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Poster presentations

Know your pulse awareness campaign: involving pharmacists for greater outreach

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Background Evidence suggests that up to 1/3 of stroke-related deaths are attributable to atrial fibrillation (AF). This condition, frequently asymptomatic, is estimated to be 50% undiagnosed. Worldwide ageing of the population will impact on the prevalence of heart rhythm disorders, suggesting the need for awareness raising. The Arrhythmia Alliance annually develops an awareness campaign aiming to contribute to improve public awareness, including teaching individuals to check their own pulse rhythm. This year, iPACT created a partnership with the Atrial Fibrillation Association (AFA) to test a model where pharmacists became actively involved in pulse check.
Purpose To educate people in London about AF and how to undertake manual pulse check; and to screen for undiagnosed AF.
Method This initiative was tested in 5 countries: Canada, New Zealand, Portugal, Spain, and the UK. This abstract describes preliminary data from the UK. A one day event was held at Southwark council premises. Led by the primary care pharmacist, this event allowed opportunistic education about AF, using standardised material developed by AFA/iPACT, including provision of an information leaflet. The trained primary care pharmacist demonstrated how to undertake manual pulse checks, and screened individuals using a single lead handheld (AliveCor) AF detection device. Data collected and analysed included individuals' demographics, heart rate, heart rhythm and when appropriate, a referral to the physician.
Findings A total of 182 people were screened and educated on manual pulse checks. The average age was 47 years {21–72}; the majority were female (n = 105; 58%). The average heart rate at point of screening was 79 bpm {51–128}. The vast majority had a normal rhythm at point of screening (n = 173; 95%). However, 2 individuals had possible AF (1%) and their ECGs were forwarded to their e-mails to allow them to take the result to their physician. An additional individual had possible AF on first reading from Alivecor; but when repeated twice, the results were normal, hence not referred. All individuals with unclassified readings after repeating (n = 6; 3%) were referred to the physician.
Conclusion The rate of detection was in the range 1–2%, confirming previous studies. If every pharmacy worldwide screened 100 people, pharmacists could make a major contribution to addressing undiagnosed AF. To achieve this, community pharmacy workforce will require adequate training on AF and on performing manual pulse checks and using detection devices. In 2017, we intend to involve more countries, so please contact us if you wish to join.

Problems with continuity of care identified by community pharmacists post-discharge

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Background Medication errors at hospital discharge are common. They are frequently evoked by medication regimen changes during hospital admission and inadequate documentation and information transfer between healthcare providers. In the Netherlands, community pharmacies are well-informed about their patients' pre-admission medication history.
Purpose This accurate medication history enables community pharmacies to verify the received hospital discharge information post-discharge. Therefore, our aim was to study the frequency and nature of all possible problems with continuity of care that community pharmacists experienced at admission to primary care.
Method A cross-sectional study was conducted in pharmacies belonging to the Utrecht Pharmacy Practice network for Education and Research in the Netherlands. All discharge prescriptions

presented by adult patients discharged from the hospital to their own home during the study period were eligible for inclusion. In the Netherlands, a discharge prescription contains the complete list of medication that the patient should use post-discharge according to the in-hospital physician. Structured checklists were used to evaluate the problems with continuity of care, defined as the frequency and nature of (1) medication discrepancies, (2) administrative problems and (3) the necessity for patient education.

Findings In forty-four pharmacies (42 community and 2 outpatient pharmacies) checklists were completed for 403 patients. The majority of the discharge prescriptions (n = 372, 92.3%) contained at least one problem with continuity of care. In 54.3% of the prescriptions the pharmacy contacted the prescriber and the remaining were clarified by (additional) patient contact or within the pharmacy. In total, 1154 problems were encountered (2.9 ± 2.0 problems per prescription). A total of 356 medication discrepancies (mean of 0.9 ± 1.1 per prescription) and 392 administrative problems (mean 1.0 ± 1.0) were encountered. Additional patient education was necessary in 406 times (mean 1.0 ± 1.0). Medication discrepancies (n = 356) resulted mainly from missing pre-admission medication (n = 106) and dose regimen changes (n = 55) on the discharge prescription. Administrative problems (n = 392) originated mainly from administrative incompleteness (n = 177), e.g. missing reimbursement authorization forms or supply issues (n = 150), e.g. insufficient pharmacy stock. The patients' lack of knowledge concerning their medication post-discharge was illustrated by the necessity for patient education (n = 406) on both medication information and medication regimen management.

Conclusion Community pharmacists are still confronted with problems due to inadequate documentation at discharge which can inflict harm to patients if not properly addressed. Furthermore, this study illustrates that solely providing medication information at discharge is likely not sufficient; a post-discharge follow-up is crucial to identify possible knowledge gaps.

Systematic review of quality indicators for pharmaceutical care

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Background The use of quality indicators (QIs) to assess pharmaceutical care (PC) has become increasingly important in pharmacy practice worldwide. Since pharmacists are expected to ensure the quality use of medicines across a broad range of conditions, gaining a full understanding of existing QIs for PC is of significance.

Purpose The aim of this study is to identify and classify existing QIs relevant to PC using the following 3 domains: (1) Donabedian framework; (2) Anatomical Therapeutic Chemical (ATC) classification system; and (3) Drug-Related Problems (DRPs) classification system, and to identify gaps in current measurement.

Method Articles were included if they fulfilled the following criteria: (a) the article was peer-reviewed and published in English, (b) numerators and denominators were defined for the QIs, or they could be directly deduced from the descriptions of the QIs, (c) the publication contained at least one PC-related QI, (d) the development of QIs was one of the objectives, and (e) QIs were developed using literature/guideline search and consensus methods. CINAHL, EMBASE, Global Health, International Pharmaceutical Abstract, MEDLINE, PubMed, and Web of Science databases were searched using MeSH and keywords to identify relevant articles published up to August 16 2016. An internet search of key organisations was also conducted.

Findings A total of 100 articles and 5 websites were identified for inclusion in the review. In total, 2058 QIs for PC were identified: 1406 QIs from articles, and 652 QIs from the web. Of 2058 QIs, 555 QIs (27.0%) have been classified, as of October 2016. When categorised using the Donabedian framework, more than 90% of QIs were process indicators. The percentages of structure and outcome indicators were 5.6 and 0.7% respectively. When categorised using the ATC code, medicines for cardiovascular conditions accounted for 18.8% of all QIs, followed by those for nervous system conditions (14.1%), and those for blood and blood forming organs (12.8%). When categorised using the DRPs classification system, 51.3% of QIs related to drug selection, followed by monitoring (22.1%), and dose selection (9.9%). QIs relevant to adverse drug reactions (0.9%), drug form (0.3%), treatment duration (2.8%), and drug use process (4.7%) were less common.

Conclusion Despite the large number of QIs for PC, significant gaps exist in each of the 3 domains. Further studies are warranted to develop QIs to address these gaps. The result of all QIs identified in this review will be presented at the coming conference.

Medication-related issues associated with adherence to long-term tyrosine kinase inhibitors for controlling chronic myeloid leukaemia: a qualitative study

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Background Tyrosine kinase inhibitors (TKIs) have markedly improved the long term survival of chronic myeloid leukemia (CML). CML has become a chronic disease. Poor adherence to TKIs could compromise the disease control and contributes to higher disease burden and mortality.

Purpose Little is known about the medication-related issues among CML patients on TKIs therapy in Malaysia. This qualitative study aimed to explore these challenging issues which could affect patient's adherence to TKIs. Subsequently, measures pertaining to the issues can be planned and implemented to improve their pharmaceutical care service and long-term outcome.

Method Face-to-face, semi-structured interviews were conducted in the Haematology Outpatient Clinic of two medical centres in Malaysia, from August 2015 to January 2016 after granted ethical approvals. A purposive sampling strategy was used to include patients with maximum variation of age groups, education levels and treatment responses. CML patients aged 18 years and above who were prescribed with a TKI were identified by screening the medical records and then invited to participate in the study. Exclusion criteria were patients who were confused or had evidence of drug resistance. Interviews were audio-recorded, transcribed verbatim and analysed thematically based on Braun and Clarke.

Findings Four emerging themes were identified from 18 saturated interviews (median duration was 41 min) including (1) concerns on adverse reactions of TKIs (2) personal beliefs regarding the use of TKIs, (3) mismanagement of TKIs in daily life, and (4) financial burden for accessing treatment. Participants omitted their TKIs due to poor tolerability to gastrointestinal side effects, ineffective prophylactic anti-emetic control and perceived wastage of medication from vomiting. Participants also modified their TKI due to fear of potential harms from long-term use, and stopped their TKIs based on beliefs in the curative claim of traditional medicines and misconception about therapeutic effects of TKIs according to disease symptoms. Difficulties in integrating the dosing requirements of TKIs into daily life

led to unintentional skipping of doses and risk of toxicities from inappropriate dosing intervals and food interactions. Furthermore, financial burden also resulted in delaying initiation of TKIs, missing appointments and dose interruption from running out of TKIs.
Conclusion Malaysian CML patients encountered a range of medication-related issues leading to a complex pattern of non-adherence behaviour that potentially hinder the optimal clinical benefits of TKIs. A pharmaceutical care service is needed to elicit and address CML patients' concerns on TKI-related side effects, improve patients' understanding of treatment rationale and empower them to self-manage their medications.

Medication reconciliation-data and relevance in ambulatory care

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Background Medication Reconciliation is a fast approach in pharmaceutical care to detect drug-related problems and the first step in a Medication Review. Most studies on Medication Reconciliation were conducted in the hospital setting or at the transition of care. A Medication Plan, which is recently became obligatory for eligible patients in Germany, facilitates Medication Reconciliation as the next step in medication safety.
Purpose The study aim was to provide accurate data on the magnitude of discrepancy between the prescription and the actually taken medicine in ambulatory care. In a second step, the clinical relevance of discrepancies was assessed to estimate the meaning of the results to medication safety.
Method The study was conducted as a secondary data analysis of the WestGem study. Medication found at a home assessment was reconciled with the primary care physician's documentation by clinical pharmacists, results were descriptive. High risk of hospitalization was based on studies of van der Hooft et al. and Budnitz et al. and included: Anticoagulation drugs, Digoxin, Cytostatics, Diuretics, Insulin, oral Antidiabetics carrying risk of hypoglycemia, Salicylates and DMARDs. Drugs likely to cause interactions in contrast were rated based on literature and databases by six clinical pharmacists according to the specific medication of the patient. Drugs were analyzed by the authors as a whole as well as per patient. Results were dichotomized as 'high-risk drugs' or 'no high risk drugs'.
Findings Medication was reconciled in 142 elderly patients with polymedication from 12 primary care practices. 1498 drugs were found at the home assessment compared to 1099 (73.4%) in the documentation of the primary care physician. 94.4% of the patients were affected by discrepancies. A total of 2.8 ± 2.4 drugs was undocumented per patient. According to the patients 21.6% of missing drugs were prescribed by medical specialists, 26.8% were over the counter drugs. For the remaining drugs the patients could not remember the origin but another 42.5% of them were prescription drugs. 53.9% of the patients used an undocumented drug, which carried a high risk for hospitalization, 76.1% a drug, which was likely to cause drug–drug interactions.
Conclusion Discrepancy between the drugs used by the patient and the medication documented by the primary care physician was profound as virtually all patients used drugs prescribed by additional physicians or acquired elsewhere. The majority of related drugs was relevant to medication safety. A collaborative Medication Reconciliation could compile the entire medication and increase patient safety.

Willingness to pay for cognitive pharmacy service in community pharmacies

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Background Pharmacy services and role of pharmacist oriented toward the patient have been linked with the improvement of clinical and economic outcomes. The relevance of a service to patients needs to be examined in the monetary terms, which can be done using the willingness to pay technique.
Purpose The study was designed to determine general public willingness to pay for pharmacist service in community pharmacy, but also attitudes and behavior of participants regarding healthcare issues, and correlation between sociodemographic characteristics or attitudes and willingness to pay.
Method Design of the study was cross-sectional survey. Via printed questionnaire delivered in the community pharmacies, participants were asked regarding the following cognitive service: counselling by the pharmacist in order to identify and resolve potential medication therapy problems after the initiation of a new medicine to optimize health outcomes of the patients. In the questionnaire detailed description of the service is provided. By the same questionnaire, we collected also the information about the participants (age, level of education, level of income, etc.), frequency of contact with community pharmacy, health status and current therapy. The participants' willingness to pay was measured through close-ended binary choice question (yes/no). If the respondents answered yes, they were also asked to choose one of the defined values for the service (<0.5 USD, USD 0.5–1, USD 1–2.3, USD 2.3–4.6, >4.6 USD). The values are linked with the Serbian health insurance system. Data were collected during the 1 month period in 2016 in Serbian community pharmacies.
Findings The total number of respondents who completed the questionnaire was 444; mean age of participants was 45.1 ± 16.1 years. Thirty-eight percent (n = 167) of respondents reported that they were willing to pay for a medication management service provided in the community pharmacy. Almost equal percent of respondents indicated a value for service of up to 1 USD (31.1% of respondents willing to pay for service), between one and 2.3 USD (29.3%) or between 2.3 and 4.6 USD (28.1%). Univariate analysis showed significant association between willingness to pay for cognitive pharmacist provided service and participants' socio-demographic factors, health related characteristics, attitudes and behavior, dilemmas and need for the certain pharmacist service. The logistic regression model was statistically significant, $\chi^2 = 4.599$, $p < .001$.
Conclusion This research shows positive attitude of respondents for payment for cognitive pharmacy services, which are not fully recognized within the healthcare system. In future pharmacist should focus on practical implementation of the service and models of funding.

Factors influencing medication adherence in unipolar depression: exploring patients' views

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Background Medication non-adherence in unipolar depression is a major obstacle to successful treatment. Whilst factors associated with medication adherence have been documented, how these factors relate to the different stages of adherence (i.e. initiation of treatment,

implementation of treatment and discontinuation of treatment) are not known.

Purpose This study aimed to explore both positive influencing factors which promote medication adherence and negative factors which reduce medication adherence, at the initiation, implementation and discontinuation stages of adherence to antidepressant medicines, based on the conceptual framework of mediation adherence endorsed by a European consortium (Vrijens et al. 2012).

Method A semi-structured interview guide designed to address the study aim was developed and pilot tested for face validity. Participants aged 18 years and over and taking antidepressant medicines for the management of unipolar depression were recruited via community pharmacies in the Sydney metropolitan area and with the support of a market research company. Face-to-face interviews were conducted and digitally audio recorded. Verbatim transcripts were thematically content analyzed and data managed using N-Vivo software. The codes were extracted and grouped according to the thematic aspects of the data. Themes were derived from data extraction and categorized into the stages of medication adherence.

Findings Twenty-three interviews were conducted. Positive factors supporting adherence at initiation of therapy included: the severity of depression, patients' self-motivation, accessibility to the healthcare system and support from mental health teams. Factors aiding persistence with therapy included: availability of antidepressant medicines, belief in and effectiveness of antidepressant medicines, and good relationships with healthcare professionals. Patients' self-management, system support (including Medicare and private health insurance), and the accessibility to healthcare services and healthcare professionals facilitated medication adherence at each stage of adherence. Stigma about depression and fear of possible adverse events were negative factors associated with initiation of therapy, whilst adverse events, clinical improvement whilst on antidepressant medicines, the ineffectiveness of antidepressant medicines and forgetfulness contributed to discontinuation. Adverse events, stigma about depression and low economic status were reported to reduce medication adherence at each stage of adherence. Mental health organizations were mentioned as useful sources to seek support, especially in emergency situations, and to communicate with other people living with depression. Data were analysed from the perspective of patients and carers, heath care providers, and the healthcare system.

Conclusion A range of factors influence patients' adherence to antidepressant medicines at the different stages of adherence. Strategies to address medication adherence in patients with unipolar depression should by multifactorial and consider both the stage of adherence and the severity of depression.

Mechanisms and context factors important for successful implementation of an improvement intervention concerning medicines use in residential facilities for the disabled

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Background Work procedures around medicines in residential facilities for the disabled are prone to errors. To improve patient safety, an improvement intervention consisting of a competence development programme followed by implementation of a medication bundle to achieve safer work procedures was developed and implemented in 35 facilities in 7 municipalities.

Purpose To identify mechanisms and context factors important for successful implementation and sustainability of an improvement intervention aimed at ensuring patient safety in residential facilities for the disabled.

Method Realist evaluation was used to identify the underlying mechanisms explaining how the outcomes were caused and the influence of context in the three municipalities reaching the best implementation results. Based on a literature study and previous experience, the initial programme theory was developed, describing how the intervention was expected to lead to its effects and in which conditions it should do so. Qualitative data on mechanisms and context factors were gathered through focus group interviews with managers and staff in the 3 municipalities, supplemented with single interviews with the 3 municipal improvement advisors. All interviews were semi-structured using the programme theory as a framework, and analysed using the template analysis style. The revised programme theory was validated through a focus group interview with the three improvement advisors.

