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INSTRUCTIONS FOR AUTHORS

The Hong Kong Pharmaceutical Journal is a journal of the pharmacists, for the pharmacists and by the pharmacists. Submissions are welcome for the following sections:

- Pharmacy Education & Practice
- Drugs & Therapeutics
- Primary Care, OTC & Health
- Pharmaceutical Techniques & Technology
- Medication Safety
- Herbal Medicines & Nutraceuticals
- Society Activities
- New Products

Comments on any aspects of the profession are also welcome as Letter to the Editor.

There is no restriction on the length of the articles to be submitted. They can be written in English or Chinese. The Editorial Committee may make editorial changes to the articles but major amendments will be communicated with the authors prior to publishing.

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Editorial

News & Short Communications

Pharmacy Education & Practice

Drugs & Therapeutics

Primary Care, Over-the-Counter & Health

Society Activities

Aims and Scope of the Journal

Charting the Course of Pharmacy in Hong Kong

In this issue of the Hong Kong Pharmaceutical Journal, we explore several key facets of contemporary pharmacy practice, highlighting both the rich history of the profession and its dynamic evolution in response to emerging healthcare needs.

We are privileged to feature an insightful interview with Professor Joan Zuo, a distinguished figure in the field. With over 25 years of experience in biopharmaceutics and pharmacokinetics, Professor Zuo has made significant contributions to the integration of Western and Traditional Chinese Medicine. In this candid conversation, she shares her career journey, research interests and her vision for the future of pharmacy education and practice in Hong Kong. Her insights underscore the importance of innovation and collaboration in advancing the profession.

Shifting our focus to a critical aspect of everyday health, our next article delves into the often-underappreciated importance of maintaining healthy gum conditions. The concept of “free gingivae” and its implications for overall oral function and systemic well-being are thoroughly explored. This article underscores the significant role of preventative measures, such as proper toothbrushing techniques and the use of fluoride-containing products, in safeguarding oral health and potentially mitigating the risk of associated systemic diseases. The authors also advocate for a more active role for pharmacists in primary oral healthcare, highlighting an area ripe for expanded professional contribution.

Furthermore, we examine the complexities of managing Parkinson’s disease, a prevalent neurodegenerative disorder. The article outlines the underlying pathophysiology of this common condition, the challenges associated with current dopamine replacement therapies and the role of adjunctive treatments. Emphasizing a patient-centered approach and the crucial involvement of pharmacists and other healthcare providers, this piece underscores the ongoing need for research and multidisciplinary collaboration to improve the quality of life for individuals living with Parkinson’s disease.

Finally, this issue examines the transformative changes underway in Hong Kong’s healthcare system, particularly the shift towards a more community-based and preventive model under the Primary Healthcare Blueprint. The article highlights the significant work of the Jockey Club PHARM+ Community Medication Service Network Project, spearheaded by the Department of Pharmacology and Pharmacy at The University of Hong Kong. The summary of the Roundtable Meeting on the Scope of Community Pharmacy Services provides key insights into the future role of community pharmacists. Discussions around standardizing service delivery, advocating for policy recognition, promoting interprofessional collaboration, and encouraging continuous service innovation underscore the pivotal role community pharmacists are poised to play in chronic disease prevention and management within the evolving primary healthcare landscape.

The articles in this issue collectively illustrate the multifaceted nature of pharmacy in Hong Kong. From pioneering research to innovative healthcare models, these contributions underscore the critical role pharmacists play in enhancing public health and patient care. We trust that this issue will provide valuable insights for our readers and stimulate further discussion within the profession. Thank you for your continued support of the Hong Kong Pharmaceutical Journal. Your feedback is invaluable as we strive to create a publication that meets the needs of our readers. Please share your ideas and suggestions for improving the Journal. Together, we can continue to advance the field of pharmacy and improve health outcomes for our community.

May PS Lam
Editor-in-Chief
7 May 2025

Prepared by Candice Leung & Branson Fok

Once Every 5 Years Zoledronate Infusion Prevents Morphometric Fractures in Early Postmenopausal Women

Date: January 16, 2025

Persistent decrease in bone mineral density due to hormonal changes is nearly inevitable among postmenopausal women. The physiological change is also noted to be inversely related to fracture risk. Clinically approved fracture-prevention strategies mainly focus on groups with high-risk of fracture: elderly, osteoporotic patients and those with previous fractures. Zoledronate infusion is known to reduce the incidence of fractures among osteopenic and osteoporotic patients, with a prolonged duration of effect.

The 10-year, prospective, double-blind, randomized and placebo-controlled trial in New Zealand recruited 1054 women at their early postmenopausal period (50 to 60 years of age) with bone mineral density T scores between 0 and -2.5. Participants were assigned in a 1:1:1 ratio to receive (1) 5 mg zoledronate infusion at baseline and 5 years later (n=352), (2) 5 mg zoledronate infusion at baseline and normal saline as placebo 5 years later (n=351), and (3) normal saline infusions for both periods (n=351). The primary end point was the presence of new morphometric vertebral fracture in spinal radiographs. Fractures occurring in other body parts, changes in bone mineral density and bone turnover markers were regarded as secondary end points.

The relative risks of vertebral fractures of women receiving zoledronate-zoledronate and zoledronate-placebo infusions as compared with the placebo-placebo group were 0.56 (95% confidence interval [CI], 0.34 – 0.92; P=0.04) and 0.59 (95% confidence interval [CI], 0.36 – 0.97; P=0.08) respectively. The relative risks of any fracture in comparison with placebo-placebo group were 0.70 (95% confidence interval [CI], 0.56 – 0.88) in the zoledronate-zoledronate group and 0.77 (95% confidence interval [CI], 0.62 – 0.97) in the zoledronate-placebo group. Only few cases of episcleritis were noted in relation to baseline infusion of zoledronate.

To summarize, intravenous zoledronate administered once every 5 years reduced the incidence of morphometric vertebral fractures over a 10-year period in early postmenopausal women.

Source: www.nejm.org

FDA Approves Novel Non-Opioid Treatment for Moderate to Severe Acute Pain

Date: January 30, 2025

The U.S. Food and Drug Administration (FDA) has approved Journavx (suzetrigine), a first-in-class non-opioid analgesic, for the treatment of moderate to severe acute pain in adults. Journavx works by targeting sodium channels in the peripheral nervous system, interrupting pain signals before they reach the brain. This approval marks the introduction of a new therapeutic class for pain management, offering an alternative to opioids and their associated risks.

Acute pain, which often arises from injuries or surgeries, is commonly treated with analgesics, including opioids. Journavx provides a non-opioid option, aligning with the FDA's Overdose Prevention Framework, which promotes the development of safer alternatives for pain management.

The efficacy of Journavx was demonstrated in two randomized, double-blind clinical trials involving patients recovering from abdominoplasty and bunionectomy. Participants were also allowed to use ibuprofen as needed for additional pain relief. Both trials demonstrated a statistically significant reduction in pain compared to placebo. The safety profile was reviewed in over 1,100 participants across trials, with common side effects including itching, muscle spasms, rash, and elevated creatine phosphokinase levels. Journavx should not be used with strong CYP3A inhibitors, and patients are advised to avoid grapefruit products while on the medication.

The FDA granted Journavx Breakthrough Therapy, Fast Track, and Priority Review designations to expedite its development and approval. Developed by Vertex Pharmaceuticals Incorporated, Journavx represents a significant step forward in reducing reliance on opioids for pain management and expanding treatment options.

Source: www.fda.gov

Nivolumab-Ipilimumab Prolongs Progression-free Survival in Microsatellite Instability-high Metastatic Colorectal Cancer

Date: February 1, 2025

Microsatellite instability-high (MSI-H) or mismatch repair deficient (dMMR) metastatic colorectal cancer patients are usually associated with poor outcomes in chemotherapy with or without targeted therapies. Various clinical practice guidelines have recommended the use of immune checkpoint inhibitors to improve progression-free survival in these patients. Both nivolumab and ipilimumab are possible immunotherapeutic options that target PD-1 and CTLA-4 pathway respectively for T cell reactivation.

In this randomized, open-label, international, phase 3 CheckMate 8HW trial, 839 patients with metastatic colorectal cancer), of which about 80% with centrally confirmed MSI-H or dMMR status, were randomly assigned in 2:2:1 ratio to receive nivolumab-ipilimumab (n=354), nivolumab monotherapy (n=353) or chemotherapy (n=132 in accordance with the research protocol for a maximum of 2 years. Dual primary endpoints of this study include progression-free survival for nivolumab-ipilimumab versus chemotherapy as first-line setting and nivolumab-ipilimumab versus nivolumab monotherapy across all lines of therapy.

The median progression-free survival was 54.1 months in the nivolumab-ipilimumab group and 5.9 months in the chemotherapy group (Hazard ratio=0.21, 95% confidence interval [CI], 0.14-0.31; P<0.001). Clinically significant improvement in progression-free survival was also noted in the nivolumab-ipilimumab group with a hazard ratio of 0.62 (95% confidence interval [CI], 0.48 – 0.81; P=0.0003), when compared with patients who underwent nivolumab monotherapy. The most common treatment-related adverse events were pruritis and diarrhoea throughout the study period, and the safety profiles were consistent with established profiles of each individual drug.

In conclusion, nivolumab-ipilimumab immunotherapy significantly prolongs progression-free survival across all treatment lines and appears as a potential new standard of care for the treatment of MSI-H or dMMR metastatic colorectal cancer.

Source: www.thelancet.com

Iptacopan Leads to Significant Improvement in Proteinuria among Patients with IgA Nephropathy

Date: February 6, 2025

IgA nephropathy (IgAN) refers to a form of glomerulonephritis caused by deposition of IgA antibody, which leads to progressive loss of kidney function. Presence of proteinuria in IgAN patients is now recognized as one of the risk factors for experiencing rapid renal function decline in particular. Iptacopan, an oral complement factor B inhibitor, inhibits the alternative pathway that potentially contributes to the pathogenesis of IgAN.

The phase 3, international, double-blind, randomized and placebo-controlled APPLAUSE-IgAN trial recruited eligible adults with biopsy-confirmed IgAN and proteinuria (defined as a 24-hour urinary protein-to-creatinine ratio ≥1) despite optimized supportive therapy. A total of 443 patients were then randomly assigned in 1:1 ratio to receive oral 200mg iptacopan (n=222) or placebo (n=221) twice daily for 24 months, alongside with the continuation of supportive treatment. The primary end point was the change from baseline in the 24-hour urinary protein-to-creatinine ratio at month 9. The safety profile of the newly developed iptacopan was also assessed in the current study.

