ABSTRACTS ORAL AND POSTER PRESENTATIONS AMGEN AWARD

This publication contains the abstracts of poster presentations in the field of hospital pharmacy presented at the 'Hospital Pharmacists' Day' held by the Flemish Association of Hospital Pharmacists from Schelle (Belgium) on February 7, 2023.

For this event, twenty-two abstracts were submitted and accepted for poster presentation. This publication contains eleven abstracts for which the BJHP received approval for publication in the BJHP by the submitting author.

OP | 1 Concentration target attainment after therapeutic drug monitoring of linezolid in critically ill patients

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BACKGROUND & AIM

Linezolid (LZD) is often used to treat severe Gram-positive infections. In recent years, pharmacokinetic variability of LZD has been described in critically ill patients. The aim of this study was to analyse LZD exposure in critically ill patients monitored with TDM.

METHODS

A retrospective observational study of all adult intensive care unit (ICU) patients receiving LZD for at least three days was conducted between August 2021 and February 2022 (Ethics Committee BC-11209). According to the institutional protocol at the ICU of the Ghent University Hospital, TDM of LZD is recommended in patients with augmented renal clearance, renal/hepatic impairment, low baseline platelet count, sepsis/septic shock and/or expected treatment duration > 14 days. Decision to monitor is at the discretion of the treating physician. Target attainment, defined as a trough concentration between 2 – 7 mg/L, was the primary endpoint and TDM-guided dose adjustments were descriptively analysed.

RESULTS

Of the 47 patients treated with LZD during the study period, TDM was performed in 14 patients (29.8%), all meeting the criteria. Noteworthy, 90.9% of the patients without monitoring were eligible for TDM as well. Intra-abdominal infections were the most common infection (42.6%). Median treatment duration of LZD in ICU was 5.7 [3.7 – 8.5] days for all patients. Therapeutic range was reached at first measurement in 9 of 14 (65.0%) patients. After TDM-guided dose adjustments, a total of 11/14 (78.6%) patients were within therapeutic range after a median of 2.6 [2.5 – 4.5] days.

DISCUSSION & CONCLUSION

Two thirds of the TDM patients reached therapeutic concentrations at first measurement and an extra 13.6% patients after dose adjustment. More patient data are needed to refine the criteria for monitoring critically ill patients most at risk for target non-attainment and to draw more robust conclusions.

OP | 2 Evaluation of the use of closed system transfer devices with monoclonal antibodies: focus on the clinical trial setting

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BACKGROUND & AIM

Monoclonal antibodies (MABs) have become a standard of care in various treatment strategies. Literature data and available local guidelines are unambiguous about safe handling MABs and whether or not to use a closed system drug transfer device (CSTD). CSTDs can reduce cross contamination and minimize exposure to potential hazardous drugs for healthcare professionals. However, in recent years more questions have been raised about their in-use compatibility and their impact on final product quality. This makes the debate on implementing CSTDs a hot topic in daily pharmacy practice, especially in a clinical trial setting where safety data are frequently not available and the compatibility of CSTDs and investigational product is often unknown. The aim of this project was to develop a standardized flowchart for the use of a CSTD when handling MABs in a clinical trial setting.

METHODS

An extensive literature review was performed using the databank Pubmed and the NIOSH guidelines leading to the development of an evidence based flowchart. An expert panel of six pharmacists reviewed the flowchart taking (dis)advantages of CSTDs into account.

RESULTS & DISCUSSION

A risk assessment was performed based on two factors: chronic exposure of the healthcare staff to low doses of the study product, and the risk of cross-contamination during preparation. Depending on the risk profile, a theoretical approach is formulated considering all the challenges posed by a CSTD, and finally translated into a hands-on approach.

CONCLUSION

Each MAB and CSTD has unique characteristics and therefore demands an individual assessment. A standardized flowchart was developed to determine whether or not to use CSTDs when handling MABs. The flowchart allows other healthcare professionals and clinical trial sponsors to define and evaluate the necessary criteria in a uniform manner when standardizing the position of a CSTD in their safe handling procedures.

