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ORAL PRESENTATION

Abstract Number: 41
Abstract Category: Empower - Clinical Sciences

Prevalence and Predictors of potentially inappropriate prescribing among older adults admitted to tertiary general hospital

Ms Vivian Y Too[1], Ms Esther JN Seow[1], Dr Pei-shi Ong[1], Ms Chau Wei Ling[2], Ms Deborah MH Chia[2]
[1]Department of Pharmacy, National University of Singapore, [2]Department of Pharmacy, National University Hospital

Background: Potentially inappropriate medications (PIMs) can cause negative health consequences. Among hospitalised elderly in Singapore, the prevalence of PIMs is unknown.

Aim: To determine the prevalence and predictors of PIMs among hospitalised elderly in Singapore, using the Screening Tool of Older People's Prescriptions (STOPP) Version 2 criteria.

Methods: To determine the prevalence of PIMs, de-identified electronic medication records of patients admitted to National University Hospital, Singapore, between July 2015 and October 2017 were screened for PIMs using STOPP V2. Subsequently, univariate analysis followed by binary logistic regression were conducted to identify factors associated with PIMs.

Results: Of 151 eligible participants, 74 (49.0%) and 84 (55.6%) received at least one PIM on admission and at discharge respectively. Despite the increase in number of patients with PIM(s), PIM index decreased from 0.120 to 0.097 (19.2% reduction). The most common pre-admission PIMs were proton-pump inhibitors (10.1%) and calcium with vitamin D supplements (7.9%) without indication, followed by use of vasodilators with postural hypotension (5.8%). At discharge, they were also proton pump inhibitors (11.9%) and calcium with vitamin D supplements (7.7%) without indication, followed by first-generation antihistamines (6.3%) and ferrous fumarate at a higher-than-recommended dose (5.6%).

Number of medications was found to be a significant predicting factor of PIMs, both on admission (aOR 1.187, 95%CI 1.088—1.295, P<0.001) and at discharge (aOR 1.207, 95%CI 1.090—1.337, P<0.001).

Conclusions: PIMs are highly prevalent among hospitalised elderly in Singapore. Future clinical employment of STOPP V2 during hospitalisation and actively deprescribing inappropriate PPIs may potentially improve medication appropriateness.

ORAL PRESENTATION

Abstract Number: 54

Abstract Category: Pharmacy Technician Project - Quality Improvement Process

Implementation of Commercial Barcode Paired Scanning in Reducing Manual Packing Errors at TTSH Outpatient B2 Pharmacy

Mr Ooi Kit Siang[1]

[1]*Tan Tock Seng Hospital*

Background: In the past, manual packing were mainly done by visual comparison between the physical item and drug image shown on the system at Outpatient Basement 2 Pharmacy (B2P) in Tan Tock Seng Hospital. In 2017, 466 packing near misses were reported. Wrong drug and strength accounted for about 25% of these near misses. These packing near misses, if not caught in time, would have reached the patients and resulted in unintended patient harm. Therefore, this project aims to achieve zero packing errors in drugs with commercial barcode available.

Method: Drugs kept at B2P were first filtered to extract those with commercial barcodes. This list is subsequently configured in Rxpress (OPAS Workflow Engine) to enable “paired scanning” (i.e. scanning of barcode on the patient drug label followed by scanning of commercial product barcode to ensure matching of the two). With this configuration, it is now mandatory to perform paired scanning thus eliminating manual dependencies.

Results: Since the implementation of commercial barcode scanning in September 2017, 95% of the drugs with commercial barcode have been implemented with barcode scanning. When comparing the period before (September 2016 – August 2017) and after (September 2017 – August 2018) the implementation of barcode scanning, there was an overall 36% reduction in manual packing errors and 87% reduction in manual packing errors for items with commercial barcode observed.

Conclusion: TTSH OPAS commercial barcode implementation is crucial in reducing manual packing errors which will result in better patient medication safety.

ORAL PRESENTATION

Abstract Number: 62

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Examining the needs for medicine management in the care of adult palliative patient

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Background: Palliative patients are often on multiple medications for disease control and symptom management, increasing the risk of drug-related problems (DRP). The lack of pharmacist involvement in medication management in ambulatory palliative care settings could exacerbate these problems during transitions-of-care.

Aims and Objectives:
1. To evaluate the needs for medication management in palliative care.
2. To identify adult palliative patients' needs regarding medication management during transitions-of-care
3. To explore patients' perspectives towards ambulatory pharmaceutical care models

Methods: Retrospective cross-sectional data of 162 adult female patients referred to palliative care at KK Women's and Children's Hospital (KKH) were analysed quantitatively to identify patient who are at increased risk of DRPs and the common DRPs. Subsequently, prospective semi-structured qualitative interviews were administered to 15 adult female palliative patients who are at high risk of DRPs, namely patients with 3 or more chronic medications, to explore their perspectives towards ambulatory pharmaceutical care models. Interviews were transcribed verbatim before being open-coded and analysed thematically.

Results: Patients with higher number of chronic medications (OR=1.159, p=0.037) are at increased risk of DRPs. Common medication-related issues encountered by patients included uncontrolled symptom management, non-compliance and inadequate explanation on medications. Most patients were satisfied with the current pharmacy services but highlighted problems with accessibility to pharmacists. The majority were more receptive towards telepharmacy over pharmacist led clinic, preferring to call only when necessary rather than regular follow up call. Most patients were reluctant to pay for the service, if available, due to financial difficulties. From the interviews, three patient archetypes emerged – "Self-initiated", "Obedient" and "Unconcerned", each displaying unique characteristics, allowing further stratification of pharmaceutical needs.

Conclusion:
The findings increase limited knowledge on pharmaceutical needs of palliative patients. This allows us to better design a well-received ambulatory pharmaceutical care model that cater to patients' pharmaceutical needs.

ORAL PRESENTATION

Abstract Number: 89
Abstract Category: Engage - Pharmacy Practice

Safety Outcomes Following PPI Deprescribing Among Patients Discharged From a Tertiary Hospital

Miss Shi Xun Lee[1], Ms Yi Rong Chen[1], Ms Christina Tan[1]
[1]*Tan Tock Seng Hospital*

Background: Inappropriate proton pump inhibitors (PPI) use has been well established. Locally, 43.2% of inpatients at Tan Tock Seng Hospital prescribed with PPI had no indication for its use. Long-term PPI use is associated with increased risks of unwanted side effects such as Clostridium difficile infection, hypomagnesemia and others. Several de-prescribing strategies propose the discontinuation or reduction in dosage of PPI, or switching to histamine-2 receptor antagonists (H2RAs). However, the safety of de-prescribing PPIs in local practice is not yet established and it is unknown whether de-prescribing will be tolerated.

Method: A retrospective study was conducted among patients whose PPI was de-prescribed during an inpatient admission. Eligible patients who were admitted between 1st Jun to 31st Oct 2017 were identified and followed through for 6 months from discharge to determine if de-prescription was successful or if they required PPI re-initiation or alternative acid-suppressant therapies (antacids, H2RAs).

Results: Of the 262 patients included in this study, 23 had demise before the 6-month timepoint while 164 patients remained de-prescribed. 57.6% of included patients had at least one relevant comorbidity (including peptic ulcers, dyspepsia or anemia). Majority of patients were de-prescribed by dose de-escalations (51.9%), 27.1% discontinued PPIs, 18.7% switched to H2RAs and 2.3% used PPIs only when necessary. Dose de-escalations had the highest de-prescribing success rate of 64.7%. Of the 75 re-initiated cases, 9 were due to upper gastrointestinal bleeding events. Majority of patients had no clear reasons for re-initiation, possibly due to gaps in continuity of care.

Conclusion: 6 in 10 patients were successfully de-prescribed and physicians tended to opt for dose de-escalations rather than discontinuation or alternatives. Proper documentation would provide greater insight on the reasons for re-initiation. Identifying risk factors for de-prescribing failure could refine our criteria for safer de-prescribing in practice.

ORAL POSTER PRESENTATION

Abstract Number: 5

Abstract Category: Engage - Pharmacy Practice

Severe Distress & Denial among Asian Patients with Type 2 Diabetes in the Primary Care: A prospective, cross-sectional, multicentre study

Dr Cheryl Wei Yan Tan[1], Ms Yingqi Xu[2], Dr Joyce Yu Chia Lee[2]

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Diabetes distress coupled with high cardiovascular risk contributes to poorer outcomes. However, the relationship between cardiovascular risk and diabetes distress among the Asian population with Type 2 Diabetes Mellitus (T2DM) in the primary care setting is unknown.

Objectives were to evaluate the association between cardiovascular risk and diabetes distress, and to identify the point-prevalence and distribution of diabetes distress, as well as characteristics of the various distress states.

This was a prospective, cross-sectional, multicentre study conducted in two outpatient clinics. Patients aged ≥21years with HbA1c>7.0% and polypharmacy were included. Patients with Type 1 DM or who were unable to communicate independently in English, Mandarin or Malay were excluded. Participants were stratified into two groups based on their Framingham Risk Score (FRS) and matched according to their baseline HbA1c. Cardiovascular risk was estimated using the FRS while diabetes distress was measured using the Problem Areas in Diabetes (PAID) scale.

Of 210 participants recruited, 132 (62.9%) were eligible for analysis. Median PAID score was 17.5 (IQR 6.25-41.56), with an even distribution in each distress category. There was no significant difference in PAID scores between high and low FRS groups (20.00 vs 13.75, p=0.446). Additionally, PAID score distribution within each group was similar (McNemar-Bowker test, p=0.477). A high prevalence of severe distress (31.4%) and denial (33.8%) was detected in our initial cohort. Among those in denial, 58.7% had accompanying intermediate-high 10-year cardiovascular risk. Subgroup analyses revealed that participants of Indian ethnicity and those with full-time employment were more likely to have severe distress whereas denial seemed more common in Malays, those of lower education and retired individuals.

There was no clear association between cardiovascular risk and diabetes distress in our sample of Asian primary care patients with T2DM. A high prevalence of severe diabetes distress and denial was detected in this cross-sectional study.

ORAL POSTER PRESENTATION

Abstract Number: 27
Abstract Category: Educate - Pharmacy Education

Construction of a probiotic reference guide for community pharmacists in Singapore and a video clip on use of probiotics for consumers

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[1]National University of Singapore [2]Watson's Personal Care Stores Pte Ltd

Background: With a wide range of probiotics available and health benefits of probiotics being strain-specific, it is challenging for community pharmacists to provide probiotic recommendations. Community pharmacists rely on international guidelines as one of the resources to guide them. However, international guidelines are not regularly updated and do not provide a holistic understanding of probiotic.

Objectives: Construction of a comprehensive, holistic, and up-to-date probiotic practice reference guide to aid community pharmacists in their practice, followed by production of a video clip for consumer education based on the reference guide and evaluation of the materials' effectiveness.

Methods: A literature search of articles that evaluated the effectiveness of probiotics with various medical conditions was conducted on PubMed (01/01/2008 to 31/12/2018). Included articles were categorised according to the Oxford level of evidence and a guide was developed for selection of probiotic strains according to specific medical conditions. A focus group discussion (FGD) involving six community pharmacists was conducted to evaluate the effectiveness of the guide in relation to their practice. Semi-structured individual interviews were conducted on recruited participants for evaluation of the effectiveness of the video clip.

Results: Data from 402 eligible articles were constructed into the reference guide, which was used to produce the video clip. During the FGD, participating community pharmacists expressed negative feedback about applicability, quality, and format of the constructed guide. Key aspects suggested to improve the effectiveness of the guide were addition of product-strain(s) matching information and conversion of the guide into an electronic application format. On the other hand, most interviewees found the video clip educational and organized.

Conclusion: A comprehensive, holistic, and up-to-date probiotic guide based on strain-specific effectiveness did not aid community pharmacists in their practice. The video clip was generally well-received and effective in educating consumers, especially those with limited prior knowledge on probiotics.

ORAL POSTER PRESENTATION

Abstract Number: 40

Abstract Category: Engage - Pharmacy Practice

Using Beer's Criteria 2015 and 2019 to Determine the Prevalence and Factors Associated with Potentially Inappropriate Medications in Elderly Hospitalised Singaporeans

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[1]Department of Pharmacy, National University of Singapore, [2]Department of Pharmacy, National University Hospital

Background: Polypharmacy is an increasing problem as it increases the risk of being prescribed a potentially inappropriate medication (PIM). To date, no Singaporean study has used Beer's Criteria 2015 or 2019 to determine the prevalence of PIM usage.

Objective: To determine the prevalence and factors associated with PIM usage in Singapore using Beer's Criteria 2015 and 2019.

Methods: This retrospective cross-sectional study gathered information on patients ≥65 years old who were admitted on randomly selected dates at National University Hospital, Singapore. Patients' medication lists on admission and discharge were evaluated using Beer's Criteria 2015 and 2019. Univariate tests, followed by multivariate analysis, were used to identify factors associated with PIMs.

Results: Of 877 patients screened, 151 were eligible. The prevalence of PIMs increased from 53.6% on admission to 69.5% on discharge when Beer's Criteria 2015 was used, and from 55.0% to 69.5% when Beer's Criteria 2019 was used. Omeprazole and frusemide were the most common PIMs. Number of medications were independently associated with PIMs ($p<0.001$ on admission with both Beer's Criteria 2015 and 2019; $p=0.006$ on discharge with Beer's Criteria 2015; $p=0.007$ with discharge for Beer's Criteria 2019). Use of PIMs was not independently associated with readmission 6 months post-discharge. There was good agreement between the two criteria on admission (kappa=0.947) and discharge (kappa=0.923).

Conclusion: The high prevalence of PIMs found indicates the need to improve medication appropriateness in the elderly, especially those with polypharmacy. Hospitalisation should be used as an opportunity to improve medication regimens.

ORAL POSTER PRESENTATION

Abstract Number: 44

Abstract Category: Empower - Clinical Sciences

Addressing Challenges Faced by Pharmacy Staff and Older Persons in Using Prescription Medication Labels – A Need for System Level Improvements.

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[1]Centre for Ageing Research and Education, Duke-NUS Medical School [2]Health Services and Systems Research, Duke-NUS Medical School

Background & objective(s): Prescription medication labels (PMLs) are predominantly dispensed in English, although many older Singaporeans cannot read English. As PMLs are an important adjunct to medication counselling, they are routinely used by pharmacy staff to counsel older Singaporeans.

Methods: This qualitative study documents the challenges faced by users of PMLs and the solutions adopted. In total, 30 in-depth interviews were conducted;20 were equally divided between older community-dwelling Singaporeans (≥60 years) who could read English and those with limited/no English reading ability, and 10 were conducted with pharmacy staff across 6 polyclinics. The interviews were audio-taped, transcribed verbatim and analysed thematically.

Results: Interviews with older Singaporeans and pharmacy staff revealed similar challenges in using PMLs. The first challenge related to reading and understanding PMLs by older people, mainly due to their limited English proficiency (LEP) or illiteracy. To address LEP, pharmacy staff reported translating PML instructions verbally and handwriting them on PMLs – often, such instructions related to dose and frequency. For illiterate patients, pharmacy staff reported drawing illustrations on PMLs to communicate key medication information. Also, numbers expressed in words on PMLs, were re-written as numerical digits. The second challenge related to PML readability, due to small font-size. To address this, pharmacy staff routinely re-wrote medication information on PMLs in larger handwriting. A third challenge pertains to the lack of indication on PMLs that pharmacy staff were often requested to handwrite in patients' preferred language.

Conclusion: Improvised solutions by pharmacy staff to address challenges faced by older Singaporeans in using PMLs, indicate a pressing need for system-level improvements to PMLs. Further, older Singaporeans expressed desire to obtain detailed medication information through PMLs or medication counselling. Improvements such as standardised and legible bilingual medication instructions and/or pictograms would appreciably facilitate medication counselling, allow for better understanding of PMLs and free-up time for detailed medication counselling.

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ORAL POSTER PRESENTATION

Abstract Number: 45

Abstract Category: Engage - Pharmacy Practice

Prevalence and Factors Associated with Medication Non-Adherence To Newly Initiated Chronic Medications In Urology Patients In Singapore

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Background: Medication non-adherence results in poor disease control and many negative consequences. Thus, there is a need to understand the current landscape of medication non-adherence and address it with suitable interventions. The primary objective of this study is to determine the prevalence of medication non-adherence in patients newly initiated on chronic medication for urological conditions in Singapore. The secondary objective is to investigate the factors associated with medication non-adherence in these patients.

Methods: A cross-sectional study was conducted on a convenience sample of outpatient prescriptions filled between January and October 2018 in Singapore General Hospital. Patients newly initiated on a chronic medication for their urological condition were recruited. A telephone interview, including administration of a questionnaire with a modified version of Thompson's Medication Adherence Rating Scale (MARS), was conducted 30 days after medication initiation. Adherence was supported by refill records. Participants were classified as non-adherent if they have: (i) a score of less than 3 on MARS Questions 1-4, (ii) a Proportion of Days Covered value of <80%, or (iii) discontinued their medication. Descriptive statistics and logistic regression analysis were conducted using SPSS version 25.

Results: Data of 117 patients was collected and analysed. The prevalence of non-adherence was 40.2%. Logistic regression analysis showed that experiencing side effects [odds ratio (OR) 0.41, 95% confidence interval (CI) 0.19-0.92] and taking anticholinergic drugs (OR 0.49, CI 0.22-1.12) were associated with medication non-adherence, although the latter was not statistically significant when analysed using multivariate analysis.

Conclusion: The prevalence of medication non-adherence is high in patients newly initiated on a chronic medication for their urological condition, reinforcing the need to improve medication adherence (MA) in these patients. Since experiencing side effects is associated with medication non-adherence, future studies on directed interventions to reduce or cope with side effects may be done to improve MA.

ORAL POSTER PRESENTATION

Abstract Number: 57

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Pharmacy Technicians Survey 2018

A/Prof Lita Chew[1], Ms Carolyn Ho[1]
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Background: The first pharmacy technicians survey was conducted by Ministry of Health (MOH) in 2011. The Pharmacy Technicians Survey 2018 was conducted to assess the impact of policies implemented since 2011, to better understand training needs for improvement in service delivery and to gather baseline data on competencies and developmental needs of entry-level pharmacy technicians.

Methods: The survey was conducted in two phases with online survey for pharmacy technicians followed by a series of focus group discussions involving pharmacy technicians, employers and graduates of the Advanced Diploma in Pharmaceutical Science. The questionnaire was designed to allow comparisons with 2011 survey and to cover the following areas: job satisfaction and career development, training, entry-to-practice (ETP) competencies and expanded roles for pharmacy technicians. Subgroup analysis by qualification groups were performed.

Results: A total of 951 pharmacy technicians across sectors took part in the online survey. Approximately two-third (68%) indicated that they were satisfied with their jobs. The perception of opportunities for skill development has improved significantly (80% in 2018 vs 50-60% in 2011). 82% perceived that training received from school was generally sufficient and 94% were satisfied with employer training. This was in contrast to the 60% who were satisfied with their training in 2011. The survey found low level of confidence at point-of-entry with only three key tasks that could be performed by at least 50% of the respondents. However, 82% took less than a year to become competent in all key tasks listed. On expanded roles, patient care roles such as provision of specific patient counselling on medication therapy were most desired.

Conclusion: The survey showed general improvements in job satisfaction, career development and training for pharmacy technicians despite issues such as workload and staff retention. The baseline ETP data will facilitate future studies on competencies of entry-level pharmacy technicians.

ORAL POSTER PRESENTATION

Abstract Number: 71

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Perspectives of the Pharmacy Community in Singapore towards Orodispersible Film and Its Compounding in the Pharmacy

Dr Wen Chin Foo[1,2], **Ms Sharlene, Shi Qi Lee[1]**, Dr Han Hui Cheong[3], A/Prof Sui Yung Chan[1]
[1]National University of Singapore [2]Roquette Asia Pacific Pte Ltd [3]KK Women's and Children's Hospital

Background: Extemporaneous oral liquid preparations are commonly compounded in the pharmacy for individualized pharmacotherapy. Limitations of such preparations are short shelf-lives and dose inaccuracies. The study team has developed a framework for the small-scale preparation of ODFs in the pharmacy, using a simple and cost-effective unit-dose compounding process and a miniature near-infrared spectroscopy to determine the identity and content of the drug. This survey is conducted to evaluate the perceptions of the pharmacy community in Singapore regarding the suitability of ODFs.

Objective: To understand the perspectives of the pharmacy community in Singapore towards suitability of ODFs for special patient populations, as well as their concerns and willingness to compound ODFs.

Method and Materials: Cross-sectional self-administered hardcopy and online 20-item questionnaires were developed. Hardcopy questionnaires were distributed at pharmacy department meetings while the online questionnaire was disseminated via e-mail to the person-in-charge of pharmacy departments of hospitals, polyclinics, community pharmacies, and pharmacy training institutions in Singapore. The inclusion criteria of participants were at least 21yo, proficient in English, and able to provide informed consent.

Results: The response rate was 35% out of 1161 questionnaires distributed as 408 pharmacists, pharmacy technicians and prospective pharmacists (pre-registration pharmacists and students) returned completed questionnaires. Of these, 80.1% agreed that ODFs were suitable for special patient populations, with many citing greatest suitability for school-aged/adolescent children aged 6-18 years and the young/middle-old aged 60-80 years. Respondents were concerned about administration (37.3%), palatability (24.3%) and storage conditions (24.3%) of ODFs. While insufficient resources and product quality were some concerns towards ODF compounding, 82.5% were supportive of implementing a simple and cost-effective ODF compounding and quality control method.