Findings The important mechanisms identified were (1) consistency between the intervention and the organizational culture and strategy; (2) believing that change is needed and actually deciding to change; (3) expecting and believing that the intervention will lead to positive results; (4) capacity building matching the demands of the intervention, meaning that both the necessary competencies and resources were available; (5) management support; (6) spreading the "good stories" demonstrating the advantages of the intervention; (7) making improvement data visible at all levels in the organization; (8) monitoring unexpected barriers, and (9) organizational anchoring of the intervention. Important context factors influencing implementation were organizational changes such as merging of facilities, changes in management at the municipal or facility level, municipal cost-savings, and difficult cooperation with general practitioners about the medication bundle.

Conclusion Knowledge on the revealed mechanisms and context factors are important when spreading a similar improvement intervention to other residential facilities and other municipalities, as careful consideration of such factors are a prerequisite for successful implementation and sustainability.

Characteristics of clinically relevant potential drug–drug interactions among ambulatory prescriptions in Slovenia

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Background A previous study on Slovenian outpatients showed that a total of 9.3% (N = 191,213) of the Slovenian population (N = 2,063,077; 1 July 2015) was exposed to clinically relevant potential drug–drug interactions (DDIs) in 2015. A better understanding of the most frequently occurring potential DDIs may enable safer pharmacotherapy and minimize drug-related problems.

Purpose The aim of the study was to evaluate characteristics of the most frequently prescribed clinically relevant potential DDIs among outpatients in Slovenia.

Method Clinically relevant potential DDIs were selected from the database of all potential DDIs among Slovenian outpatients in 2015, which was constructed based on Health claims data on prescription drugs obtained from the Health insurance institute of Slovenia. A potential DDI was defined as dispensing of two interacting drugs to one patient on the same day. The reference source of interactions was the Lexicomp drug interactions database. Clinically relevant DDIs were defined as drug combinations that should be avoided and drug combinations where therapy modifications should be considered (type X and type D, respectively). Monographs of the 95% of type X DDIs and 75% of type D DDIs were further examined regarding severity, Lexicomp reliability rating (the quality of documentation for an interaction), ATC classification, mechanism of interaction, possible adverse events and patient management.

Findings Drug combinations that should be avoided (type X): The analysis included 58 monographs, which represent 68,280 cases of potential DDIs. The reliability was rated as excellent in 1.3%, good in 34.5%, and fair in 64.2% of cases. The three most frequent possible adverse events were excessive anticholinergic effects (32.9% of cases), QTc-prolongation (24.5% of cases) and prolonged sedative effects (10.9% of cases). Drug combinations where therapy modifications should be considered (type D): The analysis included 62 monographs, which represent 411,646 cases of potential DDI in the population. The reliability was rated as excellent in 7.6%, good in 17.2%, and fair in 75.2% of cases. The three most frequent possible adverse events were increased risk of bleeding (25.0% of cases), enhanced CNS depression (21.6% of cases) and QTc prolongation (15.3% of cases).
Conclusion In the majority of clinically relevant cases of potential DDIs, the quality of documentation for an interaction based on Lexicomp rating is rated as fair. In our study, excessive anticholinergic effects and increased risk of bleeding were the most frequent possible adverse events from type X and type D DDIs, respectively.

NPM: Quality of advice provided in pharmacies and parapharmacies

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Background The consumption of non-prescription medicines (NPM) has been increasing, and with it comes the need to guarantee that better counselling are provided in pharmacies and drug stores to ensure the responsible use of medicines. Therefore, it becomes relevant to evaluate the performance of health professionals in these two locations.
Purpose This study aimed to evaluate the quality of advise when dispensing non-prescription medicines (NPM) in pharmacies and drug stores. This evaluation took into account: the quality of the initial patient assessment; the quality of the therapeutic decision (considering effectiveness, safety and necessity); and the quality of transmission of information upon medicine dispensing.
Method A covert observational cross-sectional study was used, through mystery shopping technique. Two scenarios were designed: (1) direct product request of emergency oral contraception (EOC) for own use and (2) direct product request of an NSAID for a grand mother. The two scenarios were designed so that ideally, pharmacists or technicians would identify that the client did not have an indication for EOC, in scenario 1, and the client's grandmother was taking a potentially unsafe drug to be taken together with the NSAID (warfarin), in scenario 2. Two target groups were set: pharmacies ($n = 30$) and drug stores ($n = 30$). The performance of health professionals was measured through an evaluation grid, developed based on the Good Pharmacy Practice National Standards. The results were analysed using the version 24.0 of SPSS for Windows, using Student T test for independent samples and the Mann–Whitney test, considering a 5% significance level.
Findings Looking at the results obtained in the intra-group global performance analysis, it can be seen that the presented scenario did not significantly influence the performance of the evaluated sites. For the emergency oral contraception scenario, a significantly better performance was observed for pharmacies when compared with the drug stores ($p < 0.05$). In the NSAID scenario, pharmacies also performed better, overall and in all sections evaluated, although differences were only significant in the section referring to information provision ($p < 0.05$).
Conclusion This study suggests that the performance in pharmacies is higher than in drug stores, although it is necessary to develop larger studies to confirm these data. Nonetheless, it should be acknowledged that representative organizations must play a more active role in the implementation of counselling protocols that ensure a higher quality of performance.

Pharmacy services performance as a basis for building capacity to implement cognitive services

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Background Implementation of new cognitive services is a demanding process, influenced by different barriers and facilitators. In order to successfully address these challenges, structure and process assessment is needed to build capacity for sustainable delivery of new services.
Purpose The aim of the study was to evaluate pharmacy services performance in Slovenia before the implementation of cognitive services, with a focus on pharmacy network and its work load as well as patient characteristics.
Method We performed a cross-sectional study by using health claims data on prescription medicines for the year 2013. Data on medicines prescribed in ambulatory care settings were obtained from the Health Insurance Institute of Slovenia. For the data analysis we developed appropriate procedures using the IBM SPSS Statistics v22.
Findings In 2013 there were 326 pharmacy units (1 pharmacy per 6316 inhabitants), of which 69% were public and 31% private. In total, pharmacies dispensed 15,950,757 prescription medicines to 1,471,783 patients during 8,116,596 pharmacy visits. In average each pharmacy yearly dispensed 48,928 prescriptions with considerable differences between pharmacies. Eleven pharmacies dispensed more than 150,000 prescriptions (maximum number 232,818). The largest numbers of prescription medicines were dispensed on Wednesdays and in the months between January and April. In 2013 there was in average one pharmacist per 1879 inhabitants. In average each pharmacy unit had 3 dispensing pharmacists, each dispensing 63 prescriptions daily. In average a pharmacy unit received prescriptions from 863 different doctors and 8956 different patients. The average age of patients was 45 years and majority were female (56%). However, large variations in patient characteristics were found with a difference in average age of 10 years or more comparing different pharmacy units. An average patient yearly received almost 5 different medicines (4.76) prescribed on 10.8 prescriptions. However, patients aged 82–89 years received more than 25 prescriptions yearly. Most of the patients (75%) visited only one or two pharmacies to get prescription medicines. However, approximately a quarter of patients were dispensed medicines in at least 3 different pharmacy units, which indicates decline of loyalty compared to the data from 2001.
Conclusion Pharmacists in Slovenia dispense a large number of prescriptions, what can cause work overload by core activities and may prevent pharmacists to offer cognitive services to patients. When planning the implementation of cognitive services pharmacies should take into account different characteristics of patients who visit them and schedule the appointments to the start or end of the week.

Comparing findings from prospective risk analyses of the dispensing processes in Serbian and German community pharmacies

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Background Despite their great potential to systematically identify strategies for preventing medication errors, prospective risk analyses have so far been carried out rather infrequently in pharmacy practice of both developed and developing countries, particularly in community pharmacies.
Purpose The aim of this study was to identify measures for reducing safety risks associated with the dispensing of prescription medicines in Serbian and German community pharmacies by conducting prospective risk analyses. We compared the main failure modes identified, as well as the corrective actions suggested and the potential for enhancing patient safety across countries.
Method Failure Mode and Effects Analyses (FMEA) were performed in January-May 2016 in Serbian and in October 2016 in German community pharmacies. First, multidisciplinary teams consisting of a leader and process experts involved in dispensing employed brainstorming techniques to map dispensing processes and identify failure modes, their causes and effects. Then, the associated risks were quantified by calculating Risk Priority Numbers (RPNs) for each failure mode based on its severity, occurrence and detectability. Finally, corrective actions were developed and their potential effects were evaluated for the failure modes with the highest RPNs.
Findings Our FMEAs yielded 30 failure modes in Serbian and 39 in German community pharmacies' dispensing process. Despite some organizational and procedural differences across settings, the highest risk potential in both countries was assigned to the incorrect or lacking assessment of therapy appropriateness, particularly regarding dosing and drug interactions (RPN 48 in Serbia and 45 in Germany). Dispensing of wrong medicine, its dose or dosage form were also ranked high (RPN 40 and 30), as well as incomplete patient counselling (RPN 36 and 30). The main corrective actions in both countries were education and clinical pharmacy training, workload reduction by service restructuring, and introducing computerized prescribing and electronic transmission of prescriptions to the pharmacy. The potential risk reduction by implementing the proposed corrective actions for the most critical issues was estimated to be 50.3% in Serbian (sum of RPNs reduced from 583 to 293) and 26.64% in German dispensing processes (sum of RPNs reduced from 781 to 573).
Conclusion Our results highlight many similar safety issues related to the dispensing of medicines in Serbian and German community pharmacies, particularly those arising from assessment of therapy appropriateness. Accordingly, it is a combination of corrective actions proposed by FMEA that holds the potential of reducing these patient safety risks in both countries' community pharmacy practices.

Development and content validation of Medication Literacy Assessment Questionnaire

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Background Medication literacy is the ability of individuals to safely and appropriately access, understand and act on basic medication information. It is conceptually related to health literacy, however, it involves specific skills which are not adequately evaluated by general health literacy measures. There is a lack of specific instruments focusing on assessment of medication literacy.
Purpose To develop a questionnaire assessing medication literacy among general population and to test its content validity.
Method The initial content of the questionnaire was derived from pharmacy counselling literature, patient information booklets and systematic search of articles addressing patient medication knowledge. Three academic pharmacy experts screened the resulting list of knowledge elements. In line with the medication literacy definition, they selected elements deemed essential for safe and proper use of medications from patient perspective. Test questions were formed from the selected elements. The resulting questionnaire went into process of content validation. Laypeople and healthcare professionals were recruited through snowball sampling until data saturation occurred, resulting in 13 laypeople and 14 active healthcare professionals (nurses, pharmacists, GPs) giving their feedback on general impressions, comprehensibility of the questions and answers, missing aspects of safe and proper use of medications, redundant questions and questions, which exceed the expected level of patient medication knowledge.
Findings The final questionnaire consisted of 30 test questions divided into five categories with the following question themes: 1. Dosage: actions to take in the event of a missed dose, administration frequency, administration frequency for children, correct administration site, delayed effect medication adherence, dosage/administration signature interpretation, dose adjustments for children, duration of antibiotic therapy, duration of therapy for children, maximum daily dose, maximum daily dose for children, maximum single dose, shaking suspensions, tablet splitting, when to obtain refill 2. Adverse effects: actions to take if adverse effects develop, occurrence of adverse effects 3. Interactions: alcohol interactions, food interactions 4. Precautions: precautions signature interpretation, pregnancy, photo-sensitivity, precautions symbols on outer packaging 5. Other information: medication expiration date, medication disposal, medication storage temperature, storing medication out of children's reach, multidose preparation expiration date.
Conclusion A questionnaire measuring medication literacy among general population with supported content validity was developed. With further validations, the questionnaire can be used to better understand the level of patients' medication literacy and identify literacy gaps leading to development of suitable interventions.

The perspective of self-governing local communities regarding pharmacy services in Slovenia

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Background Pharmacy services in Slovenia are part of public health services on a primary level. The organization of appropriate pharmacy network via public institutions or concessionaire and provision of services is the role of local municipalities. However, little is known about the views of local governments on this matter.
Purpose We aimed to explore the views of Slovenian municipalities on pharmacy services, with special emphasis on the current state of the services, future developments and positions on pressing issues related to pharmacy services.
Method Mixed methods approach was used. Firstly, a questionnaire was sent to all Slovenian municipalities (212), covering 5 main themes: the current state of pharmacy services, pharmacy network, potentials for development of pharmacy services, collaboration between pharmacies and municipality, financing and economic issues related to pharmacy services. At the end we also asked for some general information about the municipality. Questionnaires were fulfilled by municipal workers, responsible for pharmacy services; the response rate was 35.8%. Secondly, in order to gain a more in-depth understanding of exposed issues, we performed a focus group with participation of 6 mayors, representing municipalities differing in size, region, type of pharmacy services provision and political background.
Findings The local governments believe pharmacy services in Slovenia are at a high level of expertise and organisation. Despite overall satisfaction, issues with accessibility in less populated areas,

insufficient level of collaboration with pharmacies and unsolved founding rights in public pharmaceutical institutions were exposed. Municipalities have recognised opportunities for further development, mainly in increasing the access to pharmacy services and strengthening the market share of public pharmaceutical institutions. Cognitive pharmacy services ranked high among future developmental goals; however, willingness to take needed measures (e.g. employing new pharmacists, provide financing for new services) is lacking. Mayors, participating in the focus group, also plead for a stronger role in management of public pharmaceutical institutions, claiming pharmacists' competencies for professional provision, while organizational and financial aspects can be covered by other profiles. The main challenges for faster development of pharmacy services in the future are improving the cooperation of municipalities and pharmacies, and ensuring stable finances for the establishment of new pharmacy services.
Conclusion According to municipalities pharmacy services in Slovenia are of a good quality, although several challenges and opportunities exist. The insights gained are of high value in planning future developments in pharmacy services, especially in the light of upcoming upgrade of Pharmacies Act in Slovenia.

Analysis of problems with the use of inhaled drugs among patients diagnosed with respiratory diseases

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Background Diseases, such as asthma or COPD require the use of inhaled drugs. Drug administration by inhalation allows the application of the drug directly to the airways, which contributes to reducing the dose of the drug as well as the occurrence of side effects. Despite the many advantages of the inhalation, route of drug administration, other than oral administration, may cause problems for patients.
Purpose Qualitative and quantitative assessment of the problems with the use of inhaled drugs among patients with respiratory diseases, who use inhalers chronically.
Method The survey study was conducted among patients with asthma and COPD who used inhaled drugs. Patients were asked to assess their ability to use the inhaler, indicate problems with using this device and indicate professional staff who gave them information about inhalator. The photos of the different type of inhalers were used to allow patients to identify all types of inhalers they use in daily routine. After identification, patients were asked to describe how they manage with using each type of inhaler.
Findings 113 patients were included, mean age was 65 years (SD 16, range 23–90). Patients used 1–4 types of inhalers at the same time in total (mean 1.7 types of inhalators per patient). In the self-assessment, the most (91%) of patients claimed they use their inhalers without any problems, and they are satisfied with the treatment (83%). However, the objective assessment of storage, cleaning, dosage control and rinse of the mouth after inhalation showed that only 28 patients (24.8%) perform all these steps correctly. Half of the patients had problems with the verification of the number of doses left in the inhaler, one in five patients was not sure if he applied the total dose of inhaled drugs. More than half of the patients (58%) observed side effects during the use of inhaled drugs. Patients reported 109 symptoms of adverse reactions, e.g. hoarseness and fungal infection of the mouth.
Conclusion Results of the study showed that problems with the use of inhalers are common among patients. Many of them could be solved by pharmacists, if only they offer pharmaceutical care and education to patients.