OP | 3 Medicatie gerelateerde incidentmeldingen: de ziekenhuisapotheker als partner in de analyse van iedere melding

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ACHTERGROND & DOELSTELLING

In het UZ Antwerpen is iedere medicatie gerelateerde (bijna-) incidentmelding consulteerbaar door het VMS-team van de apotheek in het veiligheidsmanagementsysteem (VMS). Het doel van het project was om als VMS-team van de apotheek een meer actieve rol op te nemen in de analyse van deze incidentmeldingen:

- Om de VMS-teams van de andere afdelingen beter te ondersteunen
- Om actief bij te dragen aan de medicatieveiligheid door waar nodig snel processen te kunnen bijsturen
- Om de meldcultuur te verbeteren

METHODEN

Implementatie van een verificatie module binnen het VMS vanaf 1 januari 2022 met codering van iedere melding door een ziekenhuisapotheker van het VMS-team. De codering omvat steeds één van volgende acties:

- Advies: een advies wordt geformuleerd
- Verbetertraject APO / APO teamoverleg: melding wordt overgemaakt naar verantwoordelijke domeinapotheker (ter bespreking binnen periodiek teamoverleg en/of ter bijsturing apotheekproces)
- Geen (trendanalyse): de melding wordt meegenomen in rapportage zonder verdere actie

RESULTATEN

In 2022 werden er 332 meldingen gecodeerd. Voor 22 meldingen werd rechtsreeks advies geformuleerd door het VMS-team. 148 meldingen werden overgemaakt naar de verantwoordelijke domeinapotheker. Het aantal medicatie gerelateerde meldingen nam ziekenhuisbreed niet toe, maar in de apotheek wel (van 49 in 2021 naar 146 in 2022).

DISCUSSIE & CONCLUSIES

De apotheek verificatie heeft voorlopig geen invloed op de ziekenhuisbrede meldcultuur. Echter is er wel een duidelijke impact te zien op de meldcultuur binnen de apotheek. Mogelijks komt dit doordat de verificatie veel zichtbaarder is voor de apotheek medewerkers omwille van de bespreking binnen het teamoverleg. In de toekomst kan onderzocht worden of het beter kenbaar maken van de nieuwe werkwijze bij melders van andere afdelingen hetzelfde effect kan hebben op de ziekenhuisbrede meldcultuur.

PP | 1 Prospective observational study of clinical pharmacist activities at the geriatric day clinic

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BACKGROUND & AIM

Drug-related problems (DRPs) are more prevalent in older patients and associated with poor health outcomes. Clinical pharmacist (CP) activities have been proposed to optimise medication use in this vulnerable population. In this study, we aimed to evaluate the CP activities, performed at the Geriatric Day Clinic of Ghent University Hospital.

METHODS

A prospective observational study was performed during 14 non-consecutive days. CPs' recommendations were classified according to the underlying DRP, drug class and acceptance and implementation rate. One week after hospital discharge, patients for whom medication counselling was performed, were phoned to evaluate their satisfaction with the CP services.

RESULTS

A total of 63 patients were included with a mean age of 84.5±5.1 years, 69.8% were female and they took on average 9.5±3.5 medications. The CP identified on average two potential DRPs per patient, which most frequently concerned overuse (23.8%) and inappropriate dosing (18.9%). Drugs for the nervous system (32.8%) and gastrointestinal tract (21.9%) were most frequently involved and the acceptance and implementation rates were 75.7% and 53.0% respectively. A medication counselling session was performed in 28 (44.4%) patients. The main reasons why patients could not be counselled were that they did not manage their medications themselves and/or their caregiver was not present at the Day Clinic. Overall, patients reported high satisfaction with the delivered CP services although uncertainties and/or discrepancies concerning their medication lists still remained.

DISCUSSION & CONCLUSION

A pharmacist-led medication review for geriatric patients at the Geriatric Day Clinic led to a mean of two recommendations per patient which were fairly well accepted, but less frequently implemented immediately. Patients reported high satisfaction with the delivered CP activities. In the future, we aim to improve the communication of recommendations and medication lists with primary care healthcare professionals, especially for those patients who cannot benefit from counselling.

PP | 2 Safe handling of non-carcinogenic drugs in the Ghent University Hospital: development, implementation and communication of hospital-specific guidelines

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**These authors contributed equally to this work*

BACKGROUND & AIM

Guidelines for safe handling of cytotoxic drugs are well known by healthcare workers. On the other hand, the awareness of possible health risks associated with non-carcinogenic drugs is often low.

We aimed to inform healthcare workers about all types of potentially hazardous drugs by means of guidelines for personal protective equipment (PPE) and handling, communication tools and electronic warnings.

METHODS

A hospital-specific list of hazardous drugs was developed by using The National Institute for Occupational Safety and Health (NIOSH) list of hazardous drugs in healthcare settings 2020, aligned with drugs available in the hospital formulary. PPE guidelines for handling those drugs were developed in collaboration with the hospital safety advisors, summarized in a poster and communicated in the hospital. To remind healthcare workers about the drugs that might need extra precautions, an electronic alert was implemented in the electronic prescription system.

RESULTS

Precautions, guidelines and identification of group 1 molecules (drugs with antineoplastic, carcinogenic and/or immunosuppressive properties) are generally well known in our hospital. The awareness of possible toxicities (developmental or reproductive toxicity) linked with the second group was very low without safety guidelines. An extra symbol, a blue exclamation mark, was added in the electronic prescription system to identify this group 2 therapeutics.