Conclusion: User requirements and current gaps in pharmacy compounding practices were identified. The pharmacy community was supportive of ODF and the implementation of the small-scale compounding of ODFs in the pharmacy.

ORAL POSTER PRESENTATION

Abstract Number: 73

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Development of a Near-infrared Spectroscopy Calibration Model for Ondansetron Drug Quantification in Modified Starch Orodispersible Films

Dr Wen Chin Foo[1,2], **Ms Deborah Ning Teo[1]**, Dr Bing Xun Tan[2], Dr Rajeev Gokhale[2], A/Prof Sui Yung Chan[1]

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Background: Orodispersible Film (ODF), a novel dosage form, has gained interest as it is easy to administer and improves compliance for patients with dysphagia. Near-infrared (NIR) spectroscopy has potential for quality control of extemporaneously compounded ODFs. As ODFs are hygroscopic in nature, low density polyethylene (LDPE) zip-lock bags are used to protect them from humidity and contamination, before they are packed in final protective packaging.

Objective: To develop a NIR spectroscopy calibration model for in situ quantification of ondansetron hydrochloride dihydrate (OND) content in Lycoat® ODFs with/without LDPE intermediate packaging.

Methods: Using MicroNIR Pro™, of the 650 ODFs scanned, 424 samples were used as the calibration set, while 226 samples were used as the validation set. Spectral data were analysed using Unscrambler X, by applying first order derivative and standard normal variate for data pre-treatment, and analysed using Partial Least Squares regression.

Results: Quantification models were validated to be linear, accurate and precise. Independent validation was performed. Calibration models for quantifying OND (2-10mg) in ODFs with/without LDPE packaging achieved good R-square and slope values close to 1, demonstrating linearity, that is, the ability of the method to obtain predictions that are proportional to the concentration of drug in the sample within the calibration range.

Conclusion: Miniaturized NIR spectroscopy can be used a quality control tool for monitoring OND content in ODFs as it offers ultra-rapid measurement times, real-time results, simple operation and cost-effectiveness. Its non-destructive nature allows every compounded dosage unit to be tested before reaching the patient. Optically transparent LDPE bags serve as useful intermediate packaging, allowing for visual inspection and drug content quantification without direct sample contact. However, care has to be taken for these models to be developed and validated before routine application.

POSTER DISPLAY

Abstract Number: 6

Abstract Category: Engage - Pharmacy Practice

Impact of Medication Safety Initiatives to Improve Patient Safety Culture in Watsons Pharmacy

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[1]Department of Pharmacy, Watson's Personal Care Store Pte Ltd

Background: Medication errors may lead to avoidable complications and unnecessary hospitalizations. Promoting a medication safety culture within a healthcare organization is important to ensure patient safety, but limited studies on medication safety in the primary care sector are available. A Medication Safety Core Team (MSCT) was set up in the pharmacy department of Watsons Personal Care Stores Pte Ltd to launch a series of medication safety initiatives, such as a medication error reporting system and pre-filled cautionary instructions in the dispensing system, with the objective to drive safe medication practice in Watsons pharmacy. This study aimed to evaluate the impact of medication safety initiatives led by the MSCT in a community pharmacy chain in Singapore.

Method: A cross sectional study using a validated survey by the Agency for Healthcare Research and Quality (AHRQ) was conducted to elucidate pharmacy staff's perceptions on medication safety culture in Watsons pharmacy before (November 2014) and after the set-up of the Medication Safety Core Team (September 2018). Mann Whitney U test was used to compare pharmacy staff's response on the 5-point Likert scales in the survey.

Results: A total of 46 (response rate = 40%) and 59 pharmacy staff (response rate = 52.7%) participated in the pre and post-intervention surveys in Year 2014 and 2018 respectively. Participants' overall perception about patient safety in the pharmacy increased significantly ($p<0.01$). The dimension for "communication about mistakes" had the highest growth (28%), followed by "overall perceptions of patient safety" (18%). Medication errors were documented more frequently but absolute rate was still low.

Conclusion: This project has shown that a MSCT plays an important role in cultivating good patient safety culture in community pharmacy. Future work is required to evaluate pharmacy staffing, work pressure and pace to further improve medication safety in a community pharmacy.

POSTER DISPLAY

Abstract Number: 7

Abstract Category: Pharmacy Technician Project - Quality Improvement Process

To Improve and Reduce Out-Of-Stock Situations in Sengkang General Hospital Outpatient Pharmacy

Ms Hui Jun Lim[1], Ms Thi Hai Van Nguyen[1], Ms Wai Ling Yip[1]
[1]*Sengkang General Hospital*

Inventory management is essential to ensure drug sufficiency for the undisrupted provision of drugs to patients. In Sengkang-General-Hospital-Outpatient-Pharmacy, the par level system which bases on the past monthly movement and estimation is sometimes unreliable. This leads to frequent occurrences of insufficient stock situations, when there is an unpredictable increase in demand for the medication. The objective of this project is to reduce out-of-stock situations by appointing a Pharmacy-Technician to be a gondola-in-charge for each gondola and to monitor the inventory of the items under their care. Gondola-in-charges will assist the team in monitoring stock levels effectively.

Fish-Bone-Diagram was conducted to identify the reasons for out-of-stock situations and the root causes. After which, independent sample t-test was used to compare mean average number of out-of-stock items over the 30 days before and after implementation of the new work flow. The analysis were performed using Statistical Package for the Social Sciences version 17 assuming a 2-sided t-test at 5% level of significance.

Total of 34 out-of-stock items were identified in April-2018(pre-implementation) and 15 items were identified in August-2018(post-implementation).Before implementation, the average number of out-of-stock items per day was 1.1.After the implementation, the amount of out-of-stock item per day was reduced to 0.5 item a day($p<0.05$,average 0.63 items/day).

The results have proved that the workflow can be implemented to help to reduce out-of-stock situations and allow Pharmacy-Store to cope with the fluctuation of demand. It is important to have enough stocks in the pharmacy to reduce patients' waiting time, improve efficiency and patients' satisfaction. In the past, the inventory team was only informed when stocks were running out or critically low. The collaboration between gondolas-in-charge and the inventory-team was shown to reduce insufficient stock situations. However, this is a new workflow hence the Pharmacy-Technician are still adapting to it. The inventory-team still needs to remind gondolas-in-charge to be proactive to check and top up the gondolas daily.

POSTER DISPLAY

Abstract Number: 8

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Pilot study of IT tool to identify clinically stable patients for alternate day medication review to enhance work efficiency in a community hospital

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[1]JurongHealth Campus-NUHS [2]Jurong Community Hospital

Introduction: Community hospitals have been designed to bridge patient transition from acute care back to the community. As patients in these settings tend to be clinically more stable, they are generally reviewed by doctors three times weekly. In view of increasing pressure on healthcare resources with the aging population, we sought to explore the use of IT to identify clinically stable patients for alternate day medication review so as to improve work efficiency of pharmacists.

Methods: A roundtable discussion was undertaken with doctors and pharmacists to identify criteria that exclude patients from alternate day medication review. These criteria include:

- Subacute status
- Within 3 days of admission or 2 days prior to discharge
- On High Alert Medications e.g. anticoagulants, digoxin, IV electrolyte replacements or drugs requiring TDM
- Medication changes
- New laboratory results or Doctor's input

A tool was designed in EPIC, an electronic medical record system, to identify patients meeting the above criteria. Patients not meeting the above criteria were reviewed by pharmacists three times weekly. The time taken for daily medication review versus the time taken for medication review with the alternate day review tool was recorded for 50 patients over ten days.

Results: Data was collected for 500 medication reviews conducted by five pharmacists in November 2018. The average time taken for medication review of ten patients was 44.92 minutes versus 50.28 minutes, with the use of alternate day review tool versus daily review respectively. Taking an average load of 70 patients per pharmacists, the IT tool may potentially save 37.5 minutes per pharmacist daily.

Discussion: This pilot study indicates the feasibility of an IT tool to help pharmacists cope with increasing patient load. However, the safety aspect of such an approach needs to be carefully considered and reviewed before implementation.

POSTER DISPLAY

Abstract Number: 9
Abstract Category: Engage - Pharmacy Practice

Describing Pharmacists' Recommendations and Their Impact on Extended-Interval Aminoglycoside Dosing Aminoglycoside Therapies at Ng Teng Fong General Hospital

Mr Qing Bin Chew[1], Mr Wei Soo[1], Mr Wei Keat Tan[2], Mr Sing Meng Robin Choo[2], Dr Zhe Han[1,2]
[1]National University of Singapore [2]Ng Teng Fong General Hospital

Introduction: At Ng Teng Fong General Hospital (NTFGH), pharmacists are heavily involved in extended-interval aminoglycoside dosing (EIAD) and therapeutic drug monitoring (TDM). However, types of pharmacists' recommendations on EIAD aminoglycoside courses have yet to be characterised and describing them will inform future quality improvement initiatives.

Methods: A retrospective cohort study was conducted. Primary objective was to describe pharmacists' recommendations on EIAD aminoglycoside courses at NTFGH over a 2-year period. Secondary objective was to compare TDM practices and patient outcomes between pharmacist-driven dosing (PDD) [i.e. pharmacist provided dose recommendations at all timepoints of therapy] versus standard-of-care (SoC) [pharmacist provided recommendations at some timepoints of therapy or none at all].

Data collected include the types, time and outcomes of documented pharmacist recommendations, patient demographics and aminoglycoside therapy data.

Results: A total of 355 EIAD aminoglycoside courses with 321 pharmacists' recommendations were included. Recommendations on dosing (46.7%) and therapy monitoring (44.2%) were most frequent. Overall acceptance rate of recommendations was 73.2%. Pharmacists' provided dosage adjustments recommendations within one hour from initial aminoglycoside order or aminoglycoside serum level result except when serum level resulted after business hours (median 4.98, 1.48-9.5 hours). A total of 31 PDD and 69 SoC EIAD courses with ≥ 2 consecutive doses were compared to determine impact of pharmacists' recommendations. Guideline-adherent TDM practice improved with PDD compared to SoC (77.4% vs. 27.5%, $p<0.001$). Duration of aminoglycoside therapy (3.0 vs. 3.0 days, $p=0.860$) and length of hospital stay (6.0 vs. 6.0 days, $p=0.811$) were similar between PDD and SoC groups.

Discussion: Pharmacists mostly provided recommendations on aminoglycoside dosing and TDM which were well accepted by physicians. We propose that the institutional aminoglycoside guideline to be made available to physicians and for system-level enhancement allowing automatic rounding of aminoglycoside doses. Larger studies may assess impact of pharmacists' recommendations on clinical outcomes.

POSTER DISPLAY

Abstract Number: 10

Abstract Category: Engage - Pharmacy Practice

Evaluation of Procalcitonin and Antibiotic Use in Acute Exacerbations of Asthma, Chronic Obstructive Pulmonary Disease or Upper Respiratory Tract Infections

Ms. Annie Loo Yan Qi[1], Dr. Zhe Han[1,2], Ms. Solana Bernita Cheow[2], Ms. Christina Wong[2]
[1]National University of Singapore, Department of Pharmacy [2]Ng Teng Fong General Hospital, Department of Pharmacy

Introduction: Emergence of antibiotic resistance caused by antibiotic overuse has increased interest in the use of procalcitonin (PCT) to objectively define bacterial infections and to reduce antibiotic use. To optimize PCT and antibiotic use in Ng Teng Fong General Hospital (NTFGH), baseline practices have to first be characterised.

Methods: This was a single-center, retrospective cohort study on non-critically ill adult inpatients with exacerbations of asthma, COPD (Chronic Obstructive Pulmonary Disease) or URTIs (Upper Respiratory Tract Infections) in NTFGH. All data were collected from NTFGH's electronic medical records over a two-year period. Statistical analysis was performed using Mann-Whitney U test for continuous data and Chi-Square or Fischer-Exact test for categorical data. Study objectives were (1) to describe PCT use, antibiotic actions and compliance to PCT algorithm and (2) to compare the PCT and non-PCT patients in antibiotic exposure, hospital length of stay (LOS), mortality, 30-day readmission and ICU transfer rates.

Results: Among 509 PCT patients screened for eligibility,121 PCT patients and 128 PCT episodes were included. PCT was mainly utilized by acute and respiratory medicine services and at continuation setting (71.1%) after antibiotics initiation. Overall compliance rate was 56.3%. Total antibiotic exposure was higher in PCT patients (5 versus 2 days, p=0.005). Mortality, readmission and ICU transfer rates were not increased in PCT patients. LOS was one day higher in PCT patients (4 versus 3 days, p=0.001).

Discussion: Key stakeholders of PCT use were acute and respiratory medicine services and mostly utilized at continuation setting. Compliance rate at 56.3% was comparable to previous studies. PCT use did not result in increased mortality, readmission and ICU transfers but increased in total antibiotic exposure and LOS. This study has established the baseline practice for future quality improvement initiatives. Future research should focus on clinicians' perception of PCT to develop a targeted education effort.

POSTER DISPLAY

Abstract Number: 11

Abstract Category: Engage - Pharmacy Practice

Vancomycin Dosing and Therapeutic Drug Monitoring in Patients with End-Stage Renal Failure on Intermittent Hemodialysis

Ms Qianqian Xie[1], Ms Zhe Han[1], Mr Robin Sing Meng Choo[2], Mr Wei Keat Tan[2]
[1]National University of Singapore [2]Ng Teng Fong General Hospital

Introduction: There is no institutional guideline on vancomycin dosing and monitoring in end-stage renal failure (ESRF) patients on intermittent hemodialysis (HD) at Ng Teng Fong General Hospital (NTFGH). Pharmacists generally follow Heintz et al. (collectively 'Heintz') recommendations. The prevalence of intradialytic dosing, low-flux dialysers and non-anuric patients potentially limit applicability of Heintz recommendations in NTFGH.

Methods: This is a single-center, retrospective, cohort study at NTFGH. Objectives of this study are to describe vancomycin dosing and monitoring in ESRF patients on intermittent HD, and to validate Heintz recommendations at NTFGH.

Results: A total of 95 patients (132 intravenous vancomycin courses) were included. 193 pre-HD serum vancomycin concentrations (SVCs) were taken, with median of 17.5mg/L (13.7-20.7mg/L), among which 61.7% were within 10-20mg/L. Mean initial dose was 15±4.5 mg/kg and 78.3% of which were correspondent with Heintz. Heintz-correspondent initial doses achieved post-initial dose pre-HD SVC of 11.1±3.4mg/L, and had higher therapeutic pre-HD SVC attainment than doses lower than Heintz, although non-statistically significant (42.4% vs. 0.0%, p=0.102). Heintz-correspondent second doses achieved similar post-second dose therapeutic pre-HD SVC attainment as doses higher than Heintz (42.1% vs. 52.6%, p=0.516). Heintz-correspondent third and subsequent doses achieved higher post-third and subsequent dose therapeutic pre-HD SVC attainment than doses higher than Heintz (59.6% vs. 31.3%, p=0.012). As compared to anuric patients, non-anuric patients required higher third and subsequent doses (median 750mg vs. 625mg, p=0.001) to achieve similar subsequent therapeutic pre-HD SVC attainment (47.3% vs. 50.0%, p=0.799).

Discussion: For complicated infections targeting troughs of 15-20mg/L, ESRF patients should receive initial doses at the higher end of Heintz recommended range (15-25mg/kg). Dosing higher than Heintz was unnecessary for second, third and subsequent doses since Heintz-correspondent doses achieved favourable therapeutic pre-HD SVC attainment. Non-anuric patients with residual renal function and vancomycin clearance, should be also dosed at higher ends of Heintz recommendations.

POSTER DISPLAY

Abstract Number: 12
Abstract Category: Educate - Clinical Training

Developing and validating a national Advanced Pharmacy Practice Competency Framework for Singapore.

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A competency framework was developed to support professional growth of advanced pharmacy practitioners (APP) and to align with the 10-year National Pharmacy Strategic Thrust on developing a Confident Pharmacy Workforce and driving Pharmaceutical Care Excellence.

The purpose of the project was to identify the competency standards and to test the psychometric properties of the framework at measuring the competence of an APP, defined as a pharmacist with at least four years of working experience.

The project included a) identifying 25 competency standards from the UK Advanced to Consultant Level Framework (ACLF) and contextualizing them to local practice b) conducting a validation study in collaboration with the Center for Medical Education, National University of Singapore.

A group of 60 pharmacists gathered to identify and contextualize the standards to local practice. A total of 25 standards adapted from ACLF and 3 performance levels – Intermediate, Advanced and Expert were identified and described. This is followed by invitation to 170 pharmacists and their reporting officers to participate in a validation study. The competency framework was tested for content and construct validity and reliability. Kappa agreement and Cronbach's alpha were used in the statistical analysis.

The study was conducted from November 2014 to April 2015. 137 pharmacists returned their survey for which 128 data sets were complete. Kappa coefficient between self and reporting officer's assessments range from 0.45-0.76 and 0.52-0.81 between self-assessment and agreed upon competency rating (within moderate to good agreement). The Cronbach's Alpha values ranges from 0.69 to 0.90.

The results indicate that the competency framework demonstrates good reliability and validity for measuring competency of the APP. The advanced practice framework was launched by Minister of Health in 2017. To aid implementation of the competency framework, workshops are being conducted to teach pharmacists how to build and assess portfolio

POSTER DISPLAY

Abstract Number: 13
Abstract Category: Engage - Pharmacy Practice

Examining the need for medication management therapy in elderly cancer patients

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[1]National University of Singapore [2]National Cancer Centre Singapore

Background: Elderly cancer patients often have complex medication regimens due to treatment of cancer and their co-morbidities, which puts them at risk of drug- related problems (DRPs). Pharmacist-led medication therapy management (MTM) services have been introduced to mitigate the risks of these DRPs.

Objectives: To identify characteristics of elderly patients receiving chemotherapy who are at risk of DRPs and determine the pharmaceutical care needs of patients from their own perspective.
Methods: Quantitative analysis of retrospective cross-sectional data was undertaken using IBM SPSS Statistics (version 24). Semi-structured interviews were conducted with elderly patients with 3 or more chronic medications and were receiving treatment in National Cancer Centre Singapore (NCCS). Interviews were audio- recorded with consent and transcribed verbatim. Thematic analysis, in the context of grounded theory, was done using Quirkos (version 1.5.2) to analyse patient responses.

Results: Patients taking at least 5 chronic medications were found to have 1.8 times the risk of experiencing a DRP. (p=0.046, OR=1.815). Patients' main concerns included the effects, administration and cost of their medications. Informational needs regarding similar topics were often met but strengthening of the patient- pharmacist relationship is needed. There was preference for face-to-face communication, but patients were open to telepharmacy. Convenience was the driving factor in determining how patients wanted the service to be provided.

Conclusion: Patients' pharmaceutical care needs should be taken into consideration in the design of MTM services. Improvements to existing MTM services can be made according to patient archetypes to better suit their needs.

POSTER DISPLAY

Abstract Number: 14
Abstract Category: Educate - Pharmacy Education

Advocating Patients to Own Their Health

Ms Felicia Liew[1], Ms Pei Chean Yong[2], Mr Luke Lim[1], Ms Hui Wen Goh[1], Ms Celine Tan[1], Ms Xuan Wei Low[1]
[1]Republic Polytechnic [2]Woodlands Health Campus

Even though there is a National Electronic Health Records (NEHR) which healthcare professionals (HCPs) can find out about their patients' medication records, there will still be some elements such as patients' self-medication that will not be captured at NEHR. Henceforth is important for patients to know their medication to share with the HCPs to facilitate discussion on treatment options. Owning a personalized medication list (PML) can be an enabler to assist such discussion.

The objectives of this study was to determine the public's level of awareness on the importance of a PML and to create awareness on the importance of a PML. A survey was conducted on 64 residents who visited Sunlove Senior Activity Centre (SAC) at Golden Saffron to understand the residents' perception of a PML and their medication information management concepts. An awareness programme was then conducted to highlight the importance of a PML, limitations of NEHR and to engage the residents in creating their own PML by taking photos of their medications with their handphone. A pre and post-session assessment was held to establish the residents' comprehension of their own medications.

According to the survey responses (N=64), only 8% keeps a PML. 46% asks their healthcare providers (HCP) to refer to the medical records when asked about their medications. Residents (N=18) who participated in the awareness programme, 78.6% felt that they were able to create their PML before the programme started and this improved to 100% after the programme. .However 14% still felt that their preferred method of communication was to ask their HCP to refer to medical records.

In conclusion, there was a general low level of awareness on the importance of a PML amongst the residents. The awareness programme conducted raised the understanding on the importance of a PML amongst the attendees.

POSTER DISPLAY

Abstract Number: 15

Abstract Category: Engage - Pharmacy Practice

Impact of Pharmacist-Led ACS On Warfarin Knowledge in Primary Care Patients - A Pilot Study

Ms Goh Bandy[1], Mr Tang Woh Peng[1], Ms Chua Liwei[1], Ms Tan Seok Yee Maureen[1], Mr Sim Kwang Han[1], Ms Tan Soo Chieng Daphne[1], Ms Chua Joo Ling Joanne[1], Ms Lim Jit Fan Christina[1], Mr Goh Boon Kwang[1], Ms Khoo S Y Rachel[1]

[1]Singhealth Polyclinics, Pharmacy

Background: Pharmacist-led Anticoagulation Therapy Management Service (ACS) monitors patients' INR control and adverse effects, provides appropriate solutions to resolve any INR deviation and educates the patients on their warfarin therapy.

