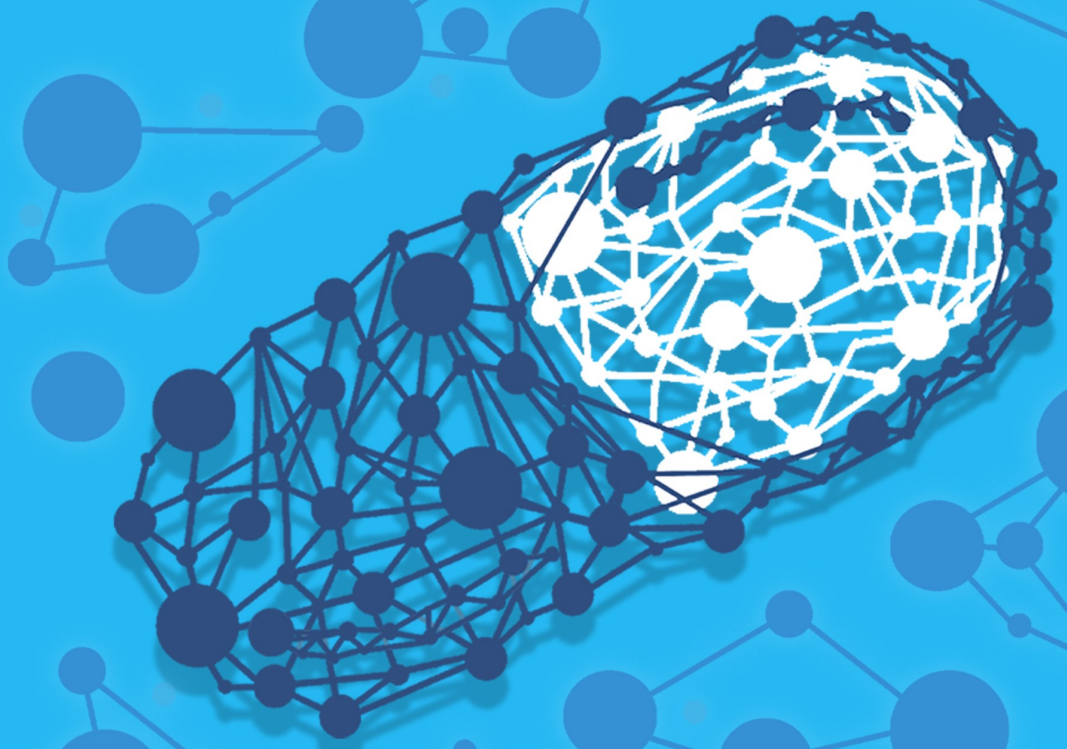
PHARMACEUTICAL SERVICES DIVISION
KUALA LUMPUR & PUTRAJAYA HEALTH DEPARTMENT



PHARMACY RESEARCH AND QUALITY REPORT

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Foreword

Pn Fuziah Binti Abdul Rashid
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Research is an integral part of development and is a critical aspect in improving health system delivery. Pharmacists working with Federal Territory of Kuala Lumpur & Putrajaya Health Department have been actively involved in research projects encompassing a wide range of research areas. In addition, various quality projects and innovative ideas have been developed to improve work system in an effort to deliver seamless healthcare towards the public.

The Pharmaceutical Services Programme has conceptualised five research priorities specifically for the pharmacy profession and pharmaceutical services in Malaysia, which are: 1) Access To Medicines; 2) Monitoring and Evaluation of Outcomes; 3) Quality and Safe Use of Medicines and Sustainability; 4) Optimisation of Therapy and Pharmacy Services Delivery; and 5) National Databases/Big Data Analytics. Therefore, we have clear directions and targets in research, and the pharmacists in Federal Territory of Kuala Lumpur & Putrajaya Health Department have continuously strived towards these paths.

Implementation of innovative pharmacy service delivery through various quality projects is conducted as part of our commitment to stay ahead and keep up with changing times. This is channeled through our participation in quality initiatives such Quality Assurance, *Anugerah Inovasi* and *Konvensyen Inovasi & Kreativiti Farmasi (KIKF).*

Pharmacy Research and Quality Report is the first effort conducted by the Pharmaceutical Services Division of Federal Territory of Kuala Lumpur & Putrajaya Health Department to compile reports of research and quality projects conducted by our diligent pharmacists. 32 research projects that were completed in the year 2018 and 2019 as well as 16 quality and innovation projects from 2017 until 2019 were selected to be included in this publication. It is hoped that this compilation of abstracts can become a guide and inspiration for future projects.

Lastly, I would like to take this opportunity to congratulate and express my gratitude to all research and quality initiative project members for their contribution to pharmacy service. Let us work together as a team to achieve better health for the nation.

Foreword

Pn Sahidah Binti Said
Senior Principal Assistant Director
Federal Territory of Kuala Lumpur & Putrajaya
Health Department

Research and quality initiatives are important components to ensure that we remain relevant and up-to-date in a changing world. They can help to increase productivity, reduce waste, and improve patient safety. In the busy setting of our workplace, these two aspects are sometimes overlooked and forgotten, but through needs, necessity and a little bit of push from the management, many projects have blossomed and implemented successfully.

Being a part of the Federal Territory of Kuala Lumpur & Putrajaya Health Department for many years, I have seen various research and quality projects undertaken by our innovative and creative pharmacy staff. We have projects from hospitals, health clinics, district health offices as well as the state health department, covering various aspects from administration to clinical and patient care.

We have achieved so much in the past few years, taking part in various conferences and competitions, producing excellent research and quality initiatives. Therefore, our achievements should be shared, and through the brainchild of the Pharmacy State Health Deputy Director, we began our work to compile abstracts and brief reports from research projects completed in 2018 and 2019 as well as quality initiatives completed between 2017 until 2019.

Alhamdulillah, after months of hard work, I am proud to witness the completion of the first volume of Pharmacy Research and Quality Report. This publication becomes a reference for future researchers and provide a platform for sharing of research findings. It also allows continuation and expansion of existing research and quality projects by ensuring dissemination of information to future generation of pharmacists.

Last but not least, I would like to thank everyone who has been directly and indirectly involved in the completion of Pharmacy Research and Quality Report Volume 1. This has been another milestone for us, and I hope that this publication will continue in the future, with more research projects and quality initiatives that will make us proud.

Foreword

Dr Navin Kumar Loganadan
Chairman
Research and Development (R&D) Technical Committee
Pharmaceutical Services Division
Federal Territory Kuala Lumpur & Putrajaya

On behalf of the Research & Development (R&D) Technical Committee of the Pharmaceutical Services Division of Federal Territory Kuala Lumpur & Putrajaya, it gives me great pleasure to share with you the first volume of the Pharmacy Research and Quality Report.

Research is a beautiful journey although not without its challenges. In pharmacy practice, continuous research by pharmacists is of paramount importance to improve the quality of pharmaceutical care to patients. Hence, every year we carry out many new research projects in various aspects of pharmacy across hospitals and health clinics. We explore areas including but not limited to the outcomes of pharmacists in pharmaceutical care and outcomes of drug therapy. Besides, multidisciplinary researches involving other healthcare professionals including doctors and nurses are also growing in our state as well as studies in the field of pharmacy enforcement. Quality studies in the form of quality assurance, innovation, and Kumpulan Inovatif & Kreatif (KIK) projects have continued to improve the quality of the pharmacy service provided in the healthcare facilities.

While the Pharmaceutical Services Division of Federal Territory Kuala Lumpur & Putrajaya always provides a platform for pharmacists to present their research work through conferences and scientific meetings, these research works must be archived. Archiving the abstracts of these projects in a Pharmacy Research and Quality Report like this one allows easy referral should anyone wishes to understand more about the projects. Besides, it also acts as an important driver of future research projects which can be expanded from the ones conducted in the past. Pharmacists can learn from the limitations of the already completed research projects and hence design better quality projects which may have greater implications for pharmacy practice.

Finally, I express my heartfelt appreciation to the editorial committee of the JKWPKL&P Pharmacy Research and Quality Report Volume 1, for working tirelessly to ensure this publication comes to fruition. The Research & Development (R&D) Technical Committee of the Pharmaceutical Services Division of Federal Territory Kuala Lumpur & Putrajaya is committed to continuing to publish upcoming researches conducted in our state in the future. It is my great hope that pharmacists continue the research culture and continue to learn throughout its process for the advancement of our pharmacy profession.

Content: Pharmacy Research

Content: Pharmacy Research

Case Report

Content: Quality Projects

Pharmacy Research Reports

2018 - 2019

Original Research No. 1

The Outcome of Pharmacists' Recommendations for Drug Related Problems among Pediatric Patients in Optimization of Pharmacotherapy

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Introduction: A Drug-Related Problem (DRP) is an incident involving drug therapy that potentially interferes with desired health outcomes. Pediatric patients are at particular risk of developing DRPs due to age-related biological and physiological changes. These factors can lead to altered pharmacokinetics, resulting in overdose or underdose, which cause an impact on patient outcome.

Objective: The aim of this study is to identify the types of DRPs, identify drug involved in pharmaceutical recommendations, identify recommendations performed during the study, determine the acceptance rate of recommendations and to identify the association between the acceptance rate with the types of interventions, and determine the outcome of pharmacists' recommendations.

Method: This retrospective, observational study involved pediatric patients aged more than 1 month old to 18 years old who were admitted to the pediatric ward of Hospital Putrajaya. Data collection was conducted between January to December 2017 using clinical pharmacy report form and medical records. The data was analyzed using descriptive analysis and chi-square test.

Result: Drugs that were frequently involved in drug-related problems were anti-infective for systemic use (n=1496, 48.59%) and for respiratory system (n=550, 17.86%). Change of frequency and dose accounted for the highest recommendations done by pharmacist (88.31%). The highest drug related problems detected was dosing adjustments for pediatric patients (n=1693, 54.99%). Pharmacy interventions had high acceptance rates by physicians whereby there was significant difference between physician acceptance for the interventions carried out by pharmacists due to the inappropriate drug ($p<0.001$) and inappropriate duration ($p=0.036$).

Conclusion: The most common DRPs in pediatrics patient were dose adjustment involving anti-infective. Pharmacy interventions in our study had a high rate of acceptance, with 99.45% (n = 3062) out of the total of 3079 interventions were accepted. In conclusion, pharmacist plays an important role in patient care and to optimize patient safety and drug therapy.

Original Research No. 2

Centralised Pharmacy Preparations of Benzylpenicillin Injection for Paediatric Ward, Hospital Putrajaya : A Cost Analysis

Ahmad Fitri Mohd Ramli[1], Ching Min Wei[1], Mohamed Azmi Ahmad Hassali[2], Tai Chu Hong[1], Nur Asyikin Adzmi[1], Ummah Puteri Kumarasamy[1], Amy Cheah Poh Ann[1], Lee Wei Nian[1], Nur Syafiqah Zainuddin[1]

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Introduction: In Pediatric wards of Hospital Putrajaya, Benzylpenicillin Injections (IV) is supplied through Centralized Intravenous Admixture Service (CIVAS) due to better chemical stability and microbiological quality in comparison to the conventional vial-per-dose supply. However, the actual overall cost involved in the Aseptic Service was unknown. This study was conducted to provide insight on the total cost involved in the aseptic preparation of IV Benzylpenicillin.

Objective: To analyze the cost of CIVAS and standard dispensing of IV Benzylpenicillin for the paediatric ward of Hospital Putrajaya.

Method: Prospective observational study was conducted on the aseptic preparation of IV Benzylpenicillin through CIVAS and paediatric ward staffs. Data on the costs of items involved was obtained from the purchasing unit and interviews of ward staffs regarding common practice of in-ward IV Benzylpenicillin preparation. Factors analyzed include price and amount of medications, consumables, time consumed for each preparation and salary rate for every personnel involved in the preparation process.

Results: Total daily medication cost for CIVAS was 27.6% lower (RM61.60) than conventional method (RM85.12). This was due to vials sharing practice in CIVAS. However, the consumable costs was higher by 25% for CIVAS (RM86.80) as compared to conventional method (RM69.44), excluding the maintenance cost of the cleanroom. The daily labor cost involved in CIVAS was 78.2% higher (RM159.32) than conventional method (RM34.72). Taking into account for every viable costs, CIVAS requires 44.3% more daily expenses than conventional method (RM308.47 versus RM171.92) in terms of IV Benzylpenicllin supply.

Conclusion: The total cost of CIVAS was higher than the conventional method due to higher consumables usage and higher labor cost. Therefore, a more cost-saving method of IV Benzylpenicillin supply is needed to minimize cost.

Original Research No. 3

Review of Cholecalciferol Effectiveness among Patients with Vitamin D Deficiency in Hospital Putrajaya (2011-2017)

Farahiyah Abraham Peintkowsy[1], Nurhazira Alang[1], Nurizzaty Radzy[1], Ahmad Ridzuan M.Hajazi[1], Rosalind Sia[1], Lim Jie Shi[1], Fadhilah Ismail[1], Mohd Amirul[1], Harkiren Kaur[1].

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Introduction: High usage of cholecalciferol has been documented in Hospital Putrajaya despite the availability of calcitriol and alfacalcidol. The concern arises as cholecalciferol is not listed in the Malaysia Ministry of Health Drug Formulary (FUKKM) and requires Director General of Health approval prior to usage.

Objective: To review the usage of cholecalciferol among adult patients in Hospital Putrajaya in term of demographic population, diseases associated with Vitamin D deficiency, cholecalciferol effectiveness in vitamin D deficiency and average duration of the treatment.

Method: A retrospective review of 138 adult patients' electronic medical record (EMR) was performed from year 2011 to 2017. Patient with baseline and post administration level of vitamin D were included in the study. Those who received cholecalciferol treatment for less than three months, absence of Vitamin D level post cholecalciferol initiation and had sufficient level of Vitamin D (>75nmol/L) were excluded from the study.

Result: Majority of the patients were female malay (89.1%) and 44.9% of patients were started with cholecalciferol in the year 2015. Thyroid disorder (31.2%), rheumatoid arthritis (26.8%), post-menopausal osteoporosis (12.3%), and obesity (11.6%) were found to be the top four diseases associated with Vitamin D deficiency. Cholecalciferol significantly reduced ($p<0.001$) the number of patients with deficient level in pre and post treatment. The average duration of treatment was 19 (SD ±17) months, with mean initiation dose of 2166.7 (SD ±1685.4) IU and median maintenance dose of 1000 (IQR 0) IU per day.

Conclusion: Cholecalciferol is effective in Vitamin D deficiency as it has significant and positive effect in raising serum Vitamin D levels. Vitamin D deficiency will affect calcium absorption, resulting in an increase in parathyroid levels and enhances the mobilization of calcium from the bone. Vitamin D is absorbed by body fat and found to have immunomodulatory actions.

