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CONFERENCE ABSTRACTS

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Pharmaceutical Practice: Hospital Pharmacy

Improving microbiological testing pass rate through the innovative teaching - audiovisual interactive mode

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Background: Sterile environment is important for chemotherapy dispensing. Several environmentally microbiological testing (EMT) failures have occurred in chemotherapy dispensing unit (CDU) and the main reason discovered by QCC is human cause.

Purpose: An innovative teaching programme 'Sterile Detective' improved the efficacy of sterile dispensing and reached the qualification of the EMT.

Method: Twenty (20) pharmacists from CDU have been included in this programme from July 2018 to September 2019 and the execution procedure is as follows: 1). Teaching scenarios have been made via questionnaires; 2). Teaching media has been changed from traditional slides to videos, both correct and incorrect demonstration versions have been recorded based upon the team consensus; 3) After having both video learning via multiple mobile devices and demonstration lectures by mentors, the trainees have to record their own post-training self-conduct process. In the end, to increase learning interest, Kahoot platform has been implemented to examine the training assessments including the pass rate of the EMT and learning satisfaction evaluation via Liker's scales.

Results: The pass EMT rate has been risen (75 to 100%). The high satisfaction score of this programme has been presented in the following: be useful for clinical operation (4.86 points), be helpful for elevating EMT pass rate (4.86 points), become more confident for dispensing (5 points), and overall training satisfaction (4.86 points).

Conclusion: Having become more systematic, interesting and helpful for blindside discovery, this innovative teaching programme not only promoted the learning satisfaction, but also boosted the pass rate of EMT to 100%.

Development of a remote model for pharmacist verification of chemotherapy during the COVID-19 pandemic

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Background: Dr Gray's Hospital Elgin provides an outpatient chemotherapy service as a satelite unit to Aberdeen Royal Infirmary (65 miles away). Treatment is ordered at Dr Gray's by a suitably trained and experienced clinical pharmacist, pending patient blood test results.

Purpose: The COVID-19 pandemic has brought with it many challenges. Anticipated staff shortages, coupled with the complete removal of shielded staff from the department, have necessitated changes to normal working practices.

Method: Remote access to the NHS Grampian network was enabled for a pharmacist, working at home on an NHS Grampian device. Subsequently it was possible to access Chemocare, the

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chemotherapy prescribing and administration system, and Trakcare, the electronic patient records system.

Following patient toxicity screening and reporting of their blood test results, the Macmillan nurses authorise the prescription, allowing final verification by the pharmacist. The technician then accuracy checks the chemotherapy and releases it for delivery to the unit, ready for administration to the patient.

Results: The clinical pharmacy service to the outpatient chemotherapy clinic has been safely maintained by an appropriately qualified pharmacist, while minimising the level of input required from pharmacy technicians.

Conclusion: There have been minimal alterations to the service. This has been possible through small adaptations to access existing electronic resources, and frequent communication between the pharmacist and technician. Through full utilisation of remote access to NHS systems it has been possible to implement this alteration to service whilst maintaining at all times patient confidentiality and full professional accountability.

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Reviewing patient harm and illegal online drug sellers: A contemporary examination

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Background: As the online marketplace exponentially expands, more patients are turning to the internet for medications. However, the internet is inundated with illegal drug sellers offering falsified and substandard products with the potential of causing harm to patients worldwide..

Purpose: This systematic review aims to find reports of death, hospitalisation or adverse events due to medications purchased online via targeted database searches.

Method: Keywords for this review were refined though a preliminary literature search. Literature for this systematic review was considered from 2009 and June 2019 using the Google Scholar, PubMed and International Pharmaceutical Abstracts databases. Articles selected for inclusion were subject to further review for cases of harm, drug class referenced, region of origin, and specific case details.

Results: One hundred and eighty-seven (187) articles were obtained pertaining to online drug sellers. Upon further review, 32 articles met the criteria for inclusion. Two articles referenced specific cases of harm. Twenty referenced a specific drug or drug class offered for sale online. Seventeen articles mentioned whether websites were operating under proper legal requirements, and seven articles mentioned regional trends or global importation of pharmaceuticals online.

Conclusion: This review emphasises the pervasiveness of illegally operating online pharmacies selling pharmaceuticals from multiple drug classes, while also describing regional trends in reporting of these topics. It is generally accepted that harm occurs from substandard and falsified products worldwide, however, this review highlights underreporting cases of harm and a need for additional examination of the patient safety impact.

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Roles and challenges of a Swiss hospital pharmacy during the COVID-19 pandemic

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Background: On March 16, 2020, because of the COVID-19 pandemic, the Swiss Federal Council declared an 'extraordinary situation' in terms of the Epidemics Act.

Purpose: To assess the roles of an inter-hospital pharmacy in the fight against SARS-CoV-2.

Method: All missions performed by our pharmacy were systematically collected and evaluated. They were also compared to its official duties.

Results: Specific missions, which have been mainly managed by the crisis unit and the four departments of the pharmacy (Pharmaceutical Logistics, Drug Manufacturing, Clinical Pharmacy and Nursing Homes Supply), were: 1) human resources continuity; 2) specific drug supply (for both hospitals and nursing homes; e.g. anaesthetics, sedatives, antiviral drugs, incl. for clinical trials); 3) clinical assistance (especially in the ICU of the main acute hospital); 4) individual drug manufacturing (e.g. hydroxychloroquine oral solution); 5) on-site pharmacies management; 6) own infrastructure securing (especially in term of hygiene); 7) hand disinfectant production; and 8) hygienic masks supply for healthcare professionals in the area. The two last missions were out of the traditional duties of our pharmacy and have been achieved with the support of staff from the Swiss civil protection. A particular challenge was the management of the shortage of various products and the identification of alternative therapeutic options.

Conclusion: Our pharmacy has faced various challenges during the acute pandemic situation. Some missions performed were even beyond our traditional ones. The disaster plan of our pharmacy has to be further developed, as well as the associated training of the staff, based on the lessons learned from this pandemic.

Survey of the prevention practices and the awareness in handling for anticancer drug injections in Japan

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Background: With an increase in the number of patients receiving chemotherapy, there has been an increase in the awareness of the risk of adverse health effects in medical personnel with occupational exposure to anticancer drugs (ADs).

Purpose: The major aim of this study is to clarify relations among the prevention practices in hospitals and the awareness of pharmacists while handling ADs.

Method: This survey involved 31 hospitals in Japan and included 523 pharmacists who routinely dispensed ADs. Two questionnaires were used: the investigations of the prevention practices employed in hospitals, and the pharmacist's awareness in handling ADs.

Results: We received valid responses from 31 hospitals and 428 pharmacists. Although the survey about the prevention practices showed that facilities were establishing an environment for the mixing of ADs, the survey evaluating individual awareness of pharmacists showed that more than half the responses had potential harmful effects, such as any damage to health and exposure while handling ADs. There were instances when the standard operating procedures were not observed. The health anxiety factors of pharmacists routinely handling ADs were calculated using logistic regression analysis; female (p<0.05, OR:0.151), experience exposure to ADs (p<0.05, OR:6.741), score of handling ADs (p<0.05, OR:1.043).

Conclusion: It is important to reduce occupational exposure to ADs and to decrease anxiety levels in pharmacists. To achieve these goals, attention should be paid not only to establish a safe facility in hospitals for drug dispensing, but also to ensure that standard operating procedures are being followed while handling ADs.

The use of quality control techniques reduces drug shortage

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Background: Drug shortage in hospital will not only reduce the quality of drug but also delay patient's treatment which might worsen the condition. What's worse, after the restoration of drug supplies, the hospital also needs to inform patients of getting their medicine by phone calls or send medicine to their home by post, which in turn increases hospital operating costs.

Purpose: The Department of Pharmacy hopes to find out the real causes of the problem through quality control circles and

QC methods, and to formulate appropriate countermeasures to reduce the rate of drug shortage, in order to improve the quality of medical care and patients' satisfaction to the pharmacy.

Method: According to Pareto principle, insufficient drug reserves and increased usage are the main causes of drug shortage. All colleagues put forward relevant countermeasures for the cause of the problem, and then selected 11 countermeasures for improvement by voting, such as standardising the drug request process and improving drug safety based on seasonal or special epidemics stock, etc.

Results: The drug shortage rate decreased from 0.28% before improvement to 0.048%; the improvement rate was 82.9%. The medicine turnover rate increased from 1.59 before improvement to 1.66. The patients' satisfaction with the pharmacy increased from 83.65% before improvement to 90%.

Conclusion: After the improvement of the quality control circle, the rate of drug shortages greatly decreases and the patients' satisfaction with the pharmacy is also improved. Finally, the Department of Pharmacy hopes to make the improvement constantly in the future to reach the goal to 0% in the rate of drug shortages and provide patients with the most comprehensive medical care services.

Incidence and influencing factors of rituximab-related hypersensitivity in inpatients: A case-control study

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Background: The increasing incidence of rituximab-related hypersensitivity (RRH) reactions has affected the application of rituximab as a first-line therapy. However, evidence of RRH reactions in the Chinese population is limited.

Purpose: This study aimed to understand the clinical application of rituximab and the occurrence characteristics of RRH reactions, to explore the influencing factors, and to provide references for clinical practice.

Method: With the aid of the Adverse Drug Events Active Surveillance and Assessment System (ADE-ASAS), the present study retrospectively monitored patients using rituximab among inpatients in the Chinese People's Liberation Army (PLA) General Hospital in Beijing from 2009 to 2019.

Results: Among 3,301 patients using rituximab, the indications mainly included B-cell non-Hodgkin's lymphoma (57.26%), neuromyelitis optica (14.00%), and nephrotic syndrome (10.45%). Among these groups, the incidence of RRH reactions was 2.65%, 2.16% and 4.35%, respectively. There were no statistically significant differences (p=0.142). Multivariate logistic regression results showed that allergy history (OR: 5.408; 95% CI: 1.310-22.320; p=0.02) and lymphocyte count before medication (OR: 3.260; 95% CI: 1.808-5.879; p< 0.001) were risk factors for RRH reaction, and prophylactic administration of antihistamines (OR: 0.156; 95% CI: 0.036-0.669; p=0.012) was a protective factor.

Conclusion: Most of the RRH reactions occurred during or after the first administration, especially in patients with an allergy history. Prophylactic administration of dexamethasone and promethazine could reduce the incidence. The effect of the premedication lymphocyte count needs to be further studied.

Association of prior antibiotic treatment with survival outcomes of immune checkpoint inhibitors in Asia

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Background: Several studies report that antibiotics may alter gut microbiota diversity and compromise the therapeutic response of immune checkpoint inhibitors (ICIs) in non-small cell lung cancer (NSCLC). Nevertheless, the data are lacking in Asia.