Objective: The study aims to determine whether ACS can be an effective tool to improve warfarin knowledge in primary care patients.

Methods: This 12-month prospective cross-sectional study was conducted across five primary healthcare centres in Singapore. Eligible patients were invited to participate in the research study when they turned up at the pharmacy for their ACS. The validated Oral Anticoagulation Knowledge (OAK) test was administered by the investigator in a standardised manner to the patients twice.

Results: 40 participants completed the study. The percentage of the study participants who passed the OAK test improved from 27.5% to 75.0% after ACS. ACS improved the OAK test score of the patients from an average of 13.2±3.2 to 16.1± 2.1, an average improvement of 3.0± 2.8 (95% CI: 2.1, 3.9) (p=0.000). Pharmacist-led ACS improved most aspects of warfarin knowledge in the patients on the anticoagulant. One top improvement reported following Pharmacist-led ACS was in knowing when to seek urgent medical attention. Patients' knowledge of dietary-drug interactions with warfarin, such as vitamin K intake, consuming large amounts of leafy green vegetables and alcohol, was also among the top improvements seen.

Conclusion: Pharmacist-led ACS effectively improved warfarin knowledge in primary care patients.

POSTER DISPLAY

Abstract Number: 16
Abstract Category: Empower - Pharmaceutical Sciences

Development of composite polymeric hydrogels responsive to environmental drug release triggers

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Background: Oral drug carriers that enable longer residence and targeted drug release in the small intestine, instead of the stomach, may potentially result in higher drug serum concentration that can reach the therapeutic window for the drug to have the intended therapeutic effect in the body. The suitability of composite polymeric hydrogels as potential oral drug carriers, using polyvinyl alcohol (PVA) and Eudragit L100 as the materials, was assessed to determine drug release in response to higher pH in the small intestine (pH range 6.0 – 7.4) as compared to lower pH (pH range 1.0 – 2.0) in the stomach.

Method: Five different polymeric ratios of PVA and L100 hydrogels were prepared via repeated freezing-thawing cycles. The hydrogels' swelling behaviours were determined at pH 6.8 (pH of small intestine) and pH 1.0 (pH of stomach). In addition, the hydrogels' drug releasing profiles were assessed at pH 6.8 and pH 1.0. Bovine serum albumin was used as the model drug cargo to study the drug release profiles of the hydrogels.

Results: The composite polymeric hydrogels experienced more swelling at pH 6.8 than at pH 1.0. The composite polymeric hydrogels exhibited higher drug release at pH 6.8 than at pH 1.0.

Conclusion: The research project provided novel evidence on the development and suitability of PVA and Eudragit L100 composite hydrogels as potential drug carriers, that can enable targeted release at the small intestine, for pharmaceutical manufacturers. Oral drug carriers made from PVA and Eudragit L100 composite polymeric hydrogels have the potential to allow for more targeted drug release at the site of the small intestine. Pharmaceutical manufacturers can develop new oral drug carriers using PVA and Eudragit L100 composite polymeric hydrogels.

POSTER DISPLAY

Abstract Number: 17

Abstract Category: Engage - Pharmacy Practice

The Management of Cellulitis and Empiric Antibiotic Use among Adult Inpatients in an Acute Medical Centre, Singapore: A Quality Improvement Study

Miss Xin Yi Wi[1], Dr Zhe Han[1], Mr Wei Keat Tan[2], Mr Robin, Sing Meng Choo[2]
[1]National University of Singapore [2]Ng Teng Fong General Hospital

Introduction: Ng Teng Fong General Hospital (NTFGH) introduced its empiric antibiotic guideline in March 2018. However, adherence of antibiotic prescribing patterns to institutional guideline is unknown. We sought to assess the level of adherence to the guideline to uncover opportunities for quality improvement initiatives.

Methods: This is a retrospective quality improvement study where medical records of 200 patients with cellulitis were reviewed.

Objectives: Objectives of this study were to describe the management of cellulitis in adult inpatients admitted with community-acquired cellulitis and to compare treatment duration and outcomes between groups that were adherent and non-adherent to the institution guideline. Patients at least 21-year-old, without healthcare-associated risk factors were included. Data was gathered through electronic medical record review and analysed using Wilcoxon rank sum test, Chi-square test and Fisher's exact test.

Results: 42 (23.2%) and 66 (33.3%) patients received guideline-adherent initial empiric antibiotics at emergency department (ED) and inpatient respectively. The adherence level in the ED was lower than that in inpatient (23.2% versus 33.3%, $p < 0.01$). Total duration of therapy was 10.6 □ 5.0 days, most patients with purulent cellulitis received at least one incision & drainage (91 [89.2%]). Blood cultures were most frequently taken for patients with non-purulent cellulitis (46 [46.9%]) whereas wound swab cultures were obtained for 62 (60.8%) patients with purulent cellulitis. Blood cultures had a low proportion of 7 (12.3%) bacteria growth. Treatment duration and outcomes (length of stay, treatment failure composite endpoint) had no significant differences between the adherent and non-adherent groups.

Discussion: Further work is needed to promote adherence to the institution guideline. Strategies like collaboration with other key stakeholders may raise awareness of the guideline. Updates to the guideline, such as duration of therapy and the definition of community-acquired infections, may clarify the specific patient population indicated and reduce unnecessary antibiotic days.

POSTER DISPLAY

Abstract Number: 18

Abstract Category: Pharmacy Technician Project - Quality Improvement Process

Evaluation and perception of telepharmacy service in community pharmacy

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Introduction and Objectives: Telepharmacy service was first introduced in 2006 to Watsons pharmacy stores to increase accessibility of medications and related advice by pharmacists to the public. In view of average answering rate and customers' long waiting time of telepharmacy calls, buddy system (paired pharmacy executive at remote pharmacy store with pharmacist at serving pharmacy store) was implemented in 2017. The objectives of the study is to gather stakeholders' perception (customers, pharmacy executives and pharmacists) towards telepharmacy and to evaluate telepharmacy efficiency after buddy system implementation.

Methods:

1) Customers were recruited by pharmacy executives in Watsons pharmacy stores from November 2018 to January 2019 to complete a hardcopy questionnaire upon receiving telepharmacy service.
2) Watsons pharmacists were invited to participate in hardcopy/online survey.
3) A focus group discussion was conducted with pharmacy executives. Survey data was analysed in count and percentage (Excel) and Odds ratio (SPSS). Focus group discussion was analysed using deductive content analysis

Results: Focus group discussion (n=4) revealed that buddy system was underutilized by pharmacy executives but it was a useful targeted approach for newly-joined pharmacy executives. Among 157 particiated customers, 140 customers (89.2%) viewed telepharmacy as a useful service to receive medication and advice without the physical presence of pharmacists and 125 (79.6%) provided positive feedback of the service. Of 36 pharmacists (response rate of 61.0%), 35 (97.2%) agreed that quieter stores allow them to answer more telepharmacy calls. It was noted that pharmacists in buddy system are statistically more likely to answer telepharmacy calls (OR: 6.38, 95% CI 1.45-28.60).

Discussion: Telepharmacy is well received among all stakeholders. New initiatives to improve telepharmacy efficiency is required.

POSTER DISPLAY

Abstract Number: 19
Abstract Category: Engage - Pharmacy Practice

SPEED: Standardizing Pharmacist's Effective & Efficient Documentation

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[1]*Singapore General Hospital*

Introduction: The current medication review process at the missed queue/ "unclaimed" counter (dedicated to attend to patients returning to collect medications due to their absence when the queue number was previously called) was not optimised which may result in unnecessary rework (review was conducted for a second time), longer waiting time and potentially reduced patient satisfaction. Our project aimed to reduce medication review rework time, presented as proxy of waiting time, at a tertiary care hospital outpatient pharmacy "unclaimed" counter by 50%.

Methods: A survey was conducted among pharmacists to understand the reasons for rework. Ishikawa diagram and Pareto chart were utilized to determine root causes. Team then brainstormed to decide on solution. The solution implemented was standardizing documentation on the prescription, and mandating the first reviewer to endorse his/her name on the prescription for accountability purposes, before placing the basket in the "unclaimed" shelves. Data was collected in the form of time taken to review an "unclaimed" prescription, both before and after implementing our solution; pre-implementation data collection was carried out for 8 weeks in January and February 2018, while post-implementation data collection was done for 6 weeks in March and April 2018.

Results: These interventions achieved a 50.5% reduction in the average waiting time (from 3.7 to 1.8 minutes). The average number of "unclaimed" prescriptions dispensed with clinical reviews documented per day was 30.7. Hence, the total man-hours saved per year were estimated to be 30 work days (assuming an 8-hour work day on Monday to Friday).

Discussions: By standardizing the documentation of medication review, we have managed to reduce patients' waiting time at the "unclaimed" counter by 50%, hence enhancing patient satisfaction. The standardization has also allowed process at the pharmacy to be more streamlined, and man-hours saved could be reallocated to other areas of operation.

POSTER DISPLAY

Abstract Number: 20
Abstract Category: Engage - Pharmacy Practice

Analysing the outcomes of short course versus long course antibiotics in geriatric patients treated for pneumonia

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[1]*Khoo Teck Puat Hospital Pharmacy*

Introduction: The Antimicrobial Stewardship Program (ASP) workgroup has observed prolonged use of broad-spectrum antibiotics in treating geriatric patients with pneumonia. While the appropriate treatment duration in this population is not well-studied, longer antibiotic therapy may increase risk of developing multi-drug resistant organisms (MDROs). This study aimed to compare the outcomes of short course (7 days) versus long course (10 or more days) antibiotics in geriatric patients with pneumonia.

Methods: This retrospective study reviewed geriatric patients initiated on broad-spectrum antibiotics (piperacillin/tazobactam, ertapenem or meropenem) for pneumonia between March 2016 to June 2017. Treatment duration was calculated from the start date to the end date of antibiotics (including de-escalated antibiotics). Exclusion criteria included extra-pulmonary bacterial infections, tuberculosis or viral pneumonia, initial cultures showing Pseudomonas spp. or Methicillin-resistant Staphylococcus aureus, pneumonitis or intrathoracic complications of pneumonia and diseases or medications associated with immunosuppression. Outcomes studied included recurrence of pneumonia, development of MDROs, median length of stay (LOS) post-antibiotic therapy and 30-day all-cause mortality.

Results: A total of 422 patients were reviewed and 160 patients passed the exclusion criteria. Of whom, 114 patients received 7 day (31.9%) and 10 or more days (39.4%) of antibiotics. The remaining 46 patients received 8-9 days of antibiotics. Baseline patient demographics were similar for both groups. There were no significant differences in outcomes between both groups. The proportion of pneumonia recurrence was 25.5% versus 14.3%, P=0.132; development of MDROs was 9.8% versus 7.9%, P= 0.751; median LOS post-antibiotic was 1.0±3.5 versus 1.0±5.0 days, P= 0.979 and 30-day all-cause mortality was 23.5% versus 25.4%, P= 0.818 in the 7-day versus 10 or more day group respectively.

Discussion: There were no significant differences in clinical outcomes between short and long course antibiotics. This study supports the use of short course antibiotics in treating geriatric patients with pneumonia where clinically appropriate.

POSTER DISPLAY

Abstract Number: 21

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Introduction of Pharmacists into the Emergency Department of a General Hospital in Singapore: A Look at Interventions Performed

Miss LiJun Kelly Chong[1], Mr Teck Ian Chong[1], Mr Jie Han Foo[1], Miss Cixin Melanie Teo[1], Mrs Liao Maryjane Flores[1], Ms Li Woon Tan[1]
[1]Changi General Hospital

Background and objective: The emergency department (ED) is predisposed to medication errors due to its high patient load and frequent work interruptions (1). In Changi General Hospital (CGH), medication errors are often detected and rectified at the ED pharmacy. To improve patient safety, pharmacists were introduced to the day shifts of CGH ED, which were previously managed by pharmacy technicians. This review evaluated the contribution of pharmacists to appropriate medication error interventions in the ED.

Methods: A retrospective audit of physician-accepted medication interventions performed for ED discharged patients during day shifts, four months before and after introduction of pharmacists into CGH ED, was conducted. Interventions performed over the same four-month period a year after introduction were also studied to investigate the impact on prescribing habits. Interventions were retrieved from Sunrise Clinical Manager and classified into “for errors” or “for non-errors” using an in-house categorization system. Chi-square analysis was conducted to study the association between introduction of pharmacists and interventions for errors.

Results: This review involved 761 interventions performed for 643 patients. Numbers of interventions performed four months pre-introduction, post-introduction, and one year post-introduction were 142, 171, and 448 respectively. Percentages of interventions for errors were 42.3%, 54.4%, and 56.3% respectively. Intervention for errors was positively associated with the presence of pharmacists (p=0.011).

Conclusion: After introduction of pharmacists into CGH ED, there were increases in both number of interventions and proportion for medication errors. These findings parallel overseas studies that recognized the value of pharmacists in the ED (1). This review is the first of its kind in Singapore and additional local studies can be undertaken to determine the full benefits of having pharmacists in the ED.

References

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POSTER DISPLAY

Abstract Number: 22

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Reducing Waiting Time for Medications at St Luke's Community Clinic Pharmacy

Ms Li Ling Loh[1], Ms Yoke Cheng Wong[1], Mr Alan Aguinaldo[1], Ms Pauline, Wei Xian Ong[1], Ms Jenny, Ewe Wah Oo[1]
[1]St Luke's Hospital

Background: St Luke's Community Clinic (SLCC) is a one-stop outpatient clinic, providing a wide range of services. SLCC Pharmacy fills up the prescriptions for the clinic patients. The average waiting time for about 65% of our patients is 15 minutes. However, for more complicated prescriptions, some may have to wait up to 30 minutes. This project aims to shorten the waiting time for more patients.

Objective: To ensure at least 80% of patients' waiting time for medications will not be more than 15 minutes.

Method: Lean management principles are applied through 2 "E"s

1. ELIMINATE WASTE
   Whilst waiting for patients to arrive at the Pharmacy, staff will start to process the doctor's electronic order in iPHARM. Medications are packed in advance. When patients arrive with physical prescriptions, a confirmation of the items packed is made. If no further changes, the medications are made ready for dispensing.
2. ERGONOMICS
   i. Motion – The top 20 most commonly prescribed medications were identified. Pre-packs of 3-month (most commonly prescribed duration) supplies were prepared. These ready-packed items cut down the counting and packing time.
   ii. Motion – The back-up stocks for the top 20 most commonly prescribed medications were strategically organized and located. The stocks were placed near the respective dispensing drug bins. This saves unnecessary time taken to locate stocks when larger quantities are required during the packing stage. The re-arrangement cuts down unnecessary movement of staff and shortens the packing time.

Results: A comparison of the waiting time for medications was done over a 3-month period, pre- and post-implementation. The results showed that we were able to shorten the waiting time significantly after implementing the 2 "E"s processes. At least 80% of our patients waited 15 minutes or less for medications, compared to 65% during the pre-implementation period.

POSTER DISPLAY

Abstract Number: 23
Abstract Category: Educate - Clinical Training

Using Pharmacists' Baseline Perceptions and Knowledge to Guide the Implementation of Pharmacy Preceptor Training at an Acute-Care Hospital

Dr Zhe Han[1,2], Ms Yen Yen Tan[1], Ms Jie Wen Phang[1], Ms Zhining Goh[1]
[1]Ng Teng Fong General Hospital [2]National University of Singapore

Background and Objective(s): Pharmacists serve as preceptors and take on significant roles in training new practitioners. Effective precepting skills form the basis for meaningful learning experiences. According to the American Society of Health-System Pharmacists, preceptors must demonstrate an aptitude for teaching that includes mastery of the 4 preceptor roles (instructing, modeling, coaching, facilitating). We sought to assess and use our pharmacists' baseline perceptions of precepting and knowledge of the 4 preceptor roles to guide the implementation of an in-house preceptor training session at our hospital, and to evaluate our pharmacists' experiences with the session.

Methods: An anonymous baseline survey to assess pharmacists' perceptions and knowledge was conducted. A pharmacy preceptor training (PPT) session aimed at defining expectations, explaining and illustrating 4 preceptor roles was conducted. Participants completed an anonymous post-session evaluation.

Results: Forty-two pharmacists completed the baseline survey. Most had less than 3 years of precepting experience (83%). Pharmacists were enthusiastic about precepting (52%) and believed in its importance (98%). However, many were unaware of the 4 preceptor roles (76%) and lacked confidence in their precepting skills. Only 24% believed they were good preceptors and 34% felt prepared to precept. As compared to inpatient, more outpatient pharmacists reported inadequate precepting time (90% vs 54%, $p = 0.043$) and believed that preceptees underperform often due to their own failure to learn (60% vs 23%, $p = 0.035$). All participants gained new insights and planned to utilize at least 1 preceptor role in future precepting. Most participants believed that in-house preceptor training is as useful as those training offered by external organizations (90%) and were interested in additional PPT opportunities (94%).

Conclusion: In-house PPT is useful and well-received by pharmacists. Institutions may develop their own PPT program to address specific learning needs of their pharmacist preceptors.

POSTER DISPLAY

Abstract Number: 25

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Review and Improve Process of Daily Duty Rostering at Tan Tock Seng Hospital Outpatient Pharmacy

Ms Peiyi Chuah[1], Ms Shen Onn Chu[1], Mr Mark Anthony Cadinong Jabigo[1], Ms Eleanor Reyes Timbol[1]

[1]Department of Pharmacy, Tan Tock Seng Hospital

Background: The Daily Duty (DD), planned and vetted before release by TTSH B2 Outpatient Pharmacy (B2OP) Roster team, is a 3 A4-page long document modified and printed on a daily basis to allocate approximately 104 OP staff to specific duties for daily operational needs. The team takes an average of 1500 mins per week to complete this.

Aims/Objectives: To reduce time spent by Pharmacy Technician (PT) and Pharmacist to draft the Daily Duty (DD) roster for 104 staff by 75%.

Implementation: This study will be conducted at TTSH B2OP. The average time taken by the PTs and Pharmacists spent on the DD would be measured each week respectively. Using advanced Microsoft excel functions, the current process will be modified to increased usage of IT to replace manual steps. The effects of the interventions will be measured by comparing the percentage differences in time spent pre and post interventions.

Results: A total of 13 interventions were made. Time spent by Pharmacists and PT per week reduced from 600 mins and 900 mins respectively to 180 mins for both. This translates to 70% and 80% improvement respectively and an overall 75% reduction in time spent per week.

Conclusion: With the use of advanced Microsoft excel functions and cloud-based SQL connections, DD rostering has become semi-automated. Time spent weekly and daily on preparation of DD has been greatly reduced. Roster team members do not have to tediously and manually check each of the 104 staff's duties. Errors are reduced. The training teams who prepare training sessions have also benefitted from the enhancements. Staff can easily access monthly roster from home to check for their work shifts, which is updated realtime online. The current template of DD rostering is also promising to accommodate future requirements and demands that staff may be required to perform.

POSTER DISPLAY

Abstract Number: 26

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Review and Improve Process of Leave Projection Exercise at Tan Tock Seng Hospital Outpatient Pharmacy

Ms Shen Onn Chu[1], Ms Peiyi Chuah[1], Mr Mark Anthony Cadinong Jabigo[1], Ms Eleanor Reyes Timbol[1], Ms Hemashantini Rama Krishnan[1]

[1]*Department of Pharmacy, Tan Tock Seng Hospital*

Background: To meet operational needs of TTSH B2 Outpatient Pharmacy (OP), leave requests of 150 staff is managed by Roster team. With leave being released 2-3 months in advance, staff welfare is compromised due to a small-time frame. Upon the release of leave, staff may request to take additional leave.

Aims/Objectives:

1. To streamline the process of annual Leave Projection Exercise (LPE) and ad-hoc leave application.
    a. To reduce time for Roster team to collect and compile leave application by 50%
    b. To reduce time spent in balloting and finalising leave projection by 50%
    c. To reduce number of steps involved in requesting for ad-hoc leave.
2. To improve staff satisfaction with the revamped LPE.

Implementation: Study conducted at TTSH B2OP. Current processes for leave requests will be reviewed. Leave results will be accessible by all staff online. A staff survey will be conducted to measure staff experience with the revamped LPE.

Results: Time spent was reduced by 91.6% compared between 2016 to 2017. There was a 66.6% reduction in time spent on the balloting in 2017 (compared to 2015-2016). The number of steps to request for additional leave was reduced. Instead of manually counting the hardcopy document for number of staff on leave (Staff's own calculation is inaccurate.), the availability is auto-calculated and visible at the top of the google excel spreadsheet. Upon approval, an electronic recording will be made, instead of updating on hardcopy. Staff gave highly positive responses as confirmed leave is released in a timely manner in block of 6 months.

Conclusion: There has been significant improvement to staff experience with leave taking. The revamped process is promising to accommodate future requirements. A possible improvement could be to create an online staff request platform. This will free up our roster inbox and quantify leave requests.

POSTER DISPLAY

Abstract Number: 27
Abstract Category: Educate - Pharmacy Education

Construction of a probiotic reference guide for community pharmacists in Singapore and a video clip on use of probiotics for consumers

Miss Charmaine-Sum-May Ng[1], Miss Yhim-Ghee Toh[1], Miss Siti-Rahil Mohd-Yussof[2], Miss Joy-Boon-Ka Chong[2], **Miss Eng-Hui Chew[1]**
[1]National University of Singapore [2]Watson's Personal Care Stores Pte Ltd

Background: With a wide range of probiotics available and health benefits of probiotics being strain-specific, it is challenging for community pharmacists to provide probiotic recommendations. Community pharmacists rely on international guidelines as one of the resources to guide them. However, international guidelines are not regularly updated and do not provide a holistic understanding of probiotic.

