Medication reviews

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Medicines management is an essential part of high-quality patient care in hospitals, homes for the elderly and nursing homes, as well as in primary care. Polypharmacy is an important risk factor for adverse drug events and drug interactions. We know that adverse drug events are associated with a prolonged hospital stay, higher mortality rate and increased costs, also the risk of adverse drug events is likely to grow due to the increasing age of hospitalised patients.

A medication review is a critical evaluation of a patient's medication list with the intention to optimise therapy in a structured way using available clinical and pharmaceutical information as well as laboratory data.

This themed issue highlights the various aspects of such reviews in a variety of patient populations, including the elderly, nursing home patients, oncology patients and other hospitalised patients. Studies from six European countries are included.

The article by Bart van der Bemt[1] is important because it makes a clear distinction between various aspects of medication review and puts this into a broader perspective by means of the Medication Therapy Management Pyramid.

Whereas most articles in this supplement focus on the top layer of this pyramid (medication review), the article on the so-called 'integrated medicines management' (IMM) programme from the team of Michael Scott from Northern Ireland covers all aspects of the pyramid.[2]

IMM is a multifaceted approach including admission, inpatient care and discharge, medication appropriateness, medicines administration and antimicrobial stewardship. These led to a major reduction of medication errors during admission, 5.5 interventions per patient in inpatient care, a reduced length of stay (by 2 days), increased time to readmission (+20 days), faster medication rounds (–25 min) and faster discharge (–90 min) together with major reduction in errors during discharge. These interventions were combined with Safe Therapeutic Economic Pharmaceutical Selection, which achieves transparent, interactive and rational (evidence-based) selection of medicines and a record of pharmacists' interventions and various other elements of IMM. The return on investment was very impressive: £5–8 per invested UK pound. This, combined with increased efficacy and safety, makes the system compelling for other hospitals throughout Europe. It seems worthwhile to investigate which aspects of IMM have contributed most to these excellent results.

The paper by Conxita Mestres and colleagues[3] on Spanish (Catelonian) nursing home patients highlights the important role that pharmacists play in assessing the medication for this patient group in a structured way, provided that they have access to relevant patient data, such as gender, age, laboratory data, medical conditions, comorbidity and medication. The authors noted that the indication for a given medicine was often insufficiently documented in the medical records. The most recorded drug-related problems (DRPs) were unnecessary drug treatment (42%), untreated indication (20%) and adverse drug events (20%). Most of the latter category were 'potential events' because they were detected prior to drug administration and therefore did not occur. Most interventions were recorded regarding the Anatomical Therapeutic Chemical classification system groups A, C and N.

The degree of acceptance by physicians of the pharmacists' remarks was relatively high (80%), which indicates a good cooperation between pharmacists and physicians. Repeated discussions on the relevance of pharmacists' interventions may further increase acceptance by physicians.

Another paper by Conxita Mestres studies the use of inappropriate drugs used by elderly patients admitted to a long-term care institute.[4] Active pharmacists' intervention led to a significant decrease in the use of potentially inappropriate drugs, such as specific antiarrhythmic agents (amiodarone), antidepressants (amitriptyline, clomipramine, fluoxetine), antihistamines (hydroxyzine) and benzodiazepines (clonazepam and diazepam).

The study by Graabaek *et al*[5] describes the methodology of a pharmacist-led medication review in Denmark to make this suitable to acute admissions using five steps: collection of clinical patient data, collection of information about the medical treatment (using the electronic medical record), interview with the patient, examination of patients' medications and recommendation for the hospital physicians. All steps are highly standardised, allowing a critical assessment of all aspects of the treatment. No final results are available as yet, but this methodology may contribute to a better treatment of acute admissions, provided that the procedure is not too time-consuming.

The study by Irvin Cehajic[6] from Norway underlines the importance of good pharmaceutical care in oncology patients. Many DRPs in this patient category were identified. This is an important finding because the prescription of intravenous oncolytics is often delivered on paper in a separate system and medication surveillance is not as well implemented as in other patients (such as internal medicine or surgical patients) in whom all medicines are incorporated into the same registration system.

The study by Tallon *et al*[7] focuses on the appropriateness of the use of medicines in Irish patients >65 years of age using at least three regular medicines on admission to the hospital. It strengthens both the importance of good medicines reconciliation (what drugs are prescribed, what is the patient actually taking and do discrepancies contribute to the admission) and a medicines review on the primary outcome: the Medicines Appropriateness Index (MAI) compared with standard care, both at admission and at discharge. The vast majority of pharmacists' recommendations were accepted by the physicians: 96.7% of interventions were accepted, whereas 69.3% of routine care interventions were accepted by physicians.