Feasibility and preliminary assessment of an interdisciplinary medication management service in Germany (ARMIN)

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Background Since July 2016, an interdisciplinary medication management (MM) service conducted by physicians (GPs) and pharmacists is offered within the project ARMIN. The overall aim is to improve both the effectiveness and safety of pharmacotherapy. To exchange information on patient's medication and drug-related problems a standardized medication plan (MP) is generated in the local software systems of both health care professionals (HCP) and exchanged via a central server.
Purpose The concept was piloted to evaluate this service including processes as well as the electronic exchange of the MP.
Method Twelve teams consisting of each one GP practice and one community pharmacy were involved with the aim to recruit approx. 10 patients each. The HCP were asked to fill in a questionnaire on (1) motivation to participate in the project, (2) estimated benefit of the service, (3) use of the software to generate the MP, and (4) completeness and understandability of the MP. Additionally, pharmacists and physicians were invited to participate in a workshop to discuss the new MM process as well as the interprofessional collaboration.
Findings Ten questionnaires filled by GPs and 8 by pharmacies were available for evaluation (response rates: 83.3 and 66.7%, respectively). During the workshop 11 teams were represented. Both HCP mentioned less adverse drug events as the main motivation to participate in the project. Additionally, GPs referred to the remuneration and saving of time and pharmacists indicated the introduction of a new pharmaceutical service and the option to contribute to medication safety in general as important reasons. Overall, the HCP appreciated that the MM process itself as well as that the distinct responsibilities were clearly defined. The initial brown bag analysis by the pharmacist was feasible and appreciated by the physicians since they could gain additional information. Approx. 75% of the HCP considered the generated MP to be complete and approx. 80% estimated that patients understood their MP. The interdisciplinary collaboration was valued by both HCP. In this early stage of implementation, technical problems with the server and local software were the main topics in the communication.
Conclusion Preliminary results from this pilot evaluation suggest that the process and shared but distinct responsibilities are appreciated by both groups. Technical problems have been identified as a challenge. Nevertheless, implementation in the local software is regarded as a precondition to offer the service in daily routine. Therefore, optimization of the software is needed in order to facilitate implementation of the service.

e-Health pharmaceutical services challenges: linking patients, pharmacists and physicians: lessons learned from ePharmacare Project

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Background The utilization of Information Systems and Technologies (IST) for the provision of healthcare services—e-Health—is a trend in health systems that will probably have an important impact on the definition of new roles for the community and hospital pharmacist.

Purpose The ePharmacare project was designed to explore the development of online pharmaceutical services. This project aimed to develop a prototype of a web-based patient management service, establishing its acceptability, feasibility, sustainability, and adaptability to future changes, involving end users in the development of the application.
Method Following a literature research, an online survey on the use of IST in Portuguese pharmacies and an observational study to study pharmacists' workload were organized to address system design requirements. The web-platform was tested in two different settings: (a) Three community pharmacies and; (b) A community pharmacist using the platform and scheduled meetings outside the pharmacy setting. Patients recruited were aged between 64 and 75, with at least a chronic medicine prescription. Initial training was given to pharmacists and to patients. The final evaluation of the web-platform included an eye-tracking test and a survey to both end users focusing on usability and utility of the application.
Findings Overall, the use of the platform by pharmacists has shown no signs of impact on their workload. However, the re-organization of pharmacy work, with clear roles assigned to each professional, and the possibility of using IST to improve pharmacy and patient management, are critical steps in the way to e-Health pharmaceutical service implementation across pharmacies. The frequent communication between patient and professional allowed the early identification of possible adverse reactions and showed some signs of possible impact on health outcomes that need to be further explored. Moreover, with the development of the work done in ePharmacare, the need to integrate several health information systems from the different healthcare providers became evident. Besides supporting chronic patients this system's integration should provide disease management stakeholders with mechanisms that assure accountability, credibility, and acceptability among other dimensions, which in turn would impact on factors such as communication, trust, professional recognition and needs assessment.
Conclusion This work highlights the potential value and challenges e-Health pharmaceutical services may bring to the profession not to mention patients. Future research should focus on the impact of an integrated primary-care e-Health pharmaceutical service on patients' health status, professionals' workload, patterns of pharmaceutical services provision and costs.

HAITool: supporting clinical pharmacist's role on antibiotic stewardship through an innovative information system

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Background Antibiotic prescribing is a complex process. Antibiotics are among the most prescribed and used drugs in clinical practice. However, it is estimated that 20–50% of antibiotics are improperly prescribed. Antibiotic Stewardship Programs (ASP) could contribute to optimize Antibiotic therapy, ensuring proper use and minimizing side effects.
Purpose This work aims at characterizing the utilization of antibiotics in an intensive care unit (ICU) of cardiac surgery after the first 6 months of implementation of an ASP. The implementation was made through both the collaboration of a multiprofessional team (internists, cardiac-surgeons, pharmacists and nurses), and the use of an information system (HAITool).
Method This retrospective descriptive study analyses data gathered 6 months before and after the implementation of the ASP. It was completed with an observational study focused on the role of the clinical pharmacist. The multiprofessional team visited the patients in the ICU ward weekly, focusing on patients with a length of stay higher than 7 days. Patients in this unit generally received antibiotic prophylaxis with vancomycin and gentamicin 48 h prior to surgery, but the focus of the intervention was on the post-surgery antibiotics prescriptions.
Findings A reduction of 3.61% in the overall consumption of antibiotics was observed, with ciprofloxacin and linezolid showing reductions of about 96%. On the other hand, consumption of antibiotics such flucloxacillin or amoxicillin/clavulanate showed an increase of 300–500%, suggesting a switch to first line antibiotics. The two most consumed antibiotics in this ICU were gentamicin and cefazoline. After 6 months of intervention, gentamicin consumption decreased 1.32%, while cefazoline consumption increased 27.38%. In 30% of the bedside visits, a pharmacist intervention was registered (e.g. dose adjustment or IV/Oral switch counselling; answering to pharmacodynamics requests; counselling on drug interactions). The access to information on antibiotics use, microbiology data and prescription patterns, through this evidence-based tool, was considered a major driver for a successful ASP.
Conclusion It was clear that the HAITool in this hospital enabled a quick access to information that was critical to inform the successful implementation of the ASP. Nevertheless, data regarding the total consumption in DDD per 1000 patients is still needed to strengthen the analysis of the results and allow comparisons with other units. However, a better use and access to the information on antibiotics use, microbiology data and prescription patterns in the unit, will allow better tailored solutions to aid professionals in the implementation of ASP.

Pharmacy practice in community pharmacies from the view of pharmacy technicians

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Background Pharmacy technicians, alongside with master degree pharmacists, are crucial members for the performance of pharmacy practice in community pharmacies. In Slovenia, the pharmacy technician education is achieved by secondary school degree. Their main duties include patient counselling at dispensing nonprescription medicines, medical devices, and other products and they can dispense prescription drugs under pharmacist supervision. Patients visiting community pharmacies expect the pharmaceutical professional staff to have thorough and in-depth knowledge. A special attention needs to be made to continuous professional development.
Purpose To evaluate the opinion of pharmacy technicians about the current state of pharmacy practice, their current and future role in community pharmacies, and their opinions about the education for the profession of the pharmacy technician.
Method Firstly, a qualitative approach was applied using focus group method. Eight pharmacy technicians, who had an important role in co-creating activities in community pharmacies, were asked to discuss relevant themes regarding the role in pharmacy practice within community pharmacies. Secondly, based on focus group results, a survey questionnaire was created and sent to all the pharmacy technicians in community pharmacies in Slovenia (383 persons). A questionnaire consisted of 13 multiple choice or five-point Likert scale questions evaluating technicians' perception of satisfaction at work, current position in pharmacy practice, current and future role in pharmacy practice, and perception of education and professional development. Demographic data was also collected.

Findings The focus group participants stated that pharmacy technicians in general are adequately qualified to do the legally allowed work, but life-long learning on individual level is necessary. Furthermore, all focus group participants expressed a very clear conviction that by upgrading the profile of the pharmacy technician the entire pharmacy team would benefit and would add the value to the pharmacy practice. According to the opinions of the focus group, the pharmacies are not uniform in relation to assigning working tasks to a master degree pharmacist or to a pharmacy technician. It appears that pharmacy technicians dispense prescription medicines without direct supervision. In total 109 pharmacy technicians responded the survey (29% response rate). The results revealed that pharmacy technicians were an important part of the pharmacy team (80% confirmation) and that they were appreciated by their colleagues (85% confirmation) or by the pharmacy visitors (90% confirmation).
Conclusion This study expressed current and future role of pharmacy technicians in pharmacy practice from their perspective. These results are helpful for the future development of pharmacy services in community pharmacies in Slovenia.

Overview of pharmacist consultant practice in the Community Health Center Murska Sobota in Slovenia

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Background Clinical pharmacist-consultant was a development project supported by the Health Insurance Institute of Slovenia aiming to evaluate clinical data available medication reviews (i.e. type 2b or 3) performed by clinical pharmacists. The project lasted between November 2012 and December 2015 and was firstly introduced in the Pomurje region (Murska Sobota). Patients were referred to medication review by their own GPs, who also stated the reasons. The pharmacist consultant practice took place in community health centres on a weekly basis and in nursing homes on a monthly basis.
Purpose To overview clinical data available medication reviews performed under pharmacist consultant practice in outpatient setting in the Pomurje region. The overview included the management of optimisation of medicines use, detection of drug related problems and interventions recommendation.
Method In this observational study, patient characteristics (gender, age, patient interview, reasons for referral, number of diagnoses and medicines) were collected. The data regarding presence of drug related problems (presence of vertigo, hypersensitivity to medicines, clinically important potential drug–drug interactions) and recommended interventions (changes in dosing regimens, newly introduced medicines, and medicine discontinuation or replacement) were considered.
Findings In total, 495 medication reviews were obtained. Patients' interviews were feasible in 35% cases (type 3 medication review). Mean age was 71 years, 62% were female. Several reasons for referral to medication review were stated. Polypharmacoterapy was the main reason (76%), followed by possible adverse drug effects (25%) and patient specific health state (9%). Mean number of prescribed medicines per patient was 12.5 (range 1–31). Mean number of evaluated diagnoses per patient was 6.6 (range 1–19). Hypersensitivity was recorded in 20%, primarily to penicillins and sulphonamides. Vertigo was present in 8% patients, in 70% of cases it was related to medicines use. Furthermore, 159 potential drug–drug interactions type X and 947 interactions type D were identified. In the recommendations only 19 type X and 232 type D potential drug–drug interactions were left. Other recommendations included 790 medicines discontinuations, 780 therapy replacements and 210 newly introduced medicines. Mean number of prescribed medicines was reduced by 1.4 medicines per patient. Changes in daily doses and dosing intervals were recommended for 46 and 75% of the patients, respectively.
Conclusion This study reveals that significant changes in patients' pharmacotherapy are recommended in order to optimise medicines use. However, studies aiming to link such optimisation proposal to realisation in GP's practice and further to improved health outcomes are warranted.

Pharmacist-patient communication during a post-discharge home visit

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Background Patients drug therapy is often changed during hospitalization. At hospital discharge patients can be confused with medication-related information, resulting in improper drug use and consequently an increased risk of adverse events or reduced effectiveness. A post-discharge pharmacist home visit may reduce these problems.
Purpose An effective home visit depends on active participation of both the pharmacist and the patient. This study aimed to describe the topics discussed during a post-discharge home visit.
Method A qualitative study was conducted, using data from the HomeCoMe-study in which protocol-led post-discharge community pharmacist home visits were performed between November 2013 and December 2014. Sixty-three home visits were recorded and transcribed verbatim. The initial coding framework of (sub)topics was based on the HomeCoMe-protocol and consisted of two main categories: (1) clinical, e.g. health status and (2) medication-related, e.g. medication regimen or side effects. Next, a data-driven iterative approach was used by two researchers to code all text fragments, complete the coding framework and identify the initiator of specific (sub)topics. Finally, frequently occurring topics were analysed and linked to the initiator.
Findings First analysis showed that pharmacists and patients discussed both main categories in all home visits consultations, with medication-related topics being most-discussed. The most prominent medication-related subtopic was "Administration and use", which includes pharmacists clarifying a medication regimen or helping with a drug-taking issue for example, followed by "Medication information", e.g. pharmacists explaining the indication for prescribing. Less frequently discussed were the "Effect of medication", "Logistics" and "Adherence". Next, the two major subtopics within the clinical category were "Patients' general health" and "Reason for hospitalisation". These included a listing by the pharmacist of patients' health issues and whether patients felt their symptoms improved or worsened. The pharmacist initiated discussion in the majority of cases, but the patient substantially initiated specific queries regarding the effect and regimen of their medication for example. Finally, a few other topics were more frequently initiated by the patient, such as complaints regarding information transfer between hospital and home and home delivery of medication.
Conclusion The myriad of medication-related and clinical topics discussed illustrates the relevance of a post-discharge home visit. As the consultations were protocol-led, it was expected that pharmacists initiated the majority of topics that were discussed. However, the patient-initiated topics are important to address and should be used to improve the home visit protocol.

Characteristics of the use of proton pump inhibitors among older people with intellectual disability

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Background Proton pump inhibitor (PPI) use is common despite evidence of the potential for harm with long term use is growing. Information about use in older people with ID, a vulnerable group, is limited despite a high rate of gastrointestinal conditions.
Purpose To characterise the use PPIs among older people with intellectual disability and explore the associations with factors known to influence medication use in this population.
Method The Intellectual Disability Supplement to the Irish Longitudinal Study on Ageing (IDS-TILDA) is a longitudinal cohort comprising a national randomly selected, sample of people of 40 years and older with intellectual disability from the National Intellectual Disability Database. Data from IDS-TILDA Wave 2 on 677 persons in 2013/2014 with medication information, was used to extract PPI use and gender, place of residence, level of ID and age. Medicines were classified with WHO Anatomical Therapeutic Chemical (ATC) classification and doses were classed as low, medium and high dose using the Summary of Product Characteristics published on the website of the Medicines Regulator. Descriptive statistics and bivariate analyses were performed.
Findings Over a quarter, 27.3% (n = 185), of participants reported use of PPI, and 54% (n = 100) were female. The largest proportion of PPI users (54%) were aged between 50 and 64 years. Only 42.7% of PPI users had an indication of PPI use (Peptic Ulcer, Gastroesophageal reflux disease (GORD) or/and an NSAID use) and GORD (38%) was the most common. Most (70%) PPIs were used in medium doses. Use among those in residential care homes (54.3%) was much higher than for those living independently or with family (7%). PPI use among those who have severe/profound ID level was 26% higher than those with mild ID level. Information about the length of PPI use was missing for 33% but of those with data, just over half recorded using the PPI for more than a year. Lansoprazole, omeprazole and esomeprazole were all used in over 25% of PPI users. NSAID use without any record of a PPI was reported in 8% of participants.
Conclusion PPI use among older people with intellectual disability is prevalent and frequently long term, often without a clear indication. PPI use needs to be assessed regularly, especially among the oldest and those with severe/profound ID, in order to avoid inappropriate long term use that could expose them to risk and potential harm.

Health impact of pharmacotherapeutic drug information consultations (PDIC) in community pharmacy

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Background When patients and users come to the pharmacy, as well as the dispensing of drugs, the community pharmacist (perceived by the user as a sanitary agent), carries out work of advice and consultation on issues related to health and medicines. Pharmacotherapeutic drug information consultations (PDIC) are those in which the patient or user only requests information about pharmacotherapy, on any of its aspects, excepting consultations on minor ailments.
Purpose To evaluate in the Community Pharmacy the impact of the attention and resolution of the PDIC on the health of the patients that demand them, measured in terms of Drug Related Problems (DRP) and Negative Outcomes associated with Medication (NOM) avoided and/or resolved by the interventions derived from this activity.
Method Analytical and prospective study of pharmacy practice in a community pharmacy of Valencia where the PDIC that patients and users demanded for 6 months of 2014 were registered. The PDIC data were recorded in a Case Report Form (CRF) and subsequently analyzed with Microsoft Access® and Excel®. The variables used described qualitatively and quantitatively the PDIC and were grouped in: the applicant information, consultation information and information from the impact of the consultation.
Findings During the study 428 PDIC were recorded. PDIC can be classified as preventive and verifying. Preventive PDIC represent 55% of the total. The difference between both types is based on the objective of the consultation on pharmacotherapy. The purpose of Preventive PDIC is to prevent a possible risk situation in the process of using the medication, while the purpose of verifying PDIC is to confirm a certain information about pharmacotherapy or request the endorsement of decisions in the medication-use process. 67% of PDIC identify NOM and/or DRP that can be resolved and avoided, respectively, with success rates of 64 and 94%. The majority of NOM are related to safety and the most frequent DRP are those related to erroneous drug administration.
Conclusion The attention and resolution of PDIC is a clinical activity that provides a positive impact on the health of patients to whom it is addressed due to its informative nature as well as its capacity to prevent, identify and resolve DRP and NOM that occur during the medication-use process. In order for this activity to become a differentiated and sustainable health care professional service, it is necessary to register it, standardize the classifications used, register it, and pay it back.

