited tool was reviewed and tested by two pediatric pharmacists and two clinical pharmacists of non-pediatric specialty through retrospective examination of 212 pharmacist clinical interventions in neonatal intensive care unit (NICU) setting. All rankings from the four clinical pharmacists were compared using the kappa statistics. Symmetry tests were applied to examine the consistency of ratings among pharmacists.

Results: Agreement between the raters was substantial for severity of error but not value of service. The weighted κ statistics for the pairwise inter-rater agreement on severity of error were above 0.6, however, the agreement on value of service shows only small agreement (0-0.2) or only fair agreement (0.2-0.4). Non-pediatric pharmacists rated higher than pediatric pharmacists on average. Chi-square test showed that severity of error and value of service were measuring different dimension of service.

Conclusion: The developed tool was shown to be practical and reliable to rate severity of errors of clinical interventions in pediatric wards. However, another parameter, value of service, needs to be improved and tested in the future before incorporated into the instrument.

Free Paper

Ab36

Symbol of National Quality (SNQ) - The Innovative Traffic Light-like Model-Dynamic Candidate Drug *iSMART* Calling System (DCDCS)

LEE, Ya-cheng[1]; PEI, Yi-tasi[1]; CHEN, Chi-hua[2]
[1] Pharmaceutic Division, Department of Pharmacy, Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Taichung, Taiwan
[2] Department of Pharmacy, Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Taichung, Taiwan

Objective: Besides an original medicine candidate calling system shown as odd and even numbers, we face the difficult task of congestion and queue jumping at medicine waiting area that result in dispensing problems and less than 75% satisfaction. We devoted ourselves to the mission of hospital with medical care for humanity and respect for life, "gratitude, respect, and love", to apply interdisciplinary information technology into daily operations constantly.

Methods: To develop the dynamic candidate drug *iSMART* calling system (DCDCS), outpatient pharmacy was designated for multiple dispensing processes. All pharmacists in different positions such as dispensing, check, and distribution were required to scan the barcode on the printed medical memo. There were also different labels for special populations, such as elder, pediatric, and speedy on the memo to remind pharmacists and assistants to separate into different counters. The system also comes out with dynamic showing number as a traffic light-like information. Patients can check their number on the electronic board and watch the "traffic light" to come to the counter picking up medicines.

Results: The results for the iSmart system as following, (1) total waiting time from 7.96 min reduced to 6.93 min (13%) during general-hour and from 9.27 min to 6.97 min (26%) during peak-hour, (2) satisfaction of the waiting time from 74.4% to 90%. This iSMART calling system (DCDCS) obtained SGS ISO 9001 certification within five year and award 2012 Symbol of National Quality in biotechnology and medicine and also applied for the patent registration (case no. 100143059) in Taiwan.

Conclusion: We anticipate many developments including friendly service, intelligent pharmaceutical process, self-learning organization and efficient management.

We continue to moving forward to excellence pharmaceutical care and quality to create a "patient-centered" and evolutionary universal smart pharmacy.

Ab37

The Impact of Antibiotic Stewardship Program in Center-Taiwan Hospital: A Segmented Time Series Analysis

LIN, Yung-ta[1,2]; HUNG, Chih-hao[1]; LIAO, Wei-chih[4]; CHEN, Chi-hua[3]
[1] Division of Clinical Pharmacy, Department of Pharmacy, Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Taichung, Taiwan
[2] Graduate Institute of Public Health, China Medical University, Taiwan
[3] Department of Pharmacy, Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Taichung, Taiwan
[4] Department of Infection, Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Taichung, Taiwan

Subject: The amount of antibiotics use is related with bacteria resistant. Making policy in hospital is a best way to control the usage of antibiotics. In this study we use segmented time-series analysis to evaluate the import of the Antibiotic Stewardship Program (Total amount control of cephalosporin).

Method: We collect the in-patient antibiotic consumption form 2011/08 to 2014/12 in the hospital. The policy (Total amount control of cephalosporin) was started at 2013/08. We defined two period by the policy : Uncontrolled period (UCP, 2011/08~2013/07) and Controlled period (CP, 2013/08~2014/12). The consumption of antibiotic was present in DID (Defined daily dose per 1000 inhabitants per day). Analysis of this study use segmented time series analysis by SPSS ver.18.

Result: We established Segmented time-series analysis model (simple periodic model, R^2=0.713), and Forecasting. Compare to antibiotic consumption in real would, the Total antibiotic DID of CP (means± SD, 903.92±23.95 vs. 879.28±33.52, P<0.05), and target group-cephalosporin DID (means± SD, 425.23±16.62 vs. 386.72±24.62, p<0.05). The slope of UCP and CP form total antibiotics (-0.21 vs. 0.19), and target group-cephalosporin (-0.68 vs. -1.50).

Conclusion: Time series analysis can help us understand the effect of policy. In our study, we can find the Antibiotic policy guideline (Total amount control of cephalosporin) can control the amount of total antibiotics usage, especially in cephalosporin. In cephalosporin usage, we also find the policy can decrease the trend of usage.

Free Paper

Ab39

Implementation of Pharmacist-managed Medication Review and Reconciliation Service at Orthopaedic Wards in Queen Elizabeth Hospital

YU, CYM[1]; LEUNG, WYS[1]; CHUNG, WFK[1]; KEI, KMC[1]; LAW, KY[2]; CHAN, PH[2]; WONG, PYE[2]; YEUNG, E[2]; LI W[2]
[1] Pharmacy Department
[2] Department of Orthopaedics and Traumatology
Queen Elizabeth Hospital, Hong Kong

Objectives: Unintentional medication discrepancy during transition of care and drug-related problems (DRPs) could contribute to adverse drug events in hospitalized patients. Previous literatures demonstrated the positive impact of medication reconciliation mostly in medical or geriatric units. This study aims to investigate the impact of pharmacist-managed medication reconciliation and review at orthopaedic wards.

Methods: The study was conducted from June 10 to Nov 28, 2014, at two orthopaedic wards. On every weekday morning (2 hours per day), a pharmacist and an intern pharmacist performed medication reconciliation at admission, discharge and transfer. Patients with ≥5 chronic medications were included in admission reconciliation. New drug orders were also reviewed during pharmacist's presence. Interventions were performed for unintentional discrepancies and DRPs identified. Their clinical significance was rated by two clinical pharmacists not involved in the service. DRPs were classified using the PCNE Classification V6.2.

Results: During study period, 348 and 428 patients underwent medication reconciliation at admission and discharge/ transfer respectively and 1260 medication charts were screened. 13.5% and 11.5% of patients had at least one unintentional medication discrepancy identified at admission and discharge/ transfer respectively. Only 6.8% of discrepancies were considered identifiable during prescription vetting in pharmacy. Overall, 75.3% of discrepancies were rated as clinically significant or serious. In multivariate regression analysis, patients with >12 chronic medications were found 4.9 times more likely to have unintentional discrepancy on admission (adjusted OR = 4.89, p=0.003). A total of 119 DRPs were identified from chart screening, of which 87.4% were considered clinically significant or serious. The most common causes for DRPs were 'drug dose too high' and 'inappropriate duplication of therapeutic group'. Overall, 89.4% of interventions proposed were accepted by prescriber.

Conclusions: The study demonstrated that pharmacist-managed medication reconciliation and medication review at orthopaedic wards could make clinically significant interventions with high physician's acceptance rate.

Ab40

A Global View of the Pharmacy Dispenser Education and Certification

CHAN, SY Windy; CHAN, KY Garen; LEE, SF Alan
School of Health Sciences, Caritas Institute of Higher Education, Hong Kong

Background and Objectives: Pharmaceutical dispensers (dispenser) support the work of the pharmacists in ensuring safe and effective use of medicines. In view of their expanding roles and responsibilities, this review aims to identify aspects of international practice that could potentially be integrated into the local system.

Methods: A comparative analysis was conducted to compare the training programme and licensure framework of local dispenser with their overseas counterparts.

Results: The six jurisdictions included in this review are Hong Kong, Australia (Western Australia), Canada (Ontario), Singapore, United States (California) and United Kingdom (West Yorkshire).

The programmes in Hong Kong and Singapore have longer study durations of 2 to 3 years on a full-time basis. Others are part-time courses targeted at working adults. The key areas of training are largely similar. The Hong Kong and Singapore programmes cover additional hours on life sciences. The Canada and United States programmes emphasize more on dispensing techniques. Placement is essential in all programmes with durations ranging between 6 and 16 weeks.

Licensure is required in Canada, United Kingdom and United States and the trainings have to be accredited by the pharmacy councils or boards. Although licensure is not currently mandatory in Singapore and Australia, national standards for training of dispensers have been established by the pharmaceutical societies. In this review, Hong Kong is the only jurisdiction that neither training accreditation nor licensure of dispensers has been implemented.

Conclusions: The local training programme for dispensers are on a par with the international practice. In consultation with regulatory bodies and pharmaceutical organizations, it would be desirable for the industry to work towards the goal of attaining training accreditation and licensure as recognition of their professionalism, in keeping with the international practice.

Regulatory

Ab17

Impact of Excipients on Quality and Safety of Oral Pharmaceutical Products

KO, Sze-ka Cindy
The Chinese University of Hong Kong, Hong Kong

Objectives: There are two objectives in this study: (1) to investigate the reasons and frequency of change of excipients in a generic drug company in Hong Kong; and (2) to evaluate the impact of excipients on quality and safety of pharmaceutical products.

Methods: The frequency and reasons for changing manufacturers of excipients were collected from Drug Company X from June 2013 to March 2014. Literature search was also conducted for the period of March 2013 to March of March 2014 to evaluate the impact of change of excipients on product quality.

Results: During the sampling period, 17 out of 145 excipients had undergone change of manufacturer or grades used. The reasons included: (1) original manufacturer did not produce the excipient anymore, (2) original manufacturer did not have stock of the excipient, (3) delayed delivery, (4) the required quantity could not meet the minimum order quantity of the original manufacturer, and (5) cost. Literature findings and some case examples from Drug Company X have shown that change of manufacturers of excipients had an impact on drug product performance.

