

## OR01.1

### ANTICHOLINERGIC BURDEN VERSUS ANTICHOLINERGIC EFFECTS IN INSTITUTIONALIZED ELDERLY

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**Background and Objective:** The natural aging process predisposes older people to anticholinergic side effects. Several tools were developed for screening of anticholinergic drugs and estimation of the anticholinergic burden, but a need to associate prescriptions' anticholinergic burden with adverse clinical outcomes still remains. We aimed to compare different anticholinergic burden quantification tools regarding their ability to predict peripheral and central anticholinergic effects in institutionalized older people.

**Setting and Method:** A retrospective cohort study with 125 patients was conducted in a nursing home in the Centre of Portugal. To calculate patients' anticholinergic burden the following tools were used: Anticholinergic Drug Scale (ADS), Anticholinergic Risk Scale (ARS), Anticholinergic Cognitive Burden (ACB), and Drug Burden Index (DBI). To assess elderly physical function the Barthel Index questionnaire was used. The peripheral outcomes 'constipation', 'dry mouth' and 'tachycardia' and the central outcomes 'falls' and 'dementia' were collected from patients' clinical records.

**Main outcome measures:** Anticholinergic burden and anticholinergic effects.

**Results:** Patients were 85.4 (SD=8.02) years old and 72.8% were female. They used 9.1 (SD=3.51) medicines and suffered from 3.1 (SD=3.21) conditions per patient. Anxiolytics, Sedatives and Hypnotics/Benzodiazepines (52.8%), Antidepressants (48.8%) and Antipsychotics (34.4%) were the main classes of drugs with anticholinergic effects found in this population. Prevalence of anticholinergic effects were: constipation (59.2%), dry mouth (16.0%), tachycardia (13.6%), falls (18.4%), and dementia (44.0%). An association between the ADS score and the anticholinergic effect occurrence was not identified. Positive associations were found between 'dementia' and high scores calculated by ARS and ACB scales (Mann-Whitney U=1358; p=0.003) and between 'constipation' and total anticholinergic load calculated by the DBI (Mann-Whitney U=1431; p=0.022). The ARS scale also presented a high prediction capability to identify elderly at high risk of physical dependence (p=0.005; r=-0.249).

**Conclusion:** The anticholinergic burden calculated with different tools correlated differently with different anticholinergic effects.

## OR01.2

### IMPACT OF DEPRESCRIBING AS PART OF CLINICAL MEDICATION REVIEW ON POLYPHARMACY OF OLDER PATIENTS IN AN INTEGRATED PRIMARY CARE SETTING

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**Background and Objective:** Deprescribing is the process of intentionally stopping drugs or reducing its dose to improve the person's health or reduce the risk of adverse side effects. The objective of this study was to examine the effect of deprescribing as part of clinical medication review on polypharmacy for older patients in an integrated primary care setting.

**Setting and Method:** Cross-sectional study. Patients  $\geq 70$  years and using  $\geq 7$  drugs were recruited from two GP practices. Two community pharmacists in a non-dispensing role invited patients to the GP practice or visited patients at home for an interview. The interview was focused on health-related goals including patient's complaints possible due to adverse effects. Recommendations for medication changes were discussed in a face-to-face meeting with the patient's GP and implemented in shared-decision making with the patient.

**Main outcome measures:** Implemented recommendations for discontinuation of drugs and dose reduction; type of drug-related problems (DRPs).

**Results:** 129 of 366 recommendations (35%) for 89 patients were aimed at the discontinuation of drugs of which 57% were implemented. 59 recommendations (16%) were aimed at dose reduction of which 54% were implemented. The most prevalent drug classes recommended for discontinuation were proton pump inhibitors (17), calcium antagonists (10) and beta-blockers (6). The most prevalent types of DRPs (mean 4.1 per patient) were "Overtreatment" (27%) followed by "Potential adverse effect" (19%) and "Undertreatment" (19%).

**Conclusion:** Deprescribing as part of clinical medication review within an integrated primary care setting can lead to a reduction in polypharmacy.

### OR01.3

#### **EFFECT OF PHARMACIST-LED INTERVENTIONS ON MOTOR SYMPTOMS AND QUALITY OF LIFE IN PARKINSON'S PATIENTS: A PILOT STUDY.**

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**Background and Objective:** Patients with Parkinson's disease (PD) use many drugs, up to seven times a day. Non-motor symptoms give rise to an even higher pill burden. However, despite the importance of medication in Parkinson therapy, patients with PD are often non-adherent to their medication and drug related problems occur frequently. Therefore, the objective was to improve on-off symptoms in ambulatory PD patients with a multi-faceted intervention program.

**Setting and Method:** A prospective pilot study was performed in an outpatient clinic, where usual care was compared with stepwise introduction of interventions. Each patient served as his own control.

The intervention program consisted of the introduction of automatic dispensed unit dose (UDP) per time, a Parkinson Kinetic Graph (PKG): an accelerometer with and without alarm-system for levodopa-intake and a pharmacist-led medication review (MR).

**Main outcome measures:** The study analysed endpoints at 6 weeks (stage 1: usual care), 10 weeks (stage 2: UDP), 14 weeks (stage 3:UDP + PKG alarm) and 26 weeks (UDP + PKG reports and alarm + MR interventions) after inclusion, on motor-symptoms and QoL (PDQ-8).

**Results:** On-time (objectified with patient diary) increased significantly from 54% ( $\pm 30$ ) at stage 1, to 64% ( $\pm 25$ ) at stage 3 to 68% ( $\pm 27$ ) at stage 4. This equals a 1.8 respectively 2.5 hours increase in on-time in stage 3 resp. 4. Off- and dyskinesia time declined with 12 resp. 10% in stage 4.

A significant difference in PDQ8 score was reached in stage 4 as compared to stage 3 (mean  $21.0 \pm 3.5$  and  $19.5 \pm 5.3$   $p=0.01$ ).

**Conclusion:** Our data support the effectiveness of a clinical pharmacist at the outpatient clinic, to optimise clinical symptoms in PD patients. Further analysis is needed to determine effects of these type of interventions on non-motor symptoms.

## OR02.1

### IMPLEMENTING THE KNMP DIABETES GUIDELINE: DESCRIPTION AND EVALUATION OF A MASTERCLASS

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**Background and Objective:** In 2016, the Royal Dutch Pharmacists Association (KNMP) introduced the KNMP Diabetes Guideline. This guideline is directed at community pharmacists who intend to deliver high quality pharmaceutical diabetes care, in cooperation with general practitioners (GPs) and other primary care professionals. Implementing pharmaceutical care requires a multifaceted approach, addressing the opportunities and barriers in the specific setting of an individual pharmacy. By developing and performing a masterclass we intended to stimulate the implementation of the KNMP Diabetes guideline.

**Programme description:** The masterclass was built on four pillars: knowledge of pharmacotherapy, organisation of pharmaceutical care in community pharmacy, collaboration of pharmacists with GPs and their staff, and patient centeredness. It comprises an intake prior to the course, two knowledge tests, five one-day meetings, and assignments between the meetings. The total duration is six months.