Objectives: Construction of a comprehensive, holistic, and up-to-date probiotic practice reference guide to aid community pharmacists in their practice, followed by production of a video clip for consumer education based on the reference guide and evaluation of the materials' effectiveness.

Methods: A literature search of articles that evaluated the effectiveness of probiotics with various medical conditions was conducted on PubMed (01/01/2008 to 31/12/2018). Included articles were categorised according to the Oxford level of evidence and a guide was developed for selection of probiotic strains according to specific medical conditions. A focus group discussion (FGD) involving six community pharmacists was conducted to evaluate the effectiveness of the guide in relation to their practice. Semi-structured individual interviews were conducted on recruited participants for evaluation of the effectiveness of the video clip.

Results: Data from 402 eligible articles were constructed into the reference guide, which was used to produce the video clip. During the FGD, participating community pharmacists expressed negative feedback about applicability, quality, and format of the constructed guide. Key aspects suggested to improve the effectiveness of the guide were addition of product-strain(s) matching information and conversion of the guide into an electronic application format. On the other hand, most interviewees found the video clip educational and organized.

Conclusion: A comprehensive, holistic, and up-to-date probiotic guide based on strain-specific effectiveness did not aid community pharmacists in their practice. The video clip was generally well-received and effective in educating consumers, especially those with limited prior knowledge on probiotics.

POSTER DISPLAY

Abstract Number: 28
Abstract Category: Engage - Pharmacy Practice

Evaluation of Nurses' Perception of Sedation In The ICU

Miss Jocelyn Teo[1], Miss Yi Jing Lim[1], Mr Muhammed Taufiq Bin Jumah[1], Miss Wendy Khong Xiao Ling[1]
[1]*Tan Tock Seng Hospital*

Background and objective(s): Critically ill patients admitted into the intensive care unit are often sedated to prevent pain and anxiety, allow for invasive procedures, synchrony with mechanical ventilation and ensure patient safety. Mechanical ventilation increases risk of complications such as pneumonia, airway damage, decreases self-care ability, and drives up healthcare costs. Therefore, it is imperative to optimise sedation use by ensuring the level of sedation achieved meets the patient's individual needs, thereby shortening the duration of intensive care. Nurses play an integral role in the appropriate management of sedative therapy, avoiding complications of both over and undersedation. Hence, it is important to understand their experience and perception of sedation management to provide effective therapy. The objective of the study is to evaluate nurses' perception of sedation management in the ICU and concerns.

Methods: Surveys which included areas of evaluation such as importance of nurses' role in sedation, personal views on sedation and confidence level in management of sedation, were distributed to 50 ICU nurses with a response rate of 70%.

Results: Confidence levels regarding sedation administration were generally high. However, an important issue identified was disagreement with physicians regarding appropriate levels of sedation, especially among more experienced nurses. Quality of communication has been identified in focus groups as an important factor in determining delivery of sedative therapy. Introduction of collaborative care by involving nurses, who are the main point of contact with patients and their family, in determining sedation goals may thus improve quality of care. In addition, protocol-directed practice has been shown to provide better patient outcomes in terms of reduced duration of mechanical ventilation and ICU stays compared to non-protocol-directed sedation.

Conclusion: Implementation of a pharmacist-proposed titration guide may help to promote confidence among nurses when titrating doses which was their main concern as highlighted in the survey

POSTER DISPLAY

Abstract Number: 29

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Drug Image Chatbot on Facebook Workplace and Workchat

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[1]*Tan Tock Seng Hospital*

Background/Objective: The lack of a centralized drug image workflow and database in TTSH causes duplicative efforts and inefficiencies. Pharmacy store created drug images to update on new drug arrivals whilst outpatient pharmacy created same images for verification of picking. Clinicians created their own collections of physical products and images for medication reconciliation and patient education. Purchasers looked at physical products to determine lookalikes before procurement. The rest of hospital did not have access to drug images.

The objective of this study is to create a central image database to:
1. Eliminate duplicative maintenance
2. Make available TTSH-specific drug images to all staff on-the-go

Methodology: Image maintenance workflow was streamlined into a single workflow at pharmacy store. Different hosting platforms were evaluated, including mediview.sg, intranet and Facebook Workplace Chatbot. Issues with mediview.sg were:
1. TTSH legal advised against using public platform out of liability and advertising concerns
2. Could not cater for TTSH-specific content, such as lookalike grouping
3. Difficulty in harmonizing image layout and workflow as mediview.sg was a shared platform

Issue with intranet was unavailability on mobile devices due to internet separation. Workplace Chatbot was selected because it is available on internet and restricted to staff access, minimizing liability. Image layout was harmonized after consulting main users. External vendor was then acquired to build Chatbot.

Results: The Chatbot was deployed in October 2018. Users search by identifying criteria (drug name, type, lookalike grouping or manufacturer), then entering search text. The Chatbot currently contains 800 TTSH-specific images, increasing by around 10 per week as new drugs arrive. It has been publicized to pharmacy users and receives around 26 searches daily.

Conclusion: Drug image Chatbot has successfully made available TTSH-specific drug images on-the-go. We intend to expand the users through publicizing to physician and nurses. We look forward to migrating to national platform when available

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POSTER DISPLAY

Abstract Number: 30
Abstract Category: Engage - Pharmacy Practice

A Review of Pharmacists' Recommendations on Vancomycin Dosing, Therapeutic Drug Monitoring and Dosage Adjustments at Ng Teng Fong General Hospital (NTFGH)

Ms Felicia Chia[1], Ms Nicole Low[1], Mr Wei Keat Tan[2], Mr Robin Choo[2], **Dr Zhe Han[1,2]**
[1]National University of Singapore [2]Ng Teng Fong General Hospital

Introduction: Vancomycin is used to treat methicillin-resistant Staphylococcus aureus infections. In Ng Teng Fong General Hospital (NTFGH), an institutional protocol is available to guide vancomycin dosing, monitoring and dosage adjustment. Pharmacists also review all vancomycin orders before administration and make recommendations to prescribers as needed to optimise therapy. However, the impact of pharmacists' recommendations on vancomycin therapy has not been analysed.

Methods: A retrospective, single-centre, cohort study was conducted at NTFGH. Inpatients ≥18 years who received ≥2 consecutive days of intravenous vancomycin over a 2-year period were included. Acute kidney injury, end-stage renal disease, peri-operative prophylaxis and concurrent oral vancomycin were excluded. Data were collected by reviewing eligible patients' electronic medical records. Objectives of the study are to describe pharmacists' recommendations on intravenous vancomycin and to evaluate impact of pharmacists' recommendations on patient outcomes.

Results: A total of 306 vancomycin courses (1859 recommendations) were included. Monitoring of trough levels and toxicity (59.6%) followed by adjustment to vancomycin dosage (36.0%) were commonly recommended by pharmacists. Acceptance rate for pharmacists' recommendations was 82.3%. Comparing courses with and without pharmacists' recommendations, greater proportion of courses with pharmacists' recommendations attained ≥1 therapeutic trough (35.5% vs. 0.0%, $p<0.001$). There was no difference in mortality (8.2% vs 8.0%, $p=0.951$) and vancomycin-associated nephrotoxicity (8.9% vs 0.0%, $p=0.076$). Duration of therapy (6 days vs. 2 days, $p<0.001$) and length of stay (17.0days vs. 9.0days, $p<0.001$) were increased for courses with pharmacists' recommendations.

Discussion: At NTFGH, pharmacists are actively involved in monitoring vancomycin therapies. Pharmacists' recommendations are well-accepted by physicians and increased proportion of courses with ≥1 therapeutic trough. Increased duration of therapy and hospitalisation may be explained by larger proportion of courses with pharmacists' recommendations were directed therapies. Larger studies in the future may further assess the impact of pharmacists' recommendations on patient outcomes.

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POSTER DISPLAY

Abstract Number: 31

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Evaluation of initiatives to improve process of daily medicines supplies to inpatients – a Quality Improvement project

Ms Jie Kang[1], Miss Stacey Hui Qi Ng[1], Mr Timothy Yi Kiet Koh[1], Mr Dao Jun Lim[1], Miss Alison Ching Yoke Low[1]

[1]Ng Teng Fong General Hospital

Introduction: Pharmacy staff supply medicines on a daily basis to inpatients, whose medicines are not kept in the ward's Automated Dispensing Cabinets (ADCs) or floor stock. Staff also need to prepare additional supplies when the items are out-of-stock in the ADCs.

Objectives: To improve efficiency of daily medicines supplies to inpatient wards and reduce costs of expired medicines kept in ADCs by

(a) Minimizing over/understock situations in ADCs
(b) Adjusting the types of medicines kept in the wards' ADCs and floor stocks.

Material and methods: The types and quantities of medicines kept in ADCs and floor stock were evaluated. Wards 11 to 14 were selected. Modifications to ADC and floor stocks were made using monthly dispensing data and ADC reports. Comparisons were made before and after adjustments in terms of number and cost of expired drugs using ADC destock report, number of times of ADC out-of-stock situations using pharmacy additional supply data, and average time required to process daily inpatient medicines to wards.

Results: After adjusting for anomalies, the cost of expired drugs dropped from $857.17 to $534.14, resulting in an improvement of $323.03 (37.7% reduction). There was an improvement in the number of out-of-stock ADC drugs (from 412 to 324). All selected wards had a reduction in frequency of out-of-stock situations for ADC drugs except ward 14. The average time required to pack the inpatient supplies improved from 78.6 minutes to 42.2 minutes (46.3% improvement), while the average time required to check reduced from 28.8 minutes to 17 minutes (41% improvement).

Conclusion: Adjusting ADC and floor stock levels decreased wastages and improved efficiency of processing inpatient medication supplies. There was improvement in terms of a reduction in ADC out-of-stock situations in three of the four wards. Further improvements can be made in future for even better impact.

POSTER DISPLAY

Abstract Number: 32

Abstract Category: Engage - Pharmacy Practice

A single centre's experience with the use of rivaroxaban and apixaban, and their efficacy and safety.

Ms Shirlene Leow[1], Dr Pei-Shi Ong[2], Ms Su-Ching Tan[3], Dr Eng-Soo Yap[4], Ms Pik-Wei Goh[3]

[1]National University of Singapore [2]National University of Singapore, Department of Pharmacy [3]National University Hospital, Pharmacy [4]National University Cancer Institute Singapore/Hematology

Introduction: Direct oral anticoagulants (DOACs) are becoming a favourable anticoagulation option. However, several studies have reported poor adherence to prescribing guidelines for DOACs and this raises questions on its efficacy and safety outcomes. Therefore, the primary objective of the study is to evaluate the prescribing patterns of apixaban and rivaroxaban, and the secondary objective is to compare the efficacy and safety of these DOACs in Singapore.

Method: Using medical records from National University Hospital, baseline characteristics of patients newly initiated with apixaban or rivaroxaban between 1 January and 31 December 2016 were compared using chi-square and Kruskal-Wallis tests. Prescribing patterns were evaluated for appropriateness based on product-insert leaflet (PIL) and FDA-approved recommendations. Primary efficacy outcomes were ischaemic stroke and any systemic embolism. Primary safety outcomes were any major or clinically relevant non-major bleeding. Kaplan-Meier curves and cox proportional hazards models were used to compare outcomes.

Results: Apixaban and rivaroxaban were prescribed to a population with similar baseline characteristics, however, higher bleeding risk patients were more likely to be prescribed with apixaban. Appropriate prescribing was identified in 73.2% of the patients and inappropriate prescribing was mainly attributed to under-dosing (16.5%). Primary efficacy and safety outcomes were not significantly different between apixaban and rivaroxaban (Hazard ratio [HR] 0.756; 95% CI, 0.156-3.679; p = 0.729 for efficacy outcomes; [HR], 0.828; 95% CI, 0.505-1.359; p = 0.456 for safety outcomes).

Conclusion: Results suggests that physicians were more likely to prescribe a DOAC with reported bleeding risk to encourage adherence to and persistence with therapy. Although prescriptions were largely appropriate, bleeding and stroke events were observed in the under-dosed patients. Therefore, emphasizing the importance of weighing risks and benefits when under-dosing patients. Comparing the study's findings to previous studies, safety outcomes were conflicting, and this was attributed to a difference in patient demographics and practice.

POSTER DISPLAY

Abstract Number: 33

Abstract Category: Empower - Clinical Sciences

Effects of compulsory HLA-B*15:02 testing policy on the usage of antiepileptic drugs for the monotherapy of partial-onset seizures in children

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Introduction: Carbamazepine is primarily prescribed as first-line treatment for partial-onset epilepsy. However, its' use has been associated with serious dermatological reactions linked to the presence of HLA-B*15:02. Compulsory HLA-B*1502 testing is a standard of care prior to initiating carbamazepine since 30 April 2013. Levetiracetam is a common alternative if the patient tested HLA-B*15:02 positive. Prescribing patterns of antiepileptic drugs (AEDs) was changed after implementation of this screening policy in Hong Kong. It is unknown if prescribing pattern for AED differed after the screening implementation at our institution. We thus aim to report on the prescribing pattern, safety and efficacy of using these AEDs pre and post-screening implementation.

Methods: This was an institutional review board-approved retrospective observational study. Primary aim was to report change in prescribing trends for the drugs pre and post-HLA-B*15:02 screening implementation. Secondary aims were to report the safety and efficacy of the drugs. Patients aged 18 who fit the diagnostic criteria of partial-onset epilepsy were included in the study. Pharmacy dispensing data for the first collection of oral formulations of either drug as monotherapy were retrieved. Also, patients who had minimum one-year of follow-up were reviewed for efficacy and safety.

Results: Three-hundred and five patients received monotherapy carbamazepine or levetiracetam during the study period. Prescriptions for carbamazepine changed significantly from 79.6% pre-screening to 42.9% post-screening, with a corresponding increase of levetiracetam prescriptions from 20.4% to 57.1% ($p<0.001$). There was no significant difference in seizure control (80.9% vs. 80% ($p=0.866$). Allergies decreased significantly from 12.9% to 2.0% post-screening ($p=0.003$).

Conclusion: The HLA-B*1502 screening program resulted in a change in prescription trend for both carbamazepine and levetiracetam for the monotherapy of partial onset epilepsy. The number of allergies was significantly reduced, without affecting seizure control. Future studies should investigate the pharmacoeconomic impact of the screening program in children.

POSTER DISPLAY

Abstract Number: 34
Abstract Category: Empower - Clinical Sciences

Comparing the understanding of written counselling information versus verbal counselling information through a Med Take Test

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[1]Woodlands Health Campus [2]Republic Polytechnic

Background: In this current age of e-commerce, patients may increasingly opt for alternative ways of medication collection in part due to learned behaviour from other experiences in their daily lives. This study aims to address the growing need of patients who may prefer not receive medication counselling physically at the pharmacy and will require alternative modes of information delivery.

Methods: Patients able to understand written English and with 3 or less prescription items from Ophthalmology, Orthopaedics, Urology or General Surgery disciplines were recruited. They were randomly assigned to control and intervention arms at the outpatient pharmacy in Khoo Teck Puat Hospital. In the control arm, patients were first given verbal counselling, and in the intervention arm, patients were first given a Patient Medication List (PML) of their prescription items. A modified Med-Take-Test (MTT) was performed to assess for understanding of counselling information given verbally or through the PML. Results comparing Med-Take-Tests between each arm and after verbal counselling were done using Chi-square analysis.

Results: The PML arm, 40.0%, was statistically inferior to counselling 57.3% ($p<0.001$) on the MTT. Although PML had lesser overall passes on the MTT, a satisfactory percentage (≥80%) by clinical standards of the populations studied was shown to understand indication, route of administration, frequency and dose information of their medication. Of note, patients across both arms performed poorly in understanding side effects (PML 59.5%, Counsel 76%, $p < 0.001$) and allergy (PML 50.5%, Counsel 72.9%, $p<0.001$) information.

Conclusion: This study has demonstrated that verbal counselling does not ensure 100% understanding of all counselling information. Written information while inferior to verbal counselling on a Med-Take Test, may perform better in longitudinal understanding of counselling. These results indicate improvements should be made to the PML and with adequate revision, may be used as a counselling tool for locker services.

POSTER DISPLAY

Abstract Number: 35

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Patient Satisfaction - Ageing in Place (AIP)

Mr Andrew Fok[1]
[1]*Khoo Teck Puat Hospital*

Background: The Khoo Teck Puat Hospital (KTPH) Community Care Team (CCT) consisting of doctors, nurses, therapists, and pharmacists periodically visit CCT patients in their homes to review their medications and medical conditions. However, patients still have to collect their medications at KTPH Outpatient Pharmacy (OP). Additionally, patients' perception of Pharmacists' visits to their homes is unknown.

Objectives:
1. To calculate average waiting time at OP and assess willingness of CCT patients to opt for Home Delivery (HD)
2. To evaluate patients' perception of CCT Pharmacists

Methods: Retrospective data collection of medication dispensed and waiting time of CCT patients at OP between June and July 2018 was extracted from the dispensing system. Willingness to opt for home delivery was asked during the phone interview.

CCT Patient satisfaction and HD Survey: CCT patients or caregivers were interviewed via telephone by a pharmacist using a survey with a 5-point Likert scale.

Results: The 125 unique CCT patients collected an average of 3.36 medications. Medications for the following conditions were collected: chronic disease 50% [79/158], minor ailments 26.6% [42/158] and others 23.4% [37/158]. Each CCT patient waited an average of 29.79 minutes.

CCT patient satisfaction and HD survey: 21 patients who were visited by CCT were surveyed. They had an average age of 76.9, with an average of 10.24 chronic medications. Average Likert scores obtained for the following: perceived benefit of Pharmacists' visits - 4.19/5; improved patients' medication knowledge - 3.95/5; keen for repeat Pharmacists' visits - 3.38/5.

73.6% [14/19] of respondents had not heard of HD. Interviewed patients collectively suggested an average price of $5.79 for HD.

Conclusions: CCT patients and caregivers felt that the waiting time at KTPH OP was acceptable and therefore they were not keen for HD. CCT patients and caregivers were appreciative of the CCT Pharmacists' service.

POSTER DISPLAY

Abstract Number: 36

Abstract Category: Educate - Pharmacy Education

Evaluation of Pharmacy Faculty Training Program on Effective Feedback through Kirkpatrick's Model

Dr Lim KW[1], Ms Khoo SR[1], Ms Koh SK[1], Ms Wu Melissa F[1], Ms Chow Melissa MY[1], Ms Fan Petrina WY

[1]*Singapore General Hospital*

Background and objectives: Comprehensive faculty training program is essential in equipping pharmacist with updated knowledge and skills to be an effective teacher. A pilot faculty training program was designed and delivered in phases since 2017 aiming to improve teaching and assessment effectiveness. Effective feedback is one of the compulsory courses identified. We conducted a study to access the impact of this effective feedback course on 18 participants using Kirkpatrick's model.

Methods: An open prospective interventional study using quantitative and qualitative instruments was performed from 15 November 2018 to 15 August 2019, on all 18 participants and subgroup of 8 and 7 participants, covering 3 levels of Kirkpatrick's model: Level 1) "Reaction" using standardized program evaluation form; 2) "Learning" by expert assessment of post-course action plan submitted by participants and 3) "Behavior" by expert assessment of transfer of skills via audit of feedback forms completed by participants. The study protocol did not include data of patients or participants. Data were collected anonymously and analyzed as part of quality management intervention of a faculty training program. Participants' verbal consent and voluntary participation was sought. Data was analysed using descriptive analysis and qualitative description.

Results: For level 1, all participants agreed that the course is relevant and useful, thus, they will recommend it to others. Many liked the interactive roll play method used. A few commented that the course should be introduced earlier before they become a preceptor needing to give feedback. For level 2, all participants whom submitted action plan adopted strategies taught, namely DESC feedback method and setting SMART goals. For level 3, the audit will only be completed in August 2019, when participants are formally involved in evaluation.

Conclusion: The preliminary results showed that the course is effective, at least for Kirkpatrick's level 1 and 2.

POSTER DISPLAY

Abstract Number: 37

Abstract Category: Pharmacy Technician Project - Quality Improvement Process

A more robust expiry date tracking system for patient safety

Miss Rizwanah Begam Binte Mohamed Sirajudeen[1], Miss Khairunisah Binte Abdul Rahman[1]
[1]*Khoo Teck Puat Hospital*

Background: Each staff in Khoo Teck Puat Hospital Outpatient Pharmacy (OP) was assigned a shelf. The shelf in-charge (IC) was responsible for ensuring First-Expiry First-Out (FEFO) and 5S.

Separately, 1 inventory staff was responsible for Expiry Date Tracking (EDT) of the entire OP formulary. However, in view of high daily workload and the sheer number of line items, EDT was often overlooked, resulting in 3 short-expiry drugs dispensed out in 3 months.

Objective: The aim was to share EDT among the various shelf In-charges (ICs) to minimize the risk of supplying expiring medications as EDT was an extension of FEFO. It also aims to reduce the time taken to complete one round of EDT.

Methods: A WhatsApp group was created as a platform to do monthly EDT updates to Inventory Team. Drugs that were expiring within 6 months and more than 6 months but less than 1 year from the month of checking were noted. The Inventory Team then took the necessary action of transferring these drugs to sections with higher usage.

