

## Clinical Therapeutics

**Conclusion:** Results of this study showed that Yarrow extract caused significant changes in blood immune parameters and can affect immune system of body even in absence of antigenic factors.

**Disclosure of Interest:** None declared.

### PP046—MEDICATION SELF-ADMINISTRATION IN HOSPITALISED PATIENTS: AN EVALUATION USING DATA FROM AN ELECTRONIC PRESCRIBING AND MEDICATION ADMINISTRATION SYSTEM

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**Introduction:** In the United Kingdom, the self-administration of prescribed medicines by hospitalized patients has been supported by the Department of Health and pharmaceutical and nursing bodies. Suggested benefits of self-administration include improved patient knowledge about their medicines, improved concordance with treatment, and increased patient satisfaction. We wished to assess the proportion of medicines administered by hospitalized patients and to describe the patient and drug factors associated with self-administration.

**Patients (or Materials) and Methods:** We used data from University Hospitals Birmingham NHS Foundation Trust, which uses a locally developed electronic prescribing and medication administration system known as PICS (Prescribing, Information and Communication System). We extracted data from every drug prescription and administration recorded from January 1, 2012, to December 31, 2012. The data were analyzed to ascertain the degree to which patients were self-administering in the hospital. Drug and patient data were also extracted to determine the association between these factors and self-administration.

**Results:** In the twelve-month period analyzed, 45,115 patients were admitted to hospital. During this time period, 657,230 drug prescriptions were recorded, of which 5.8% (38,583) were administered by the patient at least once during the course of the prescription. The most commonly administered drugs were paracetamol, salbutamol, and nystatin. The majority of medicines (14,797; 38%) administered by the patient was in a tablet form. Almost two thirds (65.4%) of prescriptions identified as the patient's own were administered by the patient.

**Conclusion:** Less than 6% of prescribed medicines were administered by the patient over a 1-year period. These data will be used to focus the promotion of self-administration to appropriate patients. However, it remains unknown to what extent self-administration could or should be increased, as an evaluation of the benefits and potential harms of self-administration is required. Further work is also necessary to evaluate the role of electronic prescribing and medicine administration systems in supporting the self-administration of medicines in patients where it is safe and appropriate.

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### PP047—DO JUNIOR DOCTORS HAVE ENOUGH READY KNOWLEDGE OF THE DRUGS THEY PRESCRIBE?

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**Introduction:** Ready knowledge is knowledge that doctors should be able to recall in a clinical setting. Doctors need to have adequate ready knowledge of drugs they prescribe in daily clinical practice to be able to prescribe them appropriately, safely, and effectively. The aims of this study were: (1) to identify which aspects of a particular drug junior doctors should have as ready knowledge; and (2) to evaluate the level of their ready knowledge.

**Patients (or Materials) and Methods:** For 3 frequently prescribed drugs (amoxicillin, hydrochlorothiazide, diclofenac), a list of knowledge statements was compiled based on the Dutch Drug Compendium1. The statements were divided into 6 categories: drug class; mechanism of action; contraindications; side effects; interactions; and method of administration (including dosage). To determine which knowledge of the 3 drugs is essential to good prescribing, a Delphi consensus study involving clinical experts was performed (1). The extent to which junior doctors meet these requirements was examined with a voluntary online assessment (2).

**Results:** (1) An average of 26 statements per drug were considered to be ready knowledge essential to good prescribing. The number of statements per category is described in the table. Knowledge about contraindications and method of administration comprise most of the essential ready knowledge. Other aspects include common side effects, basic mechanism of action, and standard adult dosage.

(2) Junior doctors' overall level of the ready knowledge identified in (1) was 69.5% (mean % of maximum score). Junior doctors' level of the ready knowledge per category is described in Table 1.

**Table.** Number of statements and junior doctors' level of total identified ready knowledge, per category (Junior doctors' level: mean % of maximum score).

Category	Contra Indications	Method of Administration	Side Effects	Drug Class	Mechanism of Action	Interactions
No. of statements	7	7	5	3	3	1
Junior doctors' level	64.3%	62.5%	83.5%	86.7%	55.5%	75.7%

**Conclusion:** For a particular drug, contraindications and method of administration comprise most of the essential ready knowledge. Other aspects include only common side effects, basic mechanism of action, and standard adult dosage. Little knowledge about interactions was identified as being essential. Junior doctors seem to have inadequate ready knowledge essential to good prescribing. Ready knowledge about mechanism of action and the major categories contraindications and method of administration is lacking most. This might be an indication to improve pharmacotherapeutic education on these aspects.

