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COMMENTARY

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Oral communications I

OR01.1: Patients' adherence to chronic treatment in lung diseases: Preliminary data from a randomized controlled trial

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Background and objective: Poor adherence to long-term therapies may result in poor health outcomes and increased health care costs. The objective of this study is to investigate the effects of an acoustic reminder on medication adherence in lung patients.
Setting and method: In this on-going prospective single-blind randomized controlled trial, in- and outpatients from several hospitals around Basel diagnosed with asthma or COPD and with prescribed inhalative medication were recruited. They must have experienced at least one exacerbation in the previous 12 months. The intervention group is provided with an acoustic reminder for inhalation and receives support calls when the medication is not taken as prescribed. Objective adherence was measured in both groups with the electronic devices "Smartinhalers" for puff inhalators and punch cards mounted with a "Polymedication Electronic Monitoring System" for powder capsules, which record date and time of each actuation. We present preliminary data on adherence patterns of the first 54 patients (154 patients are planned to enroll) recruited since January 2014 and who completed the study.
Main outcome measures: Adherence defined as percentage of days with correct dosing (correct number of prescribed inhalations).
Results: Of the 54 (76 % male, 67.9 ± 9.1 years) patients, 42 (78 %) had COPD, 8 (15 %) asthma and 4 (7 %) asthma-COPD overlap syndrome. Adherence to puff inhalers was higher in the intervention compared to control group (80 ± 19 % vs. 51 ± 21 %; $p < 0.001$). No difference was found for powder capsules between intervention and control group (92 ± 9 % vs. 88 ± 14 %; $p = 0.239$). More days with correct dosing were observed for powder capsules compared to puff inhalers (88 ± 12 % vs. 66 ± 27 %; $p < 0.001$) and for therapy plans with once-daily dosage compared to plans with multiple doses per day (89 ± 13 % vs. 66 ± 27 %; $p < 0.001$).
Conclusion: These preliminary results suggest a beneficial effect of regular reminder on the adherence of lung patients. Moreover, adherence with once-daily dosage regimens and with devices allowing the administration of predefined doses appears to be higher compared to treatment plans with multiple doses per day and devices that have to be loaded by the patient. The higher adherence rate obtained with electronic punch cards containing powder capsules might be due to their function as visual reminder.

OR01.2: Anti-HIV therapies: Comparison of the adherence in different therapeutic regimens

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Background and objective: A high therapeutic adherence is a necessary point to ensure the effectiveness of anti-HIV therapies. As a matter of fact, a suboptimal adherence can make the use of antiretroviral drugs completely useless. The causes that most frequently interfere with a proper intake of a drug are the presence of a depressive syndrome, the side effects caused by the therapy itself, the prescribed therapeutic regimen and others. Currently there is a debate on the importance of simplifying as much as possible antiretroviral therapies to once-daily dosing regimens. This work intends to compare therapeutic adherence between two groups of patients, the first one in once-daily dosing regimen and the second one in multiple-daily dosing regimen.
Setting and method: Data were collected from the Pharmacy of Marche Nord Hospital Pesaro Italy, between August 2015 and February 2016. The study involved 507 patients, selected according to the therapy administration regimen and divided into two groups: 159 patients in once-daily dosing and 348 patients in multiple-daily dosing regimen. In order to assess their adherence and persistence, the relationship between subsequent monthly dispensations of the packages of drugs (according to the number of tablets in each pack) and the prescribed doses was measured.
Main outcome measures: Adherence in HIV patients.
Results: Over the 6-month period of the study, the following results were observed: regarding the once-daily dosing group of patients, 4

(2.6 %) discontinued the therapy after the first dispensation; 10 (6.2 %) showed a less than 80 % adherence, and 145 (91.2 %) showed a adherence greater than 80 %; regarding the multiple-daily dosing patients, 7 (2.0 %) discontinued the therapy after the first dispensation, 39 (11.2 %) showed a adherence less than 80 %, and 302 (86.8 %) showed a adherence greater than 80 %. The applied statistical test (k square) found no significant difference.
Conclusion: The therapeutic adherence comparison between two groups of patients, the first one in once-daily dosing and the second one in multiple-daily dosing regimens, shows that the highest compliance is to be found in the once-daily dosing regimen group of patients.

OR01.3: Green light for compliance in patients treated for hepatitis C and addiction

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Background and Objective: In the addictology service, the prevalence of hepatitis C virus (HCV) infection is high. The current paradigm is to treat addiction before HCV infection. As direct-acting antiviral drugs (DAA) are well tolerated and effective, we decided to treat both addiction and HCV infection at the same time. Nevertheless, in these precarious patients, the treatment's cost constitutes a brake. Records of patients are thus examined by a multidisciplinary team. The aim of this study is to evaluate patient's compliance by checking supplying regularity.
Setting and Method: A retrospective multicentre case-control study was performed over 18 months, involving 2 hospitals, their pharmacies and 3 low threshold day-care structures delivering methadone. Inclusion criteria were advanced hepatic fibrosis, stable housing, clinical and biological check-up willingly completed by the patient. Every patient was matched with 2 controls. Supplying was considered as not regular if the patient had more than a day gap when renewing his prescription at the hospital pharmacy.
Main outcome measures: Supply regularity (odd-ratio). Factors associated with supply regularity (bilateral KHI2; $\alpha = 5$ %).
Results: Thirty three patients were included and associated to 66 control patients. The two populations did not differ according to sex ($p = 0.8$), age ($p = 0.6$) and therapeutic strategy ($p = 0.4$). The regularity rate in the addictology group was 73 % *versus* 82 % in the control group (odd-ratio = 1.7 [0.62–4.5]). In the addictology group, 1 patient stopped his treatment after 3 days because of unexpected loss of his housing. In the control group, 2 patients stopped their treatment. Supplying regularity was not associated with social problem (KHI2 = 1.5; $p = 0.22$), ongoing alcohol consumption (KHI2 = 0.55; $p = 0.46$) or mental disorder (KHI2 = 3.0; $p = 0.08$).
Conclusion: Despites its limits regarding estimation of compliance, the supply regularity is an interesting tool for patients' follow-up. Selected patients did not differed significantly from the control group. It seems possible to use AAD in patient with ongoing alcohol consumptions, social problems and psychological disorder. In order to secure supplying, AAD should be managed as often as possible by low threshold day-care structures. The impact of HCV-treatment on the addiction should be further studied.