Interim primary efficacy analysis showed that the adjusted geometric mean 24-hour urinary protein-to-creatinine ratio was 38.3% lower in the iptacopan group than placebo group (geometric mean ratio=0.617; 95% confidence interval [CI], 0.514 – 0.740; two-sided P<0.001) at month 9. Exploratory analyses regarding iptacopan's effect on proteinuria also align with findings of complement pathway biomarkers returning to normal as of healthy individuals in the treatment group. The incidence of adverse events was similar in both groups, with no significant increase in infection risk being observed for patients treated with iptacopan.

In conclusion, oral iptacopan improves proteinuria as compared with placebo which may potentially benefit IgAN patients who are at risk of rapid deterioration of kidney function.

Source: www.nejm.org

FDA Approves First Rapid-Acting Insulin Biosimilar Product for Diabetes Treatment

Date: February 14, 2025

The U.S. Food and Drug Administration (FDA) has approved Merilog (insulin-aspart-szjj), the first rapid-acting insulin biosimilar, as a treatment option for adults and children with diabetes mellitus. Merilog is biosimilar to Novolog (insulin aspart) and is designed to manage blood sugar levels around mealtimes, helping to reduce spikes in blood glucose. The FDA approval is granted to both a 3 mL prefilled pen and a 10 mL multiple-dose vial for subcutaneous injection.

This approval marks a significant milestone as Merilog becomes the third insulin biosimilar product approved by the FDA, following two long-acting biosimilars approved in 2021. Biosimilar products are highly similar to their reference products and offer no clinically meaningful differences in terms of safety, efficacy, or quality. By increasing competition in the insulin market, biosimilars like Merilog aim to expand patient access to these essential medications at potentially lower costs.

Diabetes affects over 38 million Americans, with approximately 8.4 million relying on insulin therapy, including rapid- and long-acting insulin. Insulin therapy is critical for managing blood sugar levels and preventing complications associated with diabetes. Merilog is administered subcutaneously by injection into the stomach, buttocks, thighs or upper arms, 5-10 minutes before a meal and should be dosed individually based on patient needs.

While Merilog offers a promising option for diabetes management, it carries risks of side effects such as hypoglycemia, severe allergic reactions, and hypokalemia. Common side effects include injection site reactions, itching, rash, and weight gain.

The FDA's approval of Merilog, developed by Sanofi-Aventis U.S. LLC, underscores the agency's commitment to enhancing the availability of high-quality, affordable insulin products. This advancement holds the potential to make a meaningful difference for millions of patients managing diabetes daily.

Source: www.fda.gov

Oral Semaglutide Reduces Cardiovascular Risks in High-Risk Type 2 Diabetes Patients

Date: March 29, 2025

The cardiovascular safety of oral semaglutide, a GLP-1 receptor agonist, has been established in previous trials. However, the cardiovascular efficacy of oral semaglutide in patients with type 2 diabetes and atherosclerotic cardiovascular disease (ASCVD), chronic kidney disease (CKD), or both has not been fully established.

In this international, double-blind, randomized, placebo-controlled, event-driven, superiority phase 3b trial, participants who were 50 years of age or older, had type 2 diabetes (HbA1c 6.5 to 10.0%), and had known ASCVD, CKD (defined by an eGFR <60 ml/min/1.73m^2), or both were eligible. A total of 9,650 eligible participants were randomly assigned in a 1:1 ratio to receive either once-daily oral semaglutide (maximal dose, 14 mg) or placebo, in addition to standard care. The primary outcome was major adverse cardiovascular events (MACE), assessed in a time-to-first-event analysis. Secondary outcomes included major kidney disease events (a five-point composite outcome).

A primary outcome event occurred in 12% of participants (579 out of 4,825; 3.1 events per 100 person-years) in the oral semaglutide group, as compared with 13.8% (668 out of 4,825; 3.7 events per 100 person-years) in the placebo group (hazard ratio, 0.86; 95% confidence interval [CI], 0.77 to 0.96; P=0.006). The results for secondary outcomes did not differ significantly between the two groups.

Participants receiving semaglutide also experienced improvements in glycemic control and weight loss. The mean reduction in HbA1c was 0.71% compared to 0.15% in the placebo group (estimated difference, -0.56%; 95% CI, -0.61 to -0.52), and weight loss was 4.22 kg versus 1.27 kg with placebo (estimated difference, -2.95 kg; 95% CI, -3.18 to -2.73).

The safety profile of oral semaglutide was consistent with prior trials. Gastrointestinal side effects, including nausea and diarrhea, were slightly more common with semaglutide (5.0% vs. 4.4%). However, the incidence of serious adverse events was slightly lower in the semaglutide group (47.9% vs. 50.3%).

In conclusion, oral semaglutide demonstrates a significant reduction in cardiovascular risk for patients with type 2 diabetes and high cardiovascular risk, while also improving glycemic control and promoting weight loss.

Source: www.nejm.org

Conversations with Pharmacy Leaders in Hong Kong – Integrating Western and Traditional Chinese Medicine: A Vision for the Future

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ABSTRACT

Professor Joan Zuo, the former Director of the School of Pharmacy at The Chinese University of Hong Kong (CUHK), shares her extensive experience in biopharmaceutics and pharmacokinetics. With over 25 years in the field, she has significantly contributed to the integration of Western and Traditional Chinese Medicine (TCM). In this interview, Professor Zuo discusses her career journey, research interests, and vision for the future of pharmacy education and practice in Hong Kong.

Keywords: *Biopharmaceutics, Pharmacokinetics, Herb-Drug Interactions , Pharmacy Education*

INTERVIEW WITH PROFESSOR JOAN ZUO

Background and Education

Professor Zuo's journey into pharmaceutical sciences began with a curiosity-driven interest in science during her middle school years. Initially fascinated by forensic medicine, she found her calling in pharmaceutical sciences due to its problem-solving nature. She completed her bachelor's degree in mainland China, which provided a solid foundation in science through extensive lab work and a year-long research project. She then pursued a Doctor of Philosophy (Ph.D.) in Canada, focusing on biopharmaceutics and pharmacokinetics.

Reflecting on her education, Professor Zuo notes that her training in mainland China was very science-oriented, with many labs and a full year dedicated to a research-based project. This rigorous training built a solid foundation for her further studies. After completing her bachelor's degree, she worked at Xian Janssen Pharmaceutical Ltd, one of the Janssen Pharmaceutical Companies of Johnson & Johnson. It is China's first joint venture pharmaceutical manufacturing company with Good Manufacturing Practice (GMP), where she gained hands-on experience in various manufacturing processes. Such experience proved invaluable in her teaching and research career, as it provided practical insights into the pharmaceutical industry.

Career Path and Research Focus

After her initial industry experience, Professor Zuo pursued a Ph.D. in Canada. Professor Zuo's interest in biopharmaceutics and pharmacokinetics was sparked during her final year project and further developed during her Ph.D. training. She is particularly interested in how medicines interact with the human body, including the processes of absorption, distribution, metabolism, and excretion (ADME).

Her current research interests include the interaction of medicines with the human body, particularly Western drug molecules and herbal bioactive components. She

has conducted significant research on flavonoids and their pharmacokinetics, leading to numerous publications and patents.

Integrating Western and Traditional Chinese Medicine

One of Professor Zuo's most significant contributions has been her work in integrating TCM with Western medicine, emphasizing the safety and efficacy of their combination use. Professor Zuo's research on herb-drug interactions began during the SARS outbreak when the Hospital Authority (HA) in Hong Kong sought to use TCM alongside conventional treatments. Her research demonstrated that TCM could enhance the antiviral activity of treatments like oseltamivir, leading to a greater acceptance of integrated medicine practices. This work has continued to be relevant, especially during the Coronavirus Disease 2019 (COVID-19) pandemic, where integrated medicine has played a crucial role in patient care.

Pharmacy Education and Vision

Joining CUHK in 2000, Professor Zuo has been instrumental in developing the Bachelor of Pharmacy (BPharm) program. She emphasizes a solid science foundation and the integration of TCM in the curriculum. Her vision includes fostering curiosity and problem-solving skills in students, ensuring they are well-equipped for future challenges in pharmacy practice.

When she first joined CUHK, Professor Zuo was keen to develop a pharmacy program that balanced scientific rigor with practical application. She believes that a strong foundation in science is essential for students to excel in practice and to develop further in their careers. Over the years, the curriculum has evolved to include more practice-based learning, with a unique focus on TCM. This integration helps students understand the origins of drugs and the potential interactions between Western and Chinese medicines.

Professor Zuo is passionate about teaching and believes in the importance of nurturing a research mindset in students. She mentions in the interview, "Teach students how to fish, not to give them a fish!" This philosophy underscores her commitment to equipping students with the skills and knowledge they need to solve problems independently and think critically.

Committees and Professional Roles

Professor Zuo serves on various committees, including the Pharmacy & Poisons Board and the TCM Research and Development Committee. She is involved in enhancing research and development (R&D) for TCM and ensuring the safety and quality of herbal products. Her contributions have been recognized internationally, and she continues to influence the field through her editorial roles and grant reviews.

Her role on these committees involves reviewing research proposals, setting standards for TCM products, and ensuring that both Western and Chinese medicines meet rigorous safety and quality standards. She also participates in forums and discussions to share her expertise and to learn from other experts in the field. This collaborative approach helps to advance the integration of TCM and Western medicine, benefiting both practitioners and patients.

Advice for Aspiring Pharmacists

Professor Zuo advises pharmacy students to maintain curiosity, engage in problem-solving, and not just focus on exams. She stresses the importance of a research mindset to stay relevant in the age of artificial intelligence (AI), encouraging students to think critically and innovate.

She believes that curiosity is the driving force behind scientific discovery and encourages students to ask questions and seek solutions. Rather than being exam-driven, she advises students to develop a research mindset, which will help them stay ahead in a rapidly changing field. By fostering a culture of curiosity and critical thinking, Professor Zuo hopes to prepare the next generation of pharmacists to tackle future challenges and to contribute to the advancement of the profession.

Challenges and Achievements

Throughout her career, Professor Zuo has faced numerous challenges, particularly in integrating TCM with Western medicine. One significant challenge was the lack of preclinical studies on herb-drug interactions, which made it difficult to design clinical trials. Despite these obstacles, she managed to conduct clinical studies that proved the safety and potential efficacy of combining TCM with Western treatments. Her research demonstrated that even though herbs might influence

the concentration of drugs like oseltamivir, the overall antiviral activity increased when used together, thus enhancing the treatment regimen.

