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COMMENTARY

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Validation of prescribing appropriateness criteria for older Australians using the RAND/UCLA appropriateness method

Basger B., Chen T., Moles R.

The University of Sydney, A15 Science Rd, 2006 Sydney, Australia. Email: ben.basger@sydney.edu.au

Aim of project/study Many techniques have been proposed to identify and reduce dug related problems (DRPs), including comprehensive geriatric assessment and the use of prescribing appropriateness criteria. The aim of this study was to establish the face validity of published Australian prescribing appropriateness criteria.
Method We used the RAND/UCLA appropriateness method, a two-round modified Delphi method, to assess the face validity of the 48 prescribing criteria. The first round involved the recruitment of a multidisciplinary group of medication management experts (e.g. geriatricians, clinical pharmacologists and pharmacists, and representatives from evidence-based medicine organisations), to review, update and rate the prescribing criteria, via e-mail. The second round involved a face-to-face meeting of these experts to discuss the findings from round one. Specifically, the median ratings, on a 9-point scale, for all experts from round one were debated and re-rated as a group. Following round two, agreement was also assessed using the interpercentile range (IPR) and the IPR adjusted for symmetry (IPRAS) method.
Results Following the first round, there was agreement for the appropriateness of 31 and disagreement for 17 criteria. During the second round, 12 of the 31 criteria (for which there was agreement) were accepted with no change, 17 were modified and retained, and 2 were deleted. Of the 17 criteria for which there was disagreement (at round one), two were accepted with no change, 8 were modified and retained and 7 were deleted. Two new criteria were also added, resulting in a total of 41 validated criteria. Agreement was reached for all criteria after round two by both the median and IPR/IPRAS methods.
Conclusions The RAND/UCLA appropriateness method was used to establish the face validity of Australian prescribing appropriateness criteria.

A novel instrument to measure medicines-related quality of life

Krska J.[1], Morecroft C.W.[2], Poole H.[3], Rowe P.H.[2]

[1]Institute Medway School of Pharmacy, University of Kent and Greenwich, UK; [2]Chatham Maritime, ME4 4 TB Chatham, United Kingdom. Email: j.krska@kent.ac.uk

Background Research evaluating medication review and similar services frequently incorporates generic quality of life measures insensitive to small changes in medicines use, or disease specific measures, which focus on the impact of the disease, not the impact of medicines. Other tools can assess patient satisfaction with services, satisfaction with information about medicines and beliefs about medicines, but none are designed to detect changes in the overall impact of using medicines on quality of life.
Aim To test a novel generic tool for measuring quality of life related to long-term medicines use.
Method NHS ethics approval was obtained. Patients were identified from two medical practices by practice pharmacists. The final questionnaire was distributed by post to two patient cohorts (A): confirmed as regularly collecting at least four repeat prescription medicines and (B): eligible for medication review because they used any medicines long-term.
Results In total 828 questionnaires were distributed to (A) and 529 to (B), of which 189 (22.8 %) and 160 (30.2 %) were returned. There were no differences in individual statement responses, theme scores and overall scale scores between cohorts. In the combined dataset, theme scores or overall score were not related to gender or age, but number of medicines was significantly related to overall score and most theme scores (Practicalities, Information, Control, Efficacy, Side effects, Attitudes and Impact: ($P < 0.05$), except 'Relationships with health professionals'. Factor analysis indicated 15 potential components, with 33/60 items loading onto one component, suggesting that the data do not support the proposed themes derived from qualitative data.
Conclusion The instrument shows good consistency in findings between two different populations of patients in primary care taking long-term medicines. It could be used to assess long-term medicines use on quality of life, or in studies to measure the effect of pharmacist or other health professional interventions.

Patients' willingness to re-use Home Medicines Review and their perceptions of the listening skills of the interviewing pharmacist

Carter S.R., Moles R., White L., Chen T.F.

Faculty of Pharmacy, University of Sydney, Pharmacy and Bank Building A15, 2006 Sydney, Australia.
Email: scar4376@uni.sydney.edu.au

Aim of project/study Some patients who are at risk of experiencing medication misadventure are unwilling to use pharmaceutical care services.[1] This work deals with patients' willingness re-use Australia's Home Medicines Review (HMR). Patients' willingness to re-use health services is dependent on their perception of service quality. A key element of service quality is patients' perception of the listening skills of the service provider. Of interest to this research was patients' perception of the listening skills of the pharmacist who most recently provided an HMR for them. It was hypothesised that patients' perception that the pharmacist had good listening skills would increase their perception that the HMR was beneficial (benefit perception); increase their selfefficacy to undertake the communication tasks required to re-use HMR (communication efficacy); and increase their willingness to re-use HMR.
Method A cross-sectional survey was conducted among patients who had received an HMR within the previous 6 months. The survey was distributed by 264 practising pharmacists throughout Australia. Measurement scales for benefit perceptions, communication efficacy and willingness were adapted from previous studies.[2] A three-item scale was developed to measure patient perceptions of listening skills. Confirmatory factor analysis was used to test the validity of the measurement model. Structural equation modelling was used to explore the relationships between variables.
Results A total of 595 out of 1,893 (31 %) respondents completed surveys. Overall, patients rated the listening skills of the interviewing pharmacist very highly and recorded a high willingness to reuse HMR. The model explained 53 % of the variation in willingness to re-use HMR. Analysis of the structural model revealed that patients' perceptions that the pharmacists had good listening skills increased their benefit perceptions (beta = 0.37, $p < 0.05$), increased their communication efficacy (beta = 0.26, $p < 0.05$) and had a positive direct effect on their willingness to re-use HMR (beta = 0.31, $p < 0.05$). In conclusion, patients' willingness to use HMR was highly dependent on whether they thought the interviewing pharmacist was a good listener. Pharmacists who provide HMR and other pharmaceutical care services need develop their listening skills in order to ensure that patients are willing to re-use their services.

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Informal caregivers' willingness to use Home Medicines Review: developing and testing the Knowledge Hassles Information Seeking Model (KHISM). (Award winning presentation)

Carter S.R., Moles R., White L., Chen T.F.

Faculty of Pharmacy, University of Sydney, Pharmacy and Bank Building A15, 2006 Sydney, Australia.
Email: scar4376@uni.sydney.edu.au

Aim of project/study Informal caregivers (caregivers) have a key role in ensuring that some of the most vulnerable members of the community have access to pharmaceutical care services. Little is known about the psycho-social factors which influence caregivers' willingness to assist their care-recipient to use these services. Previous qualitative research shows that in relation to Australia's Home Medicine Review (HMR), caregivers' outcome expectancy is grounded in information-seeking.[1] The study aimed to develop and test a new theoretical model of health behaviour, the Knowledge Hassles Information-Seeking Model (KHISM). The term "knowledge hassles" was coined to describe the mild form of stress that caregivers experience because of the need to repeatedly process information about their care-recipient's medicines. It was predicted that caregivers' knowledge hassles would increase their outcome expectancy and willingness to participate in an Australian medication management service, Home Medicines Review (HMR).
Method A cross sectional postal survey was conducted in 2009 among 2,350 members of a support group for caregivers, CARERS (NSW, Australia). Respondents were included in the study if they were involved in medication-related tasks for their care-recipient and were not paid as caregivers. Their care-recipient needed to be taking more than 5 medicines daily or more than 12 doses daily and not have experienced HMR. Structural equation modelling was used to test the model.
Results Surveys received from 324 eligible respondents (14 %) were analysed. Respondents recorded high levels of willingness to participate in HMR. The model predicted 51 % of the variation in willingness. Analysis of the structural model revealed that knowledge hassles increased outcome expectancy (Beta = 0.43, $p < 0.05$) and indirectly increased willingness (Beta = 0.19, $p < 0.05$). In conclusion, the more caregivers' experience knowledge hassles, the more they perceive HMR to be a helpful information source and the more willing they are to use it. General practitioners and pharmacists who sense that informal caregivers appear stressed about complicated medication regimens should consider whether care-recipients may be interested in facilitating pharmaceutical care services for their care-recipient. Further exploration of the Knowledge Hassle Information Seeking model (KHISM) is warranted.

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Challenges of information technologies adoption to enable community pharmacies eHealth services

Gregório J., Cavaco A., Mira da Silva M., Lovis C., Velez Lapão L.

Instituto de Higiene e Medicina Tropical, Universidade Nova de Lisboa, Rua da Junqueira, no 100, 1349-008 Lisboa, Portugal.
Email: jpgregorio@ihmt.unl.pt

Project/study aims The research's objective is to describe the utilization of IT for eHealth pharmaceutical services provision in Portuguese community pharmacies.
Method A mixed methods approach using an online survey followed by an exploratory observational time and motion study. The survey was based on two validated surveys. An email with a link to the survey was sent to 323 pharmacies. The observational study took place in 4 pharmacies during weekdays.
Results Survey's response rate was 4.7 %:23 % of pharmacies have an internet site and 38 % are present in social networks. All pharmacies claim to check their email daily, although only 15 % use it to answer patients' queries. In the observational study, 108 h and 894 tasks were recorded. Pharmacists spent 50 % of their time interacting with patients, 38 % in administrative tasks and 12 % in idle time. The survey results and idle time suggest there's potential to develop eHealth services. The presence in web-based social networks and use of email to communicate with patients indicates that pharmacies are starting to move to a web-based approach to provide information and services.

Development of decision support systems to manage QT-prolongation in clinical practice: study protocol

Vandael E., Willems R., Vandenberghe J., Foulon V.

KU Leuven, Research Centre for Pharmaceutical Care and Pharmacoeconomics, Herestraat 49, 3000 Leuven, Belgium.
Email: eline.vandael@pharm.kuleuven.be

Aim of project/study The overall aim of this project is to develop algorithms that can be used in clinical practice to prevent Torsades de Pointes and sudden cardiac death related to the use of (combinations of) QT-prolonging drugs.
Method The study consists of different parts: Pharmacoepidemiological study: deliver data on the prevalence of the use of (combinations of) QT prolonging drugs in clinical practice. Medication management: document how physicians and pharmacists currently deal with the risk for QT prolongation. Clinical studies: demonstrate the QT-prolonging effect of the addition of a QT-prolonging drug to medication profiles that already contain a drug with risk on QT-prolongation. Develop and validate algorithms to support health care professionals in the medication management of QT prolonging drugs; and investigate possibilities for integration of these algorithms in electronic decision support systems. In a pilot study, 600 medication profiles were collected in six psychiatric hospitals in Flanders and these profiles were checked on drug interactions by using an online drug interaction checker. Questionnaires about medication management were sent to all psychiatric hospitals in Flanders.
Results 365 of the 600 patients (60.8 %) had a drug interaction in their medication profile. In total, 954 drug interactions were found (568 classified as 'serious' and 25 as 'very serious'). 44 patients (7.3 %) had an interaction with an increased risk on QT-prolongation (116 of 954 interactions, 12.3 %). The QT-prolonging drugs that were most prescribed were: risperidone, sertraline, olanzapine and quetiapine. Questionnaires were completed by 12 physicians and 14 pharmacists of 14 psychiatric hospitals. In 5 of the 14 hospitals there is very little attention for drug interactions. 80 % of the physicians often ignore an interaction warning. 5 of the 12 physicians admitted that they rarely bother about the risk of QT-prolongation. The answers on questions about the clinical relevance of QT-prolongation were very divergent. These results prove the uncertainty that is left with physicians and pharmacists on the relevance of QT prolonging effects and on how to deal with this risk in clinical practice.

Medication reviews at the general practitioners' office—a multidisciplinary approach in ambulatory care?

Salvesen Blix H.

Department of Pharmacoepidemiology, Norwegian Institute of Public Health, School of Pharmacy, University of Oslo, Oslo, Norway.
Email: Hege.Salvesen.Blix@fhi.no

Aim of project/study Admission to hospitals often implies alteration of medical treatment. The follow-up of medication changes after discharge from hospital is a challenge for the GPs, and imperfect communication may impair optimal patient treatment. We aimed to investigate whether outreach visits to GPs by hospital pharmacists can improve patient drug use in primary care.
Method Patients with changes in their medicine regimens during hospitalization were eligible for the study; the patients were recruited from 6 hospitals in southern Norway. Clinical pharmacists made appointments with the patients' GPs 4–5 months after discharge. The GPs were told that the aim was to discuss the patients' drugs regimens through a collaborative medication review. Before the study a pilot was carried out, standardized data collection forms were developed, and the participating pharmacists were trained in methods for medication reviews.
Results A total of 184 patients were included in the study, and medication reviews could be performed for 105 patients. The reasons for not participating in the study were that the GPs did not want or did not have time to schedule a meeting or the patients had died. Eight pharmacists and 88 GPs took part in the study. The mean age of the patients was 76.1 years, 48 men and 57 women. For 11 patients the GPs had not received the discharge notes. Patient identified with DRP had on average 2.8 DRPs (range 1–15), 31 patients had no DRPs. The most frequent DRPs were need for medication monitoring (60 DRPs), need for additional drug (34), unclear documentation in the GPs records (19) and inappropriate drug choice (19). The GPs agreed to undertake immediate changes related to 63 (31 %) of the DRPs discussed. For 17 DRPs (8 %) no changes were performed. For 114 (56 %) DRPs a decision was postponed and could not be taken before the GP had seen the patient or medication monitoring had been performed. Five drugs accounted for 25 % of the 202 DRPs, these being digitoxin, warfarin, metoprolol, potassium and furosemid.
Conclusion Medication reviews performed in a multidisciplinary setting in primary care might improve drug use among patients discharged from hospital.