To reduce exposure to both group of drugs, guidelines for safe handling (PPE, cleaning, restrictions for pregnant healthcare workers, ...) were developed. According to the kind of exposure, manipulation and type of dosage formulation (tablets, suspensions,...) specific actions were defined.

Healthcare workers were informed of this new tool by a hospital-wide information campaign (online communication, posters, newsletters).

CONCLUSION

Guidelines for safe handling of non-typical hazardous drugs are now provided and a new symbol in the electronic prescription system reminds healthcare workers to take correct protective measures depending on the type of drug and reduce the risk for occupational exposure..

PP | 3 Inappropriate co-infusion of drugs in the intensive care unit of a Belgian general hospital

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BACKGROUND AND AIM

Critically ill patients require the administration of multiple intravenous infusions. The number of intravenous drugs they need often exceeds the vascular access. Creating a risk for drug incompatibility. This study aimed to identify the frequency of inappropriate co-infusions at the intensive care unit (ICU), review nurse knowledge regarding drug compatibility, develop and evaluate preventive measures.

METHODS

A study with pre- and post-design was set up at the ICU of Sint-Lucas Ghent. Drug infusions, vascular access and infusion set-up were recorded. The compatibility of co-infused drugs was assessed based on published compatibility data to map the baseline situation and evaluate preventive measures. Furthermore, a survey was launched for ICU nurses in order to map their knowledge regarding drug compatibility.

RESULTS

287 (35.8%,n=801) co-infused drug pairs were assessed as inappropriate in 80 patients (55.9%,n=143). The majority (19.2%) had no compatibility data, 11.2% were incompatible and 5.4% had conflicting data. Out of these 80 patients 65.0% could have their drug schedule or infusion set-up reorganized into acceptable combinations. The survey indicated nurses lack knowledge and easy accessible/understandable references regarding drug compatibility. Implementing an information card and electronic tool reduced the number of incompatible pairs (11.2% to 4.6%, $p<0.001$) and the number of patients with an incompatible pair (30.8% to 13.7%, $p<0.001$) However, the overall number of inappropriate pairs and the number of patients with an inappropriate pair did not significantly improve.

DISCUSSION AND CONCLUSION

Inappropriate co-infusion was frequent in the ICU. Implementing a cross-table as information card and electronic tool for nurses addressed their knowledge gap and lack of access to references. Implementation showed a reduction in the administration of incompatible pairs. However, no improvement in favour of more appropriate pairs could be established, due to a general lack of compatibility data. Future studies should focus on collecting compatibility data for commonly used drugs in the ICU.

PP | 4 Paracetamol, a flushing 'solution' for amoxicillin clavulanate infusion?

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BACKGROUND & AIM

Antimicrobial drugs are commonly administrated through IV infusions and it is the responsibility of healthcare professionals to ensure that the correct dose is administrated. Nevertheless, underdosing as a results of not flushing infusion lines is a widespread issue. Furthermore, not flushing can lead to administration of degradation products and incompatibilities. After a flushing test period in our hospital, it was noted that patients receiving amoxicillin clavulanate (AC) (1g/200mg, q6h) also received paracetamol infusions (1g, q6h). In order to develop an efficient flushing protocol and prevent fluid overload; the following question was raised: 'Can AC be flushed with paracetamol as flushing solution?

METHODS

Physical compatibility of AC with paracetamol was tested. Drugs were mixed in three different ratios (9/1,1/1,1/9 (AC/paracetamol)) and examined immediately after preparation, 30min and 240min of storage. A visual evaluation with a search for precipitation formation, colour change and gas production was performed. And a subvisual evaluation by turbidimetry and pH measurement was executed. All test were carried out in triplicate.

RESULTS

No visible particle formation, no change in colour and no gas production was observed by either observer in any mixture at any time point.

CONCLUSION

The mixtures AC/paracetamol is physically compatible for at least 30min at room temperature. A change in absorbance after 240min suggests incompatibility of the two drugs. However, the unmixed AC solution also showed a difference in absorbance after 240 min, which can probably be explained by degradation of AC solution given the reported shelf life is around 60 min. We can conclude secure IV flushing of AC infusion with a paracetamol infusion, considering the short contact time between AC and paracetamol during flushing.

