Proceedings

30th European Symposium on Clinical Pharmacy
Integrating Pharmaceutical Care into Practice

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Introduction to the Proceedings

The proceedings of the 30th European Symposium on Clinical Pharmacy contain the abstracts of the plenary lectures, abstracts of the oral communications and the abstracts of the poster discussion forums. Poster presentations are published as title with authors and establishment.

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PLENARY LECTURES

1 20 Years of pharmaceutical care: What have we learned?

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The origins of pharmaceutical care will be discussed with special emphasis on the development of the practice itself. The initial objectives of the practice were to apply the concepts of clinical pharmacy to community or ambulatory practice settings. After many attempts and hard lessons learned, it became clear that clinical pharmacy activities were not recognizable or reimbursable as patient care services. At this point the objectives of the practice had to be revised.
The revised objectives were the following:
– establish a new standard for medication use by an individual patient,
– create a patient care practice that interfaces with the standards of medicine and nursing,
– employ the vocabulary and standards that already exist in the health care system, and
– achieve recognition and reimbursement as a patient care service.

These objectives resulted in the development of the practice of pharmaceutical care. This practice is now complete with a philosophy, a patient care process, a practice management system, an electronic documentation system, and a reimbursement system that is consistent with all other patient care providers.
The acceptance of the practice has been broad-based and positive. Patients have recognized the service as unique, useful, and valuable to them. Prescribers have responded positively on a patient-specific, clinical practice basis. In both cases, patients and physicians, it is clear that the only way to change expectations and behaviours is by providing the service on a consistent and broad basis.
The practice results in the most positive outcomes reported yet for drug therapy in community practice. One out of every two patients who visits a pharmacy today, in the ambulatory setting, have a drug therapy problem that requires the attention of a pharmacist. These problems are equally distributed between inappropriate medication, ineffective medication, unsafe medication, and medication that is prescribed in such an inconvenient way that the patient is unable to take it as suggested. Drug therapy problems are associated with prescription and non-prescription medications, young patients as well as elderly patients, and patients on one medication as well as those on numerous medications.
The practice of pharmaceutical care is able to produce positive outcomes in up to 91% of the patients receiving this care. The practice is able to save up to ten times the cost of providing it. Savings are realized in terms of decreased hospitalisations, avoidance of unnecessary physician office visits, decreased days lost from work, decreased visits to the emergency room, savings on drug costs, and increased satisfaction and confidence on the part of the patient.
The practice of pharmaceutical care is now described and can be taught. It is well accepted by patients and physicians. The practice is being provided by thousands of pharmacists, and the practice is being recognized and reimbursed by many different payers. The opportunity to positively impact a patient's drug therapy, on a broad and dramatic scale, is finally realized, and all pharmacists can now decide if they want to be a part of this solution.

2 The patient as main variable in pharmaceutical care

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Although the term 'pharmaceutical care' has been in use now for over 25 years, there is no clear definition that holds in all countries around the world. It can be either 'the responsible provision of drug therapy for the purpose of achieving definite outcomes which improve a patient's Quality of Life' (Hepler/Strand) or 'A practice for which the practitioner takes responsibility for a patient's drug therapy needs and is held accountable for this commitment' (Strand). However, in all definitions the patient plays a central role.
The current European opinion in the field is that pharmaceutical care is care by the pharmacists around the patient and his/her medicine use. Only in the UK, preventive activities are included in the concept. There the term 'medicines management' has been invented, that actually stands for the same as 'Pharmaceutical Care' in the rest of Europe.
The drug therapy system is far from perfect. If we look at the possible errors that can be made (leading to Drug Related Problems, DRPs), we can find them at the prescribing level, at the dispensing level and at the drug use or administration level. Such errors cost the health care system a lot of money and the patients a lot of annoyance. It would be very good to find ways of reducing the number of such drug related problems, and the provision of pharmaceutical care would help to do this indeed.
When pharmaceutical care is provided, the quality of pharmacotherapy is being improved. A quality improvement circle (Demming) has been adapted by Hepler and nicely shows the mechanism.
The role of the patient in the concept also is paramount. Raising awareness about pharmacotherapy and the importance of e.g. adherence to therapy, prevents especially the patient related DRPs.
If pharmacists should be the ones to provide pharmaceutical care, their role in the health care system has to change. Relationships and responsibilities will change. This change is happening now in many European countries, but not always supported by the health care system because physicians in most countries claim a central responsibility for the total health care provision. In view of reality (the role of e.g. nurses, physiotherapists, dentists) this claim cannot be regarded as rightful.
The view that only the physician is capable of, or has the right to, providing care is not supported by the results of e.g. pharmaceutical care research. In these studies the appreciation of patients for the received (pharmaceutical) care is paramount. One can discuss however if the measured satisfaction is based on the clinical value or on the humanistic value of the care and on the effects of interpersonal contacts. The measurement of the effects of pharmaceutical care provision on the humanistic outcomes is still in its infancy and should be developed further.

3 Pharmaceutical care or medicines management?

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Over the past decade, there have been moves to change the traditional role of the community pharmacist from medicines' supplier to pharmaceutical carer. There has also been some debate around whether health promotion is an integral part of pharmaceutical care. In the UK the term medicines management is widely used in place of pharmaceutical care. We have recently defined this as *"The process of optimising beneficial outcomes and minimising harm from medicines, including medication review (appropriateness), monitoring and advice to patients and prescribers"*. The terms pharmaceutical care and medicines management and their definitions will be discussed.
The reduction of heart disease in the population and the prevention of coronary heart disease in high-risk patients are amongst the English government's priorities. One of the targets is to improve the use of effective medicines after heart attacks. Community pharmacists could help to reach these targets. A Medicines Management pilot project in community pharmacies is starting later in 2001, we are involved in evaluating it.
Few randomised controlled trials have been conducted to provide evidence for the benefit of community pharmacists' role in

Medicines Management. Community pharmacists have been shown to enhance patient care in: hypertension, through structured counselling; hypercholesterolaemia, through screening of pharmacy medication records and the provision of cholesterol testing; and, anti-coagulant control, by providing community pharmacy-based clinics. Community pharmacist intervention can improve the quality of prescribing and through the management of repeat prescribing can identify prescribed medicines that are no longer needed, side effects that patients are experiencing from treatment compliance issues and adverse drug reactions, as well as making cost savings. There is also evidence about their role in health promotion from randomised controlled trials that community pharmacists can increase smoking cessation rates.

4 Helping 21st Century patients succeed in a 20th Century health care system: serving the empowered patient, empowering the new health care consumer

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Most health care systems in industrialized countries continue to rely on professional, financing, and service delivery systems that date from the mid-20th century. Yet significant shifts in demographics, the epidemiology of health needs, technology, and consumer expectations indicate the need for innovative strategies for providing health care services. In both attitudinal surveys and in observed behavior, many consumers are seeking more health information, taking increased responsibility for their own care, insisting on working in partnership with health professionals, and expecting the same levels of service quality and convenience that they experience in other areas of life. Pharmaceutical care models are well suited to serve these more mobile, information seeking, and demanding consumers.
Each of these emerging consumer values places stress on the predominant forms of health care delivery in Europe and the U.S. and suggest latent support for pharmaceutical care and other forms of re-engineering care delivery. But policy structures and prevailing market forces inhibit the adoption and expansion of pharmaceutical care practices. In several countries, including the U.S. and U.K., efforts are underway to raise consumer awareness about quality failings of the current system, opportunities for improving health care, and new roles for consumers to play in changing health policy and practice. These range from strategic use of television programming and internet resources to employer and NGO information campaigns on health care quality and safety. Tactics include awareness campaigns, delivery of personalized web-based information services, and decision-support tools for care management and health system navigation. Advocates of pharmaceutical care should be aware of and participate in efforts to educate consumers about these barriers to health system reform. The lecture will review some examples of such consumer 'empowerment' initiatives in the U.S.

5 Validated methods to measure outcome of pharmaceutical care

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The emphasis of practice research is changing from process evaluation to outcome evaluation. This is fundamental to the implementation of the concept of pharmaceutical care. However, outcomes assessment is not easy, requiring robust and applicable measurement instruments, a key reason why structure and process assessment have been so commonly used instead. Until relatively recently, it appeared that many health care providers considered that if these were adequate monitored and funded, a good outcome (i.e. a quality service) was automatically ensured. Now, outcome measurement in pharmaceutical care must become a reality.
This lecture will illustrate the use of outcome measurement in pharmaceutical care assessment of individuals and groups of patients, citing examples from the literature. Outcome measures must be robust and suitable for the use for which they are intended – their validation must be ensured before they can be used. They should be valid (i.e. measure what they are supposed to measure), reliable (i.e. measure in reproducible way), sensitive to change (i.e. detect change over time), practical (e.g. not over burden the patient), and appropriate to for the use intended to (e.g. contained questions about the symptoms that are expected to change). In addition, there are many practical problems associated with evaluating the impact of pharmaceutical care on outcomes, which will be presented and discussed. For example, relevant outcomes may be infrequent, such as in studies to prevent specific adverse drug events, or there may be a long delay to reach the specific outcome, such as in the prevention of stroke, requiring the use of intermediate or proxy endpoints.