Original Research No. 4

Review of Infectious Control of Cephalosporin Usage and the Occurrence of Extended-Spectrum β-Lactamases Infections at Hospital Putrajaya

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Introduction: Cephalosporins owing to their broad-spectrum antimicrobial coverage can be used to treat a myriad of bacterial infections. However, rapid emergence of extended-spectrum β-lactamases (ESBL)-producers poses a major challenge in the treatment of bacterial infections, particularly the irrational use of extended spectrum cephalosporins.

Objective: To study the occurrence of ESBL infections and infectious control of cephalosporin usage among patients in Putrajaya Hospital.

Method: A retrospective study was conducted among patients in Putrajaya Hospital who were diagnosed with ESBL infections and had a history of cephalosporin exposure within the last six months. A three-year data from year 2014 to year 2016, which included data of patient's demography, types and number of ESBL cases, types of infections due to ESBL organisms and the types and usage of cephalosporin were reviewed and analysed based on patients' clinical notes.

Results: A total of 378 patients who were treated with cephalosporin, includes a majority of Malays (92%), followed by Indians (15%), Chinese (14%) and others (5%). The most common ESBL organisms throughout the 3 years were *Escherichia coli* (52%) and *Klebsiella pneumonia* (46%), followed by *P.mirabillus* and *K.oxycota*. The total number of ESBL cases showed a reducing trend from 2014 (37%) to 2016 (31%). *Escherichia coli* (52%) was the most common microorganism found in urine samples (44%), which accounted for the most number of urinary tract infection cases (47%) in medical wards. The highest usage of cephalosporin was found to be in the medical department (36%) followed by surgical department (21%). Among the types of cephalosporin used in patients with ESBL infection, the highest usage reported was cefotaxime (49.6% in year 2015 and 64.7% in year 2016).

Conclusion: The reduction of cephalosporins usage has resulted in the decrease in ESBL infections among patients in Hospital Putrajaya over the years.

Original Research No.5

Lipid-Lowering Effects of Gemfibrozil versus Fenofibrate in Patients with Dyslipidemia in Hospital Putrajaya

Lee Yun Shiang[1], Hajar Mat Noji[1], Norliyana Khairuddin[1], Maisarah Mohd Ansul[1], Atikah Nadhirah Johari[1], Tan Huan Ching[1], Zanura Anuar[1], Nik Aisyah Najwa Nik Mustaffa[1]

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Introduction: Fibrates have been shown to effectively reduce triglyceride (TG) and elevate high-density lipoprotein cholesterol (HDL-C) concentrations and are recommended as the primary treatment for the management of hypertriglyceridemia. Previous studies have suggested that fenofibrate have better efficacy in lowering lipid profile than gemfibrozil. However, data on this comparison in the real world setting is limited.

Objective: To evaluate the lipid-lowering effect and cost effectiveness of gemfibrozil and fenofibrate in patients with dyslipidemia in Putrajaya Hospital.

Method: A retrospective review of medical records of patients treated with gemfibrozil and fenofibrate in Putrajaya Hospital from January 2014 until December 2017 was performed. Lipid profile including TG, low-density lipoprotein cholesterol (LDL-C), HDL-C and Total Cholesterol (TC) during fibrate initiation (baseline) and at six months post fibrate initiation were collected for 170 patients with 85 patients each in the Gemfibrozil and Fenofibrate groups. Cost of each of the fibrate therapy for six months in the selected patients were calculated.

Results: Gemfibrozil and fenofibrate significantly resulted in 0.88 mmol/L and 0.99 mmol/L reduction in TG levels at six months respectively. In addition, fenofibrate significantly increased the HDL level by 0.09 mmol/L from baseline ($p<0.05$). The increment of HDL-C with fenofibrate (0.20 ± 0.02 mmol/L) was also significantly higher than that of gemfibrozil (0.12 ± 0.23 mmol/L). Female patients (0.13 ± 0.19 mmol/L) had a significantly better reduction of LDL-C with fenofibrates compared to male patients (0.15 ± 0.14 mmol/L). The cost of achieving a 1 mmol/L reduction of TG with fenofibrate is RM182.40 compared to RM46.25 with gemfibrozil.

Conclusion: Both the fibrates, gemfibrozil and fenofibrate significantly reduced the TG levels of patients with hypertriglyceridemia. Gemfibrozil appears to be more cost-effective than fenofibrate in reducing TG levels and therefore is a suitable choice in the government-subsidized setting like Hospital Putrajaya.

*Pharmacy Conference JKWPKL&P 2019 (Oral Presentation): Third Place

Original Research No. 6

Appropriateness of Indication and Sampling Time of Therapeutic Drug Monitoring for Antiepileptics in Hospital Putrajaya

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Introduction: Inappropriate therapeutic drug monitoring (TDM) indications and sampling times are barriers to accurate drug level interpretation by pharmacists. Sampling times are crucial for accurate interpretations of antiepileptic drug levels monitored in TDM.

Objective: This study aimed to evaluate the appropriateness of indications and sampling time for antiepileptic TDM requests and the impact of pharmacists' interventions on them.

Method: During the pre-intervention phase from February to April 2019, data including demographics, indication, sampling time and costs for all the antiepileptic TDM requests collected. The accepted standard for appropriateness of TDM indication and sampling time was set as 85%. Interventions carried out included continuous medical education session for prescribers on requesting TDM for antiepileptics, development of a concise TDM sampling guide for prescribers and carrying out active telephone interventions for incomplete TDM requests. The post-intervention phase was conducted from July until September 2019.

Result: Among the 93 antiepileptic TDM requests, 53% was for valproic acid, 34% for phenytoin and 13% for carbamazepine. During the pre-intervention phase, the appropriateness of TDM indication for antiepileptics was 82% which improved to 90% during post-intervention after the interventions were implemented. When tracked further in December 2019, this improvement was sustained at 91%. This improvement resulted in an annual cost saving of RM1103.00 in costs avoided for inappropriate TDM sample analysis by the hospital. The appropriateness of sampling time for antiepileptics showed an improvement from 74% during the pre-intervention phase to 77% in the post-intervention phase.

Conclusion: Pharmacists' interventions resulted in improvements of the appropriateness of indication for TDM. However, the adherence to sampling time documentation for antiepileptic TDM requests in Hospital Putrajaya need to be improved to ensure more accurate and timely recommendations for patients.

Original Research No. 7

Evaluation on the Effectiveness of Insulin Injection Technique Education by Pharmacists in Hospital Putrajaya : A Prospective Interventional Study

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Introduction: Insulin injection technique education is provided by Putrajaya Hospital pharmacists to ensure correct insulin injection technique and low prevalence of insulin injection-related problems among Type 2 Diabetes Mellitus (T2DM) patients. However, the effectiveness of such education in Hospital Putrajaya has not been studied.

Objective: To evaluate the effectiveness of pharmacists' insulin injection technique education on T2DM patients' insulin injection technique and insulin injection-related problems in Hospital Putrajaya.

Method: A prospective interventional study was conducted from June to November 2018 in Hospital Putrajaya's outpatient pharmacy among T2DM patients aged more than 18 years old. Patients were included if they were self-administering insulin and had a consistent medication refill history. Patients with insulin therapy of less than six months and without Hemoglobin A1c (HbA1c) within the past three months were excluded from the study. During the baseline visit, patients' insulin injection technique and related problems were assessed and scored using a validated 10-item insulin technique checklist. Subsequently, insulin technique education was provided and a follow-up evaluation on the effectiveness of the intervention was done after three months.

Results: A total of 118 patients were recruited into the study. Median insulin injection technique score increased from 9.0 (IQR, 8.0–10.0) to 10.0 (IQR, 9.0–10.0) post-intervention. Insulin injection-related problems such as lipohypertrophy, lipoatrophy, bleeding at injection site, bruising at injection site, insulin leakage from injection site and insulin leakage from needle tip post-injection significantly reduced post-intervention from 22.0% to 14.4%, 5.1% to 3.4%, 30.5% to 17.8%, 28.0% to 17.8%, 16.1% to 10.2% and 27.1% to 16.1%, respectively ($p<0.05$). Nevertheless, the mean HbA1c pre-intervention (9.0±2.1%) and post-intervention (9.1±1.8%) were not statistically different ($p>0.05$).

Conclusion: Pharmacists' insulin injection technique education was significantly effective in improving patients' insulin injection technique and insulin injection-related problems. Thus, pharmacists should be encouraged to routinely provide insulin injection technique education to T2DM patients.

Original Research No. 8

Adherence to Ramadan Antidiabetic Medication Taking Instructions among Diabetes Patients in Hospital Putrajaya : A Cross-sectional Study

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Introduction: Fasting during Ramadan can affect Muslims' adherence towards antidiabetic medications. Non-adherence to medications during Ramadan increases the risk of complication such as hypoglycaemia and hyperglycaemia.

Objective: This study aimed to observe the adherence to Ramadan antidiabetic medication taking instructions among diabetes patients in outpatient setting of Putrajaya Hospital.

Method: This study was conducted as cross-sectional review of diabetes patients' adherence to Ramadan antidiabetic medications. Patients were included in the study if they were aged more than 18 years old, fasted during Ramadan in 2018 and visited the out-patient pharmacy between January to February 2019. Data on patient's demographics, medical history, treatment review, fasting profile and hypoglycemic and hyperglycemic events during Ramadan 2018 were collected. Their adherence to the Ramadan antidiabetic medications was assessed using the medication adherence tool by Norul et al (2010) and factors associated with hypoglycemic event were evaluated using Chi-square analysis with SPSS version 22.0.

Results: Among 150 patients recruited, 63 (42%) of them did not adhere to Ramadan antidiabetic medication taking instructions. A total of 48 (32%) patients reported hypoglycemic events during Ramadan and of this, 39 patients (81.2%) did not adhere to the Ramadan antidiabetic medication taking instructions ($p<0.05$). 37 patients who took short-acting insulin and nine patients who took gliclazide were found as non -adherent. For short acting insulin, out of the 37 patients who did not adhere to Ramadan antidiabetic medication taking instructions, 36 (97.3%) reported of having hypoglycemic events ($p<0.05$).

Conclusion: Majority of diabetes patients did not adhere towards Ramadan antidiabetic medication taking instructions. Non-adherence was observed in patients who used medications that need dosage adjustment, namely gliclazide and short-acting insulin. The hypoglycaemic and hyperglycaemic events were higher in those who did not adhere to Ramadan antidiabetic medication taking instructions. Further counselling by pharmacist may help to improve their medication adherence.

*JKWPKL&P HRC Research Day 2019 (Oral Presentation): Third Place

Original Research No. 9

Factors Affecting Medication Adherence and Anti-coagulation Control in Patients Taking Warfarin

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Background: Medication adherence is the key for the treatment of chronic diseases. Warfarin has been widely used to prevent stroke and thrombus formation despite its narrow therapeutic range and fatal adverse reactions. Poor adherence in patients taking warfarin may be one of the common barriers to obtain favourable anti-coagulation outcomes.

Objective: To examine medication adherence rate among patients taking warfarin in Hospital Putrajaya as well as factors contributing to adherence and the correlation between knowledge and medication adherence towards anti-coagulation control.

Method: This cross-sectional study sampled patients who were on warfarin and attended the Medical Specialist Clinic Putrajaya Hospital from September 2017 to January 2018 using a self-administered questionnaire. Adherence was measured using four items as taking warfarin following medical advice (frequency, dosage, time, and precautions). Adherence was defined if patients scored 0 as total scores of 4 items. The factors that may influence patients' adherence were modelled using binary logistic regression. Good anti-coagulation control measured by 70% INR level within therapeutic range. Correlation between medication adherence and anti-coagulation control were measured using chi-square.

Results: A total of 163 patients were included in the study. Medication adherence were observed in 150 (92%) of sampled patients. Gender, race and education background has significant influence on patients' adherence to medication. Adherent patients had greater understanding about warfarin (79.1%) compared to non-adherent patients as measured by ten survey items. However, there was no correspondence between warfarin adherence and knowledge towards good anti-coagulation control.

Conclusions: Knowledge of medication exerts significant influence on medication adherence in patients taking warfarin. However, being adherent to medications does not correlate to good anti-coagulation control. Future studies may consider evaluating modifiable risk factors that can exert better INR control and health outcomes.

Original Research No. 10

Impact of Pharmacists' Pharmacokinetic Recommendations on Patients' Therapeutic Drug Levels in Hospital Putrajaya

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Introduction: Therapeutic drug monitoring (TDM) service plays a useful clinical tool in drug therapy. Pharmacist play a vital role in optimizing the use of TDM service to ensure safe and effective personalised drug therapy regimen.

Objective: To determine the acceptance of pharmacists' recommendation among prescribers and to evaluate its impact on patients' therapeutic drug level.

Method: A retrospective study was conducted based on TDM requests from January to December 2017 in Hospital Putrajaya. Prescribers' acceptance towards pharmacists' recommendations and patients' therapeutic drug level after the recommendations were recorded from the electronic medical record. Data was analysed statistically using the SPSS Version 22.0.

Results: TDM requests are most common from medical department about 133 (38.2%), 85 (24.4%) from orthopedic department and 86 (24.7%) from pediatric department. Other TDM requests are from surgical department, obstetrics & gynecology department and emergency department. The most common type of pharmacokinetic request was for vancomycin (n = 171, 49.1%) in the antibiotic category, and phenytoin (n = 38, 10.9%) for antiepileptics. About 331 (95.1%) of prescribers accepted pharmacists' pharmacokinetic recommendations. The pharmacokinetic results that were accepted by prescribers following pharmacists' recommendation and fell into the therapeutic range, subtherapeutic range and supratherapeutic range were 110 (48.2%), 69 (30.3%) and 49 (21.5%) respectively with no statistically significant differences among them ($p>0.05$).

Conclusion: In conclusion, majority of the prescribers accepted pharmacists' pharmacokinetic recommendations. There was also a higher possibility of achieving therapeutic range if the prescribers followed pharmacist recommendations. Pharmacists' interventions ensured appropriately performed TDM, thus increasing the chances of achieving target therapeutic drug levels and better clinical outcomes.

Original Research No. 11

Assessment of Knowledge of High Alert Medications Among Pharmacists and Nurses in Hospital Putrajaya

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Introduction: Medication errors should be taken seriously among healthcare professionals. Lack of knowledge among staff particularly in handling High Alert Medication (HAMs) can cause serious medications errors that could be fatal.

Objective: To evaluate the outcome of interventions on the level of knowledge on HAMs among pharmacists and staff nurses in Hospital Putrajaya (HPJ).

Method: A cross-sectional study involving all pharmacists and staff nurse from day care, medical, surgical, orthopedic, obstetrics & gynecology, pediatrics and intensive care unit was conducted from August 2019 untill October 2019. However, pharmacist and staff nurse on medical and maternity leave, or working in outpatient care clinics were excluded. All respondents were administered a pre-intervention test. The pharmacists carried out interventions including educational talk and providing HAMs pocket guide to nurses and pharmacists. The post-intervention test was conducted on the same respondents from September 2019 to October 2019.