Oral communications II

OR02.1: The impact of HIV associated disorders (HAND) on cART adherence

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Background and objective: HIV associated neurocognitive disorders (HAND) are defined according to their diagnostic degrees as: asymptomatic neurocognitive impairment (ANI), mild neurocognitive disorder (MND) and HIV-associated dementia (HAD). As a high adherence rate to cART is required to maintain viral suppression among HIV positive patients, it is important to investigate the impact of HAND on medication adherence. Our study hypothesis is that HIV + patients with HAND have a lower medication adherence than those that are without a deficit.
Setting and method: This was an observational, exploratory, retrospective one centre study of 43 patients with adherence collected routinely in care over a long period of time. Patients' socio-demographic characteristics and clinical data were collected by reviewing the Swiss HIV Cohort Study (SHCS) database. Adherence was measured with electronic monitors (EMs). Repeated adherence measures were available through EMs stating whether or not a patient was taking the medication as prescribed at any time *t*.
Main outcome measures: Implementation was computed as the proportion of patients taking medication as prescribed across time. A Generalized Estimating Equation (GEE) model adjusted for neurocognitive diagnosis was used to estimate implementation patterns across time.
Results: 43 HIV positive patients, with age 50 (29–80) years median (IQR), 25 (58 %) male and median (IQR) CD4 count 646 (309–1328) cells/μl were studied. Out of 43 patients, 11 patients (25 %) were normal, 7 (16 %) had ANI, 4 (9 %) had MND, 3 (7 %) had HAD and 18 (42 %) had non HIV related neurocognitive disorders (e.g. depression). Implementation over 3.5 years showed a significant decline in medication adherence among patients diagnosed with ANI, MND, HAD (implementation dropped to 50 % after around 3 years of follow-up) in comparison with patients who had a normal diagnosis or a non HIV related cognitive deficit (implementation stayed approximately stable around 90 % during follow-up).
Conclusion: Our findings support the hypothesis that HAND decreases cART adherence.

OR02.2: Tailored patient education on correct drug administration in community pharmacies (TEACH study): study protocol for a multi-centre, parallel-group, cluster-randomized controlled trial

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Background and objective: Transferring pharmaceutical interventions from the study setting into routine care is often challenging with regard to practicability. Many studies do not determine the net resources needed for the intervention which would be a prerequisite to estimate suitability for daily use. Therefore, we suggest a study design that enables determination of the net duration of the intervention facilitating a more realistic estimation of the practicability of the studied intervention.
Programme description: We describe a multicentre parallel-group single-blind cluster-randomized controlled trial in German community pharmacies to compare tailored with routine pharmaceutical consultation on correct drug administration in patients and family caregivers. Customers older than 18 years, who use eye drops, oral liquids, oral solutions in a dropper bottle, or transdermal patches, receive pharmaceutical consultation on correct drug administration. The primary outcome measure is the number of incorrectly performed drug administrations in the intervention group compared to the control group prior to counselling at the follow-up visit after 6 months. The pharmaceutical consultation comprises in both groups a baseline assessment of administration skills with an appropriate placebo, advices on correct drug administration, and evaluation of teaching success determined again by demonstration of drug administration with an appropriate placebo. In the intervention group pharmacists apply communication techniques from motivational interviewing to increase medicine users' awareness for taking a more active role in the administration process, whereas the control group provides routine care. Patients are invited for follow-up visits after 1 month, 6 and 12 months. Only after completion of the first pharmaceutical consultation, information on the study is provided and written informed consent is sought for the follow-up visits and for pseudonymous analysis of the pharmaceutical consultation at the first encounter.
Conclusion: The study sequence of first providing the pharmaceutical consultation for correct drug administration followed by often time-consuming study-specific information, allows a more realistic estimation of the net duration of a pharmaceutical intervention. The first pharmaceutical consultation reflects a standard counseling situation not requiring informed consent as such. However, to collect the data, match it with demographic data, follow-up over time and include it into a scientific evaluation, written informed consent is sought.