Results: With the shared responsibility, time taken to complete 1 round of EDT was 1 month instead of 44 weeks that 1 inventory team member would have taken. It also resulted in 0 short-expiry drugs dispensed from Feb to Dec 2018

Conclusion: This created a more current and robust EDT system. It allowed the Inventory team to focus on more pressing tasks such as investigation of variances. Furthermore, this initiative inculcated a sense of ownership in shelf ICs as well as increasing awareness of the relationship between tight inventory control and medication safety.

POSTER DISPLAY

Abstract Number: 38
Abstract Category: Engage - Pharmacy Practice

Incidence of cutaneous adverse reactions in patients receiving pemetrexed with or without prophylactic dexamethasone in a local hospital oncology unit

Ms Beng Yi Sia[1]
[1]*Tan Tock Seng Hospital*

Background: To reduce the incidence and severity of pemetrexed induced cutaneous adverse reactions (CAR), the manufacturer has suggested a 3-day premedication dexamethasone regimen, beginning 1 day before chemotherapy. However, oncologists in Tan Tock Seng Hospital (TTSH) do not strictly adhere to this premedication regimen. A study found that the incidence and severity of rash in the group without prophylaxis was significantly higher compared to the group with prophylactic dexamethasone. A single study of 14 patients found that a single dose of dexamethasone 20 mg given on the day of chemotherapy might be an alternative to pre-medication dexamethasone regimen.

Objective: The primary objective of my study is to determine if prophylactic dexamethasone reduces incidence of CAR. The secondary objective is to determine if dose of dexamethasone given on day of treatment affects incidence of CAR in patients without prophylactic dexamethasone.

Methods: This study is a retrospective medical records review of patients receiving pemetrexed-containing chemotherapy in TTSH. Doses of pemetrexed, dexamethasone and presence of CAR will be collected from electronic records. The incidence of CAR for both study groups will be compared using chi-square test. For the group without prophylactic dexamethasone, logistics regression will be used to identify the relationship between dexamethasone doses and the incidence of CAR.

Results: 108 patients were studied. Patients without prophylactic dexamethasone (n=49) had a significantly higher incidence of CAR compared to patients with prophylactic dexamethasone (n=59) ($p<0.05$). In the group of patients without prophylactic dexamethasone, giving at least 12 mg dexamethasone on the day of chemotherapy seems to have a lower incidence of CAR, although no statistical significance was achieved.

Conclusion: Prophylactic dexamethasone is recommended to reduce the incidence of pemetrexed-induced CAR. Further studies are required to ascertain if a higher dexamethasone dose on the day of chemotherapy can be an alternative to prophylactic dexamethasone.

POSTER DISPLAY

Abstract Number: 39
Abstract Category: Engage - Pharmacy Practice

Utilization of Clinical Scores in Prediction of Poor-Quality Anticoagulation Therapy

Mr Cho-Lun Chiang[1], Ms Weini Yeoh[1], Ms Ka Lok Cheung[1]
[1]*Ng Teng Fong General Hospital*

Introduction: SAMe-TT2R2 score has been utilized to predict poor-quality warfarin therapy in Western countries, whereas high HASBLED score indicated that patients had poor warfarin control in one Singapore medical centre. This study aimed to validate these findings in patients from our institution and to explore establishing a protocol of initiating anticoagulant (direct-acting oral anticoagulant vs. warfarin).

Methods: We included patients who followed up at anticoagulation clinic in NTFGH between 2015 and 2016. Patients who had only one clinic visit or received less than 14 days of warfarin were excluded. We examined the relationships between clinical scores CHAD2SVASc, HASBLED and SAMe-TT2R2, with clinical indicators modified Rosendaal time in therapeutic range (mTTR), percentage of INRs within the therapeutic range (PINRR) and variance growth rate (VGR). TTR of < 65%, PINRR of < 60%, or VGR of < 65% indicate poor-quality warfarin therapy. mTTR excludes INR taken during hospitalization.

Results: 463 patients were included in our retrospective study. The average mTTR throughout the follow-up period was 62%. Patients with SAMe-TT2R2 score ≥ 3 had lower mTTR (61±30% vs. 70±25%, Mann-Whitney U test, p = 0.03). However, between SAMe-TT2R2 score and mTTR, there was neither significant linear relationship (Pearson's Correlation coefficient, r = -0.08, p = 0.06) nor significant difference by using cutoff point of 65% mTTR (Odds ratio = 1.70, 95% confidence interval: 0.97-3.05, p = 0.06). There was no other significant association found between other clinical indicators and clinical scores.

Conclusion: None of the clinical scores was useful in predicting poor-quality warfarin therapy in our study cohort. The results of this study did not support the findings from previous studies. We need further research that looks into other patient-related factors that may also contribute poor-quality warfarin therapy.

POSTER DISPLAY

Abstract Number: 42

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Reducing the number of No Prescription Interventions by Eye Department

Miss Jiawen Alicia Lin[1], Miss Ee Ling Beh[1]
[1]*Tan Tock Seng Hospital*

Background: In 2017, Outpatient Pharmacy made 1092 phone calls to Eye Department prescribers for No Prescription received (the prescribing error rate per 1000 prescriptions was: 14.47%), increased from 545 phone calls in 2016.

No prescription: Patient arrival at Pharmacy with no prescription for ordering.

Results showed after calling the prescribers, 93% of the prescription was sent in thereafter. The average additional patient wait time for prescription to be sent in after calling prescriber was 13 mins 29s. (Data from Jan- April 2017) This form of intervention is non-value adding to all parties- patients, prescribers and pharmacy. Hence, there is a need to reduce such interventions to achieve a win-win situation for all.

Objectives: To reduce prescribing error rate per 1000 prescriptions by Eye Department for No prescription by 50%.

Methods:

1. Work with Eye Department to better understand their clinic workflow and patients' various touch points
2. Root cause analysis is done and findings presented to Eye Department- Quality Reporting Officer, Dr Owen for discussion and solutions to be shared with Eye prescribers

Results:

1. From 90.5 calls/month in average to 57.5 calls/month in average over 6 months period, 36.46% dropped (less phone disruption to prescriber during clinic consultation)
2. Completing the intervention (calling prescriber to receiving prescription and ordering) takes average 13 mins 29s, hence manpower savings for staff: 7.42 hr/month
3. The prescribing error rate per 1000 prescriptions for no prescription interventions by Eye Department decreased from 14.61% to 8.85%, overall reduction of 39.43%.

Conclusion: The collaboration of healthcare professionals (prescribers, pharmacy, clinic SOCs) has successfully reduced the prescribing error rate per 1000 prescriptions from 14.61% to 8.85%, an overall reduction of 39.43%. Besides minimizing the disruptions to prescriber, this also improves patient's experience by having a shorter waiting time and smoother transition from clinic consultation to medication collection.

POSTER DISPLAY

Abstract Number: 43

Abstract Category: Pharmacy Technician Project - Quality Improvement Process

Initiatives to tackle two root causes that contribute to pharmacy packing errors

Ms Norjanah Alias[1], Mr Devester Choo[1]
[1]*Ng Teng Fong General Hospital*

Background and objectives: This abstract describes phase 1 of a pharmacy project involving reduction of wrong drug/form/strength packing errors due to two root causes, namely:

- Staff not packing according to bin codes as a result of familiarity with bin locations
- Staff picks the wrong medicine from the correct bin due to errors in medicine top-ups.

Method:

1. Root cause 1
   Near-miss data was analysed to detect medications that are often packed wrongly. Top ten medicines are targeted for bin location reshuffles. Staff are informed that bins had been reshuffled without further details given. Daily reminders are also shared during roll calls to record near misses and follow packing protocol.
2. Root cause 2
   Gap analysis on causes of wrong medicines in bin was carried out. One contributing factor is different medicines with packaging that look-alike is not properly segregated during delivery, leading to mix-ups. Pharmacy staff worked with delivery personnel on a more structured manner of drug arrangements in delivery boxes to reduce this risk.

Results:

1. Root cause 1
   Prior to reshuffling of bins in October 2017, a monthly average of 30.2% (from 5 months' data) of wrong drug/form/strength packing near miss over total packing near miss was found. After reshuffling of bins, the wrong drug/form/strength data for the subsequent two months were 25.3% and 24.6% respectively. While there is a reduction in percentages, the team needs to be constantly vigilant and reshuffle the bins periodically for sustained improvement.
2. Root cause 2
   In November 2017, store staff adopted the practice of properly segregating look-alike medicines to prevent mix-ups during delivery. In the 3-month follow up period, no wrong top-ups due to look-alike medicines were reported.

Conclusion: Medication errors are caused by a large number of factors. Incremental improvements can help reduce risk of errors further.

POSTER DISPLAY

Abstract Number: 46

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Streamline Outpatient Pharmacy Intervention Back End Workflow

Miss Jiawen Alicia Lin[1], Miss Ee Ling Beh[1]
[1]*Tan Tock Seng Hospital*

Background: In outpatient pharmacy, intervention is a vital work process which allows pharmacy to make clinical clarifications and patient enquiries to prescribers (near miss error). In average, approximately 3370 interventions were made monthly by outpatient pharmacy to prescribers. Each intervention is tagged to an intervention code based on the nature and root cause of intervention to ensure effective reporting of prescribing error. Each month, an enormous amount of backend effort is taken to ensure each intervention is coded correctly post-intervention.

Objectives:

1. Ensure interventionists code interventions correctly so as to reduce the need for re-coding:
    a. Reduce total intervention checking time from 60hr to 30hr
    b. For re-coding rate, to drop by 30%
2. Eliminate non-value processes:
    a. Reduce raw intervention data clean up from 5hr to 2hr

The above will help to improve staff work efficiency and achieve time savings.

Methods:

1. Work with Informatics Team to identify the wastes present in the process and gather feedbacks from staff via questionnaire to identify gaps in intervention workflow.
2. Root cause analysis was done and ideas explored to eliminate wastes

Results

1a) Total intervention checking time saved: 11.5hr
1b) Drop in re-code rate: 10.88%, Estimated Time savings: 3.319hr
2a) Reduce time for raw intervention data clean up from 5hr to 1hr (Time savings: 4hr)

Conclusion: With this project, time savings and work efficiency for both the intervention coders and intervention team have been achieved. To ensure sustainability of results, all new staff/ pre-reg and students are required to complete an e-learn assignment and quiz. For old staff, feedbacks are given if they deviate from the standard intervention coding workflow (audits).

POSTER DISPLAY

Abstract Number: 47

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Auto-intervention by Department of Pharmacy and its Impact on the Time Spent on Processing Discharge Medications

Mr Brandon Chua[1], Ms. Julianne Kan[1], Ms. Peiru Wu[1], Dr. Yong Hong Ng[1], Mr. John Wong[1]
[1]*KK Women's and Children's Hospital*

Background/objective(s): Ensuring the five rights of medication use is vital in processing of discharge medication supplies. Inevitably, discrepancies may occur leading to delays in discharge medications. Hence this project aimed to reduce time spent by pharmacy staff to contact doctors on interventions while processing discharge prescriptions.

Methods: The Department of Pharmacy proposed the auto-Intervention initiative where pharmacists or trained pharmacy technicians can amend discharge medication orders based on a pre-defined criteria without contacting the prescriber. This included orders with antibiotic/steroid duration discrepancies of 1 day, omission of over-the-counter items and alterations of dosage forms (except anti-epileptic drugs). The criteria was developed upon reviewing the most common interventions performed by Department of Pharmacy. It was also approved by the Department of Pediatrics, Infectious Diseases Service and Medication Safety Committee. Thereafter, it was incorporated into the Department of Pharmacy policy and procedure in June 2016. Monthly audits were also conducted to ensure compliance to the criteria. The total number of auto-interventions, and estimated time/cost saved were captured between June 2016 to December 2018.

Results: The total of 6054 auto-interventions were done in the study period. Seven cases (0.1%) of non-compliance were noted, all of which did not compromise on patient safety. The average time saved after implementing the auto-intervention initiative was noted to be 23 minutes per prescription and the manpower cost saving for pharmacists per year was found to be $74,800.

Conclusion: Implementation of the auto-Intervention initiative has significantly reduced time spent on discharge prescription review, by removing the need to contact prescribers and the need for prescribers to amend the prescription. The amount of time saved led to man-hour cost savings, allowing both pharmacy staff and prescribers to spend more time on clinical duties.

POSTER DISPLAY

Abstract Number: 48

Abstract Category: Engage - Pharmacy Practice

Prevalence of and Risk Factors for Nonadherence to Insulin among Pediatric Type 1 Diabetes Patients in Singapore

Mr Brandon Chua[1], Ms. Jamie Stephanie[1], Ms. Soo Ting Lim[1], Dr. Ngee Lek[1,2], Dr. McVin Cheen[3]
[1]KK Women's and Children's Hospital [2]Duke-NUS Medical School [3]Danone Nutricia Research

Introduction/Objectives: Adherence to insulin among paediatric patients with type 1 diabetes (T1D) in Singapore has not been studied. Identifying the risk factors for nonadherence allows for the identification of patients at risk for poorer healthcare outcomes. Hence this study aimed to assess the prevalence of nonadherence to insulin and its associated risk factors among paediatric patients with T1D in Singapore.

Methods: This retrospective, single-centre longitudinal study. included patients with T1D aged ≤18 years with ≥1 year of insulin collection from the hospital between 2012 to 2016. Patients on insulin pump were excluded. Patients with medication possession ratio (MPR) below 100% were considered nonadherent. The Mann Whitney U te, t-test, and $\chi 2$ test were used to analyse median, means, and proportions. Regression analysis was used to identify risk factors for nonadherence. Sensitivity analyses were conducted for MPR<95% and MPR<80%.

Results: A total of 210 patients were included in the study. Patients in the nonadherent group were older and had a longer disease duration. Gender, race, financial class and number of concurrent medications were comparable between both groups. The prevalence of insulin nonadherence among paediatric patients with T1D in Singapore was 35.7% (95% CI= 29.2%–42.6%). This varied between 12.4% (95% CI: 8.3–17.6%) and 26.2% (95% CI: 20.4–32.7%) when nonadherence was defined at MPR<80% and MPR<95%. An increase in age and duration in diabetes was associated with 22.0% (p= 0.002) and 12.6% (p= 0.024) increased risk of nonadherence respectively. Patients of Chinese descent were 56% (p= 0.026) less likely to be nonadherent compared to other ethnicities.

Conclusions: The prevalence of insulin nonadherence and associated risk factors among paediatric patients with T1D is significant. Targeted interventions may be designed subsequently to improve adherence to insulin therapy.

POSTER DISPLAY

Abstract Number: 49

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Reduction of Medication Packing Near Misses via Active Review of Drug Bin Locations

Ms Chee Pheng Loh[1], Ms Cheralyn Meiqi Tay[1], Ms Alifatun Adawiyyah Binte Mustamam[1], Ms Dejucos Lucita Talion Talion[1], Ms Ai Shing Ng[1]
[1]KK Women's & Children's Hospital Pharmacy Department

Aim: To reduce medication packing near misses from Look-Alike-Sound-Alike (LASA) drugs by actively reviewing drug bin locations

Methodology:

1. In KKH Outpatient Pharmacy (OP), medications are placed in alphabetical order on the shelves with LASA drugs placed at least one bin apart. Monthly medication near miss reports from June 2016 to September 2017 revealed that an average of 14.9% of packing near misses were due to wrong drugs. Out of the 14.9%, 90% of them have the following LASA characteristics:
   a) Multiple strengths
   b) Similar appearances (colours, shapes, packaging, brand names)
   c) Similar sounding names, strengths, dosage forms
2. To mitigate the risk of mix-ups, OP Med Safety Team actively reviewed the bin locations of LASA drugs which had near misses and any drug with potential LASA characteristics to place them further apart. All staff were encouraged to provide suggestions too.

Result: All 32 shelves in OP were reviewed and bin location changes were actively carried out. Since October 2017, a total of 56 drugs were given new locations till date. Out of 56 drugs, 67% were drugs with multiple strengths, similar packaging and/or sounding names. After the location changes were made, there were only 2 cases of near misses re-occurrence for LASA drugs which were previously flagged up as near misses before. The median number of packing near misses due to LASA drugs per month dropped significantly by 42% from 7 to 4.

Conclusion: LASA drugs placed within close proximity can lead to inadvertent mix-ups resulting in packing near misses. Active review of drug bin locations can significantly reduce packing near misses. Whenever there is a change of drug appearance or addition of new drug, the respective drug bin location would be carefully considered to ensure medication and patient safety.

POSTER DISPLAY

Abstract Number: 50

Abstract Category: Engage - Pharmacy Practice

An Enhanced Pharmacist Counseling Service to Improve HbA1c in Patients with Type 2 Diabetes Mellitus – A Pilot Study

Mr Jianming Tan[1], Miss Hiu Yin Yeung[1], Dr Subramaniam Tavintharan[2,3], Ms Christine Bee Choon Teng[4]

[1]Woodlands Health Campus [2]Khoo Teck Puat Hospital [3]Admiralty Medical Centre [4]National University of Singapore

Introduction: The burden of diabetes mellitus (DM) in Singapore is estimated to soar beyond $2.5 billion by 2050. Effective interventions are required to reduce HbA1c and reduce the complications of DM. Counseling by pharmacists has been shown to improve HbA1c, medication adherence and even reduce mortality.

Objective: To evaluate the effects of an enhanced pharmacist counseling service (ECPS) on HbA1c.

Design: The EPSC consisted of 2 counseling sessions provided by the same pharmacist, one counter dispensing and a telephone counseling session 4-5 weeks later. At both sessions, the pharmacist assessed the patient's familiarity to their antidiabetic medications using the MedTake test and then identified, advised and categorized interventions to improve adherence according to the mnemonic "SIMPLE". Patient's needs identified during the face-to-face counseling were followed-up via telephone counseling. The EPSC was evaluated in a three-month randomized trial at a specialist outpatient DM clinic. Type 2 DM patients with HbA1c > 8% and poor adherence (proportion of days covered < 80%) were recruited and randomly assigned to EPSC or control group. The control group received usual pharmacy counseling at the dispensing counter. Primary outcome was a change in HbA1c 3 and 6 months from the date of recruitment.

Results: A total of 21 and 25 patients were recruited in the EPSC and control group, respectively. Median HbA1c change at 3 and 6 months in the EPSC group and control group were significantly different, -0.7% (-1.9%, -0.2%) versus -0.2% (-0.4%, 0.3%) and -1.2% (-2.2%, -0.1%) versus -0.4% (-1.3, 1.0), respectively. Median HbA1c difference between the 2 groups was -0.5% at 3 months (p=0.013) and -0.8% at 6 months (p=0.040).

Conclusion: This pilot study showed that the enhanced pharmacist counseling service is an effective and practicable intervention for improving HbA1c in patients with poorly controlled Type 2 DM and poor antidiabetic medication adherence.

POSTER DISPLAY

Abstract Number: 51
Abstract Category: Engage - Pharmacy Practice

Understanding the perception of Guardian pharmacists in the provision of Diabetes Patient Care Program (DPCP) to the community

Ms Jia Shing Soh[1]
[1]*Guardian Health and Beauty*

Background and Objective: Community pharmacists are healthcare providers most accessible to the public and are at good position to provide diabetes self-management interventions. However, the utilisation of diabetes programs available in the nation is still suboptimal. This survey seeks to understand pharmacists' perception towards diabetes program and factors that affect sign-up, using Guardian pharmacists and DPCP as reference points.

Methods: An online survey was created and sent to all Guardian pharmacists to see how far they agree with community pharmacists' role in diabetes management, types of activities that enable them to play active roles in diabetes management and how actively they offer DPCP.

Pharmacists were asked to rate their confidence level in providing diabetes counselling. The survey also asked pharmacists to rank the following:
1. Reasons for customers declining to join DPCP
2. Importance of the benefits they have gained from DPCP
3. Issues encountered when providing DPCP.

Among pharmacists who recruited participants, the survey asked which trainings or materials made providing DPCP counselling easier.

Results: 98 out of 100 Guardian pharmacists agreed that community pharmacists should play active roles in diabetes management. Pharmacists were quite confident to counsel on diabetes treatment targets. Majority of pharmacists rarely offer DPCP to customers, most common reason is "pharmacists were too busy dispensing". The most common reason for customers rejecting DPCP is "customer is not interested". Most pharmacists felt their greatest gain for providing DPCP is job satisfaction.

Conclusion: Based on this survey, programme coordinators of DPCP and similar pharmacist-led services have a better idea of factors that can affect sign-up in a retail community setting. More can be done to optimise utilisation of DPCP, thereby empowering more in the management of diabetes.

POSTER DISPLAY

Abstract Number: 52

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Reducing intervention numbers with auto top-up for insufficient prescribed quantities

Miss Jiawen Alicia Lin[1], **Miss Ee Ling Beh[1]**, Miss Yi San Chong[1]
[1]Tan Tock Seng Hospital

Background: Insufficient duration of chronic medications prescribed till next doctor's appointment is often encountered at TTSH Specialist Outpatient Clinic visits. The shortage ranges between a few days to a few months and pharmacy staff need to request for medication top-up from prescribers. This accounts for up to 30% of all outpatient pharmacy interventions from January to June 2016. Furthermore, each intervention takes about 12.8 minutes to complete which means increase patient's wait time at the pharmacy.