6 Linking pharmacoeconomics and pharmaceutical care

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When a clinician makes a decision about pharmaceutical care management in the course of treating a particular patient, he usually looks at effectiveness: evidence that the clinical strategy under consideration does more good than harm for the particular patient in the specific clinical circumstance. Pharmacoeconomics or economic evaluation of pharmaceuticals goes one step further and also looks at costs. It is a technique developed to give information concerning the relative cost-effectiveness or efficiency of alternative pharmaceutical care. In a pharmacoeconomic evaluation the additional benefits generated by a drug (e.g. additional life years, more quality of life) is compared to the additional costs of the drug treatment in comparison to an existing or reference drug. This is done to guide resource allocation: in a world with limited resources not all interventions can be done. It is necessary to choose drug therapies where additional benefits are worth the additional costs.
The benefits of the drug can be measured in different ways.
In a cost-effectiveness analysis, benefits are measured in natural units. A very crude, but important measure, certainly for life-saving interventions, is lives saved or life-years saved. Other examples are clinical measures such as changes in the Brief Psychiatric Rating Scale (schizophrenia), changes in Forced Expiratory Volume in one second (asthma) or changes in the number of symptom-free days.
In a cost-utility analysis, all benefits (life-years saved, improvements in performance, side effects of the drug) are compounded in an overall utility measure, such as a QALY or a DALY. These measures value life-years with different weights (between 0 and 1) expressing the differences in quality.
In a cost-benefit analysis, benefits are measured in monetary units. Clinical effects are translated in monetary values with values taken from actual behaviour or derived from questionnaires.
It is important that results from economic evaluation must be adapted as closely as possible to the real world. In practice it is not straightforward to properly measure and value the costs and outcomes. This will be illustrated with examples.

7 Pharmaceutical care: simple implementation or measuring outcomes?

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The subliminal conflict between science and practice has a long, and during the best of times, a fruitful history. This phenomenon which is also reflected in the title implies, however, that one may dominate the other. While the design, the conduct and the evaluation of Pharmaceutical Care studies using validated methods is considered as scientifically worthwhile – at least in an academic environment - the work of those who put a stronger emphasis on implementation techniques is often welcome with less enthusiasm. Consequently, there are more studies and publications dealing with outcome issues rather than with the implementation of the concept into the daily routine of pharmacists.
Having the framework and the opportunity to develop the scientific basis of Pharmaceutical Care at university is, of course, crucial for implementation to help ensure the judicious merger and feedback of theory and practice. However, the support of various health profession organization is needed to achieve this goal.
Planning a Pharmaceutical Care study which, by definition involves the academia as well as pharmacy practioners, frequently means that investigators are faced with limitations concerning time constraints coupled with the burden of documenting both pharmacy inputs and patient outcomes. Both elements are needed, however, for the acceptance of the beneficial effects of Pharmaceutical Care by other health care players and society. As pharmacists sometimes feel that they lack sufficient knowledge to offer comprehensive Pharmaceutical Care they need an education based on the most recent scientific knowledge and experience.
The successful implementation of Pharmaceutical Care requires an effective management of data generated in the care process which also can provide a powerful database for pharmacoepidemiological research as well as for improving the practice when we succeed in transfering newly gained knowledge back into practice.

Conclusion: Optimal Pharmaceutical Care requires at least four prerequisites which will bring science and practice closer together:
– a sound methodological base that is tested in well-designed outcome studies;
– a comprehensive, efficient data base for recording results;
– a strategy supported by the profession to transfer study results into daily pharmacy practice and
– information technology dominated by scientific data coupled with appropriate roles for expert systems.

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8 Pharmaceutical care into pratice: a UK community pharmacy experience

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Introduction: A number of factors restrict pharmacists' from fully implementing into practice the principles of Pharmaceutical Care. These factors concern; time, money, relevance, space and know-how (1). Addressing these factors can, for individual pharmacists, motivate them to adopt a model of service consistent with the Pharmaceutical Care definition. This will mean making a pragmatic business case rather than, as has been the case to date, appealing solely to pharmacists' inherent professionalism.
The need to make a business case for pharmaceutical care is accepted. This is being attempted nationally and internationally to influence health care organisations - the macro level. This must demonstrate that the service leads to better health, less hospitalisation and fewer days lost at work. Hopefully this case can be made. However, for the individual practitioner, this approach may not prove motivational. A business case, relevant to the individual practitioner - the micro level - is needed. Our work has been addressing such a business case based on the five restricting factors, and as an example, a service to diabetic patients is reported.

Diabetes Mellitus: In diabetes the aim of therapy, in the short term, is normalization of blood glucose to reduce the acute symptoms of the disease and, in the long-term, to reduce in the complications of the disease. In two community pharmacies in Belfast, N. Ireland, assessment of the computerized patient medication records showed that only 27% of patient with Type 1 diabetes and only 10% of patients with Type 2 diabetes were testing blood glucose on a regular basis. In addition, these records showed that patients with diabetes visited the pharmacy much more frequently than non-diabetic patients. Patients with Type 1 diabetes had, on average, 70 prescriptions dispensed each year making 24 visits to the pharmacy while patients with Type 2 diabetes had, on average, 52 prescriptions dispensed each year while making 17 visits to the pharmacy. From a business point of view these are valuable patients.
On the basis of this information, a diabetes campaign with the twin objectives of providing a pharmaceutical care service while enhancing the business was undertaken.

The service: Pharmacy staff undertook a training programme on the management of diabetes. This gave the pharmacists and their support staff more confidence in dealing with patients. More time was spent dealing with patients discussing their condition and establishing their health related needs - both drug related needs and lifestyle related needs. Greater use was made of dispensing technicians to provided the pharmacist with the necessary time. A range of educational leaflets were made available to patients and were used to support the pharmacists' advice.
A window display on the theme of diabetes was set up to promote the campaign. In addition, an advertisement was placed into the local newspaper featuring an "offer price" for blood glucose meters. As part of this advertisement the pharmacy was allowed a half page editorial and this was used to promote the role of the pharmacist in the management of diabetes. Additional sales would address the money concerns of pharmacists.
Letter were mailed to all patients with diabetes who used the pharmacy. This letter offered the pharmaceutical care service and advertised blood glucose meters. An in-pharmacy "blood glucose testing day" was advertised at which free blood glucose tests were performed. Sponsorship was obtained for the advertisements.

Results: Three months following this campaign an assessment of medication records showed that 95% of patients with Type 1 diabetes and 67% of patients with Type 2 diabetes are regularly testing their blood glucose. Eleven patients of 52, to whom the pharmaceutical care service was provided, had changes made to their drug therapy. Six smokers were assisted to stop using the Smoking Challenge 2000 programme.
Many more prescriptions for blood glucose testing strips were received and over the two month period following the campaign the pharmacy sold 72 blood glucose meters (the pharmacy sold 2 blood glucose meters in the previous 12 month period). Twelve new patients with diabetes were attracted to the pharmacy as they appreciated the additional advice and support they receive. Sales from nicotine replacement therapy added to the value of the service.

Conclusion: With more blood glucose testing, better therapeutic control in this cohort of patients was identified. This, coupled with additional revenue coming to the business through more pre-

scriptions, more patients, sales of nicotine replacement therapy and sales of blood glucose meters provides a strong business case to pharmacists for implementing a pharmaceutical care services to diabetic patients.

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9 Pharmaceutical care as a managerial tool in daily hospital practice

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Introduction: Pharmaceutical Care (PC) isn't a new philosophy .Is one more step in the development of Clinical Pharmacy . Attitudes are similar; what's changed is society's and health-authority's demands for more efficient knowledge . We're asked to be efficient professionals: this has to do with providing quality care at lower costs. In any setting.
In Hospitals, pharmacist's have future survival linked to their ability to control drug-budgets, while giving quality care. PC is a good managerial tool to achieve this. I'll comment on some methodological consideration and achievements.

Methodological considerations:
- Believe PC possible and convince your staff to agree that providing PC doesn't mean, nor need to put the hospital upside-down.
- Work to introduce PC in:
  - hospital organisation and working procedures,
  - hospital post-graduation education of physicians, nurses and pharmacists.
    Speak to Managers and heads of main clinical departments : choose targets (programs and wards), explain expected benefits. Speak to head of Hospital Education Committee.
    Do not demand more personnel.
- Organise Pharmacy Department : study the managerial aspects (drug purchasing included) and organise inside work to save staff-time for working at ward-level to achieve real pharmacists participation in decision taking processes. Endpoints:
  - improve safety and quality of drug-use : protocols & guides (realistic, efficient, easy to comply with), use of therapeutic equivalency.
  - save money (to patient & to hospital)
  - improve patient-care (nursing, medical, pharmaceutical)
  - use a holistic view (hospital-treatment & outside-treatment)
  - use the shortest possible time of your staff

Comments on results
- Work at PD, re-organised. Target shifted from physicians to patients, from "best" to "rational and efficient" use of medicines.
- Pharmacists incorporated to ward-staff daily clinical meetings, one hour/day, in Paediatrics, Intensive care unit, Internal medicine . Others: some periods.
- Antibiotic prescription & administration protocols, produced in Neonathology, Paediatrics and ICU. Fluid-therapy protocols accepted in surgical department, rejected in medical. Antibiotic prophylaxis protocolised and monitored.
- PC considered a scientific discipline by the team. Rules and contents defined: care given by best located member. Nearness to patients gave way to technical proximity.
- Quality and budgetary considerations included, as rule, in ward pharmacoterapy decisions with holistic view (influence of hospital prescribing)
- Treatment-protocols for patients leaving Hospital and Emergency Dept, produced to co-ordinate with GP. Hospital-induced drug use in primary-care, given consideration.

Proposal
PC, with a quality/safety/economy endpoint, can and should be used, as a managerial tool to provide efficient quality-treatment .It isn't very difficult to achieve , but demands from directors of pharmacy departments: " moderate ambition", good information systems, pro-consensus attitude and patience .