OR02.3: Pharmacist counselling for outpatient treated by oral chemotherapy

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Background and Objective: With the increasing availability of new oral anticancer agents, medication adherence is one of the priorities in the treatment of cancer. As treatment's efficacy is conditioned by drug's exposition, optimal compliance is the key factor of therapy's success. Adherence may be enhanced by the part played by clinical pharmacist, through patient education and communication with patient's health providers. Our objective is to present a pharmacy-managed program to support outpatients and their community health services before starting an oral chemotherapy.
Programme description: This pharmacist-managed program involved two steps, for three drugs selected: ibrutinib, idelalisib and cobimetinib (dispensed in hospital pharmacy and may be victim or cause of drug interaction). First, a patient counselling enables the pharmacist to expose drugs' mechanism, to explain modalities of taking medication, dealing with omitting doses, risk of drug–drug, aliment–drug and herb–drug interaction. A medication plan is worked out with patient including chemotherapy and treatment of co-morbidities. Secondly, hospital pharmacist phones community health workforces (pharmacist, primary care physician, nurse, specialist) to explain modality of treatment, risk of interactions and sides effects. Patient counselling and phone calls to health workers enable medication reconciliation as well as an analyse of drug interaction risks. A report is added to the discharge letter and integrated to electronic healthcare record.
Eight month after the program began, 48 patients benefited from the pharmacist's intervention. Sex ratio and median age are respectively 1.5 and 71.5 years [39.0; 92.0]. Of patients, 25 were using ibrutinib, 13 idelalisib, and 10 cobimetinib. 39 medication plans were set up with patients. 97 healthcare professionals were contacted (mean 2 prof. /patient). None of them knew the drug prescribed to their patient. A median of 4 co-medication per patient was identified [0; 12]. A risk of interaction was detected in 68.8 % of cases. For 6.1 % of these patients, a change of prescription was necessary, and for 97.0 % a clinical or biological monitoring was advised.
Conclusion: With the rapid development of oral cancer chemotherapy, the role of hospital pharmacists has changed. Counselling is essential to provide their expertise of drugs and of their side-effects and possible drug interaction to patients and to healthcare professionals. Communication is also an essential part of medical care for cancer patients, because of a lack of knowledge about those drugs, and because a monitoring shared between hospital and community health providers is necessary to improve both aspect of medication compliance: adherence and persistence. Evaluation of patients and healthcare professionals' satisfaction as well adherence to treatment is required to measure the influence of improved care implementation. In our centre, the aim is to extend patients' recruitment so as to monitor all oral chemotherapy treatment initiation.

Posters

PP01: The failure to adjust for renal failure

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Background and objective: Chronic kidney disease (CKD) represents worldwide health problems, which require early detection, intervention, and treatment, which may delay disease progression. Patients with CDK require appropriate medication dosing for disease severity and level of renal function for avoiding adverse drug events, preventing additional renal injury and optimizing patient outcomes. Studies conducted in hospitals found renal dosing guidelines non-compliance ranging from 19 to 67 %. The aim of this study was to assess the level of reported non-compliance with renal dosing guidelines in hospitalized patients.
Setting and method: Retrospective and observational study. Medical files of internal medicine patients in Hillel-Yaffe MC during the period 01/08/2014–30/09/2014 screened. Inclusion criteria: patients with at least two serum creatinine results and an estimated Glomerular Filtration Rate of less than or equal to 50 ml/min/1.73 m^2. Patients with acute renal failure which was defined as a difference of more

than 0.2 mg/dl between two serum creatinine results were excluded. Demographic data, medication used, and doses have been reviewed and compared to renal dosing guidelines as in the physician leaflet.
Main outcome measures: percentage of non-compliance with renal dosing guidelines of medications in internal hospitalized patients.
Results: There were 252 of 1145 (22 %) internal medicine patients that met our inclusion criteria. 1373 medication orders were written for our study group (252), 5.4 medications on average per patient. 288 of 1373 (20.9 %) medication orders required renal dosage adjustment. Non-compliance with renal dosing guidelines was found in 170 (59 %) medication orders. The most frequently prescribed medications with non-compliance with renal dosing guidelines were: Metformin, Cefuroxim sodium, Ranitidin, Ciprofloxacin, Piperacillin + Tazobactam, and Allopurinol (75, 69 61, 61, 50, 19 %, respectively). We also identified medications as complete non-compliance with renal dosing guidelines, such as Bezafibrate SR, Amoxicillin + Clavulanic acid, and Levofloxacin (100 %).
Conclusion: The results of this study show high percentage of non-compliance to renal dosing guidelines (59 %). Identifying list of medications with a high percentage of non-compliance to renal dosing guidelines can help the clinical pharmacists and physicians focus their efforts in a cost-effective issue. Clinical pharmacists interventions and medical staff education will ensure safe, effective medications prescribing, minimizing further kidney damage and disease progression.

PP02: Chronic dialysis, medication adherence and beliefs about medicines: a comparison between patients born in Switzerland and migrant patients (diana study)

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Background and objective: In the chronic dialysis unit of the Lausanne University Hospital, a large proportion of patients are migrants. It is actually unknown whether native patients (born in Switzerland) and migrant patients (born abroad, UNESCO definition) differ according to medication adherence and beliefs. The aim of this qualitative study was to: (1) explore in-depth patients' perceptions and knowledge about their treatment and (2) describe the influence of the migration background.
Setting and method: The study was realized in the chronic dialysis unit of the Lausanne University Hospital (CHUV). The research was performed in two phases using mixed quantitative-qualitative methodology. For the qualitative part, *in-depth interviews* were realized. Interviews took place according to participant preferences in the place, day, and time scheduled by them (often during dialysis sessions). For patients who do not speak French, an interpreter was requested. Each interview was recorded in high quality resolution and subsequently transcribed manually *verbatim* in digital format. Finally, interviews were analysed according to the *Grounded Theory*.
Main outcome measures: Major themes regarding perceptions and knowledge about the treatment were indentified. For the analysis, patients were categorized according to their migration status.
Results: Forty-five out of 76 eligible patients (59 %) accepted to participate in the quantitative-qualitative study. Of them, 33 accepted the qualitative part; finally 18 interviews were performed with 16 patients undergoing haemodialysis and 2 peritoneal dialysis; 12 were men and 6 were women. Nine patients were Swiss, 3 had residence or settlement permit (permit B or C), 6 were provisionally admitted foreigners or had permit for asylum seekers (permit F or N). Interviews were realized in French ($n = 12$) or with an interpreter ($n = 6$), lasting from 24 to 60 min.
Analysis is ongoing. So far, themes identified were (1) perceived treatment necessity; (a) the majority of patients were aware of the risks associated with failing medication intake; (b) maintain or improvement of health condition through treatment (especially migrant patients); (2) doubts about the medication long-term effects and polymedication (especially native patients); (3) trust in physicians.
Conclusion: Considering patients' migration background, recognizing individual vulnerabilities and providing tailored answers about medications could improve native and migrant patients' care and chronic treatment use.