Purpose: To evaluate whether there is an association with survival between antibiotic therapy and ICI therapy.

Method: This retrospective cohort study analysed data from Chang Gung Research Database (CGRD), which comprising three medical centres and four regional hospitals in Taiwan. Patients with NSCLC who received ICIs between January 2016 and March 2019 were collected. We established two groups-exposed group received systemic antibiotics within 30 days prior to ICI therapy, and control group was without antibiotics. Overall survival (OS) was the goal of our study. Survival was estimated for each group, using Kaplan-Meier method and compared statistically using the log-rank test. Cox proportional model was used for univariate and multivariate analysis.

Results: A total of 340 patients were identified for analysis. These included 128 (38%) patients who received antibiotics and 212 (62%) patients were with no antibiotic use. Of 128 patients in exposed group, half of patients prescribed a single antibiotic. The median OS was 455 days for control group, and 226 days for antibiotic group (p=0.003). Multivariate analysis found that the use of antibiotics was the most significant factor in determining OS on ICI therapy (p=0.001).

Conclusion: Antibiotics use prior to ICIs is associated with poor OS for NSCLC patients in Taiwan. Further research is needed to examine the impact of the individual class of antibiotics on OS with ICI therapy.

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Effectiveness of drug cost control in medical centre

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Background: The proportion of drugs in medical centres can show the quality of hospital medical management and effectiveness of cost control, and highlight the ability of hospital management.

Purpose: The ideal drug proportion and rational use of clinical drugs can be achieved by controlling doctor's prescription, indications, inspection data and pharmacists' pre-audit methods.

Method: Data include relevant data for 2019 collected through the HIS system, including the ratio of drugs to all drug expenses and medical income; outpatient average drug cost; inpatient average drug cost. Annual average of the above data are compared with the annual average in 2018. Outcome of evaluation is based on the performance evaluation index of the municipal medical management centre as the evaluation result.

Results: By controlling strategies the prescription authority of proprietary Chinese traditional medicines, restricting the temporary buying of drugs, monitoring drugs use, regulating the testing values of albumin, limiting outpatient prescription days. Drug costs of Chinese traditional medicines decreased $216,638; average decrease of about 52%/m; focusing on monitoring the use of drugs decreased $67,780, average decrease of about 15%/m. Proportion of drugs decrease 0.5% about $953,334. In 2019 the average medical expenses per outpatient and inpatient were $28 and $799 respectively, an increase of 7.1% and -8.1% respectively all above compared with 2018.

Conclusion: Analysis show the decrease drug costs can be effectively and reasonably controlled by medical management strategies, but the control measures in clinics outpatient still need to find other irrational drug use, and relevant control strategies are formulated after analysis.

Importance of the pharmacist in the validation of treatments

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Background: During admission there is a risk of medication errors (ME). According to the ADE Prevention Study Group, the ME occur: 56% in prescription, 34% in administration, 6% in transcription and 4% in dispensation. Pharmacist validation can prevent these ME.

Purpose: Review the pharmaceutical actions carried out in order to avoid ME, as well as the degree of acceptance by the prescriber.

Method: All registered pharmaceutical interventions, and their acceptance, from January to April 2020 included through the ATHOS-Prisma programme were included.

Results: During the study period there were 3,055 admissions and 20,343 validations. A total of 320 intravenous to oral changes were proposed due to the high bioavailability of the drug and the patient's oral tolerance, 91 being accepted; 264 administration schedule adjustments were recommended, accepting 90; 102 duplicate treatments were suspended; 95 dose changes were proposed, accepting 25; 127 drug presentations were adapted to the prescribed dose; it was proposed to suspend 86 unnecessary treatments, accepting 20; 56 reconciliations were performed on admission, 11 without home treatment and 45 with treatment, 13 being accepted; 55 paediatric admission profiles were performed (diagnosis, allergies, age and weight); 22 pharmacological interactions were detected; 19 dose adjustments according to renal function were proposed, 6 were accepted; 15 treatments were modified to avoid nasogastric tube obstruction.

Conclusion: Pharmaceutical interventions during validation constitute a key tool to avoid possible ME, however, we consider that the non-integration of the pharmacist in the different clinical units may justify the low degree of acceptance of these interventions.

Influence of diabetes mellitus on the prognosis of patients hospitalised for COVID-19

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Background: Various studies have established a relationship between coronavirus infection (COVID-19) and diabetes mellitus (DM) as a factor of poor prognosis.

Purpose: To determine the influence of DM on the evolution of patients hospitalised by COVID-19.

Method: Retrospective observational study. All hospitalised patients with COVID-19 infection treated with Lopinavir/ Ritonavir and Hydroxychloroquine during March and April 2020 were included. Two cohorts were performed: patients with DM and patients without DM. Patients who were not discharged or exited until April 30th 2020, were excluded. The treatment guidelines used were: Lopinavir/Ritonavir 200/50 every 12 hours mg for 14 days and Hydroxychloroquine 400 mg every 12 hours on the first day, followed by 200 mg every 12 hours during four days. Data were obtained through the Athos-Prisma inpatient prescription programme and review of medical records at Diraya. The chi-square test of comparison between data series of the two patient subgroups was performed.

Results: Fifty-six (56) patients, 40 men and 16 women were included. The cohort of patients with DM (n=15) presented a mean of 66.7 years (53.8-79.6) vs 65.8 years (52.4-75.7) in the cohort of patients without DM (n=41). Mortality in the group with DM was 46.6% vs. 29.2% in the group without DM. After performing the chi-square test, a $p>0.05$ was obtained, so the differences between the two subgroups were not statistically significant.

Conclusion: Our results do not associate DM with a poor prognostic factor in COVID-19 infection, although they are conditioned to the small sample size available. New studies with a larger number of patients will be necessary.

Pharmacy services provided by clinical pharmacists for COVID-19 patients

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Background: In December 2019, a respiratory illness due to a novel coronavirus, SARS-CoV-2, was first identified in Wuhan, China. SARS-CoV-2, termed COVID-19, is now a worldwide pandemic and has been identified in 216 countries and areas or territories (WHO, 2020). As of May 15th, 2020, there have been more than 4.2 million confirmed cases and 294,190 deaths worldwide.

Purpose: Ensure patient safety, drug availability, and therapeutic efficacy for all COVID-19 patients. Implement a number of changes to urgently meet the institution's patient care needs.

Method: Data were collected from a 62-year-old male patient admitted with severe COVID-19 to the intensive care unit in April 2020. The following pharmacy services were then provided: first, constant review and interpretation of new clinical data; second, patient eligibility assessment and obtaining medication through compassionate use protocols; third, evidence-based interventions (e.g. drug-drug interaction, drug-disease interaction, and dose adjustments); fourth, limit unnecessary nebuliser use. Last but not least, educate patients and the public on effective strategies to prevent acquisition and further spread of infection (e.g. social distancing, optimal hand hygiene, and personal protective equipment).

Results: With standard care and the compassionate use of Hydroxychloroquine, Azithromycin, Zn supplements, and Tocilizumab under close monitoring, the patient successfully recovered and was discharged on May 4th, 2020.

Conclusion: Pharmacists play a vital role within a multi-disciplinary healthcare team to optimise patient care during this COVID-19 pandemic.

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Efficacy and safety of Imatinib: An old friend for the treatment of chronic myeloid leukaemia

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Background: Chronic myeloid leukaemia (CML) represents 20% of the leukemias. The commercialisation of Imatinib fully changed the prognosis of the disease at that moment and, years later, new selective inhibitors of the BCR-ABL tyrosine kinase (ITK) were developed and the use of Imatinib has decreased

Purpose: To analyse the efficacy and safety of Imatinib in patients with CML.

Method: A retrospective study covering the period from September 2015 to September 2019 was conducted in a University Hospital. Every patient diagnosed with CML in treatment with Imatinib in that period was included. Variables collected were: age, months of treatment, response and adverse events (AE), which were evaluated with the Karl-Lasagna modified algorithm and only accounted if ≥4points

Results: A total of 35 patients, with a median age of 60 (25-86) years, were included. The median of months on treatment was 32 (1-207). Among these patients, half of them (17 patients) were on treatment for a median of 165 (40-207) months and are still on treatment. On the one hand, 22 (63%) patients are on molecular remission (MM); 14 (40%) complete and 8 (23%) major.

On the other hand, 13 (37%) discontinued the treatment due to lack of response (9), AE (2), and exitus non-related (2). Regarding safety, 19 (54%) patients suffered AE. The most severe were neutropenia, thrombocytopenia, diarrhoea, and fatigue. The most frequent were diarrhoea, fatigue, vomiting, and periorbital oedema.

Conclusion: Imatinib has shown to be effective achieving MM in 63% of the patients, for very long periods of time. Also, half of the patients suffered AE but well described on the clinical trials and shared by all ITKs used for CML. As well as the new ITKs, Imatinib is still a good option to treat CML in first line.

CONCILIA MEDICAMENTOS 2: Results of the bond between levels of care in a province of Spain

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Background: According to the Institute for Safe Medication Practices, 50% of the errors involving medication occur during transitions of care.

Purpose: To analyse the medication discrepancies and to estimate the potential impact of pharmaceutical interventions after the implantation of a Reconciliation Service at hospital discharge coordinated between different levels of care.

Method: CONCILIA MEDICAMENTOS 2/Medication Council 2 is an observational, prospective study in which eight Spanish hospitals and their reference areas are participating. Patients are recruited while hospitalised and the hospital pharmacist (HP) reconciles their medication. After hospital discharge, patients are followed for two months by the community pharmacist (CP). A descriptive analysis was carried out with the data collected.

Results: A total of 113 patients were recruited. Only 25 met the inclusion criteria (91% excluded due to CP not collaborating in the study). The mean age was 61 (38-87) years, being 52% women, and the mean of prescribed drugs was 7 (3-19). Patients were hospitalised in the General Surgery department (23%), Pneumology (19%) and Internal Medicine (15%) mainly. Relevant discrepancies were solved in 20 (80%) patients; 11 omissions, 5 dosing errors and 4 wrong drug. In order to reconcile the patients, 47 messages were sent from the HP to the CP and 21 were received from the CP with discrepancies detected by them

Conclusion: Most of the patients had relevant discrepancies regarding the treatment, solved by the HP. They were reconciliated in the Surgery department and also departments like Internal Medicine and Pneumology where patients are heavily polymedicated. It's important to include most of the CP in order to offer more patients the opportunity to participate.

Monitoring the adverse effects of immune checkpoint inhibitors

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Background: By increasing the activity of the immune system, immune checkpoint inhibitors (ICPI) can have adverse inflammatory effects, which are often called immune-related adverse events (irAEs).