PP | 5 Ontwikkeling van een risicoscore voor stockbreuken: Tool voor het aanpassen van voorraadniveaus geneesmiddelen

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ACHTERGROND EN DOELSTELLING

Verschillende factoren spelen een rol bij het bepalen van het meest geschikte voorraadniveau voor geneesmiddelen. We moeten rekening houden met de levertermijn, houdbaarheid, turnover, volume t.o.v. opslagcapaciteit,... Een factor waarmee we de laatste jaren vaker geconfronteerd worden zijn stockbreuken. We willen deze factor meenemen om het voorraadniveau te bepalen. Omwille van het gebrek aan onderbouwde methodes die rekening houden met stockbreuken, werd een risicoscore ontwikkeld. Deze kan gebruikt worden om de voorraadniveaus voor geneesmiddelen met een hoge risicoscore aan te passen om stockbreuken op te vangen.

METHODE

O.b.v. elektronische stockbreukendata (2017-2022) werden per geneesmiddel punten (1,2 of 3) toegekend aan onderstaande items:

- Aantal keer dat het geneesmiddel in stockbreuk ging (gedurende deze periode)
- Gemiddelde duur van de stockbreuk
- Aantal alternatieve geneesmiddelen op de Belgische markt (cfr. SAM database)

De risicoscore voor een bepaald geneesmiddel is de optelsom van de toegekende punten. Om het werk bevattelijk te houden werd beslist om geneesmiddelen met een score van 9,8 of 7 verder te analyseren. Bijkomend werd een Pareto analyse uitgevoerd, waarbij enkel de geneesmiddelen die verantwoordelijk zijn voor 80% vanhet totaal verbruik, verder werden geanalyseerd.

RESULTATEN

Bij de globale analyse werden 29 geneesmiddelen weerhouden met een hoge risicoscore. Voor die geneesmiddelen werd kritisch gekeken naar de mogelijkheid om de voorraad te verhogen. Deze voorraadverhoging werd afgetoetst aan onderstaande factoren:

- Gemiddeld verbruik vs. gemiddelde duur stockbreuk
- Klinische noodzaak
- Volume
- Houdbaarheid
- Turnover
- Kostprijs

DISCUSSIE EN CONCLUSIES

Deze methode is geschikt om snel en eenvoudig geneesmiddelen met een hoge kans op stockbreuk te identificeren. Dit gebeurt op basis van gegevens uit het verleden. De kans dat het artikel opnieuw een stockbreuk zal kennen is afhankelijk van vele factoren. De score is daarom slechts een indicatie, maar wel een breed toepasbare tool bij voorraadbeheer in de ziekenhuizen.

PP | 6 Clinical pharmacists at the ambulatory hypertension clinic: a cross-sectional study

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BACKGROUND & AIM

Hypertension is the single most preventable risk factor for cardiovascular disease. Yet, blood pressure targets are often not achieved. Common culprits are inadherence to clinical practice guidelines, therapeutic inertia and patient incompliance. Multidisciplinary hypertension clinics can improve blood pressure control. However, implementation has remained limited in Europe. Furthermore, clinical pharmacists have only rarely been involved. The aim of this study was to describe our first experiences as pharmacists at the hypertension clinic. To this end, we aimed to characterize patient compliance, adherence to the latest European guidelines on the management of hypertension and pharmacist recommendations.

METHODS

A prospective observational study was conducted between October 2020 and March 2021 at the multidisciplinary hypertension clinic of the University Hospitals Leuven. Data on pharmacist recommendations and guideline adherence were collected during patient interviews and extracted from electronic health records. The Basel Assessment of Adherence with the Immunosuppressive Regimen Scale Interview was applied to ascertain adherence to antihypertensive drugs.

RESULTS

In total, 108 patients were included with a median age of 65 years (IQR: 52-75). Non-adherence to antihypertensive treatment was found in 44.2% (46/104). Guideline adherence increased significantly from 67.3% prior to 78.8% after the multidisciplinary consultation (p=0.0015). In this pilot, clinical pharmacists provided 44 recommendations in 38 patients. Recommendations mainly concerned cardiovascular (n=14) and gastro-intestinal drugs (n=10), with an acceptance rate of 59.1%.

CONCLUSION

In total, 108 patients were included with a median age of 65 years (IQR: 52-75). Non-adherence to antihypertensive treatment was found in 44.2% (46/104). Guideline adherence increased significantly from 67.3% prior to 78.8% after the multidisciplinary consultation (p=0.0015). In this pilot, clinical pharmacists provided 44 recommendations in 38 patients. Recommendations mainly concerned cardiovascular (n=14) and gastro-intestinal drugs (n=10), with an acceptance rate of 59.1%

PP | 7 Antimicrobial stewardship as part of the host network project: how to find the (common) way to go?

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BACKGROUND & AIM

The Hospital Outbreak Support Team (HOST) is a federal project for hospital networks. Its main objective is to focus on inter- and transmural cooperation regarding antimicrobial stewardship (AMS) and infection prevention & control (IPC). The Hospital Network of Ghent consist of four hospitals. Members of each local AMS team are represented in the "HOST AMS working group".
The aim is to explore and define the priorities in the next three years with focus on AMS within the HOST AMS working group.