Her work with the Hospital Authority (HA) during the SARS outbreak was a turning point. The HA was keen on using TCM, but many Western medicine practitioners were concerned about the safety of herb-drug interactions. Professor Zuo's research provided the necessary evidence to support the use of TCM, leading to a broader acceptance of integrated medicine practices. This experience underscored the importance of safety in her research, a principle she continues to uphold.

Impact on Healthcare and Policy

Professor Zuo's contributions extend beyond academia and research. She has played a crucial role in shaping healthcare policies related to TCM and integrated medicine in Hong Kong. As a member of various government committees, she has been instrumental in setting standards for TCM products and ensuring their safety and efficacy. Her work has influenced policy decisions, leading to the establishment of guidelines for the use of TCM in conjunction with Western medicine.

Her involvement in the TCM Research and Development Committee under the Innovation Technology Bureau has been particularly impactful. This committee brings together experts from various backgrounds, including manufacturing, Western medicine, and TCM, to enhance R&D for TCM. The committee organizes annual forums that include representatives from the HA, Department of Health (DH), and Education and Training Committee (ETC). These forums provide a platform for sharing knowledge, discussing challenges, and setting research priorities.

Future Vision and Ongoing Projects

Looking ahead, Professor Zuo plans to continue her research, focusing on translational research and biotech development. She sees great potential in Hong Kong's biotech sector and believes that pharmacy and pharmaceutical sciences are well-positioned to benefit from this growth. Her ongoing projects include developing new drug delivery systems and investigating the pharmacokinetics of herbal compounds.

She is also involved in the "Incu-Bio" program at the Hong Kong Science & Technology Parks Corporation, where she evaluates early-stage biotech projects and provides guidance on how to advance them. This work is particularly meaningful to her, as it allows her to contribute to the development of new technologies and therapies that can improve patient care.

CONCLUSION

Professor Joan Zuo's interview highlights her journey, contributions to pharmacy teaching and research, and her vision for the future. Her insights provide valuable guidance for aspiring pharmacists and researchers, emphasizing the importance of curiosity, interdisciplinary collaboration, and continuous learning. Through her work, she has demonstrated the potential of integrating Western and Chinese medicine, paving the way for future advancements in the field.

Her advice to students and young researchers is particularly poignant: "Teach students how to fish, not to give them a fish!" This encapsulates her educational philosophy, focusing on empowering students to become independent thinkers and problem solvers. By fostering a culture of curiosity and critical thinking, Professor Zuo hopes to prepare the next generation of pharmacists to tackle future challenges and contribute to the advancement of the profession.

Author's background

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Restoring and Maintaining Healthy Gumlines: A Novel Approach

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INTRODUCTION

Periodontal (gum) disease, such as gingivitis and periodontitis, is a notable medical problem in the globe. By statistics, severe periodontitis affects approximately 1.1 billion people worldwide in 2019, with an increasing rate of 8.44% from 1990 to 2019[1]. It is noted that gum disease is also considered prevalent in Hong Kong. According to a cross-sectional study interviewing 1265 Hong Kong Chinese aged between 25 – 60, 62.2% of the individuals reported experiencing gum bleeding in the past 12 months[2]. Healthy gum acts as a natural protective barrier, and poor gum health not only lead to localized inflammation and infection, but also associates with systemic conditions like cardiovascular disease and diabetes[3].

Although gum health is so important, the public in Hong Kong still have many misunderstandings on the maintenance of gum health. For instance, dental scaling is sometimes avoided by certain local individuals due to misconceptions that it would "make the teeth thinner" or "widen the gum space"[4]. Besides, pharmacists' role in delivering oral healthcare services in Hong Kong is often underappreciated, and global practices on this matter will be further discussed in this article to examine how Hong Kong can learn from the experiences of other countries. This article aims to raise awareness about the importance of oral care with an emphasis on gum health conditions, and to reinforce local pharmacists' role in the primary oral healthcare field.

IMPORTANCE OF GUM HEALTH CONDITIONS

The most common types of gum diseases are gingivitis and periodontitis. Gingivitis is relatively mild, reversible inflammation of the gum, which is characterized by red, swollen and easily bled gums[5]. On the other hand, periodontitis is a chronic, irreversible inflammation state, which can potentially result in various degrees of destruction of supporting tissue adjacent to the teeth and is often characterized by bone loss surrounding the affected teeth[5]. Given that the difference in severity and reversibility between gingivitis and periodontitis, it is important to identify gum condition from the stage of gingivitis and offer appropriate and on-time treatment to prevent its progression into irreversible periodontitis. Although not many studies were done on the clinical transition from gingivitis to periodontitis, the pathophysiological changes that take place during the inflammation progression has been explored over time. For instance, "chronic periodontitis" was recognized as a significant dental health issue as early as in 1960s[6]. At that time, a critical observation was also made to identify gingivitis as the initial lesion for periodontitis, and oral plaque is also recognized as the primary etiologic cause of gingivitis[6]. Hence, attention should be paid to maintaining gum health starting from the early stage by preventing plaque buildup.

Oral inflammation may seem easy to tackle, but it can lead to more severe consequences such as bone loss and loss of teeth[7]. Apart from the perspective of oral health alone, poor gum health is also linked with systemic manifestations. It should be noted that there is a bidirectional relationship between oral health and systemic disease, given that 100 systemic diseases have oral implications[7]. Examples of systemic conditions reported to be linked with poor oral health include coronary heart disease, adverse pregnancy outcomes, stroke, hyperlipidemia, pulmonary infection, and more[8]. Although more studies still need to be done to investigate

the actual causal relationship between oral health and systemic condition, the association between these two factors should never be overlooked. Besides, there is notable evidence that these comorbidities are more commonly seen in elderly, and good oral care of nursing home residents can lead to reduced adverse effects and healthcare expenditure[7]. Given the above potential consequences of poor oral or gum health, there is an urgent need for the public to learn the ways to maintain healthy gums.

The Concept of "Free Gingivae" for Healthy Gums

The gingiva, also commonly known as the gum, is the oral mucous membrane surrounding the teeth, and it can be further differentiated into marginal, attached and interdental regions (refer to ***Figure 1***)[9]. The free (or marginal) gingiva is the "terminal edge or border of the gingiva surrounding the teeth in a collar like fashion" and it composes the soft tissue wall of the gingival sulcus[9].

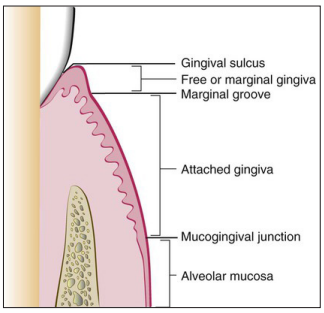

Figure 1: *Diagram showing the anatomy of gingiva[9]*

The role of healthy free gingivae may seem minor to many people, but its importance becomes notable when it is absent, as in the condition of gingival recession. Gingival recession is a clinically significant phenomenon in the field of dental care as the exposed root surfaces become vulnerable to decay and wear[10]. It can occur in both inflamed (gingivitis) and healthy gum tissues and becomes more common as people age, use inappropriate tooth brushing techniques and have tooth malposition[10]. Some of the factors contributing to gingival recession are summarized in ***Table 1*** below:

Table 1. Predisposing and precipitating factors of gingival recession
Predisposing factors: (1) Bone defects (e.g. lack of alveolar bone), (2) Thin and fragile gingival tissue, (3) Abnormal frenal attachment*
Precipitating factors: (1) Toothbrush trauma (improper toothbrushing techniques), (2) Oral piercings, (3) subgingival restoration, (4) Deep traumatic overbite, (5) Self-inflicted injuries, (6) Orthodontic therapy, (7) Plaque-induced periodontal inflammation, (8) Herpes simplex virus infection, (9) Smoking
* Frenal attachment is the mucous membrane with muscle fibers that connects the lips to the alveolar mucosa and periosteum underneath.

To preserve the health and proper functioning of the free gingival margins, measures should be taken to prevent practices that may potentially prove detrimental to the gums and teeth. Recommendations for maintaining gingival and oral health will be further elaborated upon in subsequent sections of the article.

Proper ways of removing Dental Plaque (or oral plaque)

Dental plaque (biofilm) is the complex community of microorganisms, consisting of both gram-positive and gram-negative bacteria, that adheres to the tooth surface and encased in a matrix made up of bacterial and salivary components[11]. Calcified form of plaque is also referred to as calculus or tartar[13]. Dental plaque has been acknowledged as the primary causative factor in gingival inflammatory diseases and it is proposed that the effective removal of plaque can lead to the control and lead to better management of the diseases[6]. More importantly. greater gingival inflammation in response to plaque accumulation is seen in the case of aggressive periodontitis, when compared to periodontally healthy individuals. Hence, it is preferable to clear the plaque efficiently before the condition deteriorates further.

Toothbrushing is often the first action that comes to mind when considering proper dental care. Yet, the way of toothbrushing varies among individuals and may result in varying efficacy in plaque removal. A meta-analysis[13] concludes (modified) Bass technique as most efficient in plaque and gingivitis reduction, when compared to other techniques. The American Dental Association (ADA)[14]suggests toothbrushing should be done twice a day using a soft-bristled brush, which should be replaced at least every 3 - 4 months. The optimal timing for tooth brushing remains unclear, given that individual factors such as the presence of dental caries and the risk of erosive tooth wear has to be considered[15]. The toothbrushing method recommended by ADA, which is similar to Bass technique, is attached as **Figure 2**[16]:

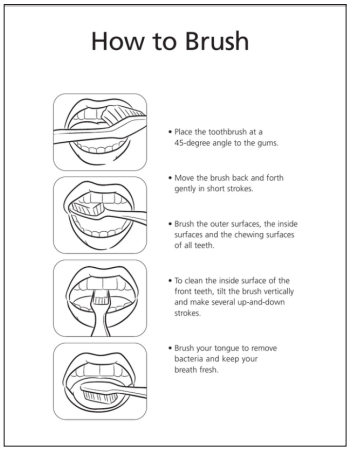

Figure 2: *ADA instruction on toothbrushing[16]*

Apart from tooth brushing techniques, the choice of toothpaste

is also important. The regular use of fluoride toothpaste is suggested by the Centre of Disease Control and Prevention (CDC), given that fluoride help repairing and preventing damage to teeth caused by oral bacteria, as well as replacing minerals lost from acid breakdown. Also, the use of fluoride toothpaste increases the fluoride content in saliva, which protects enamel from demineralization and enhance its recovery[19,18]. In general, the role of fluoride toothpaste in controlling dental caries (tooth decay) and strengthening the teeth are well-recognized. Other fluoride oral products, such as fluoride mouthwash, can also achieve a similar effect[19]. However, fluoride-containing products should be used in caution in younger children due to potential risk of dental fluorosis, which may affect the appearance of children's growing teeth. Although it is mainly a cosmetic issue, the condition can range from mild, characterized by white flecks or streaks on the teeth, to severe, which can cause brown spots and enamel pitting[20]. According to ADA recommendation, a toothpaste smear with the size of a grain of rice should be used from the emergence of the first tooth until the age of 3, while from ages 3 to 6, a pea-sized amount of toothpaste should be employed[22]. These limits on toothpaste amount aim to reduce fluorosis caused by accidental consumption of toothpaste by children.