The KNMP Diabetes Guideline was summarized in 56 recommendations. Prior to the masterclass, participants scored each recommendation with traffic light colours, based on the degree of implementation in their own pharmacy. For the recommendations scored yellow and red, they made an implementation plan which formed the main thread of the course for each participant. During the meetings, teachers shared their knowledge about diabetes treatment and pharmacotherapy, clinical reasoning, chain care, experiences of diabetes patients, and patient centred communication. They also trained skills and facilitated intervision between participants. The assignments mainly functioned as reminders and social support. For the first masterclass, pharmacists who were considered early adopters were invited to participate. 15 pharmacists started and 14 pharmacists completed the first masterclass. At the start, between 8 and 34 (average: 21,2) recommendations were already implemented (green) in the pharmacies of participants who completed the course. At the end of the masterclass, participants scored between 10 and 40 (average: 25,4) recommendations green. They improved the implementation of between 8 and 21 (average: 15,3) recommendations during the course.

**Conclusion:** This masterclass is a promising course to stimulate the implementation of high quality pharmaceutical diabetes care by pharmacists in cooperation with GPs.

## OR02.2

### METHODOLOGICAL ANALYSIS TO OBTAIN THE BEST POSSIBLE MEDICATION HISTORY IN A PROCESS OF MEDICATION RECONCILIATION IN AN ACUTE MENTAL HEALTH UNIT

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**Background and Objective:** The need to improve medication reconciliation practices, which includes obtaining Best Possible Medication Histories (BPMHs), is well recognized. Electronic medical records (EMR) are becoming more common and offer several advantages over paper records for medication reconciliation. Shared Medical Records (SMR) are the transfer of information between individual healthcare providers involved in a patient's care. The aim of this study was to identify the role of the different prescription data sources (SMR, EMR, and the patient interview), and the time needed to retrospective data retrieval, to create the BPMH in an acute mental health unit.

**Setting and Method:** A cross-sectional study was conducted in an acute unit of the Center for Integrated Responsibility of Psychiatry and Mental Health, University Hospital Center of Coimbra (January 2015 - February 2016). The following sources of information were used to obtain BPMHs: patient or caregiver interview, and a one-year retrospective analysis of SMR, EMR. Medicines were classified using the ATC classification. Normality was evaluated using the Shapiro-Wilk test. Concordance between information sources was assessed by the Cohen's kappa. The study was approved by the Ethics Committee of the Hospital University Center of Coimbra (CHUC-008-15).

**Main outcome measures:** Discrepancies in the medications lists retrospectively analysed at 3, 6, 9 and 12 months.

**Results:** During the study period, 148 patients were admitted to the acute mental health unit, with a mean age of 54.6 years (SD=16.4), normally distributed (Shapiro-Wilk  $p=0.187$ ) and 75 (50.7%) were females. About 50% of the medicines retrieved from the SMR in the 6-month analysis (1404 medicines) would be lost in a three-month analysis (791 medicines). Only 650 medicines were retrieved from the patients' EMR, with a mean of 5.1 (SD=2.9) per patient. Concordance between the information retrieved from EMR each of the SMR time-frames was null, with all the Cohen's kappa values in negative values (lower agreement than expected by chance). A total of 968 medicines were reported by the patients or their caregivers as being in use with a mean of 6.5 (SD=3.8) per patient. Concordance of patients' information with the four SMR time frames was also null, with all Cohen's kappa values in negative values. Using the three information sources (6-month SMRs, EMRs and patient interviews) resulted in a total of 1651 drugs included in the BPMHs.

**Conclusion:** To create a BPMH that will be used in a medication reconciliation process, combining all the patient medication data sources (6-month EMR, SMR, and patient interviews) is essential.

### OR02.3

#### MEDICINES OPTIMISATION FOR HIV AMBULATORY PATIENTS

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**Background and Objective:** In Greece, HIV-infected ambulatory patients are monitored in the Infectious Diseases Units of tertiary hospitals. Antiretroviral treatment (ART) is prescribed by Infectious Diseases (ID) specialists and is dispensed at the Hospital Pharmacy. Medicines shortages, adverse drug reactions (ADRs) and emerging comorbidities may modify and affect the efficacy and safety of pharmacotherapy. The impact of collaboration among physicians, pharmacists and patients on medicines optimisation and integrated care services has been assessed for the years 2015 and 2016.

**Setting and Method:** All patients of the Infectious Diseases Unit, receiving their monthly ART from the Hospital Pharmacy, participated in the study. Prescription data and medicines optimisation interventions were collected from registries in both departments. Patient satisfaction data were collected by direct interviews with the patients. All data were analyzed by EXCEL<sup>®</sup> and SPSS<sup>®</sup>.

**Main outcome measures:** During the study years 2015 and 2016, 70% and 75% of outpatients monitored in the Infectious Diseases Unit of our Hospital were eligible to receive ART, respectively. Among them, about 85% has been visiting the Hospital Pharmacy, while the rest has been receiving the medication by mail. Management of medicines shortages, ADRs and emerging comorbidities served as indicators for the assessment of medicines optimisation and integrated care services to these outpatients.

**Results:** In 2015, an average of 495 outpatients/month was administered ART, increased by 85 outpatients/month in 2016. All patients received their medication by an appointed healthcare professional at the pharmacy, were served in an average time of 5 minutes and were satisfied in a grade of 9 out of 10. Moreover, 13% of these outpatients in 2015 and 8% of them in 2016 had their therapy modified due to ADRs and emerging comorbidities, through medication review by both physicians and pharmacists. In December 2015, significant medicines shortages due to budgetary issues appeared but seamless care was achieved by collaboration between healthcare personnel and patients, so that no interruption of treatment occurred. 95% of the patients considered the offered services either very good or exceptional, 90% wished a more frequent than twice a week medication dispensing, in order to meet their needs, 80% of the patients worried about antiretrovirals shortages due to the economic crisis, while 60% were concerned regarding generic antiretrovirals prescription.

**Conclusion:** Medicines optimisation for patients with chronic diseases, such as HIV infection, demands the appropriate and prompt administration of treatment through quality procedures, regardless of the lack of personnel, infrastructure and budget allocations in the health care system. Collaboration between hospital departments and good cooperation with the outpatients improved the quality of health care services, to the benefit of both healthcare personnel and HIV-infected patients.

PP01

## HIGH RISK OF DRUG-INDUCED PHENOCONVERSION AND ANTIDEPRESSANT-DRUG INTERACTIONS AT PHARMACOKINETIC LEVEL IN A NATURALISTIC CLINICAL SETTING

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**Background and Objective:** P-glycoprotein (P-gp) and cytochrome P450 (CYP) isoenzymes (CYP2C9, CYP2C19 and CYP2D6) are key proteins involved in the pharmacokinetics of antidepressant drugs. Their functional activity (phenotype) can influence the outcomes and the success of antidepressant therapy. On this matter, drugs that patients are taking (pharmacotherapeutic profile) can interact with these proteins and change their phenotype (drug-induced phenoconversion), as well as trigger drug-drug interactions affecting the antidepressant agents. Thus, this work aimed to investigate the potential of drug-induced phenoconversion and antidepressant-drug interactions in a cohort of depressive patients treated with fluoxetine, paroxetine and venlafaxine.

**Setting and Method:** A total of 182 patients were prospectively recruited in the scope of a pharmacogenetics naturalistic study focused on the treatment of depression. All the pharmacotherapeutic profiles were revised for substrates, inhibitors and/or inducers of P-gp, CYP2C9, CYP219 and CYP2D6, using the *Transformer* and *DrugBank* databases. The global effect of interaction of the pharmacotherapeutic profiles on the phenotype of each protein was translated into the Score of Potential Drugs-Protein Interactions (SPDPI). The presence of potential antidepressant-drug interactions was also investigated.