Conclusions: Drug manufacturers should perform full testing according to pharmacopeia monograph for all excipients received. When practical constraints complicate full testing, testing of critical parameters of excipient may be considered. In addition, drug manufacturers may consider sharing the information of excipients by way of a central database. Concurrently, the Department of Health can impose a more stringent control on the use of excipient, such as the mandatory requirement for the use of pharmacopeia grade excipient. Moreover, it can also adopt a risk based approach to classify the change of excipient to different levels of change. Through the joint efforts of drug manufacturers and the Department of Health of Hong, the quality and safety of excipients can be assured.

Ab18

Medical Device Legislation in Hong Kong at its Crossroads: Regulatory Gap Analysis and Review

CHAN, CM Colleen
The Chinese University of Hong Kong, Hong Kong

Objectives: (1) To identify gaps and quick wins of current Hong Kong medical device voluntary regulatory framework in the context of the mandatory system in Singapore;
(2) To provide recommendations towards proposed legislation of medical device in Hong Kong.

Methods: A comparative analysis between Hong Kong and Singapore was performed using the product life-cycle approach.

Information was sourced from literature reviews and guidance documents from regulatory Authorities and voluntary organizations such as IMDRF and ASEAN.

Results: The existing voluntary framework (MDACS) in Hong Kong is structured and fairly comprehensive. Quick wins of Hong Kong Medical Device Control Office MDCO are recognized such as frequent dialogue and engagement with trade sectors, as well as quality service with continuous enhancement of current systems. Major gaps were identified at pre-market, on-market and post-market levels. Improvements to both Authority and industry stakeholders should be made, for example, by establishing Good Review Practice, expansion of existing medical device scope, new guidance for drug-device combination products, real-time system for recall and field safety notice alerts with standardized reporting procedures. Good Submission Practice with quality application should be adhered by the industry.

Conclusions: It is prime time for Hong Kong to embrace mandatory device regulation. The Hong Kong Government should adopt a stepwise approach, whereby the control of establishment and product aspects should be enforced as the first run within five years. I am optimistic that Hong Kong will play a significant role in creating a roadmap towards more harmonized and predictable medical device control framework. Nevertheless, merits should be given to MDCO for its continuous service and advocates in improving MDACS over the past ten years.

Regulatory

Ab19

Implementation of Quality Risk Management in a Hong Kong Pharmaceutical Manufacturer for PIC/S GMP Compliance

HO, PS Lorita
The Chinese University of Hong Kong, Hong Kong

Aim: To determine the value of Quality Risk Management (QRM) as a tool for improving compliance of existing operation systems in a local drug manufacturer with PIC/s standards.

Method:

QRM system was set up in accordance with PIC/S guidelines. Six cases were used to demonstrate how QRM could d be implemented. Case 1 was to review a legacy product's manufacturing procedures considering factors that may have impact on CQAs. Case 2 was to control dust generation and reduce risk of cross-contamination. Case 3 was to qualify raw material suppliers. Case 4 was to minimize risks associated with replacement packaging equipment. Case 5 was to facilitate the investigation of a product complaint. Case 6 was to identify risks associated with proposed changes in manufacturing steps.

Results: All six case studies were subjected to risk analysis and evaluation, using FMEA, Risk Ranking and Filtering, Ishikawa and simple custom model as tools.

The benefits of QRM in both short and long terms, including greater assurance of product quality, overall risk reduction for patients, better facilitation of scientifically justified and more informed decisions by the manufacturer have been successfully demonstrated.

Conclusions: Tolerance of risks can vary substantially between individuals. This study substantiated the utility of QRM as an objective way to manage risks. Risks should always be handled according to the risk priority levels. The level of effort, formality and documentation of the process should align with the level of risk. Using QRM wisely may potentially lower quality cost as an additional benefit. That the manufacturer is able to reduce and control risks throughout the product life cycle is evidence of the commitment of the manufacturer to assure product quality and patient safety.

Ab20

Risk-based Approach to Evaluate the Quality of Proprietary Chinese Medicine

LEUNG, CY
School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong

Objectives: The current regulation of proprietary Chinese Medicines (pCm) in Hong Kong, promulgated in December 2003, falls short of the intent embodied in the quality assurance target. The objectives of this study were: (a) to introduce a risk-based approach for pCm registration assessment; (b) to design a Question-based Review (QbR) framework; so as to improve the consistency, quality, efficiency, clarity, and transparency of the review process.

Method: A modified QbR approach developed by the Food and Drug Administration (FDA) was piloted, and pertinent gap analysis was conducted. Ways for regulatory bodies in Hong Kong to forge ahead towards the risk-based evaluation approach were investigated.

Results: The current quality technical guideline for pCm registration in Hong Kong was not thorough. Hong Kong could learn from the FDA by adopting the QbR concept in pCm registration. A 7-year time line was constructed for the parallel proceed of risk-based approach quality evaluation and transition from the current evaluation system to QbR could be facilitated by, for instance, (a) mandatory requirement of GMP; (b) updating pCm registration guidelines; and (c) offering incentive and assistance to the industry.

Conclusion: A risk-based assessment approach grounded on vigorous science is central to quality assurance of pCm products. Applicants can submit product information precisely once they recognize the critical issues, thereby reducing the need for supplements. It also helps reviewers to prepare a consistent, transparent and risk focusing evaluation on pCm.. It is anticipated that the risk-based approach quality evaluation of pCm registration would be beneficial to both the industry and regulatory bodies.

Regulatory

Ab21

Applying Risk Assessment to Evaluate the Quality Costs in a Local Startup Pharmaceutical Manufacturing Organization

CHAM, Ho-chi Gigi
The Chinese University of Hong Kong
Quality Associate Director, Powder Pharmaceuticals, Inc., Hong Kong

Objective: Assigning dollar value to typical Good Manufacturing Practice (GMP) activities enables business-oriented executives to visualize how the quality costs are spent. The analysis undertaken in the present study helps to set up priorities and to map out a basic requirement on how to evaluate the needs for each quality activity in a local start-up pharmaceutical manufacturer.

Methods: The study used real-life examples in six major areas: quality system, production, facility & equipment, laboratory controls, material, and packaging & labeling, in a start-up pharmaceutical manufacturer. Risk evaluation were conducted using Failure Mode and Effects Analysis (FMEA). Risk control activities were then identified and the related quality costs were analyzed for each example.

Results: The case studies showed the money set aside by the drug manufacturer to achieve its current compliance level and potential risk exposure. The resources in all six areas were evenly allocated between conformance cost and non-conformance cost. The quality cost distribution follows a similar trend in all six areas. The cost breakdown was estimated to be 13% for prevention, 36% for appraisal, 40% for internal failure, and 11% for external failure. As expected, the more money spent on prevention will decrease the failure costs, while the costs attributed to poor quality will increase the failure costs. The ratio between the conformance cost and the non-conformance cost should be balanced to fix the quality consequences attributed to failure.

Conclusions: Risk evaluation in conjunction with cost analysis is an on-going process that can be performed anytime. Sound business decision in the pharmaceutical industry is driven by compliance status, operation cost, manufacturability, quality assurance under the broad umbrella of patient's health and safety. Information and data related to these driving factors is important to the management team in rendering decisions affecting brand quality.

Ab22

Pharmacovigilance-Drug Safety Risk Management

CHAN, ST Yvonne
The Chinese University of Hong Kong, Hong Kong

Synopsis
Pharmacovigilence is the detection, assessment, understanding and prevention of adverse drug effects. Despite extensive testing for drug safety during the course of drug development, drug safety problems with serious consequence can and do arise subsequent to launch. A case in point is the thalidomide tragedy in the 1960's.

Aim
To extend a pharmaceutical distributor's existing drug safety risk reporting service called= pharmaco***diligence*** to a more stringent level of pharmaco***vigilance***, in order to meet the drug reporting requirements of international clients.

Method
The method comprised 5 steps:-
- Researching Pharmacovigilance - the evolution of drug safety reporting
- Comparing regulatory frameworks in the US, the EU and Hong Kong.
- Reviewing the ICH Harmonization of drug safety regulation standards.
- Formulating an extended Pharmacovigilance service in the distributor company
- Introducing this as 'best practice' to the distributor

Results
- The distributor successfully concluded new business partnerships in several Asian countries with extension in its pharmacovigilance service offering.
- By outsourcing Pharmacovigilance reporting to the Pharmaceutical Distributor, business partners are able to further minimize costs e.g.:- avoid setting up complex expensive IT validation systems
- The project heightened the awareness of Pharmacovigilance and became a platform in a 'best practice' proposal to the Hong Kong Drug Office

Conclusion
Different countries approach drug safety and risk management differently. The pharmacovigilance system in the EU and US is more sophisticated than that in Hong Kong. An effective Pharmacovigilance system requires collaboration among the stakeholders including drug manufacturers, market authorization holders, distributors, healthcare professionals and regulatory authorities. Pharmaceutical distributors can play an important role in the effectiveness of pharmacovigilance systems.

Ab01

Drugs and Driving in Hong Kong – Literature Review and Survey on Professional Drivers' Experience and Understanding

CHENG, WK; HUI, KS; LEE, CP
School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong

Objectives: To evaluate the attitudes, knowledge and behaviors regarding drug driving among professional drivers and highlight the importance of educating patients on how drugs affect their driving ability.

Methods: A literature review was conducted to acquire an overview of existing evidence about drugs and driving. Professional drivers (taxi, minibus and bus) in Hong Kong were surveyed via a labour union and direct interviews by researchers. Drivers were asked questions regarding their experience, perception and knowledge of legislation of drug driving and influence of twelve pharmaceutical drug groups and six illicit drugs on driving ability.

Results: A total of 223 professional drivers completed the survey. Only 45.7% of them knew that driving after taking the drugs which can influence driving ability or specified illicit drugs may violate the law. Approximately 48% - 82% of respondents did not know how significantly specific drug groups would affect driving ability. Driving ability was perceived to be slightly worse (41.7%) after administration of common cold medications. When driving was needed, 42.3% of respondents chose not to take common cold medications while only 12.5% of them chose not to take chronic medications such as antihypertensives and antidiabetics. Regarding where they got drug driving information in the past and where they would like to get information in the future, advertisement (58.3%, 40.8%), newspaper (46.2%, 28.3%) and the government (40.4%, 30.5%) were reported most frequently. Some other sources (27.8%, 25.6%) including radio and television programmes were also chosen.

