4CPS-232 REORGANISATION IN HOSPITAL OUTPATIENT DRUG DELIVERY: ANY PROGRESS?

E Jouhanneau*, I Girault, H Perrier, A Bruel, S Bourg, A Deboes, G Ligneul, M Raoul, I Taine, S Toutain, D Bruel. *Centre Hospitalier du Mans, Pharmacy, Le Mans, France*

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Background In our hospital outpatient drug delivery, approximately 600 patients per month were received. Following surveys among patients and pharmacy professionals in 2017, our outpatient pharmacy service was changed in January 2018. It now involves a smaller, specialised team: four pharmacists and six pharmacy technicians. Opening hours have been extended and treatment is now made ready for pick-up on request.

Purpose To compare the opinion of patients and professionals with the pharmacy service in 2017 and 2018, we conducted the same prospective surveys concerning delivery time and satisfaction.

Material and methods For one week in March 2017 and March 2018, a first prospective survey was conducted about delivery time: from patient arrival time to departure time. During March 2017 and March 2018, we collected questionnaires with 12 items concerning patients' satisfaction and patients' opinion on outpatient delivery premises, patient care and drug delivery. Professionals had to complete a questionnaire about training, working hours, technology tools, work conditions, professional collaboration and documentation.

Results Regarding delivery time, the extended opening hours contributed to evening it. The average delivery time decreased (2017: 19 min; 2018: 11 min, $p<0.01$). By making appointments, we reduced the delivery time (without: 13 min, with: 7 min; $p<0.01$). The proportion of very satisfied patients increased (from 50% to 78%). No one was dissatisfied (from 1% to 0%). Patients appreciated extended opening hours, availability and being listened to. They disliked the premises and the lack of confidentiality. Regarding the professionals, 82% of them were very satisfied in 2018. They valued the close collaboration between pharmacists and technicians, registration systems and training. They were dissatisfied about lack of confidentiality and inadequate awareness of documentation. They expressed a willingness to develop skills and knowledge.

Conclusion Based on our results, our new outpatient drug-delivery organisation increased the quality of the service provided for patients and for professionals. In a Plan-Do-Check-Act cycle, we planned different actions: renovation of premises in 2019 and providing ongoing training based on simulating situations at the counter.

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4CPS-233 ANALYSIS OF DRUG PRESCRIPTIONS OF INCOMPATIBLE DRUGS THROUGH DRUG UTILISATION REVIEW

H Kim*, S Min, S Yu, Y Jung, H Jeong. *Seoul Veterans Hospital- Korea Veterans Health Service, Department of Pharmacy, Seoul, South Korea*

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Background The Drug Utilisation Review (DUR) notifies alerts to clinicians and pharmacists when contraindicated drugs have been prescribed and dispensed. If clinicians want to override alerts, they must input reasons for not changing drugs. Pharmacists dispense prescriptions and inform patients using reasons provided by the clinician.

Purpose The purpose of this study was to confirm cases when contraindicated drugs have been prescribed overriding alerts, and to investigate prescriber's reasons for overriding drug-drug interaction alerts.

Material and methods This study investigated outpatient cases where contraindicated medications with drug-drug interaction were prescribed and administered unaltered, through the DUR, using the Electronic Medical Record, at this centre from 1 January 2018 to 30 June 2018. Prescriptions of identical medications for the same patient, prescribed on a different day, were regarded as a different case, due to having a different reason for issuing a prescription.

Results A total of 514 cases of prescriptions having contraindicated medications of drug-drug interaction were confirmed. The grounds for prescribing 514 cases of

contraindicated medications include: unadministered contraindicated medications (220 cases, 42.8%); drugs taken intermittently or pro re nata (PRN) (147, 28.6%); administered by a clinical decision (79, 15.4%); local administration (21, 4.1%); meaningless words(44, 8.6%); and emergency medication (three, 0.6%). The reasons for prescribing contraindicated medications with drug-drug interaction in cases of anti-diabetic agents with CT contrast medium were as follows: unadministered contraindicated medications(95 cases, 76.0%), meaningless words (22, 17.6%) and administered by a clinical decision (eight, 6.4%). Reasons for other genitourinary organ and rectal agents with vasodilator were PRN (54 cases, 38.3%), administered by a clinical decision (42, 29.8%), unadministered contraindicated medications (29, 20.6%) and meaningless words (16, 11.3%). Reasons for NSAID with other cardiovascular drugs were PRN (65 cases, 69.9%), unadministered contraindicated medications (16, 17.2%) and local administration (13, 28.9%).