**Main outcome measures:** SPDPI, novel quantitative metric purposed by us to translate the potential effect of a pharmacotherapeutic profile on the phenotype of a relevant protein for the pharmacokinetics of the drug in study and, therefore, the risk of drug-induced phenoconversion.

**Results:** Polytherapy was found in 88.5% of patients. A total of 862 drugs were registered; among them 44.4%, 46.9%, 40.1%, 44.8% were identified as potential substrates and/or inhibitors of the P-gp, CYP2C9, CYP2C19 and CYP2D6, respectively. The SPDPIs showed that the pharmacotherapeutic profiles of 65.9%, 84.6%, 76.9% and 98.3% of patients displayed a moderate-to-high potential to decrease the functional activity of P-gp, CYP2C9, CYP2C19 and CYP2D6, respectively (drug-induced phenoconversion). Overall, 80.8% of patients were under risk of occurrence of at least one antidepressant-drug interaction involving these proteins.

**Conclusion:** The high risk of drug-induced phenoconversion and antidepressant-drug interactions at pharmacokinetics level is common in the naturalistic clinical setting of treatment of depression due to polypharmacy. Therefore, the impact of these non-genetic factors on the pharmacokinetics of antidepressant drugs must be considered and the pharmacists must pay attention in order to avoid them and optimize the prolonged therapy with antidepressant drugs.

PP02

**PHARMACY CONSULTATION FOR ELDERLY AT THE OUT-PATIENT HAEMATOLOGY WARD: PRELIMINARY RESULTS FROM THE HEMATOCONCIL PROJECT**

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**Background and Objective:** Elderly people are exposed to iatrogenic risks due to polypharmacy and multiple comorbidities. Hemopathies could complicate the drug use process. The aim of this study was to evaluate the necessity of pharmacy consultation (PC) in the drug use process of elderly with a malignant hemopathies.

**Setting and Method:** The population of the study was composed of  $\geq 75$  years old patients, hospitalized in an out-patient and treated by chemotherapy. For each patient, the comprehensive current medication list was established from several sources (GP, pharmacy, patient's medical record, etc.). The medication complexity was assessed by the Medication Regimen Complexity Index (MRCI). Then, a synthesis was done with the following observations: creatinine clearance (MDRD formula), potentially inappropriate medication uses (PIM) according to Laroche criteria with propositions of alternatives, drug-drug interactions (DDI) and how to manage it. On the admission day, a patient consultation was carried out, involving a compliance assessment by the nine-item Morisky Scale, and a documentation of drug allergy, adverse effects and possible misuses. A medication regimen form and instructions for home medications was given to the patient. The synthesis of these information was sent to the GP, the pharmacy. Each patient has been re-evaluated at 1 and 3 months.

**Main outcome measures:** To analyse patient prescription according the French Society of Clinical Pharmacy method before patient admission.

**Results:** Since the 27/01/2017, 43 patients have been included in this program. The mean age was 80.9 ( $\pm 4.7$ ) years old. Hemopathies were mostly Non-Hodgkin lymphomas 42% (18) and myelomas 30% (13). The mean number of drug per patient was 7.0 ( $\pm 3.7$ ) and 15.0 ( $\pm 5.2$ ) if including chemotherapy and drugs for side-effects management. The prevalence of excessive polypharmacy (threshold: 10 or more medications) was 84% (36). The prevalence of PIMs use concerned 40% (17) of patients, mostly anxiolytics (36%, 8) and hypnotics (32%, 7). DDI were identified among 21% (9) of patients (30% (3) with an haemorrhagic risk and 30% (n=3) with a risk of heart rhythm trouble). The mean Morisky score was 11.0 ( $\pm 1.7$ ), with 32% (12) of noncompliant patients. The mean MRCI score was 39.0 ( $\pm 16.8$ ). Adverse effects were identified among 16% (7) of patients. A number of 80 pharmaceutical interventions have been done, concerning 84% (36) of patients for the following drug related problems: non-conformity to guidelines 30% (24), improper administration 23% (18), compliance issues 15% (12) and not recommended drug associations 10% (8).

**Conclusion:** These preliminary results have shown a high prevalence of excessive polypharmacy, PIMs use and DDI and a bad compliance for a third of patients. The assessment of the study will be better quantified after the one and three months reviewed of patient.

PP03

## MULTIDISCIPLINARY CONSULTATION MEETING : THE INVOLVEMENT OF THE PHARMACIST FOR PATIENT HEPATITIS C MANAGEMENT

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**Background and Objective:** Since 2014, the establishment of a multidisciplinary consultation meeting (MCM) is mandatory for any initiation of treatment against the hepatitis C virus (HCV). The pharmacist is more and more called upon by medical specialists because of the multitude of existing therapies and the potential risks of drug interactions (DI). Therefore, a dual objective was set: assess the situation over a year of MCMs and evaluate the impact of the pharmacist's input on the interventions carried out.

**Programme description:** Monthly, these meetings are composed of physicians (hepato-gastroenterologists and infectiologists), pharmacists and biologists. When a HCV treatment is initiated, a pharmacological analysis of DI is systematically carried out by the pharmacist, taking into account the personal treatment of the patient. For this study, the main datas (demographic, biological and therapeutic) and all pharmaceutical interventions (PIs) were retrospectively collected from January 2016 to February 2017.

The median age of 84 studied patients was 56 years old [21-83]. 62% of patients were men. The distribution of genotype was as follows: 64% genotype 1, 8% genotype 2, 15% genotype 3 and 13 % genotype 4. HCV treatment ( $\pm$  Ribavirin) was proposed for 86 of the 94 index cards (92%): Paritaprevir / ritonavir + ombitasvir  $\pm$  dasabuvir (34%), sofosbuvir + ledipasvir (32%), sofosbuvir + daclatasvir (23%) , Sofosbuvir + simeprevir (2%), sofosbuvir + ribavirin (2%), elbasvir + grazoprevir (6%) and Sofosbuvir + Velpatasvir (1%). 55% of patients had a personal treatment with 11% of antiretrovirals (ARVs). PIs were made for 18 cases (19%) with 33 DIs (on average 1.83 / case). The most DIs that came up were antihypertensives (36%), proton pump inhibitors (PPIs) (12%), statins (9%) and ARVs (9%). These PIs led to changes in the personal treatment of patients: 4 changes to the same class of molecule, 16 dose adjustments, 7 treatment discontinuations (2 were involved in PPIs) and 6 clinical and biological monitoring (immunosuppressors, oral contraceptives).

**Conclusion:** This study highlights the importance of the pharmaceutical presence during MCM with an acceptance rate of PIs of 100% by medical staff. Pharmaceutical analysis is an important step in the prevention of drug-induced iatrogenesis enabling optimization of efficiency and allows a better tolerance and acceptability of the treatment by the patient.

## PP04

### PHARMACEUTICAL INTERVENTIONS IN AN ADULT EMERGENCY DEPARTMENT

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**Background and Objective:** After establishing a systematic pharmaceutical validation (PV) one year ago in the emergencies department (ED), our objective was to describe pharmaceutical interventions (PI).