PP07: Developing a maastricht utrecht adherence in Hypertension Questionnaire short version: MUAH16

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Background and objective: Maastricht Utrecht Adherence in Hypertension Questionnaire (MUAH) provides valuable information about the reasons for poor adherence to antihypertensive medication. However, data on convergent validity is difficult to interpret and the high number of items difficult its use. We aimed to develop a short version of MUAH (MUAH16), comparing its construct validity and factorial structure with a confirmatory analysis (CFA) between the original and the short version, as well as estimating its convergent validity.
Setting and method: Each item of original MUAH was inspected regarding its content and directionality toward its factor and the global score. Ambiguous items were eliminated. Questionnaires were administrated in 8 community pharmacies of Portugal on adult patients and taking at least one antihypertensive drug. The factorial structure of both versions was analysed through CFA using two models: Model 1 tested the original version of MUAH, with 25 items loading positively on 4 correlated factors. Model 2 tested the MUAH16, with 16 items loading on 4 factors, which loaded into a global factor of adherence. Convergent validity of MUAH16 was assessed by evaluating the association between MUAH16 global score and two other adherence scales: 8-item Morisky Medication Adherence Scale (MMAS-8) and Measure Treatment Adherence (MAT).
Main outcome measures: Adherence score and adherence-related dimensions.
Results: Questionnaires were administered to 423 patients. MUAH had a poor fit to the data (Chi square$269 = 663.41$, $p < 0.001$, CFI $= 0.695$, RMSEA $= 0.06$. MUAH16 had a very good fit to the data (Chi square $100 = 171.07$, $p < 0.001$, CFI $= 0.92$, RMSEA $= 0.04$ suggesting that MUAH16 better represents adherence to antihypertensive medication. Regarding convergent validity, both global score and all the subscales of MUAH16 correlated positively and significantly with MMAS-8 and MAT scores.

Conclusion: The short version of MUAH, the MUAH16, measures adherence-related dimensions and global adherence to antihypertensive medication. It can be easily applied in the clinical setting, giving health professionals more extended information about the patient's reasons for poor adherence.

PP08: Targeted therapy adherence in an observational study of patients with cancer

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Background and objective: Target-Vig is an observational study funded by the Italian Medicines Agency to compare the incidence of adverse reactions (ADRs) reported by the Summary of Product Characteristics (SPC) or to identify any unknown ADR of 10 anticancer targeted-therapies. Further objectives are to improve patients therapy adherence and to raise awareness on reporting treatment-related toxicities.
Setting and method: Criteria of inclusion are: age > 18 years, patients treated at CRO of Aviano with one of the study drugs. Patients were observed for 2 years (2013–2015) with front and regular telephone interviews to assess health condition, adherence to treatment and ADRs. Patient compliance was assessed by a questionnaire. Through statistical and epidemiological analysis we evaluated the difference between real and SPC ADRs incidence or any unknown ADR.
Main outcome measures: The epidemiologist calculated the cumulative incidence in the observation period for each ADR, with its 95 % confidence interval. Each ADR was considered in excess compared to what is reported in the SPC if the lower limit of the confidence interval of calculated cumulative incidence was higher than the maximum value given in the SPC itself. At the end of the study patients answered to a questionnaire, in which we asked if they appreciated the continuous monitoring, if they would have liked to monitored after the study, and if the pharmacist's monitoring impacted on therapy adherence and the management of ADRs. It was observed the trend of alerts entered in the National Pharmacovigilance Network from 2013 to 2015.
Results: Patients enrolled in the study were 154. Results showed that 99 % patients enrolled appreciated the presence of clinical pharmacist; 99 % patients considered useful the presence of the pharmacist to increase the quality of care and compliance; 96 % patients prior contacted the pharmacist whenever there were changes in the treatment or side effects; 98 % wanted to be monitored after the end of the study. There was also an increase (89.18 %) of spontaneous reports from 2013 to 2015. The collected data showed increased incidence for: erythema [5 (33.3 %)] with everolimus; lacrimation [5 (41.7 %)], oedema of the eyelids [8 (66.7 %)] with imatinib; neutropenia [8 (40 %)], desquamation [7 (35 %)] with sorafenib; hypothyroidism [26 (96.3)], increased creatinine [12 (44.4 %)] with sunitinib; headache [14 (28.6 %)] with bevacizumab; mucositis [7 (58.3 %)] with cetuximab. Identified unknown ADRs are: hyperglycaemia [7 (50 %)]; 5 (25)] with lenalidomide and sorafenib, respectively; hypomagnesemia [6 (12.2 %)] with bevacizumab; neutropenia [3 (25 %)] with cetuximab.
Conclusion: Some ADRs occurred with higher incidence and there was evidence of unknown ADRs. The increase of reports counteracts the underreporting and improves information about ADRs of targeted-therapies. The patient felt accompanied during the oncological care and this avoided autonomous suspension of the drug or self-regulations to handle the side effects. This gives a high value to the clinical pharmacist in the management of targeted therapies in patients with cancer.