Electronic multidrug punch cards for patients after hospital discharge—a study design

Boeni F., Arnet I., Hersberger K.E.

Pharmaceutical Care Research Group, University of Basel, Klingelbergstrasse 50, 4056 Basel, Switzerland.
Email: fabienne.boeni@unibas.ch

Aim of project/study Typical adherence rates for oral prescription drugs are approximately 50–76 %, with non-adherence being clinically significant in half of patients and enhancing the risk of hospital admission by 2.3. As a consequence, clinical condition and quality of life (QoL) decrease and costs arise. Non-adherence is a complex behaviour that is categorised as intentional and non-intentional. Various authors suggested that drug reminder packaging may represent a simple method to help unintentionally non-adherent patients by facilitating drug management and by posing a visual aid. In Switzerland, multidrug punch cards are frequently used for nursing home residents. We suppose that the potential of multidrug punch cards is larger and that any outpatient with a complex therapy plan benefits from such a system, independently of condition or age.
Method We will conduct a prospective randomised controlled trial in community pharmacies with hospital discharged patients over 12 months. Eligible patients from the internal medicine's ward at the University Hospital of Basel will be selected by screening electronic patient records and randomised. Baseline data will be obtained from hospital records, patient interviews, and questionnaires. At hospital discharge, a pharmacist will deliver drug counselling, irrespective of group allocation, to ensure all patients being on the same drug knowledge level. After discharge, patients of the intervention group will get their medication repackaged at the study pharmacy into an electronic multidrug punch card. Patients of the control group will get usual care and their medication in commercially available packaging. Individual profiles of electronic adherence data will be discussed with the patients of the intervention group regularly. Follow-up with all patients will take place at 3, 6, and 12 months at the study pharmacy.
Results Our hypothesis: Patients with electronic multidrug punch cards and feedback on their adherence behaviour will perform significantly better in clinical, adherence, and humanistic outcomes compared to patients with commercially available packaging and usual care.
Endpoints We defined two primary endpoints: (a) a composite endpoint of time to rehospitalisation and time to major adjustment in therapy plan; (b) medication possession ratio (MPR). Secondary endpoints are adherence data according to electronic adherence data and self-report, QoL, and patient satisfaction.

Pharmacist-physician relationships from the pharmacist's perspective in Poland

Piecuch A., Kozlowska-Wojciechowska M., Makarewicz-Wujec M.

Medical University of Warszaw, ul. Banacha 1, 02-097 Warsaw, Poland. Email: anna.piecuch@wum.edu.pl

Aim of project/study To describe the professional relationships between pharmacists and general practitioners in Poland, and to identify determinants of these relationships, from the pharmacist's perspective.
Method A self-administered questionnaire was distributed among 3,937 pharmacists. Response rate was 37.0 %. Of the total 1,456 responses, 1,311 were usable (1,156 women and 155 men, mean age 40.4 years). As dependent variables, two constructs were formed: co-responsibility (4 items) and collaboration (6 items), which referred to pharmacists' professional relations with general practitioners. All items used a 5-point Likert scale. Questions and statements were based on a literature review and discussions in research team. All of the study constructs yielded Cronbach coefficient alpha values greater than the minimum acceptable value of 0.70. The particular Cronbach coefficient alpha values were: co-responsibility (0.83) and collaboration (0.85). Face validity was established through a review of the study instrument by a panel of 5 research colleagues and by testing the original study instrument in the pretest. The statistical analysis was carried out using STATISTICA 9.1 software. Ethical approval was not required for this study.
Results Most pharmacists declared that they contacted general practitioners at least once a month (70.4 %). These interactions happen predominantly by phone (71.6 %) or in person (37.9 %) (respondents could indicate more than one answer). Interprofessional interactions usually concerned formal problems related to improperly or illegibly written prescription (88.7 %). In the opinion of most surveyed pharmacists, a physician plays a predominant role in patient care (67.0 %). According to half of respondents who provided that answer, pharmacists passively dispense prescribed medications, while the other half claimed that pharmacists play a substantial supporting role in patient care. The most important factors that hamper relationships between pharmacists and general practitioners include: circumstances in which relationships are established that create favourable conditions for misunderstanding to arise (51.0 %), lack of preparation for cooperation between pharmacists and physicians (45.0 %), and lack of an electronic system which would allow exchange of information about the patient (44.8 %). The mean score from all answers was calculated for each construct. The higher the mean value, the greater the sense of pharmacists' co-responsibility for drug therapy and perception of better collaboration with general practitioners. For co-responsibility, the mean value of the construct was 3.5, and the standard deviation (SD) was 0.91. For cooperation, the mean value of the construct was 2.9 (SD = 1.1).

Depression training involving consumer educators: Impact on stigma toward people with depression

Liekens S., Smits T., Laekeman G., Foulon V.

Research Centre for Pharmaceutical Care & Pharmacoeconomics, KU Leuven, Herestraat 49, 3000 Leuven. Belgium.
Email: Sophie.liekens@pharm.kuleuven.be

Aim of project/study To measure the impact of a depression training day, involving a consumer educator, on pharmacists' stigma toward people with depression.
Method Two group, randomized, clustered, comparative design with one group of pharmacists receiving training including a 75 min session with a consumer educator (intervention group) and another group not receiving training (control group). Stigma was measured using the Social Distance Scale for Depression (SDS_D)[1] at baseline and 7–11 weeks post intervention. Post-measurement (T2) comparisons were made between the intervention (n = 50) and control group (n = 35) by Independent samples *T* tests. For the data of pharmacists who had unique identifiers that matched for the two time points, T1 and T2 (n = 52), Paired samples T-tests and One way ANOVA on the difference in change between T1 and T2 were carried out.
Results Survey instruments were completed by 149/181 pharmacists at baseline (T1 response rate: 82 %) and 85/142 post intervention

(T2 response rate: 60 %). The results of the unpaired T-test at T2 showed that the mean social distance toward people with depression in the intervention group (16.8 ± 3.8) was lower than the mean social distance in the control group (18.5 ± 4.4). This difference was considered marginally significant ($t(83) = 1.914$, $p = 0.059$). Paired samples T-tests on the data of T1 and T2 showed that in the intervention group the mean social distance toward people with depression was significantly lower ($t(25) = 2.075$, $p = 0.048$) on T2 (16.46 ± 3.31) than on T1 (17.92 ± 4.35). This is in contrast to the control group where the mean social distance toward people with depression was not significantly different ($t(25) = -1.036$, $p = 0.310$) between T1 (17.38 ± 4.57) and T2 (18.38 ± 4.75). One-Way ANOVA analysis between control and intervention group on the difference in change in social distance over T1 and T2 confirmed these significant results ($F(1, 50) = 4.242$, $p = 0.045$). The results suggest that a training day involving consumer educators, in continuing pharmacy education, decreases stigma toward people with depression.

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A review of clinical practice guidelines for the use of opioids in chronic nonmalignant pain in primary care

Kennedy M.C., Cousins G.C., Smith S., Henman M.C.

School of Pharmacy and Pharmaceutical Sciences, Panoz Institute, Trinity College, Dublin, Republic of Ireland.
Email: kennedm1@tcd.i.e

Aim of project/study The Institute of Medicine (IOM) defines clinical practice guidelines (CPGs) as "systematically developed statements about specific clinical problems intended to assist practitioners and patients in making decisions about appropriate health care"[1]. CPGs have been developed to direct the prescribing of medications for a range of conditions such as the delivery of analgesia in chronic nonmalignant pain (CNMP). Opioids are one class of analgesics used in pain management and appear in Steps 2 and 3 of the WHO analgesic ladder. The use of strong opioids in CNMP has increased in recent years despite limited evidence supporting their safety and efficacy in this condition. The aim of the systematic review is to identify, critically appraise and compare recommendations contained within CPGs for the prescribing of opioids for CNMP in primary care.

Method A systematic search strategy was used to identify CPGs for the prescribing of opioids for CNMP in adults aged 18 and older in the primary care setting. The search strategy was developed to facilitate the extraction of CPGs from a variety of resources including electronic databases, guideline repositories and websites directed at healthcare professionals and patients. The themes of key recommendations contained within CPGs were used to classify the content as clinical or patient management.

Results Sixteen CPGs were retained following application of the exclusion criteria; of these 6 originated in the USA, 4 from Canada, 4 from Australia and 2 from European countries. The focus of the CPG varies according to country of origin and target population of the guideline. US guidelines place an emphasis on patient management considerations particularly those to minimise the risk of aberrant opioid related behaviour. CPGs differ in the extent to which certain clinical information is discussed, particularly information on dosing, frequency, drug-interactions and contra-indications. The inclusion of tramadol, a centrally acting analgesic with weak affinity for the μ-opioid receptor, as an opioid appropriate for use in CNMP also varies between CPGs (4).

Reference

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Evaluation of a best-practice model for multiprofessional medication management in cancer patients

Wilmer A., Tasar A., Fleckenstein K., Hack C., Ruberg K., Ko Y., Jaehde U.

University of Bonn Institute of Pharmacy, An der Immenburg 4, 53121 Bonn, Germany. Email: a.wilmer@uni-bonn.de

Aim of project/study The aim of this project is the development, implementation and evaluation of a multiprofessional best-practice model to enhance patient safety by structured and standardized outpatient cancer care.

Background/method The complex medication of cancer patients consisting of anticancer drugs and supportive treatment is frequently associated with drug-related problems. To sustainably improve patient safety it is of particular importance that all involved health care professions cooperate as efficient as possible. A module-based medication management model was developed in a multiprofessional quality circle in order to define 'best practice'. All care modules include evidence-based recommendations for supportive care, written patient information, and an algorithm illustrating the care process. For the evaluation of the model a Patient-Reported Outcome (PRO) version of the Common Terminology Criteria of Adverse Events (CTCAE), developed by the National Cancer Institute (NCI), was chosen. Prior to the implementation of the model a pilot study was conducted to test the feasibility of measuring patient-reported toxicity.

Results In total six care modules were developed for medication review and interaction check, malnutrition and for the management of four common adverse events: nausea and emesis, mucositis, fatigue, and pain. The modules can be applied individually for each patient according to the medication and the incidence of toxicity. In total 30 outpatients with solid tumors were surveyed in the pilot study and results show that approximately 73 % of the patients suffered from severe or very severe toxicity according to PRO-CTCAE grade 3 or 4. Fatigue was the most frequent adverse event (87 %) followed by sleep disorders (70 %) and nausea (57 %). The efficacy of the model will be evaluated in a mono-centre randomised two-arm interventional trial at the oncology outpatient clinic of the Johanniter-Hospital in Bonn which is currently ongoing. Patients are allocated either to the control group receiving best standard care or to the intervention group receiving medication management according to the best practice model. The primary endpoint is the time to first occurrence of severe toxicity (grade 3 or 4) according to the PRO-CTCAE classification. The sample size is calculated on 106 patients in total.

Establishing a geriatric multidisciplinary out-patient clinic for medication review

Viktil K.K., Frøyland H., Engh E., Hylen Ranhoff A.