Purpose: To review some aspects related to the proper identification and treatment of irAEs associated with ICPI, with a view to increasing the safety and effectiveness of therapy with these drugs.

Method: A narrative review of the literature of scientific articles was carried out from the PubMed database using the search terms 'immune checkpoint inhibitors adverse effects', 'immune-related adverse events of checkpoint inhibitors.

Results: Most adverse events associated with ICPI are autoimmune in nature and generally occur during the first three months of therapy, although some can occur after the final dose has been administered. Inflammatory toxicities associated with ICPI tend to follow a predictable initial pattern affecting, in chronological order, the skin, the gastrointestinal tract, the liver and the endocrine glands. The respiratory system is also frequently affected by pneumonitis. Moderate to severe events require early detection and appropriate treatment, particularly in patients with a history of transplantation or pre-existing autoimmune disease. In most cases, adverse reactions can be

treated with interruption of treatment and/or supportive therapy, which includes, in the most serious adverse reactions, the administration of immunosuppressants (e.g. corticosteroids, infliximab, mycophenolate mofetil).

Conclusion: By increasing the awareness of the multidisciplinary health team and the patient and the immediate identification and early and appropriate treatment, many irAEs can be reversed.

Digital medication support systems for patients in home care

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Background: Home hospitalisation is hospital care provided to patients with acute or acute chronic and palliative disease. It is essential that the patient is properly monitored and that health professionals have the possibility to monitor adherence to therapeutic drugs.

Purpose: To analyse medical devices already authorised and marketed, which enable the prescribing physician and pharmacist to assess adherence to drug therapy under home hospitalisation.

Method: A literature review was performed through the search of articles in PubMed, in order to find digital medical devices to assess adherence to drug therapy under home hospitaliation. This research was conducted in September/October 2019.

Results: Two suitable digital systems were found to support medication taking at home hospitalisation. One system consists of a digestible sensor that is incorporated into solid oral dosage forms. After administration of the drug, the sensor emits a signal to a portable detector, which allows the time/date of the drug to be taken. Subsequently, these are transmitted via the network to a server that allows access to the patient and health professionals. The second system consists of a drug dispensing unit loaded with a tablet or capsule cassette. At the appropriate time, the system alerts the patient and is available to release the tablet. Subsequently, the patient presses the release button until the tablet falls directly into the tongue. Data are recorded and stored in a computer system

Conclusion: These systems are an innovative practice for assessing adherence to oral drug therapy in home hospitalisation, and have great potential to increase the efficacy and safety of drug therapy

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Shortages on viper anti-venom medicines calls for hospital pharmacists' intervention

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Background: The problems caused by medicines shortages are serious, threaten the well-being of patients and have far reaching consequences for European health systems. More precisely shortages of viper anti-venom medicines require hospital pharmacists to take action.

Purpose: The hospital pharmacists should be able to ensure therapy to all patients within the first four hours from the snake bite by supplying all public health care providers in his/her region with the adequate doses of viper anti-venom.

Method: All logistics were assigned to the reference hospital that was responsible for procurement, ordering, storing the antidote and supplying the rest of the region's hospitals. It is worth mentioning that those medicines require storage at 2-8°C. Furthermore a direct phone line between all pharmacists of the regional hospitals was established in order to register every incidence of viper bite and evaluate the whole procedure.

Results: The reference hospital responded to all calls by sending with EKAB on time, with the appropriate packaging, ensuring the cold-chain supply, the viper anti-venom to all hospitals within 40-60min driving distance. The viper anti-venom sera used during 2017 were doubled in 2018 and almost tripled in 2019.

Conclusion: Due to medicines shortage hospital pharmacists ought to ensure patient therapy and safety and reduce costs in health systems. Provided that if every hospital ordered its own medication the provider would take two days to supply them, which would not be compatible with the patient's treatment. Moreover since the new drug was ten times more expensive, difficulties may occur in stocking due to budget limitations. So by applying this practice not only was time saved but also money.

The impact of hospital pharmacy visits on pregnant women's knowledge and practices in Katsina State, Nigeria

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Background: Hospital pharmacists play a pivotal role in antenatal care and are key players in educating pregnant women on safe medicines use in pregnancy.

Purpose: To assess the impact of hospital pharmacy visits on pregnant women's knowledge of the dangers of indiscriminate drug use in pregnancy and practices; including the use of unprescribed medicines and herbal products.

Method: Two hundred and thirteen (213) women attending the antenatal clinic in two hospitals were interviewed using a semi-structured questionnaire. Questionnaires assessed pregnant women's demographics, knowledge of safe medicines use in pregnancy, current medicine use practices and the number of hospital pharmacy visits.

Results: One hundred and thirty-six (136) women attending the antenatal clinic had visited the pharmacy department at least once, while 77 women had never visited the pharmacy unit. From the responses, at least one antenatal pharmacy visit resulted in a 21% increase in the number of pregnant women aware of the dangers of indiscriminate drug use in pregnancy and a 72.9% decrease in the number of women using unprescribed medicines and herbal products in pregnancy.

Conclusion: Hospital pharmacy visits in antenatal care significantly improved pregnant women's knowledge of the dangers of indiscriminate drug use in pregnancy, and practice of safe medicines use.

Medication utilisation evaluation of prasugrel

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Background: Current guidelines suggest dual anti-platelet therapy with aspirin and prasugrel or ticagrelor is the treatment of choice in patients with acute coronary syndromes (ACS) and for those undergoing percutaneous coronary interventions (PCI). However, prasugrel for ACS patients who do not perform PCI or stent, the mortality control is slightly inferior clopidogrel. Old age and low body weight should be used with caution. Careful selection of patients who fit the prasugrel indication is crucial.

Purpose: This study analyses whether patients currently using prasugrel meet the indications approved by the FDA, whether to give appropriate loading dose, the incidence of cardiovascular events, and adverse reactions. It will serve as a reference for future.

Method: Patients using prasugrel between August 2019 and March 2020 were included in the study. We evaluate the appropriateness and safety of using this medicine

Results: The study included 127 adult patients, aged 26-85 years, with an average age of 62±13 years. Patients older than 75 years account for 84%. There were 93% of patients whose body weight was more than 50kg; 65.4% meet the indications approved by the FDA; 94% of patients used loading dose before PCI, 84.3% used prasugrel. Three patients discontinued due to bleeding, and due to mortality.

Conclusion: This study shows that most patients are properly administered the loading dose before PCI. However, 35% of patients not meet the usage specifications. Prasugrel may have a risk of bleeding. Therefore, monitoring the appropriateness must be strengthened to avoid bleeding events.

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Rapid infusion of daratumumab

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Background: The incidence of infusion reactions (IRs) in clinical trials have led to the recommended administration rates, which result in infusion times for the first, second, and subsequent infusions of 6.5, 4.0, and 3.25 hours, respectively.

Purpose: Previous experience with the infusion of monoclonal antibodies supports the hypothesis that infusion of daratumumab in less time than that indicated in the technical sheet would not increase the number of IRs.

Method: Retrospective observational study of patients treated with daratumumab from December 2017 to April 2020.

Results: Fourteen patients received treatment with daratumumab (six males, eight females, mean age: 68.2 years). Only five patients followed the recommended rates of infusion included

in the data sheet (starting at 50 mL/h to a maximum of 200mL/h). In the first infusion, two patients presented intense cough and dyspnoea requiring hospitalisation. Our protocol established initial infusion rate of 200 mL/h (over 30 min) and, if there were no IRs, increase up to 400 mL/h (total infusion time, 90 min) in those patients who did not present IRs in the first three doses of daratumumab. This protocol was carried out in nine patients and none reported IRs.

Conclusion: Daratumumab is well tolerated in most patients and it is therefore considered a safe treatment. The 400 mL/h rate resulted in a decrease of approximately two hours in the patient's stay at hospital. Further prospective stafety studies in clinical practice are required to confirm these preliminary data.

Can the online shopping model of 'lock-boxes' improve access to hepatitis C treatment in vulnerable adults?

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Background: Hepatitis C virus (HCV) predominantly affects vulnerable and disenfranchised individuals, including people who inject drugs (PWID) and people who are homeless (PWAH); prior work shows 5% attend hospital appointments.

Purpose: The medication home delivery model has been successful in our Sussex Hepatology Operational Delivery Network (ODN), but relies on clients having an address and/or ability to sign for deliveries. On-line shopping companies have adopted 'lock-box' systems for customers unable to sign so enabling convenient collection. We adopted this strategy to ensure safe provision of HCV medications for difficult-to-engage individuals.

Method: Lock-boxes were installed in two central Brighton hostels; a day hostel accessed by PWAH and a residential hostel (the latter enabling micro-elimination within the hostel). Access to lock-boxes was via individual key codes. Once clients were assessed to be eligible for HCV treatment at the weekly multi-disciplinary ODN meeting, the pharmacy team prescribed and managed delivery to the lock-boxes. Cost effective dispensing was guaranteed by using the hospital outpatient pharmacy and medication was dispensed in weekly blister-packs. Usage was monitored, when refilling the lock- boxes and via liaison with the treating nurse.

Results: This ongoing pilot started in January 2020. To date two PWAH and three hostel-resident clients have successfully completed HCV treatment. The feedback has been over-whelmingly positive from both clients and service providers. The pilot is currently reliant on one pharmacist.

Conclusion: Preliminary results from this pilot are favourable as regards improving access to HCV treatment in a difficult-to-engage cohort and merits further assessment.

Importance of the clinical interview in the medication reconciliation process

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Background: The Electronic Pharmaco-Therapeutic History (EPTH) can be a useful tool to reconcile medication.

Purpose: To evaluate the veracity of the EPTH in the medication reconciliation process.

Method: A uni-centre, prospective, interventional study in the Emergency Department (ED) of a third level hospital was conducted from November 2019 to January 2020. Poly-medicated (five or more chronic drugs) patients were included. The complete Pharmaco-Therapeutic History (PTH) was collected by the pharmacist through a patient/caregiver interview and the review of hospital consultation reports. Then, it was compared with the EPTH prescription.

Variables: age, sex, number of chronic drugs, discrepancies between the PTH collected by the pharmacist and the EPTH and drugs involved.

Type of discrepancies considered:

- Omission: EPTH does not collect drugs the patient is taking.
- Commission: EPTH collects drugs the patient does not take.
- Dose or frequency: EPTH collects drugs with different doses or frequency.
- Therapeutic duplication

Results: Two hundred and nine (209) interviews were conducted. Mean age: 74 years (28-95). 61% men. A total of 1,970 drugs were reviewed [9 drugs/patient (5-20)]. 108 discrepancies were recorded, with 35% of patients having at least one (mean: 1.5 discrepancies/patient). Types: commission (45%), omission (23%), dose (16%), frequency (9%) duplication (6%). Drugs most often involved were antidepressants.