REVISA® Project. Implementation of the medicines use review (MUR) service in the Spanish Community pharmacy

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Background Medicines use review (MUR) is a pharmaceutical service that has been carried out during the last years in several developed countries. There is currently no medication review service provided by community pharmacy in Spain. For this reason SEFAC (Spanish Family and Community Pharmacy Society) designed the REVISA® project to implement a MUR service in Spain based on the British MUR service. Funding: The Revisa® project has been partially financed by laboratories Teva and Ratiopharm.
Purpose Implementation of a defined MUR Service at the Spanish community pharmacy.
Method The key activities defining the REVISA® project are: 1. Creation of SEFAC Pharmacy Professional Services Commission in 2012, and subsequently the RUM subcommission integrating, among others, Spanish pharmacists qualified in the British MUR service. 2. Preparation of the Specification Document and the Standard Operating Procedure for the MUR service in 2013. 3. Design an observational pilot study of the MUR service in community pharmacies around Spain in 2015, and a pilot programme to train community pharmacists who voluntarily decided to take part in the pilot study. 4. Piloting the training programme and the study in 2016 and disseminating the results. 5. Extension of the training program to

all community pharmacists in 2017 and creation of an observatory for the implementation of this service. 6. Co-design a MUR service together with patient associations and medical scientific societies in 2017–2018. Review by the commission of bioethics of SEFAC and design complementary studies about health benefits and cost effectiveness. 7. Presentation of the proposal to include the service in the pharmaceutical part of the national system of health and the other entities providing health care in 2019.
Findings The achievements of the REVISA® project up to the present moment are as follows: A pharmacist team working together for the same aim. Development of procedures and specifications for the delivery of MUR service by community pharmacy. Implementation of a MUR service programme training for community pharmacists, and 51 community pharmacists trained in all over Spain. Obtaining unknown data in Spain on the MUR service from the pilot study conducted in 64 community pharmacies on 495 patients and 2.811 medicines reviewed. Development of the module of the computer application SEFAC_EXPERT® (clinical management of the community pharmacy pharmaceutical services) for the MUR service.
Conclusion The Revisa® project through the MUR subcommission continues its scheduled path, taking the key steps to implement the MUR service in Spanish community pharmacies.

REVISA® Project. Medicines use review (MUR) training programme. A new learning methodology

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Background SEFAC (Spanish Family and Community Pharmacy Society) created a pilot project for Medicines Use Review (MUR) service in Spanish pharmacies. Before full implementation, a training programme was designed for the pharmacists to learn the correct skills to conduct the MUR service in their pharmacies.
Purpose Developing a training programme for community pharmacists to enable them to conduct the MUR service in a pilot project.
Method The training programme designed was based on three parts: Part one: Theoretical training • Review of the main logistic and legal topics regarding the setting up of the MUR service in Spanish pharmacies. • Pharmacology update via videos where MUR service is delivered and recording data accurately. This part was imparted and evaluated through an e-learning platform. Part two: Practical training During an 8-h day, several groups from 12 to 16 pharmacists were trained in assisting in a research study and MUR skills. The "Researcher Manual" explained the development of the pilot project and a group activity was carried out to formulate the essential criteria of the different parts of the MUR. The rest of the day consisted of three blocks and the pharmacists, divided in groups of four per teacher, assessed four clinical cases. Teachers were pharmacists qualified in MUR in Britain. Part three: Clinical training This was carried out in each community pharmacy in the pilot study. A minimum of eight MUR cases per pharmacist were required.
Findings 76 Pharmacists were registered for this training programme: 64 pharmacists recorded a total of 491 MUR services (an average of 7), but 13 pharmacists didn't achieve the minimum quantity of MUR required for the study. Therefore, 51 pharmacists successfully completed the SEFAC Training Programme for MUR service and were ready to conduct it at their pharmacies. A survey regarding the training programme was answered by 28 pharmacists; 65% of the respondents gave the highest score to the theoretical training and the structure of the practical training, whereas 57% fully agreed that the length of the practical training was enough to achieve the right skills. The division of groups in 4 per teacher was very well appreciated, 79% respondents gave this the highest score.
Conclusion SEFAC training programme was very much appreciated by the participating pharmacists, and was successful in provide the pharmacist the confidence to face the MUR service at their Spanish community pharmacies.

REVISA® Project. Pilot study of the medicines use review (MUR) service in Spanish community pharmacies

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Background The Medicines Use Review (MUR) service consists of a pharmacist performing alongside the patient a structured review of the knowledge degree that the patient has about his medicines and the use that he makes of them.
Purpose Study of the MUR Service in Spanish community pharmacies.
Method Observational, descriptive, transversal and multicentre study, performed between March and July 2016. The Pharmacist participating in the study received a previous specific training about the MUR service and the study methodology. A total of 495 patients from 64 Spanish pharmacies participated in the study. Inclusion criteria are patients belonging to one of the following target populations: polymedicated, taking "high-risk" medicines, having problems managing medication, significant changes in medication in recent months, or suspect of adverse effects. The main variables are the patient's knowledge about their medication and therapeutic adherence. A descriptive analysis and a bivariate analysis were performed for the comparison between variables.
Findings Patients have a low knowledge degree about their treatment according to the resulting data obtained from the 2.811 knowledge test evaluated using a validated test. The items about precautions, adverse effects, contraindications and interactions are those where the patients had less knowledge degree about. Meanwhile treatment dosage and regimen are highlighted as those items with more knowledge degree. The patients studied showed a low adherence to their pharmacological treatment according to the Morisky-Green test. In reviews, 298 drug related problems (DRP) were detected. These DRP were: interactions 42%, difficulty of use 37%, duplicities 15% and contraindications 6%. In 65% of the reviews the patient was referred to another pharmaceutical service. 98.5% of participant patients referred to be satisfied or very satisfied with the service. 90% of the patients would use again the service, and 91% would recommend it to another person. 73% of the patient would be happy to pay between 5 and 20 euros. Only 14.5% would not be happy to pay at all for the service.
Conclusion The results obtained in this study show the need to implement MUR service. The most important reason is the low knowledge degree that patients have about their own medicines. MUR service would improve not just the adherence but the effectiveness of the treatment and therefore the management of their medication. These improvements could lead to a decrease in hospital emergency services and drug spending that will have to be demonstrated in future studies. The Revisa® project has been financed by laboratories Teva and Ratiopharm.

Self-management research of asthma and good drug use: a cluster controlled trial (SMARAGD study)

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Background Maintenance therapy with inhaled corticosteroids (ICS) has a central role in gaining and maintaining asthma disease control. Interventions by community pharmacists have been reported to improve inappropriate inhalation technique, asthma disease control, patient reported asthma-related functional status, asthma severity and symptoms. Nevertheless, there remains room for further improvement of delivery of pharmaceutical patient care.
Purpose To assess the effectiveness of tailored pharmacists' monitoring on asthma disease control in ICS-users.
Method Asthma patients (18–60 years) using ICS from two intervention (IG) and two control (CG) pharmacies were invited. Participating patients completed questionnaires at study start and after 6 months, including the Control of Allergic Rhinitis and Asthma Test (CARAT)-questionnaire. IG-patients completed the CARAT every fortnight and received counselling on asthma disease, ICS-adherence, inhalation technique and self-management by pharmacists when scores were suboptimal, deteriorated or missing. For Turbuhaler® users, additional electronic monitoring of inhalation medication (EMI) was available, with daily alerting for ICS-intake. As primary outcome, CARAT-scores at 6 months were compared between IG and CG in a linear regression model. As secondary outcomes adherent patients according to refill-adherence (periods of drug use covered, PDC) and MARS-5 scores were compared with logistic regression. Finally, patients with EMI were compared to non-EMI users.
Findings From March to July 2015, 39 IG and 41 CG-patients were enrolled. At follow-up, CARAT-scores did not differ between IG and CG (−0.19, 95% CI −2.57 to 2.20), neither did patient numbers with ICS-adherence >80% (0.82, 95% CI 0.28–2.37) or MARS-5 scores >20 (0.55, 95% CI 0.15–2.05). In EMI-users, ICS-adherence at an PDC >80% was 4.52 times increased (95% CI 1.56–13.1) compared to non-users of EMI, but no differences were seen for the other measures.
Conclusion Our results did not show an effect of tailored pharmacists interventions on patient reported disease stability in a general asthma population compared to usual care. To support non intentional non-adherence in this population EMI might be effective, but this needs to be confirmed with higher patient numbers for a longer follow up period for clinical outcomes.

Warfarin interactions and related side effects among outpatients in Estonia

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Background Warfarin is one of the most commonly used oral anticoagulants worldwide, but the numerous drug interactions involving warfarin are also well known. In addition to the identification of warfarin drug interaction, more information would be needed to manage the interaction and related side effects in daily clinical practice.
Purpose To identify warfarin drug interactions and analyse the frequency and characteristics of related side effects in outpatients of Estonia.
Method At GP centres 77 at least 50 + patients using warfarin and at least one more medicine were recruited. They were asked to self-assess the experienced complaints related to the use of medicines and the questions were focused on warfarin bleeding-related side effects as large bruises on skin, nosebleed, bleeding of gums and/or mucosal bleeding, red urine, bleeding during excreting and black stool. Information about INR values of previous 6 months was included by GPs. In this study the range of INR values 1.80–3.20 was considered as applicable for patients using warfarin. Warfarin drug interactions were identified by using SFINX-PHARAO database (SFINX—Swedish, Finnish, INteraction, X-referencing; PHARAO—Pharmacological Risk Assessment On-line). Type C4, D1, D2, D3 or D4 drug interactions, as clinically relevant, were included in the analysis.
Findings Warfarin drug interactions were identified in 45% of the study patients. The most commonly used medicines interacting with warfarin were amiodarone, simvastatin, ibuprofen and paracetamol. Bleeding-related but not severe side effects of warfarin were described by 60% of the patients with warfarin drug interactions. The most common problems were large bruises on skin and bleeding gums and/or mucosal bleeding. Patients with warfarin drug interactions had lower INR values than required. However, assessing the change of INR values was insufficient to detect warfarin drug interactions, especially in case of concomitant use of NSAIDs. Bleeding events were also reported by 45% of patients without clinically relevant warfarin drug interactions.
Conclusion Monitoring of the INR values and focusing only on drug interaction databases is not always sufficient to assess side effects that are caused by warfarin interactions. To ensure patients' safety, more patient centred approach is needed and attention has to be paid on patients' experiences connected with the use of medicines.

Economic aspects of medication supply for older patients with opioid-substitution therapy and polypharmacy

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Background The number of older patients with opioid-substitution therapy (OST) and polypharmacy is rising globally. Alternative supply models to assist these patients with their medication management and optimize medication adherence are required. Higher adherence is associated with reduced overall healthcare costs and reduced hospitalisation risk. However, evidence about cost-effectiveness of adherence-enhancing interventions is sparse. Electronic medication management systems might offer a benefit to older drug users receiving polypharmacy.
Purpose We aimed at (a) performing a cost-of-illness (COI) evaluation of older patients with OST and polypharmacy and (b) comparing a novel electronic medication supply model to usual care.
Method We estimated COI from a societal perspective during 1 year. Eligible patients attended an outpatient addiction service (OAS) in Basel (Switzerland), lived in stable housing near Basel city and received 3 or more medications and OST. Direct medical costs were obtained from health insurance records for the year 2014. Direct non-medical and indirect costs were estimated based on a survey of patients' caregivers. For the cost-comparison model, we calculated the mean costs for a novel supply model with electronic remote supply of polypharmacy in unit-of-use pouches, estimated changes in direct medical costs based on available literature, and compared costs

to usual care. A sensitivity analysis was performed based on the variability of cost items for the novel supply model.
Findings We included 29 patients (mean age of 47 ± 6.3 years, 6 ± 2 medications, 48.3% female) and health insurance records were available for 21 patients. None of the patients pursued a paid employment and 86% received disability benefits. Total yearly cost per patient was 109'611 Swiss Francs (SFr), with direct costs accounting for 30% of the total costs. With the novel supply model, total yearly costs per patient increased by SFr 2'509 for repackaging of medication, leasing of the dispenser, and time spent for travel, refill, and support (+2.2% compared to base case). According to sensitivity analysis overall costs did not substantially change with various estimations.
Conclusion Cost of illness for older patients with OST and polypharmacy is high, especially when considering indirect costs such as productivity loss due to disability. A novel electronic medication supply model increases overall costs marginally, but might offset the costs of more expensive alternatives such as homecare services and nursing homes. Further studies should evaluate the long-term benefits and cost-effectiveness of the novel supply model.

Pharmacist interventions for broad-spectrum antimicrobial drugs use in General Hospital Murska Sobota

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Background Rational use of antimicrobial drugs is essential for preventing resistance development which is most crucial in the reserve antimicrobials. One of the strategies to optimize pharmacotherapy with reserve antimicrobial drugs is to strictly control their prescription by the medical team by including a clinical pharmacist.
Purpose The aim of the present study was reveal the importance of a clinical pharmacist in optimizing pharmacotherapy with reserve antimicrobial drugs, and to demonstrate better treatment outcomes in patients by considering appropriate pharmacist's intervention.
Method The Special Order Form (SOF) for reserve antimicrobial drugs was developed in order to optimize treatment with reserve antimicrobial drugs. Investigation was conducted for prescribed therapies in 2015. The following data were collected: patient´s age, weight, height, glomerular filtration rate, liver or kidney disease, drug allergies, diagnose, prescribed antimicrobial drug, dosage of the drug, duration of treatment and potential pharmacist´s intervention. Where intervention was needed, physician's compliance to pharmacist´s advice (dose, duration of therapy, introduction of TDM) and treatment outcome was noted as well.
Findings A total of 2243 SOF for reserve antimicrobial drugs were reviewed. Pharmacist intervention was needed in more than a third of all cases (789 cases, 33.5%). However, in only 32.1% (253 cases) an intervention was actually made. Most of patients that received reserve antimicrobial drugs suffered from hospital acquired pneumonia (333 cases, 32.1%) for which the most often prescribed broad-spectrum antimicrobial drug was ceftriaxone (648 cases, 28.9%). Among the most needed interventions were reduction of therapy duration (325 cases, 35.1%) and dosage optimization (224 cases, 24.2%). Pharmacist's advice was taken into account in 238 of cases (76.8%). Nevertheless, the survival outcome showed that the recorded pharmacist's advice did not significantly influence the treatment outcome ($p = 0.117$). However, although the influence is not significant, the trend shows positive results of the pharmacist advice.
Conclusion According to the conducted study pharmacists have a important role in the therapy optimization with reserve antimicrobial drugs. Their interventions were needed in more than one third of all cases. The evidence of increased pharmacist interventions is the motive for introducing an electronic ordering system and the reorganization of pharmacist's work in the hospital.

Patient reported complaints as an inducement for interventions in medication reviews: the PROMISE randomised controlled trial

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Background Healthcare professionals mainly focus on potentially serious symptoms and tend to ignore common ones. However also less threatening symptoms may have a substantial impact on the quality of patients' live. As a suitable instrument was lacking, a questionnaire 'Patient Reported Outcome Measure, Inquiry into Side Effects' (PROMISE) was developed to collect information on patient reported symptoms.
Purpose To determine whether PROMISE was useful to assist patients in preparing themselves for a clinical medication review (CMR) and to facilitate pharmacists in reducing drug related symptoms.
Method A randomized clinical trial in 15 community pharmacies in the Netherlands was conducted between January and June 2016. Patients with written informed consent were randomised into an intervention group (IG) and a control group (CG). Outcomes were measured with PROMISE as well at study start as at follow up after 3 months. IG patients received a CMR at study start, CG patients had usual care until follow up. Patients could report all symptoms experienced during the last 4 weeks for 22 predefined symptoms in PROMISE and indicate whether they assumed these symptoms to be associated with their drugs in use as patient reported drug-associated symptoms (PRDAS). Number of PRDAS in IG and CG patients at follow up were compared with a negative-binomial log linear regression model, adjusted for age, sex and number of drugs in chronic use.
Findings Complete data of 78 IG and 67 CG patients were available. At study start IG patients reported on average 5.8 symptoms, 5.1 as PRDAS, CG patients 6.0 symptoms and 4.8 PRDAS. 56 (72%) IG patients and 51 (76%) CG patients reported at least one PRDAS at follow up, with an odds ratio of 0.85 (95% CI 0.38–1.88) for persisting PRDAS between the groups. Most frequently persisting PRDAS in the IG were 'muscle pain' (52%, 17 of 33 patients with persisting symptoms), 'dry mouth, thirst (63%, 20 of 32), and 'weakness, tiredness' (59%, 17 of 29) and in the CG: 'weakness, tiredness' (56%, 15 of 27), 'bruises, bleedings' (65%, 17 of 26), 'skin complaints (50%, 12 of 24), and flatulence (38% 9 of 24 patients).
Conclusion PROMISE aided patients to report various common symptoms and discuss PRDAS with their pharmacists. However, no difference was seen for the number of PRDAS at follow up compared to usual care. Further research is needed on how to enable pharmacists to deal with PRDAS.