Diakonhjemmet Hospital, Hospital Pharmacy, Pb 23, Vinderen, 0319 Oslo, Norway. Email: kirstkv@farmasi.uio.no

Aim of project/study As elderly patients are particularly vulnerable to adverse drug reactions and other drug related problems it is important to perform medication review to reduce the risk of taking medicines as well as optimizing the outcome. It is well known that during a short hospital stay or during a visit to their general practitioner it is a challenge to take care of all aspects of the medications. We therefore developed an out-patient clinic for these patients with special focus on medication review.
Method The clinic should be multidisciplinary and involve a geriatrician, a nurse and two clinical pharmacists. Further, the clinic should be based on the concordance principles and the dialogue with the patient is essential. A framework for the medication review was set up and the patient was actively involved in all three of the following parts: Assessing function in daily life activities (nurse), a systematic evaluation of the patient's use of medications through a dialogue between the patient and the clinical pharmacist, and a medical clinical evaluation by the geriatrician, including vital and other signs and symptoms. The patient visits the three health professionals individually at the same day, and immediately thereafter a consensus meeting, with all involved health professionals and the patient him/herself, is held to discuss the drug-related problems identified and solutions and actions are discussed. A multidisciplinary summary is written by the geriatrician, and this is send to the patient's general practitioner. During this work a new chapter, "Medication Review", has been written in the Norwegian Guideline of Medications for Health Professionals http://legemiddelhandboka.no/kapG24 by three of the authors. Experiences from setting up the out-patient clinical were essential for the chapter.
Results The logistics and the framework for the out-patient clinic have been established. Patients are referred from hospital physicians and general practitioners. We will report on the ten first patient visiting the clinic.
Conclusion A medication review has composite elements of which the perspective of the patient is essential to optimize the outcome and to reduce the risk of medications.

Do we inform/educate patients well about warfarin therapy?

Tadic I., Lakic D., Odalovic M., Rakic M., Tasic L.

Department of Social Pharmacy and Pharmaceutical Legislation, University of Belgrade, Faculty of Pharmacy, Vojvode Stepe 450, 11221 Belgrade, Serbia. Email: ljtasic@pharmacy.bg.ac.rs

Aim of project/study Anticoagulants are one of the classes of medicines most frequently identified as causing adverse drug events. In Serbia, warfarin has been most often prescribed anticoagulant drug. Patients' lack of knowledge regarding the use of warfarin can have significantly impact on treatment effects. Therefore we have conducted a project on the use of anticoagulant therapy. The aim of this study, which is a part of the project, was to analyse the information regarding the warfarin therapy that patients get from the health care professionals.
Method The study was conducted during the four-month period (February till May 2012) in three public pharmacies located near the health centres. The inclusion criteria for patients was warfarin (5 mg orally dosage form) prescribed and dispensed at least ones during the observed period. The questionnaire for data collection consisted of 10 questions based on the questionnaire "Satisfaction with information about medicines".
Results The study included 78 patients (40 male and 38 female patients) with average 64.97 years of age. The level of education of the most patients was primary (48.78 %). Majority of patients had been given proper information regarding the indication for warfarin (79.49 %) and administration of the medicine (87.18 %). The most patients have enough information on the remaining issues, but there were a percentage of patients who reported that they did not have any information about warfarin: what it should be done in case the patient forget to take a dose (30.77 %), whether the warfarin has any side effects (28.20 %), how long it take to act (25.64 %), what it should be done in the case of side effects (25.64 %), what are the risks of getting side effect (20.51 %), whether the drinking alcohol (10.26 %) or taking other medicines (7.69 %) are allowed during the therapy and the duration of the therapy (2.56 %).
Conclusion There is a need for improvement of the health service provision especially the step of provision of information to the patients. Therefore, facilitation of the patients' knowledge/education can be expected to improve pharmaceutical care outcomes.

Defining professional pharmacy services—the role of community pharmacy

Moullin J.M., Sabater-Hernández D., Benrimoj S.I.

University of Technology Sydney, PO Box 123, Broadway NSW 2007, Australia. Email: Joanna.Moullin@uts.edu.au

Aim of project/study To define a professional pharmacy service within the context of the community pharmacy model of service provision. The definition will facilitate the identification of professional pharmacy services, along with their indicators, to assist the evaluation of service implementation.
Method There is no universally accepted definition in the pharmacy practice literature that encompasses the entire scope of activities, services, and programs provided by community pharmacy. A preliminary literature review was conducted using online databases (PubMed, MEDLINE, with no date limits), texts and conference proceedings, along with bibliographic searching, to identify the scope of current pharmacy service definitions. The examination revealed multiple terms and definitions used to describe aspects of pharmacy practice and service provision, yet none included the full range of services delivered by community pharmacy. A definition is proposed based on Donabedian's theoretical framework.[1] Three core components, organisational structure, process indicators and outcome measures, offer a suitable configuration to evaluate service implementation and provision.
Results The initial search revealed at least 15 definitions and 13 terms emanating from 10 different first named authors and 6 organisations, in Australia, Canada, various European countries and USA. In an attempt to convert the concept of Pharmaceutical care to practice a heterogeneous mix of ideas, terms, services and classification schemes, without apparent conceptual bases, have been created. Definitions revolve around pharmacists or particular services, with a focus on drug safety, efficacy and health outcomes.
The definition proposed is: "professional pharmacy service is an action or set of actions undertaken in or organised by a community

pharmacy, delivered by a pharmacist or other health practitioner, who applies their specialised health knowledge personally or via an intermediary, with a patient/client, population or other health professional, to optimise the process of patient care, with the aim to improve health outcomes and the value of healthcare."

The definition offers the pharmacy as the organisational structure, the process of patient care as process indicators, and health outcomes and the value of healthcare as outcome measures. Professional service is the action arising from the application of the specialised knowledge of a pharmacist or other healthcare practitioner.

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Pharmaceutical care—can we influence the proper treatment for patients with diabetes

Yordanova S., Petkova V.

Institute Faculty of Pharmacy, Medical University—Sofia, 2-Dunav street, 1000 Sofia, Bulgaria. Email: stasyyordanova@gmail.com

Aim of project/study To develop an educational plan for patients with diabetes on insulin therapy in a community pharmacy, to test possibilities for its implementation and to evaluate its effect on the clinical, therapeutic, social and economic results of diabetes treatment.

Method The sample consisted of 50 individuals with type 1 and 2 diabetes on insulin treatment, that did not suffer from severe complications. The patients were divided into two groups—1st (mean age 55.74 ± 2.72)—that were additionally educated, and 2nd (mean age 58.58 ± 2.61)—a control group. A validated questionnaire (SF-36) was applied to be assessed the patients quality of life. A 4 month education was conducted on three topics: (1) essence of diabetes, nourishing and physical activity; (2) hypo- and hyperglycemia, possible complications; (3) insulin treatment. The clinical and therapeutic data were collected by an interview and from patients' diaries: duration of diabetes, blood glucose levels, details on diabetic vascular complications, and incidents of hypo and hyperglycemia for the studied period of time.

Results Progress in patients' diabetes and drug knowledge, decrease in the monthly frequency of hypo and hyperglycemic incidents (about 2 times less) and improvement in their life style were assessed.

Conclusion The results show that pharmaceutical care for patients with diabetes is effective and it has the potential to decrease the diabetes complications and from there—the economic cost of the diabetes treatment. So it can be cost-effective.

Predictors of masked hypertension in the community pharmacy setting

Sabater-Hernández D., de la Sierra A., Sendra-Lillo J., Benrimoj S.I., Martínez-Martínez F., Faus M.J.

Pharmaceutical Care Research Group, University of Granada and Graduate School of Health, University Technology Sydney, Campus de Cartuja, 18071, Granada, Spain.
Email: Daniel.SabaterHernandez@uts.edu.au

Aim of project/study Community pharmacy-masked hypertension (CPMH) is defined by the presence of elevated ambulatory (ABP) or home blood pressures (HBP) despite normal values when measured at the community pharmacy (CPBP). We have previously reported that this is a relatively frequent condition in hypertensive patients attending community pharmacies (around 15 %).[1] As ABP and HBP are stronger predictors of target organ damage and cardiovascular events than office or casual BP, CPMH could have relevant clinical implications and should be identified. The aim of this analysis was to explore the factors associated with the presence of CPMH.

Method BP was measured at the pharmacy (4 visits), at home (4 days), and by 24-h ABP monitoring in 169 treated hypertensives1. CPMH was defined as a CPBP (systolic BP/diastolic BP) <140/90 mmHg in the presence of either HBP or daytime ABP = 135 and/or =85 mmHg. Predictors of CPMH were analysed within 124 patients with normal CPBP (mean age: 55 ± 11 years; female: 63 %), using multivariate logistic regression. As CPMH was defined using either ABP (18.5 %) or HBP (22.6 %) as reference methods, two different models were constructed. Independent variables were: gender, age (4 categories), smoking status, CPBP (3 categories), body mass index (3 categories), number of antihypertensive drugs (3 categories) and diabetes.

Results Regression analysis for CPMH using ABP as the reference method, revealed only systolic CPBP >130 mmHg as an independent factor [OR = 6.76 ($p = 0.021$); <120 mmHg as reference]. Otherwise, current smoking [OR = 5.44 ($p = 0.028$)], age >54 years [54–63 years: OR = 14.32] ($p = 0.024$); >63 years: OR = 37.30 ($p = 0.006$); <45 years as reference], diastolic CPBP >80 mmHg [80–85 mmHg: OR = 10.66 ($p = 0.003$); >85 mmHg: OR = 7.80 ($p = 0.017$); <80 mmHg as reference] and systolic CPBP >130 mmHg [OR = 14.85($p = 0.003$); <120 mmHg as reference] were independent determinants of CPMH using HBP as the reference method.

Conclusion The level of BP measured at the pharmacy is the main determinant of the presence of CPMH using either ABP or HBP as the diagnostic method. Age and smoking are also associated with the presence of CPMH determined by HBP, but not by ABP, indicating that both methods are not totally interchangeable for the diagnosis of this condition.

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Medication safety at a German University Hospital—results of a pilot project

Lenssen R.[1,2], Heidenreich A.[1], Schulz J.B.[1], Trautwein C.[1], Jaehde U.[2], Eisert A.[1]

[1]Hospital Pharmacy, University Hospital Aachen, Steinbergweg 20, D-52074 Aachen, Germany; [2]Department of Clinical Pharmacy, Institute of Pharmacy, University of Bonn, Germany.
Email: rlenssen@ukaachen.de

Aim of project/study The success of medication therapy is limited by drug-related problems (DRP). Furthermore, these problems influence medication safety. Pharmaceutical care service aims at reducing these DRP. A pilot project was conducted at the University Hospital of Aachen. The aim of this project was to reveal whether the implementation of a pharmaceutical care service on wards is feasible. In

this context, we evaluated the need for pharmaceutical care for elderly and younger patients by separating the two groups at the age of 65. Additionally, we investigated which care setting is most vulnerable for DRP.
Method The patients enrolled in this project received pharmaceutical care during their stay on the cooperating wards. For each patient, a drug information service based on DRP was provided. The DRP were classified using the APS-Doc system.[1] Each DRP was analysed regarding to the step of the medication process at which the problem occurred.
Results The occurrence of more than two DRP per patient confirm the need for pharmaceutical care [average: 2.3 DRP/patient, min: 0, max: 11 DRP/patient]. Furthermore, the offered pharmaceutical care service was highly accepted on the wards: 77 % of the recommendations were translated into practice. Significantly more drug-related problems (2.5 vs. 1.9 DRP) were observed in the group of the elderly patients compared to the younger ones ($p < 0.05$). Of all detected DRP, 37 % were in the existing drug therapy on admission of the patient to the ward. Further DRP occurred at the transition of care (27 %), whereas 36 % took place during hospital stay.
Conclusion The presented results clearly reveal the necessity for pharmaceutical care. The second part of the research project focuses on elderly patients, especially home-cared patients and nursing home residents. Moreover, the effectiveness and benefit of pharmaceutical care service is currently being evaluated. This project is supported by the Foerderinitiative Pharmazeutische Betreuung e.V., Berlin and the Apothekerstiftung Nordrhein, Düsseldorf.
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Quality improvement through self-evaluation: an online application for Belgian community pharmacies

Wauters K., De Wulf I., Saevels J.

APB, Archimedesstraat 11, 1000 Brussel, Belgium.
Email: isabelle.dewulf@apb.be

Aim of project/study As of January 1, 2012, Belgian community pharmacies are required by law to have a Quality Manual. With this Quality Manual comes also the obligation to perform self-evaluations of their Quality Management System. These evaluations are performed in order to check compliance with the different aspects of Good Pharmacy Practices (GPP) and should lead to quality improvement of pharmacy care. To assist them in setting up (and maintaining) their Quality Manual, the Association of the Pharmacists of Belgium (APB) has developed in 2010 an online application MyQualityAssistant (www.MyQA.be). Since September 2012 this application has been extended with a module to perform self-evaluations.
Method The self-evaluation module consists of questionnaires on different activities in the community pharmacy. Each containing about 20 questions, regarding legally as well as non-legally compulsory issues. They can be filled in online, through secure access. After completing a questionnaire, a report is generated immediately and 3 scores (in %) are given: a score for the legally compulsory items, a score for the non-legally compulsory items and a total score. In a second part of the report, the questions for which there was no compliance with GPP, are listed. An explanation why there is no compliance with a reference to the relevant legislation is also given for each question. On September 17th, 5 questionnaires were put online on the following activities: Logistics (1), Compounding (3) and Equipment (1).
Results By the end of November 2012, already 1.029 completed questionnaires were registered and 8.4 % of the 3.500 MyQA using pharmacies already completed at least one questionnaire. The average score per pharmacy is rather high, especially what concerns the legally compulsory issues. These first results confirm that the community pharmacist in his daily activities actually takes the necessary steps to deliver quality work, though here and there also remain some points to improve.