Conclusion: Thirty-five percent (35%) of patients presented at least one discrepancy with their EPTH. The pharmacist in the ED is useful to obtain a true and complete PTH, thus avoiding possible medication errors.

Effectiveness of obeticolic acid in primary biliary cholangitis patients in a tertiary hospital

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Background: Obeticholic acid is a semi-synthetic bile acid analogue. It is used as a drug to treat primary biliary cholangitis (PBC).

Purpose: To evaluate the effectiveness of obeticolic acid in PBC patients at 48 weeks of treatment.

Method: Observational, retrospective study in a third level hospital, including all patients treated with obeticolic acid for at least 48 weeks (August 2018 to February 2020).
Collected variables were: age, sex, diagnosis, previous concomitant treatments, alkaline phosphatase (AF) value, total bilirubin (TBIL), total cholesterol (TC) and gamma glutamyl transferase (GGT) at the beginning and after 48 weeks of treatment.

Results: Five patients were included, 100% women with a mean age of 60 years (45-76). Previous treatments for BPC were all with ursodeoxycholic acid (UDCA) for at least one year and were maintained as a concomitant treatment in all of them. Starting treatment was with 5mg/day orally, and increased to 10mg for 2 of them. Mean treatment duration was 70 weeks (58-78).

The mean basal AF was 300U/L (214U/L-361U/L), with all patients having at least 1.67 times the upper limit (116U/L). The mean basal TBIL was 1.17mg/dL (0.6mg/dL-2mg/dL). The mean basal TC was 298.5mg/dl (238mg/dl-420mg/dl), and the mean basal GGT value was 259.2U/L (105U/L-367U/L). Mean values of AF, TBIL, TC and GGT after 48 weeks of treatment were 142U/L (211U/L-73U/L), 0.6mg/dL (0.4mg/dL-1.4mg/dL), 219.2mg/dL (180mg/dL-275mg/dL) and 55.2U/L (24U/L-101U/L) respectively, assuming a mean reduction in AF: 158U/L (52.6%); TBIL: 0.6mg/dl (49%); TC: 79.3mg/dl (27%) and GGT: 204U/L (79%).

Conclusion: Obeticolic acid was effective in patients who did not previously respond to UDCA monotherapy.

Medication-related problems and hospital admissions due to drug-related problems in the emergency department

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Background: Drugs are the most widely used therapeutic tool against diseases, and represent 90% of the patient therapies. Therefore, it is very important to pay attention to drugs-related problems (DRP), as they may involve visits to the Emergency Department (ED).

Purpose: To assess the incidence of ED admissions caused by DRP.

Method: Prospective, observational study in ED (November 2019 to January 2020) of a third-level hospital. Patients admitted for observation and pre-admission beds were included. A pharmacist was integrated in the healthcare team to validate the medical prescription.

Collected variables were: number of visits to the ED as a result of a DRP, patient age, patient sex, drug involved in the DRP detected. In addition, it were collected if the patient had to be hospitalised afterwards, and mean number of days spent in the observation area.

Results: Two hundred and twenty-eight (228) patients were admitted to the emergency observation area, 30 as a result of DRP (13%). Mean age: 68 years (19-89), mostly males (67%). Drugs involved: anti-agregants/anti-coagulants (17%), analgesics (17%), antiarrhythmics (10%), antineoplastics (10%), diuretics (7%), antihypertensives (7%), opioids (7%), benzodiazepines (7%) other (18%). 15 patients (50%) were hospitalized, and those who did not were under observation for an average of two days.

Conclusion: DRP in ED admissions are a significant health problem. This suggests that the detection and analysis of adverse events, followed by the implementation of prevention programmes, will lead to an improvement in healthcare and patient safety.

Immune checkpoint inhibitor (ICI)-induced acute hepatitis complicated by cytomegalovirus (CMV) hepatitis

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Background: Immune checkpoint inhibitors (ICIs) combination therapies are widely used in cancer treatment recently. One of the cons of drug combination strategies is hard to find the culprit drug once adverse drug events (ADEs) occur. We presented a case who developed acute hepatitis after receiving pembrolizumab plus lenvatinib (ICI plus targeted therapy), and described how we handled this issue.

Purpose: To identify the drug that causes ADEs and emphasise CMV reactivation in the hepatitis event.

Method: Exploit lymphocyte transformation test (LTT) and CMV polymerase chain reaction (PCR) test to investigate the case.

Results: This 58-year-old man was a hepatocellular carcinoma patient who received pembrolizumab plus lenvatinib. He developed acute hepatitis (ALT 281 U/L) three months later, and the regimen was switched to sorafenib. ALT still elevated to 797 U/L despite adding steroid. Then, we stopped sorafenib. However, ALT was still rising up to 1111 U/L, so steroid titrated and mycophenolate mofetil added. Two weeks later, ALT was still as high as 997 U/L. Hepatitis event did not resolve within six weeks after pembrolizumab withdrawal. Owing to CMV PCR test showed highly positive (6843 copies/mL), ganciclovir was introduced. Finally, ALT began to persistently decrease to 333 U/L within two weeks after adding ganciclovir. The tumor status was stable during the time period of hepatitis event. LTT results showed positive on pembrolizumab (6.54 fold) and sorafenib (15.01 fold), and negative on lenvatinib.

Conclusion: LTT is a useful tool for clinicians to identify causative drug. CMV aetiology should bear in mind in the hepatitis event that it does not resolve with appropriate treatment for ICIs users.

Commonwealth Pharmacist Partnership develops antimicrobial stewardship and infection control in Zambia

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Background: Misuse of antimicrobials combined with poor infection prevention and control (IPC) can result in antimicrobial resistance (AMR). Health partnerships are ideally placed to enhance antimicrobial stewardship (AMS) through sharing up-to-date evidence and implementing best practice.

Purpose: Brighton Lusaka Pharmacy Link (BLPL) was awarded a Commonwealth Partnerships for Antimicrobial Stewardships Scheme (CwPAMS) grant to implement AMS at University Teaching Hospital (UTH) (THET, 2020). Pharmacists-led AMS prescribing and monitoring activities aim to implement a robust data collection system and measure the impact of interventions reducing misuse and overuse of antibiotics while increasing knowledge about on IPC and AMS.

Method: BLPL conducted a three-day workshop in Zambia for pharmacists, physicians, nurses and allied healthcare professionals at UTH to enhance AMS and point prevalence surveillance (PPS). IPC training was provided by the experienced Ndola IPC team. Train the trainer workshops enables UTH to disseminate AMS, PPS, IPC and data collection standards.

Results:

- Proactive MDT committee to manage AMS and IPC activities at UTH was established
- Specialist AMS pharmacist appointed
- Two Global-PPS undertaken
- Modified antibiotic prescribing chart introduced and audited-UTH antimicrobial guidelines updated
- AMS modular training programme for health care accredited by UNZA for CPD recognition - 34 IPC trainers trained
- Bare-below-the-elbow dress code (BBE) adopted nationally by HOPAZ
- WHO hand-rub production expanded

Conclusion: This model of pharmacist-led AMS demonstrates sustainability in locally driven AMS knowledge and seeded national IPC capacity-building whilst instigating behavioural change pertinent during the COVID-19 pandemic.

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Impact of substitution of cardiovascular generic medicines on consumption and expenses

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Background: Under the healthcare reform policy, in order to ensure that all people have quality cheap price drugs following consistent evaluation and certificated generic drugs are adopted: the manufacturers who pass the evaluation of drugs declare at the lowest price through centralised purchase of low-cost drugs; the proportion of drugs in medical institutions is reduced; the mechanism of using drugs to support medical institutions is eliminated; the drugs with appropriate prices selected in the use of medical institutions are pushed forward; and the operating cost of public medical institutions is reduced.

Purpose: The study aims to explore the consumption and expenses of cardiovascular generic medicines in a hospital in Beijing, and estimate the potential savings of patients from switching originator drugs to generics.

Method: The data of a tertiary hospital in Beijing, China, were used to examine the consumption and expenses comparisons of 14 cardiovascular drugs from 23rd March 2019 until 22nd February 2020.

Results: The share of the 14 generic medicines studied was 37.86% for volume, but for the price ratio of generic to original drugs was between 0.0433 and 0.3023, 10.38% for value. The price ratio of generic to original drugs was between 0.34 and 0.98, and the volume price index of original to generic drugs was 14.11. The potential savings of patients from switching original to generic drugs was 82.15%.

Conclusion: Under the background of volume-based purchasing policy, substitution of cardiovascular generic medicines led to the drug expense decreasing largely. The hospital manager should take measures to promote the consumption of generic medicines, and the savings may be considerable.

Outcomes of pharmacist clinic for patient education on immune checkpoint inhibitors (ICIs) in Taiwan

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Background: In recent years, immune checkpoint inhibitors (ICIs) have brought revolutionary change to cancer treatment. Meanwhile immune-related adverse events (irAEs) due to ICIs therapy is getting increased. It is important to provide patient education for irAEs in order to improve patient self-care.

Purpose: The aim of our study is to increase patients' awareness of irAEs and ensure drug safety.

Method: We established a Pharmacist Clinic for cancer patients with ICIs treatment. Clinical pharmacists provided one-on-one services of ICIs introduction and treatment plan, irAEs manifestations and management. The ICIs Cognition Questionnaire was conducted before and after pharmacist counseling. At the end of three months follow-up, the patients' Satisfaction Questionnaire was surveyed.

Results: A total of 42 patients were evaluated. ICIs included nivolumab (72%), ipilimumab plus nivolumab (12%), pembrolizumab (14%) and atezolizumab (2%) between March 2019 and December 2019. The ICIs Cognition Questionnaire contained three sections of knowledge, attitude, and practice. Knowledge section: patients had insufficient knowledge to identify irAEs occurrence (88.1%) and irAEs management (76.2%). Attitude section: patients took positive attitude towards cancer immunotherapy (86%), and trusted pharmacist consultation (92%). Practice section: 71.4% of patients were aware of the hepatic or renal impairment due to ICIs. After the pharmacist instructions, the overall correct answer rate increased significantly from 50.6% to 95.3%. The overall patients' satisfaction was as high as 97%.

Conclusion: Results from our study show that Pharmacist Clinic markedly improves the recognition and management of irAEs in cancer patients with ICIs treatment.

Relationship between pharmaceutical care follow-up and short-term renal allograft and recipient survival

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Background: Non-adherence to immunosuppressants is common after kidney transplant, especially in resource poor settings with limited or no health insurance. It is estimated that up to 36% of cases per year are non-adherent to their immunosuppressants. A strong relationship has been established between medication non-adherence and outcomes in kidney transplant recipients.

Purpose: This study is aimed at determining the relationship between pharmaceutical care follow-up (PCF) and short-term renal allograft and recipient survival.