10 Integrating pharmaceutical care into practice: experiences of a transmural setting

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The diagnostic and therapeutic approaches have been changed in various ways in recent decades and will continue to evolve. Changes in legislation and regulation, the increasing role of health insurers and other third parties, the availability of powerful ICT and patient empowerment have had large impact on these changes and offered opportunities. The concept of pharmaceutical care has led to new approaches to pharmacy practice, education, and research. However, the concept has been implemented more in the extramural setting than in the intramural setting, not to mention an transmural approach. Especially the integrated in- and outpatient pharmaceutical care needs attention, since studies have shown that patient transitions between echelons in health care contribute mayoral to (potentially preventable) drug related problems.
In Tilburg, The Netherlands, a study has been carried out at the state of art concerning the continuum of pharmaceutical care. Pharmaceutical care is possibly at stake when patients migrate between in- and outpatient health care. Admission and discharge from hospital are potential determinants for incongruence in treatment. The frequency of 'medication incongruencies' and their determinants have been examined in a descriptive, prospective follow-up study. The examination is conducted in the different phases of the transition between hospital and community care. Admission and discharge information is collected from 300 patients divided over two regional hospitals. Results show that about 50% on the ATC-4 level four (N06A) showed discrepancies and even about 60% on the ATC-7 level (N06AB05). The conclusion of this study was that in our local environment a lot happens in the transition between hospital and community care and that much has to be done to the tuning of pharmaceutical care in this transition. Other conclusions were that the conversation between the specialist and the patient at intake offers an incomplete picture of actual drug use. In general the outpatient drug use is not always taken into account at admission in hospital. At admission relatively many 'incongruencies' occur. Formularies are not well tuned. Medication in discharge letters is not always reported. Four months after discharge from hospital drug use often returns to basic drug use before admission. Switching of different brands occurs frequently .
As a result of the study in Tilburg a new concept has been developed for achieving actual integrated pharmaceutical care wherein separate elements of care are linked. . In this concept the cooperation between pharmacists is based upon functionalities and not upon the setting (e.g. hospital or community). We strive after pharmacists with basic functionalities (e.g. preparing, dispensing and information provision) and pharmacists with special pharmacotherapeutic interests (e.g. for pharmacotherapeutic (transmural) meetings, care protocols, epidemiologiocal research). As such a regional network of pharmacotherapeutic specialists is evolving in which the patient is followed and supported continuously independent the place in the health care process were the patient remains and regardless the setting of the pharmacist (e.g. intra- or extramural). This 'de-muralization' by linking all elements of care with the aim to reach continuous and integrated pharmaceutical care we call 'zipped pharmaceutical care'. Linking of care concerns the processes of:

Diagnosing and Prescribing, *Dispensing* and *Use* and covers the continuum of health care, products and information. Developing tools for linking the activities in the different processes are:

Diagnosing & Prescribing: Formularies (transmural), standards of professional organizations, national and local electronic prescription system, drug evaluation committee, pharmacotherapeutic (transmural) meetings, self care standards

Dispensing: Care protocols for medicines (e.g. CARA/COPD, diabetes, helicobacter, incontinency) and medical expedients, transfer pharmacy in hospital, centralized dispensing centre

Use: Medication surveillance system for interactions, contraindications, (pseudo) double medication and patient compliance, OTC drug choice, electronic epidemiological system for monitoring and following patients as input for pharmaceutical care.
For mutual communication: regional intranet, centralized professional computer system.

Opportunities and Strengths
- Increasing quality health care process
- insight in health care process and appreciation by patient
- Providing insight in own decision making (FTO EVS)
- Contributing to evidence based decision making

Threats and Weaknesses
- Lack of cooperation of health care professionals
- Mutual distrust between health care professionals
- Feeling of condemned instead of drawned to each other
- Abandoning independence and autonomy
- Fear for changing own routines
- Lack of time
- Dissimilarity of computer systems
- Restrictive privacy legislation
- Low or no budget

For the implementation of multidisciplinary pharmaceutical care few issues for consideration are important. Firstly take little steps and secondly be clear that every individual health care professional maintains his autonomy, independence and professional responsibility.

11 Working out pharmaceutical care projects: step by step

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Although 74% of the pharmacists has a positive attitude towards pharmaceutical care, working out pharmaceutical care with community pharmacists has to be managed very carefully to have a chance on success of implementation.
Barriers to implementation as lack of reimbursement, lack of time, attitude/opinion of other professionals, health care structure in general, lack of education in assessment, in communication, in collaboration, are well known and should be taken into account. These barriers can be divided in two categories: professional, or political.

Profession related barriers: Pharmaceutical care is a holistic concept. Many aspects occur in a pharmaceutical care project which are not regular in daily practice for the participants.
After having participated in pharmaceutical care research projects, pharmacists report to continue with some aspects of the pharmaceutical care process, but seldom with the whole concept.
Community pharmacists should be offered the opportunity to gain experience with different aspects (referring, assessment, registration and documentation, …) of pharmaceutical care so that they can be easily integrated in the holistic concept afterwards. Different examples exist at this moment.
Politics related barriers: In discussions and policy about chronic diseases as diabetes, asthma, cardiovascular pathology, hypertension, chronic pain, … - which are major healthcare problems – efficient use of medication and drug related problems are a major problem for doctors and pharmacists among other healthcare providers. Also for policymakers efficient use of medicines is important in terms of budget.
Pharmaceutical care only starts to be understood outside the profession and healthcare providers and policymakers only start to realise its impact. As a consequence pharmaceutical care is still poorly recognised and appreciated in the total healthcare concept.
In the above mentioned discussions many opportunities are offered to translate the benefits of pharmaceutical care to policymakers. Different examples will be discussed.

ORAL COMMUNICATIONS

1 Development of explicit indicators of appropriateness of prescribing

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Background and objective: There is a paucity of research on the appropriateness of prescribing in secondary care in the UK. Further, existing work has been based on implicit criteria, rather than robust and explicit indicators. As part of a larger programme of work, this study aimed to develop explicit operational instructions for indicators of the appropriateness of medication intended for long-term use started in secondary care.

Design: Sixteen potential indicators for long-term medication were derived from the literature, using information available in the patient's records. The patient records comprised all medical and nursing notes, prescriptions and letters, whether paper or computer-based. The indicators were applied to all eligible drugs for 50 randomly selected patients who, during their admission, were commenced on drugs intended for continued prescribing in primary care. The indicators and explicit operational instructions were further refined and applied to the medications of another 25 randomly selected patients. Extensive notes were taken on their operationalisation.

Setting: 880-bed teaching hospital

Main outcome measures: Indicators of appropriateness of prescribing with explicit operational instructions

Results: The 75 patients were aged 63.3±17.1 years and admitted for 7.9±7.6 days, prior to discharge on 158 eligible drugs (mean 2.1 ±1.3). Of the 16 indicators, 5 were discarded at the first stage, as insufficient information was recorded in the patient's records to enable their operationalisation (e.g. whether the patient had been given information about their medication or the regimen was maximised for compliance). In some cases, it was possible to surmise data from the patient's records, but this was contrary to the *explicit* nature of the indicators. Prior to the second stage, two of the remaining 11 indicators were subdivided into five indicators, which better reflected the type of data that were routinely available from the records.

Conclusions: The development of these explicit indicators highlighted the incompleteness of the patient's record. Data extraction often required assumptions to be made. This has profound implications for research that uses explicit operational definitions or where data are extracted from electronic records.

2 Compliance with oral antidiabetics: is non-compliance a predictor for medication switching behaviour?

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Background and objective: The objective of this study is to assess the relation between the extent of compliance and switching patterns of oral antidiabetic drugs.

Design: Retrospective follow-up study including 446 randomly selected patients who were dispensed an oral antidiabetic drug from 060197 until 053199. Utilisation patterns were assessed using computerised analysis of pharmacy dispensing records. The extent of compliance was defined as the extent in which the actual use in days determined from the pharmacy's dispensing records corresponds with the prescribed drug regimen and was expressed as the so called 'Iteration Ratio' (IR is a parameter to detect compliance from pharmacy records) [1].

$$IR = \frac{\text{Actual use in days X Prescribed Daily dose}}{\text{Number of dispensed tablets X Dosage}}$$

A patient is considered compliant to his therapy when
$0.85 < IR < 1.10$

Setting: The study is conducted in six community pharmacies located in the city of Tilburg and surrounding villages.

Main outcome measures: Switches in medication and type of switch (higher/lower dosage, other/added/stop drug).

Results: 923 switches are identified. In 560 cases (60.7%) IR is > 0.85 and < 1.10; In 182 cases (19.7%) IR < 0.85 and in 181 cases (19.6%) IR >1.10.
In the 'overtreatment' group (IR < 0.85) there was a significant association with any change in medication (OR=2.39; 95% CI=1.67-3.41) in comparison with the compliant group. In the 'undertreatment' group (IR > 1.10) there was no clear association (OR=1.37; 95% CI=0.98-1.92). Looking specifically to dose changes we found an association between 'overtreatment' and dose increasing (OR = 3.06; 95% CI 1.99-4.69) and 'undertreatment' and dose decreasing (OR = 4.25; 95% CI 1.89-9.56).

Conclusions: A relation exists between compliance and medication switches. In case of 'overtreatment' more change in medication occurred as well as doses increase. In case of 'undertreatment' significant more dose decreasing occurred but no more change in medication.

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3 Follow-up of prescriptions in pediatry: how to reduce the rate of medication errors?

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Objective: Medication errors are known to be an important cause of iatrogenic disease. In order to improve drug dispensation, a survey of all prescriptions was carried out in the paediatric department of Medicine. The objectives were to identify type of errors and use these analyses to increase the awareness of both physicians and pharmacists.

Design: The software used for prescriptions is Patient Care System (IBM). The following parameters were checked: selection of pharmaceutical form, strength, dose, route and frequency. For all errors, potential outcomes were assessed. The report of incidence, type and consequences of prescription errors was monthly sent to the physicians. A meeting was quarterly organised between pharmacists and paediatricians, to present the results, to focus on most common and serious errors, and to implement adequate measures to correct them. Evolution of medication errors was followed, including corrective measure impact.

Setting: Paediatric department of Medicine in a paediatric teaching hospital.

Main outcome measures: Error reporting rate, type of errors, potential outcome, and correction's factor by Pharmacy staff.