1. Farmacotherapeutisch Kompas 2012, College van Zorgverzekeringen.

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#### PP048—A SYSTEMATIC REVIEW ON LEARNING IN A STUDENT RUN CLINIC

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**Introduction:** Medical students should be better prepared for their future role as therapeutic prescribers, to reduce medical errors and health costs. Context-based learning is widely known for its positive effects on learners; however, the extent to which context learning is applied in different pharmacotherapy-curricula varies. The optimal and most realistic form of context learning in pharmacotherapy education would be learning (to prescribe) in a learner-centered student run clinic (LC-SRC). In contrast to regular student-run clinics (SRCs), which are clinics organized and run by student-teams who mainly care for the underserved and homeless populations in the United States, LC-SRCs do not exist. In advance of our plans to start a LC-SRC, we aim to analyze student outcomes of (regular) SRCs on skills, knowledge, and attitudes.

**Patients (or Materials) and Methods:** A systematic literature review according to the PRISMA guidelines in the PubMed and ERIC databases was performed. Additionally, we used the SNOWBALL method, checking all references in included articles.

**Results:** Pubmed and ERIC database search yielded 205 unique hits; upon further analysis, 59 articles were on SRCs and 24 (41%) of this articles reported outcomes on students' skills, knowledge, or attitudes. Only 5 articles (21%) had a (quasi-)experimental design, 1 "non-experimental" article was a literature review. Overall strength of findings was rated mean 2.56 on a 5-point scale. Snowball search of 865 references yielded 52 new hits, de-doubled 27 unique new articles on SRCs. The effect of participation of medical students' skills, knowledge, and attitudes in SRCs is uncertain, mainly based on expert opinions and student surveys. Students report improved skills (ie, in history taking and physical examination), indicated they obtained knowledge they were unlikely to get elsewhere and valued the SRC as educationally relevant.

**Conclusion:** Quality of research on student participation outcomes is poor, research design is often inferior (observational not (quasi-)experimental), methods are poorly described, follow-up time if done is short, and conclusions could often not be based on results. Considering the theoretical benefits and the lack of evidence of student outcomes on participation in SRCs, further research should be performed. The best location for such research would be at a LC-SRC. The goal should be to gather conclusive evidence on learner outcomes. This highly promising concept could contribute to optimal context-based learning, improving pharmacotherapy education. Our

results of the first evaluation of our pilot LC-SRC from March 2013 - June 2013 will be presented at the EACPT congress

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#### PP050—SALIVA-BASED CYP1A2 PHENOTYPING USING CAFFEINE FROM BEVERAGES: A PRACTICAL COURSE FOR STUDENTS

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**Introduction:** Teaching in clinical pharmacology for students in medicine and biomedical disciplines is often focused on theory, while practical courses, which can introduce methods of research and clinical application to students, are underrepresented.

**Patients (or Materials) and Methods:** We adapted a saliva-based, noninvasive CYP1A2 phenotyping protocol to the needs of an afternoon practical course for third-year biomedical sciences students. Those students who freely decided to quantify their own CYP1A2 activity had to abstain from caffeine sources starting from the evening before the course day. In the morning, students collected a saliva sample at home into a tube, which was handed out together with the course documentation some days before the course. Thereafter, they drank a cup of strong coffee, black tea, or caffeinated energy drinks and abstained from caffeine until the collection of the second saliva sample at the course site in the early afternoon, 5 to 6 hours after caffeine intake. The students then prepared their own saliva samples for the quantification of caffeine and paraxanthine using a published HPLC-UV method. The run-time per sample was 18 minutes, so that in the end of the afternoon, the evaluation of a limited calibration curve and the caffeine-to-paraxanthine clearances of 2 participants was possible. Clearance values were estimated using a published formula that translates the paraxanthine and caffeine concentrations to clearance values.

**Results:** Between 11 and 20 students participated per year in groups to 3 of 5 students. As expected, metabolic caffeine clearance was accelerated in smokers (2.18 mL/min/kg body weight; coefficient of variation, 61%) compared with nonsmokers (1.37 mL/min/kg body weight; coefficient of variation, 83%). Students' satisfaction with the practical course was good.

**Conclusion:** The students got an estimate of their own phenotypic CYP1A2 activity and an impression of the interindividual variability in xenobiotic metabolism, in particular of the influence of smoking on CYP1A2 activity. As an advantage, no drug was used for this test. Additionally, students acquired knowledge of drug analysis and methods applied in clinical pharmacology.

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#### PP053—CHALLENGES IN UNDERGRADUATE PHARMACOTHERAPY EDUCATION: THE GHENT UNIVERSITY EXPERIENCE

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**Introduction:** Undergraduate pharmacotherapy teaching has to deal with the following facts. [1] Every practicing physician should be able to use medicines properly, taking into account important non-pharmacologic aspects like drug adherence and treatment cost. [2] Knowledge taught to students is often already outdated at the time they graduate. [3] Often not 1 therapy is correct but >1 therapeutic option is defensible. [4] Guidelines show first-choice treatments