Conclusions: In Hong Kong, driving under the influence of drugs is not uncommon among professional drivers. The knowledge of legislation of drug driving and influence of drugs on driving ability among professional drivers in Hong Kong is inadequate. Advertisement, newspaper articles, government leaflets and radio and television programmes appear to be relevant means for driver education.

Ab02

Incidence and Risk Factors of Glucocorticoid-induced Diabetes Mellitus in DLBCL Patients Treated with Glucocorticoid-containing Chemotherapy

CHU, MH; LO, KY; ZHOU, R
School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong

Objectives: High dose glucocorticoid as a part of the treatment of non-Hodgkin's lymphoma was found to induce diabetes in some of these patients. The present study aims to investigate the incidence and risk factors of glucocorticoid-induced diabetes mellitus (GDM) in Hong Kong. This study also aims to study the influence of GDM on the outcome of chemotherapy and the effect of chemotherapy on glycemic control.

Methods:
Patients without history of diabetes aged 18 or above with confirmed diagnosis of diffuse large B-cell lymphoma (DLBCL) treated with any steroid-containing chemotherapy with or without rituximab between 2009 and 2014 were analyzed retrospectively. GDM diagnosis was made based on the definition of DM according to the American Diabetes Association (ADA). These include a fasting plasma glucose ≥ 7 mmol/L or HbA1c ≥ 6.5%. Binary logistic regression was used to identify possible significant risk factors of GDM. Diabetic patients with DLBCL were also identified and their medications before and after chemotherapy were recorded. Self-reported side effects were also recorded.

Results: Among 78 patients, 5 developed GDM (6.4%). Steroid administration prior to glucocorticoid-containing chemotherapy was the only significant factor associated with GDM development by univariate analysis. Gender, old age, smoking history, overweight, hypertension, dyslipidemia and pre-diabetes prior to chemotherapy were not found to be significantly associated with GDM development. None of GDM patients received treatment for hyperglycemia. Two diabetic patients had changes in the original anti-diabetic medications and 2 required addition of insulin for glucose control. The most common glucocorticoid-related side effects reported were weight gain and nausea.

Conclusions: The incidence of GDM was found to be 6.4%. Diabetic control may also be worsened in diabetic patients during chemotherapy. These patients may be considered to have more frequent plasma glucose monitoring during chemotherapy.

Ab03

Identification of Gaps between H.K. GMP and PIC/S in Process Validation of the Manufacture of Tablets and the Proposal of Strategies to Close the Gaps

CHUNG, TY[1]; KO, SK[2]
[1] School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong
[2] Synco Hong Kong Limited, Hong Kong

Objective: In June 2015, Hong Kong will be fully adopting the PIC/S standard. Process validation is one of the major changes in PIC/S when compared to H.K. GMP. The present study aims to identify the gaps between H.K. GMP and PIC/S in process validation of the manufacture of tablets and to propose strategies to close the gaps between H.K. GMP and PIC/S in process validation.

Methods: The study is based on review on H.K. GMP and PIC/S guidelines in process validation. Strategies to close the gaps were proposed to manufacturers based on the gaps identified. A process validation protocol of PIC/S standard was proposed using Aspirin Tablet 80mg as an illustration, based on guidelines and existing process validation protocol. Difficulties in implementing PIC/S in process validation were investigated and solutions to overcome these difficulties were suggested.

Results: PIC/S introduces several new concepts such as, 'risk analysis', 'change control', 'critical quality attributes' and 'critical processing parameters'. It emphasizes that risk analysis should be used during decision making process. Besides, PIC/S prefers prospective process validation in which process validation should be completed before routine production. It also states that three consecutive batches of the same industrial batch size are required for process validation.

Conclusion: To close the gaps between H.K. GMP and PIC/S in process validation, several strategies have been proposed, including staff training, recruitment of overseas experts, gap analysis conducted by external consultant, understanding from senior management from pharmaceutical company, and communications between manufacturers and Department of Health (DH).

Ab04

Retrospective Review of the Impact of Clinical Pharmacist Intervention on Enhancing Patient Care in Pediatric Intensive Care Unit

KAM, KH; WONG, HL; EWIG, CLY
School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong

Aims: The positive impact of clinical pharmacists on the safe and effective use of drugs among patients has been widely recognized. In this study, we aim to evaluate the role of clinical pharmacists in a local Pediatric Intensive Care Unit by assessing the services provided and the impact of such pharmacy service.

Methods: Our study was a retrospective, observational study conducted at a local tertiary hospital. All PICU pharmacist interventions or services provided and documented on specific patient assessment forms from January 2013 to March 2015 were included in our study. Interventions and pharmacy services were classified according to the types of interventions made. The impact of each intervention on patient care was then assessed to determine the potential clinical outcome of the patient should the intervention not have occurred. A sub-study involving ward based chart review of all patients admitted to the PICU from January 2015 to April 2015 was performed to identify potential near-miss prescribing errors.

Results: There were 253 documented pharmacy services performed on 94 patient-admissions out of the total 389 patient-admissions. On average, 2.69 of these were provided per patient-admission requiring an intervention. The most frequent type of service or intervention provided was the provision of drug information (46.6%) followed by the recommendation to optimize treatment outcome (33.2%) More than half of these interventions were judged to have prevented potential Adverse Drug Events (51.8%) and most of them (68.9%) could have led to significant clinical outcome in the absence of pharmacists' interventions. In our sub-study, 114 near-miss medication errors were identified with dosing errors (43.9%) being the most frequent near-miss medication errors.

Conclusion: This study describes the roles and contributions of clinical pharmacists in the PICU setting. Clinical pharmacy services and interventions provided resulted in improved patient care by providing more informed clinical decisions as well as preventing potential negative outcomes.

Ab05

Novel Molecularly Targeted Drug-Platinum (Pt) Hybrid Compounds: Mechanistic Investigation into their Lack of Platinum Resistance

LAM, SM; TO, KKW
School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong

Aims: A novel series of Platinum (Pt)-Epidermal Growth Factor Receptor Tyrosine Kinase Inhibitor (EGFR TKI) hybrid compounds was synthesized with an aim to overcome the secondary EGFR mutation-mediated resistance to the molecularly targeted drug. However, Pt resistance may have developed in patients due to prior exposure to Pt drugs. The study aims to investigate the anticancer activity of the hybrids in Pt-resistant cells, and to elucidate the mechanisms for circumvention of Pt resistance.

Methods: Cytotoxicity of a representative hybrid DPV was evaluated in human cervical (KB3.1), and esophageal cancer cells (EC109) and their Pt-resistant sublines, using colorimetric sulforhodamine B (SRB) assay. Cellular drug accumulation and DNA platination of DPV were measured by inductively coupled plasma optical emission spectrometer. Effect of GSH-mediated Pt drug inactivation was determined using SRB assay with or without concomitant treatment of buthionine sulfoximine (BSO). Real time reverse transcription polymerase chain reaction was performed in DPV-treated cells to measure selected genes known to cause Pt resistance.

Results: DPV was minimally affected by Pt resistance in Pt-resistant sublines of KB3.1 and EC109. Cellular accumulation of DPV was similar in parental and Pt-resistant cells. DNA platination by DPV was not detectable, which suggests that it may not contribute to the anticancer activity. Similar cytotoxicity in DPV-treated KB CP20, with and without BSO, suggesting that DPV was not inactivated by GSH. DPV downregulated anti-apoptotic gene BCL2 in KB CP20.

Conclusions: DPV was minimally affected by Pt resistance. The hybrid compound was found to (i) achieve increased cellular drug accumulation, (ii) not affected by DNA repair, (iii) circumvent GSH-mediated drug inactivation, and (iv) induce more apoptosis in Pt-resistant cells. The new hybrids represent promising molecularly targeted drug candidates for treating lung cancer patients with prior exposure to Pt-based chemotherapy.

Ab06

A Drug Use Evaluation of Amoxicillin/Clavulanate in Hospital Setting: A Focus on Prescribing Patterns

CHAN, PTY; CHU, JKP
Department of Pharmacology and Pharmacy, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong

Aim/Objective: Emergence of antibacterial resistance is recognised as an alarming global public health issue by the World Health Organisation (WHO), which is accelerated by the inappropriate use of antibiotics. Due to the faltering development of new antibiotics, the efficacy of currently available agents must be preserved to prevent compromised patient outcomes and increased healthcare expenditure resulting from the failure of response to standard treatment. Antibiotic stewardship programmes (ASP) aim to promote the judicious use of antibiotics through various strategies, it is also important to characterise current prescribing pattern and to identify potential problems associated with drug use. Therefore, this Drug Use Evaluation (DUE) aims to identify factors that may affect physicians' behaviour on amoxicillin/clavulanate prescribing.

Method: A retrospective DUE was conducted during a 7-month period at The Queen Mary Hospital, Hong Kong. A total of 52 cases with in-patient amoxicillin/clavulanate prescriptions were reviewed and qualitative analysis was performed. The appropriateness of antibiotic use is assessed based on pre-defined DUE criteria and potential factors for affecting prescribing patterns were identified.

Result: The mean age of patients was 80.6 ±12 with 57.7% male. 98.1% of patients had at least one comorbidity, such as hypertension and diabetes, and 40.4% of prescriptions were indicated for community-acquired pneumonia. 50% of patients had prior amoxicillin/clavulanate exposure within 6 months before their hospital admission. 24.4% of the antibiotics were prescribed for inappropriate indications and in 35.6% of cases, doses were not adjusted appropriately according to patients' renal function.

Conclusion: Patient gender, comorbidities, availability of culture and sensitivity results and convenient dosing are factors that may influence antibiotic prescribing. They can be targeted in newly developed ASP aiming to optimise antibiotic use. Non-clinical factors, such as physicians' experience and drug cost, may also affect antibiotic prescribing so further investigation on the use of amoxicillin/clavulanate in Hong Kong is warranted.

Ab07

The Mechanism of Action of Xinmailong, a Proprietary Chinese Medicine Used in the Treatment of Heart Failure

CHEUNG, RYC; CHEUNG, AC; LEUNG, GPH
Department of Pharmacology and Pharmacy, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong

Objectives: Xinmailong (XML), a drug extracted from Periplaneta Americana, has been used in the treatment of heart failure in China for many years. This project aims to further investigate and confirm the mechanisms of action of XML in treating HF.