Patient's understanding of drug label instructions: a study among different populations living in the Netherlands

Koster E. S., Blom L., Winters N., Gilberts P., van Hulten R., Bouvy M. L.

UPPER, Universiteit Utrecht, PO box 80082, 3508 TB Utrecht, The Netherlands. Email: e.koster@uu.nl

Aim of study Health literacy concerns the knowledge and competences of an individual person that are necessary for adequate response to information about health(care). Health literacy is strongly associated with educational level and overall literacy. Previous research has shown low (health) literacy to be associated with poor adherence, increased health consumption and poor health outcomes. The assumption of health care providers that their patients can read, understand and respond adequately to the instructions found on prescription drug labels may (sometimes) be unfounded. The aim of this study was to assess understanding of drug label instructions in different (non-native) populations living in the Netherlands.
Method Four different populations living in the Netherlands were studied: people born in Iran, Turkey, the (former) Antilles and Surinam (Hindustani). Participants were recruited at meeting places for a particular ethnic group (mosques, cultural centres). Only people with sufficient comprehension of the Dutch language were included (tested by a short screening questionnaire on literacy skills). First year pharmacy students, who were born in the Netherlands, were included as reference group. All participants completed a survey with questions about the correct interpretation of 4 drug label instructions, with instructions like "Complete the prescribed course (antibiotics prescribed for 7 days)" and "Take 1 tablet as needed, maximal 6 tablets a day (acetaminophen)". For correct interpretations of the instructions presented in the survey experts of the university (staff members, practicing pharmacists) and the Royal Dutch Pharmacist Association were consulted.
Results In total, 180 Iranian, 188 Turkish, 168 Antillean, 155 Hindustani born in Suriname and 153 Dutch (reference) participants were included in the study. Some drug label instructions were misunderstood; misunderstanding of instructions occurred both in non-natives and Dutch natives (3 out of 4 labels were misunderstood by the majority of participants), but non-natives had more often problems with the instructions. For example, the instruction "Complete the prescribed course (antibiotics prescribed for 7 days)" was more often correctly answered (use the drugs for 1 week) by the Dutch reference group (95.4 %) compared to the other groups: Iranian (80.6 %), Turkish (88.3 %), Hindustani (91.6 %) and Antillean (81.0 %) participants ($p < 0.05$).

Comparing three different forms of interprofessional education on health professional inhaler technique and maintenance of correct technique

Bosnic-Anticevich S.[1], Williamson M.[2], Cvetkovski B.[1], Mavritsakis B.[1], Travers-Mason P.[2], Mendrela G.[2], Sainsbury E.[1], Stuart M.[3], Macksonformerly J.[2], Armour C.[1]

[1]The University of Sydney, Science Road, 2135 Sydney, Australia; [2]NPS; [3]Australian Catholic University.
Email: Sinthia.bosnicanticevich@sydney.edu.au

Aim of project/study To compare the effect of three education interventions, on the ability of health professionals (HPs) to achieve and maintain correct inhaler technique (IT).
Method A parallel group, three arm, repeated measure design was used to implement and evaluate three educational interventions: traditional face-to-face workshop(1) (Model 1), online learning module (Model 2) and a collaborative face-to-face workshop(Model 3). HPs' IT was assessed within a fortnight of competing the modules. If HP IT was not correct, the assessor would provide immediate personal training and assessment until correct IT was achieved. HPs then delivered the Collaborations in Asthma Management in the Community (CAMCOM), protocol, involving optimisation of patient's IT over 6 months. HPs IT was then re-assessed.
Results A total of 81 HP (27 GPs, 11 practice nurses and 43 pharmacists) participated in the study (28, 17 and 36 HPs in Models 1, 2, and 3 respectively). There was a statistically significant difference in the mean proportion of HPs with correct technique between Modules 1, 2, and 3 initially (72, 27.4 and 47.8 % respectively, Pearson's Chi Squared, $n = 81$, $p < 0.05$) and at the 6 month follow-up (57.8, 44.4 and 25.3 % respectively, Pearson's Chi Squared, $n = 41$, $p < 0.05$).

Asthma management and collaboration in primary care

Bosnic-Anticevich S.Z.[1], Kearey P.[1], Furneaux M.[2], Kok C.[1], Smith L.[1], Saini B.[1], Krass I.[1], Reddel H.[3], Armour C.[1]

[1]Faculty of Pharmacy, University of Sydney, 2135 Camperdown, NSW, Australia; [2]South Eastern Sydney Division of General Practice (SESDGP); [3]The Woolcock Institute of Medical Research.
Email: Sinthia.bosnicanticevich@sydney.edu.au

Aim of project/study To identify the attitudes and perceptions of primary health care providers (HCP) on collaborative asthma management.
Method A qualitative research approach was used and a series of interviews and focus groups conducted with primary HCPs. The sampling frame was all general practitioners (GPs), practice nurses (PNs), pharmacists, asthma educators (AE) and psychologists within a metropolitan health district. Data were collected using a semi-structured interview/focus group facilitation guide, audiotaped and transcribed verbatim. Content analysis was carried out using a deductive approach to identify major themes and concepts.
Results Four focus groups of GPs, PNs, pharmacists and psychologists were completed with 6, 7, 5 and 5 participants, respectively. Interviews were conducted with 2 asthma educators. Barriers associated with the theme of asthma management were similar for GPs, PNs and pharmacists and were commonly related to patient-related factors including patient perceptions, adherence and self-management. Psychologists perceived a limited role for themselves in asthma management. AEs, focused on the challenges around minimal resources vs high demand. Psychologists and AEs had no experience in, nor did they perceive there to be a need to engage in, collaborative practices. While similar themes around collaboration were raised by GPs, PNs and pharmacists, their views within these themes differed. Some believed that collaboration already existed, others focused on perceived barriers.

Interprofessional learning: impact on collaboration and attitudes towards health care teams

Bosnic-Anticevich S. Z.[1], Williamson M.[2], Stuart M.[3], Macksonformerly J.[2], Cvetkovski B.[1], Mavritsakis S.[1], Mendrela G.[2], Travers-Mason P.[2], Sainsbury E.[1], Armour C.[4]

[1]University of Sydney, Science Road, 2135 Sydney, Australia; [2]NPS; [3]Australian Catholic; [4]Woolcock Institute of Medical Research.
Email: Sinthia.bosnicanticevich@sydney.edu.au

Aim of project/study To compare the effect of three "interprofessional" educational interventions on attitudes towards collaboration and markers of interprofessional practice.
Method HCPs from three general practice networks were recruited into three groups (1, 2, and 3) receiving one of three models of inter professional education (i.e. joint setting group, online group and socio-cultural theory-based group, respectively). HCPs were then required to recruit and review patients with asthma five times over a 6 month period. Collaborative practice was evaluated through a series of process measure. Attitudes toward collaboration/health care teams was evaluated using the Attitudes Towards Health Care Team Scale (ATHCTS).
Results A total of 37 pharmacists, 13 general practitioners and 2 practice nurses recruited 312 patients with asthma. No significant difference was detected in ATHCTS between Groups 1, 2 and 3 over time. Of the 945 patient completed only 5 % were seen by both a GP and pharmacist (10 % in Group 1, 11 % in Group 2 and 3 % in Group 3). Of these visits 81, 94 and 37 % were entered on the electronic patient log by HCPs from Groups 1, 2 and 3 respectively.

Do we prescribe what patients prefer? A pilot study to assess patients' preferences for medication regimen characteristics

Witticke D., Seidling H.M., Klimm H.D., Haefeli W.E.

Universität Heidelberg, Medizinische Klinik, Abt. Klinische Pharmakologie & Pharmakoepidemiologie, Im Neuenheimer Feld 410, 69120 Heidelberg, Germany.
Email: diana.witticke@med.uniheidelberg

Aim of project/study The aim of this pilot study was to evaluate patients' attitudes towards different medication-related factors known to impair adherence and to assess their prevalence in ambulatory care as an essential prerequisite to improve patient adherence.
Method We conducted a face-to-face interview with 110 primary care patients maintained on at least one drug. For each drug, the

patient was asked to specify medication-related factors of interest, i.e., dosage form, dosage interval, required relationship with food intake, and the planned time of day for intake, and to rate the individual relevance of each prevalent parameter on a three-point Likert scale (discriminating between prefer, neutral, and dislike).
Results Tablets with a once-daily dosage frequency were the most preferred dosage form, with a high prevalence in the ambulatory setting. Drug intake in the morning and evening were most preferred, and drug intake at noon was least preferred, but also had a low prevalence in contrast with drug intake independent of meals that was most preferred. Interestingly, only one quarter (26.4 %) of all the patients was able to indicate clear preferences or dislikes. When patients are asked to specify their preferences for relevant medication regimen characteristics, they clearly indicated regimens that have been associated with better adherence in earlier studies. Therefore, our results suggest that adaptation of drug regimens to individual preferences might be a promising strategy to improve adherence. Because the German health care system may differ from other systems in relevant aspects, our findings should be confirmed by evaluation of patient preferences in other health care systems. Once generalizability of the study results is shown, these findings could be a promising basis upon which to promote patient adherence right from the beginning of drug therapy.

Cost-effectiveness analysis of pharmaceutical care in hypertension in Poland—Markov model

Polak W., Skowron A.

Jagiellonian University Medical College, Faculty of Pharmacy, Department of Social Pharmacy, Medyczna 9, 30-688 Krakow, Poland. Email: wpolak@cm-uj.krakow.pl

Aim of project/study To assess effectiveness and costs of pharmaceutical care in Poland
Method The cost-effectiveness analysis is conducted from the national payer and society perspective. Alternatives compared are: pharmaceutical care (PC) and standard medical care (SMC). The costs and effects of SMC were assessed in 3 outpatient clinics. PC was conducted based on Strand and Hepler definition of pharmaceutical care. The inclusion criteria were: adults with hypertension at least 3 months after first prescription for antihypertensive medicine, able to communicate with others, with full legal capacity. Patients with myocardial infarction or stroke during 6 months before inclusion, depression, schizophrenia, dialysis, after transplantation of organs or tissues, visually impaired, drugs, alcohol or medicines dependent were excluded. The cost-effectiveness analysis is based on Markov model. Time horizon is 360 days and the cycle length—30 days. The basic model consists of 4 health states: proper blood pressure (according to polish guidelines), improper blood pressure, cardiovascular death or non-cardiovascular death.
Results The probabilities of transitions are derived from data on 53 transitions in 13 PC patients and 84 transitions in 46 SMC patients. Mean age of PC patients was 62.3 years (±14.7), SMC—65.6 years (±12.8). Women consisted of 61.5 % of PC patients and 52.2 % SMC patients. PC patients had mean 0.7 additional circulatory system diseases (±0.8) compared to 1.8 in patients SMC (±1.5). PC patients used 2.2 medicines for hypertension (±1.3) and 0.5 medicines for other circulatory system diseases (±0.9) compared to SMC patients: 2.1 medicines for hypertension (±1.3) and 1.2 medicines for other circulatory system diseases (±1.3). Baseline systolic blood pressure in PC patients compared to SMC patients was 140 (±14) versus 145 (±21). Baseline diastolic blood pressure in PC patients compared to SMC patients was 84 (±10) versus 87 (±12). The probabilities of maintaining proper blood pressure in next cycle is 0.8285 for PC and 0.5889 for SMC. The probabilities of normalizing blood pressure is 0.1996 for PC and 0.3793 for SMC. Probability of cardiovascular death is 0.0013 and probability of non-cardiovascular death is 0.0005. Cohort modelling indicates that after 12 cycles 52.7 % of PC patients would achieve proper blood pressure, compared to 47.1 % of SMC patients.

Drug related problems and interventions of pharmacists on prescribed medicines in Belgium

De Wulf I., Boussery K., De Vriese C., De Meyer G., Foulon V., Lacour V., Mehuys E., Steurbaut S., Van Hees T.