Method: This was a retrospective study of the follow-up pattern from the pharmacy department of the hospital. All patients who had undergone kidney transplant and followed up in the past one year period between September 2018 and September 2019 were included in the study. Follow up was conducted by making calls to the registered phone numbers of the patients and graft death was determined using the eGFR of the patients.

Results: The overall recipient and graft survival (RGS) rates was both 84%.The mean number of days that the first call was made post-transplant was 26.3±19.4 days (median=20days). The percentage of frequency of calls were 3% for 7 calls, 6% for 6 calls, 11% for 5 calls, 14% for 4 calls, 20% for 3 calls, 16% for 2 calls, 15% for 1 call and 15% for 0 calls. The post-transplant medication adherence increased with the number of calls made to each patient within the 1 year period.The RGS among those

who were never followed-up was 33.3%. RGS significantly increased with the frequency of calls made to the patients and calling a patient more than 4 times within the year is protective

Conclusion: PCF increases the survival rates of both graft and recipients after a successful kidney transplant.

Effectiveness of an oral suspension of viscous budesonide in patients with eosinophilic esophagitis

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Background: Eosinophilic esophagitis is an inflammatory and immune-mediated disease that constitutes the leading cause of food impaction and dysphagia. The principal treatment consists in pump protons inhibitors (PPI), diet and topic steroids.

Purpose: To evaluate the effectiveness of topic budesonide in patients with eosinophilic esophagitis.

Method: Budesonide at 0.2mg/ml was designed and developed. Sixteen (16) patients were dispensed from the Pharmacy Service of which 81.25% had been refractory to treatment with PPI. They were followed using clinical history and their efficacy was evaluated comparing the previous endoscopic images and at three months of treatment. Three patients were removed because they were not evaluable after three months of treatment. It was assumed as a total response to have a normal mucosa aspect and as a partial response the improvement in the previous aspect.

Results: The 13 patients at clinical follow-up: (84,62% men) were 18±10, 81 years old and have a body mass index of 20.35±6.32 kg/m2; 30.77% suffered from another atopic disease such as asthma or rhinitis and 53.85% had some food allergy. The treatment was started at 7.54±9.53 months after diagnosis and the average duration of treatment was 18.57±13.61 months, with only two patients suspended. No patient presented adverse effects and tolerability was good. At three months of treatment, 53.87% of patients presented total response and 29.41% achieved partial response, reaching two of these total response at 8 and 48 months. Only one patient did not respond.

Conclusion: Budesonide 0.2 mg/ml is a good alternative in patients who did not respond to treatment with PPI, resulting endoscopic improvement in most patients studied at three months of treatment.

Timely shift from IV to PO AB's and economic factors associated in hospitalised patients: An interventional study

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Background: This study was conducted to evaluate the practice of IV to PO conversion and to determine the impact of conversion on the economic and clinical outcome.

Purpose: Inappropriate antibiotic use causes antimicrobial resistance. Extended courses of IV antibiotics also are associated with increased hospital stay, medicine and increased labour, preparation, dispensing and administration of IV agents and the increased morbidity and mortality associated with IV line infections

Method: An interventional study was conducted for a period of one year in a tertiary care hospital in general wards. A total of 200 patients were included in this study, where 30 patients belonged to the control phase and 170 patients belonged to the test phase. The practice of conversion from IV to PO antibiotic therapy was evaluated and compared between the two phases. Economic analysis was carried out using cost saving analysis and cost burden analysis.

Results: The average length of stay (LOS) was found to be 6.0±1.5 and 4.4±0.7 days in phase I and phase II and the duration of IV therapy was 5.2±1.8 and 2.2±1.4 in phase I and phase II which showed a positive correlation. Cost burden analysis was carried out and it was observed that the cost incurred to patients was decreased from ₹1, 42,622 (USD 2056.75) in Phase I to ₹ 32, 333 (USD 466.27) in Phase II.

Conclusion: This study showed that conversion from IV to PO antibiotic therapy in eligible patients can result in early discharge and decrease the overall health costs. Therefore, appropriate guidelines for IV to PO conversion should be developed which can promote accurate, uniform and timely conversion in the hospital.

Status investigation and management of clinical pharmacy quality control in obstetrics and gynaecology hospital

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Background: Quality control for hospital pharmacy practice is a full-process dynamic supervision, to guarantee the quality of medication therapy and pharmacy practice. The obstetrics and gynaecology hospitals mostly serve pregnant and lactating women, and the safety of medication is of concern to patients and physicians. Therefore, improving the quality of pharmacy practice and ensuring safety of maternal drug use are the core issue in obstetrics and gynaecology hospitals.

Purpose: To investigate the current level of pharmacy quality control in maternal and child hospitals in China, and discuss improvements in pharmacy practice.

Method: A 17-indicator survey of pharmacy quality control were created by pharmacy experts, involving drug administration, rational drug supervision and pharmaceutical care. Involved hospitals scored for each indicator and data were recorded by Excel software and analysed by SPSS 20.

Results: Twenty-one (21) obstetrics and gynaecology hospitals in China were involved in the study. For personnel aspects, only one hospital reached the standard for personnel allocation ratio; for drug administration, 76.5% of the institution met the criteria on drug procurement and management. The compliance rate reached 73.7% for rational drug use supervision, and for pharmaceutical care, hospitals mainly conducted medication consultation service (94.7%), while other pharmacy services such as patient education and rug therapy co-management is below 20%.

Conclusion: Rational drug use supervision and pharmaceutical care are insufficient in obstetrics and gynaecology hospitals in China. Pharmacy quality control are required to improve the quality of pharmacy practice and medication safety in specialised hospitals.

Antibiotic utilisation analysis of a Chinese tertiary hospital in 2019

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Background: Optimising antibiotic prescription in hospital is a key strategy to combat antimicrobial resistance. In China, many indicators are employed to measure clinical use of antibacterial drugs.

Purpose: To implement better antimicrobial stewardship and promote the rational antibiotic use.

Method: A retrospective study was conducted on medical records of all the patients in 2019. The rationality of antibiotic utilisation is assessed by evaluating 25% randomly sampled inpatient cases. The criteria of assessment were established based on published guidelines and official documents.

Results: Proportion of outpatients receiving antibiotics was 7.47%. Proportion of inpatients receiving antibiotics was 39.31%. Antibiotic use density [AUD= DDDs*100/inpatient days. DDDs = Total drug consumption (g)/DDD.] was 37.96. The rate of inappropriate use was 12.92%, which leads to extra 2725 DDDs consumption and 348.8 thousand RMB cost. Antibiotic DDDs consumption data collected in department level showed that six surgical departments was ranked within top ten high consumption departments. Among the top ten drugs in the list of DDDs, there were five cephalosporins, two carbapenems, two quinolones, and one nitromidazole. They are all injections. Cefoperazone and sulbactam sodium was in first place, which consumed 14787 DDDs.

Conclusion: Although the goals set for regulating clinical antibiotic use in 2019 have been achieved, antibiotics misuse still exists. Further efforts of antimicrobial stewardship should focus on the containment of cephalosporin and the anti-infection training of doctors, especially surgeons.

Immunology and related genetic factors of fluoroquinolone-induced liver injury

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Background: Drug-induced liver injury (DILI) is a frequent adverse drug reaction (ADR) that may present multiple clinical manifestations and is also one of the most frequent reasons for drug non-approval or withdrawal from market. Unfortunately, the mechanism underlying DILI is not well understood. Immune and genetic factors have always been considered to play an important role in its occurrence and development.

Purpose: Analysing the mechanism of immune factors in liver injury induced by fluoroqinolones (FQNs) and finding susceptibility genes.

Method: Based on the Adverse Drug Events Active Surveillance and Assessment System (ADE-ASAS), a real-time automatic monitoring study was conducted. Blood samples were collected from cases and controls to detect immune cells and cytokines and complete HLA genotyping.

Results: A total of 12,623 hospitalised patients using FQNs were monitored in the study among which 34 patients were found developed liver injury and finally we got informed consents from 10 cases and 20 controls. The frequencies of CD4+ helper T cells (Th cells) were found significantly higher from cases than controls and significant increases of Th22 cells were also observed in cases group. There were no significant differences in cytokines expression and distribution of HLA between the cases and controls.

Conclusion: Th22 cell may play an important role in the development of DILI but more large sample studies are needed to identify what role does IL-22 plays and if DRB1*1501-DQB1*0602 is a risk haplotype of FQNs related DILI.

Risk factors of patients with drug-induced acute kidney injury in hospitalised patients: A case-control study

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Background: Drug-induced acute kidney injury (D-AKI) has been progressively common, thus extending length of stay and increasing mortality. However, risk factors leading to D-AKI under all medication conditions during hospitalisation had been rarely assessed.

Purpose: This study aimed to delve into the risk factors of patients with D-AKI in hospitalised patients in a multi-drug environment.

Method: Based on the Adverse Drug Events Active Surveillance and Assessment System that we developed. A retrospective study was conducted among hospitalised patients in July 2019. Four controls per case were matched in terms of the admission time and medication. The risk factors were identified by binary multivariate logistic regression of this adverse reaction.

Results: A total of 23,073 patients were hospitalised in July 2019, 21,131 of which satisfied the inclusion criteria; to be specific, 115 were classified as D-AKI (0.54%, 115/21,131). The independent risk factors for D-AKI consists of alcohol abuse (OR, 1.89; 95% CI, 1.12-3.17), use of NSAIDs (OR, 2.47; 95% CI, 1.36-4.88), use of diuretics (OR, 3.19; 95% CI, 1.85-5.54), prior anemia (OR, 3.75; 95% CI, 2.17-6.46), prior chronic kidney disease (OR, 2.16; 95% CI, 1.06-4.41) as well as higher neutrophil counts (OR, 1.19; 95% CI, 1.13-1.26).

Conclusion: The occurrence of D-AKI in hospitalized patients displays significant associations with alcohol abuse, combination therapy with NSAIDs or diuretics, prior anemia or chronic kidney disease, as well as higher neutrophil counts. Clinicians are required to pay rigorous attention to patients with the mentioned factors.

Analysis of influence factors of severe neutropenia induced by etoposide-based chemotherapy

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Background: Etoposide is a widely used antineoplastic drug, however, it can induce neutropenia which may compromise optimal cancer management. In addition, there has not much research on influence factors of severe neutropenia induced by etoposide-based chemotherapy (SNIEC).

Purpose: The aim of this study is to investigate the influence factors and clinical characteristics of SNIEC.

Method: This retrospective study used Adverse Drug Events Active Surveillance And Assessment System (ADE-ASAS) to extract data of patients receiving etoposide in PLA general hospital from January 1st 2009 to December 31st 2018. Each SNIEC case was matched with four controls that did not have neutropenia. Logistic regression analysis was used to test the associations of factors to severe neutropenia.