Apart from fluoride, the details of other major ingredients commonly used in toothpaste are also listed in the table below as reference:

Table 2: Summary of ingredients commonly used in toothpaste apart from fluoride
(Note: The list is not exhaustive and only serves to provide examples on toothpaste ingredients, and some ingredients may have more than one functions)

Categories	Ingredients	Details
Abrasives (for stain removal/ whitening)	Silica/ hydrated silica	• Compatible with majority of active ingredients (e.g. not reacting with fluoride to form insoluble salt) • Concentration or amount of hydrated silica added is not proportional to abrasiveness
	Calcium phosphate	• Can be subclassified into anhydride and dihydrate forms, in which the former is harder in nature • The dihydrate form has mild abrasive effects and is compatible with other ingredients. However, it loses the water for crystallization and turns back to anhydride form after prolonged use, causing it to become harder in texture.
	Calcium carbonate	• Higher abrasiveness than calcium phosphate, but lower abrasiveness than hydrated silica in general
	Sodium bicarbonate (baking soda)	• Compatible with majority of active ingredients • Graded as a low abrasivity agent • Possess biological compatibility, acid-buffering effect and antibacterial activity in high concentrations • One analysis states the variability in the concentration of sodium bicarbonate in toothpaste (ranging from 35% to 67%). Also, its concentration is mentioned to be positively related with plaque removal efficiency, but such an association is not statistically significant
Anticaries agents	Xylitol	• Sweet in taste and offers a cooling sensation • Decreases both acid synthesis from glucose and Streptococcus mutans present in saliva and plaque by inhibiting glycolysis
	Calcium/phosphate	• Enhance remineralization and facilitate fluoride uptake
	Sodium bicarbonate	• Disfavor the growth of aciduric bacteria by increasing saliva pH, and hence preventing tooth decay • Prevent caries by enhancing enamel remineralization and lowering enamel solubility
Anti-plaque/ anti-gingivitis agents	Sodium lauryl sulphate (SLS)	• Act as enzymes inhibitor of glucosyltransferase and fructosyltransferase. By preventing these enzymes from synthesizing glucan in situ from sucrose, SLS can significantly slow the plaque regrowth and hinder Streptococcus mutans colonization.
	Triclosan	• Possess anti-inflammatory, anti-microbial and anti-metabolism properties • Triclosan alone does not effectively inhibit plaque unless combined with other antibacterial chemicals. For example, efficacy of triclosan is increased by incorporating with copolymers or addition of other antibacterial material, such as zinc citrate

Anti-plaque/ anti-gingivitis agents	Stannous ions (Tin (II) ions)	• Added in toothpastes in the form of stannous chloride/ fluoride/ pyrophosphate • May inhibit bacterial glycolysis • Stannous fluoride causes enamel surface to become hydrophobic, which disfavors bacterial colonization
	Zinc ions	• Added in toothpaste in the form of zinc chloride/citrate • Inhibits glucose uptake of several bacteria by phosphotransferase pathway and inhibits protease activity of other bacteria
Anticalculus agents	Pyrophosphate	• Added in toothpastes in the form of tetrasodium/tetrapotassium/disodium pyrophosphate. • Reduces protein binding ability of hydroxyapatite surfaces of the teeth • Prone to enzymatic hydrolysis, which leads to reduced duration in mouth cavity
	Zinc ions	• Apart from anti-plaque properties, zinc ions also inhibit crystal growth, contributing to anti-calculus effect
Desensitizing agents	Potassium salts	• It is proposed that potassium ion can depolarize the nerve and inhibit nerve response upon stimuli
	Strontium salts	• As a bioactive material to seal dentinal tubules, given that root sensitivity of teeth can be partly attributed to open dentinal tubules • Replaces calcium in hydroxyapatite and favors tissue remineralization • Strontium can also depolarize dental nerves
	Stannous salts	• Desensitizing effect due to disposition of insoluble stannous salts • Stannous fluoride may stain teeth, but staining effect can be reduced by addition of zinc phosphate
	Calcium Sodium phosphosilicate	• A bioactive glass that reacts with aqueous solvent to synthesize hydroxy-carbonate-apatite, which has similar structures to mineral in dentin and enamel • A 6-week clinical trial shows greater sensitivity reduction than potassium nitrate
	Note: A meta-analysis in 2015 supports the use of potassium-, stannous fluoride- and calcium sodium phosphosilicate-containing toothpaste for the indication of dentin hypersensitivity, but not strontium-containing desensitizing toothpaste[27].	

On the other hand, although recommended by many dental professionals, current studies have found no significant extra benefits of using dental floss in addition to toothbrushing for preventing dental caries and gingivitis[21]. Besides, regular cleanings and scaling procedures are another common approach to clear plaques and maintain dental health. A 2017 Korean clinical study (n=352) found that the patient group receiving regular professional dental scaling demonstrated higher scores on an oral health index and exhibited more favorable oral health behaviors, compared to the group receiving irregular dental scaling[22], proving the effectiveness of regular dental scaling procedure in reinforcing oral health.

Preventive & remedial measures on gum-related inflammation

To prevent the periodontal inflammation, it is important to adopt behavioral change by considering lifestyle risk factors, such as smoking, type 2 diabetes, mental stress and nutritional intake[23]. A comprehensive review article published in 2022 synthesized a multitude of global studies demonstrating the beneficial effects of smoking cessation on periodontitis and tooth loss and suggested that smoking cessation can be achieved from both pharmacological and non-pharmacological perspectives[24]. In terms of nutritional intake, it is evident that diet that is high in fiber, high in omega-6-to-omega-3 fatty acid ratio and low in sugar decreases the risk of periodontal diseases[25]. Besides, micro-nutrients such as vitamins A, B, C, zinc, calcium and polyphenols are shown to prevent periodontal diseases as well34. Moreover, plain water intake was found to have a negative relationship with periodontitis risk in a study of the population aged over 45[26], although the exact association between fluid intake and periodontitis risk is still unclear. One of the possible ways to explain such relationship would be the fact that better hydration status stimulates more saliva secretion, which can be beneficial as study points out that low saliva flow rate is associated with severe types of periodontal disease[27]. Hence, it is still recommended to stay hydrated to reduce chances of developing periodontal diseases.

Apart from preventative measures, some biomaterials appear to be useful in the treatment of pre-existing gum inflammation. One typical example is hyaluronic acid (HA) that normally present in gingiva periodontal ligament. Studies has proven HA's role in periodontal treatment, as indicated by reduced gingival bleeding after application of HA gel to gingivitis and periodontitis patients, as well as its advantages in periodontal regeneration[28].

Besides, the European Federation of Periodontology (EFP) has released a comprehensive clinical practice guideline for the treatment of stage I-III periodontitis[29]. The guideline summarizes evidenced-based stepwise recommendations to tackle the disease, including but not limited to risk factor management, subgingival periodontal instrumentation, professional mechanical plaque removal, choice of adjunctive antibiotic and surgical interventions[38].

PHARMACISTS' ROLE IN MAINTAINING ORAL HEALTH

Currently, oral health care system in Hong Kong is mainly supported through private sector, while dental care services offered by the government are very limited[30]. The prices of private dental services hugely vary among different dental clinics due to lack of regulation to govern the price[39]. According to a Hong Kong-based study done in 2007 (n=800), a clear difference is shown in dental neglect score between low- and higher-income groups, in which individuals with lower income shows higher oral dental neglect score[31]. This result implies that socioeconomic disparity is a notable factor that affects Hong Kong citizens' willingness in searching for oral healthcare services. Although it is hard to change the socioeconomic environment in Hong Kong, pharmacists can offer help in oral healthcare field from a primary healthcare approach. In 2009, the integration of dental care into primary healthcare services and the emphasis on collaborative work among healthcare providers was advocated by the WHO's 7th global conference[32]. Given that "prevention is better than cure", it would be a good move to enhance the oral health of local citizens from an early stage of disease prevention at community level.

Nevertheless, difficulties are present in incorporating pharmacists into oral care or primary healthcare in Hong Kong. A local study points out that over 30% of respondents disagreed or had not comments to consulting pharmacist prior to using OTC products, due to reasons including "uncertainty on pharmacist's role", "having low trust/acceptance level on pharmacists" and "not seeing the need of consulting a pharmacist"[33]. The study also mentioned that fewer than half of respondents (45%) believed pharmacists should serve a leading role in self-care. It is against these backdrops that pharmacists should be encouraged to take on a more active role in the provision of primary oral healthcare, by learning from pharmacy practices implemented in other countries. For example, common oral healthcare services offered by community pharmacists in Australia and Malaysia include provision of OTC treatment for oral health-related issues, referral to dentist/doctors (when needed), symptomatic identification of oral health problems and provision of counselling and guidance regarding oral health issues[34,35]. The common oral problems and their respective OTC treatment are summarized in **Table 3**[36].

Table 3: Summary of common oral problems and respective OTC treatment products[46]

Oral Problems	Treatment Products
Gum inflammation	Chlorhexidine mouthwash/gel
Mouth ulcer	Analgesic gel (e.g. NSAID, benzydamine hydrochloride, lignocaine)
Oral thrush	Nystatin mouthwash, miconazole oral gel, systemic antifungal (e.g. fluconazole – for more severe cases)
Xerostomia	Saliva stimulants or substitutes, sugar-free chewing gum
Denture cleaning	Denture cleanser

To be specific, drugs associated with adverse effects in the oral cavity require pharmacists to provide counseling to enable better management of these conditions43. Some of the oral adverse effects and respective management or prevention strategies associated with common drug classes are summarized in **Table 4**.