METHODS

Based on a literature review 23 AMS related quality indicators were identified by a panel of three clinical pharmacists. Each local AMS team scored the indicators on relevance using Likert scale 1-9. Furthermore each hospitals listed the top-5 indicators based on priority.
The list consisted of process indicators in three main categories: diagnostics, antimicrobial therapy (indication/choice of antimicrobial agent, dosing, timing, administration route, duration, stop/de-escalation, TDM, feedback/follow-up) and some specific indicators (e.g. surgical prophylaxis, Staphylococcus aureus bacteremia).

RESULTS

Each hospital prioritized different AMS quality indicators. The highest scores and priorities were given to indicators in the categories: stop/de-escalation, indication/choice of antimicrobial agent, stop/de-escalation and diagnostics.

DISCUSSION & CONCLUSIONS

Since each hospital has a different focus, the feasibility of initiating network-wide projects could be low. However, HOST can act as a central partner to share information between network hospitals. In the future, we will select and work on specific topics based on these priority scores. The best practices of a specific topic can be identified for each hospital, followed by sharing expertise and experience in the HOST AMS working group. Joint projects can be initiated in the future but are no longer the main purpose.

PP | 8 Implementation of mandatory indication-registration for antimicrobial therapy in the electronic prescribing system at Ghent university hospital

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BACKGROUND & AIM

As part of their antimicrobial stewardship (AMS) program the Ghent University Hospital implemented a mandatory indication-registration in their electronic prescribing system (EPS). Physicians are obliged to indicate a treatment base (empirical, documented, medical prophylaxis, surgical prophylaxis) when prescribing antimicrobial therapy (AMT) for systemic use and when used therapeutically, an indication needs to be selected from a predefined list.

As literature states, discrepancies can occur between the chosen indication and the documented indication in the EPS. A retrospective observational analysis was performed.

METHODOLOGY

Newly started antimicrobial prescriptions for non-critically hospitalized adult patients were evaluated for a period of fourteen consecutive days.
The primary endpoint was indication accuracy for empirical and documented therapies, defined as agreement of the indication entered during order entry with that documented in the EPS at the time of order entry. The secondary endpoint included the identification of therapies entered as prophylaxis that were in reality empirical or documented therapies according the EPS.

RESULTS

A total of 540 prescriptions from 358 patients were reviewed. 33% (123/368) of the prescriptions, entered as empirical or documented therapies, were not in accordance with the documented indication. For 9% of (35/123) the prescriptions a minor deviation was identified (f.e. suspicion of urinary tract infections versus cystitis). For 23% (87/123) a major deviation (f.e. intra-abdominal abscess versus tooth abscess) was identified. 19% (32/167) of the prescription selected as prophylaxis were not accurate.

DISCUSSION & CONCLUSION

A third of all entered prescriptions are not in accordance with the entry in the EPS which is high in comparison with previous studies were discrepancy rates of 3.3% to 26% were identified. Possible explanations could be: ignorance of the existence of a listed indication, workload, accidental errors or habits.

Mandatory documentation of the indication can be an important tool within an AMS program provided that the registered indications are reliable. To optimize this all, medical wards will be receiving feedback on this analysis and data will be presented during ward visits. A yearly analysis will be performed because the accuracy rate might fluctuate over time.

ABSTRACTS VZA AWARD

This publication contains the abstracts of the master's thesis submitted to obtain the degree of master in hospital pharmacy and submitted for the VZA award. The best master's thesis will be awarded the 'VZA award' at the 'Hospital Pharmacists' Day' held by the Flemish Association of Hospital Pharmacists from Schelle (Belgium) on February 7th, 2023.

This publication contains six out of 14 abstracts for which the BJHP received approval for publication in the BJHP by the submitting author.

A | 1 Small volumes, high stakes

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ACHTERGROND & DOELSTELLING

Het voor toediening gereed maken van medicatie is een inherent risicovol proces, vooral wanneer dit wordt toegepast voor neonaten en prematuren in een afdeling neonatale intensieve zorgen (NICU). Het inzetten van apotheekassistenten voor dit proces zou kunnen leiden tot een reductie in medicatiefouten en een toename in de dubbelcheck tijdens de medicatievoorbereiding. In dit onderzoek worden de risico's verbonden aan de huidige manier van werken op de NICU van het UZA geïdentificeerd en wordt de nauwkeurigheid van de apotheekassistent t.o.v. de verpleegkundige nagegaan in het voor toediening gereed maken van medicatie..