**Setting and Method:** The study period was from 02/11/2016 to 03/03/2017 (4 months). The data collection on demographic data and patient's prescriptions admitted overnight or during the weekend was done by a pharmacist resident during the medical staff at 8.30 am. Data missing were then collected in patient's medical records. The PV was done by the resident (under the responsibility of a senior) based on the following elements: dosages, contraindications, drug-drug interactions (DDI) and administration regimen, taking into account the patient's clinical condition, co-morbidities, and biology results.

**Main outcome measures:** PI was proposed to the physician

**Results:** A number of 405 patients with an average age of 79.7 years [22; 103] (sex ratio: 1) were included. The major reasons for referral were: geriatric problems 26.5% (repeated falls or major cognitive impairments for patients over 75 years old) and others disorders: cardiovascular 16.0%, infections 14.8%, neuropsychiatric 12.0%, respiratory 7.7%, digestive 5.5 %, multiple pathologies 4.6%, nephrology 4.3%, other 8.3%. The average number of drugs per prescription was 8.5 [1.0; 20.0]. A number of 19 IP were done on these prescriptions (4.2%).

Patients receiving these PIs were 76.9 years old on average.

Problems identified were: contraindications 52.6%, supra-therapeutic dosages 15.8%, monitoring 15.8%, associations not recommended 10.5%, and redundancy 5.3%.

The PIs proposed were to stop the drug 31.6%, substitution 26.0%, dose adjustment 21.0%, therapeutic monitoring 15.8%, optimization of the administration regimen (5.3%).

The ATC classes most commonly involved were: nervous system 26.7%, cardiovascular system 26.7%, blood and blood forming organs 13.3%, metabolism 10%, musculo-skeletal system 6.7%, genitor-urinary system 6.7%, antiinfectives for systemic use 6.7%, sensory organs 3.3%.

PIs were accepted in 68.0% of cases.

**Conclusion:** Contraindications were the first reason for intervention, and were mainly caused by drug-drug interactions. The PI acceptance decreased from 82.2% to 68.0%, mainly due to a lost of follow-up. Our organization needs to be improved so that the conclusion of PIs can be made while the patient is still in the service.

PP05

**PHARMACISTS' ROLE IN MEDICINE MODIFICATION: A QUALITATIVE EXPLORATION OF NURSES' VIEWS**

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**Background and Objective:** Oral medicine modifications (e.g. crushing tablets) are commonly undertaken to meet the needs of older ( $\geq 65$  years) patients. Whilst the clinical, legal and ethical implications of these modifications have been highlighted, modifications continue to be necessary. Nurses, in acute and long-term care, are responsible for administration and hence, in the majority of instances; medicine modification. The aim of this study is to investigate nurses' views on the role of the pharmacist in medicine modification.

**Setting and Method:** Semi-structured interviews with nurses providing care to older adults in purposively selected acute and long-term care settings in the greater Cork region were conducted between March 2016 and February 2017. Interviews were audio-recorded and transcribed verbatim. Data were analysed thematically as per Braun and Clarke. Local ethical approval was obtained.

**Main outcome measures:** Nurses' views on the role of the pharmacist in oral medicine modification.

**Results:** Eighteen nurses participated in the study (83.3% female, 33.3% acute care, 66.6% long-term care, median age (IQR) 38.0 years (32.5-52.0)). The mean interview duration was 16 minutes 29 seconds (standard deviation 6 minutes 21 seconds). Pharmacists were seen by nurses to be the most knowledgeable members of the multidisciplinary team in relation to medicine modification. They represented the primary source of information e.g. "if I have any concerns I always ring the pharmacist and I always go by their directions." Nurses in general had positive views of, and relied on, pharmacists' knowledge; however, they were frustrated with the lack of a pharmacist outside of working hours. Furthermore, some nurses reported that pharmacists do not always consider patient's formulation requirements and would welcome a proactive assessment of formulation suitability. Nurses discussed several possible pharmacist-led supports that would benefit them including: pharmacist-led education and training or a pharmacist developed site-specific formulary on medicine modification.

**Conclusion:** This study suggests that pharmacists have an important and valued role in information provision about medicine modification. In addition, it is clear that there is both a desire and a need amongst nurses, for greater pharmacist involvement in this area.

PP06

**OPIOID-INDUCED CONSTIPATION AND THE USE OF LAXATIVE CO-MEDICATION (C.O.P.E. STUDY): AN EVALUATION OF PATIENT' EXPERIENCES AND CONSIDERATIONS IN COMMUNITY PHARMACY PRACTICE**

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**Background and Objective:** Opioid-induced constipation (OIC) is a clinical relevant adverse effect of strong opioids and a prominent cause of potentially avoidable hospital admissions.

The study aimed firstly to describe the degree of laxative co-medication in starting opioid users and reasons for not using laxatives concomitantly and secondly to evaluate the influence of laxatives on patient experienced constipation during opioid use.

**Setting and Method:** All community pharmacies in the Netherlands were invited to participate in this prospective observational study. First, laxative use was signalized and registered using a clinical rule (CR) form in starting opioid users during two weeks in November and December 2016. Secondly, two patients starting with opioids per pharmacy were invited to complete a questionnaire regarding their defecation experiences prior to and during opioid use.

**Main outcome measures:** 1. Reasons for non-use of laxatives were collected by pharmacists with the CR forms.

2. The effect of laxatives on preventing constipation in starting opioid uses compared to no laxative use was analysed with multivariate regression models.

**Results:** 125 community pharmacies agreed to participate in the study. From those 81 (64.8%) returned the CR forms of 460 patients and collected completed questionnaires for 75 patients. In total 344 (74.8%) of patients starting opioids concomitantly initiated laxatives. Main reason to not use a laxative was that either the prescriber or the patient was of the opinion that laxation was not needed.

No concomitant laxative use showed a non-significant trend to increase the risk of constipation with 40%.

**Conclusion:** One in four opioid starters did not concomitantly receive a laxative. These patients showed a trend towards an increased risk to develop constipation. Therefore reluctance to immediately start laxatives should be accompanied with a monitoring, e.g. with a stool questionnaire, to prevent constipation, together with lifestyle advise.

PP07

## SECURING THE MANAGEMENT OF PATIENTS WITH SWALLOWING DISORDERS BY OPTIMIZED PHARMACEUTICAL ANALYSIS

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**Background and Objective:** Prescribing drugs for patients with swallowing disorders often leads to pill crushing, in order to facilitate drugs administration. This method, often used lack of knowledge about risks (inefficiency, toxicity) and no precise information in that field, induces a high iatrogenic risk. A recent french study showed that 42% of crushed drugs should not have been. In order to secure drugs administration, we think that a suited pharmaceutical analysis (PA) is a powerful tool to improve drug prescription.

We want to demonstrate the efficiency of a suited PA and validate methodology of this clinical practice.

**Programme description:** A prospective two-weeks study was conducted in the neurology department. The nurse or nursing staff identify patients with swallowing problems by entering an "information" into the software readable by every professional. The pharmacist analyzes the possibility or not of crushing the pills and gives advice on the administration modalities. If the drug can't be crushed, the pharmacist proposes a same International Nonproprietary Names (INN) drug and adapted galenic form or a different INN drug but same therapeutic class and adapted galenic form.