Table 4: Summary of oral adverse effects of common drug classes/ drugs and their management/ prevention strategies		
Adverse Effects	Drug Classes/ Drugs	Management/Prevention Strategies
Gingival enlargement	Anticonvulsant, CCB, cyclosporine, erythromycin, oral contraceptives	Use lowest effective dose for shortest duration, maintain personal oral hygiene via proper toothbrushing and flossing, gum excision may be needed if situation is not reversed after 3-6 months
Hyperpigmentation	Amiodarone, antibiotics, anticancer drugs, antimalarials, antiretrovirals, chlorhexidine gluconate, clofazimine, heavy metals, hormone replacement therapy, ketoconazole, methyldopa, oral contraceptives, quinidine	Shorten duration of or discontinue medication use, Surgery may be needed is situation is not normalized
Angioedema	ACEi, NSAID, selective cyclooxygenase inhibitors	Symptom relief by antihistamine or corticosteroid, avoid the concerned causative agent in the future
Chemical burns	ARB, NSAID	Discontinue causative agent, apply topical benzocaine and/or corticosteroid & follow-up in 1-2 week
Osteonecrosis of the jaw	Antiangiogenic drugs, bisphosphonates, denosumab	Discontinue bisphosphonate, maintain good oral hygiene and visit dentist regularly, dental work is required before treatment initiation, hold bisphosphonate for 2-3 months after intrusive dental procedure
Xerostomia	Amphetamines, analgesics, anticholinergics, antidepressants, antiemetics, antihistamines, anxiolytics, bronchodilators, decongestants, diuretics, skeletal muscle relaxants	Promote the habit of drinking water, use saliva-stimulating substances (sialogogues) or oral lubricants, prevention of caries-forming habits (e.g. eat or drink sugar-rich content), use lowest effective dose for causative agents, prescribe cevimeline
Oral candidiasis	Antimicrobials, ICS	Rinse mouth thoroughly after drug use
(Note: ACEi = Angiotensin-converting enzyme inhibitors, ARB = Angiotensin-receptor blockers, CCB= calcium channel blocker, NSAID = nonsteroidal anti-inflammatory drugs, ICS = inhaled corticosteroid)		

Apart from the services offered to patients over the counter, pharmacists can also involve in a multidisciplinary antibiotic stewardship team in a dental setting, which is an important field today aimed at addressing the rise of antimicrobial resistance (AMR) in the treatment of oral infections[37]. Moreover, an inadequacy of dental and oral health care training is reported in a cross-national study including medical, nursing and pharmacy schools in universities across Asia, Australia, Canada, Europe and the United States. More interprofessional education courses related to the field should be launched in in universities, as they can enhance students' knowledge in areas like self-treatment of dental disorder and adverse oral health effects caused by medications, as reported in a pilot study[39,40].

CONCLUSION

Maintaining healthy gum conditions, particularly the free gingival margins, is essential for preserving overall oral function and systemic wellbeing. As outlined in this article, poor gum health can lead to oral disorders including gingival recession, gingivitis and periodontitis, and are linked to a host of adverse health outcomes. The "free gingivae" concept highlights the importance of protecting this delicate, vulnerable tissue through proper plaque removal and other preventative measures. Individuals are encouraged to prioritize gum health by adopting the strategies discussed, such as using the modified Bass toothbrushing technique, choosing fluoride-containing oral care products, and undergoing regular professional cleanings. These steps can help prevent the onset and progression of gum disease, preserving the integrity of the free gingival margins. Additionally, addressing lifestyle factors like smoking, poor diet, and stress can further maintain gum and overall health. Improved gum health brings a multitude of benefits, not only for the mouth but for the body as a whole. By maintaining healthy gumlines, individuals can avoid localized periodontal inflammation while reducing their risk of associated systemic conditions like heart disease and diabetes. More active pharmacist's involvement in primary oral healthcare in Hong Kong should be encouraged to facilitate better health outcomes in the community. Ongoing research and innovation will be crucial to further expand more effective, evidence-based strategies for restoring and preserving gum health. As the public and healthcare providers gain a deeper appreciation for the criticality of gum care, the prospects for better oral and overall wellbeing across populations is hoped to improve in near future.

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Overview of Pharmacologic Treatment of Motor Fluctuations in Parkinson's Disease

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ABSTRACT

Parkinson's disease is a debilitating neurodegenerative disorder characterized by motor impairments such as tremors, rigidity, and gait disturbances, as well as non-motor symptoms, including sleep disorders and autonomic dysfunction. While dopamine replacement therapy remains the mainstay of treatment for managing motor symptoms, the progressive nature of the disease often necessitates complex pharmacological regimens and a multidisciplinary approach. This article provides an overview of the pathophysiology of Parkinson's disease and discusses the various pharmacological interventions available for managing complications as the disease advances.

Keywords: *Parkinson's disease, α-synuclein, Lewy bodies, dopamine replacement therapy, motor symptoms.*

INTRODUCTION

Parkinson's disease is a complex neurodegenerative disorder that extends beyond the motor systems.[1] The diverse range of motor, non-motor, and cognitive manifestations can collectively have a devastating impact on patients' quality of life, independence, and overall well-being.[2,3] The cause of sporadic Parkinson's disease remains unclear but may be influenced by both genetic and environmental factors.[4] Cell model studies suggest that Parkinson's disease is characterized by the loss of dopaminergic neurons, as well as the accumulation of α-synuclein-containing aggregates known as Lewy bodies in the pars compacta of the substantia nigra.[5] It occurs due to the extensive damage to dopamine-producing neurons, causing dopamine deficits in the midbrain, and altering the balance and activity of various other neurotransmitters (glutamate, GABA, serotonin, etc.), consequently disrupting motor control.[5,6] A wide range of medical and surgical interventions are available, but dopamine replacement therapy remains the most effective treatment for motor symptoms.[7,8] Chronic dopamine replacement treatment, however, is associated with motor complications in most patients as their disease progresses.[8] Therefore, it is recommended that clinicians initiate dopamine replacement therapy with low doses in patients with Parkinson's disease and gradually titrate it, especially in younger patients and women, who are more likely to develop dyskinesia.[8,9] If monotherapy is inadequate for motor fluctuations, trials suggest add-on drugs such as Dopamine Agonists (DAs), Monoamine Oxidase B (MAO-B) inhibitors and Catechol-O-Methyl Transferase (COMT) inhibitors as an adjuvant therapy.[10-13] This review will provide an overview of the background and different pharmacological treatment targeting the motor symptoms of Parkinson's disease.

PATHOPHYSIOLOGY

Physiologically, Parkinson's disease is progressively characterized by the loss of dopaminergic neurons in the substantia nigra pars compacta, as well as the abnormal aggregation of α-synuclein called Lewy bodies.[14,15] Lewy bodies, which contain α-synuclein filaments, are thought to trap mitochondria and lysosomes, contributing to neuronal dysfunction.[16,17] Pathogenic mutations in the α-synuclein gene lead to an accelerated formation and accumulation of the proteins at synapses, resulting in synaptic dysfunction and contributing to neurodegeneration and system atrophy.[18]

From a molecular mechanism perspective, mitochondrial dysfunction and a decline in the clearance capacity of the ubiquitin-proteasome and autophagy-lysosomal systems have been implicated in the pathobiology of Parkinson's disease (**Figure 1**).[19-22] Mitochondria are responsible for generating the chemical energy needed for the cell's biochemical reactions, including cell signaling in dopaminergic neurons.[20] Dysfunctional mitochondria can lead to high intracellular calcium levels and low ATP production, which facilitate the formation of soluble α-synuclein oligomers and insoluble fibrils to compose the core of intraneuronal Lewy bodies and Lewy neurites.[19-21] Furthermore, the concentration of α-synuclein is linked to the lysosomal clearance of abnormal and accumulated proteins. Impaired lysosomes can reduce the turnover of α-synuclein, leading to its aggregation.[23]

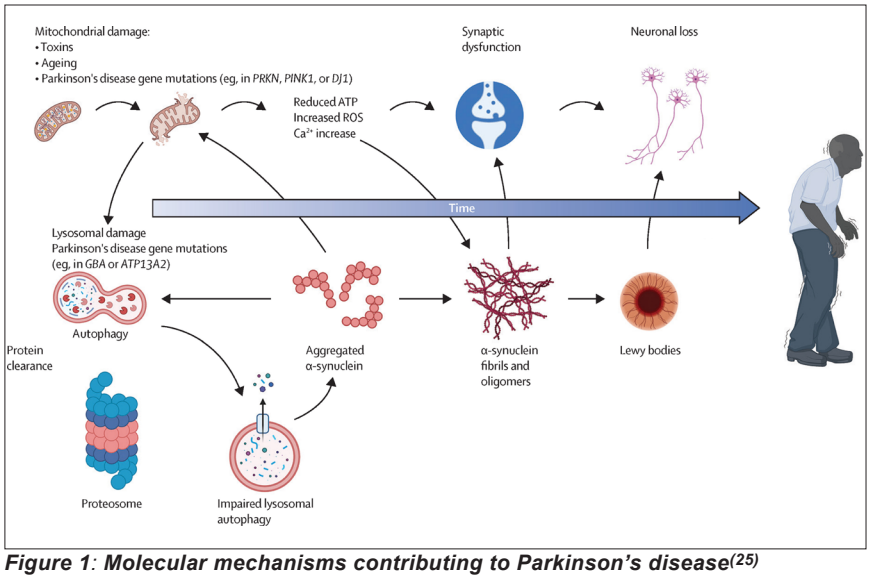

***Figure 1**: Molecular mechanisms contributing to Parkinson's disease*[25]

The cause of Parkinson's disease is believed to be multifactorial, involving the interaction of host susceptibility and environmental factors.[4] Although the cause of sporadic Parkinson's disease is unclear, it is believed that idiopathic Parkinson's disease is influenced genetically.[24-26] For example, pathogenic mutation of VPS35 can induce phosphorylation of Rab proteins, proteins that are involved in endocytosis and lysosomal trafficking, which consequently reduces lysosomal function and increases α-synuclein aggregation.[26]

Lastly, inflammation and immunity are also linked to the progression of Parkinson's disease. The cascade of inflammation can increase intestinal permeability and the leakage of inflammatory mediators into the bloodstream and through the blood-brain barrier, promoting α-synuclein aggregation.[27] For immunity, T cells were observed in the affected brain regions of Parkinson's disease patients, leading to targeted extravasation.[28]