APB, Archimedesstraat 11, 1000 Brussel, Belgium.
Email: Isabelle.dewulf@apb.be

Aim of project/study (1) To study the frequency and nature of drug related problems (DRP) detected by community pharmacists and internship students when dispensing prescribed medicines. (2) To investigate the nature and frequency of interventions by pharmacists. (3) To study whether there is a difference between DRP detection at the moment of dispensing versus in a quiet setting.
Method All tutors of the participating universities in Belgium were asked to contribute to the study. Participating pharmacists quantified drug related problems and their interventions for 5 full or 10 half days. Registrations were made by using a web tool based on the classification list of PCNE. This list had been translated and validated for the Belgian community pharmacy setting prior to the development of the web tool. The web application was evaluated by 38 students in a pilot study. A few adaptations were made to improve the user friendliness.
Results Six of the seven Belgian universities and 530 (10.5 % of the 5,025) Belgian pharmacists were willing to actively participate in the final study: 280 pharmacists and an equal number of internship students conducted the study in November/December 2012 and 250 pharmacists and internship students will do so in February/March 2013. On December 12th 4.907 DRP's were registered. 4,406 DRP were detected at the moment of dispensing, 501 (10 %) were detected a posteriori, when the students analysed the prescription at a quiet time. In 2.359 (48 %) of the registrations medicines that were prescribed for the first time were involved, 2.469 (50 %) registrations were made for repeat prescriptions and 78 (1.6 %) registrations were related to compounded drugs. Further analysis of DRP and interventions has not yet been done.

Adaptation and validation of a drug related problem classification tool in community pharmacy

De Vriese C., Sansterre G., De Wulf I., Claeys C.

Universté Libre de Bruxelles, 69 Boulevard du Triomphe, 1050 Brussels, Belgium. Email: cdevries@ulb.ac.be

Aim of project/study (1) To translate and adapt the PCNE drug related problems (DRP) classification tool (v.6.2.) to the Belgian community pharmacy setting. (2) To assess the content validity and the reliability of this classification tool.

Method The translated and adapted version of the tool was submitted to a group of 15 pharmacists, which reviewed the format and content of the items. Content validity indexes were calculated. After adaptation of the tool, 109 DRP were collected in community pharmacy and 56 of these DRP were submitted to 10 community pharmacists to test the inter-rater reliability of the tool.
Results The PCNE classification tool has been translated in French and adapted by adding 11 items in the section «causes» (mostly related to the logistics of the prescribing and dispensing process, and related to the behaviour of the patient), and 2 items in the section «interventions». The process of content validation resulted in modifying the definitions of potential problem and manifest problem, and in adding 2 items in the section "causes". The final adapted tool included 84 items classified in 4 sections (problems, causes, interventions and outcomes), with full instructions on how to use it. In term of reliability of the tool, the inter-rater agreement was very good between the pharmacists since it was of 90 % for the majority of the items. However, the agreement for "potential problem", "manifest problem" and "effect of drug treatment not optimal" was only of 59, 61 and 69 %, respectively, suggesting some lack of understanding for those items. Concerning the outcomes of pharmacist's interventions, the agreement was of 80 % for the item "problem totally solved". A difference in pharmacist's perception to consider that the intervention is sufficient to totally solve the DRP could explain this result. In conclusion, these results showed that the tool is reliable and has adequate validity to measure the frequency and the nature of DRP detected in a Belgian community pharmacy setting.

Initiation of a drug-drug interaction register for community pharmacies

Braun C.A.[1], van Bömmel-Wegmann S.[1], Simons S.[1], Diederichs L.[2], Wülfing M.[3], Schummer B.[4], König F.G.[4], Schwalbe O.[5], Jaehde U.[5]

[1]Institut of Pharmacy, Clinical Pharmacy, University of Bonn, An der Immenburg 4, 53121 Bonn, Germany; [2]MVDA e.V., Cologne; [3]LINDA AG, Cologne; [4]ADG mbH, Mannheim; [5]Apothekerkammer Westfalen-Lippe, Münster.
Email: c.braun@uni-bonn.de; s.wegmann@uni-bonn.de

Aim of project/study The aim is the development of a drug-drug interaction (DDI) register, which collects all DDI notifications in German community pharmacies including how DDIs are managed by the pharmacy staff. The DDI register can help to estimate the incidence of DDIs detected in German community pharmacies and provides a basis for advanced education of the pharmacy staff in order to improve the quality of DDI management.
Method To get in contact with a high number of German community pharmacies, we cooperate with the pharmacy collaboration "LINDA AG". In a four-week pilot-phase in nine German community pharmacies the management of the ten most frequent DDIs was documented by the pharmacy staff using an electronic documentation system. Afterwards, 26 semi-structured interviews were performed in order to improve the documentation program's usability and its user interface. The interviews were transcribed and two researchers independently performed a content analysis using the program MAXQDA10. Text passages ("codings") were marked with a "code". These codes were pooled in categories. Based on the codings recommendations for improvement were elaborated.
Results During the pilot-phase nine community pharmacies documented 164 DDIs. This number increased up to 467 within the following 6 months while the documentation frequency decreased continuously. Most of the documented DDIs were antihypertensives with NSAIDs (251; 54 %), especially ACE inhibitors and NSAIDs (107; 23 %), followed by DDIs with polyvalent kations (76; 16 %). During the qualitative part of the research, based on the interviews particularly four main topics ("support", "setting and organization of pharmacy", "DDI management" and "DDI register") emerged. Therefore, codes were pooled in these main categories. Recommendations for improvement especially concerned the electronic documentation system, the dispensing software and the implementation of documentation in daily routine. The documentation tool was adjusted due to the results of the semi-structured interviews.
In conclusion, the interviews and the initially high number of DDI documentations showed that an implementation of the register in the pharmacies' daily routine is feasible. The study will be extended to all types of DDIs using automatic collection of all potential DDIs on a central data server.

Clinical pharmacy case education

Vlcek J., Maly J., Fialova D., Linhartova A.

Charles University, Faculty of Pharmacy, Heyrovského 1203, 50011 Hradec Králové, Czech Republic. Email: vlcek@faf.cuni.cz

Aim of project/study To increase quality of pharmaceutical care by increasing the knowledge and skills of pharmacists on how to maximize effect and minimize risk of pharmacotherapy.
Method The section of clinical pharmacy together with pharmaceutical chamber developed interactive seminars for pharmacists. The project was started in 2006, and a team of lectors (pharmacists)was set up. This team meets twice a year during a business meeting and develops content and quality standard rules. Every individual seminar is led by lector together with physician (consultant). The task of lector is to promote discussion concerning drug related problems (not only describing it, but fitting it into theoretical knowledge and skills), to identify problematic substances and find a way to monitor the clinical relevance of DRP, and to manage it. Consultants make comments from the medical point of view. The participants (maximum is 30 on each event) receive several cases 1 week before the workshop. The workshops are running in majority of regions of Czech Republic and so it is not necessary for pharmacists to spend lot of time with travelling. Participants and lector have to fill out a questionnaire at the end of the workshop. The questionnaire was developed on business lector's meetings.
Results We started with 5–20 seminars, but now 70–80 seminars are given annually. In 2011 and 2012 respectively 1,767 and 1,750 pharmacists participated. Preliminary results from the questionnaires show that for 96 % of participants workshops meet their expectation, 82 % reported that it will be useful in their daily dispensing practice, 96 % enjoyed discussing the topic and about 98 % appreciate the professional level and interactivity of the workshops.

To assess the patterns and quality of medicines use among an aging population with ID in Ireland

O'Dwyer M., Pecklar J., McCarron M., McCallion P., Henman M. C.

Trinity College Dublin, Westland Row, Dublin 2, Ireland. Email: odwyerm8@tcd.i.e

Method Medication use data was drawn from the first wave of data collected as part of the Intellectual Disability Supplement to the Irish Longitudinal Study On Ageing (IDS-TILDA). A representative sample of 753 participants with ID over the age of 40 were included in the first wave. A pre-interview questionnaire and face-to-face interview was used to gather data on the health, social, environmental and economic status of participants. Information on medicines taken on a regular basis were recorded. This information was then cross-checked by the interviewer at the time of the interview. Medicines were classified using the Anatomical Therapeutic Chemical Classification System (ATC). Patterns of medication use were analysed according to age, gender, level of ID, presence of polypharmacy and reported conditions.

Results Most (91 %) participants reported use of one of more medicines (range 1–18 medicines) 59.2 % reported polypharmacy (use of 5 or more medicines). Antipsychotics, antiepileptics and laxatives were reported most frequently. Psychotropic polypharmacy was frequent and 17.5 % of the cohort reported the use of an antidepressant and antipsychotic while 16.7 % reported the use of an antipsychotic and an anxiolytics. Two-thirds (38.1 %) reported use of one or more antiepileptic drugs (AEDs). Of these 71.4 % reported a doctor's diagnosis of epilepsy (this was assumed to be the primary indication of AED use in these participants), while 28.6 % of participants who reported use of antiepileptic drugs did not report a diagnosis of epilepsy. Of these three quarters reported a doctor's diagnosis of an emotional/nervous/psychiatric condition. However, 18 participants reported use of AEDs but did not report a diagnosis of epilepsy or a doctor's diagnosis of an emotional/nervous or psychiatric condition. Describing patterns of medicine use in this population and relating use of medicine to reported conditions is the first step in determining appropriateness of medicine use.

Amsterdam tool for medication review (ATMR): development and validation

Mast M.R., Ahmad A., Hoogenboom S.C., Nijpels G., Elders P.J.M., Beckeringh J.J., Cambach W., Hugtenburg J.

VU University Medical Center, De Boelelaan 1117, 1081HV Amsterdam, The Netherlands. Email: JG.Hugtenburg@vumc.nl

Aim of project/study To detect drug related problems (DRP) and optimise treatment of elderly patients, primary caregivers should regularly examine the medication of these patients. In its most comprehensive form, a clinical medication review (CMR) should consist of a medication analysis, treatment analysis and patient counselling. Several sets of explicit criteria, including Beers' criteria, iPET, START/STOPP criteria have been developed as tools to assist caregivers in making appropriate choices or assessing medication of elderly patients. However, these tools are often not practicable and lack the patients' perspective. The aim was to develop a structured, comprehensive and practicable assessment tool to facilitate and support the process of CMR by pharmacists and GPs.

Method On the basis of their clinical experience one clinical pharmacologist and one GP developed a comprehensive list of DRP related to the most frequently supplied medicines for common chronic diseases in elderly in the Netherlands as listed by the Institute for Public Health and Environmental (RIVM) and Foundation for Pharmaceutical Statistics (SFK). Deviation from treatment recommendations for these common diseases according to the Dutch GP treatment guidelines was considered inappropriate. In order to collect DRP for the checklist, PubMed and the Cochrane library were searched. The tool was optimized by means of a content validity procedure. For this purpose, a panel of eleven experts in the field, two pharmacists, one clinical pharmacologist, two clinical geriatrics and six GPs with cardiovascular, asthma/COPD, diabetes or osteoporosis expertise was asked to comment on the tool.

Results A structured, comprehensive and practicable tool to facilitate and support the CMR process by GPs and pharmacists has been developed. The tool consists of a list of 131 DRP and a script for a patient interview including 17 questions addressing drug use from the patients' perspective, including perceived effectiveness, side effects, problems with drug taking and adherence. The tool can be used for the detection of specific DRP, in addition to methods describing the process of CMR in a less detailed manner, including the descriptions of Lowe and co-workers, Pharmaceutical Care Network Europe, A Guide to Medication Review of the British National Prescribing Centre.

E-learning course: Medication Therapy Management (MTM)

Schmid K., Dircks M., Trojan M., Dörje F., Koczian U.

Bayerische Akademie für Klinische Pharmazie, Maria-Theresia-Str. 28, 81675 München, Germany. Email: kathrin.schmid@blak.aponet.de

Aim of project/study Pharmacists have always played a major role in the distribution and right usage of medication in Germany. In addition pharmacists have become more and more involved in patient-centered care and have taken more responsibility for medication therapy in collaboration with other healthcare professions. Additional knowledge is needed to meet the requirements for these new responsibilities. An advanced training for post-graduated pharmacists will be developed that includes the knowledge and skills required for the implementation of a Medication Therapy Management Service. The training should combine the flexibility of distance-learning with the advantages of close collaboration between participants and mentor.

Method Different teaching methods and technical educational equipment were compared to develop a course structure that would allow flexible learning but also gives the opportunity to apply the knowledge. The content is based on requirements in clinical settings.