Methods: Ca^{2+} imaging and Western blotting were two major techniques used for the investigation. $Fura^{-2}$ photometry was the imaging method used to study how XML affects the intracellular Ca^{2+} level in cardiomyocytes. Western blotting was adopted to investigate whether or not XML could affect the protein expression levels of GPX-1 and catalase as this is the most common and simple technique in analyzing and quantifying the proteins of interest. In order to know more about the toxicity of XML, MTT assay was used. It is a technique based on the mitochondrial activity of living cells to convert MTT into formazan crystals. Direct cell counting using Trypan Blue, a stain that colors dead cells, was also performed. This method is described as dye exclusion method and is useful in evaluating cell viability.

Results: The results of $fura^{-2}$ photometry showed that XML potentiated the electrical impulse-induced Ca^{2+} influx into cytosol of cardiomyocytes. In contrast, results of Western blotting showed that XML had no effect on the expression levels of GPX-1 and catalase. Although, MTT assay and Trypan Blue exclusion method showed conflicting results, suggesting high dose of XML may reduce cell viability but increase the mitochondrial activity in cardiomyocytes.

Conclusions: This study was limited by the small sample size. Further experiments should be carried out to confirm the pharmacological properties of XML found in the study.

Ab08

Community Pharmacists Professional Development – Investigating Chain Store and Non-chain Store Pharmacists' Interests

HUI, WCW; CHAN, PWL; TAM, EYT
Department of Pharmacology and Pharmacy, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong

Aim: This study aims to analyze and compare the daily duties and lifelong learning experiences of chain store and non-chain store pharmacists, and investigate the area of knowledge they want to further pursue.

Methods: A voluntary and anonymous questionnaire was sent to all the community pharmacists in Hong Kong according to the List of Authorized Sellers of Poisons (2014 October version). 604 pharmacists were recruited. Questionnaires received before deadline implied consents from the recruited subjects.

Results: There is no difference in daily duties of chain store and non-chain store pharmacists. Majority of respondents have no lifelong learning experience (67.1%). Top 5 popular topics among chain store pharmacists are: Cardiovascular system (12.5%), Central nervous system (10.5%), Immunological products and vaccines (8.4%), Skin (8.3%) and Eye (7.9%). While that of non-chain store pharmacists are: Cardiovascular system (12.4%), Skin (10.9%), Central nervous system (9.3%), Respiratory system (8.3%) and Gastro-intestinal system (8.2%).

Conclusions: The perfect match of daily pharmacist duties in both chain store and non-chain store pharmacies, underlines the equal significance of lifelong learning for both groups of professionals in Hong Kong. Resources can be allocated to develop training programmes based on the popularity of topics. Jointed programmes should be developed for both groups of pharmacists, based on their specific interests and needs, for future mandatory lifelong learning system.

Ab09

Preparation of Substituted Phenylacetyl Glucuronides for the Stability Analysis of Phase II Metabolites of Carboxylic Acid Drugs

KWOK, RWM; WORSLEY, AJ; WONG, JKC
Department of Pharmacology and Pharmacy, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong

Introduction: Non-steroidal Anti-inflammatory drugs are one of the classes of the most widely used drugs. However, idiosyncratic life-threatening hepatotoxicity has been reported. Some studies link the occurrence of adverse drug reactions to the formation of non-steroidal anti-inflammatory drug metabolites – acyl glucuronides.

Objective: This project aims to develop an efficient synthetic route to produce the acyl glucuronides of different non-steroidal anti-inflammatory drugs.

Method: Various synthetic strategies reported in literatures were compared. A selective acylation on benzyl glucuronate developed by Bowkett E. R. was adapted in this project. The carboxylate group on glucuronic acid was first protected by benzylation using TBAF as a mild base. The protected compound was then allowed to esterify with phenylacetic acid with the use of a coupling agent HATU and a base N-methylmorpholine. Lastly, a deprotection procedure by hydrogenolysis was attempted to remove the benzyl group. All reactions were monitored by thin layer chromatography.

Result: Esterification gave satisfying yields of a white solid and showed a desirable selectivitiy in producing the β-anomer. The structure of obtained benzyl ester was confirmed by NMR spectroscopy. However, the final deprotection was not fruitful. The final product resembles a syrup-like yellow liquid, suggesting the presence of impurities.

Conclusion: Fortunately, the identity of the intermediate Benzyl 1-O-phenylacetic glucuronate has been confirmed. The experiment also obtained a satisfying yield and a high selectivity in producing the β-anomer over the α-anomer in the selective acylation step.

In future, further optimization of reaction and the storage conditions would be inspected. Different substituted phenylacetic acids could be used to form acyl glucuronides using via this synthetic pathway. Evaluation of their properties could be carried out to investigate the effect of the substituents on the stabilities of different NSAID metabolites. This would be valuable in reducing severe adverse drug reactions, setting up drug safety policies, and developing new drugs.

Ab10

Inhaler Technique and Satisfaction among Hong Kong Asthma Outpatients

LAU, SSC[1]; LAM, DCL[2]; CHAN, EWY[1]; KWOK, PCL[1]
[1] Department of Pharmacology and Pharmacy, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong
[2] Department of Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong

Aim/Objectives: Suboptimal inhaler technique and poor inhaler satisfaction impacts an asthma patient's clinical outcomes. This study aimed to evaluate the level of inhaler technique among Hong Kong asthma outpatients; to study their inhaler satisfaction and contributing attributes; and to assess their asthma control and its relationship with technique and satisfaction.

Method: Patients visiting the asthma clinic in Queen Mary Hospital, Hong Kong were recruited over 6 months for questionnaire interviews. Patients demonstrated inhaler technique and were evaluated with steps checklists. They also rated their satisfaction across inhaler attributes. The validated Asthma Control Test (ACT) was used to assess patients' symptom control. The primary outcomes were the rate of wrong steps (number of missed/wrong steps ÷ total recommended steps; RWS) and total satisfaction score.

Result: Thirty-two participants (69% female) gave 45 inhaler technique performances, of which the median RWS was 10%. All patients showed at least one technique error. The MDI had the highest rate of errors (median RWS 20%). The most cited reasons for errors were absence of instruction (52.9%) and forgetfulness (23.5%). Participants had a mean satisfaction score of 52.0 out of 60. The Accuhaler provided the highest satisfaction (mean score 56.1). Ease of use (59.4%), carry (37.5%), information about remaining doses (34.4%), and feeling of taking a dose (31.3%) are major drivers of inhaler satisfaction and preference. None of the subjects had their preference considered during inhaler prescription but 41% patients preferred otherwise and expected improvements in technique and compliance. Subjects had a median ACT score of 21.0 out of 25. Patients visiting more clinics and had worse symptom control (Pearson correlation = -0.376).

Conclusion: This study showed suboptimal inhaler technique among Hong Kong asthmatics and demonstrated the importance of inhaler education and ongoing technique evaluation. It highlights the value of taking inhaler preference into consideration during prescription.

Ab23

Effect of Pharmacist Anticoagulant Counselling Service on Patients' Knowledge, Adherence and Control of Anticoagulant Therapy

LI, YS[1]; LAI, WYW[1]; PANG, KCJ[1]; KWOK, CLP[2]
[1] Department of Pharmacy, Tung Wah Hospital, Hong Kong
[2] Department of Pharmacology and Pharmacy, The University of Hong Kong, Hong Kong

Objectives: To evaluate the effectiveness of pharmacist anticoagulant counselling service in improving patients' knowledge, adherence and anticoagulation control and to determine correlation between patients' knowledge, adherence and anticoagulation control.

Methods: This was an open-labelled, prospective study conducted at the out-patient setting of a local public hospital. Patients' anticoagulant knowledge, adherence and INR control in terms of time in therapeutic range (TTR) was assessed. Satisfaction survey was then conducted. Primary end-point of the study was to investigate the effect of pharmacist counselling in anticoagulant knowledge, adherence and INR control in terms of TTR and their inter-correlation. Also, any correlation between demographic and anticoagulation control was determined.

Result: 38 patients with 23 men (mean age 75.2) were recruited, 36 patients completed the study. Pharmacist counselling service was shown to improve anticoagulant knowledge significantly (+4.44,p<0.001). Non-significant improvement of adherence (+0.03,p=0.744) and INR control in terms of TTR (+6%, p=0.391), expanded TTR (±0.2 units) (+4.8%,p=0.243) and adjusted TTR (+9.1%,p=0.185) was noted after counselling. Neither knowledge nor adherence was correlated significantly with INR control and also correlation between knowledge and adherence.

27-count of drugs, 4-count of herbs/TCM and 6-count of supplements with potential interaction were spotted. Nil thromboembolism or major bleeding events were reported.

Age (p=0.022) and continuous renal function (p=0.047) was significantly correlated to expanded TTR while number of concurrent medications were significantly correlated to both TTR (p=0.006) and expanded TTR (p=0.046). All recruited patients were satisfied with the service (mean satisfaction score=4.19 out of 5).

Conclusion: Pharmacist counselling service could significantly improve patient anticoagulant knowledge in managing anticoagulant therapy. Knowledge and adherence were not significantly correlated with INR control nor significantly correlated with each other in the study. Polypharmacy and older age may contribute to poor INR control while patients with better renal function may have better INR control. All patients were satisfied with the service.

Ab24

The Impact of Pharmacist-Led Medication Reconciliation in Surgical Ward Targeting High Risk Patients in a Local Hospital

TSOI, HY; LI, LYL
Department of Pharmacy, United Christian Hospital, Hospital Authority, Hong Kong

Introduction: Medication errors are highly prevalent upon hospital admission and discharge. Clinical pharmacist involvement in medication reconciliation is effective in identifying and rectifying medication errors. However, pharmacist involvement at all stages of the reconciliation process for every patient may not be feasible at individual institutions. This study evaluated a targeted approach in selecting high-risk patients in an effort to reduce unintended medication discrepancies.

Objective: To determine the percentage of incidence and the severity of unintended medication discrepancies before and after targeting high risk patients in surgical wards.