CLINICAL MANIFESTATIONS

Parkinson's disease is progressively characterized by both motor and non-motor symptoms, and it can progress rapidly without treatment.[1] Motor symptoms are classified into cardinal symptoms (dopamine responsive) and axial symptoms (non-dopamine responsive).[29] Non-motor symptoms are subdivided into neuropsychiatric and autonomic dysfunction. These non-motor symptoms may precede motor symptoms by five years or more, and they contribute significantly to the disability and worsening quality of life compared to motor symptoms.[30] Parkinson's disease is typically staged using various classification systems, with the most common being the five-stage system proposed by Margaret Hoehn and Melvin Yahr, although the progression is not uniform in all patients.[31] Stage 1 consists of unilateral movements, including tremor, rigidity, a clumsy leg or facial weakness. Stage 2 involves motor symptoms occurring on both sides of the body or at the midline, together with speech abnormalities and rigidity in the trunk muscles. Stage 3 is characterized by slowness of movement, early signs of postural instability, and difficulty making automatic and involuntary adjustments. Stages 4 and 5 are considered advanced Parkinson's disease, in which individuals suffer from severe symptoms and are unable to walk unassisted or live independently.[31] Apart from motor symptoms, non-motor symptoms can also be debilitating for patients, such as excessive daytime sleepiness, rapid eye movement, drooling, constipation, dementia, anxiety, and depression.[30]

COMMON PHARMACOLOGICAL MANAGEMENT

The main goals of therapy are to maintain functional independence and preserve quality of life by decreasing symptoms. The common oral pharmacologic interventions for motor symptoms include: levodopa, DAs, COMT inhibitors, MAO-B inhibitors, adenosine A_{2a} antagonist, anticholinergics, amantadine and clozapine (**Figure 2**).[32]

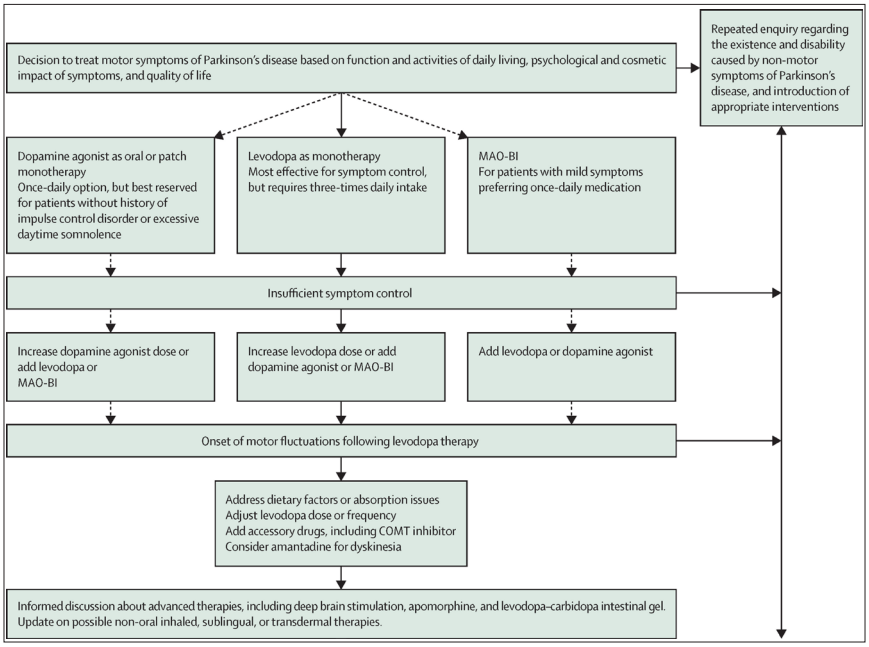

***Figure 2**: Algorithm for the approach to treating Parkinson's disease [32]*

Levodopa with dopa-decarboxylase inhibitor (DDI)

Levodopa is the precursor of dopamine to relieve motor symptoms, and carbidopa is a DDI, which prevents the breakdown of levodopa in the blood-stream peripherally, allowing more of it to cross the blood-brain barrier.[33] It is considered as the most effective treatment to relieve motor symptoms of Parkinson's disease over DAs and MAO-B inhibitors.[34] Even though patients using levodopa as an initial treatment are more likely to develop dyskinesia, the prevalence is low with superior motor benefit.[9] Hence, both the American Academy of Neurology (AAN) and National Institute for Health and Care Excellence guidelines support that levodopa should be the preferred first-line drug for symptomatic control, unless patients have additional risk factors to develop dyskinesia.[9,34] Nausea, vomiting and orthostatic hypotension are the common acute adverse effects, whereas wearing-off phenomena, somnolence, delusions, dyskinesia, peripheral neuropathy, impulse control disorders and psychosis are the chronic complications.[9] Nausea is a common early and dose-dependent adverse effect of levodopa. Taking levodopa with meals may decrease nausea and improve compliance; however, dietary protein can decrease the entry of levodopa into the brain and lower its therapeutic efficacy.[34] It is suggested that a dosage lower than 400 mg per day reduces the risk of dyskinesia in early Parkinson's disease.[34] The timing to initiate levodopa treatment has been controversial. While levodopa improves motor symptoms in Parkinson's disease, recent research suggests that delaying treatment with levodopa does not prevent levodopa-related motor complications.[35] In addition, chronic use of levodopa can induce elevation of plasma homocysteine levels, which are a risk factor for stroke, heart disease and dementia. Recent studies suggest routine supplementation of vitamin B12 and folic acid might minimize the promotion of homocysteine levels induced by chronic use of levodopa.[36]

If motor symptoms are not manageable with the initial dosage or if the patient is experiencing motor fluctuations such as wearing off, delayed-onset, and dyskinesia, it is recommended to escalate the dose of levodopa, then add a DA, COMT inhibitor or MAO-B inhibitor.[8,10,11,13] Recent studies suggest patients may benefit from using multiple agents with fewer side effects, rather than relying on the higher doses of a single agent.[32]

Dopamine agonists (DAs)

This class of medications split into two groups based on the chemical structure: ergot-like derivatives, such as bromocriptine and cabergoline, and non-ergot DA. Due to its safety concerns, including the risk of peritoneal, pulmonary, and cardiac or valvular fibrosis, ergot-like derivatives have fallen out of favor for treating Parkinson's disease.[37] Non-ergot DAs include ropinirole and pramipexole as oral agents, and rotigotine as a transdermal patch. They are significantly selective to D2 and D3 receptors than D1 and D5 receptors.[37] Dopamine receptor agonists are classified

to two groups; D1-like (D1 and D5 receptor subtypes) and D2-like (D2, D3 and D4 receptor subtypes).[37] The selectivity of D2 and D3 receptors enhances the efficacy in managing motor symptoms including bradykinesia and rigidity, which allows these agents to be used as monotherapy in early Parkinson's disease or as adjunctive therapy with levodopa. While D1-like receptor activation (D1 and D5) may potentially provide motor control as demonstrated in experimental models. Currently available DAs primarily target the D2-like receptor family.[37] Pramipexole is excreted in urine by active tubular secretion, and ropinirole is metabolized in the liver and then excreted in urine; hence they require dosage adjustments in renal failure patients.[38] Whereas rotigotine patch is metabolized in the liver by cytochrome P450 and glucuronidation, with no dose adjustments required in patients with renal failure.[39] Apomorphine is a non-ergot derived DA available in both sublingual and subcutaneous injection formulations. It is favorably selective for D2, D3, and D4 receptors in comparison with D1 and D5 receptors, allowing effective management of motor symptoms with reduced risk of dyskinesias.[37] The sublingual formulation is designed as a bilayer to prevent oral irritation with rapid delivery and is considered a rescue medication for patients experiencing severe motor complications.[32] Subcutaneous apomorphine infusion is considered when motor fluctuations become persistent and are no longer adequately controlled by oral and transdermal medications.[32] Common adverse effects include nausea and vomiting, sleep attacks, orthostatic hypotension, impulse control disorder, psychosis and dyskinesia; however, impulse control disorders are the main concern with DAs.[9]

MAO-B inhibitors

This class of medications, including rasagiline, selegiline, and safinamide, works by selectively inhibiting MAO-B, an enzyme responsible for the degradation of dopamine to dihydroxyphenylacetic acid and hydrogen peroxide.[40-42] They can be used as monotherapy or as adjuvant therapy for symptomatic patients with early Parkinson's disease, particularly for those with motor symptoms that do not significantly affect their quality of life but who still desire medication. MAO-B inhibitors carry a theoretical risk of serotonin syndrome when co-administered with serotonin selective reuptake inhibitors (SSRIs). However, this occurrence is rare, and combination of SSRI and MAO-B inhibitor is generally well tolerated.[43] Overall, MAO-B inhibitors have higher tolerability than DAs, and have a lower frequency of specific adverse effects.[44] For selegiline, the common adverse effects are orthostatic hypotension and hallucinations, which may limit its use in patients with late-onset disease.[44] The safety of rasagiline is well established as monotherapy or adjunct to levodopa treatment; reported adverse effects include headache, confusion, nasopharyngitis, fall and dyskinesia.[44] Safinamide, the newest MAO-B inhibitor, is an orally administered α-aminoamide derivative that provides strong, selective, and reversible inhibition of MAO-B. It blocks voltage-dependent sodium and calcium channels and inhibits stimulated glutamate release.[42] Safinamide is the only MAO-B inhibitor that provides reversible inhibition, and it is safe and well-tolerated in patients with fluctuating symptoms. Due to its unique double mechanism of action, inhibiting MAO-B and blocking sodium and calcium channels, it positively provides further benefits to fluctuating Parkinson's disease patients and presents some extra benefits in both motor and non-motor symptoms.[45]

COMT inhibitors

COMT inhibitors, such as entacapone, tolcapone and opicapone, work by maintaining dopamine concentration through decreasing the breakdown of levodopa.[46] They are not useful as monotherapy but are effective for treating motor fluctuations. Tolcapone, currently not registered in Hong Kong, is less commonly used due to its requirement for frequent blood tests to monitor hepatic toxicity.[32] Opicapone, also not registered in Hong Kong, is a third-generation, long-acting COMT inhibitor that causes fewer side effects than entacapone and has the advantage of a once-daily regimen.[47] Common adverse effects are related to the dopaminergic and gastrointestinal effects, such as dyskinesia, nausea, vomiting, orthostatic hypotension, sleep disorders and hallucinations.[46]

Adenosine A_{2a} antagonist

Istradefylline, currently not registered in Hong Kong, is a selective adenosine A_{2a} receptor antagonist.[48] By blocking the A2a receptors, it can enhance the efficacy of dopamine replacement therapy, particularly for managing motor fluctuations.[49] The most common adverse effect is dyskinesia, whereas gait disturbance, gastric ulcer, myocardial infarction, and hallucination are considered drug-related adverse effects.[48]