Objectives:
Phase 1:
- Reduce number of topup interventions for Cardiology (CVM) and Neurology (NNI) by 30%.
Phase 2:
- Roll out to ALL Departments and reduce the above by 30%
- Create a standardized list of auto-topup criteria and duration for all departments

Methods: CVM and NNI data due to under-duration was analysed for 6 months before and after implementation of the automatic medication topup rule. The data is obtained from monthly pharmacy intervention workload reports.
Phase 2: The distribution data of mismatch duration was analysed to study on the practicality of expanding auto-topup criteria from 1 week to 2 weeks.
The set of standardized exclusion criteria was completed after collating suggestions from all Head of Departments, ensuring medication safety is not compromised after implementation.

Results:
Phase 1: 30.6% reduction of pharmacy interventions (168 interventions lesser) in 6 months by NNI and CVM
Phase 2: 24.8% reduction of pharmacy interventions (57 interventions lesser) monthly from February till May 2018

Conclusion: The automatic medication topup rule is effective in reducing number of pharmacy interventions for under-duration of chronic medications prescribed till next appointment. This improves patient experience as there is no unnecessary wait time for interventions, reduce phone disruption to doctors and pharmacy staff is able to focus on value adding activities for patients (eg dispensing/ med reconcilation) than calling prescribers for top-up.

POSTER DISPLAY

Abstract Number: 53
Abstract Category: Engage - Pharmacy Practice

A Validation of a Predictive Model Abstract

Miss Rachelle Koh[1], Mr Gordon Bong[1]
[1]*Khoo Teck Puat Hospital*

Background: With increasingly complex medication therapies, drug-related problems (DRPs) are more common. Pharmacist-led patient medication interviews upon admission can help to identify and resolve DRPs. However, it is not possible to comprehensively interview all patients as interviews are time-consuming. Identifying predictors of DRPs can aid pharmacists in prioritising patients at higher risk to interview. This study aimed to validate the predictors of DRPs from a previous model in 2017.

Method: This was a prospective study conducted in Khoo Teck Puat Hospital (KTPH) which analysed 350 inpatients over 4 weeks. Using predictors generated from the previous model (age above 55 years old, history of hyperlipidaemia, more than 5 line items), a logistic regression model was constructed with the current dataset. The Receiver Operating Characteristic (ROC) curve and Hosmer and Lemeshow test were conducted to evaluate if the models generated could predict for DRPs.

Results: It was consistently found that patients with more than 5 line items were significantly associated with higher risk of DRPs (OR 3.37, P <0.05). Statistical significance was preserved even when both previous and current datasets were combined. While the other two predictors were not shown to be significant, the model generated predicted for a higher percentage of DRPs as compared to the null model (ROC = 0.646).

Conclusion: Although the model was not found to be an excellent predictor of DRPs, this study was able to confirm that patients with more than 5 line items were at higher risk of DRPs. This affirms pharmacists' efforts in de-prescribing unnecessary medications.

1 Bong, G., Ong, C., Chang, G., Heng, J., & Koh, Y. Patient Interviews and Medication Reconciliation Standards.

POSTER DISPLAY

Abstract Number: 55

Abstract Category: Educate - Pharmacy Education

Introduction of Communication Skills Training Program for Pre-registration Pharmacists in KK Hospital

Ms Chee Pheng Loh[1], Ms Patsy Tsen[1], Ms Ai Shing Ng[1]
[1]*KK Women's & Children's Hospital*

Background and purpose: Effective communication by pharmacists with patients and with other healthcare co-workers is vital in improving patient safety, clinical outcomes and overall satisfaction. With the aim to develop students' communication skills, a communication skills training program was introduced into existing pre-registration pharmacist training framework at KK Hospital Outpatient Pharmacy.

Methods: Pre-discussion self-learning

- Self- reading of slides focusing on communication skills and Patient-centered Communication Tool (PaCT)1.
- Reflecting on challenging communication experiences.

Facilitated discussion

- Each student shares his authentic communication experiences. Discussion facilitated by pharmacists helps stimulate students' thinking, increase their awareness and help them make associations to effective communication skills and PaCT.
- Students engage in role-play that reveal common communication gaps experienced by new pharmacists.

Post-discussion

- Self-assessments by students using in-house survey help student reflect on their learning.
- Facilitators assess students' interaction with real patients.

Results: Two cohorts of 6 students took part in this pilot training from May to December 2018. As a learning tool, 75% of students found role-play and facilitated discussions more effective than self-reading. Self-assessment showed that all students were able to identify some areas for improvement. Observational assessments by facilitators showed that students applied the communication tools learnt from this training during subsequent dispensing and interaction with co-workers.

Conclusion: Communication skills training program benefits pre-registration pharmacists in improving their communication skills with both patients and other healthcare co-workers. The program can be further extended to new pharmacy technicians and pharmacists.

1. Gloria R. Grice, Nicole M. Gattas, Theresa Prosser, Mychal Voorhees, Clark Kebodeaux, Amy Tiemeier, Tricia M. Berry, Alexandria Garavaglia Wilson, Janelle Mann, and Paul Juang (2017). Design and Validation of Patient-Centered Communication Tools (PaCT) to Measure Students' Communication Skills. American Journal of Pharmaceutical Education: Volume 81, Issue 8, Article 5927

POSTER DISPLAY

Abstract Number: 56
Abstract Category: Engage - Business Practices

Risk stratification of patients visiting Outpatient Pharmacy (OP)

Miss Faith Hong[1]
[1]*Khoo Teck Puat Hospital*

Introduction: Khoo Teck Puat Hospital (KTPH) Outpatient Pharmacy (OP) serves patients of different demographics, and therefore, different needs. This study aims to identify patient groups that are more likely to have drug related problems (DRPs) so as to further improve patient safety. This stratification will also flag patient groups that are less likely to have DRPs to target them for alternative collection methods involving minimal counselling.

Methods: Random sampling was performed for KTPH patients collecting medications at OP between June to August 2018. Sampled patients were then interviewed using a short screening tool to identify possible DRPs and medication adherence issues (MAI). Patients' demographics and prescription related factors were also collected. Chi-square tests were then performed to identify possible associations between independent factors and the likelihood of having MAI.

Results: Four hundred and fifty patient visits were analysed. Forty-one (9.1%) DRPs were identified. The majority of DRPs were due to MAI (53.7%) and adverse drug reactions (ARDs, 22%). Surprisingly, 68.2% of the patients with MAI were aware of their medication regimes. There was a possible association between patient collecting medications from non-restructured institutions and MAI. However, no association was found between age, gender, race, English proficiency, number of line items and MAI. MAI were most frequently observed in patients with Endocrinology (16.7%), Gastroenterology (12.5%), Dermatology (10%) and Cardiology (9.09%) prescriptions, while no MAI was reported from Ophthalmology, Orthopaedics, Psychiatry, Dental, Palliative, Intermediate and Long Term Care and Geriatrics prescriptions.

Conclusion: Patients from the above mentioned disciplines with no reported MAI may be considered for alternative medication collection methods such as locker or home delivery services, while Endocrinology, Gastroenterology, Dermatology and Cardiology patients may benefit from more extensive patient counselling. Further studies may explore the factors contributing to ADRs.

POSTER DISPLAY

Abstract Number: 58
Abstract Category: Engage - Business Practices

A Cross-sectional Survey on the Unmet Needs of Informal Caregivers Supporting Cancer Patients in Singapore

Miss Xue Qi Koh[1], Dr Phebe Si[2], A/Prof Lita Chew[1]
[1]National University of Singapore [2]National Cancer Centre Singapore

Background: Informal caregivers (ICs) supporting cancer patients are at increased risk of reduced quality of life, anxiety and depression, due to the immense burden of providing care and concurrently dealing with the possibility of losing loved ones. It is hence important to assess ICs' unmet needs to assist them for a better well-being.

Objectives: To identify the most pressing needs of ICs supporting ambulatory cancer patients receiving intravenous chemotherapy treatment in Singapore, and to describe characteristics of ICs that predispose them to different types of unmet needs.

Methods: A cross-sectional survey was administered to 155 ICs (defined as the main person providing care) accompanying cancer patients for outpatient chemotherapy at the National Cancer Centre, Singapore. Survey sections included caregiver demographics, caregiving details, Barthel Index, Zarit Burden Interview (ZBI), and Support Persons Unmet Needs Survey–Short Form. Descriptive statistics summarised survey scores while chi-square tests and multiple logistic regressions were used to investigate factors associated with unmet needs.

Results: "Dealing with worry about the cancer getting worse" was the top reported unmet need (n=36), from the domain "The future". Information needs were associated with being employed and high caregiver burden. Work and financial needs were associated with age <45, being employed and higher caregiver burden. Personal and emotional needs were associated with higher caregiver burden.

Conclusion and Implications: There is demand for cancer caregiving support in Singapore, especially regarding concerns relating to the future. Caregiver age, employment status and ZBI can be used to predict unmet needs and individualise support plans.

POSTER DISPLAY

Abstract Number: 59
Abstract Category: Engage - Business Practices

Regulating Online Pharmacies and E-Commerce of Medicinal Products to Safeguard Public Health

Mr Mervyn Ming Xuan Lee[1], Dr Lai Wah Chan[2], Mr Chong Hock Sia[3]
[1]*Singapore General Hospital* [2]*National University of Singapore* [3]*Health Sciences Authority*

Background and objective(s): The introduction of the Internet has led to a proliferation of online pharmacies and e-commerce of medicinal products (MPs). While the shift of commerce from physical stores to online platforms has led to lower costs and convenience, illegal e-commerce of MPs may threaten public safety. Hence, this study aimed to investigate the challenges and regulatory control of this business model for MPs.

Methods: This study consisted of a critical review to gain a deep insight into the prevalence and operation of online pharmacies and e-commerce of MPs. It analysed the challenges faced by the Regulatory Authorities (RAs) and the existing efforts from the authorities and organisations to regulate the e-commerce of MPs; and proposed possible solutions.

Results: The findings showed that online pharmacies and e-commerce of MPs are increasingly prevalent. An alarmingly high percentage of online pharmacies are illegitimate, do not comply with the relevant laws and engage in the sale of counterfeit MPs. Consumers are generally unaware of the risks posed to their health by counterfeit MPs. In addition, prescription-only medicines (POMs) can be purchased easily without a valid prescription from illegitimate online pharmacies. This presents a huge concern because unsupervised use/potential misuse of POMs can lead to severe side-effects. RAs have been implementing domestic and international measures to protect consumers via the use of accreditation systems and the .pharmacy domain to direct consumers to legitimate online pharmacies. A more holistic approach is proposed to address the challenges.

Conclusion: Regulating online pharmacies and e-commerce of MPs is highly challenging due to a lack of effective legislations and internationally harmonized framework. RAs may consider adopting a more strategic and holistic approach. Although compliance costs may increase with tighter e-commerce regulation of MPs, safeguarding public health should ultimately be the over-riding concern of all RAs and stakeholders.

POSTER DISPLAY

Abstract Number: 60
Abstract Category: Engage - Pharmacy Practice

Medication Waste Management: Challenges and Opportunities in Singapore

Miss Prischelle Ng[1], A/Prof Lita Chew[2], Mr Keegan Lin[2]
[1]*National University of Singapore* [2]*National Cancer Centre Singapore*

Background: Improper management of medication waste could result in undesirable impacts on the environment and the community. Medication waste includes “expired products, dispensed drugs that are unwanted or discontinued, and contaminated medications”. Though guidance for medication disposal is publicly available, there is no data to reflect the level of awareness of proper medication disposal in Singapore. Unused medications post-dispensing is a problem in other developed countries and thus is reasonable to assume its existence in Singapore.

Aim: To identify the challenges and opportunities relating to medication waste management in Singapore.

Methods: Patients and caregivers at National Cancer Centre, Singapore were surveyed during a two-week medication waste management campaign. Healthcare professionals answered an online survey with similar questions. Data from the surveys were analyzed using SPSS Statistics 25.
Results: A total of 175 patient and caregivers, and 254 healthcare professionals were surveyed. The most common reason for unused medication in households was ‘condition resolved’ (43.4%) and 75.4% of respondents disposed of their medications into a trash bin. The majority (85.7%) of those surveyed were unaware of the recommended disposal practices for medications. Both populations felt a need for medication disposal points to be set-up (74.9%, 87.8%). Respondents opted for ‘limit dispensing supply’ and ‘limit prescription duration’ as methods to reduce medication waste in Singapore.

Conclusion: The results of this study have revealed existing gaps in our management of medication waste, and provided possible solutions to reduce medication wastage. Future efforts should include studies with national agencies to understand and ease the process of medication waste management.

POSTER DISPLAY

Abstract Number: 61
Abstract Category: Engage - Pharmacy Practice

Community-based Pharmaceutical Care Services to support seniors and caregivers

Ms Amy Chan[1], Dr Huei-Xin Lou[1], Ms Siew Ann Lee[1]
[1]*Ministry of Health*

Background: To support healthcare shift beyond hospital to community, polyclinic and retail pharmacists were stationed in centre-based care facilities to deliver community-based Pharmaceutical Care Services(PCS). PCS empower seniors/caregivers to independently handle their medications and support right-sited care. PCS consists of four key activities: medication reconciliation, adherence and knowledge assessments, medication optimisation and counselling.

Objectives: To pilot PCS in centre-based care facilities, work with primary-care providers in managing identified medication-related problems(MRPs) and understand required pharmacists' skillsets in these facilities.

Methods: Pharmacists provided PCS through a one-on-one interview with seniors/caregivers. The pharmacists captured seniors' medication list and an agreed pharmaceutical care plan in the National Electronic Health Records. Feedback from seniors/caregivers, and centre staff were also obtained.

Results: 155 seniors taking ≥5 medications or ≥12 doses of medications daily were enrolled from 8 sites. All received a copy of their medication list and plan. The average number of chronic medical conditions, medication and daily doses were 7+3, 9+4 and 12+5 respectively. 61% of seniors experienced 227 MRPs and 168 (74%) were due to the seniors/caregivers' lack of understanding on why, when and how to take and store medications. Through education and counselling, pharmacists resolved 98 (43%) of the MRPs. The pharmacists led the communications with other care providers to resolve the remaining MRPs. Feedback from seniors/caregivers mentioned engagement and empowerment post PCS. Centre staff deemed PCS as necessary for improving medication safety. The pharmacists involved expressed professional satisfaction when delivering this new model of care in the community.

Conclusions: This study showed MRPS in seniors/caregivers in the community could be resolved by placing pharmacist in centre-based facilities to work with the primary-care providers. The development of skillsets for pharmacists to embark on this role expansion is currently in progress. Future studies can evaluate the impact of implementing PCS in expanded community settings to support right-sited care model.

POSTER DISPLAY

Abstract Number: 63

Abstract Category: Empower - Clinical Sciences

Impact of CHADS-VASc and HASBLED Scores on Outcomes in Asian Patients with Non-Valvular Atrial Fibrillation Treated with Direct Acting Oral Anticoagulants vs Warfarin

Mr Fabian Aw[1], Dr Doreen Tan[2], Ms Elena Lee[3], Ms Jin Shing Hon[4], Ms Nancy Yong[5], Mr Ming Chai Kong[6], Ms Yee May Wong[7], A/Prof Lita Sui Tjien Chew[8]

[1]Woodlands Health Campus [2]Khoo Teck Puat Hospital [3]Changi General Hospital [4]National Heart Centre [5]National University Hospital [6]Singapore General Hospital [7]Tan Tock Seng Hospital [8]National University of Singapore

Introduction: The use of direct acting oral anticoagulants (DOACs) for prevention of stroke in non-valvular atrial fibrillation (NVAF) has become more attractive as compared to warfarin. A meta-analysis found that the benefits of bleeding and stroke reduction was reduced in older patients, highlighting potential limitations of DOACs in certain populations. We hypothesized that the benefits of bleeding and stroke reduction of DOACs over warfarin were attenuated in patients with higher CHADS-VASc and HASBLED scores.

Methods: We performed a retrospective cohort study, recruiting patients with NVAF newly initiated on oral anticoagulants from six public hospitals and specialist centres in Singapore. Patients were followed up for one year from initiation of anticoagulant for outcomes of stroke and systemic embolism (SSE), major bleeding and clinically relevant non-major bleeding events. We report the odds ratios for SSE and bleeding events, stratified by CHADS-VASc and HASBLED scores.

Results: A total of 1900 patients were eligible for review. Higher CHADS-VASc scores were not associated with increased odds of major bleeding in patients taking rivaroxaban or apixaban compared to warfarin. At higher CHADS-VASc scores, rivaroxaban did not significantly lower the risk of SSE compared to warfarin, CHADS-VASc < 3 OR 0.871 [p=0.01], CHADS-VASc ≥3 OR 1.40 [p=0.462], CHADS-VASc ≥ 4 OR 1.55 [p=0.427]. Apixaban was associated with higher odds of SSE compared to warfarin regardless of CHADS-VASc scores, CHADS-VASc < 3 OR 3.33 [p=0.206], CHADS-VASc ≥ 3 OR 4.60 [p<0.001], CHADS-VASc ≥4 OR 5.50 [p<0.001].

Conclusion: Higher CHADS-VASc scores increased the odds of SSE with DOACs over warfarin but did not influence the odds of major bleeding. There was no clear relationship between HASBLED scores and efficacy and safety. The risk-benefit ratio of DOACs over warfarin needs to be re-evaluated in our population. The efficacy of apixaban needs to be re-evaluated in our local population.

POSTER DISPLAY

Abstract Number: 64

Abstract Category: Engage - Pharmacy Practice

A Drug Utilisation Evaluation of Subcutaneous Rituximab in Patients at the National University Hospital (NUH)

Mr. Zhi Yao Chan[1,2], Ms. Siew Woon Lim[1,2]

[1]*Department of Pharmacy, National University Hospital* [2]*Oncology Pharmacy, National University Cancer Institute*

Background and Objectives: Rituximab is a monoclonal antibody directed against the CD-20 antigen on B-lymphocytes and is widely used in haematological malignancies and rheumatologic conditions. Approved in Singapore in 2016, a new subcutaneous Rituximab and hyaluronidase formulation was made available. It is indicated in adult patients with follicular lymphoma and diffuse large B-cell lymphoma. This has provided an alternative to patients who would otherwise receive it via intravenous route. In view that subcutaneous Rituximab is a new formulation introduced into NUH's formulary in 2017, a drug utilisation evaluation was conducted to assess its prescribing patterns.

Methods: Appropriateness of prescribing based on dosing regimen, pre-initiation checks and pre-medications ordered, costs and time spent administering drug and adverse effects associated with the use of subcutaneous Rituximab were evaluated using electronic medical records.

Results: Seventy-two patients were analysed for the study period of May 2017 to September 2018. Majority of patients (95.8%) were prescribed subcutaneous Rituximab for its approved indications. All patients had a baseline hepatitis panel conducted and prophylactic anti-virals were initiated for patients who required. One patient (1.39%) was not pre-medicated prior to receiving subcutaneous Rituximab. All patients tolerated at least one dose of intravenous Rituximab before receiving subcutaneous Rituximab. Subcutaneous Rituximab is well tolerated, 10 patients (13.9%) experienced cytopenias documented as rituximab-related, 5 patients (6.9%) had infections documented to be treatment-related and none of our patients experienced mucocutaneous skin reactions. A cost minimalisation analysis revealed for patients with body surface area of 1.5 metres square or greater, subcutaneous Rituximab use resulted in cost savings for all patient classes. Administration time saved for each subcutaneous dose prescribed was approximately 85 minutes.

Conclusion: Subcutaneous Rituximab is a useful drug formulation, appropriately prescribed in NUH. Its use has resulted in substantial cost reductions and timesaving in resource intensive intravenous-related administration processes to patients.

POSTER DISPLAY

Abstract Number: 65

Abstract Category: Engage - Pharmacy Practice

Using Multi-lingual Pictogram Label to Improve Medication Safety and Understanding in Tan Tock Seng Hospital Outpatient Pharmacy

Mr Hung Mook Tang[1], Ms Woan Chyi Lim[1], Ms Ca Lynn Kwa[1], Mr Raymond Yao Zhong Liew[1], Mr Jabigo Mark Anthony[1]

[1]*Tan Tock Seng Hospital*

Background: In Tan Tock Seng Hospital Pharmacy, medication labels are available in English and words only, this posed as an issue for patients who are not English educated or with low health literacy. There might be higher chances of misinterpretation of the medication labels which can result in patients taking medications incorrectly. Pharmacy staff had to translate and handwrite the indication & dosage instructions into the language and pictorial form which patients can understand. There is a risk of human error and may possibly lead to mistakes. Besides, there is only a limited pool of staffs who are proficient in the other 3 common languages used in Singapore (eg. Chinese, Malay & Tamil).

Aims/ Objectives: Use of multilingual pictogram medication label to improve medication safety and understanding with the aim of improving public health literacy.

Methods:

1. Design of multilingual pictogram medication label to include indication, doses and cautionary instructions in different languages such as English, Mandarin, Malay and Tamil.
2. Use of Rxpress System to auto-translate dosing information into the pictogram label.
3. Standardisation of packing workflow for both standard English label and multilingual pictogram label.

Results:

1. The multilingual pictogram reduces the need of asking other colleagues to translate and handwrite the dosing instruction which may incur chances of incorrect translation leading to incorrectly written instructions. It has also helped in minimising disruption to other colleagues who are already engaged with their patients.
2. A 100 patient survey was done, 86% of patients understand how to take medication correctly and what the medication is for with the use of multilingual pictogram label.
3. 96 out of 100 patients preferred the multilingual pictogram label over the standard English label.

Conclusion: Both staffs and patients find it easier to understand the medication use with the multilingual pictogram label.