Methods: This was a single-center, pre-post intervention study conducted at the surgical wards of the United Christian Hospital. Following institutional review board approval, pre-intervention data (From ward A) were collected retrospectively over 3 months from December 2013 to February 2014; while post-intervention data (From ward A and B) were collected prospectively over 3 months from December 2014 to February 2015. The potential severity of the unintended medication discrepancies were rated by pharmacists and classified into 3 levels according to NCC MERP index.

Results: There was a non-statistically significant increase in the percentage of incidence from 5.32% to 7.35% (p-value 0.056) when comparing pre-intervention and post-intervention group. Statistical significance was shown when comparing ward A patients only in both groups, the percentage of incidence increased from 5.32% to 8.15% (p-value 0.021). There was no statistically significant difference in terms of the severity level of medication discrepancies between pre-intervention and post-intervention group (Ward A and B: p-value 0.295; Ward A only: p-value 0.388).

Conclusion: Targeting high risk patients in medication reconciliation process in surgical wards is a feasible approach given the limited time and resources available for pharmacists, resulting in a higher percentage of incidences of unintended medication discrepancies being detected, although the potential severity of the discrepancies may not be altered.

Ab25

Impact of Pharmacist Intervention on Drug Adherence and Therapeutic Outcome of Rheumatoid Arthritis Patients Discharged from Day Medical Centre

LUI, LK
Department of Pharmacy, Tseung Kwan O Hospital, Hong Kong

Objectives: In the past two decades, pharmacological treatment of rheumatoid arthritis (RA) has undergone great advancement to effectively slow disease progression. However, adherence to medications is variable. This study aimed at determining the impact of pharmacist intervention on drug adherence and disease activity in RA patients.

Methods: This is a single-centre, prospective, self-controlled, single-armed pilot interventional study. Pharmacist intervention consisted of two face-to-face medication counseling sessions (four months apart) and a phone follow-up at one month after the first session. Primary outcome was patients' drug adherence measured by eight-item Morisky Medication Adherence Scale (MMAS-8) questionnaire during each counselling session. Secondary outcomes were patients' knowledge on drugs for rheumatoid arthritis and patient satisfaction towards the service. The Disease Activity Score in 28 Joints (DAS28) was measured as the therapeutic outcome.

Results: A total of 34 patients were recruited. Drug adherence at phone follow-up was higher than baseline, demonstrated by a drop of mean MMAS-8 score from 2.57 to 1.37 (p=0.003). Adherence at second session remained higher than baseline value (p=0.007). Drug knowledge on DMARDs was higher both at phone follow-up (p=0.018) and second session (p=0.001) than baseline. Drug knowledge on corticosteroids at phone follow-up remained the same as baseline (p=0.893), however, it became significantly higher than baseline at second session (p=0.012). For analgesics, drug knowledge level at phone follow-up was higher than baseline (p=0.005), but it dropped back to baseline level at second session (p=0.401). The DAS28 score decreased from a mean score of 4.45 at baseline to 3.80 at second counseling session (p=0.005). The mean satisfaction score was 36.6 out of 40.

Conclusions: The present study showed that pharmacist intervention has a positive impact on drug adherence and drug knowledge in patients with RA. Also, disease activity of these patients was indirectly decreased.

Ab26

Preparation and Delivery Service for Trans-arterial Chemoembolization (TACE) Procedure in Liver Cancer Treatment

SUNG, Hui-ti
Division of Clinical Pharmacy, Department of Pharmacy, Kaohsiung Chang Gung Memorial Hospital, Kaohsiung, Taiwan

Objective: Attempts to down-stage liver cancer by eradicating tumor cells with DC Beads-induced arterial thrombosis and continuous partial release of specific quantities of anti-cancer medication have been developed in liver cancer treatment. Since it is difficult to efficiently monitor and control the therapeutic effects of combining chemotherapy drugs and DC Beads as well as the complications caused by returning medicines. A one-stop preparation and delivery service for Trans-arterial Chemoembolization (TACE) procedure has been developed for treating liver cancer, which improves treatment efficiency and quality.

Method: We have integrated all steps into "One-Stop" service offered by the chemotherapy pharmacy of hospital. Combining all necessary steps into one step, which from the chemotherapy acquisition, backup from medical supply unit, drug mixing/delivery, confirmation of clinical effectiveness, refunding and storage.

Currently, complicated processes are as followed:
1. Delivery a variety of medicines from the supply room to angiography room.
2. Mixing chemotherapeutic drugs.
3. Delivery drug by care personnel to angiography room.
4. Radiologists mix major ingredients of the conjugated DC Beads and wait for settled before applying.
5. If patients are not appropriate for the illness, it is complicated to return the medication. Where would the medication be stored?

Results: Since 02, 2013 to 06, 2013, there are 24 errors happened in procedure before one-stop integration.(Including 3 errors in acquisition, 2 miss-paid, 1 refunding error, 2 drug-mixing and 1 storage events.) We have reduced expected errors from 282 to 0 event calculated from 07, 2013 to 04, 2014. We have reduced errors like acquisition, delivery, drug mixing, refunding problem and errors, which make a safer drug service procedure.

Conclusion: The newly designed "One-Stop" service for chemotherapy has integrated and simplified the procedures in care unit, angiography room, accounting unit, and supply unit, etc. resulting a beneficial quality of medical care.

Ab27

Evaluation of the Effectiveness of Certified Dispenser-led Inhaler Technique Counseling Sessions at Out-patient Setting of Our Lady of Maryknoll Hospital

MAK, SY; LAU, WM
Department of Pharmacy, Our Lady of Maryknoll Hospital (OLMH), Hong Kong

Objectives: This study evaluated the effectiveness of certified dispenser-led counselling sessions in providing independent, consistent and thorough inhaler technique counselling to outpatients referred by other healthcare professionals or pharmacy staff.

Methodology: Dispensers received comprehensive in-house training by pharmacists under 'Advanced Inhaler Technique Counselling Certification Program'. After certification, they performed independent assessment and detailed counselling on inhaler technique for new and current users at out-patient pharmacy counter in OLMH. Re-assessments and interventions were performed at next medical follow-up.

Result: Sixty-six subjects (out of 77, 86%) completed two counselling sessions from 6th November 2013 to 27th November 2014. In current user group (n=33), the baseline mean demonstration score was 5.3 out of 9. The score was significantly increased to 8.8 out of 9 after first counselling session, with a net increase of 3.5±2.4 (39%, p<0.00001). The mean demonstration score dropped by -1.2±1.5 (-13%) after the first and before the next follow-up counselling session (p=0.0009). After the follow-up counselling session, the mean demonstration score increased by 1.3±1.5 (14%, p=0.0005). In new user group (n=33), the mean demonstration score after the first counselling session was 8.9 out of 9. The mean score dropped to 7.3 out of 9 before follow-up counselling session, with a net decrease of -1.6±1.6 (-18%, p=0.00004). After follow-up counselling session, the mean demonstration scores increased by 1.6±1.6 (18%, p=0.00007). With only 4 cases (6%) demanding pharmacists' further follow-up, the service model is proved to be effective to better meet patients' need with assured quality.

Conclusion: With ever-evolving inhaled devices and substantial patient population-in-need, an expanded role of Certified Dispensers in inhaler technique counselling under pharmacists' support in training as well as in handling complicated cases can be an effective service model with improved service accessibility and better utilization of skill-mix in achieving improved therapeutic outcome.

Ab28

Clinical Implications of Pharmacist Interventions on Drug Administration for Geriatric Patients with Dysphagia

CHANG, MY[1,2]; LI, SGY[1,2]; SO, WY[1]; LEE, VWY[2]; IP, LF[3]; CHENG, YL[3]; LAI, WK[1]
[1] Department of Pharmacy, Alice Ho Miu Ling Nethersole Hospital (AHNH), Hong Kong
[2] School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong
[3] Department of Medicine, Alice Ho Miu Ling Nethersole Hospital, Hong Kong

Background: Dysphagia is common in elderly which could lead to drug administration related problems. A previous pilot study in Alice Ho Miu Ling Nethersole Hospital (AHNH) has proven that clinical pharmacist was effective in the management of drug-related problems (DRPs) via a multidisciplinary approach in hospitalized geriatric patients.

Objectives: To investigate in-depth the DRPs associated with drug administration in dysphagic patients for future development of geriatric clinical pharmacy service.

Methods: Patients either presented with dysphagia requiring crushing of medications or undergoing enteral tube feeding was recruited prospectively during the routine multidisciplinary geriatric round. Pharmacists identified any DRPs of recruited subjects and recommended interventions to case physicians and nurses during pharmacy ward rounds. Clinical recommendations, the corresponding outcomes and reasons for non-acceptance were documented for data analysis. Chi-square test and logistic regression test were used to compare categorical variables and continuous data respectively.

Results: From Aug 2014 to Mar 2015, a total of 304 patients were recruited. 147 patients (48.4%) were intervened during pharmacy ward rounds, with 212 DRPs identified being drug administration related, which corresponded to an average of 1.44 DRPs/patients. 131 DRPs (61.83%) were accepted by the geriatric parent care team. 'Extended-release (ER)/Sustained-release (SR) formulation' ranked the highest (70, 33.0%) of the DRPs identified. Of the 131 DRPs being accepted, 'Antibiotics' ranked the lowest rate of acceptance (47.8%). Patients with enteral tube was found to be significantly less likely to be intervened (p<0.001). Patients with higher number of oral medications at screening were also found to be significantly associated with increased intervention rate (p<0.001). Physicians did not usually specify the reasons for not accepting the interventions (29, 35.8%). Other than that, cost and well-controlled were the most common reasons for non-acceptance (both 18, 22.2%).

Conclusions: Pharmacists demonstrated clinical roles in identifying and resolving DRPs in geriatric patients with dysphagia. A number of future directions were identified for development of geriatric clinical pharmacy service.