METHODEN

Aan de hand van een prospectieve risico-inventarisatie wordt de huidige procesflow geïdentificeerd en worden de bestaande risico's benoemd en gescoord op basis van frequentie en gevolg. Daarnaast wordt een gehaltebepaling uitgevoerd op intermediaire producten en restanten van toegediende medicatie op de afdeling klaargemaakt door verpleegkundigen en op duplicaten hiervan gemaakt door apotheekassistenten. Gebruik makende van een gepaarde t-test werd de afwijking t.o.v. de doelconcentratie vergeleken tussen beide groepen. Aan de hand van een enquête wordt nagegaan hoe de verpleegkundigen staan t.o.v. het inschakelen van een apotheekassistent voor de medicatievoorbereiding..

RESULTATEN

21 faalwijze-gevolg combinaties werden geïdentificeerd, waarvan drie onvoldoende afgedekte risico's. De afwijking van 45 verpleegkundige stalen werd vergeleken met deze van de groep van apotheekassistenten. Bij deze vergelijking werd geen statistisch significant verschil gevonden in de afwijking t.o.v. de doelconcentratie tussen beide groepen, ook niet wanneer gekeken werd naar producten die manipulatie van kleine volumes vereisen. Verder stond bijna 3/4e van de verpleegkundigen ervoor open om deze taak door apotheekassistenten te laten uitvoeren.

CONCLUSIE

Er is geen significant verschil in nauwkeurigheid bij het voor toediening gereed maken van medicatie voor de totale groep stalen, noch voor de subgroep van stalen die manipulatie met een klein volume vereisen. Hoewel dit toelaat om deze taak te laten uitvoeren door een apotheekassistent i.p.v. een verpleegkundige, is het noodzakelijk om bijkomende controlemaatregelen te implementeren in het bereidingsproces. Het organiseren van bijkomende opleidingen kan gebruikt worden om de hoge afwijkingen bij bepaalde producten aan te kaarten. Dit om een hoge nauwkeurigheid en een goede kwaliteit van de bereiding te kunnen garanderen en bijgevolg de medicatietherapie van de patiënt te optimaliseren.

A | 2 Improving appropriateness of DOAC use in the hospital: a pharmacist-led before-after study

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BACKGROUND & AIM

Direct oral anticoagulants (DOACs) are classified as high risk medications given their pharmacological propensity for bleeds. Check of appropriateness of DOAC prescriptions depends on a whole series of patient-specific factors. Documentation of these data in the electronic health record (EHR) may seem self-evident, but in practice it is not always optimally executed. The primary objective of this study was to reduce the number of missing data in the medical records of hospitalized patients treated with a DOAC. The secondary objective was to bring the prescribing of DOACs more in line with the guidelines.

METHODS

This pharmacist-led monocentric before-and-after study was conducted at Imelda hospital, a regional hospital located in Bonheiden, Belgium. Data were collected on hospitalized patients who received DOAC-therapy for atrial fibrillation or venous thromboembolism. During the intervention period, hospital-wide education was given to physicians, nurses and hospital pharmacists. In addition, supportive materials were implemented at the system level, including a poster and flash card with dosing instructions, an updated procedure on high risk medications and the integration of memo's and dosing guidelines in the EHR. Lastly, prospective feedback was offered by the hospital pharmacist in case of a missing parameter in the medical record or if the DOAC-therapy was identified as inappropriate. Comparisons were made between the usual care and intervention group to determine the impact of the pharmacist-led service on medical record completeness and appropriate DOAC prescribing.

RESULTS

A total of 613 patients were included in this study. Prior to the implementation of the pharmacist-managed service, necessary parameters were missing in 38,3% of the patients. After implementation of the multifaceted initiatives, this number decreased to 18,7%. Prospective feedback to the prescriber and/or nurses led to the completion of the missing parameters in all but six patients (1,9%). During the usual care group, 25,7% received an inappropriately prescribed DOAC. After implementation of the initiatives, the number of inappropriate DOAC-therapies decreased significantly to 18,7%. Moreover, prospective feedback by the pharmacist was able to further reduce the number of unmotivated-inappropriate therapies to 2,3% of all prescriptions. Overall, 41 out of 48 pharmacist interventions led to a therapy reconsideration by the physician (85,4%).

CONCLUSION

This study showed the potential value of a pharmacist-led initiative to reduce missingness of clinical data in medical records and to bring the prescribing of DOACs more in line with the guidelines.

A | 3 Optimalisatie van de toediening van intraveneuze antibiotica door middel van reductie van het residueel volume rekening houdend met kostenefficiëntie

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ACHTERGROND
Het is al jarenlang bekend dat bij toediening van intraveneuze antibiotica een toch wel significant gedeelte van de te infunderen oplossing, het residueel volume (het volume dat achterblijft in de infuusleiding en/of infuuszak), de patiënt niet bereikt en verloren gaat. Dit resulteert mogelijks in een verminderd therapeutisch effect en een hoger risico op resistentievorming.