Evaluation of potentially drug-related patient-reported common symptoms assessed during clinical medication reviews, a cross-sectional observational study

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Background Common non-alarming symptoms are often considered to be less relevant clinically, but they can be highly relevant from a patient perspective. Patients should be encouraged to report symptoms that might be related to drugs in use, for instance in the patient interview as part of a clinical medication review (CMR).
Purpose To describe the types and numbers of patient-reported symptoms assessed during a CMR and to elucidate their potential association with the drugs in use.
Method This observational study was performed using the data of a clinical trial on patient-reported outcomes of CMRs. Fifteen community pharmacies selected patients for a CMR with at least five drugs in chronic use. Patients were asked to complete the questionnaire on Patient Reported Outcome Measure, Inquiry into Side Effects (PROMISE). It offers a list of 22 symptoms experienced during the previous 4 months and to state whether the patient regarded a symptom to be drug related. In descriptive analysis this information was used together with information on their drugs in actual use from pharmacy dispensing data. For the drugs in use, 'very common' side effects (occurring in >10% of the users) were collected from the Summary of Product Characteristics (SmPC). The chance for each additional drug in use to contribute in the patient reporting a specific symptom as a side effect, was assessed with logistic regression analysis.
Findings 180 patients were included. 168 patients (93.3%) reported at least one symptom with the PROMISE instrument. In total patients reported 1102 symptoms for the 22 symptom categories. 101 (56.1%) of the patients assumed at least one symptom to be caused by a drugs in use. 107 (59.4%) of the patients reported at least one symptom that corresponded to a 'very common' side effect listed in the SmPC with a at least one of the drugs in use. The probability of a patient assuming a symptom to be a side effect was significantly increased for each additional drug in use for the symptoms 'dry mouth and thirst', 'constipation', 'diarrhoea', and 'sweating'.
Conclusion PROMISE was useful to collect numerous patient-reported symptoms and information on patients assumption that these symptoms might be related to their drugs in use. Use of several drugs with the same side effects resulted in an increased risk to be experienced by patients as side effects for the following symptoms: 'dry mouth and thirst', 'constipation', 'diarrhoea' and 'sweating'.

The role of pharmacist in medication reconciliation in general hospital Murska Sobota

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Background Incomplete drug history and poor communication within the health care team are often the cause of medication errors and adverse drug events. Medication reconciliation is the key to reduce the number of medication errors and to provide seamless care. Purpose The aim of the present study was to demonstrate the benefits of medication reconciliation by implementing it into everyday clinical practice in different departments of General Hospital Murska Sobota and to evaluate the role of the pharmacist in the coordination of patient hospital treatment.
Method The research was conducted in four departments: orthopedic, internal, surgical and infection diseases. Pharmacist daily reviewed the list of newly admitted patients by using the hospital information system Birpis and randomly selected patients that were included in the study. A comprehensive drug history review before admission to the hospital and medication treatment prescribed upon admission was performed. Potential discrepancies were identified. Pharmacist informed the treating physician about the medication inconsistencies and proposed treatment improvements.
Findings 108 randomly selected patients with an average age of 68.3 years were included in the study, among which 103 were receiving at least one drug at the time of the hospitalization. On average 6.35 medications per person were prescribed. In 53.4% of patients enrolled, at least one discrepancy was detected between the medication the patient was taking prior to arrival at the hospital and the one prescribed on the therapy list in the hospital. In total, 138 discrepancies (1.34 discrepancies per patient) were identified. 6 was the largest number of detected inconsistencies in one individual. The most common discrepancy (36%) was omission of a drug that the patient was taking before coming to the hospital. It was also shown that discrepancies were mostly present in medications for cardiovascular diseases (34%), gastrointestinal and metabolic diseases (23.7%) and medications for the nervous system (14.4%). Pharmaceutical intervention addressing the discrepancies in drug therapy was accepted by treating physicians in 55.6% of all cases.
Conclusion The study results show drug therapy inconsistences and omissions during hospitalization in General hospital Murska Sobota. Medication reconciliations were identified as vital to decrease medication discrepancies occurring during hospitalization.

Development of a transfer document for the community pharmacist at hospital discharge

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Background In 2013, only 54.6% of Belgian elderly patients had contact with their general practitioner (GP) in the first week after hospital discharge. Therefore, the community pharmacist (CP) can play an important role in continuity of medication management. However, there is currently no structured communication to CPs at hospital discharge in Belgium.
Purpose This research investigated which information CPs would like to receive to perform adequate medication reconciliation and patient counseling.
Method First, initiatives for information transfer to the CP were identified by an international and grey literature review. Next, a discharge document was developed and presented to 19 healthcare professionals (10CPs and 9GPs) during semi-structured interviews, and further optimized.
Findings Belgian community pharmacists would like to receive a full medication list containing drug indications, medication registered at hospital admission and reasons for drug adjustments. GPs acknowledged the benefit of sharing this information with pharmacists. In contrast to international initiatives, Belgian healthcare professionals were hesitant to include data on renal function and other lab values in the transfer document. The final transfer document contains the following elements: patient characteristics, clinical data (e.g. reason for hospitalization, comorbidities and allergies) and two comprehensive medication lists, one with drugs at admission and with drugs at hospital discharge.
Conclusion Consensus was reached on the content of a transfer document for the CP at hospital discharge. A proof of concept study will be conducted to investigate the impact of this transfer document on patient-related outcome measures. Automatic software generation of this discharge document and electronic transfer will be crucial elements for success.

Studying the impact of medication use evaluation by the community pharmacist (SIMENON): study protocol

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Background Many studies have shown that elderly, poly-medicated patients are prone to drug-related problems. Although there is growing evidence that the pharmacist could play a role in identifying and solving these problems, no structured pharmaceutical care services currently exist in Belgium to support elderly patients in their medication use.
Purpose The SIMENON study aims (1) to investigate the impact of a medication use evaluation by the community pharmacist on patient reported outcomes and (2) to describe drug-related problems and subsequent interventions identified during this review. In preparation for this intervention study, a feasibility study was conducted to test the proposed medication review process, formalize the educational program and develop supportive materials.
Method The medication use evaluation consists of a six step approach: patient inclusion, preparation by the pharmacist, patient anamnesis, analysis by the pharmacist, patient counseling and follow-up. In the feasibility study, nor the pharmacists nor the patients were recruited in a random manner. Instead, an iterative process with multiple individual and group feedback moments was conducted for data collection. In the SIMENON study, Belgian community pharmacies ($n = 80$) participate on a voluntary basis. Patients are recruited randomly at a ratio of 12 per pharmacy ($n = 960$). A before-after design is used to measure the impact of the medication review from the patient perspective. Patients are surveyed at three time points (before the intervention and 3 and 12 weeks after the intervention). The questionnaires focus both on humanistic (medicines related quality of life, patient satisfaction, self-management) and clinical outcomes (adherence). The medicines related quality of life is the primary outcome and is measured using the Living with Medicines Questionnaire. Drug related problems and solutions are documented throughout the medication review process by the pharmacist using the PharmDisk classification.
Findings In the feasibility study seven Belgian pharmacists included in total 19 patients. This exploratory research confirmed the six step approach and uncovered that pharmacists are reluctant to patient inclusion. Hence, a need for education on patient communication during the inclusion phase was revealed. Furthermore, a need for evidence-based information to guide pharmacists during the analysis phase, was identified. Based on these findings, an educational program was developed, including training on patient inclusion. The SIMENON study has just started and is expected to finalize in April 2017.
Conclusion This abstract describes the development of a protocol for an intervention study in which 80 Belgian community pharmacists perform a medicines use review for elderly, poly-medicated ambulatory patients.

Development and evaluation of an algorithm in medication management for best practice. Effectiveness of the intervention and translation into standard care for nursing home residents. The AMBER-study

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Background Residents of nursing home facilities are vulnerable to drug-related problems and inappropriate medication. Although Medication Review is a proven tool to optimise medicine use and to reduce drug-related problems it rarely is implemented into standard care.
Purpose The aim of phase I of the AMBER-study is to determine frequent and relevant aspects in the medication process in nursing homes. To consider the special conditions of the setting and to ensure a high feasibility, interviews with physicians, nurses, pharmacists and patients were performed. Results serve to develop an algorithm in phase II and III of the study, which aims to guide pharmacists in performing a Medication Review.
Method Based on a mixed-method approach, problem-centred, written interviews with health-care practitioners and patients were conducted. Open questions and 51 specific aspects on therapy and DRP were assessed, covering general challenges, patient goals, communication barriers, medical goals and pharmaceutical aspects. Parameters rated by more than 50% of the participants with an average score of 3 or higher on a scale from 1 to 5 (with 1 as being infrequent or irrelevant to 5 being frequent and relevant) were chosen as meaningful. In a second step, top five scores per profession were utilised and will be regarded for the algorithm.
Findings Qualitative research revealed communication problems as the major barrier in the medication process. Lack of information, missing knowledge about side effects and handling of drugs were further aspects, frequently mentioned by all health-care providers. Preliminary results of quantitative research show a high variability between the professions. Pain management, communication with the hospital, blood pressure control, blood sugar control and lack of feedback on the effects of the medication were rated as the most frequent and relevant aspects by pharmacists. Cognitive impairment, missing monitoring, polymedication, hampered communication with patients, blood sugar control and lack of knowledge on pill crushing and splitting were the most meaningful aspects rated by nurses. Physicians rated cognitive impairment, polymedication, risk of falls, pain management and blood pressure control as most meaningful.
Conclusion Preliminary results indicate that treatment goals in a nursing home setting clearly differ from ambulatory care. Communication barriers and missing information play an important role. Furthermore, blood pressure and blood sugar control, pain management, cognitive impairment and polymedication were rated as meaningful by more than one health-care profession. An algorithm for Medication Review in nursing homes needs to take these specific parameters into account.

Professional autonomy correlates with quality dispensing processes and pharmaceutical care services by community practitioners in a northern county in Taiwan

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Background Community pharmacies and physician clinics are both legal practice settings in Taiwan for pharmacists engaging in primary care. The quality of dispensing services would have substantial impacts on pharmacotherapeutic safety and efficacy and, certainly, on societal image of the profession toward the two settings; however, investigations are lacking.
Purpose The objectives of the study were to establish quality indicators for probing dispensing service quality, to investigate factors associated with better quality, and to compare quality of services offered by the two primary pharmaceutical care settings.
Method Questionnaires and indicators for estimating dispensing quality were developed by a panel of specialists. Questionnaires recorded relevant queries in six domains, namely practice setting characteristics, pharmacists' attributes, hardware and software at

work, medication management and inventory control, pharmacist-physician relationships, and societal environment and policy issues. Quality indicators reflected efforts devoted to dispensing processes (from receipt of a prescription till the delivery of medications), and pharmaceutical care services (face-to-face drug consultations, follow-up assessment, and patient reliance) by pharmacist practitioners. The survey instrument was distributed in 2008 via regular mail to random samples of community pharmacies (pharmacists-in-charge) and clinics (practicing pharmacists) in a northern County in Taiwan. Descriptive and multiple logistic regression were performed as appropriate.
Findings A total of 505 questionnaires (response rate 52.6%), including 231 pharmacy and 274 clinic practitioners, were collected. Multiple logistic regressions indicated that certain factors could predict quality of dispensing processes and pharmaceutical care services, respectively. Specifically, the overall quality of dispensing processes were better at community pharmacies (versus clinics), with more prescription drugs, regular check-up of medication expiration dates by pharmacists, confidence in medication storage conditions, and larger dispensing areas. In contrast, pharmacists with attributes of older age and physicians' employees were associated with inferior quality. The quality of pharmaceutical care services of NHI-contracted pharmacies and clinics were better if with larger dispensing area, in-person inventory check-up by pharmacists, and confidence in medication storage conditions. To the contrary, inferior pharmaceutical care service quality was associated with pharmacists of male gender, physicians' employees, and the Tai-Lin subarea.
Conclusion Professional autonomy should be the key to quality dispensing processes and pharmaceutical care services. Pharmacists endowed with greater responsibilities, by taking control of their practice settings, medication management, and inventory control, offered higher quality services to the public. To further validate the findings, researches from the perspectives of collaborative professionals and patients should be designed and performed in the future.

Evaluating internal medicine patients' comprehensibility of a standardized medication plan

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Background A standardized medication plan (MP) was recently enacted into German Law. It has never been studied if patients with chronic diseases requiring polymedication understand the standardized MP and can transfer the given information into practice.
Purpose The aim of the study was to evaluate if patients with polymedication comprehend the German national MP and what variables are associated with better comprehension.
Method 140 patients who took at least five medicines regularly were prospectively included in a cross-sectional study: 40 general internal medicine (GIM) patients, 50 patients with the primary diagnosis chronic heart failure (CHF), and 50 with diabetes mellitus type 2 (DMT2). We performed a structured test-scenario studying the handling of a provided MP then evaluated the execution of the information on the MP by filling pill boxes and requested patients' opinion. An established weighted scoring system, the "Evaluation Tool to test the handling of the Medication Plan" (ET-MP) for the filled pill boxes was applied. The corresponding ET-MP score (0–100%) was calculated in order to quantify the ability of the patients to handle the MP. In addition for CHF and DMT2 patients, signs of depression, cognitive function and self-care behavior in chronic heart failure were characterized using the PHQ-9, Mini-Cog, and G9-EHFScB-9 questionnaires, respectively.
Findings Only 37% (n = 52) of the patients were able to handle the medication plan without difficulties (ET-MP score >90%). The mean ET-MP score was 78 ± 56% (GIM: 86 ± 19%, CHF: 78 ± 23% ($p = .16$ vs. GIM), DMT2: 68 ± 30% ($p = .13$ vs. CHF; $p = .006$ vs. GIM)). Understanding of the MP was better in patients aged <70 years (83 ± 22%) compared to ≥70 years (71 ± 28%, $p = .004$). Patients with more or equal than 10 years of education achieved higher ET-MP results (88 ± 19%) than patients with <10 years of education (67 ± 27%, $p < .0001$). Patients with signs of cognitive impairment exhibited significantly lower ET-MP scores (61 ± 28%) than patients without cognitive impairment (80 ± 24%, $p < .0001$). There were no significant correlations of the ET-MP score with the number of daily medications, living situation, sex, the Charlson Comorbidity Index, the PHQ-9 Score, usage of a dosing aid or possession of a medication list.
Conclusion Many internal medicine patients with polymedication show problems using the standardized medication plan. Higher age, lower education and cognitive impairment identify patients that require additional assistance.

Medication management service in qualified community pharmacies (Apo-AMTS project)

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Background At present, there is no profound knowledge available on the effects of medication reviews on the incidence of drug-related problems in community pharmacies in daily routine and their value in Germany. A nationwide structured medication review is not yet implemented and only a few associations offer advanced training programs to acquire the necessary skills. One of these training programs, the Apo-AMTS project, was introduced in Westphalia-Lippe in 2012. Aim of the Apo-AMTS project is to identify, reduce, and prevent drug-related problems in patients with polymedication, and to establish a structured medication management in community pharmacies as inherent part of pharmaceutical services.
Purpose Aim of this Study is to evaluate how the medication management service affects the quality of the medication.
Method During an observational study within a period of 12 months, 120 pharmacies in Westphalia-Lippe will perform medication reviews for 1000 patients taking five or more drugs. The procedure comprises of two meetings between the pharmacist and the patient, a structured patient interview, a detailed check of the entire medication including OTC drugs and dietary supplements, and the preparation of a medication plan. This medication plan will be re-evaluated and updated after 3 months. The outcome of the pharmaceutical intervention will be evaluated by using the MAI score, the MRCI (Medication Regime Complexity Index) score, and the reduction of drug-related problems including its nature and the following intervention.
Findings While preparing the study, a revised and validated documentation sheet was implemented. The experience-based modification allows a more complete and reproducible documentation and closes the gap from a single medication review to ongoing medication management. The document is used as a guide to conduct structured medication reviews. The observational study started in October 2016. First results are expected in summer 2017.
Conclusion Medication management is a feasible approach in the German pharmacy setting and has the potential to improve the quality of drug therapy in patients with polypharmacy.