PP09: Evaluation of drug-drug Interactions in tele-pharmaceutical intensive care

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Background and objective: Tele-medical services can become a promising concept to improve high quality medicine in sparely populated areas. Since 2012, ICU tele-medical services have been successfully implemented at RWTH Aachen University Hospital and surrounding area. In 2015, a pharmacist supported the tele-medical-ICU-team.
Setting and method: From March 2015 to July 2015, 103 patients [2] received tele-medical service, including tele-pharmaceutical care. Data were anonymously recorded. All drug-related problems (DRP) were documented and analysed using APS-Doc [1]. In a sub analysis we reviewed all drug-drug interactions (DDI) detected by the software ID Diacos Pharma Check. Based on the results a small pocket card with most common and severe DDI interactions was developed.
Main outcome measures: The aim of the sub analysis was to analyse status-quo of medication safety considering particularly DDI interactions in tele-medical ICU-patients.
Results: On average, 2 drug-related problems per patient were detected in 51 tele-pharmaceutical consultations. The total number of detected DDI by the software were 1129 (11 per patient) Only 89 DDI (7.9 %) were assessed as relevant in the current patient case by the clinical pharmacist and were followed by a recommendation to the tele-medical team.
Conclusion: The close cooperation between the clinical pharmacist and the tele-medical-ICU-team contributed essentially to detect relevant DDI and avoid over alert by the software. This project was financially supported by the ministry of health, emancipation, care and age of the county North Rhine-Westphalia and the European Regional Development Fund.

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Griesel C and Lenssen R equally contributed to this abstract.

PP11: The evaluation of phenytoin treatment according to the corrected phenytoin levels

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Background and objective: Phenytoin is an antiepileptic drug which is eliminated by CYP2C9, CYP2C19 (less important: CYP2C18, CYP3A4) enzyme. Therapeutic concentration range is very important due to the narrow therapeutic drug levels. Targeted therapeutic concentration range is 10–20 mg/L (40–80 lmol/L) in blood serum for adults and children older than 3 months. Phenytoin has highly variable pharmacokinetics due to its complex of binding to Albumin (%90). It is difficult to determine the correct dosage of this drug because of significant dose related toxicity. It is also important for inpatient in intensive care unit.
Setting and method: A retrospective study was conducted in all inpatients ($n = 72$) that including phenytoin treatment at the

university hospital in 2015. All laboratory data were collected from the hospital medical record system. 11 different departments were examined to monitor therapeutic concentration range during phenytoin treatment. Corrected phenytoin levels were calculated from total phenytoin concentration by Winter–Tozer equation according to albumin level for hypoalbuminemic patients.
Main outcome measures: The aim of the study that evaluation of phenytoin treatment according to the corrected phenytoin levels.
Results: Phenytoin level monitoring for a year in the hospital ($n = 315$) have checked for hypoalbuminemia and 90 results are calculated again because of hypoalbuminemia. After reconsideration 25 of the 76 patients evaluated as therapeutic range, according to the calculation results, not in the target range actually in the toxic range. 12 of the 41 results out of target range were calculated within the target range. There have been found a significant difference ($p \leq 0.01$) between the laboratory result and the corrected calculation of the clinical pharmacist. Also there have been found a significant difference ($p \leq 0.01$) between the drug monitoring of phenytoin level of different inpatient service. The %83.3 of phenytoin-treated patients in the intensive care unit at 2015 is monitored for phenytoin level beside most of the services do not check for phenytoin level for phenytoin-treated patients even once.
Conclusion: In conclusion phenytoin-treated patients should monitored for phenytoin level for monitoring of the treatment and for avoiding the sub-therapeutic or toxic levels of phenytoin. The results have to recalculate if necessary by considering the albumin level and renal failure of the patients.

PP12: The determine of possible drug interaction of clarithromycin

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Background and objective: Clarithromycin is a macrolide antibiotic which is often used in the antimicrobial therapy. Also it is very important for drug interaction because it is a potent inhibitor of CYP3A4. The pharmacokinetic changes in concomitant medication use was observed in the studies may lead to cause an increase in the concentration of the other drug. Especially when used in combination with drugs that are substrates of CYP3A4 such as statin by causing an increase of statin plasma concentrations as rhabdomyolysis has led to more frequent occurrence of side effects.
Setting and method: 100 adult and paediatric inpatients in the university hospital that taking clarithromycin treatment, evaluated for the retrospective study. Patients selected randomly by using the hospital's medication record system. All the patients checked for drug interactions during treatment and the data recorded as "serious-use alternative" "significant-monitor closely" "moderate" or "minor"
Main outcome measures: The aim of the study is to determine drug interaction with clarithromycin in patients taking drugs interacting frequency ratio.
Results: It was determined average 3.65 drug interactions for a patient, 1.53 of them is serious. It was observed a significant difference between different inpatient services. Cardiology clinic is at the top with average 5.36 interactions. It also has to be considered that average age of the inpatients is higher at this clinic. Geriatric population has greater risk of the polypharmacy. It was determined a significant correlation between the number of total drugs using and the number of drug interactions ($p \leq 0.01$). Also there are another significant correlation ($p \leq 0.01$) between the number of total drugs and the importance of interactions for each classification such as serious-use alternative, significant-monitor closely, moderate and minor.
Conclusion: Monitoring for drug interaction to review the drug choice according to the interactions and pharmacist consultation for drug interaction for the physicians may reduce the number of medical events caused by medicines. Therefore clinical pharmacists are vital for improving inpatient treatment if they should check for drug interactions.