Results: More than 5 000 prescriptions were checked during 4 months. The initial error-reporting rate was 20%. The most common error concerned the strength (75%) followed by the pharmaceutical-form (13%). In spite of a lowest incidence, the dose-error (7%), frequency and route errors (3 and 2%) were the most relevant. The consequences were mainly dose's inaccuracy (43%), contamination and time preparation increase - for injectable forms - (31%), overcost (11%), overdose (13%) and subtherapeutic-dose for about 2%. Pharmacy staff checking led to correction of 90% of prescriptions' errors. Corrective measures led to a reduction of errors from 21 to 9%.

Conclusion: This study confirms that prescription errors are frequent. This monthly assessment of prescriptions' quality allows developing awareness of both physicians and pharmacists. Quarterly meeting between the Pharmacy and the Clinical ward led to a better understanding of errors and the development of corrective actions.

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4 Drug profiling and assessment of quality of life in Parkinson's disease patients

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Background and objectives: Parkinson's Disease (PD) is a progressive neurological disorder caused by degeneration of neurones leading to a depletion of dopamine. There is no cure for PD and the aim of treatment is to optimise quality of life (QOL). Study objectives were: to identify demographic characteristics associated with poor QOL in PD patients; and to assess effects of medicines on QOL in PD patients.

Design: Prospective cross-sectional study of PD patients.

Setting: 50 PD patients registered with PD Society in Cardiff and Newport.

Main outcome measures: Letters were sent to 200 patients registered with PD Society inviting them to participate. Patients were also recruited at monthly branch meetings. Assessment tools used were 39-item Parkinson's Disease Questionnaire (PDQ-39) and Drug History Profile (DHP). PDQ-39 consists of 8 dimensions, which address QOL issues found to be important to PD patients. DHP consists of 7 questions designed to collect information on current medication.

Results: Response rate was 100%. Mean age of the patient population was 70.44 years with mean duration of illness of 7.84 years. Percent mean PDQ-39 scores for each dimension varied greatly. Mobility had the greatest impact on QOL (mean 60.05), social support the least impact (mean 17.35). Age and gender of patient did not significantly influence QOL. Duration of illness and number of medicines prescribed had a significant influence on QOL ($p<0.05$). As number of medicines prescribed increased, QOL decreased. Majority of patients did not use over the counter medicines (72%) or herbal medicines (84%). Patients were in regular contact with their GP, PD clinic and PD Society but only two-thirds had regular contact with a PD nurse or sought help from therapists within the past 12 months.

Conclusion: QOL was poorer in patients with PD for a longer duration. PD can seldom be adequately controlled with monotherapy, leading to increase in number of medicines prescribed as disease worsens. This has a knock-on effect on QOL, which becomes more impaired.

5 DRIVE – drug in virtual enterprise

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Background and objective: The continuous evolution of the Healthcare Sector due to the introduction of advanced new technology, has brought about efficiency improvements in the quality of patient care, yet also bringing a general risk of an increase in the number of errors that may occur. Patient safety and supply chain integration are worth significant values in the drug delivery system, the objective of the *DRIVE* project is to deliver dedicated information services among key value-makers, i.e. hospitals (including drug related hospital sub-processes from pharmacy to bedside), drug manufacturers, and drug distributors. The partners of the DRIVE project, funded by the European Community, are: San Raffaele Hospital, Karolinska Institute, AtosOrigin Integration, AstraZeneca, GlaxoSmithKline, the Joint Research Center, Politecnico di Milano, and Aurion.

Design: The DRIVE Project has been divided into 3 phases. Real Cases & Modeling, Development, and Pilot Demonstration & Exploitation/Dissemination. First phase: defining the real and future case, and the study of the clinical, logistical and trust requirements of data from the "smart" system. Second phase: the development of the "smart" system: software and hardware. Third phase: implementing a prototype from the hospital and distributing and sharing the results.

Main outcome measures: Such innovative and added value services produced by DRIVE will jointly produce value in a safe and secure hospital framework by means of real time information sharing.

Results: As the first phase of the project is coming to end, a real case analysis has been completed and also validated by various stakeholders outside the project consortium. Along with this validation, initial experimentation has been conducted on a prototype of the "Smart Cart".

Conclusions: The errors that occur in the Healthcare environment, places the safety of the Patient at great "risk". This study proposes to demonstrate that the application of modern information technology (Robotics, E-commerce) can contribute to reducing errors and improving the organisation in the Healthcare field in terms of the safety and quality of service.

6 The clinical relevance of pharmacists' interventions leading to a prescription modification

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Background and objective: In a study concerning prescription modifications in Dutch community pharmacies 400 interventions (22.2%) were classified as *potentially* clinically relevant (see ref.). The objective of this study is to rate the clinical relevance of these pharmacy interventions leading to a prescription modification

Design: The cases: Of all 400 initially selected cases we skipped 99 cases for several reasons. We enrolled 52 (25%) randomly selected 'wrong dose'-interventions and 92 (99%) 'other potentially relevant interventions'. Ultimately we randomly assigned 26 'wrong dose'-interventions in group A and 26 in B; 46 'other interventions' in group C and 46 in D.

The panel: Based upon literature we composed a panel consisting of 5 groups of health care professionals each holding 4 members: community pharmacists, hospital pharmacists, general practitioners, specialists for internal diseases and non-practising medical or pharmaceutical experts. Each member will assess two groups of selected cases: group A *or* B *and* group C *or* D meaning that every case will be assessed by two panel members of the same group of professionals.
The rating form: Of each case in an A4-format we present: gender and age of patient, the initial prescription, prescriber, first use or not, type of intervention (e.g. interaction), consultation and the ultimate delivery (outcome). The reviewer will give his general opinion about the modification and will specify his opinion with respect to efficacy and/or adverse health consequences (probability and importance). Besides he will rate the use of extra health care and/or lost working days.

Main outcome measures: Clinical relevancy ratings of 144 cases as to efficacy and/or adverse health consequences (probability and importance; scale 1 - 5) and use of extra health care and/or lost working-days. Determinants: type of intervention, (group of) professional(s).

Results: In the forthcoming months the ratings will be received and analysed.

Conclusion: This study presents a method to rate a part of pharmacists' clinical pharmacy activities.

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POSTER DISCUSSION FORUMS

1 Quality indicators for pharmacotherapy and pharmaceutical care in hospitals: development and field testing

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Background and objective: To develop and test a set of quality indicators for pharmacotherapy and pharmaceutical care in hospitals, in order to measure and to improve the level and quality of care provided.

Design: After a literature review and consultation of experts candidate indicators were selected and identified in a "pharmaceutical care concept" which was tested in nine hospitals. The answers of the participating hospitals were scored based on a decile system resulting in a profile for each level of intermediary measure points. The correlation between these different levels was tested by Spearman analysis in order to evaluate the predictive power of this performance measurement tool.

Setting: Preliminary research conducted in nine Belgian hospitals.

Main outcome measures: 67 candidate indicators were structured in 5 levels of intermediary measure points. 1) Environmental factors stimulating pharmacotherapeutic management; 2) Information and support, promoting formulary adherence, rational prescribing, safe use and compliance; 3) Sensibilisation to improve rational prescribing; 4) Content of formulary, Pharmacotherapeutic Committee activities; 5) Medication usage.

Results: Of the 67 indicators, 51 indicators had a response rate of more than 77% of the sites. Reasons for not answering were data not available or unclear question. 35 of the indicators were classified as useful by more than 45 % of the sites. Spearman analysis revealed a significant correlation ($p<0.05$) between some levels. "Environmental factors stimulating pharmacotherapeutic management" correlated with "Information and support, promoting safe use" and "Sensibilisation to improve rational prescribing". "Information and support stimulating pharmacotherapeutic management" correlated with "Content of formulary".

Conclusions: This preliminary study shows that the quality of different areas of pharmaceutical care can be measured by a set of indicators. The results of this investigation will be discussed during a meeting with the participating hospitals. Further research will be done to select relevant and useful indicators and to validate this measurement tool.

2 Pharmacist intervention leads to improved compliance with diuretics in patients with congestive heart failure

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Background: Non-compliance with drug-treatment in heart failure can cause serious problems. Several studies have shown that non-compliance is a major cause of morbidity and unnecessary hospital re-admissions in patients with heart failure. Non-compliance may also reduce life expectancy. Especially non-compliance with loop-diuretics is prone to lead to acute congestive heart failure.

Objective: What is the effect of an intervention on therapy-compliance in patients with congestive heart failure who are treated with loop diuretics?

Setting: Patients with congestive heart failure (mainly NYHA II and III), treated with loop diuretics.

Design: Patients were randomised to two groups after signing informed consent at a visit to a cardiologist. All patients received an eDEM's (electronic Drug Event Monitoring System; a medicine-container with a microchip that registers the moment of opening). Half of the patients received an intervention based on repeated consultations with their pharmacist aiming to improve compliance with therapy.

Main outcome measures: Drug-compliance, number of re-hospitalisations and death.

Results: 152 patients were randomised. Due to a very high morbidity and mortality compliance data were only available on 91 patients. Overall compliance of the control and intervention patients was respectively 91.2 vs. 97.9%. 43 patients in the control group had 324 days with missed doses vs. 126 days with missed doses in 48 patients in the intervention group. 16/43 patients in the control group were less than 95% compliant vs. 6/48 patients in the intervention group. These differences in compliance were statistically significant ($p<0.05$).

Conclusion: A pharmacy-based intervention did improve compliance in patients with severe congestive heart failure. The compliance was unexpectedly high in the control group. This could be explained by a selection of relative compliant patients and by the fact that a large proportion of patients also visited a specialised heart failure clinic. Less compliant patients might benefit more from pharmacist compliance counselling.