Results A part-time/extra-occupational course was created consisting of seven modules including medicine information as well as theoretical and clinical knowledge in various medical areas. Each module starts with presentations by pharmacy experts that the participants download online and study independently according to their own time schedule. Additionally, around thirty-five patient cases are presented by the students in online

conferences focusing on the identification and resolution of drug-related problems. Each presentation is followed by a discussion with all participants under the supervision of the mentor. During these discussions the students apply their theoretical knowledge to clinical practice and improve their communication skills. Three seminars are given for additional intensive training that cannot be delivered online, e.g. communication. It is expected that these also improve atmosphere and motivation during the course duration. To ensure intensive training only ten participants with a prespecified knowledge base are able to enroll in one course and will be supervised closely by a mentor. The course will be given over a period of 15 months.

Pharmacists' knowledge regarding medications safety during pregnancy

Odalovic M., Vezmar Kovacevic S., Krajnovic D., Tadic I., Lakic D., Tasic L.

Department of Social Pharmacy and Pharmaceutical Legislation, University of Belgrade, Faculty of Pharmacy, Vojvode Stepe 450, 11221 Belgrade, Serbia. Email: ljtasic@pharmacy.bg.ac.rs

Aim of project/study The aim of the study was to assess pharmacists' knowledge regarding safety of medications during pregnancy.
Method The study was conducted as the internet survey during 2 months period (April–May, 2012). Questionnaire was distributed to pharmacists, members of Pharmaceutical Chamber of Serbia, via e-mail addresses. Participation in the study was volunteer and anonymous. A total of 19 medications were selected for survey according to frequent, typical or non-recommended usage during pregnancy. Assessment of knowledge about safety of medications during pregnancy was based on Food and Drug Agency (FDA) risk classification. Four answers were offered regarding each surveyed medication where pharmacist had to choose only one (Completely or almost completely safe for the fetus (A and B FDA categories)/ Must be assessed benefit/risk ratio for each pregnant women (C and D FDA categories)/Contraindicated for the use in pregnancy (X FDA category)/I'm not sure).
Results A total of 119 pharmacists accepted to participate in the study; 89.1 % was female. The average age of participants was 36.31 ± 8.13 years, and the average years of working experience were 10.44 ± 8.50. More than a half of pharmacists thought that medications carried higher risk for the fetus than they actually did in the case of amoxicillin with clavulanic acid (53.0 % of participants), ciprofloxacin (79.0 %), erythromycin (59.6 %), doxycycline (94.1 %), nonsteroidal antireumatics in the first and third trimester (67.2 and 64.7 %, respectively), ACE inhibitors (81.5 %) and metoclopramid (85.8 %). On the contrary, majority of pharmacists thought that progestogens and verapamil were safer than they were, 63.0 and 38.7 %, respectively. A great number of pharmacists were not sure regarding safety of fenoterol and hexoprenaline, 21.0 and 29.4 %, respectively. For the rest of studied medications majority of pharmacists had adequate knowledge regarding medications safety during pregnancy (acetaminophen, statins, carbamazepine, lamotrigine, valproic acid, anxiolytics, warfarin).

Patients' knowledge of pen-insulin therapy

Knjeginjic M.[1], Cuic Cvijanovic C.[2], Dabic N.[3], Jovanovic M.[4], Vezmar Kovacevic S.[5], Culafic M.[5]

[1]Pharmacy Belgrade; [2]Pharmacy S. Mitrovica; [3]Pharmacy Cacak; [4]Pharmacy G. Milanovac; [5]Department of Pharmacokinetics and Clinical Pharmacy, Faculty of Pharmacy, University of Belgrade, Serbia. Email: micass@ptt.rs

Introduction Diabetes affects an increasing number of people in Serbia today. Good glycemic control significantly reduces the risk of serious, long-term complications of diabetes. Insulin therapy is often an important part of diabetes treatment. Pen injector devices containing insulin in prefilled cartridges have been designed to make injections easier. Correct insulin injection technique is essential for optimal control of diabetes.
Aim of the study To evaluate patients' knowledge of correct use of insulin pen devices, compliance with treatment and general awareness of possible diabetic complications. This way, we were able to identify patients who need additional counselling.
Method The study was conducted in community pharmacies in four towns in Serbia during 2 month period. All data were collected using structured questionnaire (closed question form). Patients who visited the pharmacy were eligible for inclusion in the study if they had insulin prescribed by a physician during study period, and gave an informed consent.
Results 112 diabetic patients (61 % male, 39 % female, mean age 60.3 years) were included. Only 27 % of patients were able to correctly administer insulin dose using pen device. A large number of patients (75 %) did not use a new needle for each dose. 28 % of patients never performed the safety test before each injection. About 20 % of patients did not hold the needle long enough after injecting into the skin. Half of patients have regularly checked all the parameters that indicate the presence of diabetic complications. 79 % of patients had been counselled about diabetes therapy in the last 12 months, but in only 2 % of cases counselling was performed by a pharmacist. Our results clearly identify a need to improve patients' knowledge about all aspects of diabetes therapy. Pharmacists in Serbia should take a more proactive role in patient counselling as well as in promoting safe practice in the correct use of pen insulin devices.

Analyzing qualitatively graphic descriptors in a set of Portuguese Medicines Package Inserts

Pires C.M., Vigário M., Cavaco A.M.

Research Institute for Medicines and Pharmaceutical Sciences (iMed.UL), Faculty of Pharmacy, University of Lisbon.
Av. Prof. Gama Pinto, 1649-003 Lisbon, Portugal.
Email: cmbpires@ff.ul.pt

Aim of project/study Figures and tables are key elements to illustrate information, facilitating medicines use and treatment adherence.

Study aim To develop qualitative graphic descriptors (QGD) addressing graphical information conveyed by Package Leaflets (PL) i.e. figures, pictograms and tables. Absolute and relative frequency of graphics and their descriptors were measured.
Method Selection of all branded medicines PL from the 3 most consumed pharmaco-therapeutic groups in Portugal i.e. cardiovascular, central nervous and musculoskeletal medicines (2009 data). PL were organized and analysed according the European QRD template. QGD were developed based on QRD terminology.
Results 651 PL were identified, presenting a total of 18 figures (2.8 %), 23 pictograms (3.5 %) and 77 tables (11.8 %). Qualitatively, Pictures present 3 different QGD: "how to <take> <use>" (n = 12), "how it looks like" (n = 3) and "precautions" (n = 3); Pictograms 1 QGD: "how to <take> <use>" (n = 23); Tables present 6 QGD: "posology" (n = 33), "adverse reactions" (n = 25), "marketing authorization holders" (n = 14), "interactions" (n = 2), "fargerström test" (n = 2) and "precautions" (n = 1). Overall, the sampled Portuguese PL disclosed few graphic elements and QGD are limited. Readability studies are recommended to confirm PL graphics utility in medicines use and treatment adherence.

Determination of risk factors for drug-related problems—a multidisciplinary triangulation process

Kaufmann C.[1,2], Stämpfli D.[2], Hersberger K.E.[2], Lampert M.L.[1,2]

[1]Clinical pharmacy, Kantonsspital Baselland, Bruderholz, Switzerland; [2]Pharmaceutical Care Research Group, University of Basel, Klingelbergstrasse 50, 4056 Basel, Switzerland. Email: carole.kaufmann@unibas.ch

Aim of project/study Detecting patients at risk for drug related problems (DRPs) may help pharmacists to apply intensive pharmaceutical care where it is needed most. The aim of this study was to determine evidence-based risk factors for DRPs. The results shall serve as a basis for the development of a prospective patient risk assessment tool.
Method We used a triangulation process: (a) We conducted a multidisciplinary expert panel using the method of the nominal group technique (NGT). The panel consisted of ten healthcare providers: one clinical pharmacologist, three senior hospital physicians (geriatrics, emergency, internal medicine), one general practitioner, two nurses (acute hospital care, home care), two community pharmacists and one clinical pharmacist. During a structured discussion, all participants had to write down as many risk factors as possible from their professional experience and rank them by their importance. (b) The subsequent discussion was audio-taped and we retrieved additional factors from a qualitative analysis. (c) We performed a literature search in PubMed and Embase. Titles and abstracts were screened for the terms "risk factors", "high risk", "predictors" combined with "drug-related problems" or sub terms of its definition. Finally, we compiled a questionnaire to validate the risk factors with the Delphi technique. We addressed the same participants as in our first expert panel.
Results (a) The first expert panel resulted in 33 items. (b) Fourteen additional risk factors were extracted from the qualitative analysis of the NGT-discussion. (c) Literature research resulted in 39 additional items. From this total of 86 risk factors we excluded 40 factors that where compliant to exclusion criteria (such as factors mentioned in only one publication, set in the lowermost quartile of our NGT's ranking list, representing an unpredictable event or circumstance, interventions to improve seamless care, issues of seamless care). We eliminated 5 synonyms and split one risk factor into two components. Thus, 42 factors where implemented in the Delphi questionnaire. Panellists judged 28 risk factors as "important" or "rather important". The consensus list contains patient-associated (e.g. dementia) as well as drug-related (e.g. anticoagulants) and disease-related (e.g. visual impairment) risk factors.

Perception by patients of effectiveness and safety of treatments in relation to their knowledge of aim, dosing, duration and good utilization of their medication: The need for a protocolized dispensing activity

Salar Ibáñez L., Solá Uthurry N., Cámara R., Cosín A., Dago Martinez A., Gutiérrez P., Rodriguez M.J.

Pharmaceutical Care Foundation and SEFAC. José Aguilar 38, 46022 Valencia, Spain. Email: l.salar.000@micof.es

Aim of project/study "D-Valor"-Study is an observational, prospective and multicentre study to register data of dispensing pharmacists activities about five therapeutic drug groups: Biphosphonates, NSAID, Asthma-treatment drugs, Benzodiazepines and Statins. We also evaluated the incidences with patients and doctors involved in the study.
Method Any community pharmacist working in pharmacies in Spain could participate. Participants received theoretical pharmacotherapy training about the drugs chosen. The dispensing procedure of FORO[1] was recommended. Within this protocol the patients with chronic treatments are asked about perception of safety and effectiveness of their medications. The data about each dispensing act were registered on line in a specific program.
Results A total of 201.050 dispensing acts were registered, of which 152.604 (75.9 %) were for chronic treatments. Data were registered by 2.529 pharmacists in 1.927 pharmacies. The relation between patient's knowledge and perceived effectiveness or safety were analysed. The perceived effectiveness of treatments was 32 % better if the knowledge on the aim of the medication was correct; 30 % better if the knowledge about utilisation was correct; 26 % better if their knowledge about duration of treatment was right and 25 % better if the knowledge about dosing was just as prescribed. The perceived safety of treatments was 8 % better if the awareness of dosing and utilisation was correct; 3 % better if the knowledge about the AIM of the medication was right and 2 % better when the duration of the treatment was well learned. Some differences between these results depended on the therapeutic group analysed.
Conclusions Patients need to have good information and knowledge about their medications to get the best therapeutic results. If the procedure of dispensing drugs is well defined to improve the patient's lack of knowledge about some basic issues, problems of security and effectiveness may be prevented.
Reference

1. Pharmaceutical Care FORUM. Madrid 2008.

Collaborative development of outcome measures to investigate intermediate medication reviews provided in community pharmacies

Messerli M.[2], Lottaz V.[1], Vriends N.[1], Hersberger K.E.[2]

[1]Department of Psychology, Clinical Psychology and Psychiatry, University of Basel, Basel, Switzerland; [2]Department of Pharmaceutical Sciences, Pharmaceutical Care Research Group, University of Basel, Switzerland. Klingelbergstrasse 50, CH 4056 Basel, Switzerland. Email: markus.messerli@unibas.ch

Background 'Polymedication-Check' [PMC] is a specialised medication review focusing on adherence issues.
Aim To develop primary (adherence) and secondary (patient knowledge, beliefs about medicines, handling difficulties) outcome measures to be used in a randomized-controlled trial to investigate the impact of such a cognitive service in Switzerland [NCT01739816].
Method First, we selected validated questionnaires and we constructed in collaboration with a clinical psychologist a comprehensive in depth patient interview (PI). Second, we tested this drafted PI with pharmacy master students in a role play setting. Students were instructed to answer as a pseudo patient following a fictive patient with polymedication. Third, two master students in clinical psychology were used for the interviews. They were intensively instructed in a session with a pharmacist and a clinical psychologist and they got continuing supervision. Forth, quality assurance was provided by recording single PI and analysis on exceeding empathy and exhausting of patients or interviewer. Based on these experiences, the follow-up PI was developed with an enlarged expert panel consisting of representatives from pharmacoeconomy and health service research.
Results We defined the Beliefs about Medicines Questionnaire (BMQ) and the 8-item Morisky Medication Adherence Scale (MMAS-8) as suitable. In addition, we created questions investigating changes caused by the polymedication check. If possible, we choose closed ended questions, mostly categorical or likert scales. Tests showed the ten-item Likert scale as advantageous to a four-item scale. The final PI contains 58 questions, subdivided in "medicines use", "adherence and use of reminder devices", "visits at GP/hospital", "beliefs about medicines", "care provided by pharmacists". PI performed with students as pseudo patients proved feasibility, understanding and suitability to assess adherence issues. Median duration was 27 min (range 18–40 min). Supervision of interviewers and analysis of audiotaped interviews with patients yielded valuable information for the roundtable discussion with multidisciplinary experts and enabled development of an optimised PI for the follow-up after 4 months.