Results: There was a total of 267 respondents included in this study. The average score for pre-test and post- test for pharmacist was 68% and 69% respectively. Meanwhile for nurses the average score pre-test was 56% and post-test 57%. There was only a meagre improvement of 1% in the pre- and post-test score after the interventions. Pharmacist scored better than nurses with a difference of 12% between them. All pharmacist (100%) had at least a bachelor's degree while only 5% of nurses had a bachelor's degree.

Conclusion: Despite having better training in drug therapy, pharmacists' level of knowledge on HAMs was not much better than nurses. This finding highlights the important need to educate the pharmacists in handling of HAMs in order for them to play a more effective role in preventing serious medication errors involving this class of medications.

Original Research No. 12

Nurses' Knowledge, Attitude and Practice in the Preparation and Administration of Intravenous Medications in Putrajaya Hospital

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Introduction: Medication safety has long been recognized to be important in the provision of patient care.

Objective: This study aimed to determine knowledge, attitude and practice levels of nurses regarding the preparation and administration of intravenous (IV) medications and its associated factors.

Method: In this descriptive cross-sectional study conducted in Hospital Putrajaya (HPJ) from July to August 2017, all nurses working in the wards regardless of status or shift were included via convenience sampling. A validated questionnaire was used to collect data in this study. Data was analysed statistically using SPSS Version 21.

Results: A total of 205 respondents were included of which 0.8% were nurse supervisors, 3.9% were head nurses and 95.3% were staff nurses. The respondents had average level of knowledge (mean score 9.1 ± SD 3.14) and attitude (mean score 29.28 ± SD 2.58) but good level of practice (mean score 26.7 ± SD 3.04) in administering IV medications. Less than 50% of respondents obtained correct answers for calculation and dosing of IV medications. Furthermore, this study found that practice of preparing and administering IV medications was influenced by work experience (p = 0.026) while attitude was influenced by gender (p= 0.038).

Conclusion: Nurses in Putrajaya Hospital had an average level of knowledge and attitude but good level of practice in administering IV medications. Therefore, intensive regular training programs are needed for the nurses to improve their knowledge.

*Pharmacy Conference JKWPKL&P 2018 (Oral Presentation): Third Place

Original Research No. 13

An Evaluation on Venous Thromboembolism Prophylaxis in Hospital Putrajaya

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Introduction: Venous thromboembolism (VTE) contributes to longer duration of hospitalization, higher morbidity and mortality. Major surgery is a risk factor for VTE, however medical patients not undergoing surgery are also at risk.

Objective: To review the VTE prophylaxis practiced in Hospital Putrajaya (HPJ) by determining the prevalence of VTE risk in medical and surgical patients, identifying the types of VTE prophylaxis and comparing its current practice with the existing Ministry of Health Clinical Practice Guidelines (CPG) on VTE.

Method: In this cross-sectional study conducted in HPJ from September to December 2017, hospitalized patients aged 18 and above were recruited using convenience sampling. The Padua Prediction Score and Caprini Risk Assessment Model were used to assess the appropriateness of VTE prophylaxis in three surgical and two medical wards.

Results: A total of 416 patients were included with 169 (40.6%) from medical and 274 (59.4%) from surgical wards. The prevalence of VTE risk in medical and surgical patients was 50% and 71.7% respectively. In the medical ward, 51 (72%) high risk patients received VTE prophylaxis whilst only 48 (27%) surgical patients with moderate to high risk of VTE received prophylaxis. About 32 (60.4%) medical patients received Subcutaneous (SC) Fondaparinux and 20 (64.5%) surgical patients received SC Low Molecular Weight Heparin as VTE prophylaxis. Majority of patients in both medical and surgical groups had low bleeding risk (IMPROVE score <7), therefore had no contraindication for VTE prophylaxis. There was no significant difference between level of VTE risk and types of pharmacological agent used for VTE prophylaxis ($p>0.05$).

Conclusion: Majority of moderate to high risk surgical patients did not receive any VTE prophylaxis. Therefore, risk assessment tools and CPG should be well utilized to help determine the need for VTE prophylaxis in medical and surgical patients to reduce thromboembolic risk.

*JKWPKL&P Research Day 2018 (Poster Presentation): First Place

Original Research No. 14

Association between Triple Whammy and Renal Function in Hospital Putrajaya Patients

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Introduction: Angiotensin converting enzymes inhibitors (ACEi) or angiotensin receptor blockers (ARB) combined with a diuretic and a non-steroidal anti-inflammatory drugs (NSAID) is known as triple whammy and can increase the risk of acute kidney injury (AKI).

Objective: To identify the incidence of concomitant prescribing of ACEi or ARB, NSAIDs and diuretics in Hospital Putrajaya (HPJ) patients and to investigate the relationship between serum creatinine (Scr) level and patient characteristics.

Method: This was a retrospective review of 11830 patients prescribed with ACEi or ARB, diuretics or NSAIDs from September 2016 until March 2017 in HPJ. Patients were excluded if their treatment duration was less than one month, had end stage renal failure and was prescribed non-concomitant triple whammy agents. Patients' demographic and clinical data were extracted from the electronic medical records and was analyzed using SPSS Version 21.

Results: From 138 patients who had been prescribed with triple whammy, 103 patients were included. Majority of the patients were female (72.7%), Malay (75.8%) with a mean age of 61 ± 10.9 years old. Mean duration of treatment was 13.3 ± 19.5 months. We found that only 0.87% patients were concomitantly taking triple whammy drugs. There was no significant increase in Scr after triple whammy initiation. No incident of AKI requiring hospitalization was reported. A subgroup analysis of patients aged ≥60 years old with treatment duration ≥1 year and coexisting diabetes mellitus and rheumatoid arthritis showed no significant increase in Scr level in them.

Conclusion: The incidence of triple whammy in HPJ is low. There is no significant increase in Scr level in those initiated with triple whammy. Therefore, prescribing combination of those drugs in HPJ is considered safe but still need monitoring of patients' renal function to avoid any harmful event.

Original Research No. 15

Prescribing Errors Requiring Pharmacists' Interventions at the Out-Patient Pharmacy of Hospital Putrajaya

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Introduction: E-prescribing has been shown to significantly reduce prescribing errors especially for incomplete prescriptions. However, the number of prescriptions that has errors and need pharmacists' interventions kept increasing over the years. The time spent for these interventions results in increased patient waiting time.

Objective: This study aimed to review the prescribing errors at the out-patient pharmacy of Hospital Putrajaya.

Method: This was an observational, prospective study conducted at out-patient pharmacy of Hospital Putrajaya. Out of 5134 interventions, a total of 400 interventions from August to October 2017 were randomly selected. The numbers were generated by a complex algorithm that gives the appearance of randomness. By using Research Randomizer, four sets of 100 numbers were generated for the sample size. The types of prescribing errors were documented. Mistakes were defined as error in prescribing decision making while slips was an error in generating prescription.

Results: A total of 138 prescriptions were prescribed by general medicine clinic, followed by emergency (n=64) and orthopedic clinic (n=64). Wrong dose (n=234) was the highest prescribing error. Interventions were done for prescription mistakes (60.3%), slips (22.2%) and patient information (11.8%). Order entry (37%) was common but preventable. This prescribing problem could be reduced by improving the current Information Technology system, training of prescribers and pharmacists and updating the availability of drug by memo or email to prescribers and pharmacists. 95 omission errors were reported during this study and average time spent for each intervention was 15 minutes.

Conclusion: Wrong dose was the highest prescribing problem that occurred in the out-patient pharmacy of Hospital Putrajaya. Training of prescribers and pharmacists particularly in familiarization with the hospital's computerized information system may help in reducing the prescribing errors.

*Pharmacy Conference JKWPKL&P 2018 (Oral Presentation): Second Place

Original Research No. 16

The Usage of Oral Medication for Spasticity in a Rehabilitation Hospital in Kuala Lumpur

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Introduction: Spasticity is a major problem affecting patient's mobility, function and activities of daily living during rehabilitation therapy.

Objective: This study aimed to examine the prescribing pattern of oral medication used for the treatment of spasticity in Hospital Rehabilitasi Cheras (HRC).

Method: All inpatients prescribed with at least one oral drug indicated for spasticity from 1 January 2017 to 30 June 2017 were included in the study. Prescriptions with incomplete data or clinical notes were excluded from the study.

Results: A total of 99 patients prescribed with oral spasticity medications were included in this study. Baclofen was the most prescribed oral spasticity drug (81%) followed by Clonazepam (22%) and Eperisone (13%). There were 14 patients who received combination treatment of which 10 patients received Baclofen with Clonazepam combination. Baclofen was the preferred choice of treatment for all causes of spasticity in HRC. Spinal cord injury recorded the highest usage of Baclofen (35%) and Clonazepam (60%). The diagnosis with the highest mean daily dose (MDD) for Baclofen were cerebral palsy and hypoxic ischemic encephalopathy among adults (60mg/day), and traumatic brain injury among paediatric patients (27.5mg/day). For Clonazepam, spinal cord injury patients had the highest MDD in both adult (1.27mg/day) and paediatrics (0.5mg/day). The MDD of Eperisone was highest among the adult spinal cord injury and cerebral palsy patients (150mg/day). The MDD of oral spasticity medications were lower in patients who received adjunct treatment with Clostridium Botulinum Toxin injections for both adult and paediatric patients. Percentage of discontinuation was 14.7% in Baclofen and 33.3% in both Clonazepam and Eperisone.

Conclusion: Patients with spasticity received either single or combination of oral spasticity medications in HRC. Further study is prompted to evaluate the effectiveness and safety of spasticity treatment in this hospital.

Original Research No. 17

Retrospective Study on Subcutaneous Anticoagulant Usage in Spinal Cord Injury Patients in Hospital Rehabilitasi Cheras

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Introduction: Spinal cord injury (SCI) patients continue to have a significant risk of pulmonary embolism and deep vein thrombosis after the acute period of their injury. However, research on the sub-acute and chronic rehabilitation phases are lacking. Clinicians are advised to have a low threshold for suspecting venous thromboembolism in the sub-acute phase of SCI and to continue prophylactic anticoagulation therapy for a longer period of time.

Objective: To review the usage of subcutaneous anticoagulant in the sub-acute phase of SCI patients in Hospital Rehabilitasi Cheras (HRC).

Method: All SCI patients who had started subcutaneous anticoagulant in HRC between January 2016 to June 2017 were included. Prescriptions with incomplete data or clinical notes were excluded from the study. The type of and duration of anticoagulant prophylaxis were documented.

Results: A total of 17 spinal cord injury patients were identified. Majority of gender were made up by 70.6% of male and 29.4% of female. The mean age of the population was 47±19.54 years. The ethnic group comprised of 70.6% Malay and 29.4% Chinese. In view of religious reasons, 14 (82.4%) patients were given Fondaparinux whereas three (17.6%) were given Enoxaparin. The mean duration of prophylaxis was 22.6±17.9 days whereas the mean length of stay was 49.6±27.5 days. There was a positive correlation between duration of prophylaxis and length of stay ($r = 0.63$, $p = < .001$).

Conclusion: This study showed that Fondaparinux was preferred subcutaneous anticoagulant compared to Enoxaparin in SCI patients. Increased duration of anticoagulant prophylaxis will also increase the length of hospital stay. Further study is needed to determine safety and efficacy of the anticoagulants in the management of venous thromboprophylaxis in SCI patients.

Original Research No. 18

Botulinum Toxin Type A Use in Hospital Rehabilitasi Cheras for Patients with Movement Disorders: A Retrospective Review

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Introduction: Botulinum toxin type A (BTX) is used for the management of movement disorders. Since BTX is expensive, only Rehabilitation Physicians in Hospital Rehabilitasi Cheras (HRC) are allowed to prescribe. However, the prescribing pattern and types of patients receiving BTX in HRC were unknown.

Objective: This study aimed to evaluate patient's demography, injections dose, administration sites and prescribing patterns of BTX in HRC.

Method: A retrospective study involving review of Controlled Medicines Application Forms and medical records of HRC patients receiving BTX in 2016 was conducted. Patients with incomplete medical information were excluded.

Results: A total of 106 patients were identified, of which 77.4% were adult (age ≥18years) and 22.6% were pediatric patients (age <18years). Majority of the patients were male (71.6%) and the mean age of the population was 35.4±20.1 years. Malay (66%) made up the highest ethnic group, followed by Chinese (20%), Indian (10.3%) and others (3.7%). The dose of Botox® used was ranged from 5ü to 100ü while Dysport® was ranged from 25ü to 400ü depending on the muscle sites injected. The most commonly injected muscles with Botox® were biceps (n=14) and flexor digitorum superficialis (n=14) while for Dysport®, gastrocnemius was the muscle site injected the most (n=39). Findings showed that Dysport® was used for the management of spasticity and dystonia in both upper and lower limbs which is not in accordance to the recommended indications. The usage of Botox® was highest in Pediatric specialty (46.3%) while Traumatic Brain Injury Specialty utilized Dysport® the most (47.7%).

Conclusion: This study showed that Botox® is the preferred preparation for pediatric patients whereas Dysport® is more commonly used in adult patients. Further study is needed to confirm the effectiveness of BTX in adult and pediatric population.

Original Research No. 19

A Review of Long Term Oral Proton Pump Inhibitor Use in a Tertiary Hospital

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Introduction: Unnecessary long-term use of proton-pump inhibitors (PPIs) could lead to unwanted adverse effects, namely hypomagnesemia, increased risk of myocardial infarction, osteoporosis/bone fracture and worsening of renal function.

Objective: This review was aimed to study the long-term use of oral PPIs, to determine the appropriateness of monitoring parameters and long-term adverse complications in patients in Hospital Putrajaya.

Method: This was a retrospective cohort study where all patients, aged 18 years and above, who were prescribed with oral PPIs in Hospital Putrajaya for more than six months, in the year 2016 were recruited. Patients who had PPI initiated from other healthcare facilities were excluded.

Results: Among the 321 patients studied, mean duration of PPI prescribed was 31.1 ± 29.9 months. General medicine prescribed the most PPIs (51.4%), followed by surgical (32.1%) and rheumatology (7.2%) disciplines. Indicated use of long-term oral PPI as decided in the Drug Therapeutic Committee (DTC) was for gastroesophageal reflux disease (GERD), endoscopic-proven ulcer and prophylaxis for dual anti-platelet therapy. The study found that 67% of long-term PPI was not prescribed according to DTC decision. Monitoring on long-term adverse effects was found to be lacking. Only 86% of long-term patients had renal profile, 26% calcium level, 19% magnesium level and 3% bone mineral density (BMD) done periodically. 6 out of 277 (2.1%) patients had developed chronic kidney disease (CKD) or worsening CKD, 2 out of 9 (22.2%) patients had osteoporosis/fracture while 1 out of 61 (1.6%) patients developed hypomagnesemia after long-term use.