Ab29
Severe Anaphylactic Reaction with Oxaliplatin Chemotherapy

CHEN, Chi-hua[1]; HSIEH, Hui-hsia[2]; LIN, Yung-ta[2]; WU, Tien-yuan[1,3]
[1] Department of Pharmacy, Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Taichung, Taiwan
[2] Clinical Pharmacy Division, Department of Pharmacy, Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Taichung, Taiwan
[3] Department of Pharmacology, School of Medicine, Tzu Chi University, Hualien, Taiwan

Objective: Oxaliplatin is the third generation platinum chemotherapeutic agent as a single therapy or in combination with fluorouracil (5-FU) to treat colorectal and gastric carcinoma. Life-threatening severe anaphylactic reaction (SAR) is a very rare adverse effect, but the incidence increases with multiple cycles of therapy. With the increasing use of oxaliplatin in clinical practice, we are now encountering a significant increase of SAR.

Patients and Methods: A 3-year, 151 inpatient basis cases exposed to oxaliplatin were reviewed retrospectively at Taichung Tzu Chi Hospital. The oxaliplatin related 2-week chemotherapy regimen (FOLFOX) consisted of leucovorin 400 mg/m^2 as a 2-h infusion, and oxaliplatin 85 mg/m^2 given as a 2-h infusion in 250 mL of 5% dextrose , followed by a 46-h infusion of 5-fluorouracil 2400 mg/m^2. Dexamethasone 8mg IVD and diphenhydramine 30mg IVD were premedication to prevent hypersensitivity.

Results: Six patients (3.97%, 6 of 151 cases) were identified as life-threatening SAR after oxaliplatin infusion. Patients had received 2-10 cycles of oxaliplatin chemotherapies. The onset time of SAR were a second to an hour while oxaliplatin infusing. Five patients were successfully resuscitated with oxygen support and medical interventions and fully recovered. However, one patient suffered from SAR and then expired in 80 min after rescued. Another patient was re-challenged oxaliplatin without any adverse effect by slowing the infusion rate in the treatment course. Therefore, we revised the chemotherapy protocol in oxaliplatin infusion time from 2-h to 4-h. Fortunately, no anaphylactic reaction developed thereafter.

Conclusion: Oxaliplatin based chemotherapy regimen will continue to be the first line treatment for various cancers. However, severe adverse reactions, SAR, of oxaliplatin were higher in Asian than in Caucasian. Therefore, an appropriate strategy to prevent SAR should be devised and assessed in a larger clinical trial and pharmacogenomic studies may need to be performed.

Key words: Oxaliplatin, Anaphylactic, FOLFOX

Ab30
Reducing Ward Return in United Christian Hospital

WONG, Man-ching
Resident Pharmacist, United Christian Hospital, Hong Kong

Objectives: To reduce ward return and unnecessary dispensing through streamlining the existing medication supply processes.

Methods: In-house rules of in-patient dispensing were modified. The supply of adjustmentdoseof prescribed drugs and long term injections with prolong dosing intervals was reduced.

Two surgical and medical wards were chosen respectively for investigation. Cost and quantity of returned reusable injections, quantity of unserviceable items, time spent on ward return, weremeasuredand recorded for a three-week period before and after the intervention.

In order to examine the impact of intervention, and reveal any seasonal fluctuation in consumption of medicines,occupied bed days, dispensing expenditure and quantity were compared with past records.

Results: For the cost of the returned injections, there were 72.5% and 80.1% reductions in medical and surgical wards respectively. The quantity of returned injections decreased by 65.2% in medical and 50.3% in surgical ward.

For selected injections which included frusemide, tranexamic acid injection and injections with prolonged dosing interval, the cost and quantity of returned injections was reduced by 85.2% and 56.7% respectively in medical wards. No selected injections were returned in surgical wards.

There was 17.7% reduction of time spent on handling ward return.

The quantity of the unserviceable oral solid medications decreased by 54.2% in medical wards and 11.9 % in surgical wards.

No seasonal fluctuation was observed in 2013 in terms of bed occupancy in the selected wards. Comparing 1st and 3rd quarter in 2014, the overall occupied bed days decreased by 0.7%, while dispensing quantity decreased by 15.2%.

Conclusions: The intervention caused significant reduction in terms of medication expenditure and quantity of drugs supplied to wards, cost and quantity of the returned serviceable injections and selected injections, time spent on processing ward return and quantity of unserviceable items.

Ab31

A Study on the Impact of a Pharmacist-led Neurology Refill Clinic: Experience of a Local Hospital in Hong Kong

FONG, TS[1]; SUEN, KW[1]; CHAN, WYM[1]; LEE, CP[2]
[1] Department of Pharmacy, Tseung Kwan O Hospital, Hong Kong
[2] School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong

Objectives: To investigate the impact of the Pharmacist-led Neurology Refill Clinic in Tseung Kwan O Hospital and describe the role of pharmacist in the management of neurological medications.

Methods: This was a retrospective case review study between September 2007 and 31st December 2014. Study population included patients with epilepsy, migraine, neuropathic pain, Parkinson's disease or dementia, who were newly started on or had dosage adjustments in their neurological medications. Primary outcomes were number, types and outcomes of drug-related problems (DRPs) identified and interventions performed by pharmacists. Secondary outcomes included (1) medication discontinuation rate at case close, self-discontinuation rate with the associated reasons and risk factors, (2) drug wastage reduction, and (3) patient satisfaction.

Results: Among the 285 cases referred to the clinic, 236 cases were recruited into the study. A total of 438 DRPs were identified in 204 cases (86.4%), and 302 interventions were performed in 140 cases (68.6% of the cases with DRPs detected). Regarding the outcomes, 48.4% of DRPs were either totally or partially solved. Medication discontinuation rate at case close was 15.7%. Self-discontinuation rate was 19.9%, among which 40.4% could continue back on the referred regimen or a modified regimen after pharmacist's interventions. The most common reason for self-discontinuation was side effects (63.8%), and multiple logistic regression analysis identified migraine as a risk factor for self-discontinuation. Refill was not dispensed in 26.3% of the cases, resulting in a drug wastage reduction which translated into HKD 71,531.53 (HKD 18,510.78 after excluding pharmacist cost). Patient questionnaire showed that the service was well-accepted by patients and effect of counseling was generally sustainable.

Conclusions: Pharmacists can contribute to the management of patients on neurological medications through identifying and managing DRPs. The Pharmacist-led Neurology Refill Clinic was also demonstrated to reduce self-discontinuation, result in drug wastage reduction, and was well-accepted by patients.

Ab33

Prescription Verification Service on Anticancer Medications by Oncology Clinical Pharmacist

MAK, CYT[1]; WONG, KML[1]; TSUI, WLV[1]; CHENG, MYG[1]; NGAN, KCR[2]; YIU, HYH[2]; LAW, KMK[1]; LEUNG, WYS[1]
[1] Department of Pharmacy, Queen Elizabeth Hospital, Hong Kong
[2] Department of Clinical Oncology, Queen Elizabeth Hospital, Hong Kong

Introduction: A prescription verification service on anticancer medications by an on-site oncology clinical pharmacist has been implemented in the Department of Clinical Oncology, Queen Elizabeth Hospital. This retrospective audit aims to evaluate the number and type of recommendations made by the oncology clinical pharmacist in the service.

Methodology: Drug-related recommendations made by the oncology clinical pharmacist from January to June 2015 were documented in this audit. The Classification for Drug-related problems developed by the Pharmaceutical Care Network Europe Foundation (PCNE) was adopted.

Results: From January to June 2015, 3,198 anticancer medication orders were screened. A total of 509 recommendations, of which 137 were classified as drug-related problems: 48 (35.0%) for missing pre-medications or supportive care medications, 18 (13.1%) for unrecognized discrepancies between prescription and treatment protocol, 12 (8.8%) for treatment d_1uration prescribed shorter than intended, 11 (8.0%) for underdosing and 10 (7.3%) for overdosing.

In recommendations on pre-medications and supportive care medications, aprepitant (11, 8%) and famotidine (9, 6.6%) were the most commonly involved.

Recommendations were made when an anticancer medication was underdosed for >10% and carboplatin (5, 3.6%) and trastuzumab (2, 1.5%) were the most commonly involved. Carboplatin was involved miscalculation of creatinine clearance or omission of an intended dose escalation in the prescription. The need for reloading trastuzumab from 6mg/kg to 8mg/kg when there was >28 days between 2 doses was omitted.

Prescriptions with anticancer medications overdosed for more than 10% were intervened and carboplatin (6, 4.4%) was the most commonly involved.

Of the 3,198 anticancer medication orders, 657 involved only oral anticancer medications and 21 (3.2%) recommendations were made by pharmacists.

Conclusion: It is demonstrated that clinical pharmacists have a role in improving medication safety and optimising treatment outcome. Full coverage by clinical pharmacists in oncology clinics can be a potential area for further improvement.

Ab34

Assessment of Pharmacist-initiated Clinical Interventions in a Pharmacist-led Renal Medication Management Therapy Clinic

AU, HC Alvin; SO, WY Simon; LAI, WK Kandy
Department of Pharmacy, Alice Ho Miu Ling Nethersole Hospital, Hong Kong

Objectives: Chronic kidney disease is associated with a decreased rate of survival and an increased rate of hospitalisation. The complications included electrolyte and fluid abnormalities, anaemia, hyperparathyroidism complications, metabolic bone condition, metabolic acidosis, hypertension, hyperlipidaemia. Medication therapy management program aimed at improving health outcome of chronic kidney disease patient with enhanced management of coexisting disease state, delay progression of chronic kidney disease related complications, increase patients survival rate, reduce healthcare cost. Clinical pharmacist provided interventions to optimise the identified drug related problems. The aim of this study was to identify the prevalence and pattern of the drug related problems in the medication therapy management clinic and to identify the acceptance level of pharmacist-initiated clinical interventions and the relationship between acceptance level and level of pharmacist interventions.

Methods: Pharmacist interventions and identified drug related problems were categorised into five conditions with fifteen categories of drug related problems. Acceptance rate of the clinical interventions by renal physicians was measured.

Results: Records of 396 pharmaceutical care plans from renal medication therapy management clinic cases were analysed dated from 2011-14. Clinical pharmacist recommended an average of 3.5 pharmacist interventions per case and the total number of pharmacist interventions was 1403. The top three categories of common drug related problems were identified in chronic kidney disease-mineral and bone disorder related, hypertension and electrolyte related conditions. The acceptance level of all pharmacist interventions was 84.6% as accepted.