Mapping the complexity of work functions related to medication in the transition between hospital and home. Piloting a new approach

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Background Many studies have explored the nature and consequences of medication-related adverse events arising at the transition between hospital and primary care. Another approach to patient safety is to recognize that failure and success have the same source. The performance variability of multiple and complex interrelated functions may combine and lead to non-linear consequences later in the workflow.
Purpose To map the medication-related work functions at transition between hospital and home and describe potential variability in central work functions using the Functional Resonance Analysis Method (FRAM).
Method Central work functions were identified and described, based on data from five patients. Patients were followed from the decision to discharge until the patient received medication from a community pharmacy and initiated treatment at home. Focus for the collection of data was medication availability and information as prerequisites for correct use of medicine. Data were collected by one of the researchers observing the patient discharge interviews, performing interviews with patients before and after discharge, and reviewing hospital and medication records. A workshop was held with a hospital doctor, a hospital nurse, a general practitioner, a home care nurse, two social and health care workers, two social and health care helpers, a municipal risk manager and a community pharmacist. The participants gave input to "work as done" with medication at and after hospital discharge. For each work function, the aspects of input, output, time, control, preconditions and resources related to the function were described. The FRAM Visualizer software was used for mapping work functions and their complex interactions. Potential variability and control functions emplaced to dampen resonance were identified.
Findings Mapping the discharge process revealed a complex picture of 35 individual work functions related to medication availability and information. Potential variability in terms of timing and precision was identified in all functions, particularly in the functions "discharge interview" and "electronic prescribing", where little timing and consistency were found concerning the information about medicines. This resulted in home care, general practice and community pharmacy emplacing informal control actions to moderate the consequences of this variability. An example of an informal control function is "calling the hospital ward to get missing prescriptions". No control functions were identified for the medication-related functions undertaken by the hospital doctor.
Conclusion The FRAM method proved useful in mapping the complex work processes related to medication at hospital discharge, and identifying critical steps important for patient safety.

Awareness campaign on atrial fibrillation in Portuguese community pharmacies: preliminary results

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Background In Portugal, Atrial Fibrillation (AF) has a rate of underdetection of, approximately, 36.0% and one in three strokes is due to AF. Community pharmacies are the most easily accessible health care resource for citizens, and constitute therefore the ideal venue to search for people with possible cardiac abnormalities, such as AF.
Purpose To raise awareness of AF by conducting a screening campaign aiming to search for people with signs and/or symptoms suggestive of AF in the general population; and to pulse take all patients agreeing to participate.
Method A cross-sectional study was conducted during 1 week (21th until 26th of November of 2016) in 24 community pharmacies in mainland Portugal. Pharmacies from Spain, New Zealand, Canada and UK also joined this initiative. This abstract reports the findings from two of these located in the Lisbon area. Patients resorting to those pharmacies during the campaign period were invited to join. Those agreeing, had their pulse taken manually by their pharmacist, were applied a checklist evaluating the presence of symptoms, medical and pharmacotherapeutic history. If the patient's pulse was above 100 beats per minute or irregular, the pharmacist referred the patient to the family doctor for further evaluation. Data was analyzed using IBM SPSS v. 22.0 (uni- and bi-variated analysis).
Findings A total of 21 patients were recruited. The majority of the sample was female ($n = 15$; 71.4%) and the mean age of the participants was 57.90 years old ($SD = 16.02$). In these preliminary results, two patients (9.5%) were referred to the family doctor for further evaluation. One of them presented a heartbeat above 100 beats per minute, an irregular pulse and characteristic symptoms (shortness of breath at rest, tiredness and lower limb edema); the second patient was asymptomatic and simply presented an irregular pulse. None of the patients was medicated with OAC, but the first was taking low-dose aspirin. No confirmation was yet received from the physician.
Conclusion These preliminary results show that this awareness campaign can be a successful way to not only raise the general population's knowledge of this condition, but also possibly to increase the rate of early detection of cardiac abnormalities, including AF. The target sample for each pharmacy is 100 participants, hence more results will be presented at the conference.

Evaluation of the implementation of an interprofessional type 2 diabetes adherence program in Swiss primary care setting

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Background An interprofessional medication adherence program (SISCare®) was selected by the Swiss government to promote the pharmacist's role in primary care. It is adapted from a successful standardized and evidence-based practice model. The program includes motivational interviews, electronic drug monitoring and feedback reports to the patient and the physician. During the interviews, a web-based platform allows to record the patient's data and to guide the pharmacist. SISCare® is currently in implementation since April 2016 in primary care setting for type 2 diabetes patients (DT2).
Purpose To assess the implementation (process, impact and outcomes) of the program SISCare-DT2 in primary care setting applied to chronic patients taking at least one oral antidiabetic drug.
Method Semi-structured interviews and focus groups with pharmacists were conducted and analysed using the Framework for the Implementation of Services In Pharmacy (FISpH). We reported a set

of implementation measures at 32 weeks: (1) implementation process (number of pharmacies moving through the stages: exploration, preparation, testing, operation, sustainability), (2) implementation impact (evaluation of influencing factors, implementation strategies), (3) implementation outcomes (e.g. reach, fidelity).
Findings Thirty volunteer pharmacies were trained for the program and accepted to participate in the study (phase: exploration). Among them, at 32 weeks, 25/30 (83%) have implemented at least one implementation strategy (phase: preparation) and 15/30 (50%) have included at least one patient (phase: testing). We observed a common step-by-step implementation process in the pharmacies: (1) internal organisation (workforce coaching, identification of eligible patients), (2) preparation of the interprofessional collaboration (local networking with physicians); (3) relationship-building with the patients (e.g. targeted use of the leaflet). The main facilitators were the previous use of the web-based platform and the involvement in other interprofessional programs. The lack of perception of a return on investment, as well as of the added value of the service may be barriers for the pharmacists. Sixty-six patients were included (mean inclusion per pharmacy: 4.4 [min 1–max 20]. The targeted number of patients per pharmacy is ten. Analysis of the fidelity (e.g. the degree to which the service is performed as it was originally designed) is currently ongoing.
Conclusion The implementation of the program SISCare-DT2 in primary care setting is in progress. Focus groups have just been conducted to better understand influencing factors notably during the sensitive stages of the implementation. This formative evaluation allows to continually adapt support tools and to tailor implementation strategies according to the pharmacies contexts.

Overview of the legislative framework for pharmaceutical care and its role in the recognition, prevention and management of adverse drug reactions

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Background Pharmacists are the most accessible healthcare professionals and pharmacotherapy consultants. Increasing the patient awareness of medicines is a key aspect of the good pharmacy practice (GPP) documents worldwide. Therefore pharmaceutical care could be used as a tool for promoting pharmacovigilance activities in society.
Purpose The aim of the study is to explore the European legislative framework, national and international guidelines regarding pharmaceutical services and concept of pharmaceutical care. The main objective of the work is to analyze the "preventing harm from medicines component" of the GPPs in the context of the new pharmacovigilance legislation.
Method The main European legislative documents regarding medicines for human use and the implementation of their requirements on national level has been analyzed. The special emphasis was put on the role of the pharmacist as a highly qualified consultant and source of information on the healthcare system and medicinal products. The FIP/WHO guideline on GPP, the Bulgarian rules for GPP and the PGEU annual data and factsheets have also been included in the analysis. We specify the main components of the pharmaceutical care and show the feedback from some newly developed pharmacy services programs in several member states.
Findings The general framework of the European pharmaceutical legislation is focused on providing the patient with safe and effective medicinal products of high quality. As well as the requirements regarding manufacturing process, clinical trials and prescribing, another main component is the communication between pharmacist and patient which aims at informing and consulting consumers for both the benefits and the potential risks of the therapy. These requirements are based on the GPPs and are implemented in Bulgarian legislation. PGEU data from several member states showed that additional pharmacy services other than dispensing medicines could improve patient compliance and facilitate treatment process. They are also a tool to help society understand better the medicinal product life cycle, the importance of adverse drug reactions reporting and the impact this could have on the development of the pharmaceutical system.
Conclusion Pharmaceutical care is the most accessible and patient-friendly method to show that the main focus of the healthcare systems worldwide is patient safety. Broadening the scope of pharmacy services by including information on pharmacovigilance and adverse drug reaction reporting could help patients take a more active part in the treatment process, improvement of compliance, adherence and drug safety.

Patient access to high-priced hepatitis C antiviral medicines and financial risk associated to their delivery in community pharmacies: a case report in Switzerland

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Background The reimbursement scheme and high GDP per capita in Switzerland should guarantee an easy access to new high-priced hepatitis C antiviral medicines (HCVm, e.g. Harvoni®). However, some patients experience difficulties obtaining their treatment in community pharmacies.
Purpose To quantify and investigate the issue of obtaining HCVm in a Swiss canton (Canton of Vaud) and to describe the process flowchart for HCVm delivery in a community pharmacy to understand the potential financial risks that could lead to a refused delivery.
Method First, attitudes and experiences of community pharmacists in the Canton of Vaud ($n = 249$) were explored by an online survey in April/May 2016 (Google forms). Questions were on the number of patients with an HCVm prescription during the last two years, the number and reasons of refused deliveries, as well as patients' reorientation or not to another pharmacy. Second, we estimated a range of total costs of the delivery and gross financial results for a 3-month treatment with Harvoni® using the process flowchart for HCVm delivery. We included all steps: (1) directly related to patient contact: e.g. check insurance status, identification of drug-related problems, counselling, and (2) to activities in the back-office: e.g. billing process, drug ordering. Several scenarios were tested according to different criteria: (1) clinical (e.g. patient with/without other health problems), (2) therapeutic (e.g. prescription within/outside the restricted medical indications), and (3) organisational (e.g. task division between pharmacist and technician). Data were based on a 2-year experience with 68 patients in one pharmacy. We performed univariate sensitivity analyses to extrapolate results to other pharmacies.
Findings Of the 114 respondents (participation rate: 46%), half had already managed a patient with an HCVm prescription (60/114, 53%). Out of them, 23% (14/60) refused delivery to at least one patient. The main reasons were: reimbursement uncertainty, financial risk and commercial strategy. Patients were often not reoriented in case of non-delivery (10/14, 71%). In some scenarios, delivery of an HCVm resulted in direct financial loss and fees-for-services never covered professional services.
Conclusion Access to high-priced HCVm is hampered by the financial risk supported by pharmacists (working capital requirement, insufficient remuneration, potential loss). A network of specialized pharmacies ensuring HCVm delivery might resolve this issue. The simulation study was based on one pharmacy, however, sensitivity analyses allowed extrapolation to other pharmacies.

Importance of promoting best practices in pharmaceutical care to healthcare stakeholders and general public: Croatian example

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Background There is a great need to document, promote and disseminate best practices in pharmaceutical care and advanced patient-oriented services to the public, government and healthcare stakeholders, to empower the role of pharmacists in modern healthcare system.

Purpose We wanted to strengthen the position and accentuate the contribution of pharmacist in Croatian healthcare through the enabling the access to the best pharmacy practices, which can serve as a basis for upcoming scientific and professional research of pharmaceutical care. On the occasion of World Pharmacists Day (FIP), Croatian Pharmaceutical Society organized the 1st Forum of Excellence in Pharmaceutical Care with equal FIP's WPD 2016 slogan "Pharmacists: Caring for You." aiming to promote best practices in pharmaceutical care in Croatia, and to document pharmaceutical interventions that are implemented during past decade on community and hospital pharmacy level.

Method Croatian Pharmaceutical Society organised 1st Forum of Excellence in Pharmaceutical Care and created the Book of abstracts-publication (digital and hard copy) of best practices in pharmaceutical care in Croatia (community and hospital pharmacies) in the context of the: contribution to improving proper, responsible and rational medicines use and outcome; prevention and disease management; health promotion, contribution of pharmacist to health literacy of patients and public health activities in the local community. We documented 14 best practice examples in pharmaceutical services/interventions and presented them during Forum, including 4 general discussions on pharmaceutical care and lecture (by general practitioner) on collaboration between a physician and pharmacist. Healthcare stakeholders were invited to Forum, and general public was introduced to publication on best pharmacy practices throughout PR activities. Digital publication on best practices in pharmaceutical care in Croatia: Ćhttps://issuu.com/farmaceut.org/docs/forum_izvrsnosti_all_final_crop?e=12540525%2F30000297.

Findings This initiative was a step towards documenting and promoting valuable and excellent engagements of pharmacists (best practices) and modern pharmaceutical care in Croatia, implemented with other partners in health for the benefit of patients, healthcare systems and the community in general. Thanks to the presentation of the best pharmacy practices to health administration and regulators, we promoted and increased awareness of the contribution of pharmacists in the health care system. This publication should serve as a platform for health technology assessment of pharmaceutical interventions and significantly better financial valorisation. Also, promoting best practices in pharmaceutical care to the health administrations and general public should have positive final outcome for all stakeholders in health: satisfied patients, pharmacists and physicians (who have better control of the patients behaviour and outcomes), health administration, insurance companies and society as a whole (health is related to social productivity).

Conclusion The best pharmacy practice and modern pharmacy services have a very promising future if they are timely presented to all participants of the health system, especially health administration. Best practices in pharmacy should not remain an independent entity and individual (undocumented) islands of excellence initiated by proactive individuals. They should be timely recognized, valued and strategically implemented as the best practice of healthcare also, taking into consideration the continuity and financial viability of such services.

Analysis of the demand for antibiotics in Spanish community pharmacies with private, irregular or no prescription; interventions by the pharmacist

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Background Antibiotic resistance is one of the main challenges facing medicine today. It is a growing threat to public health that affects all countries in the world, since the new mechanisms of resistance spread on an international scale.

Purpose To quantify the proportion of oral antibiotic demand corresponding to therapeutic group Anatomical Therapeutic Chemical classification J01 (antibacterials for systemic use) with private prescriptions, irregular prescriptions and self-medication in the community pharmacy. To analyze the prescribing physician profile, the symptoms for which the medication is prescribed, and the reasons why the population demands antibiotics without a prescription. To evaluate intervention by the pharmacist and conduct health education referred to correct antibiotic use.

Method A prospective, cross-sectional, descriptive, observational multicenter study to be carried out in Spanish community pharmacies during 4 weeks—one in each season of the year (2016–2017). Classified by the Spanish Medicines Agency (AEMPS) as an EPA-OD (post-marketing prospective follow-up) study (SEF-ANT-2016-01) with Ethics Committee approval. Inclusion criteria: subjects requesting antibiotics for oral administration belonging to therapeutic group J01. Exclusion criteria: subjects with communication difficulties or requesting antibiotics with financed prescription. A case report form (CRF) is designed for collection of the following variables: type of pharmacist and pharmacy, sociodemographic data, antibiotic requested, type and reason for request, specialty of the prescribing physician, type of treatment, knowledge of the process of antibiotic use, drug-related problems (DRPs) and negative medication outcomes (NMOs) identified, and pharmacist behavior and intervention. A platform http://investigacionsefac.org/antibioticos/is habilitated for data compilation. The SPSS statistical package is used for the analysis of results.

Findings A total of 351 community pharmacists (70% women) in 290 community pharmacies of all 17 Spanish Autonomous Communities have participated in the study. In the first week of the study (21–27 November 2016) a total of 5460 group J01 antibiotic containers for administration via the oral route were dispensed. Of these, 75.52% corresponded to financed prescriptions and 24.48% to the sum of private prescriptions. A total of 1730 patients have been included in the study. In 61.38% of the cases (n = 1060) the demand for group J01 antibiotics corresponded to private prescription, while in 16.06% of the cases (n = 277) was without a prescription, and in 22.56% of the cases (n = 390) the demand corresponded to self-medication. The rest of the variables are still under study.

Conclusion The pharmacist is the near professional and expert in antibiotics, and can advise patients on all aspects related to these drugs (including self-medication), indicate drug treatment (not requiring medical prescription) or refer the patient to the physician.

Medication possession ratio may detect half of the self-declared non-adherent patients to direct oral anticoagulation treatment: a pilot study

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Background Poor adherence to direct oral anticoagulation (DOAC) treatment in practice has been reported. Identifying non-adherent patients is needed to initiate adherence counselling. Because of non-forgiving characteristics, DOACs require strict intake intervals that translate into very high adherence rates. The Polymedication Check (PMC) is a reimbursed intermediate medication review in Switzerland that focuses on adherence and medicines use in outpatients.
Purpose We aimed at assessing whether the affirmative answer to the PMC question "Do you sometimes forget to take your medication?" coincides with a Medication possession ratio (MPR) <90% (non-adherence) in DOAC treated patients.
Method Fifth-year pharmacy students recorded one PMC with an anticoagulated patient during internship in community pharmacies between November 2014 and March 2015. Patient's refills of the past 12 months were used to calculate a MPR for DOAC if at least two refills were available. Assumptions for the calculation of the MPR were made according to Arnet 2016.
Findings The 69 PMCs concerned DOACs for 30 (43.5%) patients (52% women, 73.0 ± 12.2 years old, 9.9 ± 4.9 medications). The most often prescribed DOAC was rivaroxaban (93.3%), apixaban and dabigatran were marginally prescribed (3.3% each). Five PMC were excluded (poor documentation, n = 2; less than two refills, n = 3). Refills (mean of 2.9 ± 0.8 per patient) were available for a mean of 128 ± 62 days. MPR ranged from 50.6 to 182.7%. MPR below 90% was observed in 4 patients (16%), out of them two self-reported to sometimes forget to take the DOAC. Other two patients reported non-adherence but showed a MPR > 90%.
Conclusion This pilot study shows that deviant behavior is confirmed by calculation of medication possession ratio for only half of the admitters of non-adherence, probably due to the masking of a recent behavior into an averaging calculation method. We question the appropriateness of calculation methods from refills (such as the MPR) as single trigger to adherence counselling. MPR does insufficiently mirror recent non-adherence or disclosed forgetfulness.