Conclusion: Majority of the prescriptions for PPIs were not indicated for long-term use. Guidelines recommended that PPI use should be given as brief as possible. Monitoring parameters such as BMD, calcium, magnesium level, renal profile and electrocardiogram should be performed during the initiation of long-term PPI therapy and at least once a year.

Original Research No. 20

Audit on the Usage of Gabapentin and Pregabalin for the Management of Neuropathic Pain in Hospital Rehabilitasi Cheras

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Introduction: In view of increasing consumption of pregabalin and gabapentin in Hospital Rehabilitasi Cheras (HRC), an audit has been conducted to determine the usage of these drugs since the cost of using pregabalin in the treatment of neuropathic pain is approximately seven times more than the cost of using gabapentin.

Objective: To determine the usage of gabapentin and pregabalin for the management of neuropathic pain in HRC.

Method: This study included a sample of patients aged 18 and above treated with gabapentin and/ or pregabalin for neuropathic pain in HRC in the period of 1 January 2016 to 31 December 2016. Patients who were less than 18 years of age, did not have neuropathic pain or had missing data were excluded from the study.

Results: 88 subjects were studied. 60 subjects (68.2%) were given gabapentin, 23 subjects (26.1%) pregabalin, and five subjects (5.7%) were given both. By race, 34 subjects (38.6%) were Malay, 36 subjects (40.9%) were Chinese and 18 subjects (20.5%) were Indian. Most subjects were males – 53 (60.2%), while 35 subjects (39.8%) were females. From the subjects receiving gabapentin, 59 subjects (90.8%) had an average daily dose (ADD) of 300 – 900 mg, 6 (9.2%) subjects had an ADD of 900.1 – 1800 mg, no subject had an ADD of 1800.1 – 3600 mg. From the subjects receiving pregabalin, 16 subjects (57.1%) had an ADD of 75 – 150 mg, 12 (42.9%) subjects had an ADD of 150.1 – 300 mg, no subject had an ADD of 300.1 – 600 mg.

Conclusion: 26.1% of subjects were given pregabalin without gabapentin, and therefore could be treated for neuropathic pain at a price that is 7-fold less of what was expended.

Original Research No. 21

Cost-effectiveness of Pharmacist-Managed Respiratory Medication Therapy Adherence Clinic on Asthma Patients: A Prospective Multicentre Study

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Introduction: Uncontrolled asthma contributed to a higher cost of management. In Malaysia, pharmacist-managed Respiratory Medication Therapy Adherence Clinic (RMTAC) was introduced to aid patient's asthma control through education and continuous monitoring.

Objective: To evaluate the cost-effectiveness of RMTAC service versus standard counselling service in improving asthma control in government health clinics setting.

Method: A multi-centre non-randomised controlled study was conducted in 16 government health clinics in Kuala Lumpur and Putrajaya. Subjects enrolled into RMTAC service were assigned to the intervention group; while subjects from clinics without RMTAC service were categorized as control group. Patients were followed up for six months to assess asthma control according to Global Initiative for Asthma (GINA) symptom control classification, inhalation technique and exacerbation frequency. The cost effectiveness analysis was conducted from the perspective of health care provider (Ministry of Health Malaysia). The direct costs of intervention and standard service were calculated during the study duration.

Results: A total of 321 patients were recruited; RMTAC group (n=158) and control group (n=163). RMTAC significantly improved asthma control with 51.9% of subjects acquiring well-controlled status after 6-months intervention compared to 20.9% in control group ($p<0.001$). Mean improvement in GINA score was 1.91 and 0.81 in RMTAC and control group respectively ($p<0.001$). Majority of the RMTAC patients also mastered good inhalation technique (75.3%), significantly higher than control group (31.9%) ($p<0.001$). No significant difference was found in exacerbation frequency. The mean 6-month cost per patient for RMTAC and standard care were MYR166.27 and MYR120.22 respectively. The incremental cost-effectiveness ratio (ICER) calculated for RMTAC was MYR41.86 per 1 unit improvement in GINA score.

Conclusion: RMTAC service resulted in significant improvements in patient's asthma control and inhalation technique at a small additional cost. RMTAC service by pharmacists should therefore be expanded to more healthcare facilities in Malaysia to benefit more patients.

*Pharmacy Conference JKWPKL&P 2019 (Oral Presentation): First Place

Original Research No. 22

Outcome of Tablet Varenicline for Smokers Following a Smoking Cessation Programme in Hospital Putrajaya

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Introduction: In Malaysia, approximately 22.8% of Malaysian population aged 15 years and above were smokers, 43.0% of men and 1.4% of women smoked manufactured cigarettes, hand-rolled and smokeless cigarettes. A variety of pharmacological options are available to help smokers stop smoking including nicotine replacement therapy (NRT) and non-nicotine-based medications (NNRT: varenicline & buproprion). Varenicline has been reported to have unique properties that help smokers refrain from smoking again.

Objective: The main objective of this study was to determine the outcome and safety of varenicline in smoking cessation patients at Hospital Putrajaya (HPJ).

Method: This is a retrospective study with data collection from January 2015 till December 2016. 100 patients registered under Quit Smoking Clinic, HPJ from 1st of Jan 2015 until 31st December 2016 with exclusion patients below 18 year old, patient default over 1 year and on combination therapy were analysed in this study.

Results: From this study, 100% of the cohort is male (n=87) where 90% is Malay, followed by 5% Chinese, 3% other race and Indian 2%. Majority of patients' education background were degree holders (57%). About 37.9% of the cohort age between 31-40 years old, 25.3% 41-50 years old, 19.5% between 21-30 years old, followed by 13.8% 51-60 years old and >60 years old about 3.5%. From the smoking history, 39.1% smoked between 16 to 20 sticks per day and 46.1% of the cohort have been smoking for almost 11 to 20 years. 87.4% subject from this study have successfully achieved abstinence rate during the quit smoking treatment. Only 16.1% of the patients experienced side effect from the treatment which the commonest side effect reported was nausea (n=8). 33.3% of the cohort do have some co-morbidities with hypertension (n=16) being the highest problem, followed diabetes (n=11) and about six patients had underlying cardiovascular disease.

Conclusion: Most participants quit successfully with varenicline. The main adverse effect was nausea, but mostly had mild effect which subsided over time.

Original Research No. 23

Impact of Insulin Injection Technique Re-Education on Perception of Insulin Therapy among Urban -Dwelling Type II Diabetes Mellitus Patients in Health Clinics in Kuala Lumpur

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Introduction: Glycaemic control of diabetic patients can be influenced by many factors such as insulin technique, compliance, patient perception, diet and lifestyle factors. Patient perception towards insulin therapy may affect their compliance and subsequently glycaemic control.

Objective: To investigate the impact of insulin injection technique re-education on the perception of insulin therapy and its influence on glycaemic control.

Method: This was an un-blinded randomized control trial that recruited patients up to four months follow-up. Patient insulin perception was measured using the validated Insulin Treatment Appraisal Scale (ITAS). 160 patients were recruited, whereby 80 patients were randomized to the control group and received standard care comprising of insulin injection technique counselling upon the first visit and last visit on the 4th month. 80 patients were randomized into the intervention arm where they received monthly insulin injection technique counselling up to four months. Both groups of patients completed an ITAS survey on their first and last visit. Higher ITAS scores indicate a higher negative perception on insulin.

Results: There were no significant differences between the ITAS score of the control group pre- and post-intervention (51.88 [11.46] vs 52.29 [10.91]; P = 0.409). However, the ITAS score of the intervention group pre- and post-intervention were significantly different (51.93 [8.21] vs 49.84 [8.28]; P = 0.007). The lower ITAS mean score post-intervention in the intervention group suggests a more positive perception towards insulin therapy. Significant changes in insulin perception was observed in pre- and post -intervention across both groups (2.49; 95% CI, 0.68 to 4.30; P = 0.007). The mean ITAS score difference in the intervention group (-2.10 [6.50]) showed a reduction in ITAS score, as compared to the mean ITAS score difference in the control group (0.42 [4.26]), suggesting patients who received monthly insulin injection technique counselling had a more positive perception towards insulin therapy after four months. Significant correlation between the changes in ITAS scores and HbA1c values pre- and post-intervention in the intervention group was also observed (Spearman's rho = 0.242; P = 0.049).

Conclusion: Insulin injection technique re-education can affect patients' existing insulin perception.

Original Research No. 24

Impact of Pharmacist's Re-education on Insulin Injection Site Lipohypertrophy Among Type 2 Diabetics in Health Clinics in Kuala Lumpur and Putrajaya

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Introduction: Lipohypertrophy (LH) is an abnormal accumulation of fat scar tissue in the subcutaneous layer, caused by repeated insulin injections in the same location. Injection into this site leads to variability of insulin absorption and thus erratic glycemic control.

Objective: The study aimed to determine the prevalence of LH and insulin injection practices among insulin users and the impact of pharmacist's monthly re-education on injection site rotation in preventing LH.

Method: A total of 160 type 2 diabetics who self-injected insulin for at least one year with poor injection techniques and HbA1c above 8% were recruited from 15 health clinics. The patients were randomly assigned to control and intervention groups. Intervention group received monthly re-education on LH and injection technique assessment for 4 visits. Control group received standard pharmacist counselling only on the first visit. Assessment on injection site rotation practices and presence of LH was performed on first and fourth visit.

Results: Our study found that 25.6% (n=41) patients had LH in the injection site. 10% revealed that they injected into the lump. 1.9% did not rotate their injection site. 35.7% admitted that they reused their needles more than 3 times. Only 5.7% had their injection site checked by healthcare professional at least once a year. There was significant difference on presence of LH pre and post re-education in the intervention group (30.0% vs 18.9%; p=0.002) compared to the control group (21.3% vs 13.9%; p=0.07). One patient in the control group had development of LH after 4 months. Gender (p=0.035), method of rotation (p=0.013) and size of injection site (p=0.049) were found to be associated with development of LH.

Conclusion: Pharmacist assessment and re-education on insulin injection site rotation played a role in preventing lipohypertrophy. Monthly re-education is more effective in preventing LH compared to standard counselling.

*National Pharmacy R&D Conference 2018 (Oral Presentation): First Place & Pharmacy Conference JKWPKL&P 2018 (Oral Presentation): First Place

Original Research No. 25

Incidence Rate of Adverse Drug Reactions in Hospital Rehabilitasi Cheras

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Introduction: Adverse Drug Reaction (ADR) is an appreciably harmful or pleasant reaction resulting from an intervention related to the use of a medicinal product, which predicts hazard from future administration and warrants prevention or specific treatment, or alteration of the dosage regimen, or withdrawal of the product.

Objective: To determine the incidence of ADR in Hospital Rehabilitasi Cheras (HRC).

Method: This was a retrospective cross-sectional study on the incidence of ADR identified in HRC over the period of January 2013 to December 2017. All ADR reports submitted to the Research and Drug Information Unit, Department of Pharmacy were reviewed and data were extracted for analysis.

Results: A total of 73 reports were documented of which 54.8 % were male and 45.2 % were female. Their mean age was 42 years old. The most common types of drug responsible for ADR were drugs affecting the central nervous system (CNS) (42%) followed by anti-microbial drugs, endocrine, cardiovascular, musculoskeletal and respiratory, and the less common were immunological/vaccine, cytotoxic and nutrition/blood. Meanwhile, the most common signs and symptoms encountered in ADR was gastrointestinal 24.1% followed by neurology, haematology and urinary. Interestingly, this study found that patient with stroke showed highest percentage (40%) of developing ADR. In contrast, patient with TBI and those on smoking cessation program had the least incidence of ADR. Most ADR cases (72%) recovered and none of them had fatal consequences.

Conclusion: ADR can be managed with medicine or by withdrawal of the suspected drug. As patients with stroke and patients on CNS drugs have a higher risk of developing ADR, they should be carefully managed. We believe that if proper attention is given to this aspect, it may help to reduce the incidence of ADR.

Original Research No. 26

The Response of Rheumatoid Arthritis Patients to Tocilizumab in Hospital Putrajaya

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Introduction: Different clinical trials have demonstrated good efficacy and safety profile of Tocilizumab in different populations of patients with rheumatoid arthritis. However, in Hospital Putrajaya, a variation in the response has been observed in patients receiving Tocilizumab therapy.

Objective: To evaluate the response of patients with rheumatoid arthritis to Tocilizumab and to identify the incidence of adverse effects.

Method: A retrospective study was conducted on patients receiving Tocilizumab treatment in Hospital Putrajaya. The DAS28 scores before treatment and throughout receiving treatment were used to investigate how soon the response is observed as well as the duration required to attain remission. The occurrence of adverse events was also recorded in attempt to identify possible risk factors.

Result: Majority of patients receiving treatment were female (77.8%), Malay (50.0%) with a mean age of 51 (SD 10.9). The mean time to respond was 12 weeks (SD 7.79), while the mean time to attain remission was 36 weeks (SD 22.14). It was observed that 33% (n=6) experienced adverse events during treatment with Tocilizumab. Only patient weight showed significant association with the occurrence of adverse events.

Conclusion: Response was observed at week 12 and remission at week 36 as compared to week 12 and week 24 respectively in published studies. The overall incidence of adverse events is 33.3%. There was also significant association between patient's weight at the start of treatment and the occurrence of ADRs.

Original Research No. 27

Safety Culture Perception among Pharmacy Staff in Tertiary Hospital and Health Clinics in Putrajaya

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Introduction: Safety culture in a health care organization is a crucial diagnostic tool when trying to assess the quality of health care provided. Organization's culture and the attitudes of teams can influence patient safety outcomes, and measures can be used to monitor changes over time.

Objective: To assess the perception on safety culture among pharmacy staff in Hospital Putrajaya and health clinics in Putrajaya.

Method: A cross-sectional study was conducted by distributing validated questionnaires to eligible participants in government hospital and health clinics in Putrajaya from June to September 2017. The questionnaire consists of demographic information and 31 items forming six patient safety climates for teamwork, safety, stress, job satisfaction, perceptions of management and working conditions. Answers were given on a 5-point Likert scale with conversion to 100 point scale. Results were analysed statistically using SPSS.

Results: A total of 132 participants completed the questionnaire. Safety climate received the highest mean of 74.3 $\pm$ 13.8 and perception of management was the least with mean of 65.7 $\pm$ 15.9. Overall positive response (score > 75%) was 37.1%. Teamwork and job satisfaction climates among staffs in health clinics were higher than hospital ($p<0.05$). All groups of staff had equal perception of safety culture in their facility. When comparing each safety culture climate using Pearson correlation, increase in teamwork, job satisfaction, perception of management and work condition were found to decrease stress ($p<0.05$).

Conclusion: Experienced staff had better perception on safety culture. Teamwork between staff had contributed to better job satisfaction and further reduces stress level at work.

Original Research No. 28

A Review on the use of Oral N-Acetylcysteine in Preventing Contrast-Induced Nephropathy in Hospital Putrajaya

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Introduction: Contrast-induced nephropathy (CIN) has become the third most common cause of hospital acquired acute kidney injury after hypotension and surgery. CIN is reported to increase from 20% to 40% in high-risk patients following the administration of a contrast agent.