3 Reorganisation of the pharmacy department, prepared for pharmaceutical care

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Objectives: Modern hospital pharmacy consists of distribution and preparation activities together with patient and therapy related pharmaceutical support. The hospital management wants to stimulate the quality of drug therapy but the hospital pharmacy at the moment is primarily product in stead of therapy oriented. The financing of the healthcare in Belgium is shifting from a fee for service system towards a budget system with shared responsibilities for both government and hospitals. This worries the hospital management.

Design: The hospital management hired an external consulting company to evaluate and redesign the pharmacy department.

Setting: The pharmacy department of the university hospitals of Leuven delivers pharmaceutical services to 4 hospitals (2000 beds) located in the region of the city and to the faculty of medicine. The pharmacy personnel perform all related activities, except clinical services. There are also teaching and training activities for the faculty of pharmacy.

Results: The consulting company concluded that different hospital departments, using different computer technologies, carry out many similar tasks. And especially for the pharmacy department, the follow-up of budget and the clinical pharmacy, are not parts of daily practice. The reorganisation of the pharmacy as a business unit with two subunits has been proposed and implemented: classical hospital pharmacy and clinical pharmacy with its own responsibilities but with a close collaboration between them. The pharmacy has to be focused on the core business: the drug delivery and the drug therapy with an

increase of competence in both. The hospital management recognises clinical pharmacy as an important contribution to the patient and the hospital. A new organisation chart has been described.

Conclusions: The reorganisation of the pharmacy can bring pharmaceutical care more in daily practice close to the patient with a more patient and therapy oriented support in the pharmacy with respect of the hospital budget.

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4 Increased co-operation between community and hospital pharmacists about discharge prescriptions

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Objective: In this preliminary research an inventory is made of the possibilities to increase the co-operation between the community and hospital pharmacists to solve and prevent medication errors, which can occur when a patient is discharged from hospital.

Design: Eight couples are formed consisting of a community and a hospital pharmacist. Each couple describes at least ten interventions caused by an error in the prescription or discontinuation of the pharmacotherapy. The couple co-operates during the intervention and describes the problem, the possible cause of the problem, the intervention, the scientific background of this intervention and the way of co-operation. In the end an inventory of all the interventions will be made to find out what kind of interventions have been performed. An important issue is to look for structural causes, which make the interventions necessary.

Setting: Eight couples consisting of a community pharmacist and a hospital pharmacist in the Netherlands.

Main outcome measures: Categorisation of the interventions in structural problems and ad hoc problems as well as the way of co-operation. Assessing structure indicators for co-operation.

Results: The first results indicate that structured co-operation will lead to more intensive teamwork between both disciplines. It is to be expected that the problems caused by prescriptions and the following interventions will be solved more structurally and will take less time. We expect to get results from approximately 30 useful interventions. The structure indicators show us that if we want to deepen the project, we should focus on each couple individually. On regular base there are changes in the formation of the couples and this needs attention for the structure of co-operation.

Conclusions: Structured co-operation will achieve a more efficient way of problem solving, by which the patient receives pharmacotherapeutic treatment with less medication errors, in and outside the hospital. Recommendations for structured co-operation should be made, as a result of this research project.

5 The prevalence of drug treatments for depression and dementia in people with Parkinson's disease

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Background and objectives: Parkinson's Disease (PD) is a progressive neurological disorder caused by degeneration of neurones leading to a depletion of dopamine. Depression and dementia feature quite highly among PD patients. The study aimed to establish if there is a difference between the percentage of PD patients suffering from depression and dementia, and the percentage being treated and to assess the impact that treatment vs. non-treatment of depression and dementia has on the QOL of PD patients.

Design: Prospective cross-sectional study of PD patients.

Setting: Patients were recruited through the Parkinson's Disease Society (PDS) in Cardiff, Pontypridd and Newport, UK.

Main Outcome Measures: Patients were either interviewed at a PDS meeting or a home visit was arranged. Data was collected in an interview format: the PDQ-39, Mini Mental State Examination (MMSE) and Geriatric Depression Scale (GDS) were completed, and a drug history profile was noted.

Results: Of the 50 patients interviewed56% of the population were suffering from depression; of these, 26% were being treated for depression. Cognitive impairment was detected in 35% of the patients with no one receiving pharmacotherapy for dementia. Presence of dementia had a significant effect on QOL ($p=0.021$) and the level of depression ($p=0.021$). Depressed patients recorded lower MMSE scores ($p=0.014$). The breakdown of QOL scores identified that untreated depressed PD patients had lower QOL in every aspect, except mobility, when compared to treated-depressed and demented patients.

Conclusion: There is a substantial under-treatment of depression and dementia amongst patients with PD. As this study and other studies have shown depression and dementia are widespread throughout the PD population. Treatment of these complaints is likely to have a positive effect on QOL, general well being and possibly improve motor symptoms. These findings must be considered by clinicians to optimise the therapy that PD patients receive.

6 Medication in discharge letters: frequently missing or incomplete

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Background and objective: Transition of patients from hospital to community health care is an error-prone moment in continuity of medication. Communication about continuation and changes in medication between different health care providers is an important tool to prevent such errors. Currently, a discharge letter is the source of information used by medical specialists to inform the general practitioner about medication after discharge of the patient from the hospital. The objective of the present study was to measure the quality of the information about medicines in hospital discharge letters.

Design: Analysis of 118 randomly chosen discharge letters of 4 medical specialties of two Dutch hospitals.

Setting: Two general hospitals located in Tilburg, The Netherlands.

Main outcome measures: Frequency of lacking any information about medication to be used after discharge and frequency of incomplete information about medication. Incomplete information was defined as missing of relevant information about drug use or errors in name, dose, dosage form and/or frequency.

Results: In 50 (42%) of the discharge letters information about medication was completely lacking. The remaining 68 letters contained information about 476 medicines. Of these, 37% contained

one or more relevant missing items. Strength (17%), dose (21%) and dosage form (22%) were the most frequently lacking.

Conclusions: The communication about medicines from medical specialist to general practitioners after discharge of the patient from the hospital is frequently missing or incomplete.

7 Service users views of supplying emergency hormonal contraception in the pharmacy

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Background and objective: Since 1999, community pharmacists in Manchester, Salford and Trafford (MST) Health Action Zone (HAZ) have been supplying emergency hormonal contraception (EHC) under patient group directions (PGD). After undertaking training, pharmacists can supply EHC at no cost, on completion of a consultation with the user. The objective of this paper is to provide quantitative and qualitative data on service users views about their experiences of obtaining EHC in the pharmacy.

Design, setting and outcome measures: During November 2000 to March 2001, 53 pharmacies supplying EHC distributed a 28-item questionnaire to users. This consisted of questions relating to satisfaction with EHC supply (the main outcome measures). A total of 5020 questionnaires were distributed. 430 questionnaires were returned (9% response rate). To provide triangulation of these results, 2 focus groups with service users were also conducted.

Results: Questionnaire data. Ninety-three per cent (399/430) of users found it either very easy or easy to obtain EHC from the pharmacy. Ninety-one per cent of users (392/429) felt either comfortable or very comfortable about discussing EHC with the pharmacist and 86% (361/427) felt there was enough privacy in the pharmacy. Importantly, 99% (425/429) of users were either very satisfied or satisfied with how their request for emergency contraception was dealt with. Sixteen per cent (68/427) of users indicated that they were concerned or very concerned that their request for emergency contraception in the pharmacy would not be kept confidential.

Focus group data. Women reported a high level of satisfaction with the service and commented positively on the ease with which they could obtain EHC from the pharmacy. They stated that more information about the service was needed in order to promote uptake. These data will be supported by a series of quotations.

Conclusions: These preliminary results demonstrate a high level of user satisfaction with the supply of emergency contraception via patient group direction in the pharmacy.

8 Drug related problems among patients discharged from hospital

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Introduction: A drug related problem (DRP) is an event or circumstance involving drug treatment that actually or potentially interferes with the patient's experiencing an optimum outcome of medical care. It is suggested that these DRPs frequently occur when patients are transferred across primary and secondary healthcare sectors such as to and from the hospital. In an Educational Course on Pharmacy Practice Research, held at the ESCP Spring Conference in May 2000, Reykjavik, Iceland it was decided to start a project into these DRP's related to hospital discharge.

Objective: To examine the nature and frequency of DRPs in community pharmacies in different countries among patients discharged from hospitals and to examine several variables related to these drug related problems.

Design: Community pharmacists asked patients with a prescription after discharge from the hospital between February and April 2001 to participate in the study. A patient-questionnaire was used to detect drug-related problems. Pharmacists documented interventions, and prescriber, patient and pharmacy variables on a separate form.

Setting: Community pharmacies in Austria, Denmark, Germany, the Netherlands, Portugal and Spain.

Main outcome measures: Nature and frequency of DRPs among patients discharged from hospital; patient, drug and prescriber related determinants for a drug related problem.

Results: In a preliminary analysis of 321 patients drug related problems were identified in 189 patients (59%). The most common identified problems were uncertainty or lack of knowledge about the aim or function of the drug (52%) and side effects (39%). When a DRP occurred, the most common pharmacy interventions were patient medication counselling (44%) and practical instruction to patient (23%).

Conclusion: Community pharmacists won't be able to identify all drug-related problems in patients discharged form hospital. However, by communicating with patients who are discharged or their relatives, they are able to reveal a high number of problems that might be relevant for patient outcomes.

9 Sequential screening for diabetes in community pharmacies

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Background and Objective: There are no randomised trials demonstrating benefits for a community screening of asymptomatic populations. But there is sufficient indirect evidence to justify opportunistic screening in a clinical setting of individuals at risk. Objective: Develop a concept for a community pharmacy based sequential screening for diabetes including measurement of major risk factors and when appropriate blood glucose measurement. The concept is thought to be used 2002 in a national campaign for screening for diabetes in about 600 Swiss community pharmacies.