PRACTISE survey-PhaRmAcist-led CogniTIve services in Europe: first results

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Background In Europe, a change from product to services centred community pharmacy practice was reported, with a large variance in dissemination of different community pharmacy services. Cognitive services such as medication review (MR) emerged as an important topic and recently the official PCNE definition of MR was released. The aims are to map the remuneration models of different pharmacist-led cognitive services in primary care across Europe, with a special focus on MR and to update a survey by Bulajeva et al. (2014).
Purpose The project was initiated at the PCNE working symposium in Hillerød (2016) by an international project team of PCNE members from Portugal, Slovenia and Switzerland. This project team is supported by further PCNE members from The Netherlands, Denmark, Finland, and Belgium.
Method The study has a cross-sectional design with an online-survey covering two topics: Part A about 21 different pharmacist-led cognitive services (44 items) and Part B about the different types of MR (63 items). For the survey the online tool Findmind was used. To collect representative data of the current situation in Europe, at least three participants per country/region with special background (community pharmacy, policy maker, and research) and with insight in community pharmacy practise are desired. Therefore, mainly members of PCNE and ESCP are invited. A key representative is approached for each country known to the project team who is invited to suggest two further participants from their country to fulfil the perspectives from all three backgrounds.
Findings On 3rd November 2016, key representatives from 26 different European countries were invited with a personalised link to the survey. After 14 days, 5 persons (5/26, 19.23%) had completed the survey and 2 (2/26, 7.69%) had started. Further 2 persons (2/26, 7.69%) suggested a substitute for their country, because they declared not to be qualified to answer the survey. Four weeks after the release, at the time of submission of this abstract, 10 (10/26, 38.46%) key representatives completed the survey. 5 of them (50%) had a background in research and 5 (50%) in community pharmacy. Furthermore, 5 persons had started, but had not yet completed the survey. The initially invited key representatives suggested further 25 representatives which were invited in the meantime.
Conclusion At the time of abstract submission, a satisfying response rate was achieved proving feasibility of the survey. We are looking forward to present first results from the two parts of the survey during the PCNE working conference 2017.

Portuguese pharmacists' perceived needs of education in anticoagulation

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Background Atrial fibrillation is the most common cardiac arrhythmia globally, responsible for one third of strokes, and often resulting in death or incapacity. In recent years, therapeutic treatment options have expanded with the introduction of novel oral anti coagulants (NOACs) and subsequent expansion of their indications. However, the extent to which pharmacists have increased their knowledge and confidence in this therapeutic area remains unclear.
Purpose To identify and assess pharmacist's knowledge gaps in the areas of anticoagulation (AC), and to compare and contrast knowledge gaps by therapeutic area; by area of practice; and by country's provision of pharmacy services.
Method An online survey was developed by iPACT in English and subsequently translated and adapted to 19 countries, including Portugal. The survey comprised a total of 25 questions divided into 3 domains (general confidence level with advising patients on AC; perceived training needs; and training formats preferred) and was disseminated via a link in the society's newsletter. Sub-group analysis assessed differences between confidence levels by therapeutic groups. Countries were clustered according to the literature into: advanced level (Australia, the Netherlands and Canada) and basic level service provision (Brazil, Hungary and Gulf Countries); and Portugal's performance was compared with these 2 groups. Statistical analysis was performed using SPSS® version 24, focusing on bivariate analysis to compare confidence by therapeutic class and by country, and descriptive analysis of preferred forms of training.
Findings After 9 months, 181 responses were obtained in Portugal out of a total of 3324 participants worldwide. The confidence levels of pharmacists to counsel patients on vitamin K antagonists (VKA) was significantly higher than for newer non-vitamin K oral anticoagulants

(NOACs) in Portugal ($p < 0.001$). Hospital pharmacists felt more confident than community pharmacists with advising patients on VKAs in Portugal ($p = 0.002$), whilst not significantly different for NOACs. Whilst there were clear differences in confidence levels between countries with advanced pharmaceutical services (M = 25.3; SD = 5.96) and those with basic services (M = 30.1; SD = 7.06), Portugal's performance was closer to the latter (M = 29.0; SD = 6.01), an obvious cause of concern. The vast majority expressed a clear preference for e-learning (72.8%) as a method of continuing education in this area, similar to worldwide results.

Conclusion Portuguese pharmacists expressed low confidence levels for advising patients on AC, a finding perhaps unexpected considering specific post-graduate education in this area. Consequently, it is essential to invest on education to better fill the knowledge gaps and indirectly increase medication safety.

Pharmaceutical counselling on anticoagulation: identifying needs of German community pharmacies

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Background The role of the community pharmacist evolves from dispensing to counselling, taking into account prescription and non-prescription drugs. Pharmaceutical counselling is especially important with anticoagulation drugs that need an optimal adherence in order to give benefit to the patients.

Purpose This survey is the German arm of an international survey conducted by the international pharmaceutical anticoagulation care task force (iPACT). The purpose is to identify the educational needs of the pharmaceutical care team in German community pharmacies assessed by reported self-confidence when advising patients on anticoagulants.

Method In October and November 2016 we conducted a multiple-choice survey with pharmacists and pharmacy technicians in Germany. Data were collected anonymously live and online. In the first part of the survey, demographic data were collected. The second part dealt with the self-confidence of the participants when counselling patients on direct acting oral anticoagulants (DOAC), low molecular weight heparins (LMWH), and vitamin K antagonists (VKA), the references they used, their willingness to receive additional education on specific anticoagulation topics and the form of the training as well as the support needed.

Findings A total of 279 questionnaires were completed (206 pharmacists, 69 pharmacy technicians and three others). 259 participants worked in community pharmacy. 57% (118) of the pharmacists felt very confident or confident to counsel patients receiving DOACs, 65.7% (136) with LMWH and 79.6% (144) in the case of VKA. Answers from pharmacy technicians (PT) differed as follows: Very confident or confident with DOACs 28.6% (20), LMWH 65.7% (50) and VKA 52.8% (37). In both groups, most insecurity was seen in "monitoring INR/making recommendations on these values" (pharmacists: 26.8%, PT 45.7%) and "management of bridging/switching anticoagulants" (pharmacists: 14%, PT: 28.6%). Main focus of interest for further education were interactions and their management (pharmacists: 50.2%, PT: 32.9%). Participants use information from pharmaceutical industry as a reference (pharmacists: 70%, PT: 55.7%), followed by internet and pharmacy software. Both groups prefer seminars/symposia and personalized e-learnings as educational form and would find a list of frequently asked questions supportive. 79.7% (165) pharmacists and 71.4% (50) technicians reported that information should be accessible from the pharmacy software.

Conclusion Based on these findings, different approaches should be considered for pharmacists and pharmacy technicians in order to provide a comprehensive, practice-based education addressing their individual needs. Following any education live or per e-learning, content should be made accessible through the pharmacy software in order to assure sustainability.

Impact of a community pharmacy intervention on medicine use and adherence rates in patients with osteoporosis: ICAROS-study

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Background The introduction of pharmaceutical care services is not without problems. The implementation and adoption of the first reimbursed advanced pharmaceutical care in Belgian community pharmacies was low. Pharmacists experienced primarily practical barriers and also lack of training in performing counseling sessions. Also, patients reported to experience it as slightly uncomfortable.

Purpose This study aims to evaluate the feasibility of a community pharmacy intervention for patients with osteoporosis, focusing on the quality of the pharmacotherapy and adherence.

Method A 3-month study in 105 community pharmacies was set up. The target group were ambulatory patients who used at least 1 osteoporosis drug (bisphosphonate, strontium ranelate, denosumab, SERM, teriparatide) in the last 12 months. After analyzing the adherence, pharmacists discussed with their patients the use of their drug and the use of calcium and vitamin D. Pharmacists recorded the observed DRP's and interventions in a webtool. 4–8 weeks after the interview, pharmacists evaluated if the interventions were implemented and if the DRP's were solved. Before the study, pharmacists received a communication skills training. They also received an information package and access to the webtool. The acceptability by patients was measured by a paper-based questionnaire. The acceptability by pharmacists was evaluated by telephone interviews and a websurvey.

Findings 80 pharmacies completed the study. The webtool includes data of 1619 patients: 948 (58.55%) documented conversations, 436 (26.93%) documented refusals and 235 (14.52%) missing data. Of the 948 documented conversations, slightly more than half took place on appointment (477). Reasons mentioned by patients were: more opportunity to ask questions about both the drug and the disease, and more privacy. 643 patients filled in the questionnaire. 94% of them were satisfied or very satisfied with the additional support. More than 90% felt it was important or very important to get information from their pharmacist about the disease (92.4%) and the drug (93.6%). In addition to information on the correct use of medicines (431), patients indicated the wish to be informed about the effect of the drug (382) and possible side effects (327). Analysis of acceptability by pharmacists is on-going. Telephone interviews revealed that pharmacists found it motivating to help patients to optimize their pharmacotherapy.

Conclusion Both pharmacists and patients were satisfied about the counseling session. Patients find that counseling sessions gifs them the opportunity and necessary time to ask questions about their condition and treatment. Approximately 1 on 2 patients is willing to make an appointment in the pharmacy.

Translation and validation of the CLEO tool to assess the relevance of clinical pharmacists' interventions

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Background At Swiss hospitals, it is common practice to document pharmaceutical interventions (PIs) with a classification system. Adding the French evaluation system CLEO would allow clinical pharmacists to assess the potential relevance of a pharmaceutical intervention in three independent dimensions (CLinical, Economic, and Organisational).

Purpose Our objectives were to translate CLEO into German, to validate the German version and to demonstrate the first use within a sample of study patients.

Method We translated CLEO according to the ISPOR principles of good practice for the translation and cultural adaption process for patient reported outcome measures. During 13 days, PIs performed in routine clinical pharmacy services at three Swiss hospitals were evaluated to demonstrate interpretability. Ten clinical pharmacists who had worked with CLEOde, filled a 19-item questionnaire to assess user's agreement on appropriateness, acceptability, feasibility, and precision (7-point Likert scale; 1: entirely disagree, 4: neutral, 7: entirely agree). To assess interrater (intraclass correlation coefficient ICCA, 1) and test–retest reliability (mean Spearman rank correlation coefficient $\bar{\rho}$, mean $\overline{\text{ICCA}}$, 1), the pharmacists were asked to evaluate 10 model cases with CLEOde. The tool was used within a study population recruited from January until November 2016.

Findings CLEO was translated into the German version CLEOde. This version was used by 10 clinical pharmacists to estimate the potential relevance of 324 performed PIs, creating a data set of identified drug related problems, performed interventions, and potential relevance. The reported time was less than one minute per PI. To use CLEOde as a tool to evaluate PIs was reported to be appropriate (mean user's agreement $= 5.45 \pm 0.76$), acceptable (4.43 ± 1.28), feasible (5.27 ± 1.44), and precise (5.90 ± 1.16). Interrater reliability was good for the dimensions clinical (ICCA, $1 = 0.63$) and economical (0.65), and poor for the organisational dimension (0.30). Test–retest correlation ($\bar{\rho}$) was strong for all three dimensions with excellent to fair reliability (clinical: $\overline{\text{ICCA}}$, $1 = 0.76$; economical: 0.85; organisational: 0.53). The tool was applied to all pharmaceutical interventions performed in a sample of 110 study patients.

Conclusion We successfully translated the French evaluation system CLEO into the German version CLEOde. We demonstrated interpretability, appropriateness, acceptability, feasibility, precision and reliability. Reliability of the organisational dimension should be improved. CLEOde could be combined with existing classification systems for drug-related problems to add qualitative value to quantitative information about PIs.

MOSAIC: presentation of a strategy for seamless care research

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Background Efficient and safe transitions of patients between healthcare settings and professionals is the goal of seamless care research. Medication management at transitions has to be optimised to establish continuity of care. Seamless care focusing on medication management is one of the major research areas of the Pharmaceutical Care Research Group (PCRG).

Purpose The aim of this project was to update and present the seamless care research strategy based on the 'Medicines management Optimisation by Structured Assessment in Integrated Care' model (MOSAIC) developed over years, including past and current work by the PCRG seamless care team and by adding future project ideas.

Method All information on past, current, and future PCRG projects in seamless care research since 2011 was collected during meetings with team members and electronically (e.g., prior publications, relevant literature from reviews). The collected information was consolidated into the MOSAIC model. Ideas for future projects were derived from the model to yield the draft of the updated PCRG seamless care research strategy. The draft was presented to all members of the seamless care team ($n = 7$), to the head of the PCRG, and to external and international peers. Feedbacks were integrated into current version of the strategy.

Findings PCRG seamless care research focused mainly on the development of valid and reliable tools for optimising critical processes. Appropriate tools are considered a prerequisite to develop advanced and targeted services. Past and current research projects included the DART tool for identifying patients at risk for experiencing a drug related problem; the PharmDISC tool to document pharmaceutical interventions at the community pharmacy; the CLEO tool to evaluate the relevance of pharmaceutical interventions; research on medication plans, which showed to have to be adjusted to patients' needs and preferences; and a study for validation of discharge prescriptions by a clinical pharmacist based on qualitative data about the community pharmacists' needs in handling these prescriptions. The draft strategy was charted into a graph. Future projects could be derived from the model, focusing on processes at hospital discharge. The strategy included the focus on research that is locally relevant and implementable in daily practice.

Conclusion We hereby present the PCRG strategy in seamless care research. The strategy describes a vision for seamless care leading to continuity of care focusing on medication management. Future projects involve process related research about hospital discharge and should be implementable in a local context, however, open for national and international collaboration.

From hospital to domiciliary hospitalization: a pharmacist intervention

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Background In November 2015 a new model of hospitalization was created in Portugal, entitled domiciliary hospitalization unit (DHU). This model emerges as a possible solution to the A&E excessive use, prevailing in Portugal.

Purpose This study aims to evaluate the existence of pharmacotherapeutic errors during patient transition across the health care system. It also aims to integrate a pharmacist into this multidisciplinary team, who can through medication reconciliation detect and solve these errors.

Method A mixed model was used, where an observational retrospective design explored medication discrepancies prior to DHU and an intervention prospective design was found most suitable to readily act upon discrepancies found during DHU. Medical and therapeutic history were obtained through the hospital pharmacy database; current medication information was checked and completed by open observation at the patient's home. The data here presented are from

patients hospitalized between August and September of 2016. All patients transferred from the hospital to the DHU were included in the study. Patients without outpatient medication and those receiving the pharmaceutical visit only during the first day of DHU hospitalization were subsequently excluded. Medication review and reconciliation were made between the outpatient medication and the DHU medication and/or with the hospital service prior to DHU. At the time of medical discharge, therapeutic guides were performed. Data was analysed using Statistical Package for the Social Sciencies (SPSS) v.24.0. Descriptive and bivariate analysis have been used (Spearman correlation coefficient to explore associations between days of hospitalization and number of medication discrepancies).

Findings Of the 20 admitted patients, 70% were males and 30% females, most of whom were 85 years old or more (85%). They were hospitalized in DHU an average of 11.15 days. Patients had on average 9.2 ± 3.9 outpatient medications, of which 3.8 ± 1.97 were omitted and 1.05 ± 1.27 had wrong taking indications. The three drugs classes most omitted were antihypertensive drugs (23.38%), oral antidiabetics (18.18%) and psychoactive drugs (14.29%). The number of missing drugs was not influenced by the number of days the patient remains in the service prior to reconciliation ($rs = -0.134$; $p = 0.572$). Many patients had the home medication poorly stored (45%) and expired (15%).

Conclusion Patient's safety was the main focus of the pharmaceutical intervention, though which all medications omissions and incorrect doses were detected and rectified. Pharmaceutical interventions also emphasized storage of medication, identification and collection of expired drugs, and further enhanced adherence to prescribed treatment. This abstract is ongoing work.

Experiences of pharmacists, general practitioners, geriatricians and patients with externally evaluated clinical medication reviews

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Background In order to facilitate implementation in the recently performed Opti-Med randomized controlled trial (RCT) in a primary care population of older patients GP patients were electronically selected and medication analyses were conducted by external expert teams using an electronic evaluation tool on the basis of the START/STOPP criteria. Within the Optimed cluster RCT on the usefulness of clinical medication reviews (CMRs) conducted by teams of external evaluators in older (>65 years) general practice patients, a process evaluation was performed.

Purpose To gain more insight into: (1) appreciation of and experience with this particular method of conducting a CMR, (2) implementation of the intervention, (3) factors contributing to successful implementation or failure, (4) ideas to implement this method of conducting CMR in clinical practice.