Pharmaceutical and pharmacoeconomical assessment of the influence of diabetes on children

Yordanova S., Petkova V., Petkova E., Petrova G.

Faculty of Pharmacy, Medical University—Sofia, 2-Dunav str, 1000 Sofia, Bulgaria. Email: stasyyordanova@gmail.com

Aim of project/study Assessment of the parents' knowledge about their children disease and pharmacoeconomical assessment of continuous subcutaneous insulin infusion usage for children with type-1 diabetes in Bulgaria, compared to the changes in the body mass index and the glycated hemoglobin.
Method Questionnaires for the parents. A combined retrospective and prospective analysis of children patients' records after the introduction of CSII Cost—effectiveness analysis
Results The results from the questionnaire show that blood control is very difficult to maintain for a 24 h period. Only 3 families declare full control. Two from the children are with CSII. All the families declare that their quality of life has changed after the diagnosis. The University pediatric clinic is introducing CSII on the request of the parents and only 30 children apply such. 17 children with diabetes type 1 during the period 1999–2011 were observed (mean age 113, 82 months in the active group and 112, 41 in the control group. The CSII price with blood glucose monitoring system is 7850 BGN (4025,64 Euro) thus reaching 1962,50 BGN (1006,41 Euro) per patient per year. Subcutaneous insulin infusion (CSII) systems are of a limited usage because they are not reimbursed by the health insurance fund in Bulgaria. Our study shows that the usage of CSII children population is an efficient therapy and it confirms the literary data about improvement in terms of better metabolic control, reduced rates of complications and better quality of life. The study also shows that the children using CSII manage to maintain stable and target HbA1c level that is the precondition for better diabetes management (UKPDS). Improvements in glycemic control associated with CSII led to reduced HbA(1c) that can guarantee good diabetes management, but its control over BMI in growing children is still unclear. The CSII pumps appears to be cost-effective for the Bulgarian paediatric population and health care system.

netCare—a new telemedicine service in Swiss pharmacies

Erni P., Ruggli M.

PharmaSuisse, Stationsstrasse 12, 3097 Switzerland.
Email: Martine.ruggli@pharmasuisse.org

Aim of project/study Implement netCare, a new service in the pharmacies: netCare allows patients to get a first structured triage based on decision trees and if needed a videoconsultation with a physician for the most common diseases. A study will be done in order to prove the efficiency, safety, efficacy of the service
Method The project started in April 2012. In 200 Swiss pharmacies, the pharmacist has the possibility to triage the patient following one of the decision trees, which were elaborated by pharmacists and doctors. The results of that triage can be: The patient (a) can be treated by the pharmacist (with OTC drugs), (b) must be sent to a practitioner or even ER, (c) can ask the telemedicine doctor's help being connected by video from the pharmacy. If needed the physician will directly send a prescription to the pharmacy. A follow-up will be done after 3 days to evaluate if the treatment is efficient. The patient is also asked to come back to the pharmacy if he feels worse or if there are concerns about the treatment/medication. The pharmacists are giving feed-backs of each netCare service with a standardized questionnaire for study purpose. The pharmacists had to follow a specific education to be allowed to work in the project.
Results This sort of collaborative practice between pharmacists and doctors brings a solution to a patient within 30 min and is—as the first results show—appreciated by the patients. Approximately 1,300 completed questionnaires, 400 video consultations. All developed algorithms were used, especially cystitis, conjunctivitis, pharyngitis. netCare is used especially by patients between 18 and 65, who are also willing to pay for the service. The service is highly appreciated on Saturdays and mornings. netCare is a perfect addition to today's primary care for the following reasons: High availability—no

appointment required, Better use of the existing pharmacy infrastructure, netCare allows quick and secure access to a competent first and structured triage, netCare can optimize the primary health care costs due to the pharmacist's triage, preventing unnecessary ER visits. netCare can improve primary care in rural areas where shortage of family physicians is most visible.

Community pharmacies: from dispensing drugs to pharmaceutical care. Actors involvement in the wider health service network

Nadin G.

Universita cattolica Milano, Via necchi 7, 20125 Milano, Italy.
Email: Giancarlo.nadin@unicatt.it

Aim of project/study In Italy a 2009's law introduced service offering in the pharmacies. We carried out an explorative survey aimed to assess the "sentiment" of these professionals to embrace the opportunity opened up by the new law (Nadin and Pacenti, 2011). Shadows and lights emerged; one of the main issue, as detected as well as by international literature surveys, encompasses relationship with other health care operators such as GP (General Practitioners), specialists, therapists, nurses, etc. The separated silos erected in the past among the operators do not facilitate the high level of communication required to manage, in a coordinated way, the patient pathology as in a networked perspective would be asked. In this paper the author wants to investigate problems and opportunities related to the relationship between pharmacists and health care operators revisited in the light of the patient perspective.
Method We analyzed an experimental sample of dual relationship: physicians and pharmacists involved in pharmaceutical care (medication therapy management, compliance, review of the therapy, drug to drug interaction, adverse effect of medication, etc.). The relationship will be examined under the lens of the ARA model depicted by the IMP's school of thought. Therefore the paper tries to outline actors bonds, resources involved and activities put in place by the operators to improve coordinated service to the patient and at the same time pursue their personal goals. This paper must be intended as a first step analysis aimed to design a wider quantitative research focused on the collaboration among health care operators. Thus first insights and findings will be discussed in the perspective of the designing the framework for an extensive research.
Results Specified duties and responsibilities are required and clear stated but the optimization of the service offered to the patient walks through interchange and collaboration. Therefore it becomes pivotal to rethink correctly the degree of freedom and consequently the burden of risk between the operators. The pharmacist's beliefs and attitudes play an important role in their intentions to collaborate with physicians. The findings suggest a strategy that involves collaboration to improve medication adherence and this can be most effective (Kucukarslan et al. 2010). Although this analysis has no statistical validation and is explorative in the domain of physician-pharmacist relationship some consideration can be proposed. The style of conduction impressed to the cure path by the physician has a great impact on the relationship with the pharmacist. Since the first is a predictor for the latter it is necessary to investigate the model of cure chosen by physician to set up and improve the physicians-pharmacist relationship. The relationship between physician and pharmacist is also a predictor for the relationship with patients and it can become a true constraint for pharmacist.

Consequences of drug-related problems

Thomsen L.A., Frøkjær B., Herborg H.H., Rossing C.

Pharmakon, Milnersvej 42, 3400 Hilleroed, Denmark.
Email: lat@pharmakon.dk

Aim of project/study To map the consequences of drug-related problems (DPRs) based on a review of the literature. The study was for the Danish Community Pharmacy Evidence Database.
Method Pubmed was searched May 2012 for literature reviews published Jan 2006–May 2012 and newer epidemiological studies not included in relevant reviews. Grey literature was searched on Scandinavian healthcare webpages. The identified literature had to describe the prevalence, incidence or costs of adverse drug events (ADEs) as manifestations of DRPs. Studies had to be conducted in primary care (incidence studies) or in hospital care with the aim of identifying admissions caused by DRPs (prevalence studies). The incidence of ADEs, preventable ADEs (pADEs) and drug-related hospital admission (DRAs) were determined per 1000 person-months. The prevalence of DRAs was determined as the percentage of all admissions. The preventability rate was determined as the proportion of ADEs being preventable.
Results Twenty-five articles and one scientific report were included. The incidence per 1,000 person-months was for ADEs 18.5 [14.9–21.6], for preventable ADEs 4.2 [2.8–5.6] and for DRAs 0.45 [0.10–13.1]. In the elderly population, the incidence per 1,000 person-months for ADEs was 27.0 [16.5–57.6] and for pADEs 6,9 [1.3–21.3]. The prevalence of DRAs was 6.4 % [5.1–33.2 %] in the general population, 16.6 % [10.7–22.6 %] in the elderly, and 2.8 % [2.1–4.1 %] in children. The prevalence of pDRAs was 3.7 % [2.6–4.3 %] in the general population and 5.6 % [2.7–8.2 %] in the elderly. The overall preventability rate of ADEs was 19 % [17–21 %] and of DRAs 53 % [20–73 %]. Important risk factors were multiple diagnosis or medications, impaired cognitive function and high age. Primary care ADEs increased healthcare costs; estimated costs per ADE varied considerably due to methodological differences. Non-adherence increased healthcare costs 50 % in diabetes and dyslipidaemia and 30 % in hypertension.
Conclusion The study shows that ADEs are frequent in primary care, and that weak elderly with chronic diseases are at particularly high risk. Almost half of DRAs are avoidable with medication errors and insufficient implementation of prescribed therapy being frequent causes of such admissions. DRPs increase healthcare costs, but the societal costs need to be validated in cost-of-illness studies considering national healthcare settings.

An automated dose dispensing system that supports patient safety

Thomsen L.A., Fonnesbæk L., Hanne Herborg H.

Pharmakon, Milnersvej 42, 3400 Hillerød, Denmark.
Email: LAT@pharmakon.dk

Aim of project/study To identify risk factors in the ADD process that compromise patient safety and to identify measures to achieve a safer and more effective ADD system. The ADD process included all steps in the medication use process such as prescribing, packaging, administration and monitoring of ADD medicines.

Method We conducted four preliminary studies on implementation of ADD and experienced medication errors (MEs). A cross-sectional analysis identified the most frequent ME types and important risk factors. Results were presented to a multidisciplinary expert group of health care professionals having practical experience with ADD and a member of the Danish Rheumatism Association representing the patient perspective. Through an appreciative inquiry process followed by three consecutive consensus rounds, the expert group agreed on measures to improve safety and efficiency of the ADD system.
Results The most frequent MEs experienced by health care professionals were inadequate coordination of ADD, errors when administering medicines in nursing homes/home care, and errors at hospital admission or discharge. Important risk factors were the ADD regulatory framework being an unsuitable add-on to existing regulations, health care professionals' attitudes, knowledge, coordination and implementation of ADD, unsupportive IT systems, economic concerns causing safety issues and hindering problem solving, and errors in home-based use of ADD being largely unknown. The expert group agreed on 40 recommendations for a safer and more effective ADD system. The recommendations mainly concerned development of the existing IT systems and the regulatory framework. The expert group also developed a best practice model for safe ADD implementation. ADD has contributed to safer and more efficient packaging of medicines and should continue. A safer and more efficient ADD system can be achieved by implementing the developed national best practice model. To really enhance patient safety, it is necessary to revise the ADD system with specific attention to safety and efficiency. The expert group prepared recommendations for revision of the ADD system with that objective.

Review of hypertension medications in primary care

Ponjavic M.[1], Mitrovic J.[2], Lubarda M.[3], Stankovic M.[4], Vezmar Kovacevic S.[5], Culafic M.[5]

[1]Pharmacy Belgrade; [2]Pharmacy Leskovac; [3]Pharmacy Valjevo; [4]Pharmacy Niš; [5]Department of Pharmacokinetics and Clinical Pharmacy, Faculty of Pharmacy, University of Belgrade, Serbia.
Email: mponjavic@beotel.rs

Aim of project/study All chronic diseases including hypertension, require significant life-style changes and adequate medication treatment (usually life-long). Patient's understanding of the condition and its treatment is essential in achieving blood pressure control and minimizing the risk of complications. The purpose of this study was to review the prescribing pattern of antihypertensive agents and to compare it with the recommendations in the NICE clinical guideline 127. We aimed to evaluate patients' knowledge of hypertension and their level of adherence.
Method The study was conducted during March to May 2012 in community pharmacies in four towns in Serbia. Data collection was performed using structured questionnaire (closed question form). All patients who visited pharmacy during data collection period with a prescription for antihypertensive medication(s) for hypertension treatment were included in a study (if they had no concomitant cardiovascular disease).
Results Total number of patients who were eligible to take part in a study was 170. The mean age of the patients was 59.9 years, of which 42.3 % were males and 57.7 % were females. Majority of patients take two antihypertensive drugs (44.7 %); almost one-third take three antihypertensive agents. Angiotensin converting enzyme (ACE) inhibitors are the most commonly prescribed drugs (80 % of patients), followed by ß blockers (59 %). Small number of patients have their medications titrated up to maximum dose. 94.7 % patients demonstrate adequate knowledge about complications of hypertension. Almost 90 % of patients reported to have a good level of adherence. Our results show that a great number of patients take beta-blockers in therapy of hypertension, as a first or second line treatment, against recommendations in the NICE clinical guideline. We need to investigate the level of adherence in more depth. Pharmacist need to take more active role in recommending the medications in line with valid clinical guidelines. Team work with physicians is crucial in order to achieve better patient care.