Design: Based on analysis of literature and experiences from pilot projects a new concept was designed and submitted to experts.
Setting: Development of the concept by 2 pharmacists and submission to 3 experts in the field of diabetes and public health.

Main outcome measures: Approved concept ready to implement into pharmacy practice.

Results: New triage guidelines with respect of other risk factors for the development of diabetes were established for community pharmacy practice. The screening procedure was structured into different sequences. The sequential screening and the triage guidelines were summarised in a commented flow chart. For counselling on the influenceble risk factors specific action plans were designed using the Transtheoretical Model of behaviour change.

Conclusions: In an interdisciplinary approach a comprehensive concept for a targeted screening for diabetes could be developed, which is ready to be used in practice.

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10 Pharmacist-physician interactions to prevent and solve drug related problems in a Portuguese community pharmacy

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Background and objective: Pharmaceutical care meets patients' drug therapy needs by identifying, preventing and resolving drug related problems (DRPs). The purpose of pharmacist-physician collaboration in the delivery of pharmaceutical care is to combine the unique knowledge and competences of each to achieve optimal outcomes in, and for, the patient. Knowing the characteristics of pharmacist-physician interactions to provide pharmaceutical care in the community setting may help pharmacists to communicate with physicians in a more efficient way.The objectives of the study were: To examine the nature of interactions with physicians to solve DRPs;
To describe several variables related to these interactions: DRPs type, interaction form, time estimate, physicians' feedback.

Design: 6-month prospective follow-up study.

Setting: A community pharmacy in a rural area.

Main outcome measures: Nature of pharmacist-physician interactions; Interaction form; DRPs type.

Results: A total of 75 cases (65.3% female, 78% older than 64 years) were included in the study. Recommendations to solve detected DRPs were made in 45.3% of the cases, with an acceptance rate of 58.8%. In 34.7% of the interactions the physician conceded the information he was asked for. Interprofessional communication was made by telephone in 65.3% of the cases, predominantly with general practitioners (80%). Telephone calls tended to be less time-consuming than written communications, and had immediate feedback, which probably determined its overuse. The most frequent DRP (33.9%) was the use of a dose, interval or duration inferior to the one needed; few patients (4.6%) had more than one DRP.

Conclusion: It may be helpful for community pharmacists to become familiar with DRP classification systems. Written communication templates based on classified DRPs may reduce the time spent in the interactions. It can be useful to provide local general practitioners with information on the pharmacist role and competence and on pharmaceutical care concept and value.

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11 Use of bupropion in the Netherlands

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Background: Clinical trials have shown bupropion to be effective in smoking cessation. There are no data available on the use of bupropion in daily practice.

Objective: To describe patients who are prescribed bupropion in daily practice, to describe patterns of use of bupropion and factors, which determine successful abstination from smoking.

Setting: 36 pharmacies in the Netherlands.

Design: Cohort study with case-control analysis. Participating pharmacists selected all patients who received at least one prescription for bupropion between January 1st and April 30th of 2000. The pharmacists noted several drug and patient related characteristics. Subsequently pharmacists interviewed patients by telephone about the success of their smoking cessation.

Main outcome measures: Abstinence rate and factors determining successful abstination.

Results: 36 pharmacists identified 323 patients with a prescription for bupropion (148 male (52.7%), 133 female (47.3%)). In 92.9% of patients bupropion was prescribed by the general practitioner. The majority of patients (190, 67,6%) were dispensed less than 60 tablets. This implies use of less than 4 weeks, while 7-9 weeks is the recommended period of use. 75 (26.7%) of patients collected between 90 and 135 tablets which is approximately the recommended period of use. Pharmacists interviewed 215 (66.6%) patients by telephone. 82 patients had secret telephone numbers or were repeatedly not at home when calling. 5 patients did not want to cooperate with the interview. 53 (27.3%) patients still did not smoke 6 months after the prescription for bupropion. Only 36 patients reported having visited the prescriber to discuss smoking cessation more than once after the prescription for bupropion.

Conclusions: Most patients do not use bupropion in accordance with the recommended period. Nevertheless 27.3% of patients did succeed to stop smoking 6 months after the prescription for bupropion. This abstinence rate is only slightly lower than reported in literature. Bupropion is not reimbursed in the Netherlands. It is difficult to assess whether patient's self-payment has lead to selection of extra-motivated patients or has been a barrier to finish using bupropion. Patients have not received the same support given in clinical trials with bupropion.

12 Patients with epilepsy or Parkinson's disease at south Swedish nursing homes- a descriptive study and a pharmacotherapeutic intervention

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Objective: To describe the drug use for epilepsy- and Parkinson-patients older than 65 years, living at nursing homes and to evaluate the impact of multidisciplinary support-team interventions on health-related quality of life, confusion state and activity of daily living (ADL).

Design: A descriptive, cluster-randomised-controlled study. A pharmacist assessed each resident's medication use, disease specific symptoms, and drug-related problems were identified. A multidisciplinary support-team evaluated the patients' medication and when appropriate suggested changes. The active group physicians received the written suggestions of changes in drug treatment. All measurements were repeated after 5-6 months.

Setting: A total of 48 nursing homes (157 patients) were recruited: 30 in the active group and 18 in the control group.
Main outcome measures: Health-related quality of life (SF-36, Sullivan et al. 1995), confusion state (Behave-AD, Reisberg et al. 1989) and ADL according to Schwab and England.

Results: The patients used on average 8-9 drugs for continuous use. According to Beer's criteria about 40 % used inappropriate drugs. Dopamine-receptor blocking psychotropic drugs was used by 29 % of the Parkinson-patients. Indication for a patient's total drug treatment was not documented for 45 % of the patients. There were no significant differences between active and control group in change in SF-36, Behave-AD or ADL for epilepsy-patients. For Parkinson-patients there was a significant decrease in ADL for the active group but no difference in SF-36 or Behave-AD.

Conclusion: Nursing home residents with epilepsy or Parkinson's disease use many drugs and often drugs that are classified as inappropriate. Methods on how to improve the pharmacotherapy and measure improvement in clinical outcomes of these patients still have to be developed.

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13 Twenty French patients affected by the withdrawal of Choloxin® (dextrothyroxine): Alternatives proposals from the Regional University Hospital of Lille, France

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Objective: Dextrothyroxine (DT4) has long been used for its hypocholesterolemic properties. DT4 is still used as a suppressive therapy for predominantly pituitary resistance to thyroïd hormone associated with marked thyrotoxicosis. Twenty French patients are concerned by this therapeutics but the production of the two products containing DT4 has been stopped. We set our approach to the problem, so that the patients can carry on receiving their treatment.

Design: Literature and Internet review, contacts with actors.

Setting: Pharmacy department.

Main outcome measures: Point on the situation, alternative treatments and solutions proposed.

Results: DYNOTHEL® (Henning Laboratory) available under a temporary licence issued by the French Agency for the Safety of Health Products was the first to be affected by halt of the production.
Then CHOLOXIN® (Knoll Laboratory) was available for a short time and stopped.
We asked KNOLL to carry out a study of the stability of the last batch they produced. The expiry date was extended by an extra year. Alternative treatments were considered: beta-blockers for thyrotoxicosis symptoms and triodothyroacetic acid. There have been discussions between Orphan Europe and the PC-HP (Central Pharmacy of State Hospital, Paris), but as yet, the production has not resumed.

Conclusion: The extension of the expiry date is a short-term solution. There are alternatives but DT4 remains the most efficient drug. It is part of the remit of an orphan drug laboratory or the PC-HP to deal with such problems especially as an increase is expected to happen because of a better knowledge of the pathology. Hospital pharmacists have an important role to play when production of an orphan drug is halted. They are uniquely placed to interact between physicians, the regulatory authorities, manufacturers and importers, working in the best interests of the patient.

14 Pharmacist intervention through computerised medical prescription in daily routine

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Objective: To describe and quantify the daily routine pharmacist interventions through the computerised unit-dose drug distribution system. To determine the pharmacist interventions rate of impact on the pharmacological therapy.

Design: One-year prospective study.

Setting: All hospital units in a 41.792 hospital stays a year.

Main outcome measures: Everyday and through the computerised unit-dose system, we carry out the therapeutical monitoring of the patients and particularly with reference to the following aspects of the pharmacotherapy: route of administration, dosage, sequential therapy, therapeutic duplications, drug interactions, no hospital protocol, inappropriate duration treatment, drugs not included in the hospital formulary, omitted treatment/dosage and others. The computerised unit-dose system let us edit computerised medical prescriptions with the update treatment. The pharmacist intervention is shown as a comment. On the medical prescription right below the drug affected by the intervention, for the physician being able to read it and make the necessary changes. Everyday in the pharmacy we record all the pharmacist interventions on a specific sheet where, apart from personal particulars, appear the date, physician, clinical unit, diagnostic, pharmacist, intervention type, impact code (efficacy, toxicity, cost), significance code (significant, serious, fatal), pharmacological group according to the anatomic classification and the acceptance or not of the intervention.

Results: 1897 interventions were recorded (5.2 interventions/day, 4.5 interventions/100 hospital stays). The most common types of interventions were drugs not included in the hospital formulary (36.48%), drug interactions (18.77%), no hospital protocol (11.6%), dosage (11.28%), and sequential therapy (6.80%). There were 3 impact codes assigned to these interventions: 12% decreased toxicity, 31% increased efficacy and 56% decreased cost. Most of the interventions turned out to be significant (98%) and accepted (82%). The majority of interventions pertain to the group of digestive system drugs (31.68%), cardiovascular system (14.23%), locomotor system (12.12%), and antibiotics (8.49%).

Conclusions: The computerised unit-dose drug distribution system has shown to be effective in achieving pharmacist interventions on the therapeutics and in providing rapid and easy access to physicians to the pharmacist interventions. Our analysis found that pharmacist interventions play an important role in ensuring the best drug therapy and safety in order to improve patient care.