Results: A total of 14,557 patients were treated with etoposide. Finally, 45 patients were identified as SNIEC. Multivariate logistic regression analysis showed that the influence factors were: Karnofsky performance status(OR=0.88, 95%CI=0.81- 0.94, P<0.01), prior cardiovascular disease (OR=8.17, 95% CI=1.86-35.85, *p*<0.01), adrenal metastasis (OR=6.13, 95% CI=1.10-34.05, *p*=0.03), lymphocyte count <0.7×109/L (OR=3.46, 95% CI=1.12-10.66,P=0.02) as well as albumin<35 g/L (OR=11.08, 95% CI=3.55-34.57, *p*<0.01).

Conclusion: SNIEC was highly correlated with performance status, concomitant cardiovascular disease, adrenal metastasis, lower lymphocyte count and serum albumin. Thus, clinicians should use etoposide more carefully while their patients have above factors.

Evaluating medicines storage conditions in patients' home with sodium valproate granules in Japan

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Background: Sodium valproate granules (VPA granules) are hygroscopic formulations and can agglomerate under inappropriate management conditions. However, there is little known about patients' medicines storage after pharmacy dispensing.

Purpose: To evaluate the medicines storage of VPA granules at patients home temperature and humidity conditions after being dispensed at the pharmacy.

Method: This study was a prospective and observational study of outpatients who visited Kameda Medical Centre and were prescribed VPA granules; and agreed to participate in the study. A portable data logger capable of measuring temperature and humidity for 24 hours of the medicine storage conditions at a patient's home was delivered at the time of the first visit. At the following visit, the data logger was collected and data about temperature and humidity were obtained. We defined a suitable temperature of 1.0-30.0°C and a suitable humidity of 75.0% or less. Study period was from July 5th 2018 to February 20th 2019.

Results: Thirteen patients were included. Eighteen data loggers were distributed and return rate was 100%. The temperature was out of range of the storage condition in 0.8% of the total observation time. The humidity exceeded 75% relative humidity in 0.7% of the total observation time. For data loggers (22.2%) had temperature deviations and seven data loggers (38.9%) had humidity deviations. Nine data loggers (50.0%) showed no deviation in both temperature and humidity.

Conclusion: Storing a drug in an inappropriate environment changes the nature of the drug, affecting its efficacy and safety. Although patient education on drug management was delivered while dispensing, further patient education on oral medicines' storing methods are still necessary.

The preparedness of public hospitals and healthcare providers to face COVID-19 pandemic

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Background: The effective SARS-CoV-2 infection prevention and control in any country depends on awareness and training of healthcare practitioners (HCPs) in addition to the preparedness and protective measures of healthcare settings.

Purpose: The study aimed to measure the preparedness of public hospitals and healthcare providers to face COVID-19 pandemic in Iraq.

Method: This was a cross-sectional study based on an electronic survey (Qualtrics) in English distributed among HCPs working in public hospitals across the country. The survey was distributed via two professional Facebook groups between March 22nd to April 7th 2020. The author adopted with modifications the survey items from previous studies of Middle East Respiratory Syndrome (MERS).

Results: The authors received 347 completed surveys (52.2% pharmacists, 38.3% physicians and dentists 8.6%). All the seven items measuring HCP awareness of COVID-19 disease and preventive measures were above average with total mean of 27.91 (±4.21) out of 35 points. In contrast, 10 out of 12 items measuring the public hospital preparedness to COVID-19 were below average (between 1.73 and 2.7 out of 5) particularly those related to provide staff trainings and protective personal equipment (PPE). Additionally, 81.8% of the participants

Conclusion: Iraqi HCPs have adequate levels of awareness of COVID-19; however, the public hospitals need to enhance staff training and protective measures in addition to providing adequate PPE to HCPs. The Ministry of Health needs to provide adequate numbers of mechanical ventilators to public hospitals to face COVID-19 pandemic.

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Safety and effectiveness of erenumab in chronic refractory migraine

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Background: Erenumab is a human monoclonal antibody that inhibits the peptide receptor related to the calcitonin gene, a vasodilator associated with the physiopathology of migraine.

Purpose: To evaluate the effectiveness and safety of erenumab in chronic migraine of ≥8 days/month, with previous failure to three or more drugs, including botulinum toxin.

Method: Observational, retrospective study in a third level hospital, including patients with migraine diagnosis treated with erenumab (March 2019 to February 2020). Variables: age, sex, erenumab posology, and previous and concomitant treatments. Effectiveness was evaluated by comparing the number of days of migraine per month (DMM) at baseline and after 12 weeks of treatment. Adverse effects were collected.

Results: Six patients were included, all women with a mean age of 51 years and previously treated with an average of eight drugs (triptans, NSAIDs, topiramate and botulinum toxin). Erenumab posology in all cases at the beginning of treatment was 140 mg every 28 days. After 12 weeks of treatment, five patients reduced the DMM compared to the mean baseline of 18, being a reduction >60% in four of them and 26% in the remaining one. One of those patients achieved a 100% in reduction, dropping from 16 to 0 DMM and erenumab posology was reduced to 70 mg every 28 days at week 36. The sixth patient had to discontinue due to ineffectiveness of erenumab in week 22 (DDM reduction of 0%). Regards to the safety profile, only one patient presented itching.

Conclusion: Erenumab has shown to be effective and well tolerated in patients with few therapeutic options in real life clinical practice, although long-term follow-up studies are needed to confirm these results.

Influence of rational drug use planning on key monitoring drugs

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Background: Focus on monitoring the proportion of drug use plays an important role in all drug expenses. It can show the effects of rational drug use improvement plan in our hospital, which aimed to reduce the unreasonable medical expenditure and improve the level of rational drug use.

Purpose: Key monitoring drugs rational use and clinical drugs can be achieved by limiting doctors' prescription rights, as well as controlling the dosage, indication, laboratory index and the prescription days of key monitoring drugs, limiting the use of drugs that exceed the threshold, which is set according to its budget percentage.

Method: Data sources from 2017-2019 are collected through the HIS system and business intelligence of the hospital, including consumption expenses, and the ratio of key monitoring drugs to all drug expenses. The annual average of the above data are compared with the annual average in 2017 and 2018 year .

Results: By monitoring drug use, regulating albumin prescriptions. The consumption of key monitoring drugs decreased about 15.4% compared with 2018 and about 22.63% compared with 2017. Drug costs of key monitoring medicines decreased about 16.67% compared with 2018 and about 18.26% compared with 2017. Proportion of key monitoring drugs decrease from 18.08% to 8.09% during 2017-2019.

Conclusion: The results of study data analysis show that the control of key monitoring drugs in our hospital has made some progress, but more effective measures need to be taken to promote the rational use of the standard of key monitoring drugs.

Drug dosing in patients with renal impairment

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Background: Inappropriate prescribing (IP) is common in patients with poor renal function in hospital and in outpatient settings. The prevalence of acute kidney injury (AKI) has been reported to be 5-10% among hospitalised patients and up to 35% following major surgery (Chertow *et al*., 2005; Hansen *et al*, 2013).

Purpose: To assess prevalence of IP in surgical wards in a 400-bed acute care hospital and to identify the most common drug classes which are inappropriately prescribed.

Method: The retrospective descriptive study included patients 18 years and older admitted to surgical wards for more than 24 hours with documented estimated glomerular filtration rates (eGFR) less than 60 ml/min/1.73m2. Patients were selected using stratified random sampling method. Data about medications and eGFR results were collected using electronic health care records.

Results: One hundred and thirty-nine patients were included in the study (63% female; 37% male) with an average age of 78 (range 42-98) years and mean length of stay of 5 days. Chronic kidney disease and AKI were documented in 12.9% (n=18) and 10.8% (n=15) of the patients, respectively. The prevalence of IP among surgical patients was 38.3% (222 of 579 prescriptions). At least one inappropriate prescription was present in 83 (59.7%) patients and 23 (27.7%) of them received ≥3 inappropriate medications. One or more contraindicated medications according to renal function was prescribed for 29 (20.9%) patients. The most common drug classes which were inappropriately prescribed were antimicrobials (40.5%) and analgesics (66.0%).

Conclusion: Results of the study show that renal dosage adjustment is still an ongoing problem that needs to be addressed.

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Medical device: Patient safety

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Background: The staggering number of medical device-related incidents led the European Union to update the Directive for Medical Devices with a focus to increase safety and vigilance.

Purpose: To understand occurrence and handling of medical devices' incidents in a hospital procurement unit.

Method: A total of 150 observation hours were performed in the Quality Assurance Unit of the Hospital Central Procurement Unit. Devices involved in incidents were classified using Global Medical Device Nomenclature (GMDN, 2020). Root cause investigation and classification was carried out.

Results: A total of 333 medical device incidents were investigated and closed from January 2016 to July 2019. The leading devices with incidents were sutures (10.5%), dressings (9.61%) and gloves (6%). A root cause investigation tool (Amoore, 2014), was updated in this study by generating two new major failure groups (supplier and regulatory compliance). The updated tool was used to classify causes of incidents studied as device-related (35%), infrastructure (14%), supplier (9%), regulatory compliance (8%), no problem found (6%), operator (2%), clinical and patient factors (1%). For 24%, the cause was unknown.

Conclusion: The study led to an understanding of the medical device-related incidents handling and the required documentation for a structured analysis. The innovated tool for investigating causes of incidents is now implemented in the hospital procurement unit.

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Establishing a pharmacovigilance framework within a hospital centralised procurement system

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Background: In the effort to ensure access to medications which are not registered on the Maltese market, the hospital central procurement unit (CPSU) is responsible to register medicines via Article 126a of EU Directive 200/83/EC. The registration process also requires a pharmacovigilance framework for these medicines.

Purpose: The objective was to identify and establish a robust framework for pharmacovigilance for medicines registered by CPSU and to propose action plans for implementation of the framework.

Method: The study followed a qualitative research design of focus group discussion and interviews with CPSU and Medicines Authority, the medicines regulatory agency, management and staff, and a framework development.

Results: The focus group interview revealed six major themes, namely, challenges in procurement, roles in products registration, medication safety, adverse drug reaction (ADR) reporting, barriers to pharmacovigilance, and acknowledgment of pharmacist's role. Following the identification of the themes that required addressing, a framework of pharmacovigilance to be implemented in CPSU was developed to include ADR reporting, medication safety principles in procurement, legal perception, and establishment of a product recall process. Validation of the framework was conducted via focus group and the optimised system launched within CPSU.

Conclusion: The establishment of a pharmacovigilance system in CPSU is a patient safety focused system ensuring access to medicines for which there is shortage and access issues whilst ensuring quality, safety and efficacy of the medicinal products.