Objective: To identify characteristics of patients who received oral N-Acetylcysteine (NAC) for CIN prevention and to determine the outcome of oral NAC in preventing CIN besides identifying the risk factor (s) associated with CIN.

Method: This was a retrospective, observational study conducted in Hospital Putrajaya. A total of 389 patients who received oral NAC during 2015 and 2016 were included according to inclusion and exclusion criteria. A paired t-test was conducted to evaluate the impact of the NAC on preventing CIN. Data was analyzed using SPSS Version 21.

Results: A total of 336 patients were included. Only 96 of the patients fulfilled the criteria while the rest were excluded due to no pre- or post-procedure renal profile (60.4%), ESRF (5.7%) and cancellation of procedure (5.4%). The results showed no significant decrease in eGFR post-procedure (mean eGFR 46.71 ± 25.0 ml/min) to eGFR pre-procedure (mean eGFR 43.2 ± 25.0 ml/min) at $p>0.05$. The study showed both diabetes mellitus and hydration were significant variables associated with incidence of CIN using Simple Linear Regression (SLR) at $p<0.25$. Hydration was identified as significant risk factor associated with the incidence of CIN via Multiple Linear Regression at $p<0.05$.

Conclusion: About 28.5% of the patients who received oral NAC were monitored for pre- & post-contrast procedure for CIN. Most patients (85.5%) who received oral NAC did not show any significant decrease in eGFR post-contrast procedure. Hydration status was identified as a significant risk factor associated with CIN.

Original Research No. 29

Prevalence of Verbal Orders in Medical Ward Hospital Putrajaya

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Introduction: Medication errors are significant and often preventable healthcare problems. These errors include prescribing errors, dispensing errors, medication administration errors and patient compliance errors. More issues can arise when medications are ordered verbally and the normal pharmacy check systems are not in place.

Objective: To identify the prevalence of medication ordered verbally without prescription, identifying the common types of medications and prescriber categories of medications often ordered verbally.

Method: Prospective randomized study conducted in Hospital Putrajaya (HPJ) throughout the month of January 2017. Prescriptions for all drugs administered to patients hospitalized in medical wards throughout January 2017 were included and analyzed from electronic medical records.

Results: A total of 365 drug administrations were analyzed. The prevalence of medication administration made without a prescription in medical wards HPJ was 7%. Majority of orders (92.3%) were made by house officers followed by medical officers (7.7%) and none was observed by specialists or consultants. Medications that were most commonly ordered verbally were endocrine drugs followed by psychotropic, cardiovascular and dermatology drugs. The most common route of administration was intravenous (76%) followed by oral (8%) and topical (8%). All medications served to patients were items present in the wards as floor stocks of which (12%) were found to be High Alert Medication.

Conclusion: A high number of medications were administered to patients in medical ward, via verbal orders prescribed mainly by house officers and they were floor stock medications. In order to avoid potential medication errors due to verbal orders, ward pharmacists need to re-emphasize to house or medical officers to order medications prior to administration and medications that were administered in emergency cases need to be followed by an order through Fisicien within 24 hours.

Original Research No. 30

Audit on the Usage of Oral Antiepileptic Drug in the Inpatient Setting of Hospital Rehabilitasi Cheras

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Introduction: Antiepileptic drugs (AEDs) are used for the management of epilepsy in Hospital Rehabilitasi Cheras (HRC). Although monotherapy remains the mainstay for the treatment of epilepsy, combinations of AEDs are used frequently in patients not responding to a single medication. Polytherapy increases the potential of drug-drug interactions and toxicity.

Objective: To determine the usage of oral AEDs in inpatient setting of HRC.

Method: All patients aged ≥ 18 years old using at least one oral AED in inpatient setting of HRC from 1 January 2016 to 30 June 2017 were selected. Inpatient prescriptions and clinical pharmacy notes were reviewed. Data was collected in data collection form. The potential between drug interactions were identified using MIMS GATEWAY.

Results: A total of 84 patients were identified, of which 65.48% were male and 34.52% were female patients. The mean age of the population was 47.80 ±17.2 years. Malay (65.48%) made up the highest ethnic group, followed by Chinese (19.05%) and Indian (15.48%). The usage of AEDs was the highest (55.95%) in Traumatic Brain Injury department. Monotherapy with AED was given to 73.80% of patients, whereas polytherapy of AEDs was given to 26.20% of patients. Phenytoin was the commonest monotherapy (48.39%) followed by Sodium Valproate (43.55%) and Carbamazepine (8.06%). The most frequent polytherapy given is Phenytoin with Sodium Valproate (81.82%). There were 186 drug interactions either between both AEDs, or between AEDs and concomitant medications identified, of which 90% were moderate interactions, followed by minor interactions (9%) and severe interactions (1%). Findings showed that only 67.74% of patients on monotherapy have at least one drug interaction identified. In contrast, 90.9% of patients on polytherapy have at least one drug interaction identified.

Conclusion: Monotherapy with AED is given to majority of the patients. Combining more than one AED is also widely practiced in HRC. Drug interactions are more common in patients on polytherapy with AEDs.

Case Report, No. 1

Gabapentin Induced Rash

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OBJECTIVE

To describe two cases of skin reaction during gabapentin therapy and discuss how we evaluated the probability of an adverse drug reaction.

CASE DESCRIPTION

CASE 1: Patient was a 65 year-old Indian female with diagnosis of middle cerebral artery (MCA) infarct. Patient was prescribed with oral gabapentin 300mg at night since May 2017. Patient claimed that last year, there were only rashes at the back but patient can tolerate with it. This year, the adverse effect became worse with rashes at the back, lips and swollen eyes. Patient stopped taking gabapentin by herself in July 2018 and the adverse effects were resolved.

CASE 2: Patient was a 69 year-old Malay male with diagnosis of middle cerebral artery (MCA) infarct. Patient was prescribed with oral gabapentin 300mg at night on 20 December 2018. Patient claimed that after two to three days of consuming gabapentin, he experienced maculopapular rashes on both legs. He discontinued taking gabapentin by himself on 8 January 2019 and the rashes were recovering 20 days later. On 31 January 2019, the doctor changed the medication to oral pregabalin 75mg once daily.

DISCUSSION

Pharmacy Department of Hospital Rehabilitasi Cheras has received two adverse drug reaction reports involving rash following use of gabapentin to treat neuropathic pain. In both of the reported cases, skin reactions only occured after gabapentin was introduced. In Case 1, drug relationship scoring using Naranjo Scale was 2 which indicates possible relationship whereas in Case 2 the relationship was certain. Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS), also known as multiorgan hypersensitivity, has occurred with use of gabapentin. Some of these reactions have been fatal or life-threatening. DRESS typically, although not exclusively, presents with fever, rash, and/or lymphadenopathy, in association with other organ system involvement, such as hepatitis, nephritis, hematological abnormalities, myocarditis, or myositis sometimes resembling an acute viral infection. Eosinophilia is often present.

LEARNING POINT OF THE CASE SERIES

Healthcare professional should raise a suspicion of hypersensitivity reaction in patient taking gabapentin presented with rash. Drug induced rash in most of the cases may not be harmful but it may be a warning sign of a more serious skin reaction in patient taking gabapentin. Healthcare professional should always assess compliance in patients taking gabapentin and address any issue regarding side effects of this drug in every visit.

Case Report, No. 2

Mirtazapine-Induced Weight Gain

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OBJECTIVE

Failure to address the adverse effects of anti-depressant by healthcare practitioner after starting anti-depressant may compromise the success of treatment. The objective of this case report is to describe a case of rapid weight gain during mirtazapine treatment.

CASE DESCRIPTION

A 75 year-old Malay male with diagnosis of middle cerebral artery (MCA) infarct with cerebral oedema and multiple comorbids was admitted to Geriatric Ward, Hospital Rehabilitasi Cheras for cognitive and mood assessment. Patient had loss of interest, was verbally abusive and suffered from insomnia for the past five months. He was diagnosed with post-stroke depression. He weighed 66kg upon admission. Initial laboratory investigations were all within the normal range. Geriatric Depression Score was 11/15. Despite being on sertraline treatment, his symptoms did not improve sufficiently. He was not sleeping at night and slept only one hour during daytime. Sertraline was discontinued and mirtazapine was prescribed. The patient's mood and sleep pattern improved while his appetite increased. He had rapid weight gain, gaining 5kg in nine days.

DISCUSSION

Drug-induced weight gain is an adverse effect of anti-depressant drugs which can lead to non-compliance to treatment and worsening of co-morbid conditions. Mirtazapine is likely to cause weight gain through blockade of histamine H1 and serotonin 2C receptors. A study comparing mirtazapine and fluoxetine showed that patients treated with mirtazapine experienced significant weight gain as compared to patients treated with fluoxetine.

LEARNING POINT OF THE CASE REPORT

Weight gain should be put into consideration during selection of anti-depressant.

Pharmacy Quality Reports

2017 - 2019

Quality Assurance, No. 1

Mengurangkan Insiden Item *Dressing* Luput Di Wad-Wad Hospital Rehabilitasi Cheras (HRC)

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Pemilihan Peluang Untuk Penambahbaikan (Masalah yang Digariskan)
Penggunaan item *dressing* yang telah luput kepada pesakit meningkatkan risiko luka lambat sembuh dan jangkitan kuman. Terdapat peningkatan item dressing yang luput di wad-wad HRC. Pembekalan item *dressing* yang selamat kepada pesakit merupakan tanggungjawab semua anggota kesihatan.

Pengukur Utama Penambahbaikan
Kajian ini dijalankan untuk mengurangkan insiden item *dressing* luput/tamat tempoh, mengenalpasti faktor-faktor yang menyumbang kepada berlakunya perkara tersebut serta tindakan penambahbaikan yang boleh diambil dan dinilai keberkesanannya. Indikator bagi kajian ini adalah kuantiti item *dressing* luput dan standard yang ditetapkan adalah sifar berdasarkan *Pharmacy Practice & Development QAP Indicators 2011.*

Proses Pengumpulan Maklumat
Kajian ini dijalankan secara kaedah keratan rentas (*cross sectional study*) dengan menggunakan data retrospektif. Data item *dressing* luput dikumpul dengan menggunakan Borang Pemeriksaan Wad, Vot & Daftar Nota Minta 2014 – 2015 dan kad petak Farmasi Logistik. Kajian ini dibahagi kepada 3 peringkat iaitu *pre*-intervensi (Disember 2015 - Februari 2016), peringkat penambahbaikan (bermula Mac 2016) dan *post*-intervensi (Julai - September 2016).

Analisis dan Interpretasi
Sebanyak 85 item *dressing* telah luput sepanjang tempoh *pre*-intervensi. Ini disebabkan oleh tiada pemantauan, frekuensi penggunaan yang tidak konsisten dan pembelian yang tidak dirancang dengan baik.

Strategi Penambahbaikan
Tindakan penambahbaikan yang diambil ialah dengan mengadakan sesi taklimat berkaitan pengurusan stor yang baik, penetapan paras stok serta penyediaan *master list*, carta lokasi dan kad petak bagi setiap item *dressing* di wad.

Kesan Penambahbaikan
Kajian ini dapat mengurangkan kuantiti item *dressing* luput daripada 85 (*pre*-intervensi) kepada 1 unit sahaja (*post*-intervensi) dalam tempoh 18 bulan.

Langkah Seterusnya
Perlaksanaan sesi taklimat secara berkala, pemantauan berterusan seperti pemeriksaan item *dressing* di wad sekurang-kurangnya 4 kali setahun, orientasi kepada jururawat terlatih yang menjaga stok item *dressing* dan edaran memo dalaman akan diteruskan bagi memastikan sasaran sifar dapat dicapai.

*Mini Konvensyen Quality Assurance 2017: Pemenang Tempat Ketiga

Quality Assurance, No. 2

Improving Drug Supply to Substore in Logistic Pharmacy Hospital Putrajaya

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[1]Pharmacy Department, Putrajaya Hospital

Selection of Opportunities for Improvement (Outline for Problem)
There has been an increase in the number of incomplete drug supply to sub-stores from Logistic Pharmacy. In 2016, 86% of drugs were fully supplied to sub-stores. This can lead to inadequate supply of medicine to patients, dissatisfaction and inconvenience to staffs and patients.

Key Measures for Improvement
100% of standard item drugs supplied to sub-stores within 14 days.

Process of Gathering Information
A cross-sectional study was carried out in August 2016. Pre-intervention data collection includes the number of 100% drugs supplied within 14 working days, the number of item purchased before stock is nil and pattern of drug indenting by sub-stores. Post-intervention data was collected on November 2017.

Analysis and Interpretation
In August 2016, 14% of the drugs were not fully supplied to sub-stores. Major factor contributing to the incomplete supply is insufficient stock (80%). About 49% of the drugs were ordered after stock nil which showed that there was a delay in purchase. Among the contributing factors identified was high workload for purchaser, limited storage area, no proper monitoring of drugs and maintenance of buffer stock. About 8.8% of indents were non-adherent to the schedule. Audit trail on sub-store indenting pattern found that 65% of drugs were over indented. This is due to lack of standardized monitoring system and insufficient time to indent all drugs in one request.

Strategy for Change
Expansion of Logistic Pharmacy area from 465.6m^2 to 507.6 m^2 was carried out to increase storage area. Box 'Nil In Stock' was created to place bincards of nil drugs to expedite purchasing. A monitoring sheet was created for drugs not supplied to end user. Improvement in workflow of drug supply to sub-store was made effective. Minimum and maximum usage were revised for all items in PHIS system, and created the Min-Max master sheet. Furthermore, new indent schedule was created to enforce efficient purchasing and indenting. For emergency indent, an urgent stock requisition (SR) request function was implemented in Fisicien system. Standardized drug usage monitoring sheet with formulated stock calculation was created for efficient indenting. Training to key managers of stores was provided on new indenting system and new stock monitoring sheet.

Effects of Change
Percentage of drug supplied to sub-store was increased from 86% to 98.5%.

The Next Step
Periodic training on stock indenting to all staffs and to further implement to other sub-stores.

*Mini Konvensyen QA JKWPKL&P 2019: Saguhati Penyertaan

Quality Assurance, No. 3

Improving Chronic Medication Collection Service using Value Added Service among Health Clinics in Pejabat Kesihatan Titiwangsa

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[1]Kuala Lumpur Health Clinic, [2]Setapak Health Clinic, [3]Dato Keramat (Setiawangsa) Health Clinic, [4]Titiwangsa District Health Office, [5]Kampung Pandan Health Clinic

Selection of Opportunities for Improvement (Outline for Problem)
Low usage of Value Added Service (VAS) may contribute to increase in patient's waiting time and collection of medications over the counter.

Key Measures for Improvement
The targeted prescription using VAS by Pejabat Kesihatan Titiwangsa (PKTT) health clinics is 11950 prescriptions per year. However, PKTT only achieved 84% (10090) in 2017. The main objective of the study is to increase VAS usage and achieve 100% of the target.