Method Focus group discussion with seven evaluators [including general practitioners (GPs), geriatricians and pharmacists]. Interviews with eight GPs who used the results of a CMR in discussions with their patients aimed to optimize their medication. Patients who discussed their medication with their GP following a CMR (n = 276) gave their opinion on their part of the CMR intervention by completing a short questionnaire.

Findings Collaboration between the evaluators was perceived as very good. The complementary knowledge of each team was considered an advantage while evaluators felt more confident in making important decisions. When conducting CMRs in very old patients geriatricians were found to apply guideline recommendations more critically than GPs. Interviewed GPs found the intervention efficient and useful. Benefits of external recommendations following a CMR included their objectivity, quality and structure. Disadvantages: the recommendations were not always useful since they were based on incomplete data, or because they had already been tried. Despite agreement on the necessity to conduct CMRs and prioritization, there was no consensus on the optimal procedure and which group of elderly patients should be targeted. Collaboration between GPs and geriatricians was valued. Lack of time and of ICT facilities and the occasional incompleteness medical records were considered main obstacles. In approximately 90% of patients CMR recommendations to optimize medication were discussed with GPs, 72% of patients found these conversations (very) useful and 82% indicated that they could ask all questions they wished.

Conclusion All health care workers involved reported to have mostly positive experiences with the Opti-Med research project and the medication of nearly all patients who participated was reviewed according to the study plan. There was considerable support to implement the Opti-Med intervention in clinical practice.

Cost effectiveness of ceasing overuse of proton pump inhibitors, started as protective co-medication

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Background Proton pump inhibitors (PPIs) are frequently initiated as protective co-medication for nonsteroidal anti-inflammatory drugs (NSAIDs) and low-dose aspirin (ASA) Less attention is paid to their subsequent discontinuation after NSAID or ASA cessation.

Purpose To assess the extent of PPI overuse, as the proportion of subjects that started PPIs as protective co-medication and continued them after NSAID and ASA cessation; to estimate potential cost savings and effect gains from inappropriate PPI medication and resulting side effects.

Method Pharmacy dispensing data from the Dutch Foundation of Pharmaceutical Statistics were used to map PPI overuse in 2014. For the cost-effectiveness analysis strategies to whether or not PPI continuation were compared. The need for PPI thearpy was assessed based on the Dutch GP NHG) treatment standards. For both strategies incremental costs and effects (QALYs) were estimated with a Markov model.

Findings Related to NSAID treatment 11.0% of the PPI users were found with inappropriate PPI continuation and in 5% of ASA users. Discontinuation of inappropriate PPI use in a 70-year-old subject suggested cost savings of €170.46 (95% CI 75–282) at 0.003 (95% CI 0.001–0.005) increase of QALYs compared to their continuation. Total savings from inappropriate PPI use related to NSAID or ASA treatment in the Netherlands in 2014 were estimated at €6,712,355 (95% CI 2,600,809–11,287,994). Correspondingly a successful intervention to stop a patient's inappropriate use could cost up to €188 (95% CI €73–€315) to pay for itself.

Conclusion Inappropriate continuation of NSAID or ASA related PPI initiation is substantial. Interventions to stop inappropriate PPI use should be stimulated and could easily pay for themselves.

Oral communications

Recognition and addressing of limited pharmaceutical literacy (RALPH): development of a screening tool for the pharmacy setting

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Background Recognition of patients with inadequate health literacy skills is difficult. Communication in the pharmacy is the last opportunity to ensure that patients understand how to use medicines correctly. Therefore insight in patients' health literacy is of importance for the pharmacist.
Purpose To develop and validate an instrument (RALPH), suitable for use in daily pharmacy practice, that measures different aspects of health literacy necessary for correct medication use.
Method The RALPH-instrument consists of 12 questions in three health literacy domains: functional domain regarding reading and writing skills (three questions), communicative domain regarding skills to find/ask information and to assess concerns (four questions) and critical domain regarding skills to analyse information applicability and quality (four questions). The instrument is constructed to be completed as an interview. Data collection took place in community pharmacies' waiting areas. Patients collecting their own medication were interviewed. Second, patients undergoing a medication review were interviewed using the RALPH-instrument. For these patients, additional questions about their medication use were asked by the pharmacist.
Findings In total, 274 patients were interviewed in the pharmacy waiting area and another 147 during medication review. First results show that in both groups approximately 12% of patients had troubles finding understandable medication information. Furthermore, 17% of the patients in the pharmacy waiting area and 24% of the medication review patients found it difficult to decide whether medication information applies to them. 24% of the medication review patients could not mention the (correct) indication for their own medication and about 10% did not know the correct dosage instructions.
Conclusion A substantial amount of medication users experiences difficulties in understanding instructions and finding (understandable) information about their medication. The RALPH-instrument may help pharmacists to identify these high-risk patients.

Development of a medication discrepancy classification system to evaluate the process of medication reconciliation

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Background Medication discrepancies across transitions of care are the sole quantitative measure related to the medication reconciliation process. Our recent published systematic review about how medication reconciliation has been conducted and how medication discrepancies have been classified identified significant inconsistencies in reporting, measuring and classifying medication discrepancies and the absence of a well-designed tool to evaluate medication reconciliation outcomes (1).
Purpose The aims of this study are to evaluate how medication discrepancies have been classified in the literature and to develop a comprehensive taxonomy to classify medication discrepancies identified through the medication reconciliation process.
Method The medication discrepancy classification system was developed based on a comprehensive systematic review of the literature and the experience of our research team. We searched six different databases in accordance with the PRISMA statement up to April 2016. The studies were eligible for inclusion if they aimed to classify medication discrepancies and contained a classification system for these discrepancies. All relevant data related to the classification of medication discrepancies were extracted and were used to inform the design of a comprehensive taxonomy.
Findings Ninety-five studies were included in our review; three taxonomies for classifying medication discrepancies were identified. These tools were utilized in 11 studies (11.6%), three of which described the establishment of the tools. Most studies classified medication discrepancies empirically, based on the data collected (57/95, 60%). There were 22 studies (23.1%) that categorized discrepancies based on other relevant studies published in the literature. Five studies (5.3%) utilized a classification for (DRPs) to classify medication discrepancies. The number of classification terms ranged from 2 to 50 terms. Additionally, a small number of studies (11/95, 11.6%) stated the reasons for discrepancies in their categories and seven studies described interventions related to medication discrepancies. Our comprehensive taxonomy builds on existing frameworks for classifying medication discrepancies. It contains four sections: operational definitions, types of medication discrepancies, causes of medication discrepancies and intervention/recommendations. The tool categorizes the types of medication discrepancies into 13 categories and 28 sub-categories. The tool is undergoing psychometric testing for content validity and inter-rater reliability.
Conclusion We believe that a well-designed comprehensive taxonomy for medication discrepancies is critical for systematically evaluating and comparing different medication reconciliation services. 1. Almanasreh E, Moles R, Chen TF. The Medication Reconciliation Process and Classification of Discrepancies: A Systematic Review. British Journal of Clinical Pharmacology. 2016.

Medication persistence with lipid-lowering treatment in Slovenia

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Background Low medication persistence on lipid-lowering agents decreases their long-term clinical benefits in patients at risk for cardiovascular events. The persistence with these agents seems to be low and a large proportion of users discontinue within the first year.
Purpose The study aimed to evaluate medication persistence with lipid-lowering agents after treatment initiation in Slovenian population.
Method The patients initiated on lipid-lowering therapy in 2009 that could be followed until the end of 2013 were included in the study. National health claims database on all outpatient prescription medicines obtained from the Health Insurance Institute of Slovenia was used. The parameters used were the active substance according to "C10" class of the Anatomic Therapeutical Chemical Classification, units dispensed and dispensing date. Once daily dosing was predicted, so the number of units dispensed equalled the number of days covered. Median time and probability of persistence were evaluated using the Kaplan–Meier survival curve. The discontinuation was detected if medication possession ratio was less than 33%. Log-rank test was also used to assess the impact of different factors affecting persistence.
Findings The persistence was determined for 30,571 patients initiating lipid-lowering monotherapy. Their mean age was 60 ± 11 years and 50.5% were female. The majority (97.0%) were initiated a statin treatment, the remaining patients were prescribed other agents

(fibrates, ezetimibe, omega-3 fatty acids, and nicotinic acid). Altogether, 48.6% of the patients discontinued within the first year. Median persistence time was 502 days (1.4 years). However, 12.8% of patients were dispensed only one prescription. Men were more persistent than women (median time 544 vs. 466 days; $p < 0.01$), patients older than 65 years were more persistent than younger (median time 600 vs. 455 days; $p < 0.01$) and patients treated with statins were more persistent than patients on fibrates or ezetimibe (median time 516 vs. 211 and 266 days, respectively; $p < 0.01$). Treatment re-initiation occurred in 11,234 patients representing 59.0% of those who discontinued. After second start, median persistence time was 391 days (1.1 year), meaning that 48.8% discontinued within the first year.
Conclusion Several Slovenian patients discontinue lipid-lowering agents very early after treatment initiation. Although many of them restart, approximately half discontinue again. As the beneficial effects of lipid-lowering agents increase with the length of treatment, Slovenian patients do not seem to benefit of the therapy. More careful considerations should be undertaken when introducing this treatment.

A protocol for a cost-utility study on medication reviews to elderly polypharmacy patients at the community pharmacy

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Background 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.
Purpose To investigate the economic impact of medication reviews of elderly polypharmacy patients at the community pharmacy, from a health-care point of view.
Method In the Southern Region of Denmark 50 pharmacists were recruited from 28 community pharmacies. Each pharmacist completes 20 medication reviews over a period of 6 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 enter data on each review into a central study database. Patients complete the EQ-5D questionnaire at the pharmacy before and 6 months after the medication review. 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 12 month 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. 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.
Findings To date 204 medication reviews have been conducted and a further 124 are scheduled. Data analysis will take place 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.

Comparing Medication Regimen Complexity Index and polypharmacy as measures of medication use

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Background The Medication Regimen Complexity Index (MRCI) was developed to quantify the features of medication regimens in order to assess regimen impact on adherence and other outcomes. Polypharmacy and Excessive Polypharmacy have also been used as for these purposes.
Purpose The aim of this study was to examine the relationship between the MRCI in older adults with intellectual disabilities and factors known to be associated with polypharmacy. A secondary aim was to compare the MRCI's predictive validity to that of the number of medications.
Method Medication data were drawn from the 2014s wave of the Intellectual Disability Supplement to the Irish Longitudinal Study on Ageing (IDS-TILDA); a longitudinal study on Ireland's aging population with Intellectual Disabilities (ID). This study randomly selected 5% of the individuals in the National Intellectual Disability Database aged 40 and over and recorded their demographics, lifestyle, health characteristics, needs and medication use. The Medication Regimen Complexity Index (MRCI) was calculated for 677 participants and its association with demographic and other characteristics were assessed while controlling for co-morbidity using the Functional Comorbidity Index. Descriptive statistics and Univariate Linear Models were used.
Findings The median MRCI score, including medications and supplements, was 19 and the median medication and supplement count was 7. For medications-only, the median MRCI score was 18 and the median medication count was 6. Age, level of ID, and type of residence were significant predictors of MRCI scores, but gender was not. MRCI increased statistically significantly as the overall Functional Comorbidity Index (FCI) increased. The variation in MRCI values was accounted for by Type of Residence (16.7%; Kruskal–Wallis test); 4.6% by age groups, 6.97% by level of ID, and 11.5% accounted for by FCI score. After controlling for comorbidity (FCI), MRCI associations with independent variables such as age, level of ID, and type of residence remained statistically significant. There was a high correlation between the MRCI and the number of medications.
Conclusion Participants with more complex medication regiments were older, had a more severe level of ID, were more likely to live in Residential Settings and had greater comorbidity. The MRCI showed similar properties when compared to the total number of medications in the factors associated with medication use assessed in this study.

Why do health care professionals still prescribe non-selective β-blockers in patients with asthma or COPD?

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Background Prevailing guidelines advise to avoid the use of non-selective (ns) β-blockers in patients with asthma or COPD. Despite this contra-indication, community pharmacies in the Netherlands dispensed ns-β-blockers monthly on average to 10 patients with inhalation medication.
Purpose To assess whether prescribers initiating ns-β-blocker were aware of asthma or COPD comorbidity and if so, to explore reasons of prescribers and pharmacists to disregard the recommendation from the guidelines.
Method An exploratory study was performed in 53 community pharmacies in the Netherlands between February and July 2016. Participating pharmacists were asked to select patients with actual use of as well inhalation medication as β-blockers from their pharmacy records. Subsequently they were to identify the initial prescriber of the ns-β-blocker and to interview three prescribers, preferably different medical specialists, about their awareness of the contra-indication and their choice to nevertheless initiate the ns-β-blocker in these patients. Finally they were asked for their reasons of this co-dispensing.
Findings 827 patients were identified for using ns-β-blockers with inhalation therapy. From these, 153 ns-β-blocker initiators were interviewed (64 general practitioners (GP's), 45 ophthalmologists, 24 cardiologists and 20 other prescribers). 107 prescribers (70%) indicated to have been aware of the contra-indication at ns-β-blocker initiation. From these, 40 (37%) prescribers did not consider the contra-indication to be relevant. 23 (21%) prescribers stated that the patient already tried alternative medication and 23 (21%) prescribers explained that there was no alternative medication available in their opinion. 46 (42%) prescribers mentioned not to have been aware of the contra-indication at the moment of the first prescription of the ns-β-blocker. Of those, 15 (33%) doctors replied that they would have chosen an alternative medication if they had known about the presence of the lung disease. Pharmacists mentioned that the pharmacy information system did not signalize this contra-indication automatically in all cases. If a computerized signal was generated in 84 (56%) of the 151 cases the patient was informed about the possibility of limited airflow.
Conclusion About two thirds of the interviewed doctors initiating ns-β-blockers in long patients were aware of this contra-indication. Reasons named were the lack of an alternative and regarding this contra-indication as not relevant. Further research is needed to evaluate whether these considerations are legitimate. Some ns-β-blockers initiators would have reconsidered this choice when having been aware of the co-morbidity. There seems to be a role for pharmacists to signalize this contra-indication more actively to prescribers of ns-β-blockers in patients with lung diseases.

Criterion validation of the Living with Medicines Questionnaire Version 3 (LMQ-3)

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Background There are few patient-reported tools available for quantifying medicine use experiences. The Living with Medicines Questionnaire (LMQ-3) is a generic, patient-reported measure developed in England, for long-term medicines users. Criterion-related validation is one necessary aspect of psychometric testing for such instruments to be used in pharmaceutical care research or practice.
Purpose To investigate the criterion-related validity of the LMQ-3 against standard measures of treatment satisfaction and health-related quality of life.
Method NHS Ethics approval was obtained. The LMQ-3 was tested alongside the TSQM-II, an 11-item instrument measuring satisfaction with four aspects of medicines (effectiveness, side effects, convenience, global satisfaction), and the EQ-5D-5L, a generic measure of health status. The instruments were combined and distributed by hand to patients in community pharmacies, general practices and hospital out-patient departments. Spearman's correlation coefficients (r) were used to assess relationships. Hypotheses tested were: negative relationship between LMQ-3 total score and TSQM-II global satisfaction score; negative correlations between LMQ-3 side-effect burden, lack of effectiveness and practical difficulties domain scores with TSQM-II side effects, effectiveness and convenience subscales; weak negative correlation between LMQ-3 total score and overall health status, measured using EQ-5D-5L.
Findings 1306 questionnaires were distributed: 220 in GP practices; 150 in community pharmacies and 936 in outpatient clinics. 422 completed questionnaires were returned (32.3%); 36.4% (n = 80), 44.7% (n = 67) and 29.4% (n = 275) for GP practices, community pharmacies and outpatient clinics respectively. 52.8%, (n = 208) were female, mean (±SD) age was 56.1 (±18.17), range 18–92 years, and the mean (±SD) number of medicines used was 4.6 (±3.67). A strong negative correlation was found between LMQ-3 total score and TSQM-II global satisfaction scale (r = −0.616), confirming that higher medicine burden was associated with lower satisfaction. Strong correlations between thematically-comparable subscales were also found: LMQ-3 lack of effectiveness with TSQM-II effectiveness (r = −0.628); LMQ-3 side-effect-burden with TSQM-II side effects (r = −0.597); and LMQ-3 practical difficulties with TSQM-II convenience scale (r = −0.529). There were weak correlations between LMQ-3 total score and EQ-5D-5L scores; ranging from 0.284 for self-care to 0.436 for anxiety/depression. LMQ-3 total score was negatively associated with overall health score (r = −0.383).
Conclusion Findings support the validity of the LMQ-3 as a measure of medicine burden and suggest it assesses a distinct concept negatively associated with treatment satisfaction and HRQoL. The measure should be of use in intervention studies involving pharmacists and could also enable them to improve pharmaceutical care for individuals.