Sidra Pharmacy's evidence-based approach to meet changing demands on the service: COVID-19

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Background: From December 2019, the healthcare system as we know it changed, as the WHO declared a worldwide COVID-19 outbreak.

Purpose: Evidenced-based review of pharmacy emergency major incident plan, alongside internationally recognised policies, with government updates (Ministry of Public Health; 2019; ASHP, 2020; GPhC, 2020; Ministry of Public Health; 2020); RPS, 2020).

Method: Pharmacy leadership identified staff who could work remotely, split shifts; receive cross training. The clinical team worked closely with the infectious disease/antimicrobial stewardship team towards devising a clinical plan to manage those under our care.

Results: Service changes included: team members resorted to online or telephone discussions; verification of medication orders took place from home; activation of automation systems; changes to the pharmacy homecare service; communication moved to digital virtual platforms; measures such as the addition of floor markings and medication deliveries to clinics were implemented. Patient education leaflets and social media platforms were utilised to inform patients. Introduction of a drive-through pharmacy collection service, home delivery services, online medication request services, along with expansion of the telephone request infrastructure. Tailored 'ABC' analysis were performed to identify 'valuable' medicine. Non-formulary stocks were distributed to all patients, to prevent any panic or assumption about shortage. All 2021 medication supply plan was booked with manufacturers. The Pharmacy Director was able to create new 'just-in time' delivery channels..

Conclusion: It is important to reach out to approved evidenced-based guidance, and services must change in order to maintain high level patient care within a crisis. The question now arises - iIs there a need for further improvement?'.

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Effectiveness and safety of nivolumab in squamous cell cancer for head and neck patients

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Background: Nivolumab is a PD1 receptor inhibitor indicated for the treatment of patients with head and neck squamous cell carcinoma (HNSCC).

Purpose: Assess effectiveness and safety of nivolumab in monotherapy in recurrent or metastatic HNSCC who progresses during or after platinum-based treatment.

Method: Retrospective observational multi-centre study of patients treated with nivolumab from February 2018 to February 2020. The variables collected were: age, sex, functional status, previous treatment lines, number of cycles received, progression-free survival (PFS) and overall survival (OS). Adverse effects were recorded. Data were obtained from medical records (Diraya) and electronic prescription (Prisma and Oncofarm) applications.

Results: Twenty-nine (29) patients were included, 62.2 years was the mean age (range 52-79), of whom 79% were men. Patients presented an ECOG of 0-1. Fifteen patients were treated with nivolumab in second line, 11 in third, 2 in fourth and 1 patient in sixth line. The median treatment was 8.4 cycles. Eleven patients are still on nivolumab treatment, with a median response time of 7.5 months. The median PFS of the remaining

patients was 4.02 months. The median OS of these patients was 3.46 months. Adverse events registered included four patients presenting grade II-III asthenia, seven experienced loss of strength in lower and upper limbs and three had oropharyngeal candidiasis. No patients discontinued treatment due to adverse reactions

Conclusion: Nivolumab is presented as a therapeutic alternative in HNSCC´s patients who progress to platinum-based treatments. The effectiveness is very limited. The safety and tolerability profile was acceptable and similar to that recorded for the use of the drug in other indications.

Review of an alternative method of oral administration in oncohaematological pathology

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Background: Correct administration of oral drugs in patients with swallowing problems remains a challenge.

Purpose: To determinate alternative methods of oral administration of antineoplastic agents approved for oncohaematology therapy.

Method: Twenty-nine (29) antineoplastic agents included in the hospital pharmacotherapeutic guide were selected. The databases used in the bibliographic search were Pubmed, Cochrane, Embase and Uptodate. The criteria collected were: medicine´s brand name, active substance and the search terms 'difficult swallowing', 'nasogastric tub', 'crush', 'extemporaneous' and 'nasogastr*'. The search was completed with the information from the summary of product characteristic, the oncology pharmacy group (GEDEFO), the pharmacotherapy and paediatrics working group, belonging to the Spanish Society of Hospital Pharmacy, and the data provided by the manufacturing laboratories.

Results: Information was found on 22 consulted drugs. The main alternative methods of administration were: pharmaceutical compounding (7), dissolution (12) and crushing (2). Data were not found on 7 antineoplastic drugs and melphalan is the only unstable drug when manipulated. Simple syrup, water, Ora Plus and Ora Sweet are the main solvents. It is worth mentioning that nilotinib is stable only in applesauce. Manipulating a drug may alter its bioavailability, although its concentration in bioequivalence levels is maintained.

Conclusion: Despite the manipulating not being recommended in the summary of product characteristic, the limited literature available indicate that it is a good alternative to optimise the treatment in patients with swallowing difficulties or those who need the administration through nasogastric tube.

Effectiveness and safety of ocrelizumab in relapsing-remitting and primary progressive multiple sclerosis

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Background: Ocrelizumab is a recombinant humanised monoclonal antibody that acts selectively against B cells expressing CD20.

Purpose: Assess effectiveness and safety of ocrelizumab in patients with relapsing-remitting (RRMS) and primary progressive multiple sclerosis (PPMS).

Method: Retrospective observational multi-centre study of patients treated with ocrelizumab from February 2018 to December 2019. The variables collected were: sex, age, type of MS, functional status (according expanded disability status scale, EDSS), previous treatments, duration, clinical evolution (relapses, progression, improvement and stability of the disease) and magnetic resonance imaging (MRI) data. Adverse effects were recorded as number and degree of lymphopenia. Data were obtained from electronic prescription (Prisma) and medical records (Diraya) applications.

Results: (Twenty-six) 26 patients were included, mean age 41.5 years (range 26-61), of whom 61% were men. Eleven patients with RRMS and 15 with PPMS (mean of EDSS 4,7). Fifty percent (50%) of the patients had specific treatment for MS, of which 31% with immunomodulators and 15% with biological treatment. The median treatment was 33.5 weeks. Eight percent (8%) of patients showed improvement, 65% confirmed disease stability, 19% worsened, and two patients had an outbreak. MRI shows a decrease in number and size of lesions in one patient and stability of the disease in the rest. Adverse events registered included five patients with lymphopenia grade 1 and three patients with lymphopenia grade 2.

Conclusion: Ocrelizumab has been shown to be effective in slowing disease progression, controlling clinical and radiological activity in both RRMS and PPMS. The safety profile of ocrelizumab is consistent with that observed in clinical trials.

Analysis of antibiotic consumption in an intensive care unit

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Background: The follow-up of antibiotics and especially those of restricted use against multi-resistant bacteria is one of the pharmacist's main activities as a member of the Programme for Optimising the use of Antibiotics (PROA) in our hospital.

Purpose: To analyse the evolution of antibiotic consumption in the intensive care unit (ICU) of a university hospital.

Method: Retrospective, comparative study of antibiotic consumption (ATC J01-J02AX06) during 2017-2019. The data were obtained from the APD management programme. The variables collected were: global Defined Daily Dose (DDD) ATC J01-J02AX06 per 1000 stays, and consumption broken down by active principles. Excel Microsoft Office 2010 was used for statistical data processing.

Results: During the study period, the global DDD/1000 stays was 2390,24 (2017), 2540,72 (2018), 2563,02 (2019). In ICU was 1746,1 (2017), 1618,3 (2018), 1569,2 (2019). In 2019, 51 different active principles of antibiotics were dispensed in the hospital. Of the total DDD consumed in the hospital, 61% was in ICU. Main prescribed antibiotics in ICU expressed in DDD/1000 stays: meropenem (DDD 204,8), levofloxacin (DDD 170,9), erythromycin (DDD 118,9), piperacillin- tazobactam (DDD 112,8), linezolid (DDD 88), amoxicillin-clavulanic (DDD 64,2), ceftriaxone (DDD 59,8) and vancomycin (DDD 59,7), being similar in the other periods studied.

Conclusion: Although there is a tendency to reduce the overall consumption of antibiotics, this consumption is high. PROA teams contributes to improve the management of antibiotics (especially broad-spectrum), therefore, their implantation in ICU could optimise the pattern of antibiotics use and the quality of care.

Investigation of methotrexate-induced epidermal necrosis (MEN) at a single centre

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Background: Methotrexate (MTX), a folate antimetabolite, is widely used in rheumatoid arthritis and psoriasis. In general, oral MTX with weekly dosing is well tolerated. Of note, methotrexate-induced epidermal necrosis (MEN) is a life-threatening adverse drug reaction (ADR) although it is rare.

Purpose: To investigate the risk factors of MEN.

Method: We collected ADR reports of MEN cases between January 2009 and December 2019 at our hospital. Analysis of age, gender, renal function, mortality, initial MTX dose, cumulative MTX dose, and indications of MTX were examined for each MEN case.

Results: Total 11 MEN cases were identified. Among 11 cases, eight cases were older than 60 years, and the male was the majority (8 males). The indications of MTX were psoriasis (9 cases), rheumatoid arthritis (1 case), and one pemphigoid case. Six patients had stage 4 chronic kidney disease (CKD), and two patients were on intermittent hemodialysis (IHD) (i.e. total 8 cases had severe renal impairment). Four cases (36%) expired and they were all stage 4 CKD patients. Median initial MTX dose was 8.75mg (range 2.5-15), and median cumulative MTX dose was 20mg (7.5-45).

Conclusion: The results of our study showed that males older than 60 years with psoriasis could be victims of MEN for MTX users. Stage 4 CKD was the major risk factor for MEN occurrence and mortality due to MEN. Considering 36% mortality rate, for psoriatic patients with stage 4 CKD and IHD, we strongly recommended to choose alternative medicine other than MTX.

Development and effectiveness of a clinical pharmacist training programme in a medical centre of southern Taiwan

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Background: Mandatory structure for advanced pharmaceutical care for clinical pharmacists (CPs) was scarce in Taiwan. Therefore, a well-organised training programme on CPs is warranted for construction.

Purpose: Competency frameworks are being gradually applied as a template for a training roadmap. The aims of the study are composed of two parts: development of training course (TC) on CPs core competency, and effectiveness assessment through curriculum process.

Method: First of all, development of TC is derived from seven core competencies within the Taiwan Society of Health System Pharmacists (TSHP). Two-round consensus has been conducted utilising Delphi-method to select the final components of TC. Instruction mode has been attached on each TC. Second, 360-degree evaluation has been applied among teachers, patients

and trainees. Satisfaction survey using a 5-point Likert scale and in-depth interview have been conducted as evaluation manifested as effectiveness.

Results: Components of final TC can be divided into two categories: clinical service and healthcare quality. Clinical service contains ADR, TDM, nutrition, and SOAP documentation, and healthcare quality is composed of EBM and SDM integration. Four pharmacists have been recruited. Teachers show higher satisfaction to trainees (score: 4.82±0.04). During the patient education in wards, improved patient perceptions has been noted as well (score: from 3.27±0.03 to 4.72±0.02).