Process of Gathering Information
A cross-sectional study was conducted from December 2017 to December 2018. Number of prescription using VAS was obtained from the JKWPKL&P monthly report. Two validated questionnaires have been distributed to 200 patients and 60 pharmacy staffs respectively to assess VAS awareness, problems encountered and opportunities for VAS improvement.

Analysis and Interpretation
Result showed that only 25% of patients have used VAS. The main contributing factors are patient's preference to collect medications from pharmacy counters (46%), unfamiliarity to VAS (38%), close proximity to health clinics (31.3%) and patient failed to understand VAS explanation by pharmacy staff (10.7%). Ensuring waiting time to be achieved (66.7%), lack of awareness (46.7%) and heavy workload (33.3%) are the main reasons for lack of promotion by pharmacy staffs.

Strategy for Change
Remedial measures were taken to improve VAS usage such as education session for pharmacy staff, VAS promotional video, multilingual VAS pamphlet and implementation of One Stop Drive-Thru Center in Klinik Kesihatan Kuala Lumpur.

Effects of Change
In 2018, the total number of prescriptions using VAS in PKTT had increased to 12499, which is 104.6% of targeted prescriptions.

The Next Step
We can implement more VAS such as locker services and extend other VAS to after office hour and weekends. In addition, One Stop Drive-Thru Centre may collaborate with other healthcare facilities to make drive through service available to more patients.

Quality Assurance, No. 4

Reducing the Number of Discharged Patients who Require Medication Interventions at Health Clinics' Pharmacy Counter in Kuala Lumpur Health Department

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Selection of opportunities for improvement
The prescribing of unavailable/unauthorized drugs for discharged patients resulted in increased number of avoidable medication interventions.

Key Measures for improvement
The percentage of discharged patient requiring medication intervention at the first visit is less than the baseline (47.3%).

Process of gathering information
A cross-sectional study with universal sampling method was carried out at five health clinics. The verification study was done in October-December 2018, followed by the first cycle of remedial action in January-March 2019 and second cycle in July-September 2019. The number of pharmacist interventions among newly discharged patients with referral letter from other facilities were recorded.

Analysis and Interpretation
79 out 167 (47.3%) newly discharged patients required avoidable medication interventions. The contributing factors were lack of communication between doctors and pharmacists (50.3%), lack of in-house standard operating procedure for discharged patients (25.1%) and lack of patients' awareness about registration procedure at referred facilities (24.6%).

Strategy for Change
The workflow was changed by having patients' referral letters reviewed by pharmacists prior to doctor consultation. Pharmacists provided recommendation according to drug suitability and availability in their facility. Strategy 1 was giving briefing to the registration staff to make sure they referred the newly discharged patients to the pharmacy before giving an appointment date. Strategy 2 was putting up a notice at the registration counters to direct the newly discharged patients to the pharmacy. Strategy 3 was using a medication review form to be a communication tool between doctors and pharmacists. Strategy 4 was sharing updated drug formulary with doctors via WhatsApp. First three strategies were done during Cycle 1 while the last strategy in Cycle 2.

Effects of change
The number of newly discharged patients that required avoidable medication interventions reduced from 47.3% to 14.3% in Cycle 1 and further reduced to 4.13% in Cycle 2.

The next step
It is hoped that the medication review form can be used to check the discharged patients' remaining medication supplied from their previous healthcare facility to save medication cost.

Inovasi, No. 1

My e-Indent

Dahlia Nadira Abd Manan[1], Khoo Yong Leong[2], Nur Sohaila Abdul Jalil[3]

[1]Bahagian Perkhidmatan Farmasi JKWPKL&P, [2]Klinik Kesihatan Jinjang, [3]Pejabat Kesihatan Daerah Kepong

PENDAHULUAN: Pembekalan ubat-ubatan kepada klinik komuniti merupakan tanggungjawab unit farmasi di klinik kesihatan. Pembekalan akan dibuat berdasarkan pesanan oleh klinik komuniti. Terdapat tiga buah klinik kesihatan dan tujuh buah klinik komuniti di bawah pentadbiran Pejabat Kesihatan Kepong. Pembekalan ubat akan dibuat setiap bulan bagi memastikan ubat mencukupi sepanjang masa klinik beroperasi.

MASALAH SEBELUM INOVASI: Sebelum inovasi, pesanan ubat dibuat secara manual. Penolong Pegawai Perubatan (PPP) akan mengisi borang pesanan dan menghantar borang tersebut ke unit Farmasi yang mengambil masa lebih kurang lima hari. Tempoh yang lama untuk menerima borang pesanan menyebabkan proses pembekalan juga akan menjadi lambat dan kemungkinan stok ubat akan habis sebelum bekalan ubat diterima. Ini menyebabkan terputusnya bekalan ubat kepada pesakit.

PENERANGAN PROJEK INOVASI: My e-Indent ini merupakan satu inovasi yang memudahkan klinik komuniti mengisi dan menghantar borang pesanan mereka ke klinik kesihatan daripada manual kepada automatik sepenuhnya dan telah mengatasi masalah borang pesanan lambat diterima di klinik kesihatan. Sistem ini juga memudahkan unit farmasi di klinik kesihatan untuk membuat pembekalan kerana sistem akan mengira secara automatik jumlah yang perlu dibekalkan kepada klinik komuniti. Melalui sistem ini juga, jumlah penggunaan ubat bulanan akan dapat dipantau dan dapat mengelakkan berlakunya pembaziran ubat. Tiada kos yang diperlukan bagi projek ini.

KEADAAN SELEPAS INOVASI: Selepas inovasi dihasilkan, pesanan ubat dilakukan melalui Sistem e-Indent dimana pesanan tersebut dapat diterima oleh unit Farmasi secara serta-merta.

FAEDAH–FAEDAH PELAKSANAAN: Selepas inovasi ini dijalankan, masa penghantaran borang pesanan ubat telah berjaya dipendekkan dari 5 hari kepada serta-merta dan proses pembekalan ubat dapat dilakukan mengikut jadual yang telah ditetapkan iaitu dari seminggu kepada 2 hari sahaja. Sistem ini juga dapat memantau pergerakan stok di klinik kerana semua stok ubat perlu diperiksa dengan betul sebelum dimasukkan ke dalam sistem. Pemeriksaan secara berkala ini boleh mengelakkan daripada berlaku pembaziran disebabkan oleh stok berlebihan atau stok bertarikh luput. Pembekalan ubat juga dapat dibuat mengikut jadual yang telah ditetapkan dan dapat memastikan pesakit menerima ubat yang tepat dan cepat.

KESIMPULAN: My e-Indent merupakan satu sistem yang sangat baik dan boleh digunakan oleh semua klinik komuniti. Sistem ini dapat menjimatkan masa penghantaran borang pesanan dan pembekalan dapat dilakukan mengikut jadual yang ditetapkan. Pemantauan stok ubat dapat dilakukan secara berkala dan dapat mengelakkan pembaziran ubat.

Inovasi, No. 2

HPJ VAS Database (EzVAS)

Ahmad Ridzuan bin Mohd Hajazi[1], Shamini A/P Kanakarathnam[1], Goh Jun Xial Joel[1], Nurul Zaidah binti Badarudin[1], Maizan binti Saad[2], Shulizal Aida binti M Salleh[2]

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PENDAHULUAN: Projek EzVAS adalah inisiatif untuk memperkasakan perkhidmatan Servis Tambah Nilai (*Value Added Services,* VAS) di Jabatan Farmasi, Hospital Putrajaya (HPj) bertujuan menambah baik proses kerja dan meningkatkan mutu perkhidmatan sedia ada supaya lebih efisien dan mesra pelanggan.

MASALAH SEBELUM INOVASI: Perekodan data pesakit tidak sistematik. Rekod fail *Microsoft Excel* berbeza digunakan untuk setiap VAS menyebabkan berlaku pembaziran masa dan tenaga kerja anggota Farmasi untuk merekod data pesakit serta tidak mesra pengguna. Ketiadaan atau kehilangan rekod temujanji pesakit berlaku menyebabkan proses pendispensan ubat terbantut dan seterusnya menimbulkan gambaran buruk terhadap perkhidmatan VAS yang ditawarkan. Akses pengguna yang terhad meyebabkan temujanji terlupa direkodkan selain kelewatan maklum balas kepada pesakit yang ingin membuat temujanji. Kerumitan dalam penyediaan statistik bulanan secara manual.

PENERANGAN PROJEK INOVASI: EzVAS merupakan laman sesawang secara atas talian yang menggabungkan dan menyelaraskan rekod pesakit yang melanggan perkhidmatan VAS di Jabatan Farmasi, HPj. VAS yang terlibat adalah Farmasi SMS Take N Go, medibox dan Pandu Lalu Hpj@IKN.

KEADAAN SELEPAS INOVASI: Rekod pesakit dapat diuruskan dengan lebih baik dan sistematik. Seterusnya menjimatkan masa selama 10 minit untuk tujuan perekodan temujanji pesakit. Tiada kehilangan rekod temujanji pesakit dilaporkan kerana mempunyai sistem *back-up* bersepadu. Maklumat status ubat dapat disampaikan secara cepat kepada pesakit dan kes terlupa rekod temujanji pesakit dapat dikurangkan sebanyak 80% sebulan kerana akses yang tidak terhad.

FAEDAH–FAEDAH PELAKSANAAN: Maklumat pesakit dapat diakses dengan mudah dan pantas. Keseragaman dalam penyimpanan rekod pesakit bagi pelbagai jenis perkhidmatan tambah nilai dan seterusnya menjamin keselamatan maklumat pesakit kerana boleh diakses dengan nama pengguna yang didaftarkan sahaja. Penggunaan ruang dalam cakera keras komputer dapat dijimatkan. Mengurangkan kerumitan dalam proses pendaftaran dan pendispensan bagi perkhidmatan tambah nilai. Statistik dapat dijana serta merta. Oleh itu, ianya mesra pelanggan dan meningkatkan produktiviti anggota farmasi yang bertugas. Penghasilan EzVAS tidak memerlukan kos kerana ia hasil projek kolaborasi dengan Jabatan Teknologi Maklumat HPj. Sekiranya kepakaran luar diperlukan, hampir RM80,000 perlu dibelanjakan untuk membina aplikasi ini.

KESIMPULAN: Inovasi ini dapat diaplikasikan oleh institusi KKM yang lain supaya lebih responsif, efektif dan memberi impak yang tinggi dalam penyampaian perkhidmatan berkualiti kepada rakyat.

Inovasi, No. 3

Laman Web Program CPE

Mohd Taufiq Azmy[1], Daniel Liew Chieng Yien[2], Chin Heng Chu[3], Jason Ng Chia Chyuan[4], Leong Poh Yee[5], Noor Fazilah Zainal Abidin[6]

[1]Klinik Kesihatan Kuala Lumpur, [2]Cawangan Amalan & Perkembangan, JKWPKL&P, [3]Klinik Kesihatan Setapak, [4]Klinik Kesihatan Cheras, [5]Klinik Kesihatan Cheras Baru, [6]Klinik Kesihatan Petaling Bahagia

PENDAHULUAN: Projek ini merupakan inisiatif Unit Sumber Maklumat Farmasi di bawah Jabatan Farmasi Wilayah Persekutuan Kuala Lumpur & Putrajaya. Projek ini menggunapakai laman web bagi memaparkan persembahan slaid pembelajaran professional berterusan *Continuous Professional Development* (CPD) bagi semua anggota di bawah Jabatan ini.

MASALAH SEBELUM INOVASI: Kesibukan tugasan di unit farmasi Hospital dan Klinik Kesihatan menyebabkan kekangan anggota untuk menghadiri program *Continuous Pharmacy Education (CPE) Learning*.

PENERANGAN PROJEK INOVASI: Projek ini menggunapakai laman web bagi menyampaikan pembelajaran CPE kepada anggota melalui kaedah persembahan slaid, pertanyaan soalan yang perlu dijawab dan penyampaian sijil pembelajaran secara atas talian.

KEADAAN SELEPAS INOVASI: Perlaksanaan projek ini membantu anggota untuk mempelajari sesuatu tajuk/perkara daripada program pembelajaran CPE tanpa perlu menghadiri program berkenaan seterusnya memudahkan akses anggota untuk memperoleh mata CPD berikutan kekangan masa, anggota dan kewangan.

FAEDAH-FAEDAH PELAKSANAAN: Projek ini memberikan beberapa faedah atau kelebihan kepada anggota-anggota farmasi dari segi kemudahan akses kepada program CPE tanpa perlu menghadiri kursus secara fizikal sekiranya terdapat kekangan kakitangan serta masa dan menambah pengetahuan anggota dengan lebih mendalam.

KESIMPULAN: Projek ini mampu meningkatkan pengetahuan dan kecekapan anggota seterusnya memudahkan anggota untuk mempelajari perkara berkaitan farmasi yang dikemaskini pada bila-bila masa dan di mana jua. Pengurangan kos, penjimatan masa dan tenaga, peningkatan produktiviti, kepuasan pelanggan yang baik serta potensi projek ini di masa akan datang ternyata merupakan sesuatu yang bernilai untuk dilaksanakan dan dipraktikkan oleh Jabatan Farmasi dan Jabatan Kesihatan Negeri secara amnya.

Inovasi, No. 4

EzSPUBag

Nurul Ain Binti Mohd Arop[1], Nadia Idiana Binti Md. Nasir[2], Jazalina Binti Abd Jalil[1], Rathnaa A/P Nadrajan[2], Azra Nadilah Binti Razali[2], Norasyikin Binti Zulfaqqor[1], Noratikah Binti Zamri[2], Jalil Bin Mohamad Yasin[2]

[1]Jabatan Farmasi, Hospital Putrajaya, [2]Pejabat Kesihatan Putrajaya

PENDAHULUAN: Sistem pembekalan ubat-ubatan melalui Sistem Pendispensan Ubat Bersepadu (SPUB) merupakan perkhidmatan di mana pesakit boleh mendapatkan baki bekalan ubat susulan seterusnya dari mana-mana fasiliti kesihatan Kementerian Kesihatan Malaysia (KKM) yang berdekatan dengan kediaman pesakit. Ubat-ubatan SPUB adalah ubatan yang dibekalkan dari fasiliti yang merujuk sekiranya ubatan tersebut tidak terdapat di dalam formulari fasiliti yang dirujuk. Ketiadaan sistem yang seragam bagi pengendalian dan pemantauan ubat-ubatan SPUB yang diterima boleh mengakibatkan kerugian kepada Unit Farmasi.

MASALAH SEBELUM INOVASI: Berlaku pembaziran ubat apabila ubat tidak dituntut ataupun tamat tarikh luput, masalah kekangan ruang, proses pengisian yang lebih sukar 'traceability' ubat dan seterusnya boleh menyebabkan masa menunggu pesakit yang lebih lama.