Medication plan—feasibility in daily practice

Botermann L., Laufs U., Griese N., Krüger K., Schulz M., Kloft C.

ABDA—Federal Union of German Associations of Pharmacists, Jaegerstrasse 49/50, 10117 Berlin, Germany & Department of Clinical Pharmacy, Free University Berlin, Germany.
Email: l.botermann@abda.aponet.de

Aim of project/study A medication plan (MP) showed to be helpful for patients but also for physicians (GP) and pharmacists to inform them about a patient's medication. To the best of our knowledge, there is no defined process for the consolidation and updating of a MP implemented in Germany. Such a process where the pharmacist performs a medication review on the basis of the GP's medication history, the medicines the patient brought to the pharmacy and the patient's medication file kept in the pharmacy, if any, is part of the study PHARM-CHF, a pharmacy based interdisciplinary program for patients with chronic heart failure: a randomized controlled trial. To get information about the feasibility of this process we conduct a survey along with this study. Our first objective is to investigate the feasibility of the consolidation of a MP by a pharmacist in co-operation with the GP and the patient and the feasibility of its use for patients and pharmacists. Another objective of Pharm-CHF is the investigation of the number and kind of discrepancies between physicians' and pharmacies' drug files/histories and the medication the patient is actually taking.
Methods The feasibility of the consolidation of a MP and its use is investigated through surveys. 120 Patients and 30 pharmacists are going to be questioned 4 months after implementing the MP. Content of the survey for pharmacies are how long it took to consolidate the MP; how often the medication and thus the MP changed and which challenges occurred during the consolidation process. Content of the patients' questionnaire will be if they felt better informed about their medication and the medication regimen; where they stored the MP; if they brought the MP to every pharmacy and GP visit. For the creation of the MP, a medication review is essential. For this purpose, the pharmacy gets the patient's medication history from the GP and the patient brings his/her medicines into the pharmacy. If available, this information will be complemented and contrasted to the medication data kept in the pharmacy. We will also study the number and kind of discrepancies between these lists and their potential threat to the patient's health.
Results Not available yet.

Patients' "self-reconciliation" of the medication list compared with medication verification with pharmacist

Ekedahl A.

Medical Products Agency, Uppsala, Sweden & Linnaeus University, Kalmar, Sweden & Möllevägen 48, SE 236 31 Höllviken, Sweden.
Email: anders.ekedahl@mpa.se

Aim of project/study To investigate the effect of patients receiving the Medication List (ML) in the Electronic Medical Record (EMR) before a scheduled visit to the physician with a call to control the ML and bring it to the visit, compared to medication verification with a trained pharmacy student immediately before the visit.
Method Patients, with >5 prescribed medications in the ML, scheduled to visit a physician at 4 Health Care Centres in the Kalmar County, were invited to participate and were assigned to (1) selfreconciliation (SR)—to check the ML for accuracy and discrepancies at home and bring the ML to the visit with the physician; or (2) a medication verification (MV) with a pharmacy student immediately before the visit. All patients were interviewed immediately after the visit to the physician.
Results 172 patients (104 women) with in total 1,740 prescriptions in the ML (including missing prescriptions in the ML) were included—106 SC-patients (1,125 prescriptions) and 66 MV-patients (615 prescriptions). There were no differences between the groups before the visit; 80 % of patients in both groups had at least 1 discrepancy in the ML, in total 221/1,125 discrepancies (19.6 %) in the ML in the SR-group compared with 144/615 (23.2 %) discrepancies in the MV-group. After the visit, 57/106 (54 %) patients in the SR-group had a ML without discrepancies compared with 42/66 (64 %) patients without discrepancies in the MV-group ($p = 0.203$; not significant). Total numbers of discrepancies after visiting the physician were 93/1,043 (8.9 %) in the SR-group compared with 48/560 (8.3 %) in the MV-group ($p = 0.5273$; not significant).

Medicine use review in Italy: a pilot project using asthma as model (Preliminary data analysis)

Manfrin A.[2], Caparrotta L.[1], Krska J.[2]

[1]Department of Pharmaceutical and Pharmacological Sciences, University of Padua (Italy); [2]Pharmacy Practice Research Group, Medway School of Pharmacy, Kent-Greenwich University, Chatham Maritime, ME4 4 TB Chatham, United Kingdom.
Email: a.manfrin@kent.ac.uk

Background In Italy there are 18,021 community pharmacies; 3,500 more will be opened in 12 months due to changes in regulations. There is a huge pressure on price cutting and the need of new pharmacy model: socially, professionally and economically sustainable.
Aim of project/study To assess the ability of selected Italian pharmacists to complete Medicine Use Review documentation following provision of MURs. To determine the type of Pharmaceutical Care Issues pharmacists identify during MURs
Method Multicenter study: 80 pharmacists equally divided in four Italian locations, Turin, Pistoia, Brescia and Treviso. Develop training materials and deliver face-to face training, including use of online MUR template. Collect and analyse data from MUR template (online). Inclusion criteria: Pharmacies: must have a consultation area and internet connection and Pharmacists: qualified and registered in Italy, experienced in providing advice to patients, good and up to date consultation skills, good communication skills. Patients: 18 years of age, using asthma medications.
Results 612 MURs were performed between October and November 2012. Patients were 45.1 % (n = 276) male and 54.9 % (n = 336) female; their age was not normally distributed, higher numbers were found between 61 (20.9 %, n = 142) and 80 (20 %, n = 136) years of age. 49.8 % (n = 305) confirmed that they missed doses or changed when taking (non-adherent). 854 PCIs were identified by pharmacists and the most common were 161 education required, 137 monitoring issues, 112 discrepancies between dose prescribed and dose used. 111 patients confirmed that asthma was well controlled, 320 complained about shortness of breath, 126 night awakening, 158 needed rescue medicine, 244 limitations on activity and 175 complaints were classified as other (fatigue, cough, loss of voice, muscle pain). Positive correlation (Goodman's gamma = 0.693) was found between how patients were getting on with their medications and the fact that the medicines were working ($p < 0.001$).
Conclusions Pharmacists found that 50 % of the patients were non-adherent to their asthma treatment. The MUR training enabled pharmacists to understand PCIs and identify them when conducting MUR service. Preliminary results suggest Italian pharmacists could deliver an MUR service to benefit patients with asthma

Cost-effectiveness of a community pharmacist-led sleep apnea screening program—a Markov model

Perraudin C., Le Vaillant M., Pelletier-Fleury N.

Cermes3- Bat E, 7 rue Guy Môquet, 94800 Villejuif, France.
Email: clemence.perraudin@gmail.com

Aim of project/study To estimate the quality of life, costs and cost-effectiveness of three screening strategies among patients who are at risk of having moderate to severe Obstructive Sleeep Apnea Syndrome (OSAS) in primary care.
Method We constructed a decision-analytic Markov model with published data. Target population: Hypothetical cohort of 50-year-old male patients with symptoms highly evocative of OSAS. Time horizon: The 5 years after initial evaluation for OSAS. Perspective: Societal. Interventions: (1) "Screening strategy without CP": we assumed that 15 % of patients who were at risk of OSAS who visited a GP were referred to a sleep specialist. (2) "Screening strategy with CP": patients were screened for OSAS by the CP before visiting their GP. They were informed of an OSAS screening program through flyers that were placed on the counter. The CP program involved i) a discussion with the patient on the risks and comorbidities associated with untreated OSAS and ii) 2 validated questionnaires for OSAS screening, including the Berlin Questionnaire and the Epworth Sleepiness Scale. Patients were asked to communicate their scores to the GP to encourage a referral to a sleep specialist. The CP could also call the doctor. We assumed that some of the patients who received a CP program did not communicate their scores to the GP. This source of uncertainty was taken into account in the different screening rates that were further tested in the model. (3) No screening. Outcomes measures: Quality of life, survival and costs for each screening strategy
Results Results of base-case analysis: Under almost all modelled conditions, the involvement of CPs in OSAS screening is cost effective. The maximal incremental cost for "screening strategy with CP" was about 456€ per QALY gained. Results of sensitivity analysis: Our results were robust but primarily sensitive to the treatment costs by continuous positive airway pressure, and the costs of untreated OSAS. The probabilistic sensitivity analysis showed that

the "screening strategy with CP" was dominant in 80 % of cases. It was more effective and less costly in 47 % of cases, and within the cost-effective range -maximum incremental cost effectiveness ratio at €6186.67/QALY—in 33 % of cases. Implications: To our knowledge, this study is the first to evaluate the CP involvement to improve OSAS screening, in collaboration with GPs, in at-risk individuals. CP program in OSAS screening is a cost-effective strategy. This result is consistent with the trend in Europe and the United States to extend the practices and responsibilities of the pharmacist in primary care and might be helpful to make further health policy decision.

Preventive care services in community pharmacies for improvement of cardiovascular risk factors—evaluation by participants

Grote S.M., Dörje F., Schlager H., Lee G., Richter W.O.

WIPIG—Wissenschaftliches Institut für Prävention im Gesundheitswesen der Bayerische Landesapothekerkammer [Scientific Institute for Prevention in Health Care—an Institution of the Bavarian Chamber of Pharmacists], Maria-Theresia-Str. 28, 81675 Munich, Germany. Email: info@wipig.de

Aim of project/study To evaluate preventive care services of community pharmacies
Method Thirteen community pharmacies in the northeast of Bavaria, Germany, conducted a screening of cardiovascular risk factors in adults. People at risk were offered the possibility to participate in a preventive care program which included individual counselling by a pharmacist. The topics covered diet, exercise, weight reduction, smoking cessation and advice to consult a physician if necessary. After 1 year of follow-up change of risk factors was measured. All participants of the final assessment received a postal questionnaire to evaluate the care service. The questionnaire contained questions about the health status and the provided services.
Results A total of 1,906 persons underwent baseline assessment. Modifiable cardiovascular risk factors were detected in 1,636 subjects. In 944 cases lifestyle interventions were considered sufficient to optimize cardiovascular risk. 254 participants asked their pharmacy for individual counselling. The return rate of questionnaires was 25.7 % (268 of 1,043 participants of the final assessment). Most of them wanted to identify their risk factors, to stay or to become healthy and to prevent myocardial infarction actively. 89.9 % (n = 241) now feel better prepared to take care of their health in future. 88.4 % (n = 237) would appreciate further individual counselling by a pharmacist. Overall satisfaction with the preventive care services of the community pharmacies was documented by 162 persons. 96.9 % (n = 157) were satisfied, 3.1 % (n = 5) were partially or not satisfied. Our results show that preventive care services are well accepted by a substantial part of the population. Participants of a prevention program including risk factor assessment and individual counselling were satisfied with these services. Preventive care is not yet established in German community pharmacies but our findings lead to the conclusion that implementation would be beneficial to health care.

Choosing a method for validating prescribing appropriateness criteria

Basger B.J., Chen T.F., Moles R.J.

The University of Sydney, A15 Science Rd, 2006 Sydney, Australia. Email: ben.basger@sydney.edu.au

Aim of project/study At least 19 different explicit prescribing appropriateness criteria have been reported including Beers Criteria [1] and STOPP/START[2]. We aimed to evaluate the methods used to validate these criteria, to facilitate the most appropriate choice for validation of our own proposed criteria.
Method The methods used to establish the face validity of different explicit prescribing appropriateness criteria were evaluated.
Results A number of different methods were used to establish face validity of criteria including the Delphi technique, the modified Delphi technique, the Nominal Group Technique; and case study review. The most commonly used methods were the Delphi and Modified Delphi techniques, which generally involve mail or e-mail survey rounds designed to establish consensus among experts. The use of these methods varied e.g. different numbers of rounds and experts. Interestingly, the RAND/UCLA appropriateness method has not been used. This method involves, a combined mail or e-mail survey followed by a face-to-face meeting. It has been described as the best method for systematically combining recommendations from clinical guidelines with the opinion of healthcare providers.
Conclusion There is variability in the methods used to establish face validity of explicit prescribing appropriateness criteria, with no universally accepted method. Although logistically more challenging, the RAND/UCLA appropriateness method appeared to offer advantages over other methods.
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