Conclusions: In conclusion, pharmacist interventions recommended by the clinical pharmacist in this renal medication therapy management clinic can effectively deliver to physicians and optimise the physician pharmacotherapy decisions.

Ab38

Development of Dispensing Competency Assessment Framework for Dispensers in Our Lady of Maryknoll Hospital

LAU, WM; LIE, CH; CHEUNG, LP
Pharmacy Department, Our Lady of Maryknoll Hospital, Hospital Authority, Hong Kong

Objectives: To design dispensing competency assessment framework for dispensers after assessing staff compliance to work instructions on dispensing for in-patient and out-patient.

Methods: Based on Hospital Authority guidelines and local protocols, compliance assessment checklists for out-patient and in-patient dispensing were developed respectively. 16 dispensers were assessed by pharmacists in the study. Descriptive statistics were used to describe the results. Percentage of compliance was used to compare the results of different parts of the assessments. A satisfaction survey was conducted to collect feedback from staff on content appropriateness and outcome achievement, with 5 statements comprising score rating from 1 (disagree) to 10 (agree). Further modifications and improvements were made to design a finalized competency assessment framework.

Results: An overall of 98%-100% compliance was achieved for different parts of in-patient and out-patient assessments, which was satisfactory. Survey revealed that dispensers valued the use of competency framework, with an average score of 7.9-8.5 out of 10 achieved among the 5 questions on content appropriateness and outcome achievement. The competency assessment framework was finalized by defining different elements that integrate the knowledge and skills of professional performance, and performance criteria that specify the level of performance expected of a competent dispenser. Evidence examples were defined and subsequently categorized into mandatory and non-mandatory ones based on the crucial nature. Different assessment methods (e.g. observation, ask, check record, etc.) were suggested to guide the use of the framework by different assessors.

Conclusions: Competency assessment can help identify strength and weakness of a staff when performing dispensing activities. Training need can be identified and improvements can be made accordingly to ensure medication safety and to meet increasing expectation from patients, which were agreed by dispensers. The final framework can be further extended to different job scopes and responsibilities of dispensers, including clinical support roles and Tech-check-Tech tasks.

Ab41

Effect of a Physician-Pharmacist Collaborative Polypharmacy Clinic in Local General Out-patient Clinic

CHEUNG, MY Emily[1]; LAW, LT Sally[1]; LEUNG, YS Wilson[1]; KO, SH[2]; CHAN, KH King[2]
[1] Department of Pharmacy, Queen Elizabeth Hospital, Hong Kong
[2] Department of Family Medicine and General Out-patient Clinics, Hong Kong

Objectives: A physician-pharmacist collaborative polypharmacy clinic was piloted in a HA general outpatient clinic since May 2015. The clinic aims to optimize medication use and enhance drug compliance in polypharmacy patients by providing personalized medication therapy management. This abstract aims to prospectively evaluate the service outcomes.

Methods: Patients receiving ≥5 chronic drug items, with suboptimal disease management or poor compliance were referred by physicians to the polypharmacy clinic. A joint pre-consultation meeting was carried out to align management plan for polypharmacy. After medical consultation by physicians constituting multimorbidity care planning and revision of medications, pharmacists then reviewed the medication regimen; assessed medication adherence and knowledge; provided individualized education and counselling on drug administration, health-related lifestyle factors and encouraged self-monitoring. The number and types of drug-related problems (DRPs) identified were analyzed. Total number of drug items and number of drug doses to be taken per day were measured.

Results: During the service pilot from May to September 2015 with operation for 20 four-hour sessions, 35 patients(male, 51 %) were recruited. A total of 149 DRPs were identified, with 109(73.2%), 25(16.8%) and 15(10%) interventions involving suboptimal drug treatment, unnecessary drugs and adverse drug events respectively. Pharmacists made 24(16.1%) and 58(35.9%) recommendations on drug addition and discontinuation with doctor's acceptance. Out of 149 interventions, antihypertensive agents were the most commonly involved(56.4%), followed by antidiabetic agents(19.5%).

The mean number of medications reduced from 9.4 to 8.0($p<0.0001$), and mean number of doses taken per day per patient was also considerably reduced from 10.5 to 8.9($p<0.0001$). Survey results showed that most patients showed satisfaction towards the service and appreciated the efforts of both pharmacists and physicians.

Conclusion: Polypharmacy is an emerging problem in ageing population with multiple comorbidities. A physician-pharmacist team approach is shown to effectively identify and resolve DRPs and reduce the pill burden, which would simplify the drug schedule and enhance patient adherence.

Ab42

Establishment of a Centralized Electronic Database for Documenting Drug-Related Problems and Clinical Pharmacists' Interventions and Pooled, Retrospective Analysis in a General Acute Hospital

CHAN, TF; NG, TM; YUEN, YH; WONG, KM; CHEUNG, Y; CHUNG, WF; CHU, KY; KEI, KM; LEUNG, WYS
Department of Pharmacy, Queen Elizabeth Hospital, Hong Kong

Objective: A standardized electronic database was established by Queen Elizabeth Hospital pharmacy in 01/01/2015 for documenting all drug-related problems (DRPs) and pharmacists' clinical interventions using a validated classification system. This abstract reported the summarized characteristics of the DRPs documented in the database since its establishment.

Methods: Pharmacists providing different clinical pharmacy services (medication reconciliation Service, geriatrics, infectious diseases, oncology, and paediatrics) documented their interventions through a pre-designed electronic form from 01/01/2015 to 30/09/2015.

The electronic form included three parts. The first part described patient demographics. The second part applied the Pharmaceutical Care Network Europe (PCNE) classification system of DRPs version 6.2 to record causes, problems, interventions and outcomes. The third part addressed the severity and DRPs related to high alert medications as classified by the Hospital Authority.

Results: Between 01/01/2015 to 30/09/2015, there were 2,346 DRPs identified by pharmacists and intervened. 1885 (80.3%) interventions were approved by prescriber. Multiple drug classes were involved, in which the top 3 drug classes concerned were "Broad-Spectrum Penicillins" (n=126, 4.6%), "Intravenous Nutrition" (n=101, 3.7%) and "Other Antineoplastic Drugs" (n=96, 3.5%). The most common cause of DRPs was "Indication of Drug-Treatment Not Noticed" (n=630, 21.8%), followed by "Prescribing Error (Necessary Information Missing)" (n=332, 11.5%) and "Drug Dose Too High" (n=261, 9.0%). According to PCNE classification, these DRPs could lead to "Effect of drug treatment not optimal" (n=681, 29.0%), "Untreated Indication" (n=678, 28.9%) and "Adverse Drug Event (Non-Allergic)" (n=561, 23.9%). 1719 (73.3%) DRPs were classified as "Significant" or "Serious" in terms of severity level.

Conclusions: The abstract described an electronic database that standardized pharmacists' clinical intervention documentations with a validated classification system of DRPs. Results showed that pharmacists' interventions are valuable and can potentially improve patient care by resolving various DRPs. Identification of common drug groups involved and causes can also provide focuses of pharmacy services in the future.

Ab44

Evaluation of the Prescribing Pattern and Efficacy of Antiemetic for Chemotherapy-Induced Nausea and Vomiting in a Hong Kong Public Hospital

CHAN, YM[1,2]; CHAU, RYH[1,2]; WONG, KM[1]; LAM, TN[2]; LEUNG, WYS[1,2]; LAW, KM[1]; YIU, HY[3]; NGAN, RKC[3]
[1] Department of Pharmacy, Queen Elizabeth Hospital, Hong Kong
[2] School of Pharmacy, The Chinese University of Hong Kong, Hong Kong
[3] Department of Clinical Oncology, Queen Elizabeth Hospital, Hong Kong

Objectives: This study aimed to determine the antiemetic prescribing pattern and evaluate the control of chemotherapy-induced nausea and vomiting(CINV) in patients newly started on cisplatin-based, carboplatin-based or anthracycline-cyclophosphamide(AC) combination-based chemotherapy.

Methods: A prospective, observational study was conducted in Queen Elizabeth Hospital. Patient characteristics and treatment details for the first two cycles of chemotherapy were collected. CINV outcomes from days 1 to 7 or 8 were evaluated through self-reported emesis diary. Appropriateness of prescribing pattern, proportion of patients who achieved complete response(CR) or complete protection(CP) and who experienced emesis were determined.

Results: Eighty-seven subjects were enrolled over 8 weeks in early 2015. It was observed that antiemetic prescribing adhered more closely to international guidelines in the acute phase(59.4%) than the delayed phase(50.0%). All subjects on high emetic risk regimens were prescribed dexamethasone and serotonin antagonist on day 1, but not aprepitant(25.0% in cisplatin-based; 54.3% in AC-based regimens). Serotonin antagonist was not prescribed for acute CINV in 35.7% patients on moderate emetic risk regimens. Dexamethasone was prescribed for preventing delayed CINV in 23.7% patients on high emetic risk regimens and 50.0% patients on moderate emetic risk regimens, while serotonin antagonist was prescribed in less than 10% patients. CP and CR were higher on the day of chemotherapy(59.5%; 78.4%) than on subsequent days(17.6%; 36.5%) in 74 subjects included in efficacy analysis. Twenty-two(29.7%) patients vomited, five of whom added serotonin antagonist post-chemotherapy at second cycle but three still experienced emesis. Subgroup analysis showed that fewer subjects on AC-based chemotherapy prescribed with aprepitant experienced emesis (5.6% versus 58.3%, p=0.003).

Conclusions: With aprepitant becoming free for patients receiving high emetic risk chemotherapy, prescribing aprepitant for preventing acute and prolonged dexamethasone for delayed emesis in all such patients are recommended to strengthen CINV control. Improvement of emesis control is anticipated with improved adherence to international guidelines.

Ab45

Development and Implementation of Parenteral Nutrition (PN) Pharmacist and Pharmacy Intravenous Admixture Services (PIVAS) for Neonatal Intensive Care Unit (NICU) at University of Hong Kong and Shenzhen (HKU-SZH) Hospital

LEUNG, Bill; CHAN, Oi-lun Helen; ZHUO, Yu-bo
The University of Hong Kong - Shenzhen Hospital, China

Objectives: This study evaluates the development and implementation of NICU PN pharmacist.