Out of 15 patients identified, 13 patients benefited a suited PA. The pharmacist carried out 59 pharmaceutical interventions. In 46%, the PA detected an impossibility of crushing the pills. Following this PA, in 74%, the pharmacist substituted with a same INN drug and adapted galenic form, in 15% he substituted with a different INN drug but same therapeutic class and adapted galenic form and in 3,7 % there was no alternative.

**Conclusion:** These results confirm the necessity of a suited PA to improve treatments efficiency and to achieve an optimal drug prescription. We asked for a software upgrade enabling the identification of patients with swallowing disorders by flagging them with a specific icon. This study will be submitted to the « Commission du Médicament et des Dispositifs Médicaux Stériles » before being broadcasted to the entire health departments. Afterwards, we shall work on pill crushing techniques.

PP08

## ANALYSIS OF PSYCHOTROPIC DRUGS PRESCRIPTIONS IN ELDERLY IN GERIATRICS AND OUT OF GERIATRICS

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**Background and Objective:** In 2014, a study, aiming at reminding the good practices of psychotropic drugs prescriptions in elderly, was conducted in 2 departments of geriatrics (long time care and accommodation for dependent elderly). Two years later, we have analyzed the evolution of the practices within the same departments and completed with 4 more departments of medicine in which no raising awareness had been made.

**Programme description:** 1-Prospective collection of psychotropic drugs prescriptions with Pharma® software in these departments: long time care, accommodation for dependent elderly (during 2 weeks), internal medicine, downstream emergency unit, neurology, hepato-gastroenterology (daily during 3 months).

Inclusion criterion, same as 2014:  $\geq 75$  yo and more than 1 psychotropic drug prescribed.

2-Conformity analysis of each prescription according to the same reference intern document used in 2014, but updated: conform (C), no conform (NC), to be debated (D) in view of the clinical situation. In geriatrics, all the NC were discussed with the prescriber. In medicine departments, the NC were highlighted by an electronic pharmaceutical opinion describing another therapeutic option. The day after, if the latter had not been applied, then a discussion was started with the prescriber.

3-Notification of the prescriber's decision: option taken into consideration (or not) and the reasons.

Geriatrics departments: 94 prescriptions analyzed (188 lines). 20 lines NC and 40 D were found. In these 60 lines, 9 had previously been noticed by the pharmaceutical team. After re-evaluation, the acceptance rate of the options offered was of 23%.

Other departments: 55 prescriptions analyzed (77 lines). 29 lines NC and 7 D were found. On 22 prescriptions previously analyzed, 11 comprised already an electronic pharmaceutical opinion. After re-evaluation of 17 NC and 4 D, the acceptance rate of the options offered was of 76%.

The most frequent reasons of non-compliance were: posology, inappropriate drug classes and incompatible associations. The pharmaceutical validation has detected 50% of the non-compliances in medicine and 15% in geriatrics, what should however be mitigated by the validation directly within the geriatrics departments. The acceptance rate of options has been improved (23%) since 2014 (13%) but the reasons to maintain the prescriptions were the same.

**Conclusion:** The action begun in 2014 about the psychotropic drugs good practices has raised awareness of the geriatricians. Aiming at optimizing the pharmaceutical validation and avoiding producing inappropriate prescriptions which could potentially be maintained outside, a training course about drugs prescription in the elderly intended for the pharmaceutical team and the doctors is under creation.

## PP09

### PHARMACISTS ROLE IN THE DEVELOPMENT OF A THERAPEUTIC PATIENT EDUCATION (TPE) PROGRAM BASED ON THE DIRECT ACTING ANTIVIRALS (DAA) USED IN CHRONIC HEPATITIS C TREATMENT

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**Background and Objective: Background:** It is now usual to dispense hepatitis C DAA to outpatients, whose virological success rate is high in the general population. However, subpopulations are at risk of re-infection or noncompliance for which an individualized approach with TPE is required.

**Objective:** To describe pharmacists' role in setting up and running TPE sessions for hepatitis C.

**Programme description: Material and methods:**

Hepatology department, based on multidisciplinary team (hepatologist physicians, psychiatrists, addiction specialists, pharmacists, nurses, psychologists), developed a TPE program on viral hepatitis in april 2016. Following written consent, entry into the program was systematically offered to vulnerable patients (background of substance abuse, active alcohol consumption, risk of non-compliance).

Pharmacists were involved in individual sessions concomitantly to DAA dispensing, since the day when patient started TPE program. Pharmaceutical sessions aimed outpatients to acquire following competencies:

- DAA's name, action mechanism,
- Terms of administration, what to do if forgotten,
- Side effects (SE) and their management,
- Drug interactions (adapted to outpatient treatment).

Pharmacists also answered to questions concerning the patient and monitored compliance and SE.

Interactive practical tools were developed: treatment logbook (also allowed evaluating objectives at each session), cards about known and preconceived SE, timetable for drug intake. Patients fulfilled a satisfaction survey at last session.

Indicators are monitored by the pharmacist during the program :

- number of patients included
- pharmaceutical session goals acquisition
- assesment of patient satisfaction
- number of patients who obtains an undetectable viral load 12 weeks after the end of treatment (Sustained Virological Response 12 : SVR12)

**Results:** 31 outpatients were included. Pharmacists conducted 65 sessions, 2 or 3 individual meetings per patient (one hour-long total per pharmaceutical session) depending on treatment length (8-24 weeks). 6 patients were still ongoing and 25 achieved the program. Among them, 12 had an undetectable viral load after 12 weeks, 1 relapsed and 12 are within twelve weeks post treatment. 100% of goals were achieved as from the first pharmaceutical session. 100% of patients were satisfied about pharmaceutical session.

**Conclusion:** Role of the pharmacist is to transmit skills for starting and to assist the patient during treatment. SE are sometimes more easily disclosed to pharmacist, thereby allowing to take them into account so that the treatment can be adapted until completion. TPE benefits for these subpopulations are expected in the short term with regards to compliance and empowering the patient during treatment and in the long term to eliminate risky practices and leaving additions. Evaluation of program's benefits in terms of virological success need to be continued.

## PP10

### DETERMINATION OF IMPORTANCE FOR NEW VACCINE ADOPTION: A BEST-WORST SCALING METHOD

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**Background and Objective:** The introduction of new vaccines depends on various criteria, including policies, clinical guidelines and economic considerations. Various stakeholders have differing criteria they view as important in selecting vaccines into a national immunization program. This study aimed to determine vaccine attributes importance to various stakeholders in new vaccine adoption in Thailand, using the best–worst scaling (BWS) method.

**Setting and Method:** The vaccine attributes and levels identified from a literature review and semi-structured interviews were categorized into burden of disease, age group, budget impact, fever from vaccine, severity of disease, vaccine effectiveness and cost of vaccine. Main-effects orthogonal design was used to identify 18 best-worst scenarios. A postal survey was conducted among policy makers, healthcare professionals and healthcare administrators during October 2013 and January 2014. Respondents were asked to choose the most important and the least important choices in each scenario.

**Main outcome measures:** Importance weights were estimated by a conditional logistic regression. The coefficients from regression analysis reflect the average weighting those respondents gave to various attribute levels. Then the relative attribute importance was calculated by the difference between the maximum and minimum coefficient for each attribute divided by the sum of all differences.