The study by Hugo de Wit,[8] which was performed in institutional care settings for older people in the Netherlands, focuses on the requirements of the Dutch Healthcare Inspectorate requiring that a medication review is performed by a pharmacist in cooperation with a physician for all residents of nursing homes (twice per year) and residential homes for the elderly (once per year). The availability of laboratory data was quite different for hospital pharmacists (78%) and community pharmacists (29%). Community pharmacists also had access to a limited set of laboratory data (75% of pharmacists who had access to laboratory data), whereas hospital pharmacists who did have access to laboratory data had complete access to all data in 86% of cases. The estimated time spent on a medication review was 29 min. This means that a

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pharmacist who is responsible for the pharmaceutical care of 500 nursing home patients needs about 250 h per year to perform an annual medication review of all patients. The authors recommend the use of automated medication reviews using Clinical Decision Support Systems (CDSS). These may contribute to continuous monitoring of the medication of patients using data from the electronic patient record, laboratory data and data from the pharmacy information system. Such a system, provided that the clinical rules are optimised in collaboration with the physicians, may be an important tool in improving patient care, without spending enormous amounts of time in a medication review.

The importance of using CDSS is also highlighted by the paper of Pieter Helmons[9] from the Netherlands. The reduction of irrelevant alerts compared with the conventional Dutch database is impressive, leading to major reduction of time spent on medication alerts, without any loss of relevant findings. To the contrary, CDSS also takes into consideration the most recent laboratory values and therefore provides added value concerning medication surveillance.

Carli Wilmer from the Netherlands shows that it is important to identify patients at risk of developing DRP.[10] Comorbidity, polypharmacy and the use of specific drugs, such as antithrombotics and antidiabetics, were frequently associated with DRP. The authors could not clearly identify a set of risk factors besides previous intensive care unit stay, admission to the rehabilitation ward or comorbidity. There is a clear need for additional research to enable healthcare providers to select patients who would most benefit from a medication review. This seems to be another argument for implementation of a computerised CDSS to allow medication reviews in large numbers of patients.

Conducting a medication review may pose specific problems and opportunities when these focus on medicines prescribed by junior doctors. This is studied by Barry Jubraj[11] from the UK. Junior doctors were very reluctant to stop medication, and 80% stated that they would consult a senior physician before doing this. The percentage gradually declines in the first year of practice. Special attention should be paid to these junior physicians when performing a medication review, focusing on education and a bottom-up approach.

It is by no means our intention to provide a complete overview of pharmaceutical care in European hospitals. We are just presenting some examples of ongoing projects in selected hospitals.

Hospital pharmacists play an important role in medication review although several studies highlight the multidisciplinary aspects of a good medication review. It is our hope that these studies stimulate discussion of the pros and cons of various methods of medication review.

It is my hope that the interesting work performed by the hospital pharmacists included in this special issue will inspire colleagues throughout Europe in their efforts to improve pharmaceutical care. Please feel free to contact the authors if you wish to obtain more information or if you would like to collaborate with them.

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REFERENCES

1 van den Bemt BJF(B), Huiskes VJH. The medication therapy management pyramid shifting medication review to an integrated medication therapy management process. *Eur J Hosp Pharm* 2015;22:219–21.
2 Scott MG, Scullin C, Hogg A, *et al*. Integrated medicines management to medicines optimisation in Northern Ireland (2000–2014): a review. *Eur J Hosp Pharm* 2015;22:222–8.
3 Mestres C, Hernandez M, Llagostera B, *et al*. Improvement of pharmacological treatments in nursing homes: medication review by consultant pharmacists. *Eur J Hosp Pharm* 2015;22:207–11.
4 Mestres C, Agustí A, Puerta L, *et al*. Prescription of potentially inappropriate drugs for geriatric patients in long-term care: improvement through pharmacist's intervention. *Eur J Hosp Pharm* 2015;22:198–201.
5 Graabæk T, Bonnerup D K, Kjeldsen LJ, *et al*. Pharmacist-led medication review in an acute admissions unit: a systematic procedure description. *Eur J Hosp Pharm* 2015;22:202–6.
6 Cehajic I, Bergan S, Bjordal K. Pharmacist assessment of drug-related problems on an oncology ward. *Eur J Hosp Pharm* 2015;22:194–7.
7 Tallon M, Barragry J, Allen A, *et al*. Impact of the Collaborative Pharmaceutical Care at Tallaght Hospital (PACT) model on medication appropriateness of older patients. *Eur J Hosp Pharm* Published Online First: 18 June 2015 doi:10.1136/ejhpharm-2014-000511
8 de Wit HAJM, Winkens B, Gonzalvo CM, *et al*. Clinical practice of medication reviews in institutional care settings for older people in the Netherlands: an explorative survey. *Eur J Hosp Pharm* 2015;22:212–18.
9 Helmons PJ, Suijkerbuijk BO, Panday PVN, *et al*. Doing the right things and doing things right: inpatient drug surveillance assisted by clinical decision support. *Eur J Hosp Pharm* 2015;22:236–242.
10 Wilmer CM, Huiskes VJB, Natsch S, *et al*. Drug-related problems in a clinical setting: a literature review and cross-sectional study evaluating factors to identify patients at risk. *Eur J Hosp Pharm* 2015;22:229–35.
11 Jubraj B, Marvin V, Poots AJ, *et al*. A pilot survey of junior doctors' attitudes and awareness around medication review: time to change our educational approach? *Eur J Hosp Pharm* 2015;22:243–8.