PENERANGAN PROJEK INOVASI: Peralatan utama yang digunakan adalah beg fail berzip bersaiz A4/B5 untuk kegunaan khas setiap pesakit. Beg ini akan disimpan mengikut kategori fasiliti yang merujuk beserta senarai nama pesakit.

KEADAAN SELEPAS INOVASI: Projek Inovasi ini memudahkan pemantauan secara berkala dan mengelakkan pembaziran ubat yang tidak dituntut/tamat tarikh luput. Penyimpanan ubatan SPUB juga menjadi lebih teratur dan sistematik. Penggunaan ruang juga dapat dioptimumkan.

FAEDAH-FAEDAH PELAKSANAAN: Projek Inovasi SPUB ini telah diseragamkan dan dilaksanakan di semua Unit Farmasi di bawah Pejabat Kesihatan Putrajaya. Sistem yang sistematik memudahkan pemantauan dilakukan secara berkala dan konsisten yang dapat mengelakkan berlakunya pembaziran daripada ubat-ubatan yang tidak dituntut atau telah luput. Selain itu, pemantauan yang efisien membantu dalam penggunaan ruang penyimpanan ubat-ubatan yang optimum. Penjimatan masa dari segi pencarian dan pengisian ubat-ubatan SPUB yang secara tidak langsung dapat mengurangkan masa menunggu pesakit.

KESIMPULAN: Projek Inovasi EzSPUBag ini mudah untuk diaplikasikan oleh fasiliti lain kerana ianya adalah efisien, mesra pengguna dan mampu memberikan impak dari segi penambahbaikan perkhidmatan yang diberikan kepada pelanggan.

Inovasi, No. 5

Drug Album 2.0

Nur Rafidah Binti Yahil[1], Jason Ng Chia Chyuan[2], Ahmad Faiz Bin Mohd Rasid[3], Che Ku Norhafizan Binti Che Ku Salim[4], Nor Baizura Binti Noh[5] , Daniel Liew Ching Yien[6]

[1]Klinik Kesihatan Dato' Keramat, [2]Klinik Kesihatan Cheras, [3]Klinik Kesihatan Tanglin, [4]Klinik Kesihatan Sentul, [5]Klinik Kesihatan Putrajaya Presint 11, [6]Bahagian Perkhidmatan Farmasi JKWPKL&P

PENDAHULUAN: Projek ini adalah satu kerjasama di antara ahli Jawatankuasa Perkhidmatan Maklumat Ubat (DIS). Album ini merangkumi semua ubat kronik yang pernah diberikan kepada pesakit di klinik kesihatan yang terdapat di bawah Jabatan Kesihatan Wilayah Persekutuan Kuala Lumpur & Putrajaya.

MASALAH SEBELUM INOVASI: Pertukaran jenama ubat yang kerap membuatkan kekeliruan mengenai ubat yang diambil oleh pesakit. Tidak semua pesakit mengetahui nama ubat, dan hanya mampu bercerita mengenai rupa bentuk atau warna ubat tersebut yang menyukarkan proses identifikasi ubat tersebut. Pihak preskriber juga tidak mengetahui rupa bentuk ubat yang dibekalkan di Farmasi menyukarkan lagi proses komunikasi antara preskriber dan pesakit. Pegawai Farmasi perlu menyediakan Album Ubat secara fizikal, yakni menggunakan contoh ubat yang ada di dalam Farmasi untuk menunjukkan sampel kepada pesakit sekiranya berlaku pertukaran jenama atau jenis ubat. Disebabkan oleh itu Album Ubat 2015 telah dihasilkan. Namun begitu, kekurangan perincian menyebabkan album ubat itu sukar digunakan. Maka, inovasi ini dihasilkan.

PENERANGAN PROJEK INOVASI: Projek Drug Album 2.0 diletakkan di bawah kategori produk. Projek ini merupakan satu produk penambahbaikan daripada Album Ubat Edisi Pertama yang dicetak pada tahun 2015. Produk ini mengandungi nama generik dan jenama, gambar ubat dan syarikat pengilang yang akan membantu semua pihak untuk proses identifikasi ubat. Projek ini dibuat secara *softcopy* dan boleh diimbas menggunakan kod QR, bagi memudahkan ia diakses oleh para kakitangan kesihatan.

KEADAAN SELEPAS INOVASI: Projek ini telah dikongsikan secara atas talian melalui email di kalangan kakitangan kesihatan bagi membolehkan produk tersebut mudah diakses. Kod QR juga disediakan bagi memudahkan petugas kesihatan untuk mengakses produk tersebut.

FAEDAH-FAEDAH PELAKSANAAN: Projek ini membolehkan proses identifikasi ubat menjadi lebih mudah dan cepat. Sesi konsultasi akan berjalan lebih lancar dan kurang kesilapan pengubatan menjadikan perkhidmatan yang diberikan lebih baik.

KESIMPULAN: Drug Album 2.0 yang dihasilkan oleh Jawatankuasa DIS telah membantu Pegawai Perubatan dan Pegawai Farmasi di Klinik Kesihatan ketika sesi konsultasi bersama pesakit. Perincian informasi bersama gambar yang tepat dan jelas menyebabkan pesakit dan penjaga dapat melakukan pengecaman ubat dengan yakin. Oleh itu, Drug Album 2.0 ini menjadi satu sumber rujukan penting dalam memberikan servis terbaik kepada pesakit dan orang awam.

Inovasi, No. 6

Informasi Ubat Melalui *QR CODE*

Noornazli Zahirah Abdullah[1], Nurhazira Zamri[1], Seah Yin Kuan[1], Shreeta Sivarasa[1]

[1]Jabatan Farmasi, Hospital Putrajaya,

PENDAHULUAN: Projek Inovasi *QR Code* adalah satu inisiatif yang telah dilaksanakan untuk menambahbaik sistem perekodan bagi semua pertanyaan yang diterima di setiap unit Jabatan Farmasi.

MASALAH SEBELUM INOVASI: Setiap hari, Jabatan Farmasi menerima banyak pertanyaan dari anggota kesihatan mahupun pesakit. Walaubagaimanapun, pertanyaan yang diterima tidak direkodkan secara efisien. Pertanyaan yang diterima akan direkodkan dalam *J-Drive* iaitu satu fail maklumat yang boleh diakses oleh semua pekerja di Hospital Putrajaya. Namun, fail *J-Drive* tersebut hanya boleh diakses oleh seorang pengguna di dalam satu masa sahaja. Ini mengakibatkan pertanyaan yang diterima secara serentak dari semua unit di dalam Jabatan Farmasi tidak dapat direkodkan. Susulan itu, jabatan ini mengalami kesukaran untuk mencapai sasaran bulanan yang ditetapkan.

PENERANGAN PROJEK INOVASI: *QR Code* yang dijana merupakan pautan kepada "*Drug Information Enquiry Form* (DIEF)" yang sedia ada di dalam fail *J-Drive* melalui penggunaan *google form. QR Code* ini ditampal di setiap monitor di Jabatan Farmasi bagi memudahkan atau meningkatkan aksesibiliti kepada DIEF. Semua pertanyaan yang diterima boleh diakses dan direkod menggunakan telefon pintar secara atas talian pada bila-bila masa dan di mana-mana sahaja.

KEADAAN SELEPAS INOVASI: Inovasi ini bermula pada bulan Mei 2019 dan bilangan soalan yang direkodkan pada bulan tersebut adalah sebanyak 437 soalan berbanding daripada bulan-bulan sebelumnya yang hanya merekodkan purata sebanyak 142 soalan sebulan. Ini menunjukkan pertambahan sebanyak 200% selepas *QR Code* diperkenalkan.

FAEDAH-FAEDAH PELAKSANAAN: Inovasi *QR Code* ini dapat mengurangkan kecuaian lupa untuk merekod pertanyaan di dalam fail *J-Drive* kerana fail tersebut hanya dapat diakses oleh seorang pengguna dalam satu masa sahaja. Apabila *QR Code* diperkenalkan, proses perekodan pertanyaan yang diterima dapat direkodkan secara atas talian dengan hanya menggunakan telefon pintar sahaja. Proses penggunaan *QR Code* jauh lebih pantas dan efektif. Selain itu, DIEF yang disediakan amat mesra pengguna dan lebih tersusun berbanding borang pengisian maklumat di fail *J-Drive*. Inovasi ini juga dapat memberi data yang lebih tepat dalam statistik bilangan pertanyaan yang diterima dalam satu bulan dan mencapai sasaran yang ditetapkan.

KESIMPULAN: Kesimpulannya, Projek *QR Code* ini merupakan inovasi EKSA Unit Maklumat Ubat untuk memudahkan kerja-kerja perekodan pertanyaan yang diterima oleh semua pegawai farmasi. Walaubagaimanapun, inovasi ini dapat ditambah baik dengan meringkaskan borang pautan untuk mengurangkan masa pengisian maklumat pertanyaan.

Inovasi, No. 7

C-Pen Bank

Ahmad Fitri Mohd Ramli[1], Ching Min Wei[1], Mohamed Azmi Ahmad Hassali[2], Tai Chu Hong[1], Nur Asyikin Adzmi[1], Ummah Puteri Kumarasamy[1], Amy Cheah Poh Ann[1], Lee Wei Nian[1], Nur Syafiqah Zainuddin[1]

[1]Jabatan Farmasi, Hospital Putrajaya, [2]Fakulti Farmasi, Universiti Sains Malaysia

PENDAHULUAN: Projek C-Pen Bank adalah suatu inisiatif yang telah telah diambil bagi memperkasakan perkhidmatan penghasilan produk steril iaitu penyediaan ubat suntikan antibiotik yang dibekalkan kepada pesakit di wad kanak-kanak Hospital Putrajaya.

MASALAH SEBELUM INOVASI: Jumlah penggunaan harian bagi ubat injeksi Benzylpenicillin adalah sangat tinggi di kalangan pesakit kanak-kanak di Hospital Putrajaya. Hal ini menyebabkan beban kerja yang tinggi kepada pegawai pengeluaran steril kerana ubat perlu disediakan di dalam picagari secara individu mengikut jumlah dos harian. Selain daripada itu, pertukaran regimen rawatan serta pergerakan keluar pesakit discaj telah menyebabkan berlaku pembaziran di mana ubat yang telah disediakan terpaksa dibuang. Berdasarkan kajian yang telah dijalankan, sebanyak kira-kira 30% daripada keseluruhan ubat antibiotik yang disediakan tidak digunakan dan dibuang setiap hari. Selain itu, pembekalan ubat ini hanya dapat dilakukan pada waktu pejabat. Oleh itu, jururawat perlu membuat rekonstitusi di wad bagi kes-kes baharu yang diterima di luar waktu pejabat.

PENERANGAN PROJEK INOVASI: Melalui projek C-Pen Bank, ubat suntikan Benzylpenicillin disediakan secara pukal, iaitu sebanyak 50mL – 100mL di dalam botol cecair intravena 0.9% Sodium Chloride. Antara kelebihan produk ini adalah ia mempunyai tarikh luput yang lebih lama iaitu selama tujuh hari sekiranya tidak digunakan. Proses penghasilan produk ini juga adalah jauh lebih pantas dan memerlukan penggunaan *consumables* yang lebih sedikit berbanding sebelum ini. Melalui sediaan pukal ini, jururawat hanya perlu mengambil jumlah isipadu Benzylpenicillin yang diperlukan bagi setiap pesakit mengikut dos yang telah ditetapkan oleh doktor.

KEADAAN SELEPAS INOVASI: Pengeluaran dan pembekalan ubat suntikan Benzylpenicillin adalah lebih lancar dan pantas berbanding sebelum ini kerana proses kerja yang lebih efisien. Jabatan Farmasi juga dapat membekalkan ubat ini pada hujung minggu, dan secara langsung memudahkan tugas jururawat kerana tidak perlu lagi membuat rekonstitusi ubat selepas waktu pejabat.

FAEDAH-FAEDAH PELAKSANAAN INOVASI: Proses penghasilan ubat suntikan Benzylpenicillin adalah lebih pantas tanpa menjejaskan kualiti produk yang dihasilkan. Kini, ubat ini dapat dibekalkan sepanjang masa dan secara langsung meringankan beban kerja jururawat yang bertugas. Selain itu, pembaziran dapat dikurangkan kerana sediaan yang dibekalkan tidak lagi spesifik kepada seseorang pesakit, tetapi ia boleh digunakan oleh mana-mana pesakit di dalam sesebuah wad.

KESIMPULAN: Inovasi C-Pen Bank bukan sahaja dapat mengurangkan kerumitan proses kerja malah terbukti dapat mengurangkan pembaziran dan menjimatkan perbelanjaan kerajaan. Ianya juga berpotensi untuk diaplikasikan oleh fasiliti-fasiliti Kementerian Kesihatan Malaysia yang lain supaya dapat menyediakan perkhidmatan pembekalan ubat steril yang lebih efisien dan berkualiti tinggi kepada wad.

Inovasi, No. 8

Smart Integrated Reporting Insight (SIRI)

Helmi Hafiz Hashim[1], Nurrafizah Ahmad[1], Syed Fadzli Syed Sailuddin[1], Aina Nazirah Rosman[2]

[1]Bahagian Perkhidmatan Farmasi JKWPKL&P, [2]Klinik Kesihatan Kuala Lumpur

PENDAHULUAN: Pelaporan Pengurusan Farmasi (PF) dan Petunjuk Prestasi Utama *(Key Performance Index, KPI)* merupakan kaedah utama bagi setiap fasiliti di bawah JKWPKL&P melaporkan aktiviti Farmasi yang telah dilaksanakan. Laporan ini akan dihantar oleh fasiliti ke Penyelaras PF/KPI peringkat Jabatan melalui Pegawai Farmasi Kesihatan yang kemudiannya akan diekstrak/dikompilasi/ dianalisa sebelum dipanjangkan ke Bahagian Perkhidmatan Farmasi (BPF), KKM melalui Timbalan Pengarah Kesihatan Negeri (Farmasi) mengikut tarikh yang ditetapkan. Pelaporan ini diperlukan bagi melihat pencapaian, menjadi sumber rujukan dan asas bagi pembentukan garis panduan atau polisi yang baru.

MASALAH SEBELUM INOVASI: Proses ekstrak/kompilasi/analisa memakan masa yang sangat lama sehingga lima hari, setiap bulan, kerana melibatkan hampir 23,445 unik data dari dua Hospital, 5 PKD dan 17 KK. Laporan akhir yang dijana tidak dijamin ketepatan datanya kerana melibatkan jumlah data yang banyak. Penghantaran laporan akhir ke BPF,KKM seringkali melebihi tarikh yang ditetapkan. Kesilapan data di dalam laporan akhir sering berlaku dan perlu menyemak semula semua laporan yang diterima untuk pembetulan. Penyelaras PF/KPI terpaksa membuat proses ekstrak/kompilasi/analisa di rumah, luar waktu pejabat sehingga lewat malam bagi menepati masa penghantaran laporan ke BPF, KKM.