Conclusion: Novel lecture design has been developed tailored to unmet needs on CPs. Trainees have gained satisfaction from teachers and improved patient knowledge after intervention. The prototype of course package may pave the way to CPs accreditation in Taiwan.

The use of ICD-10-CM T codes in hospital claims data to identify adverse drug events in Taiwan

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Background: Adverse drug events (ADEs) are public health problem worldwide. Therefore, optimising medication use and reducing ADEs are priorities for public health. The way to monitor and improve medication safety is to identify ADEs.

Purpose: The aim of this study is to examine the potential usefulness of ICD-10-CM T codes in routine hospital data for the identification of ADEs and increase reported rate in Taiwan.

Method: We use administrative claims data of hospitalised patients from a medical centre in north Taiwan during July 1st 2016 to June 30th 2018. The definition of ADEs was the presence of an ICD-10-CM T codes. The inpatients who discharged with T codes could be caught by the computerised T-codes information platform and a review of the medical charts was done by pharmacists to confirm the ADEs.

Results: During the study period, a total of 1,384 inpatients who discharged with T-codes were identified. The codes that identified the highest percentage of ADEs were code T36 (56.6%), followed by code T42 (17.7%). Overall, 789 clinically significant ADEs were identified after chart review. Dermatologic symptoms are the most commonly involved. The overall Positive Predictive Values (PPVs) for a code representing an ADE was 57%. Furthermore, the number of ADE cases that confirmed using the T-code increased ADE reporting rate by 9.17%.

Conclusion: The PPV of ICD-10-CM T codes analysed in our study may be suitable to identify ADEs. In conclusion, the results confirm a potential resource of utilising ICD-10-CM T codes for detecting ADEs from administrative data to ensure medication safety surveillance.

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Suspected quetiapine-induced hyponatremia in a patient with prolonged mechanical ventilation

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Background: Quetiapine is often used to treat delirium. Some case reports have already showed that quetiapine may induce hyponatremia, which might relate to syndrome of inappropriate antidiuretic hormone secretion (SIADH). However, patients who are on mechanical ventilation may develop hyponatremia due to SIADH as well.

Purpose: There is a case of hyponatremia which had used both quetiapine and prolonged mechanical ventilation. Even though quetiapine-induced hyponatremia is rare than mechanical-ventilation-induced, we prefer to suspect the main reason for this case is quetiapine use. Why we suspect this and the progress of this case will be discussed below.

Method: It is a retrospective case report of a 52-year-old male who was admitted due to intracerebral hemorrhage. We survey this case according to the medical records in E-Da hospital from March 25th 2020 to May 8th 2020.

Results: This patient used mechanical ventilation from March 25th to April 18th and got extubation on April 20th. He started to use quetiapine for delirium since March 29th. High dose was given from April 02nd to April 9th. Hyponatremia was found on April 10th, therefore we added 5g salt in his diet daily. We changed to add 7g salt on APril 21st and tapered off quetiapine from April 22nd to April 23rd. Hyponatremia still existed on April 27th, so we changed to add 10g salt and restricted his daily water supply to 500ml. After that, hyponatremia finally got improved and he was discharged on May 8th.

Conclusion: Hyponatremia occurred after high dose quetiapine use. After he weaned off mechanical ventilation, hyponatremia did not improve. Thus, we consider the main reason for this case is quetiapine use. We also consider that using quetiapine and mechanical ventilation at the same time might increase the risk of hyponatremia.

Strategic plan of the Spanish Society of Hospital Pharmacy 2020-2023

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Background: The Spanish Society of Hospital Pharmacy (SSHP) has presented its Strategic Plan for the next four years in order to respond to the needs of a profession in the field of specialised health care.

Purpose: To expose the new strategic plan of the SSHP.

Method: The plan was designed after an analysis of professional needs for the coming years. It was presented to SSHP members who supported it in October 2019.

Results: The strategic plan motto is 'It's in our hands', and focuses on five strategic lines:
Alliances: To establish professional alliances, work with patients, healthcare professionals and administration, and strengthen national and international relationships.
Evidence: The pharmacist must know and provide the best available clinical evidence to the clinical team. Training in specific areas related to the care processes needs to be expanded.
Research: To promote research and innovation activities, actively, that contribute to scientific progress, to generate evidence and to improve the profile and recognition of the Hospital Pharmacy.
Optimisation: All growth expectations must be associated with optimisation and unlearning activities. It is not only a matter of not doing it, it is doing it more efficiently and with better results, and prioritising the activities in a healthcare system with limited resources.
Union: To work as pharmacists as a united and cohesive collective with an image of professionalism and prestige.

Conclusion: The SSHP has set out its roadmap for the coming years by outlining a clinical and research professional, committed to the patients' health, through the indicated and efficient use of medicines.

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Thinking of drug prescription management and environmental protection

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Background: It's been a long time since the hospitals established a system to avoid duplicate medication. However, it's difficult to obtain the patient medication administration record from another medical unit, and hard to prevent duplicate medication. Through the patient medication record system provided by National Health Insurance (NHI) Administration, we can enhance the effectiveness for doctors to lower the chances of duplicate medication and protect patient medication safety.

Purpose: We want to know that how many medication wastes can be reduced through this system.

Method: The in-hospital computerised system will operate three cross-validation checks with the patient's medication record from NHI: a)medicine with the same pharmacology mechanism; b) medicine with the same ingredients; c) the same medicine that is produced by the same company.
The data were collected between January 2017 and March 2019. We analysed prescription day overlap and number of prescribed pills to examine duplicate medication.

Results: During the research period, 189,905 cases of duplicate medication were found; 46,870 prescriptions were withdrawn after the system alerted duplicate medication. It suggests that 20,831 medicine bags made by paper and plastic were also not issued per year.
The result suggests that in 651,029 days of double issuance of medication between hospitals, 404,749 days were withdrawn. In terms of medication dosage, 691,656 tab/cap/vial/amp were reduced.

Conclusion: Using computerised system to control and cross-validate patents' medication prescriptions can reduce the chances of double issuance. This will effectively reduce unnecessary medication usage which might lead to abuse and contamination of the environment.

Incidence and risk factors of drug-induced liver injury in hospitalised patients

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Background: Drug-induced liver injury (DILI) is probably the most diagnostically challenging of all liver-related conditions. The importance is whether the agent is known to be hepatotoxic and has been implicated previously in cases of liver injury. However, there are differences in the types of drugs used in different hospitals, and the hepatotoxicity of many drugs is still unclear.

Purpose: Statistics on the incidence of drug-induced liver injury and the main suspected drugs in our hospital; find the risk factors that may affect DILI; to provide clinical risk points for reference.

Method: Adverse Drug Events Active Surveillance and Assessment System-2 (ADE-ASAS-2) was used to automatically monitor hospitalised patients from January to March 2019 in the first medical centre of PLA General Hospital, and the non-DILI hospitalised patients were included in the 1:2 ratio as a control group.

Results: One hundred and twenty-two (126 times) out of 35,083 inpatients were included in the DILI case group, with an incidence of about 0.36%, lysine aspirin (3.77%) had the highest incidence. We found that the distribution of DILI types of diverse drugs was different. The history of the hepatobiliary disease was statistically significant in the multivariate logistic regression of the control study, which may be a risk factor for DILI.

Conclusion: Compared with some European and American hospitals, the incidence rate in our hospital was lower. The statistics of hospital DILI information can improve the domestic data; The risk and harm of DILI can be reduced by initially judging suspicious drugs for different types of DILI and focusing on the corresponding indicators of patients with a history of hepatobiliary diseases.

Effectiveness evaluation of importing dose monitoring mechanism into antineoplastic prescription system

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Background: Advances in antineoplastic agents have greatly contributed to improving patient survival in recent years. The rationality of prescribing cancer treatments has a great correlation with the safety of patients' medication, and it is also one of the important indicators of the quality of cancer diagnosis and treatment.

Purpose: We aim to enhance the prescription appropriateness by developing the platform with antineoplastic dose monitoring mechanism.

Method: According to NCCN guideline, we set up the standard dose of antineoplastic agents in the system. Inappropriate dose prescriptions which have been prescribed over ±15% can be intercepted by the control mechanism and then the analysis of dose adjustment appropriateness will be performed.

Results: This system was launched in May 2019. Analyse the 233 chemotherapy prescriptions, total of 492 chemotherapy drugs, of which the proportion of prescriptions with doses less than 15% of the normal dose accounts for 13.9%, and the ratio of prescriptions above 15% of the normal dose is 0%. The results of this study found that the top three reasons for dose adjustment were, hepatic impairment accounting for 33%; age factor accounting for 30%; and renal impairment accounting for 23%. Further analysis of the 68 prescriptions with a dose reduction of more than 15%, a total of 28 (41%) chemotherapeutic drugs had to be adjusted without proper reasons, which was a suspected prescription with insufficient dosage.

Conclusion: In conclusion, we indeed enhance patient medication safety through integrating the intelligent dose management system and the professional competence of the pharmacists.

Pharmacist interventions to 311 oncology and hematology cases in a medical centre in Taipei, Taiwan

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Background: Pharmacists' interventions and contribution to the quality of a healthcare system are known to the world in recent decades (Reeves *et al*., 2017; Skjøt-Arkil *et al.*, 2018). The key to achieving the best performance relies on well established and fully functioning standard operation procedures among multi-disciplinary teams (Ervin *et al*., 2018).

Purpose: Pharmacists are expert in drug procurement process, medication reconciliation, reduce unnecessary healthcare expenses, facilitate shared decision making process and thus have a pivotal role in improving quality of care. This session will introduce how clinical pharmacists can assist in those areas by showcasing 311 patients' drug related problems (DRPs) and one case discussion on how pharmacists can contribute to avoid medical dispute.

Method: From January 1st 2018 to February 28th 2019, 311 inpatient cases age 18-96 with over 15 diagnosis were enrolled; 62.1% male (193) and 37.9% female (118), other patient characteristics are displayed in graph 1 [*not included*]. DRPs and interventions classified into nine categories are documented for future review and doctors were informed of these records.

Results: The results are shown in Graph 2 [*not included*]. One documentation was reviewed by authorities for a suicidal case died in 48hrs; as proof of adequate medical intervention, family later dropped lawsuits.

Conclusion: This research and result may serve as a reminder that healthcare providers are a team. Comprehensive documentation can strengthen the reason behind all medical decisions and actions to help to improve relationships between all healthcare workers, patients and the family. Potential pitfalls in the evaluation of DRPs and diseases can lead to an incorrect intervention; including pharmacists in medical decisions is fundamental to the successful of our clinical work.

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