Anticholinergics

They can be used as adjunctive therapy or monotherapy for patients with tremors who are unresponsive to levodopa replacement.[32] Anticholinergics, such as benztropine and trihexyphenidyl (benzhexol), act by antagonizing M1 muscarinic cholinergic receptors in the striatum.[50] Common side effects include dry mouth, constipation, dry eyes, blurred vision, confusion and urinary retention.[32]

Amantadine

The exact mechanism of action in Parkinson's disease is unknown; however, it is believed to be related to its dopaminergic property, which enhances dopamine release from presynaptic neurons and inhibits dopamine reuptake.[51] It is also a weak and non-competitive antagonist of the NMDA receptor, which influences dopaminergic activity indirectly.[51] Amantadine can be used as monotherapy or adjuvant therapy and can be highly effective in reducing levodopa-induced dyskinesia, fatigue, and gait freezing.[51] It is available in immediate-release and extended-release formulations, which are not interchangeable. Common side effects include CNS depression, impulse control disorders, dizziness, livedo reticularis, orthostatic hypotension and anticholinergic adverse effects.[32]

Clozapine

It acts on multiple receptors including dopamine, serotonin, cholinergic, adrenergic, and histaminergic receptors.[52] Due to the low affinity for the D2 receptor, it does not worsen the motor symptoms.[52] Low-dose clozapine has beneficial effects on dyskinesia and hallucinations; however, it requires regular specialized blood count (ANC) monitoring due to the risk of agranulocytosis, as well as baseline electrocardiogram due to the risk of clozapine-induced tachycardia.[52-55]

CONCLUSION

Parkinson's disease is a common neurodegenerative disorder primarily characterized by the selective and progressive loss of dopaminergic neurons in the substantia nigra, accompanied by the accumulation of Lewy bodies. This underlying pathophysiology is the driving force behind the classic motor symptoms that define Parkinson's, which include tremor, rigidity, bradykinesia, and postural instability. Dopamine replacement therapy, particularly with levodopa, remains the mainstay of treatment for managing these motor symptoms. However, significant unmet clinical needs persist, such as the development of levodopa-induced motor complications and the lack of responsiveness to levodopa for certain symptoms. To address these challenges, a variety of adjunctive treatments have been developed, including MAO-B inhibitors, COMT inhibitors, and DAs. Incorporating these combination therapies, along with a patient-centered approach that involves pharmacists and other healthcare providers, is crucial for optimizing treatment regimens and achieving the best possible outcomes for patients with Parkinson's disease. Ongoing research and a comprehensive, multidisciplinary approach to care are essential for improving the quality of life and functional independence for individuals living with this complex neurodegenerative disorder.

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Questions for Pharmacy Central Continuing Education Committee Program

2 CE Units

Overview of Pharmacologic Treatment of Motor Fluctuations in Parkinson's Disease

1. ***Which of the following can cause Parkinson's disease?***
   a. High homocysteine in plasma
   b. Loss of the brain chemical dopamine
   c. Depletion of Lewy bodies in the substantia nigra
   d. Lack of α-synuclein aggregation

2. ***What are Lewy bodies?***
   a. Pockets of air found in the brain
   b. Microscopic crystalline matter found in the brain
   c. A build-up of salt found in the brain
   d. Protein deposits found in the brain

3. ***How many stages of Parkinson's disease were defined by Margaret Hoehn and Melvin Yahr?***
   a. 2
   b. 3
   c. 4
   d. 5

4. ***Which of the following is not a cause of Parkinson's disease?***
   a. Genetic mutation in VPS35
   b. Dysfunctional mitochondrial causes low intracellular calcium and high ATP production, promoting autophagy-lysosomal systems
   c. Abnormal aggregation of α-synuclein in pars compacta of the substantia nigra
   d. Extensive damage of dopamine-producing neurons, followed by the alternation of various other neurotransmitters

5. ***Which of the following should not be used as monotherapy in managing Parkinson's disease?***
   a. Levodopa with DDI
   b. MAO-B inhibitors
   c. Adenosine A2a antagonist
   d. Dopamine agonist

6. ***Which of the following is not a levodopa-induced complication?***
   a. Somnolence
   b. Dystonia
   c. Dyskinesias
   d. Anosognosia

7. ***Which of the following is not a manifestation of Parkinson's disease?***
   a. Gait disturbances
   b. Sleep disorders
   c. Dementia
   d. Rapid hand movements

8. ***Which of the following is the newest MAO-B inhibitor?***
   a. Istradefylline
   b. Opicapone
   c. Safinamide
   d. Apomorphine

9. ***Which of the following is the main disadvantage of dopamine agonists?***
   a. Hallucinations
   b. Somnolence
   c. Edema
   d. Impulse control disorders

10. ***Which of the following statement is incorrect?***
    a. Clozapine requires specialized blood count monitoring due to the risk of hypertension, bradycardia and pericarditis
    b. Immediate release and extended release formulations of amantadine are not interchangeable.
    c. Anticholinergics can be used as monotherapy for patients with tremor but unresponsive to levodopa replacement
    d. Adenosine A2a antagonist should be used as adjunctive therapy because it enhances the efficacy of dopamine replacement therapy

Answers will be released in the next issue of HKPJ.

Jockey Club PHARM+ Community Medication Service Network - Roundtable Meeting on Scope of Community Pharmacy Services in Evolving Primary Healthcare Model

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INTRODUCTION

The transformation of Hong Kong's healthcare system towards a more community-based, preventive, and integrated model under the Primary Healthcare Blueprint, issued by the Health Bureau of Hong Kong SAR Government in 2022, has opened new avenues for the development of community pharmacy services. In support of this strategic direction, the Hong Kong Jockey Club Charities Trust has initiated and funded Jockey Club PHARM+ Community Medication Service Network Project.

Under the project, the Department of Pharmacology and Pharmacy, The University of Hong Kong (HKU) is committed to build the capacity of community pharmacies, evaluate service effectiveness and enhance professional standards to ensure service quality, efficiency and consistence. Taking a leading role in fostering the establishment of primary healthcare pharmacy model, HKU creates a network among providers of community pharmacy services to foster knowledge exchange, collaborative learning and stakeholder engagement. HKU regularly convenes roundtable meetings with stakeholders from different sectors. These forums foster knowledge exchange and alignment of practice models, as well as strengthening interprofessional collaboration to meet the goals of a strengthened primary healthcare system.

Roundtable Meeting on Scope of Community Pharmacy Services in Evolving Primary Healthcare Model (the Roundtable) was successfully held on 19 February 2025 in campus of The University of Hong Kong. This article presents the summary and key insights made in the Roundtable regarding scope of community pharmacy services.

OBJECTIVES OF THE ROUNDTABLE MEETING

Bringing together frontline practicing community pharmacists, other healthcare professionals and community partners to discuss and collectively explore the future direction and scope of pharmacy practice in community settings.

This meeting aims to:

- Articulate the service scope in community pharmacy in the context of the evolving primary healthcare model
- Harmonise the service scope across various community pharmacy settings
- Drive the development of framework and guidelines for service scope and standards in community pharmacy services
- Foster dialogue, knowledge-sharing and consensus-building to drive best practices and innovation in

Photo 1: Introducing the background of the Roundtable

community pharmacy services

ROUNDTABLE HIGHLIGHTS

The Roundtable brought together 39 participants from community pharmacies, district health centres (DHC), DHC express, and community partners.

Three featured presentations offered practical insights into development of community pharmacy services:

- Ms Gladys Cheung, pharmacist from HKU, shared about the *Communication Toolkit: Constructing a Trustworthy Community Pharmacy Model with Well-defined Service Scope*
- Mr Terry Lee, senior pharmacist from PHARM+ Hong Kong Sheng Kung Hui Community Pharmacy, shared about *Extent of Pharmacy Practice in Medication Management Services – Service Gaps, Cases Sharing and Insight.*
- Mr. Stephen So, Health and Research Manager from Mannings, delivered a sharing about *Innovation in Community Pharmacy: Potential Development of Immunization Service.*

During the Roundtable, participants contributed valuable insights and opinions on shaping the scope of community pharmacy services through group discussions.

Executive Summary: Communication Toolkit: Constructing a Trustworthy Community Pharmacy Model with Well-defined Service Scope

- A strategic approach has been adopted to raise public awareness of primary healthcare pharmacy services.
- HKU has built a variety of communication toolkits such as standardized terminology and service models via collaborative approach so that the pharmacy profession could establish a common language and shared vision to facilitate effective communication and collaboration. This initiative aligns the understanding of key primary healthcare concepts among different stakeholders.
- A variety of public education initiatives have been organized by HKU to improve health literacy and public awareness of primary healthcare pharmacy services. These initiatives center on raising public awareness of primary healthcare pharmacy services and the role of community pharmacists as accessible, frontline health resources. By using a unified public messaging approach, the aim is to improve health literacy, empower self-care practices, and underscore pharmacists' contributions to preventive healthcare in Hong Kong.
- User case sharing could build trust and relatability with the audience. HKU has initiated a call-to-action to collect engaging user experience for educational purposes and stakeholder engagement.

Executive Summary: Extent of Pharmacy Practice in Medication Management Services – Service Gaps, Cases Sharing and Insight

- PHARM+ Hong Kong Sheng Kung Hui Community Pharmacy delivers medication management services (MMS) in community pharmacy, outreach for singleton and doubleton families, and residential care homes.

Photos 2, 3 and 4: Speakers shared practical insights in development of community pharmacy services

- Service gaps are discovered throughout the implementation of MMS, namely healthcare system gap, tripartite communication opportunities and challenges (pharmacist-doctor-patient), patient engagement and awareness, and operational gap.
- Integrating pharmacists into the primary healthcare team is essential for better holistic care of patients for optimization of medication use.