DOELSTELLING
In deze masterproef werd onderzocht hoe de toediening van een intraveneus antibioticum kwalitatief verbeterd kan worden door middel van reductie van het residueel volume. Hierbij werd rekening gehouden met de gebruiksvriendelijkheid, kostenefficiëntie en veiligheid.

METHODEN
Door middel van een literatuurstudie en een online enquête, verstuurd naar alle Vlaamse en Nederlands-Limburgse ziekenhuizen, werden de actuele (flush)methoden in kaart gebracht. In een laboratoriumonderzoek werden de mogelijke (flush)methoden ter reductie van het residueel volume gemeten. Bovendien werd een eigen ontwikkelde experimentele methode mee in het onderzoek opgenomen. De courante (flush)methoden en eigen ontwikkelde experimentele methode werden met elkaar vergeleken op basis van kostenefficiëntie, gebruiksvriendelijkheid en veiligheid.

RESULTATEN
Er is een groot verschil tussen de Vlaamse en Nederlands-Limburgse ziekenhuizen betreffende de aanpak en de methode van het flushen van infuusleidingen na het toedienen van een intraveneus antibioticum. Uit het laboratoriumonderzoek bleek dat indien er geflusht wordt met minimaal éénmaal het residueel volume, 95% van de glucoseoplossing doorgespoeld werd. Uit de vergelijking werd het duidelijk dat flushen door middel van een voorgevulde spuit de meest kostenefficiënte, gebruiksvriendelijke en veilige methode is. De eigen ontwikkelde experimentele methode is volgens het laboratoriumonderzoek uitvoerbaar.

DISCUSSIE EN CONCLUSIES
Aan te bevelen is het herbekijken van de gebruikte infuussystemen en (flush)methoden in de Vlaamse ziekenhuizen. Naast het opleiden van het ziekenhuispersoneel, opstellen van eenduidige onderbouwde protocollen is een geoptimaliseerd en duidelijk beleid over het reduceren van het residueel volume noodzakelijk in een ziekenhuis. Tevens is het aanbevolen om infusen met een gemakkelijk wateroplosbaar geneesmiddel te flushen. Verder laboratorium- en klinisch onderzoek voor de eigen experimentele methode zijn nodig alvorens deze methode breed klinisch toegepast kan worden.

A | 4 Optimalisatie van de medicatiebegeleiding voor ambulante patiënten in de ziekenhuisapotheek

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ACHTERGROND EN DOEL
Aangezien er tot nu toe weinig medicatiebegeleiding werd voorzien voor ambulante patiënten in de ziekenhuisapotheek van het AZ Sint-Jan Brugge-Oostende AV werd nagegaan hoe dit kan geoptimaliseerd worden op een efficiënte en doeltreffende manier.

METHODEN
Een enquête werd afgenomen bij ziekenhuismedewerkers en patiënten om de huidige informatieverstrekking in kaart te brengen. Een prospectief observationeel onderzoek werd uitgevoerd a.d.h.v. een voor/na studie met als interventie de gestructureerde uitgiftebegeleiding. De impact op de kennis van de patiënten, de werkdruk en wachttijd aan de balie en de medicatie gebonden problemen werden gemeten..

RESULTATEN
Een significante verbetering in kennis van de patiënten werd aangetoond over de combinatie met voedsel, te vermijden voedingsmiddelen en bewaaromstandigheden. De gemiddelde score op de kennistest steeg van 3,93/7 naar 6,34/7. Bij 65,7% van de patiënten bleek de thuismedicatielijst niet accuraat. Voor 20 patiënten werden 42 relevante geneesmiddelinteracties gedetecteerd, waarvan er 13 aanleiding gaven tot een advies. De wachttijd voor personeelsleden daalde significant, voor patiënten bleef dit gelijk.

DISCUSSIE EN CONCLUSIES
Dankzij de implementatie van de eerste uitgiftebegeleiding aan de balie van de ziekenhuisapotheek werd een significant verschil in kennis van de patiënten aangetoond. Het nieuwe apotheeksysteem (ApotPlus®) en de opsplitsing van de balies zorgt voor een efficiënte werkwijze. De wachttijd blijft aanvaardbaar voor patiënten en is ingekort voor personeel. In de toekomst kan het project verder uitgebreid worden naar andere geneesmiddelklassen en kan er meer gefocust worden op herhaalde uitgiftebegeleiding. Daarnaast kunnen de langetermijneffecten van een eerste uitgiftebegeleiding door een apotheker of apotheekassistent worden onderzocht.