PENERANGAN PROJEK INOVASI: Inovasi yang dibangunkan telah mengatasi semua masalah beserta faedah tambahan dengan memudahkan/memendekkan proses ekstrak/kompilasi/analisa daripada 5 hari kepada serta-merta disamping menjamin ketepatan/integriti data. Formula/skrip yang telah 'ditanam' membolehkan data dari setiap laporan PF/KPI secara berasingan diekstrak, dianalisa dan kemudian dikompilasikan secara automatik serta *real-time* ke satu fail lain yang lengkap yang dijenamakan SIRI, siap untuk dihantar ke BPF, KKM.

KEADAAN SELEPAS INOVASI: Tiada proses manual diperlukan, seterusnya meningkatkan produktiviti dan mutu kerja. Ketepatan data yang dikompilasi dijamin 100%. Laporan dapat dihantar ke BPF, KKM pada tarikh yang ditetapkan.

FAEDAH-FAEDAH PELAKSANAAN: Masa yang dijimatkan dapat dimanfaatkan untuk menjalankan aktiviti pengurusan farmasi lain sekaligus meningkatkan produktiviti kerja. SIRI adalah mesra pengguna dan anggota Farmasi boleh menggunakannya dengan mudah. Proses ekstrak/kompilasi/analisa 23,445 unik data menggunakan tenaga manusia yang minima. SIRI dapat diakses pada bila-bila masa dan dimana jua.

KESIMPULAN: SIRI adalah proses berinovatif berimpak tinggi dimana ianya dapat mempermudahkan proses ekstrak/kompilasi/analisa dan penjanaan laporan akhir serta menjamin ketepatan/integriti data laporan.

*Konvensyen Inovasi dan Kreativiti Farmasi 2017: Pemenang Tempat Ketiga

Kumpulan Inovatif dan Kreatif (KIK), No. 1

t-UMP

Siti Juwahir Binti Jumi[1], Izzah Syahmina Binti Anuar[1], Lee Yun Shiang[1], Shangeetha A/P Selarajoo[1], Teng Sook Yee[1], Asilah Binti Che Ayub[1]

[1]Jabatan Farmasi, Hospital Putrajaya

Projek KIK yang dikendalikan oleh kumpulan ini mengambil inisiatif untuk memperkasakan lagi perkhidmatan Ubat Melalui Pos (UMP) di Hospital Putrajaya (HPj). Objektif projek ini dijalankan adalah untuk mengurangkan masa pendaftaran dan penyediaan bekalan ubat susulan melalui perkhidmatan UMP, mengurangkan risiko kesilapan pendispensan, menjimatkan kos pelanggan dan jabatan, serta meningkatkan kecekapan, sekaligus menaikkan imej baik Jabatan Farmasi HPj.

Beberapa punca masalah dikenalpasti seperti tempoh masa yang lama diperlukan oleh pesakit untuk mengisi borang UMP di Kaunter Farmasi Klinik Pakar, kesukaran membaca tulisan pesakit dalam borang UMP, serta pembaziran masa akibat penyalinan semula semua maklumat pesakit dari borang UMP. Oleh itu, kumpulan KIK ini telah mereka beberapa cara penyelesaian yang lebih mesra pelanggan dan diberi nama t-UMP.

Penghasilan inovasi t-UMP ini telah menghapuskan penggunaan borang manual sepenuhnya. Ia berjaya mengurangkan kesesakan di kaunter Farmasi Klinik Pakar terutama pada waktu puncak, memberi kemudahan kepada pelanggan yang kesuntukan masa untuk hadir mengambil ubat di farmasi, seterusnya berjaya meningkatkan pencapaian masa menunggu di Farmasi Klinik Pakar, dari 95.5% kepada 97.66%.

Inovasi t-UMP yang digunakan bersama dengan aplikasi *excel.report* berjaya menghapuskan proses kerja penyalinan semula maklumat pesakit daripada borang manual ke dalam *database* UMP. Semua maklumat pesakit yang diperlukan dapat diekstrak terus daripada aplikasi tersebut. Penghapusan ini dapat mengurangkan risiko kesilapan akibat kesukaran membaca tulisan pesakit yang kurang jelas. Inovasi t-UMP ini dapat menghasilkan penjimatan masa yang diperlukan untuk memproses borang manual, iaitu dari 9 hari kepada 4 hari sebulan, selain dapat menjimatkan kos kertas dan percetakan dari RM113 kepada RM11 sebulan.

Ini terbukti dapat meningkatkan produktiviti anggota di samping meningkatkan imej dan kualiti perkhidmatan farmasi di HPj. Terdapat peningkatan jumlah penyertaan pesakit dalam perkhidmatan UMP, iaitu peningkatan sebanyak 13.9% pada tahun 2018 (14,944 penyertaan) berbanding tahun 2017 (13,125 penyertaan).

Inovasi t-UMP ini telah diperluaskan penggunaannya ke Pusat Bersalin Berisiko Rendah (PBBR) di Presint 8, bermula pada Disember 2018. Kini, pesakit-pesakit di PBBR, khususnya pesakit Dermatologi dan pesakit Obstetrik & Ginekologi dapat menikmati kemudahan UMP yang lebih mesra pengguna yang pastinya memberi banyak manfaat kepada mereka untuk mendapatkan bekalan ubat susulan. Inovasi ini juga adalah sebahagian daripada kaedah tranformasi perkhidmatan kesihatan di KKM dalam menjadikan kerajaan yang lebih responsif, efektif dan memberi impak yang tinggi dalam penyampaian perkhidmatan berkualiti kepada rakyat.

*Persidangan Kebangsaan Pusat Perubatan Akademik 2018: Pemenang Tempat Kedua

Kumpulan Inovatif dan Kreatif (KIK), No. 2

Kad *Patient's Own Medicines* (POMs)

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[1]Jabatan Farmasi, Hospital Rehabilitasi Cheras

Hospital Rehabilitasi Cheras (HRC) mendapat rujukan pesakit dari hospital-hospital di seluruh Malaysia untuk mendapatkan rawatan rehabilitasi. Kebanyakan pesakit yang dirujuk ini telah dimulakan rawatan penyakit kronik dari hospital primari masing-masing. Jabatan Farmasi HRC menghadapi masalah apabila pesakit kehabisan ubat atau tidak membawa ubat mereka semasa mendapatkan rawatan rehabilitasi di HRC. Ini adalah kerana formulari ubat HRC adalah terhad dan tidak dapat menampung kepelbagaian ubat yang dirujuk. Bagi mengatasi masalah ini dan meringankan beban jabatan farmasi, Kumpulan Sinaran telah mencipta kad *Patient's Own Medicines (POMs).* Projek ini mendapat sokongan berterusan dan pengiktirafan pelaksanaan daripada Pengarah Hospital dan Ketua Jabatan Farmasi.

Kad *POMs* merupakan satu kad kepada pesakit yang bertujuan untuk mengingatkan pesakit supaya membawa bersama ubat semasa menerima rawatan di wad. Signifikasi pemilihan projek ini adalah kerana menyokong program *POMs* yang diperkenalkan oleh Bahagian Perkhidmatan Farmasi pada tahun 2016. Program *POMs* menggalakkan pesakit untuk membawa ubat-ubatan mereka ke hospital supaya anggota kesihatan dapat mengenal pasti sejarah pengubatan yang tepat bagi memastikan kesinambungan penjagaan pesakit.

Melalui program *POMs*, penggunaan ubat boleh dioptimakan dan pembaziran ubat boleh dielakkan. Pengumpulan data telah dilaksanakan pada Januari dan Februari 2018 di mana sebanyak RM 2381.21 kos ubat-ubatan telah dijimatkan. Selain itu, kumpulan KIK telah mengadakan kajian tinjauan berbentuk soal selidik kepada anggota hospital, pesakit dan ahli keluarga pesakit. Kumpulan KIK Sinaran telah memilih strategi *design thinking* untuk menyelesaikan masalah ini. Sejak terciptanya kad *POMs*, ia telah digunakan secara meluas di Hospital Rehabilitasi Cheras dan diedarkan ke semua wad dan klinik. Berdasarkan soal selidik yang dijalankan ke atas 30 orang anggota hospital, terdapat peningkatan pesakit yang membawa bersama ubat semasa kemasukan ke hospital.

Projek ini dapat meningkatkan ekonomi negara melalui penjimatan kos pembelian ubat serta meningkatkan kesedaran dan penglibatan rakyat Malaysia dalam sektor kesihatan. Potensi pengembangan projek ini dapat dilihat kerana ia mudah untuk digunapakai kerana menggunakan bahan-bahan yang senang didapati dan kos yang rendah, serta penggunaan Bahasa Melayu dan Bahasa Inggeris yang bersesuaian dengan rakyat tempatan. Selain itu, proses penghasilan produk hanya memerlukan masa yang singkat.

*Mini Konvensyen KIK JKWPKL&P 2019: Pemenang Tempat Kedua

Kumpulan Inovatif dan Kreatif (KIK), No. 3

Go!Cert

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[1]Bahagian Perkhidmatan Farmasi, Jabatan Kesihatan Wilayah Persekutuan Kuala Lumpur dan Putrajaya

Setiap pembelajaran berterusan akan diberikan mata kredit seperti yang ditetapkan dalam Surat Pekeliling KPK Bilangan 6 Tahun 2016 dan sijil tamat kursus adalah bukti mata kredit yang diperolehi. Pencapaian mata CPD ditetapkan untuk pembaharuan Sijil Tahunan Ahli Farmasi, penilaian Anugerah Pekerja Cemerlang dan merupakan Petunjuk Prestasi Utama (KPI) untuk perkhidmatan awam kerajaan Malaysia.

Sebelum projek dilaksanakan, urus setia perlu menyediakan senarai tandatangan kehadiran peserta, mengedar borang penilaian LDP1C (Borang Laporan Penilaian Keberkesanan Kursus (Dalam dan Luar Negara KKM) dan LDP1D (Borang Penilaian Keberkesanan Kursus) kepada peserta. Urus setia akan menyediakan sijil berdasarkan senarai kehadiran dan hantar kepada Timbalan Pengarah Kesihatan Negeri (Farmasi) untuk tandatangan pada setiap sijil bagi setiap peserta. Dianggarkan proses ini memerlukan 2 minggu dari hari tamat kursus sehingga pengedaran sijil. Kemungkinan kehilangan sijil akan berlaku semasa pengedaran.

Ahli kumpulan menjalankan kajian dan analisa atas masalah ini dan hasilnya adalah membangunkan satu sistem iaitu *Go!Cert*, yang berasakan *web-based* tanpa melibatkan kepakaran luaran.

Peserta kursus hanya mengimbaskan Kod QR dan mengisi borang maklum balas *Google Form* atas talian berkenaan kursus yang dihadiri. Sijil tamat kursus akan dihantar kepada peserta dalam 1 hari. Dengan ini, perbelanjaan percetakan sijil dapat dikurangkan dan sijil ini dapat dimuatnaikan ke myCPD2 sebagai bukti tuntutan mata CPD.

Faedah projek dapat menjimatkan masa, tenaga kerja dan kos percetakan, serta meningkatkan kepuasan hati pelanggan dan *stakeholder*. Impak lain termasuk analisis keberkesanan kursus LDP1D dan keberkesanan pegawai LDP1C yang menghadiri latihan.

Penggunaan sistem *Go!Cert* telah diseragamkan untuk kursus anjuran Bahagian Perkhidmatan Farmasi, Jabatan Kesihatan Wilayah Persekutuan Kuala Lumpur dan Putrajaya (JKWPKL&P). Pelaksanaan sistem ini dapat dikembangkan dan diperluaskan ke 2 Hospital, 5 Pejabat Kesihatan Daerah, Klinik Kesihatan serta Bahagian-bahagian lain di JKWPKL&P.

***Mini Konvensyen KIK JKWPKL&P 2019: Pemenang Tempat Keempat**

Kumpulan Inovatif dan Kreatif (KIK), No. 4

TEMP-TRUST

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Suhu adalah amat kritikal dan jika produk rangkaian sejuk disimpan di luar julat, terdapat risiko ubat dan vaksin akan rosak dan tidak dapat digunakan. Demi memastikan keselamatan dan kualiti produk terjaga, penentuan suhu yang tepat dan pemantauan aspek pengurusan rangkaian sejuk sangat penting.

Kebanyakan termometer digital yang digunakan di fasiliti JKWPKL&P tidak dikalibrasi secara berjadual selepas sijil kalibrasi tamat tempoh. Menurut hasil soal selidik, 70% staf meragui bacaan suhu termometer apabila termometer tersebut telah jatuh tetapi masih digunakan kerana proses penggantian baru yang lambat. Sehingga kini, masih belum ada kaedah lain yang boleh digunakan untuk memastikan bacaan suhu adalah betul dalam masa yang singkat apabila temometer tersebut diragui bacaan.

Satu prosedur verifikasi termometer dibangunkan untuk verifikasi termometer digital yang telah tamat tempoh kalibrasi di fasiliti JKWPKL&P. Prosedur yang telah diperakui oleh Pengarah Kesihatan Negeri dan Jawatankuasa Pengurusan Rangkaian Sejuk JKWPKL&P ini diletakkan di dalam Kit Verifikasi TEMP-TRUST. Jika mempunyai keraguan terhadap bacaan termometer, maka Kit Verifikasi TEMP-TRUST boleh digunakan. Penambahbaikan telah dilakukan untuk memastikan kaedah ini memberi keputusan yang lebih tepat dan dipercayai.

20 Kit Verifikasi TEMP-TRUST telah diagihkan ke hospital dan pejabat kesihatan termasuk dua Kit simpanan di JKWPKL&P. Projek ini dilaksanakan di semua 37 fasiliti kesihatan, melibatkan hospital, klinik kesihatan, K1M dan Klinik Kesihatan Ibu dan Anak.

Sebanyak 123 dari 129 termometer yang diverifikasi telah lulus proses verifikasi manakala enam termometer gagal. Enam termometer yang gagal verifikasi perlu dihantar untuk kalibrasi atau ditukar baru.

Inovasi ini telah mengurangkan kos operasi kerana hanya termometer yang gagal verifikasi perlu dihantar untuk kalibrasi atau ditukar baru. Ini memberikan penjimatan langsung sebanyak RM 11,760.00. Selain itu, projek ini dapat menjimatkan masa dan meningkatkan tahap produktiviti kerana proses verifikasi menggunakan kit verifikasi memudahkan tugas dan mempercepatkan proses kerja sedia ada, dari 19 hari kepada 90 minit sahaja. Berdasarkan Kajian Kepuasan Pengguna yang dijalankan, 89% staf menyokong penggunaan kit verifikasi manakala 94% staf pula berpendapat ianya sesuai digunakan.

Kit Verifikasi TEMP-TRUST merupakan satu inisiatif berinovatif yang diperkenalkan bagi memastikan kualiti ubat/vaksin yang diberikan kepada pesakit diyakini.