PP14: Evaluation of the financial loss related to the unused remnants injectable cancer drugs except DRG

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Background and objective: The cost of cancer drugs includes the good medical practice and optimization of their use, in particular during the step of preparing. Monitoring of unused remnants is performed in our centralized preparation unit. The aim of our study is to evaluate the economic impact of the unused of remnants of cancer drugs except DRG (Diagnosis related groups) and discuss areas for improvement.
Setting and method: The prospective data have been collected for 8 months from April 2015 to January 2016. Data's were extracted on a daily basis from the manufacturing orders via the Computer Engineering Chimio® software. After preparation, the technician recorded monthly the date, name of specialty and the unused volume expressed in milliliter. Then we sorted by specialty and by day. For each pharmaceutical speciality, we determined the cost of unused product and the frequency of the remnants' destruction. All of this data was used to calculate the cost of the remnants and financial loss.
Main outcome measures: During the study period, we realized 2300 molecules except DRG. The total cost is 2979812 €. 2016 out of 2300 preparations generated remnants that have not been reused. Financial loss due to the unused of remants is 82414 euros (which represents 3.4 % of the total cost). 11 out of 22 molecules generated 91 % of the financial loss, according to the Pareto law. The most destroyed remains concerns the following molecules: azacitidine, temsirolimus, trastuzumab, pemetrexed.
Results: Azacitidine represents the greatest monetary loss (15932.73€: 19 %), followed by temsirolimus (12246.73€:15 %), trastuzumab (11381.26€:14 %), cabazitaxel (7255.91€:9 %) and trastuzumab emtansine (6608.87€:8 %). But reported to the frequency of preparation, the greatest loss concerns cabazitaxel (1814€), followed by trastuzumab emtansine (1652€), brentuximab vedotin (1447€), rituximab (1171€) and bevacizumab (548€).
Conclusion: Remnants' loss have been divided into 2 categories: the avoidable and the non-avoidable. The non-avoidable loss are not only due to the low stability of reconstituted medicine but also to the unadapted dosages of some marketed products. This problem concerns the following specialities : azacitidine, temsirolimus, cabazitaxel, trastuzumab, brentuximab vedotin, and cladribine. The avoidable loss are caused by the unit of preparation related issues such as the availability of a single dosage, a poor inventory control or non rounded values of dosages. This problem concerns the following specialities : rituximab, trastuzumab emtansine, bevacizumab, pemetrexed. Keeping the stability data up to date is needed to reduce waste. The availability of more dosages can reduce financial loss at the cost of logistical constraints. In our medical centre, regrouping medical appointments can not limit losses because of the low number of patients for each prepared speciality and the 10000 yearly preparations. This study shows that dosage of available drugs should be adapted to standard posology and the physician may prescribe the rounded doses.

PP15: ADHIÉRETE Programme

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Background and objective: Long life expectancy brings with it an increase in chronicity, use of medicines and an increase in the likelihood of adherence problems. Lack of adherence is one of the leading causes of morbi-mortality according to the World Health Organisation. 20–50 % of all patients do not take their medication as prescribed. The main objective of the study was to evaluate adherence in elderly (≥60 years), chronic and polypharmacy (≥5 medicines) patients with adherence problems before and after the intervention of a community pharmacist. Pharmaceutical Care Services and Personalized Dosage Systems (PDS) and/or ICT (apps), were used as support tools. As secondary objectives the detection of Drug Related Problems and/or Negative Medicine Outcomes, the evaluation of the impact of each adherence support tools used or the assessment of Quality of Life, among others, were considered.
Setting and method: Naturalistic (pre-post), prospective, randomized, uncontrolled study. Each community pharmacy recruited 5 patients: (a) 2 PDS, (b) 2 App – monitoring system and (c) 1 PDS + App – alarm system. Each patient made at least 7 visits to the community pharmacy. Each pharmacist had access to an online tool to create patient profiles and to send customized messages and warnings.
Main outcome measures: The Morisky–Green Test and the EuroQoL 5D Questionnaire were used as methods to assess adherence and patient's quality of life, respectively. Adherence was also measured by the rate of medication uptake.
Results: 174 patients recruited, 114 valid for analysis. 74 patients completed the study. 40 patients concluded the study early; the cause cited most often involved the use of ICT (22 patients). 56.1 % of patients used 5–8 medicines; 34.2 % used 9–12 medicines. The most prevalent diseases were hypertension (74.3 %), hypercholesterolemia (55 %) and cardiovascular disease (52.3 %). Adherence, assessed by Morisky–Green Test, evolved from 35 % in Visit 3 to 75.7 % in the Final Visit. Adherence, assessed by the medication uptake, went from 62.1 % (Visit 3) to 89.2 % (Final Visit). The average difference between the Final Visit and V1 for the Quality of Life was 0.078 points. Patient Satisfaction scored 81.28 over a total value of 100. For the App-monitoring system group, adherence, quality of life and satisfaction results, though improving, were lower than in the other groups.
Conclusion: Regardless the support tool used, the pharmacist's intervention seemed to be effective for the improvement of adherence. The results in the App-monitoring system group were significantly lower than in the PDS and PDS + App—alarm system groups. The improvement of adherence might be linked to an improvement in the quality of life.