**Results:** A total of seventy respondents completed the questionnaires. The attribute with highest importance for all groups was severity of disease (35.86%). Fever from vaccine (16.71%), burden of disease (13.48%) and budget impact (12.81%) were not much different importance from each other. For policy makers and healthcare professionals, the attributes with high importance were severity of disease (35.03% and 35.89%), fever from vaccine (22.88% and 16.08%) and burden of disease (14.82% and 15.25%), respectively; whereas the attributes with high importance for healthcare administrators were severity of disease (32.53%), budget impact (15.07%) and fever from vaccine (14.99%), respectively.

**Conclusion:** The BWS method makes it possible to take into account multiple criteria from multiple stakeholders for new vaccine adoption. The results revealed the alignment of a desire for high protection against severe disease in vulnerable groups together with concerns about budget impact and safety.

## PP11

### EFFECT OF KIDNEY FUNCTION ON AMIKACIN PHARMACOKINETICS ON HOSPITALIZED PATIENTS: A KNOWLEDGE TO IMPROVE THERAPY

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**Background and Objective:** Amikacin has been one of the most important antimicrobial agents against Gram-negative pathogens although its nephrotoxicity. Furthermore, it is mainly eliminated through glomerular filtration and therefore its therapeutic drug monitoring (TDM) becomes crucial particularly in renal patients to optimize the treatment. The aim of the present study consisted on analyzing the influence of renal function in the plasma concentrations and pharmacokinetics of amikacin in hospitalized patients.

**Setting and Method:** The present retrospective study included 628 patients undergoing therapy with amikacin and admitted in Coimbra University Hospital pole of the Hospital and University Centre of Coimbra, EPE, in Portugal, between 2008 and 2015. Blood samples were collected 1 h after the end of amikacin infusion and 30 min before the following administration to attain the peak concentration ( $C_{max}$ ) and the trough concentration ( $C_{min}$ ). Demographic data, dose and frequency of administration and creatinemia of amikacin were also collected for each patient, whose pharmacokinetic parameters were then calculated using equations Sawchuk and Zaske. The population was divided regarding the age of each patient (18-34; 35-49; 50-64; 65-79 and  $\geq 80$  years old) and regarding, according to the *National Kidney Foundation*, the value of clearance of creatinine ( $CL_{cr}$ ):  $<60$ , 60-120 and  $\geq 120$  mL/min/1.73m<sup>2</sup>. After checking the normality and homogeneity of variances test, ANOVA was used to determine statistical differences among groups.

**Main outcome measures:** Half-life time ( $t_{1/2}$ ), elimination constant ( $Ke$ ), distribution volume ( $VD$ ) and clearance of amikacin ( $CL_{AMIK}$ ), and  $CL_{cr}$  were estimated.

**Results:** 793 serum samples were collected, among which 68% required adjustments in following administrations. Statistically significant differences were found between the 5 age groups regarding  $t_{1/2}$ ,  $Ke$ ,  $CL_{AMIK}$ , but not for  $VD$ :  $CL_{cr}$ ,  $CL_{AMIK}$  and  $Ke$  diminished as the age enhanced, contributing to higher  $t_{1/2}$ . Moreover  $C_{max}$  maintained constant while  $C_{min}$  increased from 1.82  $\mu\text{g/mL}$  in the youngest group to 6.44  $\mu\text{g/mL}$  in the oldest group. Regarding renal function, as the  $CL_{cr}$  enhanced, the  $CL_{AMIK}$ ,  $Ke$  increased, contributing to lower values of  $C_{min}$  (mean values of 7.15  $\mu\text{g/mL}$  against 3.14  $\mu\text{g/mL}$ ). It was also observed that within each sub-population defined according to patient renal function, the age of the patient did not determine the pharmacokinetics of amikacin as no significant differences had been detected.

**Conclusion:** Patients with renal lesion presented an excretion of amikacin diminished and, therefore, the  $t_{1/2}$ , and  $C_{min}$  of the drug significantly increased. Indeed, the  $C_{min}$  reached higher values than those acceptable after once-daily administration. Therefore, hospital pharmacists must perform TDM of amikacin to define the dose in an attempt of preventing accumulation of antibiotic in kidneys, but maintaining concentrations high enough for bactericidal effect.

PP12

**MEDICATION REVIEW FOR HOSPITALISED AND AMBULATORY PATIENTS: A PROTOCOL FOR A QUASI-EXPERIMENTAL, PRE-POST, PILOT STUDY.**

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**Background and Objective:** Polypharmacy is common in multimorbid, fragile, chronic, elderly patients, and can result in drug-related problems (DRPs) and drug-related negative clinical outcomes (DRNOs). Medication reviews to detect DRPs/DRNOs on these patients do not usually employ the strategy of using both implicit and explicit methods. The aim was to design a medication review protocol for detecting DRPs/DRNOs in hospitalised and ambulatory patients.

**Programme description:** Setting and Method: Literature review; design of a medication review protocol to be implemented in a quasi-experimental, pre-post, pilot study that will be performed in ambulatory and hospital settings. Patients will be recruited from a hospital and a community pharmacy. Pharmacists will interview 40 multimorbid, fragile and/or chronic, elderly patients and, in collaboration with physicians, will review and reconcile their medication plans. Explicit and implicit methods will be used: Beers, Priscus, STOPP-START criteria and Anticholinergic Risk Scale as explicit methods, and the Medication Appropriateness Index as an implicit method. Additionally, pharmacists will give recommendations to patients to increase the effectiveness and safety of the use of medicines. The Clinical Research Ethics Committee has already approved the protocol study.

Main outcome measures: Medication plans' improvement in terms of DRP/DRNO reduction; assessment of support and communication among healthcare team members.

Results: This protocol study will help in developing an intervention in multimorbid, fragile, chronic, elderly patients in ambulatory and hospital settings. It will also increase the role of the community pharmacist in the health system as a provider of patient care.

**Conclusion:** DRPs/DRNOs are expected to be detected and reduced thanks to the comprehensive series of implicit and explicit methods used in the medication review and medication reconciliation process together with the recommendations given to the patients. Communication among healthcare providers will also affect this reduction.

PP13

## A PROTOCOL FOR A COST-UTILITY STUDY ON MEDICATION REVIEWS TO ELDERLY POLYPHARMACY PATIENTS AT THE COMMUNITY PHARMACY

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**Background and Objective:** Polypharmacy is increasing in a growing elderly population. One way to assess the quality of the medication is to perform medication reviews, which can result in better compliance, patient safety and a more rational pharmacotherapy. However, attempts to evaluate the economic impact of medication reviews have so far lacked conclusive results.

The purpose of this study is to investigate the economic impact of medication reviews of elderly polypharmacy patients at the community pharmacy, from a health-care point of view.

**Setting and Method:** In the Southern Region of Denmark 50 pharmacists were recruited from 28 community pharmacies. Each pharmacist have completed 20 medication reviews over a period of six months (Sep 2016 - Feb 2017); in total 1000 medication reviews. Inclusion criteria were patients 65 years or older; receiving 5 or more prescribed medications; living in their own home and capable of administering medicines themselves. The community pharmacists entered data on each review into a central study database. Patients completed the EQ-5D questionnaire at the pharmacy at recruitment and will complete the questionnaire again 6 months after the medication review. A register-based control group of 4000 persons will be generated based on the remaining four regions of Denmark using propensity score matching. The extracted data will be used for process evaluation of the medication review service at the pharmacies and for the overall cost-utility study.

**Main outcome measures:** Data on the following outcome measures will be extracted from the study database: number and type of medication-related problems, rational use of medicines, feedback from general practitioners on implementation of pharmacist recommendations, and quality of life.