Methods: NICU was first open in March 2014 and Service Chief soon identified the need for a pharmacist involvement in the provision of PN in NICU. A multidisciplinary nutrition support team was formed for the 12 bed NICU in December 2014 comprising of a NICU consultant, a pharmacist and a nurse with an aim to standardize the provision of PN. An approved PN prescribing guideline was required and Pharmacy took the lead and finalized the guideline which was then approved and implemented in January 2015. Training was also conducted to increase guideline compliance. The PN pharmacist would join the daily nutrition ward round. She would identify and resolve inappropriate PN orders with an aim to maximize energy, protein and mineral accretion and to prevent growth failure. She would also provide pharmaceutical optimization of intravenous therapy and promote medication safety. Evaluation of the pharmaceutical interventions made during July and September 2015 was conducted.

Result: 260 PN bags and 107 IV items were prepared during the 3 months period. 96.4% (54 of 56) of the pharmaceutical interventions made by the PN pharmacist were accepted by the prescribers. 98.2% (55 of 56) considered significant. 19% (11 of 56) involved optimization of first day PN therapy and 23% (13 of 56) involved correction of PN fluid volume.

Conclusion: HKU-SZH hospital is one of the first teaching hospitals in China under management of University of Hong Kong, serving for the local Shenzhen population. Healthcare reform is a huge task with many challenges and obstacles but is also a great opportunity for pharmacists to extend their roles and build up the trustable relationship with doctors and nurses. The results would be useful for other hospitals in China who would be interested to implement Pharmacy services in NICU.

Ab46

Implementation of Ward-based Pharmacist Medication Review in High Risk Geriatric Patients. Observational Study of Drug-related Problems

CHU, KY[1]; YUEN, YH[1]; LEUNG, WYS[1]; LAW, KM[1]; WONG, CT[2]; LUI, TC[3]; WOO, KF[3]; CHUI, SM[3]; MAK, YF[2]

[1] Department of Pharmacy, Queen Elizabeth Hospital, Hong Kong
[2] Department of Medicine, Queen Elizabeth Hospital, Hong Kong
[3] Community Nursing Services, Kowloon Hospital, Hong Kong

Objectives: In Kowloon Central Cluster, patients aged≥60 years accounted for 51.4% of all bed-days occupied in 2013. Older patients are more prone to drug-related problems(DRP) due to the use of multiple medications. DRP are associated with increased risks of hospital readmissions, morbidity and mortality.[1,2] This study aims to analyze the types and severity of DRP observed by ward-based pharmacist and its rate of acceptance by physicians.

Methods: A pilot service was implemented in the male medical ward C5 in QEH since Dec 2014. Patients were those aged ≥60 years with Hospital Admission Risk Reduction Program for the Elderly(HARRPE) score≥0.2 (i.e.≥20% risk of emergency admission in 28 days). Pharmacist conducted review of patients' medical records, current and previous medication history and laboratory values. Patients were interviewed to understand their drug compliance and possible adverse effects. Pharmacist identified reconciliation errors and DRP and provided appropriate interventions for physicians, nurses, patients and their caregivers. The interventions were classified according to the Pharmaceutical Care Network Europe(PCNE) and ranked by severity[3-4]. Individual patient education was also provided at bedside.

Results: A total of 269 potential DRP were observed in the 679 patients (mean±SD age 80.4±12.6) in 42 weeks. DRP were most commonly associated with anti-bacterials (n=48, 17.8%) and cardiovascular drugs (n=47, 17.5%). Six DRP involved the Hospital Authority high alert medications, including hypoglycemic drugs, insulin and anticoagulant. More than two-thirds (n=180, 66.9%) of DRP were rated as significant severity and 12 (4.5%) were serious. There were 258 interventions recommended to physicians, of which 212 (82.2%) were accepted resulting in 145 therapeutic modifications (56.2%).

Conclusions: Clinical pharmacists identified a high number of DRP in high risk geriatric patients. Pharmacist recommendations were highly accepted by physicians. Further studies should investigate that clinical pharmacy service in geriatrics can contribute to the optimization of therapeutic management and potentially reduction in hospital readmissions.

References
1. Roughead EE, Semple SJ. Medication safety in acute care in Australia: where are we now? Part 1: a review of the extent and causes of medication problems 2002-2008. Australia and New Zealand Health Policy. 6:18, Aug 2009.
2. Stewart S, Pearson S, Luke CG, Horowitz JD. Effects of home-based intervention on unplanned readmissions and out-of-hospital deaths. Journal of the American Geriatrics Society. 46: 174-180, 1998.
3. Classification for drug related problems V6.2. The Pharmaceutical Care Network Europe (PCNE).
4. Overhage JM, Lukes A. Practical, reliable, comprehensive method for characterizing pharmacists' clinical activities. American Journal of Health System Pharmacy 1999; 56(23): 2444-50.

Ab47

Safe and Effective Use of Insulin Injections and the Roles of Clinical Pharmacists - CQI Perspective

LEUNG, Yuen-ki Christina[1]; LI, Xing[2]

[1] Senior Pharmacist (Clinical Pharmacy Service) The University of Hong Kong – Shenzhen Hospital (HKU-SZH), Shenzhen, China
[2] Pharmacist (Clinical Pharmacy Team) The University of Hong Kong – Shenzhen Hospital (HKU-SZH), Shenzhen, China

Objectives: HKU-SZH has achieved Extensive Achievement (EA) level in the "Medication Safety" standards in the ACHS (Australian Council on Healthcare Standards) accreditation carried out in September, 2015. During the preparatory stage for this accreditation, different departments of HKU-SZH were given training relating to CQI (Continuous Quality Improvements) and how to complete the CQI form.

The clinical pharmacy team completed 5 different topics of CQIs. One of them was relating to the safe and effective use of insulin. Insulin is one of the high alert drugs in HKU-SZH. Medication incidents relating insulin happen worldwide in different healthcare settings. Some of them are detrimental to patients or even fatal. The quality improvement tools that the clinical pharmacy team have implemented are: (i) initiated the change of the insulin dose unit in the electronic prescribing system from "IU" and "U" to "international unit" and "unit" in April, 2015, (ii) prepare 3-monthly medication safety alert newsletter to the healthcare staff (iii) provided education & training sessions to the pharmacists, nurses and patients relating to insulin, (iv) prepared a A4 size coloured insulin card for the ward staff to aid drugs history taking, (v) to design insulin leaflet and insulin dosage diary for patients, (vi) pharmacist's involvement in the diabetic out-patient clinic.

The objectives of this study are to find out (i) the improvement measures to prevent insulin incidents happen in HKU-SZH, (ii) the impact on the number of medication incidents after the improvement plans have been implemented, (iii) the feedback from the healthcare staff and patients regarding the training sessions delivered by the clinical pharmacists and the quality improvement tools implemented by the pharmacists.

Methods: Measure quantitatively the number of patients medication incidents reported from 17th April to 9th July, 2015 including near misses, and collect feedback from the healthcare staff and the patients regarding the quality improvement tools and education and training sessions prepared by the clinical pharmacists.

Results: From April to July, 2015, there was no insulin-related medication incident reported. The Quality and Safety Management committees have given good feedback regarding the Medication Safety Alert newsletter. The Head nurses gave positive feedback regarding the teaching session provided by the pharmacists and the A4 size coloured insulin card. The patients find the patient counselling service useful in the out-patient clinic. They also find the patient leaflet and insulin dosage diary booklet beneficial for their insulin management and the talk relating to "safe and effective use of insulin" useful which was delivered in out-patient forum.

Conclusions: The clinical pharmacy team has learnt the quality improvements in patient care and medication safety cannot be achieved without an effective multi-disciplinary teamwork and commitment to quality. There are 8 pharmacists in the clinical pharmacy team and we enjoy the process of this quality improvement development.

Ab48
Clinical Pharmacy Service in QEH PICU

CHU, MW[1]; CHEUNG, Y[1]; NG, TM[1]; HO, YL[1]; FUNG, HC[1]; YEUNG, WS[1]; LEUNG, WYS[1]; LAW, KM[1]; CHAN, WKY[2]; POON, TYM[2]

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

[2] Department of Paediatrics, Queen Elizabeth Hospital, Hong Kong

Objectives: Paediatric clinical pharmacy service has been implemented in QEH B2 ward (mixed PICU, HDU and general beds) since January 2014.

This abstract aims to describe the implementation of this clinical pharmacy service, and analyse the rate, types and causes of drug related problems (DRPs) categorized using the Pharmaceutical Care Network Europe (PCNE) Classification V6.2.

Methods: Clinical pharmacists visited B2 ward to review patients' medication profile every weekday and participated in consultant round once weekly. A centralized database was built to collect all interventions suggested by pharmacists. From January to September 2015, interventions collected were categorized using PCNE classification V6.2. Data for PICU, HDU and general beds were separately analysed.

Results: Clinical pharmacists participated in 34 morning consultant round and reviewed medication orders for 1,901 bed-days occupied (BDO). Seventy-six DRPs were identified, including 54 (71%), 15 (20%) and 7 (9%) being PICU, HDU and general beds, respectively. If expressed as the numbers of DRPs per 100 BDO screened, the figures for PICU, HDU and general beds were 6.4, 1.7 and 4.4 respectively.

70 DRPs (acceptance rate 93%) were related to prescribing and 6 DRPs (acceptance rate 100%) were related to drug administration. The top three drug classes involved in DRPs in PICU were 1) antimicrobials (24%), 2) cardiovascular drugs (16.7%) and 3) antiepileptics (11.1%).

Top three types of problems identified using PCNE were 1) P1.2-effect of drug treatment not optimal (42.6%), 2) P2.1-adverse drug event (29.6%) and 3) P1.4-untreated indication (5.56%).

Top three causes of problems identified using PCNE were C3.1–drug dose too low, C3.2–drug dose too high and C3.3–dosage regimen not frequent enough (each 17.5%).

Conclusions: The data suggested that paediatric clinical pharmacists could help optimising drug therapy and identifying DRPs. DRPs were more commonly identified in PICU than HDU and general beds. Problems with dosage adjustment were most commonly encountered.

References

1. Mil JWF, Westerlund LT et al. Drug-Related Problem Classification Systems. Ann Pharmacother 2004;38:859-67.