PP16: Impact of a community pharmacy-based information program on type 2 diabetic patients' adherence to their oral treatment: IPhODia, a cluster randomized study vs usual practice

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Background and objective: Despite significant improvements in the follow up of type 2 diabetes patients, the latest results of Entred 2007–2010 show an insufficient level of control, with too many patients with HbA1C > 7 %. In spite of regular controls, physicians encounter difficulties informing patients due to a lack of time and means. Thanks to their number, expertise and accessibility, pharmacists could play a beneficial role in patient adherence. The IPhODia study aims to assess the impact on adherence of specific information provided by community pharmacists
Programme description: The intervention consists of three different 30 min interviews over 6 months, covering thematic information on diabetes, namely (1) diet for diabetics, (2) monitoring drug treatment and (3) the diabetes complications. Two groups of pharmacists have been randomized, one providing interviews in addition to the usual drug delivery, one delivering drugs in usual settings. The criterion for evaluation is the Medication Possession Ratio (MPR). In total 182 pharmacists (91 + 91) recruited 529 patients (280 +249). 45 % of pharmacists are in rural area, 85 % have a confidentiality space and 65 % have already been trained on therapeutic education (no difference between 2 groups). Among 529 patients, 57.6 % are men (55.7–60.2, Non-Significant difference between the two groups = NS), with a mean age of 65.7 years (65.1–66.4, NS) and a diabetes duration of 10.4 years (10.7–10.1, NS); 44.9 % are overweight (44.2–45.7, NS), Antidiabetic treatments are : monotherapy for 31.4 % of patients (29.54–33.5, NS), dual therapy for 43.2 % (42.1–44.3, NS) and tritherapy for 25.5 % (28.4–22.2, NS). 69.7 % (67.8–71.9, NS) of patients are treated with an antihypertensive medication and 64.7 % (62.5–67.1, NS) with a lipid lowering agent. Mean HbA1C level is 7.8 % (7.9–7.7, NS).
Conclusion: This study will be able to assess the impact on adherence of specific information provided by community pharmacists to type 2 diabetes patients. 6 month results will be presented.

PP18: Use of medicinal plants for the elderly as an economically viable and safe alternative to the use of traditional medicines

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Background and objective: The use of medicinal plants represents an important resource for treatment, cure and prevention of countless diseases. This study aimed to determine the traditional use of medicinal plants by the elderly and the importance of this practice as an economical and safe alternative to the use of traditional medicines.
Setting and method: The study is an exploratory, descriptive and field type, with voluntary participation of 351 elderly (60 or older), in Maringá, Brazil. This study was approved by the ethics committee. The interviewer applied to the participants a semi-structured questionnaire containing socio-demographic information (gender, age, education, monthly income) and issues related to the consumption of medicinal plants (what parts of the plant were used, how and why making use, where they get the plant and if they indicate the use of medicinal herbs to others).
Main outcome measures: The sample calculation assumed confidence level of 95 %, a margin of error of 5 %, based on calculations made in *Statdisk Software* Version 8.4. The data were statistically analysed with the help of the software *Statistica 8.0*. The evaluation of averages and standard deviation was performed for quantitative variables. As for the qualitative variables were used frequency tables with percentage and contingency tables using the Chi squared test to check for possible significant associations between the variables of interest. The level of significance adopted was 5 %, i.e. the associations considered significant were the ones whose $p < 0.05$.
Results: The results demonstrated that the use of medicinal plants is an important therapeutic resource for the elderly, since 78.4 % of them made use of medicinal plants. Regarding the socio-demographic data, this study showed the prevalence of females in using medicinal

plants (58.7 %),but there was a significant statistic difference between genders ($p = 0.00041$).Regarding the monthly income of the respondents, 65.5 % were retired, of which 59.3 % earned a minimum wage and 13.1 % received two minimum wages = 0.00041). Regarding the place where they acquired medicinal plants, mostly used to obtain in the backyard, these data demonstrate the influence of the economic factor in the acquisition of medicinal plants as the fact that many of them are grown in backyards, what makes them accessible to a large population.

Conclusion: The use of medicinal plants by the elderly was 78.4 %, among the mentioned plants, hortelã, boldo, erva doce, melissa, camomila, guaco, capim santo, alecrim, arruda, arnica, carqueja, espinheira santa, berinjela, chuchu e sabugueiro deserve special mention, because they are easily found and grown in backyards, representing savings for their users.The form and part of the plant used, mostly coincided with the literature, reflecting popular knowledge about medicinal plants. Most seniors use medicinal plants safely representing a low-cost option for these users.

PP19: How to set up tools for pharmaceutical interviews? Educational diagnosis test applied to patients coming at the hospital pharmacy

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Background and objective: The aim of our study is to improve the quality when dispensing medical treatments by setting up pharmaceutical interviews. The plan is to draft documents which will be used to explain and educate patients about their treatment. Our first aim is to identify each patient's expectations, needs and understanding of the medicine they are taking in order to adapt our tools to their needs.

Programme description: Setting up a questionnaire which will be presented to patients and their helpers. People included: patients or helpers who come to the hospital pharmacy for medication for chronic illnesses. Ambulance personnel will not be included. The questionnaire will include 15 questions about different themes: population characteristics, hospital discharge or not, the patient and his treatment, adverse effects (AE), follow-up, effects on everyday life. Thirty-day study, 537 dispensations were done by the hospital pharmacy, 119 questionnaires completed (22 %). Seventy five percent of people coming are patients, 22 % are helpers. Seventy nine percent of patients know all of the medicines they are taking, 13 % only some of them and 6 % nothing at all; 87 % of patients take their medicine without help; 98 % know what their medicine is for and use precise vocabulary to describe their illness. Open-ended questions show that patients lack knowledge about: pharmacology (AE, usage warnings, contra-indications), the rules surrounding delivery of medication, what to do if they forget to take their medicine, availability in city pharmacies. Patients know that they have regular follow-ups (blood tests, imagery). Specific details emerge depending on the illness: *Oncology*: physical decline, progressive isolation (patients and helpers), frequent sick leave. *Infectious diseases*: HIV patients lack precise knowledge about their illness. Those patients whose anti-infectious treatment is alongside chemotherapy often mix up the roles of their different treatments. *Patients with plasma-derived medicinal products* (coagulation factor, immunoglobulin): 70 % of patients have not had AE, their difficulties are linked to immunoglobin injections and patients did not know how to deal with the situation. Sixty percent of patients do not know of any AE or what to do in case of AE. *Endocrine pathologies*: patients do not forget their treatment for more than 24 h because of the noticeable symptoms that show up quickly if they are late taking their medicine.