Conclusion We confirmed that certain medications were sometimes prescribed using an incorrect reason. Some clinicians input a reason that was something other than a PRN drug use, or entered a meaningless words. It is necessary to improve the system of entering the reasons why clinicians prescribe contraindicated drugs.

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4CPS-234 PHARMACIST INTERVENTIONS IN NEONATAL INTENSIVE CARE UNIT AND ASSOCIATED COST AVOIDANCE AND COST SAVINGS

[1]Y Kim*, [1]J Rho, [1]Y Suh, [1]K Choi, [1]E Lee, [2]E Lee, [1]CW Choi. *[1]Seoul National University Hospital- Bundang, Department of Pharmacy, Seongnam-si- Gyeonggi-do, South Korea; [2]Seoul National University, College of Pharmacy, Seoul, South Korea*

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Background In neonates, frequent changes in dosing intervals and dosage can increase the risk of medication errors. In addition, patients in the Neonatal Intensive Care Unit (NICU) are highly dependent on total parenteral nutrition (TPN), which is one of the most important interventions made by pharmacists. Although the role of ICU pharmacists in improving clinical outcomes has been documented, there are currently few reports on the economic impact of such interventions in this country.

Purpose The purpose of this study was to analyse interventions made by a NICU pharmacist and describe the economic impact by calculating cost avoidance and cost savings associated with accepted interventions.

Material and methods From 1 March to 31 August 2016, a retrospective evaluation was conducted by analysing clinical intervention records from prescription review, TPN consults and Clinical Pharmacokinetic Consultation Service reports delivered by pharmacists in a tertiary hospital. Interventions were graded based on probable outcome severity by three independent pharmacist evaluators. This grade was used to calculate cost avoidance. Cost avoidance and cost saving from accepted clinical interventions were calculated to show the economic impact of NICU pharmacists.

Results During the study period, a total of 608 clinical interventions were performed, TPN was involved in 482 (79.3%) interventions and the number of intervention activities related to prescription review was 81 (13.3%). The most frequent interventions related to prescription review were 'incorrect dose and interval (46.1%)', followed by 'incorrect administration schedule' and 'consult for medication information and treatment plan'. The prescriber's acceptance rate of pharmacist recommendations was 95.2%. Over the 6 months, total cost avoidance was 175,863,624 won and total cost saving was 75 033 won.

Conclusion This study showed the impact of a NICU pharmacist on medication safety and costs in a tertiary hospital. However, further study is needed to demonstrate the clinical pharmacist's contribution to the improvement of clinical and economic outcomes more comprehensively.

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4CPS-235 PARENTERAL NUTRITION-ASSOCIATED CHOLESTASIS AS AN EARLY-ONSET ADVERSE EFFECT IN ADULT PATIENTS

P López-Méndez*, F Fernández-Fraga, M Moreno-García, N Ibañez-Heras, T Molina-García. *Hospital Universitario de Getafe, Pharmacy Department, Madrid, Spain*

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Background Parenteral nutrition-associated cholestasis (PNAC) may occur in 25–100% of adult patients receiving long-term parenteral nutrition (PN).

Purpose To analyse the onset of PNAC in hospitalised adult patients and the possible risk factor associated.

Material and methods Observational, retrospective and longitudinal study that included adult patients who received PN for at least 5 days from January 2017 to September 2018 with normal serum level of alkaline phosphatase (AP), gamma-glutamyl traspeptidase (GGT) and total bilirrubin before starting PN. The primary endpoint was defined as time to the onset of cholestasis established as elevation in GGT (>106.6 U/L) or total bilirubin (>1.8 mg/dL) or AP (193.5 U/L) + (GGT or bilirrubin) that could not be explained by other causes. Possible risk factors were collected: gender, age and sepsis at initiation of PN, cyclic PN infusion, kcal/kg, balance between dextrose and fat and fat >1 g/kg/d at the onset of cholestasis or at the end of PN treatment in those patients who did not develop cholestasis. Statistical analysis was performed by Chi-square test for qualitative variables and student's *t*-test for quantitative variables using STATA.

Results One-hundred and fifty-six patients were included. 48.7% of patients developed cholestasis within a median of 6 (IQR=4) days. The results of possible risk factors were:

Conclusion PNAC is an adverse effect that not only happens in patients receiving long-term-PN, but also occurs in a high