Data on the following outcome measures will be extracted from national health-care registers after 3, 6, 9 and 12 months of follow-up: public expenses related to prescribed medicines, number of admissions/contacts to hospital/emergency room/general practitioners and public expenses related to such contacts, and mortality.

**Results:** To date 975 medication reviews have been conducted. Data analysis will take place in 2017-2018 and the final report will be published by the end of 2018.

**Conclusion:** The economic impact on health care costs and patients quality of life are very important factors in obtaining government funding for medication reviews delivered from community pharmacies. Data and results from the above study will generate some of the evidence needed to make a valid assessment by policy makers.

## PP14

### COMPARISON BEFORE/AFTER THE CREATION OF A RECALL IN THE PRESCRIPTION SOFTWARE ON THE ASSOCIATION OF TRACE ELEMENTS AND VITAMINS IN PARENTERAL NUTRITION

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**Background and Objective:** Binary and ternary mixtures for parenteral nutrition (PN) contain no trace elements (TE) or vitamins. The prescription of these micronutrients (MN) is recommended on the first day of a PN. We conducted two studies on two different periods. The aim was: First, to assess whether supplementation of MN in PN is carried out correctly and if not, to take corrective actions. Then, the identification of the causes of the failure that co-prescription. Secondly, assess the impact of these corrective actions following the same initial assessment.

**Setting and Method:** We have surveyed computerized PN prescriptions using a request in the software during 2 periods: First, a prospective 4-months study and then, a prospective 1-year study. We have reported MN types (over both periods) and causes of systematic non-prescription MN associated with PN by calling prescribers (second period). Between the 2 periods, we have implemented corrective actions. We compared two periods to assess the impact of corrective actions.

**Main outcome measures:** In first period, 40.9% of PN prescriptions were associated with the prescription of TE (Decan®) and vitamins (Cernevit®). 45.5% of prescriptions contained a ternary mixture alone and 13.6% had a ternary mixture associated with vitamins without TE. In view of disappointing results regarding the association of MN in PN, we have created the systematic appearance of a sentence when a PN is prescribed in the prescription software to remind prescribe MN.

In second period, 55% of the 131 PN prescription studied were associated with TE and vitamins (Decan® + Cernevit®). 42.7% had a ternary mixture and only 2.3% were a ternary mixture with supplementation with B vitamins and/or only 2 TE (Mg and P).

**Results:** The causes of non-prescription supplementation were: forgetting to 79%, unknowing to 13% (don't know that the PN were not supplemented), 5% non-strict PN (partial oral feeding) and 2.6% for a transitional PN. Among the 79% of oversights, there is certainly a significant part of unacknowledged ignorance. Forgetfulness and ignorance are the main causes of MN nonprescription (92% of cases). There may be unacknowledged misconceptions for prescribers who say they forgot to prescribe MN.

**Conclusion:** After intervention in the prescription software, PN prescriptions were associated with MN in greater proportion (55% vs 40,9%). For patients with a ternary mixture alone, 55.5% of these patients were supplemented after call to prescribers. So, after a double pharmaceutical intervention (prescription software + call doctors), it remains only 12% of PN prescription that are not supplemented with MN. Pharmaceutical intervention combined with the computer seems to be the most effective solution. An advocacy and training to the PN prescription is planned.

PP15

## A CLINICAL PHARMACISTS TEAM IN ORTHAEPEDIC SURGICAL UNITS : RESULTS AND SATISFACTION AFTER 10 MONTHS

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**Background and Objective:** In October 2015, a clinical pharmacists team was set up within 3 surgical units of the Clinic for Orthopaedic Surgery and Traumatology of a university hospital. Its missions included pharmaceutical analysis of prescriptions, therapeutic optimization, and medication reconciliation (MR) for 84 beds.

The objective of this study is to assess the impact of a clinical pharmacy service on patient safety and to evaluate the physicians' and nurses' satisfaction in surgical units.

**Setting and Method:** From October 2015 to July 2016, all the pharmaceutical interventions (PI) were registered in an Excel database and categorized according to the French Society of Clinical Pharmacy (SFPC). They were related to either proactive MR or retroactive MR.

A satisfaction survey including 12 items was performed after 6 months of implementation of the pharmaceutical team. 71 healthcare professionals (anesthesiologists, surgeons, residents and nurses) working in the different units were interviewed. Questions were related to the quality of the information delivered by the pharmaceutical team, the impact on the patient safety and the time saved by the users.

**Main outcome measures:** Number and type of pharmaceutical interventions & Healthcare professionals' satisfaction

**Results:** Over the studied period, the clinical pharmacy team realized MR for 2931 patients including 52% of proactive MR. We performed 1984 PIs, meaning that 25% of patients have benefitted from a PI during their hospital stay. Most of the PIs concerned inadvertently omitted medications (33%), incorrect dosage (21%), inadequate treatment information (19%) and interruption of unnecessary treatment (7%). According the ATC classification (Anatomic, Therapeutic and Chemical), the most representative medications were those of the nervous system (31%) and of the cardiovascular system (18%). Regarding to our satisfaction survey, the response rate was 66% among all professionals' categories. The vast majority of the respondents (94%) was satisfied by the clinical pharmacy team and did not wish to go back to the previous organization. Furthermore, 94% of respondents agreed that the clinical pharmacy service should be extended to other surgical units.

### **Conclusion:**

The high number of PIs proved the usefulness of the clinical pharmacy team to improve patient safety regarding medications. The satisfaction survey showed that the clinical pharmacy team is well established in the healthcare process. We believe this result can provide a standard for the creation of such teams in other surgical units.

**PP16**

**REVIEW OF THE RELEVANCE OF ANTITHROMBOTIC THERAPY AFTER ACUTE CORONARY SYNDROME FOR ATRIAL FIBRILLATION PATIENTS**

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**Background and Objective:** In atrial fibrillation (AF) patients treated with oral anticoagulant (OAC), post acute coronary syndrome (ACS) management requires co-prescription of OAC with antiplatelet therapy. This combination increases the risk of major bleeding ; treatment duration must be respected to control it.

The objective is to evaluate the conformity of prescriptions with OAC and antiplatelet therapy after an ACS for AF patients according to the current recommendations.

**Programme description:** Retrospective study of prescriptions in 2016 : identification of AF patients after an ACS requiring triple combination therapy of OAC and dual antiplatelet therapy (DAPT) then evaluation the conformity of prescriptions with the recommendations of the European Society of Cardiology. After an ACS for AF patients, a short period of triple therapy (OAC and DAPT) is recommended for 1 to 6 months, followed by a period of dual therapy (OAC plus a single antiplatelet SAPT) up to 12 months, then OAC only for a long-term. We evaluated AF patient bleeding risk with HAS-BLED® and HEMORR2HAGES® risk scores.

56 patients were included. 25 cases couldn't be analyzed due to lack of data. 31 cases were analyzed : median age 75 years [50-91] and sex ratio 5M/2F. 6 of prescriptions (19%) are consistent with the guidelines. The nonconformities (25) were : 13 patients (48%) had a too long duration of DAPT with a low to intermediate haemorrhagic risk (1.9% to 8.4%/year); 1 patient (3%) had a too long duration of SAPT with an intermediate haemorrhagic risk (5.3%/year) ; 11 patients (35%) had both too long duration of DAPT and too long duration of SAPT with a low to high haemorrhagic risk (1.9% to 10.4%/year).