POSTER DISPLAY

Abstract Number: 66
Abstract Category: Engage - Pharmacy Practice

Developing a decision support tool for pharmacists and clinicians to guide warfarin titration and dosing of novel oral anticoagulants

Miss Oh WL[1], Dr Phoon KY[1], Dr Moosa Aminath S[1], Mr Wee Q[1]
[1]*SingHealth Polyclinics*

Background: Pharmacists and clinicians often encounter patients on warfarin who require dose titration. Conventionally, many steps are required to work out the adjusted regimen and follow up management. The institution's guidebook on management of warfarin consists of many pages which will take a long time to go through especially in a busy clinic. With the availability of novel oral anticoagulants (NOAC) in the polyclinics, we would also need a more efficient and reliable way of checking the suitability of the prescribed drug doses.

Objective: To develop an easily accessible and user-friendly decision support tool that can guide warfarin titration and NOAC dosing, which also incorporates the guidelines in an abbreviated format.

Methods: An Excel-based tool, the "Warfarin calculator", was initially developed to incorporate the dose titration algorithms and tables of the recommended regimen based on the percentage adjustment. The calculator was renamed "Warfarin NOAC calculator" after incorporating NOAC dosing guide. We gathered feedback and incorporated additional features that will make the calculator more comprehensive and user-friendly.

Results: We have made several enhancements by adding the following tabs to the initial prototype: (i) INR guide that provides suggested management, (ii) macro-enabled warfarin calculator that automatically suggests titration regimens, (iii) chart-based warfarin calculator (the initial prototype),(iv)AF guide to calculate mCHA2DS2-VASc and HAS-BLED scores, (v) NOAC switch guide to provide dose recommendations, and (vi) oral anticoagulants and procedure guide that provides recommendations on use of anticoagulation pre and post procedures.

Conclusion: The "Warfarin NOAC Calculator" is an easily accessible and multi-functional decision support tool that eliminates the need to refer to lengthy written guidelines when managing patients on warfarin or NOAC. Pharmacists found that the calculator can provide recommended regimen at a glance and is reliable, however further enhancements can be made to make it less complicated and more appealing to those who prefers using electronic calculator.

POSTER DISPLAY

Abstract Number: 67

Abstract Category: Engage - Pharmacy Practice

Real World Safety of Direct Oral Anticoagulants - A retrospective cohort study

Ms See Ah Shera Wong[1], Ms Liping Chen[1], Mr Shu Hui Thng[1], Ms Jin Shing Hon[1]
[1]*Department of Pharmacy, National Heart Centre*

Background and objective(s): With the increased usage of direct oral anti-coagulants (DOACs), it is imperative to ensure safe use of DOACs. The objective of this study is to audit the bleeding rates and possible risk factors for bleed in National Heart Centre Singapore (NHCS) patients who are on a DOAC.

Methods: All patients dispensed with a DOAC in NHCS from 1st January to 31st March 2017 were included in this study. Bleeding events were tracked from drug initiation till 31st December 2018. Patients were screened for the occurrence of any documented bleeding events. Details regarding the type of bleed and the management and possible risk factors contributing to the bleed are collected and analysed.

Results: A total of 1513 patients were included in the study (rivaroxaban: 1083; apixaban: 484; dabigatran: 240). Total 8.9% of patients had a bleeding event (1.8% with >1 bleeding event), 2.8% had major bleed. The rate of intracranial bleed per patient year (apixaban: 0.33%; dabigatran: 0.09%; rivaroxaban: 0.27%) is comparable or lower than those reported in the DOAC primary trials. The incidence of bleeding appears to be the lowest for dabigatran (2.5% vs 10.2% for rivaroxaban and 8.9% for apixaban). No identifiable risk factors were found other than concomitant use of aspirin among patients with major bleed.

Conclusion: Bleeding rates for DOACs in NHCS are comparable or lower than that in the primary trials. To ensure continued safe use of DOACs, renal function and other bleeding risks like age or concomitant antiplatelets should be considered during prescribing.

POSTER DISPLAY

Abstract Number: 68

Abstract Category: Pharmacy Technician Project - Quality Improvement Process

Optimization of shelving space in Tan Tock Seng Hospital Level 2 Pharmacy

Miss Li Ling Tan[1], Miss Alicia Lin[1], **Miss Michelle Lock[1]**
[1]Tan Tock Seng Hospital

Background and Objectives: Over the years, Level 2 Pharmacy faces a space constraint problem as the limited workspace is unable to support the increasing workload and number of staff. This has resulted in overspilling and over stacking of stocks, reduced work efficiency, human traffic congestion (especially during stock receiving days), and safety hazards to staff. Additionally, there are empty shelves not fully utilized and multiple storage areas with lack of proper labelling. This is due to disorganization and poor arrangement of items which boil down to the lack of ownership at the pharmacy, resulting in motion waste for staff. Hence, this project aimed to optimize space in the pharmacy through Six Sigma (6S) methodology, so as to achieve time and cost savings (by reducing waste), improved staff satisfaction and, mostly importantly, a safer working environment for all.

Methods: A waste walk was done to identify activities that consume resources but create no value for the customer. Through the 5 Whys analysis, the root causes were found to be lack of ownership towards 6S and under-utilization of space at top shelves for storing stocks of temporary transit.

Results: Minor works were done to increase backend floor space by removing one shelf and relocating the trolley that was blocking the entrance. Documents and ancillary items were rearranged according to frequency/ease of use and par level was set to reduce overstocking. Items were labelled for easy identification and retrieval.

Conclusion: After completion of project, staff can move easily and comfortably between buffer and backend area with the space created. There was an increase in work efficiency (6S score improved from eight to 17) and staff satisfaction (92.9% of staff were satisfied with the changes and agreed that workplace safety was improved). Reduced wastage of stationery and ancillary items also resulted in cost savings.

POSTER DISPLAY

Abstract Number: 69

Abstract Category: Engage - Pharmacy Practice

Moderators and Mediators of a Pharmacist-involved Collaborative Care Model in managing high-risk patients with Diabetes

Ms Kwee Keng Kng[1], Ms Cynthia Goh[1], Ms Vivian Tan[2], Mr Zheng Kang Lum[2], A/Prof Joyce Lee[2]

[1]Department of Pharmacy, Tan Tock Seng Hospital [2]Department of Pharmacy, National University of Singapore

Background: The role of collaborative care models in effectively managing individuals with diabetes mellitus (DM) is well-documented in literature. However, the degree of clinical impact varies across the findings, and little is known about the reasons for these variations.

Objectives: This study aimed to identify clinical activities (mediators) and individual characteristics of participants (moderators) of a successful pharmacist-involved collaborative care model in a tertiary healthcare institution.

Methods: This retrospective observational study was conducted using the outpatient database from Tan Tock Seng Hospital Cardiology department. Individuals aged ≥ 21 years with Type 2 DM who received pharmaceutical collaborative care intervention between 1 January 2014 and 28 February 2018 were evaluated. Individuals diagnosed with Type 1 DM, had missing baseline HbA1c levels, or attended only 1 Risk Factors Management Pharmacist-led Clinic (RFMP) visit were excluded. The intervention group received added pharmaceutical care from clinical pharmacists while the control group received cardiologist's usual-care. Moderation and mediation analyses were conducted using a regression-based approach. Johnson-Neyman plots and simple line plots were used to probe the interaction effect in moderation analyses.

Results: A total of 308 individuals (154 in each arm) were analysed. The moderators found for HbA1c reduction at 6 months were baseline HbA1c ≥7.78%, medication non-adherence and smokers. Clinical activities were not mediators of intervention effectiveness.

Conclusion: Individuals with baseline HbA1c ≥7.78%, non-adherent to their medications and individuals who are smokers with DM are more likely to benefit from pharmaceutical collaborative care models.

POSTER DISPLAY

Abstract Number: 70

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Prevalence and Management of Hypertensive Events Among Ambulatory Cancer Patients Receiving Parenteral Chemotherapy in National Cancer Centre Singapore (NCCS)

Ms Xiao Wen Luah[1], Mr Jian Wei Goh[1], Assoc Prof Lita Chew[1,2], Dr Olive Lai[2], Dr Jo Lene Leow[2], **Ms Ching Man Wong[2]**

[1]National University of Singapore [2]National Cancer Centre Singapore

Background: Hypertension (HTN) is the most commonly identified comorbidity among cancer patients, increasing risks of acute organ damage and long-term complications. At National Cancer Centre Singapore (NCCS), there is no clear guideline on management of hypertensive patients. Appropriate hypertension management is important to patients undergoing anti-cancer treatment, as uncontrolled hypertension may limit treatment options, influencing long-term survival and quality of life.

Objectives:
(1) Establish prevalence of hypertensive events amongst ambulatory patients receiving parenteral chemotherapy at NCCS; (2) Chart hypertensive event management approaches and outcomes; (3) Identify patient-related factors contributing to hypertensive events

Methods: A retrospective cross-sectional study was conducted using data from visit records between 02 July to 06 July 2018 to study hypertension prevalence. A prospective cohort study was conducted from 02 January to 01 March 2019 to chart management and outcomes of hypertensive patients receiving chemotherapy, as well as to study patient-related factors. Prospective data was collected using structured interviews and electronic medical records. Descriptive statistics, Kruskal-Wallis H test, Mann-Whitney U test and multinomial regression analysis were performed using IBM SPSS statistics V25.0.

Results: Prevalence of hypertensive events at NCCS was 24.7%. Among the subjects studied (N=555), age and past medical history of HTN were associated with hypertension prior to chemotherapy. Four management approaches were identified among the 113 patients recruited prospectively. Maximum Systolic Blood Pressure (SBP) is likely the best independent variable to determine appropriate intervention. Majority (112, 99%) of patients completed treatment on the day of visit. Within 14 days of follow-up, 1 patient deceased likely due to cardiovascular event. Top 3 prevalent patient-related factors possibly resulting in elevated SBP are: caffeine consumption, feeling anxious/frustrated, and white coat hypertension.

Conclusion: Hypertension remains a problem among cancer patients. Early identification of hypertension, standardization of care and patient counselling services can potentially improve patient safety and service quality.

POSTER DISPLAY

Abstract Number: 72

Abstract Category: Engage - Pharmacy Practice

Proper Disposal of Medication Labels with Patient's Personal Data at the Pharmacy Department, St Luke's Hospital.

Ms Foo Li Yong[1], Mr Aguinaldo Alan Ipapo, Ms Ong Pauline Wei Xian, Ms Chua Alicia Xue Li, Ms Ou Yee En, Ms Lai Chien Kuan

[1]*St Luke's Hospital*

Background: Staff is required to comply with the Personal Data Protection Act (PDPA) when handling patient's personal data. Daily, the Pharmacy staff handles many patients' medication labels which contain personal data like patient's name and NRIC. This includes the need of disposal of such medication labels. Prior to the project, the labels were discarded into the general waste bins after the staff remembers to obliterate patient's information. This was very ad-hoc, not efficient and sometimes, overlooked process.

Objective: To implement a more seamless, efficient yet thorough process of disposing used patients' medication labels, for compliance to PDPA.

Method:

1. Waste bins are differentiated:
   a) General waste bins (open tops without lids)
   b) Waste bin with lid, labelled ''Plastic/Box labels"
   c) Waste bin with lid, labelled "Bottles/Tubes labels"
2. Staff discards patient medication labels stuck on plastic zip-lock bags and boxes into the bin labelled" Plastic/Box labels"; the others stuck onto bottles, tubes and unit doses into the bin labelled "Bottles/Tubes labels".
3. Periodically a staff (or volunteer) clears these two bins. The medication labels on the plastic zip-lock or boxes will be cut through, whilst the patients' names & NRIC on the labels stuck on the bottles and unit doses, will be obliterated with a thick black marker ink.
4. After the obliteration, the labels are then discarded into the general waste bins.

Results: This innovative project has resulted in:

1. Lesser interruption and distraction during work. Medication safety is not compromised.
2. More efficient, streamlined process.
3. Freeing up staff for this disposal as volunteers can help with the task.
4. Full compliance to the legislation.
5. Savings for the Hospital as no extra cost is incurred for the disposal.

Conclusion: Compliance to PDPA is ensured without incurring much change to work processes and cost to the Hospital.

POSTER DISPLAY

Abstract Number: 74
Abstract Category: Pharmacy Technician Project - Quality Improvement Process

Combined Outpatient Typing and Billing Training for New Pharmacy Technicians in a Tertiary Care Hospital

Ms Zee Jian Tan[1], Ms Kathleen Yah Tinn Yik[1], Ms Doris Bee Hoon Teo[1]
[1]*Singapore General Hospital*

Background: Newly joined outpatient pharmacy technicians (PT) undergo training programmes to become competent in performing daily tasks. One of the tasks is typing and billing. The current training programme is time and manpower consuming. Training sessions were often aborted during periods of high patient load and low staff number which would delay the completion of training. Besides that, training sessions were conducted separately at respective outpatient pharmacies, creating duplication of work and manpower.

Objective: To implement revised typing and billing training program which aims to reduce time and manpower required by 50%.

Method: A group of PT trainers were identified and training materials were reviewed and harmonised. Trainers would be rotated to conduct training on Saturday. Total training time spent on each session were captured.

Results: There were 3 sessions conducted from April to July 2018, with a total of 9 new PTs trained. The revised program resulted in 50% time saved and no cancellation of sessions (48 hours saved compared to 96 hours, and 3 trainers compared to 6 trainers, respectively). This equates to 0.02 full time employment saved per year1.

Conclusion: Overall, this revised training program has successfully reduced time and manpower spent by 50%. This is in line with the organization's priorities in innovation and productivity i.e. optimize performance amidst shrinking of manpower supply.
Moving forward, the team plans to gather feedback from trainers and trainees on aspect done well and area for improvement.

Reference:

1. 1 full time employment is equivalent to 231 days or 1940.4 hours. 231 days = (5 days x 52 weeks) – 18 days annual leave – 11 days public holidays. 1940.4 hours = 231 days x 8.4hours/day (based on 42 hours/week divide by 5 days)

POSTER DISPLAY

Abstract Number: 75

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Beyond Hospital to Community, New Model of Care Enhances Patient Satisfaction.

Mr Benjamin Leow[1], Ms Jasmine Loke[2], Ms Sandy Ho[3], Mr Keegan Lin[4]
[1]Unity by FairPrice Co-operative Ltd [2]AstraZeneca Singapore Pte Ltd [3]Zuellig Pharma Holdings [4]National Cancer Centre

Background and Objective: Singapore Ministry of Health (MOH) has listed moving healthcare beyond hospital to community as one of the strategies to keep healthcare good and affordable into the future *(1).* In this study, we aim to measure patient satisfaction for a new dispensing model of care implemented as part of a pharmaceutical company's patient access program. Traditionally, the tertiary hospital pharmacy provides both the purchased medication and complimentary patient programme goods. In this new model, patients purchase medication at the tertiary hospital pharmacy, National Cancer Centre Singapore (NCCS) and collect the complimentary patient program goods at the community pharmacy, Unity at multiple locations island-wide. With this model, it allows the streamlining of processes at the tertiary care level and at the same time, achieving the transition of care to the community level where the community pharmacists are involved in providing oncology medication support.

Method: This study aims to recruit 150 patients who are active on AstraZeneca's patient access program, Access360, in NCCS. Patients will answer 6-8 questions regarding process, output, and outcome measures.

Results: In the preliminary analysis of sample size (n=10), an average rating of 3.8 out of 5 was given for the patients' experience with this model of care. More than half of the patients have cited short waiting time and good service by Unity pharmacists as reasons for the positive experience. Initial survey results have shown that this new model of care could bridge patient care beyond hospital to community, with positive patients' experience.

Conclusion: This suggests a potential new model of care which could be implemented across Singapore, involving both tertiary and community pharmacies in delivering timely, quality and affordable healthcare.

1 https://www.straitstimes.com/singapore/health/the-3-beyonds-singapores-strategy-to-sustain-quality-healthcare-as-demand-rises - Published 30 Nov, 2017. Accessed 22 May, 2019.

POSTER DISPLAY

Abstract Number: 76
Abstract Category: Engage - Pharmacy Practice

Impact of a Pharmacist-led Pneumococcal Disease and Influenza Vaccination Program in a Community Hospital

Mr Kiah Heng Pang[1], Ms. Sing Choon Lim[1], Dr. Fatima Singaporewalla[1]
[1]*St. Andrew's Community Hospital*

Background: Pneumococcal disease (PD) and influenza are common respiratory diseases preventable with vaccination. Despite the benefit, vaccination rates remain low, both nationally and in the hospital. The pharmacy department developed a structured screening and administration program to improve rates in our hospital. We evaluated the impact of this program.

Methods: Between September 2018 and March 2019, pharmacists screened newly admitted patients for eligibility and contraindication(s) using a pharmacy-developed standardised screening form based on guidelines by the Advisory Committee on Immunisation Practices (ACIP) and the National Adult Immunisation Schedule (NAIS). Patients from palliative and paediatric wards were excluded. If eligible, a recommendation would be made to the primary doctor. Verbal consent from the patients or their caregivers were sought. The outcomes of the recommendations were recorded and if rejected, the reasons as well. Within one week of administration, any ADRs were reported by nurses.

Results: Out of 1112 patients screened, 900 were eligible for pneumococcal (PV) and 915 for influenza vaccination. 377 received PV and 337 influenza vaccination, with rates of 41.9% and 36.8% respectively. Reasons for rejection of the pharmacists' recommendations by doctors include infection and/or fever during stay, low platelet count, increased aPTT, poor prognosis with limited lifespan and early discharge of patients. Reasons for rejection by the patients or their caregivers include concerns of costs and ADRs, skepticism of effectiveness and fear of injections. Incidences of ADRs were low and non-serious, with 7 systemic and 9 localised ones reported.

Conclusion: The program has increased the vaccination rates in the hospital, with pharmacists being crucial to its success. Following this, other vaccines such as varicella vaccine may be included. It is hoped that, with the implementation of this program, the role of pharmacists in preventative care is further established and may even be expanded to that of immunisers.

POSTER DISPLAY

Abstract Number: 77

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Quality Improvement (QI): A multi-disciplinary approach to achieve 80% pneumococcal vaccination rate in a community hospital (CH)

Ms Ho Catherine[1], Ms Teoh Boon San[1], Dr Luke Low[1], Dr Soh Ling Ling[1], Ms Cerrer Evelyn Bayudan[1]

[1]Sengkang Community Hospital

Background: Vaccination is a cornerstone of public health intervention in control of infection diseases. However, pneumococcal vaccine uptake for adults in Singapore remains low, despite national guidelines. A vaccination program which involves doctors, pharmacists and nurses was implemented in a recently operating CH to encourage pneumococcal vaccination among elderly patients. This QI aims to achieve Pneumococcal vaccination rate of 80% over 4 months.

Methods: Using Cause and Effect analysis, 23 root causes were identified. Through multi-voting and Pareto analysis, the top two causes were 1. lack of awareness among health care professional (HCP) 2.HCP does not prioritize immunization service.
Plan-Do-Study – Act methodology was also used to review and improve the uptake rate.

Interventions implemented:

1. Educational talks and trainings to medical and nursing were provided.
2. Vaccination posters were displayed to increase awareness.
3. Standardized screening criteria was used.
4. Pneumococcal vaccination history and consent were obtained by pharmacists from patients and caregiver.
5. Doctors ordered the vaccination if agreeable on pharmacists' intervention.
6. Nurses acknowledged the administration of the vaccination in the electronic system which interface to National Electronic Health Records (NEHR).
7. NEHR Patient Medication lists were provided to patients prior to discharge as immunization record and as a reminder for upcoming vaccination schedules.

Results: A total of 300 eligible patients were screened from 1/2/2019 to 31/5/2019 and average pneumococcal vaccination rate of 82% was achieved at the end of the data collection period.

Conclusion: A multidisciplinary approach is essential to run vaccination services within a hospital and pharmacy can help to be the lubricant in the team to ensure the smooth running of vaccination services. This practice is now being conducted as standard service in our hospital.

POSTER DISPLAY

Abstract Number: 78
Abstract Category: Engage - Pharmacy Practice

A New Approach for Community Pharmacy Health Champion Programme (CPHCP)

Ms Cinny Lim[1], Ms Carolyn Chan[1]
[1]*Pharmaceutical Society of Singapore*

Background: Community pharmacists are known to be professionals in the management of minor ailments. They also have important roles in providing non-pharmacological advice on chronic conditions as they are more accessible for public approach.

Objective: This year, Pharmaceutical Society of Singapore Community Chapter (PSSCC) has revamped the Community Pharmacy Health Champion Programme (CPHCP) to focus on non-pharmacological advice coupled with a new documentation framework.

With Singapore Pharmacy Congress, PSSCC hopes to:
1. Showcase this new documentation framework.
2. Determine the impact of community pharmacists' counselling on improving exercise time, diet and medication adherence, and their effects on disease control objectively.
3. Identify possible improvements in blood glucose and/ or blood pressure levels resulting from specific non-pharmacological advice from community pharmacists.

Methods: PSSCC has initiated the current CPHCP cycle with the new documentation framework. Using this framework, community pharmacists have carried out 7 months of follow-ups from November 2018 to June 2019 with patients diagnosed with pre-hypertension, hypertension, pre-diabetes and diabetes.

Results: Results are pending collation from the community pharmacy chains. Preliminary results show through non-pharmacological counselling, patient's exercise time, diet and medication adherence have improved and shown to have positive impact on their disease control.