A | 5 Evaluation of a Pharmaceutical Transitional Care Program for Orthopaedic Patients: A Before-After Prospective Study

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BACKGROUND & AIM
When transitioning from secondary to primary care, patients are at high risk for adverse drug events (ADEs) and drug-related hospital readmission. Orthopaedic patients are particularly at risk due to the high-risk medications (i.e. antibiotics, analgesics and antithrombotic agents) they receive. Objective: A multifaceted pharmaceutical transitional care program was implemented to measure its effect on continuity of care of orthopaedic patients. The continuity of care was measured by medication adherence, medication knowledge, appropriate use of analgesics and satisfaction of patients, general practitioners (GPs) and community pharmacists (CPs).

METHODS
A before-after prospective study was carried out from February 2022 to April 2022 in a Belgian general hospital. Patients discharged from an orthopaedic ward with at least one high-risk medication were included. The pharmaceutical transitional care program consisted of discharge counselling and post-discharge follow-up calls in combination with improved communication and information transfer between the primary and secondary care.

RESULTS
A total of 49 patients were included in the final analysis: with 24 in the regular care group and 25 in the intervention group. The differences in medication knowledge, adherence, appropriate use of analgesics and patients' satisfaction between the two groups were not found to be statistically significant.

DISCUSSION & CONCLUSIONS
Due to the small sample size, no conclusions could be drawn about the impact of the care program on medication knowledge, adherence, appropriate use of analgesics or patient satisfaction. Further research with larger sample sizes is necessary to determine the effect on clinical and patient-reported outcomes.

A | 6 Developing a validated knowledge test on rational prescribing of antibiotics and a measurement of this knowledge in junior physicians at Ghent university hospital

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OBJECTIVES
Knowledge deficits are recognized as a significant barrier on rational prescribing of ABs, which is a key driver of AMR. Junior physicians are found to be poorly confident and to have insufficient knowledge, but there is no guidance in what exactly to assess. The aim of this study is to develop and seek validity evidence for a first questionnaire to assess objective knowledge, based on generic ESCMID-competencies required to prescribe ABs rationally, and gain insight into this objective and self-reported knowledge for JPs at Ghent University Hospital using a three-part survey

METHODS
In a first phase of this cross-sectional, single-center study a three-part survey was developed based on literature to assess demographics, self-reported and objectivate knowledge on all 22 ESCMID-competencies. Validity evidence for the set of objective knowledge MCQs was sought in a second phase using Messick's validity framework. Content validity was gathered by a Delphi-panel composed of eight experts while response process validity was covered by written instructions and electronic programming. A pass-fail score using the contrasting groups method was assessed to establish consequential validity. Internal structure validity was gathered by calculating difficulty and discrimination indices for all MCQs and relations to other variables was evaluated. In a third phase, the survey was distributed between February and May 2022 to all JPs in Ghent University Hospital (Belgium) to assess self-reported and objective knowledge

RESULTS
A set of 44 (sub)MCQs to asses objective knowledge was developed, yielding an excellent S-CVI (0.91) in two Delphi-rounds. An average p-value of 0.59 and a Di of 0.33 were retrieved for this set of MCQs, indicating respectively medium difficulty and good discriminatory power. Twenty-two novices and ten experts completed the questionnaire, resulting in a pass-fail value of 11.5 points (54.8%) and respectively 17.5% and 14.4% theoretical false positives and false negatives. Mean (SD) knowledge scores of experts and novices were respectively 13.9 points (2.3) and 9.4 points (2.2) which differed significantly ($p<.001$). Twenty-seven (7.3%) JPs completed the self-reported knowledge questions and 18 JPs (4.9%) completed the full survey. Mean (SD) self-reported knowledge scores were respectively 68.2% (18.2%) and 76.3% (22.0%) which did not differ ($p=.472$). A median knowledge score (IQR) of 67.9% (13.1%) was obtained and differed from the pass-fail score ($p=.004$). Hereon based fourteen JPs passed the knowledge questionnaire, yet on a corresponding competency level five (sets of) MCQs yielded a score <50%. This objective knowledge score showed a positive association with self-reported knowledge ($p=.001$). Compared to novices, JPs scored significantly higher ($p<.001$), but no differences with experts were found ($p=.796$)

CONCLUSION
We developed and validated the first survey to assess self-reported and objective knowledge of JPs based on generic ESCMID-competencies on rational prescribing of ABs. Although JPs at Ghent University Hospital tended to overrate themselves and showed some knowledge gaps, overall high scores were retrieved. Future research should investigate generalizability of these results and the correlation between knowledge scores and actual prescribing behaviour ($p=.796$)