15 Non-compliance with cyclosporine in kidney transplantation: comparison of two measurement methods (self-report and electronic event monitoring)

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Introduction: Kidney Transplantation (KTx) is characterised by demanding a life-long immunosupressive therapy (IT) in order to prevent graft rejection. Previous studies have demonstrated that the prevalence of non-compliance with IT ranges from 2% to 23%. Measuring drug-taking behaviour has been particularly challenging and several methods have been used in clinical research. Each of them has limitations in terms of validity and reliability. In an attempt to overcome many of the limitations of more traditional measures of non-compliance a new method Electronic Event Monitoring (EEM) has emerged.

Objectives: To know the prevalence of non-compliance with cyclosporineand to compare two indirect methods: Self-report (SR) and EEM.

Setting: This study integrated 17 patients (10 women and 7 men, mean age 47 years) who had undergone KTx between 1995 and 1997 at the KTx Unit of the Red Cross Hospital in Lisbon.
Non-compliance was assessed in two ways: by interview conducted by the investigator about non-compliance behaviour regarding their IT in the last month, and by EEM. Patients were identified as non-compliant when they admitted (at least twice) to: having skipped a dose of cyclosporine, or deviated more than two and a half hour from the prescribed dosing schedule.

Results: Of the 17 patients submitted to KTx only one (5.9%) admitted that in the previous month had forgotten to take two or more doses of cyclosporine and only six patients (35.3%) admitted to have had deviated more than two and a half hour from dosing schedule. However the evaluation of non-compliance by EEM revealed that 52.9% of the patients missed two or more doses of cyclosporine and 47,0% deviated more than two and a half-hour from dosing schedule. Furthermore 29.5% of the patients had had 2 to 9 drug holidays.

Conclusion: This study demonstrated that the prevalence of non-compliance was higher in EEM than SR, and that EEM had the extra benefit of studying the dynamic aspects of non-compliance behaviour.

16 Information about drugs containing excipients with known effects: a French overview

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Objective: The 01/13/01 French decree established an official list of generic drugs and identified excipients which are responsible of side effects and contra-indications (=excipients with known effects). Our objective was to make a descriptive overview of all drugs marketed in France containing these excipients and to diffuse it to health practitioners.

Design: The decree defined 38 excipients with known effects (e.g. lactose, ethanol). Each effect is related to an administration route and sometimes to a threshold dose. These data were captured in the French database Thériaque (http://www.theriaque.org) in addition to the data issued from the Summary of Product Characteristics (SPC). Results were obtained on the 06/01/01 by using computerised queries in the database.

Setting: CNHIM.

Main outcome measures: Number of excipients and their derivatives, drugs containing these excipients and side effects. Connection between the SPC quantitative composition and the threshold dose.

Results: 300 excipients with known effects and their derivatives such as salts, esters, hydrated form, bases were identified. Among the 8900 marketed drugs in Thériaque, 5567 drugs (804 generics, 1013 OTC) contained one or more of these excipients. 2483 (382 generics, 455 OTC) contained 1 excipient, 1819 (282 generics, 284 OTC) contained 2 excipients and 1265 (140 generics, 274 OTC) contained 3 or more excipients. According to the excipient and its administration route, 410 effects (intolerance/idiosyncrasy, direct toxicity and allergy) were described. Among the 5818 excipients with a threshold dose contained in the marketed drugs, 3385 were connected to a quantitative composition in the SPC.

Conclusion: The information relative to the excipient side effects especially for generic drugs and OTC is important in pharmacy drug dispensing. In the SPCs (especially the European ones), the lack of information about the effects of these excipients and their threshold doses is a difficulty for health practitioners. Otherwise, the list of these excipients is not exhaustive and will have to be completed by the French health authorities.

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POSTERS

Clinical pharmacokinetics and stability studies

1. *Assessment of the conservation of refrigerated drugs in a French University Hospital*
   Llamas-Prudhon C, Menat C, Limat S, Hénon T, Jacquet M, Woronoff-Lemsi MC
   Pharmacy, Besançon University Hospital, 25030, France

2. *Simultaneous determination of oxcarbazepine and 3 other antiepileptic drugs with their active or toxic metabolite in human serum by HPLC-UV detection*
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3. *Closporin A monitoring using C2 in paediatric renal transplantation*
   Fidalgo G, Lourenço R, Pereira ME A
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Nutritional support and intravenous therapy

4. *Experience with centralised intravenous unit dose distribution in an Italian clinical pharmacy*
   Polidori P, Johnson HJ, Pellerito C
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5. *Preparing and storing conditions of sodium nitroprusside solution in order to keep it available for the medical corps at any time*
   De Rijdt, T.
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6. *Manpower requirements for Hospital Pharmacy based Centralised Cytotoxic Reconstitution (CCR). A survey in 6 European countries*
   Griffiths W, Ackermann M, Lizana H, Bonnabry P
   Pharmacy, University Hospitals of Geneva (HUG), Switzerland

7. *The results of studying Y-site compatibility of intravenous drugs enhance Good Clinical Practice and diminish the risk of catheter obstruction on intensive care units.*
   Verstraeten, M.
   Pharmacy Department, University Hospital Leuven, Leuven, Belgium

8. *Effect of freezing, long term storage and microwave thawing on the stability of cefuroxime in 5 % dextrose infusion*
   Hecq J-D, Schlesser V, Vanbeckbergen D, Jamart J, Galanti LM
   Laboratory, Hospital Pharmacy and Biostatistical Centre, University Hospital of Mont-Godinne, Yvoir, Belgium

9. *Evaluation of ambulatory enteral nutrition (aen) in elderly patients*
   Martínez MJ, Martínez MA, Sanmartín S[1], Guzman J[1], Castro I, Prieto O, Inaraja MT
   Meixoeiro Hospital. [1]Geriatric Residence Institution, Vigo, Spain