**Conclusion:** The long durations of combination therapy with OAC and antiplatelets represent a significant hemorrhagic risk for patients including old. This study reveals complexity and difficulties of meeting the recommended durations of long-term treatments and lack of communication between health professionals. No information on duration leads to medicine's continuation. After an ACS, a standard prescription could improve patient follow-up. Moreover, the medication reconciliation at patient discharge would help to secure the management.

PP17

## PATIENT-CONTROLLED ANALGESIA PREPARATIONS: IMPROVEMENT OF THE DRUG USE PROCESS

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**Background and Objective:** The centralized pharmacy preparation unit (CPPU) manufactures narcotics or midazolam for patient-controlled analgesia (PCA) pump for home hospitalization, living in a 30-km length area from the hospital. The main objective of this study was to assess a program aiming at improving the traceability of these preparations in the drug use process.

**Setting and Method:** A retrospective assessment was performed before and after the implementation of the traceability program including an *ad-hoc* Excel® sheet tracking several mandatory information of the whole drug use process (prescription, manufacturing, delivery, transport and administration). The two period of assessment were: before the program (S1), from May to June 2016; after the program (S2), from November 2016 to February 2017. A batch number (BN) has been assigned to each preparation. Proportions were compared by a chi-square test.

**Main outcome measures:** The completeness and the conformity of all the traceability documents were checked for each preparation before and after the program.

**Results:** A number of 72 preparations have been manufactured for 15 patients during S1 and 72 for 21 patients during S2. For S1, the majority of prescriptions were oxycodone 43.1%, morphine 38.9% (1 to 4g), fentanyl 18.1%. For S2, it was oxycodone 47.9%, morphine 43.7% (1 to 5 g), midazolam 8.4%. The proportion of a comprehensive traceability documents increased significantly between S1 and S2: 44 (61.1%) vs 71 (98.6%) ( $p < 0.0001$ ). The main missing document during S1 was the prescription, 17 (23.6%) compare to none in S2 ( $p < 0.0001$ ). Concerning the quality of prescription, 12 (21.8%) were improper concerning the dosage at S1 and 10 (13.9%) at S2 ( $p = 0,18$ ). At S1, 13 (18.1%) manufacturing records were missing, none at S2. Concerning the transport during S1, 41.6% of delivery traceability was complete compare to 80.5% in S2 ( $p < 0.0001$ ). A proportion of 9 (12.5%) administration records were missing in S1; and only 1 (1.0%) in S2 ( $p < 0,009$ ). In the presence of records in S1, 32 (51.0 %) were improper compare to 29 (41.0%) in S2 ( $p < 0.16$ ).

**Conclusion:** The high rate of missing prescriptions before implementation of the program was due to a lack of awareness and to the length of the validity of PCA prescriptions (28 days). The problem of non-sensitization for traceability is also found toward the absence of manufacturing records and the incomplete traceability for the delivery step.

The improvement of the drug use process was possible thanks to a strengthen of its control, a re-sensitization for the traceability within the CPPU and for clinical wards.

Other possibilities for improvement have been proposed: improve the awareness of nurses concerning traceability of their identity on the administration records and sensitize physicians to improve their prescriptions with all the mandatory information (basal rate, demand dose, demand interval, loading dose, lockout amount and interval).

PP18

## UNEXPECTED PLASMA CLOZAPINE CONCENTRATIONS MANAGED BY CLINICAL PHARMACIST: ABOUT 2 CASES

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**Background and Objective:** Clozapine is often last resort treatment for schizophrenic patients. It was demonstrated that therapeutic drug monitoring permits to improve drug response, to decrease adverse effects and relapse. We report the management of two patients with variable clozapinemia and high for one of them. A patient was schizophrenic (clozapine dose: 400 mg/day, plasmatic concentration (clozapinemia)=  $427.5 \pm 121.5$  ng/ml). The other had paranoid schizophrenia, epilepsy and a lymphoma (dose: 450mg/day, clozapinemia =  $905.1 \pm 196.1$  ng/ml).

We aimed to show how clinical pharmacy monitoring can help to manage patients with unexpected plasma clozapine concentrations.

### Programme description:

#### Methods :

Step1: A systematic approach of variations causes was used: prospective case reports datas and literature search (recommendations of the Revue Médicale Suisse, Pubmed data, table of Geneve Hospitals on drugs interactions...). Step2: Information transmission to clinical team.

#### Results :

A lot of factors were identified in the literature. Among these factors, some of them were transmitted to the clinical team:

1-Some clozapinemia results biased because dosages realized too early (steady state not reached); dosage just after taking medication. Clozapine dose not always correlated with plasma concentration. Necessity to respect drug dosage recommendations to interpret clozapinemia pointed out to the service.

2-Pharmacogenetics: CYP2D6 and 1A2 phenotypes impacts. One patient genotyped for the CYP2D6 but homozygote for two functional alleles. No genetic test for CYP1A2 realized but the norclozapine/clozapine ratio seemed to be normal. Necessity for patient with high concentration variations to realize genotyping.

3-Importance of some factors reminded: hypoproteinemia (clozapine 95% bound to plasma proteins, both patients affected), infection, inflammation (strong increase of clozapinemia found when patients were having an inflammatory syndrome), weight.

4-Mechanistic interaction importance was transmitted (plasma protein binding displacement, enzymatic inhibition).

5-Finally, sex, ethnic group, tobacco, coffee, broccoli... were underlined.

In our cases, plasma protein binding displacement, inflammation and hypoproteinemia seem to be significant. Here, patients non-smokers. One change of coffee consumption for one patient was found but an inflammation syndrome concomitantly was found too.

**Conclusion:** Clinical pharmacy has an interest for a better management of clozapine treatment by understanding plasma clozapine concentration variation causes.

PP19

**MEDICATION PROCESS: RISK ASSESSMENT IN THE INTENSIVE CARE UNIT**

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**Background and Objective:** Patient safety is a major concern. Critical care environment generates a high risk of iatrogenic events. The medication process has to be secured. We aimed to evaluate risk factors and to identify control points throughout all medication use stages (prescription, dispensation, preparation, administration).

This is a monocentric survey to evaluate medication use practices. We carried out a survey which took place for a five-month period in 4 Intensive Care Units (ICUs) in our hospital.

**Programme description:** We administered self-questionnaires to 178 nurses. We obtained a 40% response rate. Computerized Physician Order Entry (CPOE) was used most of the time (97%), but oral prescriptions were unavoidable in emergency situations. Incomplete or ambiguous prescriptions were found in 28.2% of cases. The medication list has been transcribed on a piece of paper in 74.6% of cases, in order to select medications and pick them from the automated dispensing system (ADS). During the preparation of medications, interruptions were frequent (56.3%). Syringe labeling information was not standardized.

**Conclusion:** Therapeutic safety in ICUs is ensured mainly by the CPOE, which has been recently improved thanks to the interface with the medication formulary, and the ADS. However, the lack of an interface between CPOE and ADS remains an important point to be solved, so transcription could be completely avoided. We have improved the information for the preparation and administration of medications through several multidisciplinary working groups. A project to standardize labeling of injectable awaits institutional validation. Some risks inherent to ICUs such as task interruption cannot be fully controlled and need increased vigilance on the part of health providers.