Conclusion: Preliminary feedback indicates community pharmacists having an impact on chronic disease management via non-pharmacological counseling and the new CPHCP documentation framework is able to document these necessary information.

POSTER DISPLAY

Abstract Number: 79

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Self-Administration of medication Programme: Successes and Failures

Ms Lay Keuan Tan[1], Ms Hwei Ling Yek[1], Mr Chang Chern Koh[1], Ms Mui Ling Tan[2], Prof Wai Ping Yau[2], Ms Su Fang Chua[2]
[1]Ren Ci Hospital [2]National University of Singapore

Background and objective: In Ren Ci Hospital, patients who need to self-manage their discharge medications are referred for the Self-Administration Medication Programme (SAMP) as part of discharge planning since April 2016. The programme assesses patients' competency to manage their medications using a validated tool, Drug Regimen Unassisted Grading Scale (DRUGS). Interventions, including post-discharge support, are employed to enhance patients' competency. The study aims to evaluate and fine-tune the programme.

Methods: A retrospective study was conducted on the 142 referrals from 1st July to 31st December 2018. Wilcoxon signed-rank test was used to compare the DRUGS score before and after SAMP. Interventions associated with patients' improved ability to self-manage medications, as well as factors associated with patients' requirements for post-discharge medication support, were identified using the Wilcoxon rank-sum test and logistic regression, respectively. Reasons for patients declining SAMP participation were also identified.

Results: 12.7 %(n=18) of the referrals did not fulfil the referral criteria. 14.1 %(n=20) patients declined SAMP. 5.6% (n=8) referrals were rejected by pharmacists for other reasons.
67.6 %(n=96) of the referrals was enrolled into the SAMP. 13 patients were identified to require post-discharge support and the Abbreviated Mental Test (AMT) score was predictive of this need (p=0.01). The DRUGS score improved significantly from 77.9% to 100.0% (p<0.0005). Writing of non-English instruction on medication labels was identified as an effective intervention (p=0.003).

Conclusion: SAMP improved the DRUGS score and the use of non-English written instruction was an effective intervention. SAMP identified patients who required post-discharge support and the AMT was a predictive factor. Better communication was required for greater awareness of the referral criteria. Greater engagement with the eligible patients may have helped them to see the merits of SAMP.

POSTER DISPLAY

Abstract Number: 80

Abstract Category: Empower - Clinical Sciences

Retrospective study on the prevalence and risk factors of potassium disorders at a step down care institution in Singapore

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Background and objectives: Potassium disorders (hyperkalemia and hypokalemia) are commonly encountered in clinical practice, especially in the acute care setting. Despite being associated with poor outcomes; these disorders are insufficiently characterized in patients at the step-down care setting.

To determine the prevalence and risk factors of potassium disorders in patients at Ren Ci Community Hospital in Singapore.

Method: A nested case-control study in a retrospective cohort of 1,161 patients admitted to Ren Ci Community Hospital between January and December 2017 was conducted. Patients with at least one serum potassium measurement during their stay were included. For each specific potassium disorder, patients with the disorder were classified as cases while patients without the disorder were classified as controls. Data on patient's demographics, use of medications and predefined comorbidities were recorded. Multivariable logistic regression was used to identify potential risk factors associated with hypokalemia and hyperkalemia.

Result: Of 918 patients included, hyperkalemia occurred in 32 (3.5%) patients, with 18.9% recurrence. Hypokalemia occurred in 285 (31.0%) patients, with 24.2% recurrence. The presence of chronic kidney disease, congestive heart failure and lower creatinine clearance were independent risk factors for hyperkalemia. The presence of malignancy, poor oral intake or diarrhea, lower baseline serum magnesium, use of antibiotics and glucocorticoids/mineralocorticoids were independent risk factors for hypokalemia.

Conclusion: Potassium disorders, specifically hypokalemia, are common in the step-down care setting. Identification of patients at risk for potassium disorders in the step-down care setting will enable closer monitoring and better management of underlying condition(s) in these patients, which often constitutes the cornerstone of therapy.

POSTER DISPLAY

Abstract Number: 81
Abstract Category: Empower - Clinical Sciences

Evaluation of a pharmacokinetically-derived amikacin dosing regimen for paediatric febrile neutropaenia in a tertiary haematology-oncology unit in Singapore

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Background and objectives: A novel, age-based amikacin dosing guideline for the treatment of paediatric febrile neutropaenia (FN) was introduced in our institution in January 2018 as conventionally-dosed amikacin (7.5mg/kg Q12H) did not achieve therapeutic peak (Cmax) levels in all our patients in a previous chart review. This new dosing regimen was derived from a retrospective pharmacokinetic analysis of amikacin in patients aged 1-18 years in our institution. The primary objective of this study was to evaluate the safety and efficacy of the novel regimen.

Methods: This was a retrospective chart review of patients aged 1-18 years who received IV amikacin for FN (January to October 2018) dosed according to the novel dosing regimen: 15mg/kg/dose Q12H (age <10 years) or 10mg/kg/dose Q12H (age ≥10 years). Cmax and trough (Cmin) levels were drawn for therapeutic drug monitoring (TDM) analysis after the first dose. The primary outcome was the percentage of patients who achieved therapeutic Cmax (25-40mcg/mL) with the novel dosing regimen. Secondary outcomes included percentage of patients who achieved defervescence within 72 hours, Cmin levels >10mcg/mL, 30-day all-cause mortality and new-onset oto- and nephrotoxicity within 30 days of amikacin initiation.

Results: A total of 40 fever episodes from 23 patients were evaluated. In patients <10 years, the novel dosing achieved therapeutic Cmax in 17/24 (70.83%) episodes; in patients ≥10 years, the regimen achieved therapeutic Cmax in 7/16 episodes (43.75%). No patient had amikacin Cmin >10mcg/mL despite higher total daily doses. In patients who required further dose adjustments, the mean doses of amikacin required were 16.9mg/kg/dose Q12H (age <10 years) and 13.2mg/kg/dose Q12H (age ≥10 years). No new-onset oto- or nephrotoxicity attributable to amikacin was reported.

Conclusion: Implementation of a pharmacokinetically-derived amikacin dosing regimen for paediatric FN reduces time taken to reach therapeutic Cmax levels to achieve therapeutic levels without increased drug toxicity.

POSTER DISPLAY

Abstract Number: 82

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Role Redesign of Pharmacist and Pharmacy Technician to Improve Productivity of Outpatient Pharmacist

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Background: KTPH Outpatient pharmacists process prescriptions from Specialist Outpatient Clinics (SOCs) at various locations. Level 5 (L5) SOC patients collect their medications through the Capsule workflow after doctors' consultation. The Capsule pharmacists perform medication reconciliation, prescription-processing (confirm items and quantity to be collected and tag 3rd party payers) and patient interview (include medication counselling). The delinking workflow was proposed to allow pharmacists to focus on medication reconciliation while pharmacist technicians (PTs) take on prescription-processing and patient interview. The project aims to find out whether (1) the delinking process improves pharmacist's productivity without compromising medication safety; and (2) improves patients' wait time.

Methods:
Phase 1: L5 Capsule prescription load and Drug Related Problems (DRPs) were compared with delinking workflow.
Phase 2: Time motion study was carried out at two locations: D38 (similar to L5 Capsule workflow) and OP (similar to L5 delinking workflow), to compare the activities performed by the pharmacists and PTs at every step of prescription-processing.

Results: Comparing delinking workflow against L5 capsule workflow: the delinking pharmacist reviewed 2.5 times more prescriptions a day (65 vs 26); the delinking pharmacist also identified 58% more DRPs a day (3.26 vs 2.06). However, number of DRPs per patient was reduced by 38% from 0.08 to 0.05 with the delinking process. Comparing delinking workflow against D38 workflow: the patient wait time to collect medicines was reduced by 27% from 22 minutes to 16 minutes with delinking process; the productivity of delinking pharmacist had improved by 48% from 58.4 line items verified a day to 86.4.

Discussion & Conclusion: Role redesign through the delinking workflow has shown improvement in pharmacist's productivity in terms of prescription-processing. The reduced DRPs per patient could be due to fewer DRPs during the period of study. The delinking workflow has also improved patients' wait time to collect medicines.

POSTER DISPLAY

Abstract Number: 83

Abstract Category: Engage - Pharmacy Practice

Evaluation of Community Pharmacist-led Allergic Rhinitis Management (C-PhARM) Service in Singapore 2017/2018

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Background and objectives: A Community Pharmacist-led Allergic Rhinitis Management (C-PhARM) service involving structured patient assessment, individualized management and follow-up was developed to improve patient outcome in Watsons pharmacy. This service was launched in April 2016 and re-launched in May 2017, where more modes of follow-up were provided. The objective of the study is to evaluate C-PhARM's effectiveness on patients' allergic rhinitis (AR) management after the re-launch.

Methods: This is a retrospective observational study using C-PhARM documentation data from May 2017 to December 2018. Patients' self-reported AR symptom, using the Total Symptom Severity 4 (TSS4) questionnaire, was the main outcome measure of C-PhARM's effectiveness. Customer enrollment, pharmacists' involvement and recommendations as well as customers' preferred mode of follow-up were also assessed in this study.

Results: Among 231 patients who were enrolled into C-PhARM, 71 (30.7%) consented to be followed up, 38 (16.5%) received at least one follow-up and 32 (13.9%) exited the service. A total of 27 (45.8%) pharmacists were involved in patient recruitment and the most common recommendations made by pharmacists at baseline were intranasal corticosteroid sprays (102, 44.2%), allergen avoidance (93, 40.3%) and oral antihistamine and decongestant (39, 16.9%). Among those who successfully exited from C-PhARM, 29 (90.6%) reported improvements in AR symptom (from mean TSS4 of 6.38 at baseline to 1.10, $p < 0.0001$), 2 (6.3%) reported no change or worsening of AR symptoms (from mean TSS4 score of 2 at baseline to 2.50) and 1 (3.1%) had no score recorded. WhatsApp was recorded as the most preferred follow up mode with response rate of 70% whereas phone call has the highest response rate of 85.7%.

Conclusion: Community pharmacists can play an important role to improve patients' AR management. Nonetheless, interventions to improve the follow up rate would be required.

POSTER DISPLAY

Abstract Number: 84
Abstract Category: Engage - Pharmacy Practice

Pharmacist-run Direct Acting Antiviral Service

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Background: Direct-acting antivirals (DAAs) have demonstrated remarkable efficacy, with sustained virologic response (SVR) in more than 90% of patients across all genotypes. However, non-adherence remains a significant barrier to achieving SVR. A pharmacist-run DAA service was initiated to provide complementary pharmacotherapy management for Hepatitis C patients to manage side effects and improve adherence to achieve SVR.

Methods: Patients are first screened by the Gastroenterologist and subsequently referred to the service for initiation of DAA. During the first visit, the pharmacist establishes a baseline of patient's medical history, counsel dose, administration, medication regimen, adverse effects, management of adverse effects, drug-drug interactions and precautions. Follow-up visits are conducted fortnightly to assess compliance, discuss action plans to improve compliance and manage adverse effects. Duration between visits are shortened or lengthened depending on compliance. DAA tablets are counted at each visit and adjusted medication possession ratio (aMPR) is derived. Patients are considered adherent if their aMPR is above 95%.

Results: A total of 19 patients were enrolled and a total of 101 pharmacist encounters from 1 July 2018 to 2 Jan 2019. Sofosbuvir/Velpatasvir was prescribed to all 19 patients, of which 10 required weight-based Ribavirin. Of the 19 patients, 1 was excluded due to admission into a hospital for unsteady gait and 1 was excluded due to lack of HCV RNA at end of therapy. All 17 patients achieved SVR (HCV RNA undetectable 3 months after completion). There were no discontinuations due to adverse effects. The most reported adverse effect was fatigue (42.1%). The aMPR ranged from 85% to 100%. Of the 17 patients, 5 had aMPR below 95%.

Conclusion: A pharmacist-run DAA service can complement gastroenterologists' and help patients achieve treatment outcome. Information provided may be beneficial to others looking to initiate Pharmacist-run Hepatitis C DAA Service.

POSTER DISPLAY

Abstract Number: 85
Abstract Category: Engage - Pharmacy Practice

Identifying the incidence and risk factors of hyponatremia in patients newly started on antidepressants

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Background and Objectives: Hyponatremia is the most frequently encountered electrolyte disturbance in clinical setting. Patients suffering from hyponatremia complain of neurologic symptoms like nausea and headache, while more severe cases can cause seizures and coma. Hyponatremia is increasingly reported as an adverse event associated with the usage of selective serotonin reuptake inhibitors (SSRIs). There might be more severe implications as SSRIs are often used as first-line pharmacotherapy for mood disorders.

This study is centered on the identification of hyponatremia occurring in patients newly started on antidepressants, and the association between antidepressant and incidence of hyponatremia. Moreover, risk factors predisposing to the onset of hyponatremia were determined, as was the time course of hyponatremia development and the monitoring frequency needed.

Methods: A retrospective, descriptive cohort study in the inpatient setting at Tan Tock Seng Hospital. A total of 326 individuals were identified to newly-start on antidepressants (mainly SSRIs, serotonin norepinephrine reuptake inhibitors (SNRIs), mirtazapine, bupropion and vortioxetine) from January to March 2017. Serum sodium levels were correlated against patient demographics, pre-disposing factors and antidepressant dose and dose changes.

Results: 103 were reported to develop hyponatremia, of which 81 were prescribed SSRIs, 2 cases with SNRIs and 20 cases with mirtazapine. High risk individuals were identified to be either (i) at least 65 years (ii) taking concomitant medications such as NSAIDs, antiepileptic drugs or nephrotoxic drugs, or (iii) having underlying comorbidities like central nervous system or renal disorders, malignancy or pre-existing hyponatremia. Hyponatremia was detected at a mean of 12.6 days, a median of 7 days and over a range of 2 to 65 days after initiating anti-depressant. The overall incidence rate of hyponatremia with antidepressant was found to be 31.6%.

Conclusion: There is increased risk of hyponatremia associated with antidepressant initiation, particularly SSRIs, and within the first three weeks of treatment.

POSTER DISPLAY

Abstract Number: 86

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

Establish a centralized sterile drug compounding

Ms Miko Thum[1], Ms Cheng Li Ng
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Background and Objectives: In 2017, MOH approved the Hub-and-Spoke compounding and distribution model to provide centralized sterile drug compounding service in public healthcare sector. The model addresses key challenges faced by stakeholders and achieves system-wide benefits below:

a. Maximize economic benefits by leveraging on technology/robotics to address key concerns such as medication and staff safety, productivity, shrinking workforce, quality assurance and supporting new models of care;
b. Strengthen the public healthcare sector's system-level resilience without relying on commercial manufacturers that are susceptible to economical cycle;
c. Achieve potential savings when new healthcare institutions and institutions, who are unable to meet the Regulation of Sterile Pharmaceutical Services in Healthcare Institutions" under future Healthcare Services Act, leverage on the hub for supply of compounded sterile products. New healthcare institutions should build their own sterile facilities to cater for urgent and first orders only.

Method: A total of three non-cytotoxic and two cytotoxic hubs and their respectively capacities are proposed to cater to public healthcare institutions' needs for the next 5 years. The hubs will be developed to Good Manufacturing Practice (GMP) standards to protect the patients' safety, reduce level of risk inherent in large-scale production of drugs and achieve consistent high quality manufacturing standards. A centralized sterile drug compounding workgroup, formed in 2017 under the leadership of Chief Pharmacist, has been working on the harmonization of various components of sterile drug compounding for adoption by the hubs.

Conclusion: The hub-and-spoke model will operate on a harmonized compounding workflow, leverage on technology and a reliable and efficient distribution network to improve patient and staff safety, work productivity and support new models of care. The harmonized workflow and adherence to GMP standards will address the anticipated risks and failure modes identified with Failure Mode & Effects Analysis to improve patient and staff safety.

POSTER DISPLAY

Abstract Number: 87

Abstract Category: Engage - Pharmacy Practice

Tolerability and safety of adjuvant chemotherapy regimens in elderly patients with stage III colon cancer

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Background: Reports concerning toxicity of adjuvant fluoropyrimidine-based chemotherapy in elderly patients with colon cancer are conflicting. The objective of this study is to determine the tolerability and safety profile of adjuvant chemotherapy regimens in elderly patients with colon cancer and assess for differences in patients between 65-69 years old and ≥70 years old.

Methods: A retrospective, single-centre study was carried out. Patients ≥ 65 years old receiving at least 1 cycle of fluoropyrimidine-based chemotherapy for adjuvant treatment of newly diagnosed stage III colon cancer from January 2012 to December 2016 were included in the study. The primary outcomes were adjuvant chemotherapy completion rates, incidence of dose modifications, relative dose intensity (RDI) received and documented adverse events. Descriptive statistics were used. P value <0.05 were considered to indicate significance.

Results: 95 patients were included in study, of which 38 (40.0%) patients were ≥70 years old. Compared to patients between 65-69 years old, patients ≥70 years old were less likely to be prescribed oxaliplatin doublet chemotherapy (36.8% vs 94.7%, p<0.001) and full doses for the first chemotherapy cycle (55.3% vs 84.2%, p=0.002). However, significantly higher percentage of patients required ≥1 subsequent dose modifications in the 65-69 age group (86.0% vs 57.9%, p=0.020). The overall chemotherapy completion rates and RDIs were 84.2% and 80.1% respectively. No significant differences were observed in the adjuvant chemotherapy completion rates (87.7% vs 78.9%, p=0.251) and median RDIs (75.8% vs 82.3%, p=0.230) between the 2 age groups. Incidence rates of any adverse events and ≥grade 3 adverse events were also similar between the 2 age groups (p=0.260 and p=0.840 respectively).

Conclusion: Tolerability and safety of adjuvant chemotherapy appear to be similar in the 2 age groups due to differences in chemotherapy regimens received. Less aggressive adjuvant chemotherapy may be warranted in selected elderly patients to limit toxicities.

POSTER DISPLAY

Abstract Number: 90

Abstract Category: Pharmacy Technician Project - Quality Improvement Process

Evaluation and perception of telepharmacy service in community pharmacy

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Introduction and Objectives: Telepharmacy service was first introduced in 2006 to Watsons pharmacy stores to increase accessibility of medications and related advice by pharmacists to the public. In view of average answering rate and customers' long waiting time of telepharmacy calls, buddy system (paired pharmacy executive at remote pharmacy store with pharmacist at serving pharmacy store) was implemented in 2017. The objectives of the study is to gather stakeholders' perception (customers, pharmacy executives and pharmacists) towards telepharmacy and to evaluate telepharmacy efficiency after buddy system implementation.

Methods:

1. Customers were recruited by pharmacy executives in Watsons pharmacy stores from November 2018 to January 2019 to complete a hardcopy questionnaire upon receiving telepharmacy service.
2. Watsons pharmacists were invited to participate in hardcopy/online survey.
3. A focus group discussion was conducted with pharmacy executives. Survey data was analysed in count and percentage(Excel) and Odds ratio(SPSS). Focus group discussion was analysed using deductive content analysis

Results: Focus group discussion (n=4) revealed that buddy system was underutilized by pharmacy executives but it was a useful targeted approach for newly-joined pharmacy executives. Among 157 particiated customers, 140 customers (89.2%) viewed telepharmacy as a useful service to receive medication and advice without the physical presence of pharmacists and 125 (79.6%) provided positive feedback of the service. Of 36 pharmacists (response rate of 61.0%), 35 (97.2%) agreed that quieter stores allow them to answer more telepharmacy calls. It was noted that pharmacists in buddy system are statistically more likely to answer telepharmacy calls (OR: 6.38, 95% CI 1.45-28.60).

Discussion: Telepharmacy is well received among all stakeholders. New initiatives to improve telepharmacy efficiency is required.

POSTER DISPLAY

Abstract Number: 91

Abstract Category: Engage - Administrative, Social, Economic, Operational Related Medication or Pharmacy

National Drug Formulary- An integrated information resource

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[1]*Ministry of Health*

Background: Multiple sources of information are used by local healthcare professionals (HCPs) in their practices, and there is currently no single integrated directory for clinical and drug-related information in Singapore. A lack of systematic adoption and publication of a standardised drug vocabulary limits exchangeability of medication records between care settings and different healthcare institutions. This poses challenges in the transition of patient care across settings.

Objective: The national drug formulary (NDF) initiative aims to establish a Singapore-specific, authoritative and national reference base to guide evidence-based best practices for medication prescribing, dispensing and administration.

Methods: By providing consolidated up-to-date drug and localised clinical information, the NDF will facilitate HCPs in making better-informed decisions enabled by evidence-based best practices and value-added information. The NDF is targeted at HCPs practising in Singapore, which include doctors, dentists, pharmacists and nurses in both public and private sectors.

As an online reference source, the NDF will include a listing of drugs that are registered in Singapore and a separate listing for drugs with government subsidy. In addition to the drug terminology (and descriptive details, the NDF will provide reference links to subsidy information, post-market safety information and Drug Guidance and Appropriate Care Guides where available. NDF will facilitate the appropriate utilisation of drugs, which is aligned with MOH's key shifts to better health- Beyond Quality to Value.

Conclusion: By providing up-to-date drug and localised clinical information via a single source, the NDF will gel and complement the existing initiatives of Drug Guidance and Appropriate Care Guides, group purchasing etc to influence the appropriate use of drugs in Singapore. NDF will facilitate HCPs to make better-informed decisions in a confident manner enabled by evidence-based best practices and value-added information.