10. *Hazard Analysis-critical control points (HACCP): a method applied to quality improvement of intravenous drug manufacturing for clinical trials*
    Falconi I, Ballereau F
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11. *Vitamins in intravenous lipid emulsions - Benefit to the premature infant or to the stability of the emulsion?*
    Massetti C[1], Fahnenstich H[2], Grünig HM[3], Saxer A[3], Lampert ML[3]
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12. *Economic implication and nurses' satisfaction about IV drug administration systems*
    Tilleul P[1], Sejean K[1], Mons B[1], Laporte JM[1], Toullec H[2], Forget D[2], Begue D[3]
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13. *Optimising the Drug Treatment in Elderly Patients*
    Ribeiro N, Falcão F
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14. *Study to Assess Knowledge of Medications in People with Parkinson's Disease*
    Salek MS, Rogers M, Evans N, Luscombe DK
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15. *Thalidomide in a university hospital: a management example of drug under Authorisation of Temporary Prescription*
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16. *Assessment and modelling of total direct medical costs associated to hypertension treatment*
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17. *Compliance with statins in the hyperlipidemia out-patient clinic*
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18. *Pharmacist's involvement and contribution to the computerisation of the drug circuit using an appropriate software in hospital*
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19. *Olypharmacy is certainly inappropiate?*
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20. *GTP-z: Good pharmacoTherapy Practice for hospital pharmacies*
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21. *Are cyclodextrins useful in improving the stability of cysteamine hydrochloride in eye drop solution?*
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22. *Clinical impact of prophylactic therapy of respiratory syncytial virus (rsv) infection in high risk patients*
Cardells C[1], Soler F[1], Perez A[1], Estopiñá G[2], Trujillo A[2], Martinez-Santana S[2], Martinez B[1], Bobis MA[1], Butiñà MT[1]
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23. *A descriptive study of chemotherapy prescriptions in haematological malignancies*
Castro I, Campelo E, Martínez MJ, Inaraja MT, Loureiro C[1], Martínez N, Pellicer S
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24. *Efficiency and tolerance of etanercept*
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25. *Erythropoietin in anemic patients with chronic kidney disease*
Gorchs M, Pedro de V, Basagaña G, García M
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26. *Comparison to French guidelines of antibiotic prophylaxis practices in total hip replacement surgery*
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27. *Importation of an oral solution of gamma-hydroxybutyrate: an awkward procedure*
Decaudin B, Schemoul E, Deveaux M, Lefebvre MN, Guieu JD, Yilmaz M
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28. *Impact of clinical recommendations on red-cell transfusion requirements in intensive care patients in a hospital school center*
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29. *Evaluation of erythropoietin dose adjustment in end-stage renal disease patients undergoing hemodialysis*
Feydel A, Guillet B, Galliano S, Darque A, Gensollen S, Bongrand Mc, Timon David P, Brunet Ph, Berland Y
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30. *Effect of freezing, long term storage and microwave thawing on the stability of piperacillin plus tazobactam in 5 % dextrose infusion*
Hecq J-D, Schlesser V, Vanbeckbergen D, Jamart J, Galanti LM
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31. *Nature, frequency and determinants of compounded medicines in Dutch community pharmacies*
Buurma H[1], Engering M[2], Storimans M[2], Sysling H[2], van Yperenburg A[2], de Smet P[3], van den Hoff O[3], Egberts T[4]
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32. *A quality improvement system: an application to the clinical trial management in a hospital pharmacy*
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33. *Therapy of chronic hepatitis B with Lamivudine : study of HBeAg seroconversion and viral resistance in 22 patients*
Tiret I[1], Riachi G[2], Donnadieu N[1], Mendel I[3], Herve S[2], Goria O[2], Dieu B[1]
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34. *Screening for diabetes in community pharmacies*
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35. *Diagnosis of Helicobacter Pylori infection*
Zarb Adami M, Serracino Inglott A, Azzopardi LM, Caruana S
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36. *Provision of first aid facilities at place of work*
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37. *Pharmacist intervention in first aid*
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39. *Methods of pain relief after caeserean section*
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40. *Clinical relevant changes in INR despite interaction signalling upon electronic order entry by physicians*
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41. *Campath-1H in fludarabine-resistant/relapsed chronic lymphocytic leukaemia (CLL): report on the efficacy and toleration of the treatment for 9 patients*
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42. *Diabetes mellitus type II and treatment of dyslipidaemia; a study investigating the possibility of case finding in community pharmacies*
Koning de F, Heijden van der E, Heymeijer G-J, Lenderink B, Peterse M, Veen van der E, Verest O, Verheggen P, Zijl van T, Egberts T
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43. *Utilisation patterns of bisphosphonates in daily clinical practice with special attention to frequency and determinants for switching*
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44. *Observational study as a tool for monitoring NSAIDs-induced gastropathy, pilot study*
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45. *Institutional clinical trials: contract with the industrial supplier of the investigational product*
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46. *Angiotensin converting enzyme inhibitors (ACE-I) and angiotensin receptor antagonists (AA-II): prescribing, discontinuation and switching*
Faber A, Rozema M, Bouvy M, Dam B, Grendel A, Reicher A, Venema N
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47. *The utility of the guideline on substitution of the drugs not included in the hospital formulary*
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48. *New therapeutic target for the treatment of chronic myeloid leukemia (CML)*
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50. *Analysis of strong opioïds' prescriptions in community pharmacies*
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51. *An evaluation of clinical tasks performed by nurses in community pharmacies*
Scheepers LN, Gerber JJ
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52. *Analysis of clinical pharmacy interventions undertaken in an Australian teaching hospital*
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53. *Medical prescription monitoring in elderly patients. Renal function appreciation and drug dosage.*
Bord B, Peyriere H, Dubois A, Blayac J-P, Hillaire-Buys D
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54. *Design of an useful patient information tool in pharmaceutical care in tuberculosis outpatients*
Pérez I, Garabito MJ, Lluc A, Desongles T, Santos MD, Ramos R
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55. *Pharmaceutical care in advanced cancer: using patients' baseline quality of life information as a guide for treatment decision making*
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56. *Pharmacist intervention in best practice prescribing of proton pump inhibitors*
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57. *Evaluation of an educational program for patients taking anticoagulant treatment*
Léger S, Allenet B, Bosson J-L, Pichot O, Figari G, Calop J
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58. *Role of a Pharmacist in an Intensive Care Unit*
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59. *Reimbursement for the provision of patient care services: Perceptions of payers and providers in South Africa*
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60. *"Near to Patient" pharmacy and patient packs: implementing a model for hospital medicine management in the UK*
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61. *Assessment of the use of a new parenteral nutritive standard mixture for prematures*
Rousseau A, Lassiaz C, Schmitt D, Brudieu E, Allenet B, Calop J
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62. *Cancer patients' drug related problems as identified by patients and health care professionals.*
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63. *Assessment of Pharmaceutical Care services provided to the elderly patients of a French community pharmacy*
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64. *Implementation of an analgesic adequacy index to evaluate pharmaceutical interventions in patients having cancer chronic pain.*
Ramos R, Velázquez MD, Cobos J, Santos MD, Desongles T, Pérez I, Garabito MJ, Quintero P, Bautista J
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65. *Evaluation of human albumin use in a university hospital*
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66. *Medication breaks' at the migration between in- and outpatient health care services; frequency and determinants*
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67. *Amiodaron induced thyroid disorder*
Bouvy ML[1 2], Heerdink ER[2], Hoes AW[3], Leufkens HGM[2]
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68. *Drug utilization pattern of antiepileptic drugs: A prospective pharmacoepidemiologic study in Oman*
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69. *Unit-dose system as a mean of evaluating drug use*
Bautista Paloma J, Del Prado JR[1], Garabito MJ, Ramos R, Santos MD, Pérez I, Desongles T
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70. *Evolution of Antibiotic Consumption and Bacterial Resistance in São Francisco Xavier Hospital*
Falcão F, Cabrita J, Ribeiro N, Pessanha MA, Ferreira A, Aleixo A
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71. *Adherence to the 1998 European guidelines for the management of cholesterol in secondary prevention of coronary artery disease (CAD)*
Tissot E[123], Cornuz J[2], Berg C[3], Mooser V[2], Aebischer N[4], Darioli R[5], Kappenberger L[4], Bassand JP[6], Woronoff-Lemsi MC3, Pannatier A[1]
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72. *The use of psychodrugs among the students of Lisbon University*
Cabrita J, Ferreira H, Iglesias P, Ferreira P, Baptista T, Rocha E
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73. *Characteristics of patients treated with colistin*
Mateu–de Antonio J, Marin M, Grau S, Salas E, Alvarez–Lerma F[1]
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74. *Surgical glues: Plasma-based or synthetic?*
Dautel D, Denies F, Yilmaz M
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75. *Impact of local guidelines on the prescriptions and consumptions of haematologic growth factors (HGF) in 1999 and 2000*
Petiteau F[1], Bouillot S[1], Dulin R[1], Puntous M[2], Reiffers Jr[2], Saux Mc[1]
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76. *Consumption of antidepressants in a 729-bed teaching hospital in Belgium*
Corman C, Ernes C, Delporte J-P
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77. *Evaluation of the use of Piperacillin/Tazobactam and Imipenem in a general hospital*
de Pedro Ambrosio V, Morón A, Serrate G, Basagaña G, García M, Segura F
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78. *Analysis of clopidogrel use from 1999 to 2000 in a reference hospital*
Alberdi A, Álvarez L, Martín JA
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79. *Discontinuation of low dose aspirin among patients in Dutch community pharmacies*
Nieuwhof M, Leendertse A, Elst M vd, de Jong J, Meulenberg O, Struik G
Masterclass Pharmacy Practice Research, SIR Institute for Pharmacy Practice Research, Leiden, The Netherlands

80. *The feasibility of using routine pharmacy intervention data to establish the prevalence and range of prescribing errors*
Tully MP[1 2], Higgins MP[1]
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81. *Reliability estimation of a tool to measure asthmatic patients health-related needs*
Costa F[1], van Mil JWF[2], Cavaco A[3], Caramona M[4]
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82. *Analysis of antibiotherapy in two medicine wards at Coimbra's university hospitals*
Cunha EP, Rocha MJ, Torres MA, Caetano M, Campelo I
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83. *Drug consumption study in university paediatric hospital*
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Pharmacoeconomics

84. *Evolution of the budget of psychiatric drugs in a French psychiatric hospital*
de L'Escalopier C, Surugue J
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85. *Cost assessment of adult Burkitt Lymphoma (BL) treatment*
Valnet Rabier MB, Fest T, Limat S, Angonin R, Cahn JY, Woronoff Lemsi MC
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86. *A cost-benefit analysis model comparing linezolid iv/oral and vancomycin IV in the treatment of methicillin-resistant S. aureus infections of skin and soft tissues*
Kenigsberg PA
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87. *Socio-economic evaluation of home versus hospital sequential high-dose intravenous immunoglobulins for patients with systemic auto-immune disease*
Wibaux A, Hachulla E, Yilmaz M, Lefebvre MN, Hatron PY
Internal Medicine Department, Hôpital Claude Huriez and Central Pharmacy, University of Lille, France

88. *Use of anti-ulcer drugs on gastro-enterology departments in southern Sweden*
Eriksson T[1], Nilsson S[2], Johnson F[3], Höglund P[4]
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Drug information

89. *Acceptance and use of "compliance pads" in community pharmacies*
Hersberger K, Traber M, Zehnder S, Bruppacher R
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90. *Thalidomide in advanced multiple myeloma: assessment of the level of knowledge of patients and compliance to treatment.*
Schemoul E, Gransard C, Lefebvre M-N, Yakoub Agha I, Facon T
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91. *Patients perceptions on self-medication*
Serracino Inglott A, Zarb Adami M, Azzopardi LM, Said Pullicino A
Department of Pharmacy, University of Malta, Msida, Malta

92. *Drug information for community pharmacists: Survey on needs, wishes and use of drug information with special focus on new information technologies*
Zehnder S[1], Beutler M[2], Bruppacher R[1], Ehrenhöfer T[1], Hersberger K[1]
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93. *Drug information sources used by the health care professionals in Finnish hospitals*
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Education in clinical pharmacy

94. *Writing Discharge Prescriptions: A Novel Training Programme for Hospital Pharmacists*
Baig M, Wells C, Wallace R, Cairns C, Tyrrell A
Department of Pharmacy, St. George's NHS Trust, London, United Kingdom

95. *Patient oriented activities in Dutch community pharmacy: diffusion of innovations*
Pronk MCM[1], Jonkers R[2], Blom AthG[1], Rogers EM[3], Bakker A[1]
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96. *Quantitative and qualitative evaluation of the novel Clinical Pharmacy course in Berlin, Germany*
Sanghani S[1 2], Buerger C[1], Fliß G[1], Huether A[1], Reif S[1], Warnke U[1], Kloft C[1] ckloft@zedat.fu-berlin.de
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97. *Clinical pharmacy practice: Implications for pharmacy education in Belgium*
Spinewine A, Dhillon S
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98. *Evaluation of a new Master of Science degrees in Clinical Pharmacy International, Practice and Policy for overseas Pharmacists*
Dhillon S, Kostrzewski A
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99. *Evaluation of the clinical internship 2000-2001 at the K.U. Leuven: expectations not fulfilled*
Leemans L, Laekeman G, De Rijdt T, Kinget R, Knockaert D, Verbeke N, Verbruggen A, Willems L
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100. *Postgraduate Clinical Pharmacy training course in Gerontology: Assessment after 6 years of practice*
Guelfi MC, Bodenan L, Seigle-Murandi B, Decroix MO
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