Executive Summary: Innovation in Community Pharmacy: Potential Development of Immunization Service

- Supported by medical doctor, pharmacist-led influenza vaccination service has been piloted.
- The major objectives of pharmacist-led vaccination service are to promote public health, enhance vaccination rate, and offer convenient alternatives to individuals who wish to receive influenza vaccines
- Important considerations for implementing vaccination service are doctor engagement, development of standard protocols (e.g. health assessment form, emergency protocol), insurance coverage, vaccine supplies, clinical waste handling, cold chain management and manpower arrangement.
- Several challenges were identified in the pilot vaccination service:
  - **Legal framework for pharmacy-based vaccination service:**
    Currently there is no robust framework supporting vaccination service in community pharmacy. The most applicable and available reference framework is Vaccination Subsidy Scheme Doctors' Guide published by the Centre for Health Protection, Department of Health, which highlights that vaccination should be administered by qualified healthcare professionals or by trained personnel under the doctor's personal supervision, and the doctor should be present at the venue during the vaccination activity; or else, he/she should be personally and physically reachable in case of emergency at non-clinic settings.
  - **Quality assurance:**
    As in other healthcare systems, vaccines with favorable safety profile can be delivered by other qualified healthcare professionals including pharmacists in community pharmacy. Quality assurance and regulatory framework can be established to empower qualified pharmacists to contribute to the vaccination services while safeguarding patient wellness and safety. [1]
  - **Constraints from prescription-only classification of vaccine:**
    Vaccines are prescription-only medicines which community pharmacy cannot supply without prescription. The future regulatory framework should take this issue into account. Reference can be taken from the United Kingdom Patient Groups Directions which enable qualified community pharmacists to supply and administer the prescription-only vaccines to healthy individual without prescription under defined inclusion criteria. Electronic record will automatically share with doctors on National Health Service IT system after vaccination. [2]
  - **Physical setting of pharmacy and its equipment:**
    The setup of vaccination venue requires space and privacy for consultation, vaccination and resting. In the meantime, various equipment is highly desirable including Electronic Health Record Sharing System and purpose-built pharmaceutical-grade refrigerators which are costly and require extra space.
- Despite the challenges, users of the pilot service were highly satisfactory with service quality and professionalism of pharmacist, which marked as a foundation for further development of immunization service in community pharmacy.

KEY INSIGHTS FROM THE DISCUSSION

Photo 5: Representatives from community pharmacies, DHC, DHC express, and community partners discussed various topics during the Roundtable.

1. Expanded Role of Community Pharmacists in Primary Healthcare

Participants reached consensus that community pharmacists should play a pivotal role in chronic disease prevention and management:

- **Chronic disease management:** Community pharmacists have a significant role in chronic disease

management including optimization of medication therapy, side effect management of medication therapy, regular monitoring of health conditions and health promotion.

- **New medication service:** Regarding MMS, emphasis can be placed on patients who are recently discharged from hospitals and are put on new medications. A robust referral mechanism should be established between hospitals and community pharmacies.
- **Health screening and assessment:** Health screening and assessment should be developed in a structured manner in community pharmacy which has great accessibility to the public. Particularly, follow-up on blood pressure monitoring and assessment of continuous blood glucose monitoring were highlighted in the discussion. Community pharmacists could conduct a comprehensive review on these self-care monitoring and provide tailor-made recommendations on disease management.
- **Smoking cessation service:** Community pharmacy plays an important role in smoking cessation service. Community pharmacy serves as a good access point for this service where both professional consultation and medications such as nicotine replacement therapy (NRT) are available in this setting. However, the service models and workflow compared with the currently available services in other settings remain a challenge to community pharmacy. For example, service fee in other settings is fully subsidized while that in community pharmacy is not and the service user might need to pay for the service fee or the NRT.
- **Health resource hub:** Community pharmacy acts as a health resource hub where community pharmacists offer a wide range of comprehensive medication and health information. Pharmacist consultation conducted in this context in a detailed manner should be strengthened and service fee should be considered in the future for cost recovery.
- **Health empowerment on over-the-counter products and supplements:** Community pharmacists play a proactive role in health empowerment for the public on wise use of over-the-counter products or health supplements. While redefining the scope of community pharmacy services, health empowerment is always one of the integral elements of community pharmacy.

2. Considerations for Scope of Community Pharmacy Services

As flagged up in the Roundtable, most participants concurred that there were few significant dimensions for future discussion:

- Sustainability is a crucial consideration when developing various innovative community pharmacy model
- Pharmacists working in primary healthcare settings always encounter health enquiries of different levels of details ranging from simple drug information such as side effects to complex disease management. The resources needed to address these health inquiries may vary significantly. Hence, pharmacist consultation fee should be explored in the future to signify the pharmacist's contribution and value to the service.
- Tele-services are at the forefront of shaping the future landscape of healthcare development. The pharmacy profession should put more emphasis on integrating technology into pharmacy service development.
- A shared communication platform among healthcare providers and pharmacists working at different workplaces is necessary to ensure continuity of care.
- Pharmacists can play a crucial role in medication management of residential care homes.

3. Current Challenges of MMS

As discussed in the Roundtable, majority of the participants agreed with the challenges identified in scaling MMS:

- There is insufficient system integration among pharmacists, doctors, other healthcare providers and community organization. Systematic referral and a co-created communication platform should be made readily available to all healthcare providers so that each party could access the patient health records and communicate at one stop.
- The communication mechanism between community pharmacists and prescribers should be strengthened. Currently, it is challenging for pharmacists to directly reflect the medication therapy problems identified during MMS to the prescribers.
- Health information is scattered in different clinical settings which hinders MMS efficiency as pharmacists are required to identify the potential medication therapy problems arising from various contexts.
- Regarding the medication adherence issues identified during MMS, currently there is no consistent follow-up nor prescriber reporting system to support the intervention.

A consensus was reached on the importance of system-level reforms, including interoperable health records and shared care protocols to enable multidisciplinary collaboration.

4. Potential for Immunization Services

As brainstormed in the Roundtable, many participants were eager to explore the potential of developing pharmacist-led vaccination service in supporting public health initiative.

Participants acknowledged that community pharmacies offer convenient and trusted access points for vaccination. However, a policy-driven framework is crucial to guide service development, ensure professional standards, and establish public confidence.

While many existing local community pharmacies do not have the necessary settings, transformation and preparations are immensely resource demanding. Participants proposed that reimbursement of pharmacy refit with installation of new equipment should be considered to transform the community pharmacies to meet the future needs and ensure primary healthcare sustainable.

SUMMARY OF ROUNDTABLE OUTCOMES

By characterizing the scope of community pharmacy services and associated process of care, the primary healthcare pharmacy model can be shaped more clearly. The Roundtable aligned the profession in ensuring community pharmacies being integrated into broader health initiatives and ignited new ideas regarding the capabilities of community pharmacies.

ACTION PLAN AND NEXT STEPS

The Roundtable concluded with a shared commitment to advancing community pharmacy services in alignment with government priorities on primary healthcare reform. A consolidated set of opinions and recommendations will be reflected to the *Task Group on Guideline Formulation*, with the aim to:

- Standardize service delivery and define scope of practice
- Support policy advocacy for funding and service recognition
- Promote interprofessional collaboration through integrated digital platforms
- Encourage continuous service innovation tailored to community needs

CONCLUSION

The evolution of community pharmacy services in Hong Kong is both timely and necessary. As Hong Kong strengthens its primary healthcare system, community pharmacists must be empowered to deliver high-quality, patient-centred care. Through collective action and stakeholder collaboration, HKU will continue to take the lead to build a future-ready pharmacy model that supports preventive care, chronic disease management, and improved population health outcomes.

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Activities of the Society of Hospital Pharmacists

The Society of Hospital Pharmacists of Hong Kong (SHPHK) is delighted to bring you updates on our recent and upcoming events. Your engagement and support are important to the success of these events.

Hybrid Seminar: Update on the Latest Advances in Non-Small Cell Lung Cancer (NSCLC) Treatments

On 17 January 2025, a hybrid seminar "Update on the Latest Advances in Non-Small Cell Lung Cancer (NSCLC) Treatments" was held at Marco Polo Hong Kong Hotel for in-person attendees and online for virtual participants. This event attracted more than 70 online attendees from Hong Kong and Macao, as well as over 20 in-person participants. The seminar includes two topics: "Management updates in early-stage non-small cell lung cancer", presented by Dr. Chik Yin Kwan, Specialist in Clinical Oncology, Department of Clinical Oncology, Queen Elizabeth Hospital; and "the role of hospital pharmacists in late-stage non-small cell lung cancer management", presented by Mr. Kenneth Yiu, Clinical Pharmacist, Queen Mary Hospital.

From left: Mr Kenneth Yiu, Clinical Pharmacist, Queen Mary Hospital (Speaker); Dr. Chik Yin Kwan, Specialist in Clinical Oncology, Department of Clinical Oncology, Queen Elizabeth Hospital (Speaker); and Mr Tony Lau, Clinical Pharmacist, Queen Mary Hospital (Moderator)

Webinar: How Much Do We Know About Labour and Delivery?

This webinar has two parts. The first part of the webinar was successfully held on 10 February 2025, attracting more than 100 attendances. The first session covered the stages of laboring and potential complications, including post-partum hemorrhage, and featured a case-sharing segment by an experienced midwife. The webinar was presented by two speakers: Ms. Ho Lai Fong, Vice President of the Hong Kong College of Midwives, and Ms. Zoey Tsui, Hospital Pharmacist and General Committee Member, SHPHK.

Looking ahead, the second part of the webinar will delve into topics such as drug use during labor and lactation and more. It will feature presentations by Ms. Ho Lai Fong, alongside Ms. Ellen Lai, Hospital Pharmacist and General Committee Member, SHPHK. The exact date will be announced soon, and attendees can expect another enlightening discussion.

You are most welcome to follow the Society's Facebook page (@SHPHK) and Instagram (@SHPHK1987) to know more about the Society's development and activities. You may also visit the Drug Education Resources Centre (DERC) Website: www.derc.org.hk to keep abreast of the latest news and development of pharmaceutical services in Hong Kong. Join us now as new member or renew your membership at the Society's website: www.shphk.org.hk.

Hong Kong Pharmaceutical Journal: For Detailed Instructions for Authors

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Hong Kong Pharmaceutical Journal (HKPJ) is the official publication of the Pharmaceutical Society of Hong Kong, the Practising Pharmacists Association of Hong Kong and the Society of Hospital Pharmacists of Hong Kong. It is a journal of the pharmacists, for the pharmacists and by the pharmacists. The Journal is currently divided into several sections: Editorial Comment; News & Short Communications; Pharmacy Practice; Pimary Care, Over-the-Counter & Health; Drugs & Therapeutics; Herbal Medicines & Nutraceuticals; Pharmaceutical Technology and New Products. It publishes review articles or original papers relevant to these different fields of pharmacy. In addition to the regular three issues of the Journal per year, there are issues dedicated solely to reports on special function of the society. The Aims and Scope of the Journal are published on the inside back cover of the first issue of each year.

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