Conclusion: Only 22 % of patients included because of the various exclusion criteria (non-chronic patients, people not close enough to the patient, too busy). Assessing the needs and knowledge of patients is an essential step before the setting up of a therapeutic education programme. It helps to set up tools that are adapted to those concerned. This first important step helped to identify needs with themes that will be contained in our future tools. Our study identified disease specific lacks in knowledge, our tools will be able to include these specific information.

PP20: Pharmaceutical care consultations and multidisciplinary educational program for improving adherence in oncology

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Background and objective: Recent development of oral anticancer drugs makes medication adherence a major concern in oncology. Healthcare system should be reorganized because of the increased number of patients treated by oral anticancer drug and the chronicity of this disease. Pharmaceutical care consultations together with Patient Educational Program dedicated for new patients on oral chemotherapy was initiated in Paul Strauss Cancer Centre (Strasbourg, France) in June 2014. The main objectives of this program are maintenance of adherence to oral anti-neoplastic therapy, promotion of a better understanding about treatment regimen and potential side-effects, patient safety and implementation of self-care management.

Setting and method: We investigated risk factors of non-adherence detected during pharmaceutical care consultations performed at initiation of oral anti-cancer drug.

Main outcome measures: For patients following the educational program, medication adherence was assessed with Morisky Green's scoring after 15, 30, 60, 90 days of treatment.

Results: 131 patients were included in the program. 143 pharmaceutical care consultations were performed (some patients being treated with two different treatments). Mean age of the patient was 63 (min = 21; max = 86). Most of them were treated for colorectal cancer (57 %). Most frequently prescribed drugs were capecitabin (52 %) and regorafenib (15 %). Pharmacist interventions allow the detection of 3.8 risk factors per patient. The most frequent risk factors are side effects (established or potential for 86 % of patients), age over 65 (52 %), overmedication (49 % of patients take more than 5 different drugs), gender (41 % of female), comorbidities (34 %), previous treatment failure (28 %), disease duration (26 %), social factors (14 %). Other risk factors rarely detected were treatment duration, psychological or cognitive disorders, severity of symptoms, and functional status. Majority of patients (59 %) had between 2 and 4 non adherence risk factors and 31 % displayed more than 4 factors. Anticancer drug treatment duration was not correlated with the number of risk factors per patient. Morisky Green scoring was investigated through 297 interview meanly in the first 3 months of treatment and was equal to zero in most of case (92 %).

Conclusion: Early detection of risk factor for low adherence in patients receiving oral anticancer drug give the opportunity for the development of personalized medicine. Oncology pharmacist intervention together with nurse follow-up through an educational programme allow the maintenance of adherence.

PP21: Ask the pharmacist: Is it suitable to repackage Lamotrigine dispersible/chewable tablets into Multidrug punch cards?

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Background and objective: Lamotrigine is a phenyltriazine anticonvulsant used either alone or in combination with other drugs in the management of seizures and in the maintenance therapy of bipolar disorder [1]. Poor adherence to medication is an important issue among patients with these diseases [2]. This situation makes lamotrigine an ideal candidate for use in systems to improve drug management, such as Multidrug Punch Cards (MPCs). Dispersible/chewable tablets (DCT) is the pharmaceutical form most commonly used (and the only marketed in our country) for oral administration of lamotrigine. The sensitivity to the effects of moisture of DCT increases the need to obtain information regarding its stability once repackaged into MPC. The aim of the present study was to determine the stability of lamotrigine DCT repackaged into MPC.
Setting and method: Lamotrigine 100 mg DCT were randomly repackaged into one-week cold-sealed MPCs and evaluated for physicochemical stability over a 21 day period in controlled conditions corresponding to Climatic Zones I/II (25 ± 2 °C; 60 ± 5 % relative humidity). At scheduled times, various tests were performed on tablets in its original packaging (day 0; control samples) and on tablets repackaged into MPCs (day 21; MPC samples).
Main outcome measures: Chemical stability: A validated high-performance liquid chromatography (HPLC) method, adapted from the U.S. Pharmacopeia, was used to quantify lamotrigine 100 mg DCT [3]. Physical stability: Physical appearance, dissolution test, uniformity of mass, friability and resistance to crushing were evaluated according to compendial requirements [3, 4].
Results: Chemical stability: Lamotrigine content remained within the U.S. Pharmacopeia acceptance range of 90–110 % during the 21 day study (day 21: 97.7 %). Physical stability (at day 21): There were no noticeable appearance changes in the tablets. As for dissolution testing, the amount of lamotrigine released in 15 min was not less than 80 % of the labeled amount. None of the individual masses deviated by more than 5 % from the average mass. The resistance to crushing of the tablets decreased by 6.6 % when compared with control samples. However, the friability was low (0.2 %).
Conclusion: The present study shows that lamotrigine DCT maintained their stability for at least 21 days when repackaged into MPC under the storage conditions of Climatic Zones I/II.

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