

Purpose To quantify the benefits that pharmacists reaped in the day-to-day work in terms of productivity (number of preparations/day), after the annual upgrade.

Materials and Methods The performance of the APOTECaChemo equipment was analysed before and after the 2012 upgrade. The time required for cyclophosphamide, trastuzumab and gemcitabine reconstitution was also investigated.

Results An average of 45 doses per day was prepared before the upgrade, with a maximum of 60 preparations. After the installation, an average of 75 preparations per day was recorded, with a maximum of 100. The reconstitution of stable powder drugs (cyclophosphamide, trastuzumab and gemcitabine) during 'spare time' (weekends, early mornings, lunch times) allowed an average gain of 55 (11.5%), 72 (15%) and 24 (5%) minutes per day, respectively.

Conclusions The new upgrade allowed us to increase daily productivity by 66.6%. The continuing multidisciplinary dialogue among the stakeholders (physicians, pharmacists, technicians and engineers) enables us to make better use of APOTECaChemo in the daily clinical activity and encourages the technology to develop.

No conflict of interest.

TCH-032 PHARMACY PREPARATION: RETROSPECTIVE ANALYSIS OF MORPHINE BAGS USED FOR THE PREPARATION OF ELASTOMERIC INFUSION PUMPS

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Background The Italian Law no. 38 of 15 March 2010, has considerably simplified the prescribing and dispensing of medicinal products for the treatment of pain. The law regulates all matters concerning the medical treatment that the Italian state provides to citizens through the National Health Service.

National networks are also in place for palliative care and the treatment of pain, which provide guidelines for implementing the Hospital Territory Without Pain project.

Purpose To examine whether pharmacy compounding can improve the service offered, optimise the time and resources used for preparation, and whether this will require the allocation of new resources.

Materials and Methods Since the beginning of 2011 the San Giovanni Bosco hospital pharmacy has used morphine bags at levels of 2% morphine per 100 ml to prepare elastomeric infusion pumps for analgesic treatment in addition to vials used. The aim was to monitor how the consumption of morphine was changing by comparing the quantities consumed in 2010 and 2011. This was done using data from the controlled drugs register.

Results In 2011, the quantity of morphine consumed increased by 4.5%. The amount of morphine waste from broken elastomeric infusion pumps, expired vials and bags, bags left unused due to death of the patient or change of treatment and bags with unused content increased in total by 94%. 35% of morphine destroyed was deemed outside of its validity period while 62% of elastomeric infusion pumps were returned to the pharmacy as faulty. Despite the increase in expired morphine and the increase in morphine purchased there has been a reduction in spending of approximately 28%.

Conclusions This analysis allowed us to verify that the use of morphine bags has led to a slight reduction in expenditure. It is also important to emphasise the easier fitting of the infusers by operators which leads to time savings.

No conflict of interest.

TCH-033 PHYSICO-CHEMICAL STABILITY OF READY-TO-ADMINISTER EPINEPHRINE INJECTION SOLUTIONS 20 µg/ml, 50 ml

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Background In the University Medical Center Mainz standard concentrations are defined for medicinal products to be administered by continuous injection with syringe pumps in adult intensive care patients. Patient-individual doses are provided by adjusting the injection rate. Various medicines are aseptically prepared in the pharmacy department as ready-to-use products. Batch preparation of the products and keeping them in stock is only possible if stability of the products is tested using a validated method.

Purpose The purpose of this study was to test the stability of ready-to-administer epinephrine solutions for injection 20 µg/ml in 50 ml plastic syringes.

Materials and Methods Epinephrine bulk solution 20 µg/ml was prepared aseptically by diluting Suprarenin 25 mg/25 ml Sanofi-Aventis with 5% glucose infusion solution in empty infusion bags (PP/PE). The solution was filled with the NeoCare Compounder into 50 ml BD Perfusion Syringes, Luer Lock Tip, protected from light. The syringes were stored at 2–8°C in the refrigerator. Epinephrine concentration was determined by using a validated HPLC method with UV detection at 280 nm and an innovative HPLC column Nucleodur which contains sulfonyl groups.

Results The concentration of epinephrine in the 50 ml syringes remained unchanged over a period of 2 months. After 28 days and 2 months of refrigerated storage the concentration amounted to 100.5% and 100.8% of the nominal concentration, respectively. Neither adrenochrome (detection wavelength 480 nm) nor any other degradation products were detected during the study period. With regard to these results batch production is feasible. Stability over 2 months is assured.

Conclusions Epinephrine solution for injection 20 µg/ml, aseptically prepared by diluting the marketed injection concentrate with 5% glucose infusion solution in 50 ml light-protected plastic syringes, is stable under refrigerated storage conditions for at least 2 months.

No conflict of interest.

TCH-034 RECYCLING DRUGS FOR VIRAL DISEASES IN THE OUTPATIENT AREA

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Background When drugs are multidose packaged, all units must be dispensed to the same patient. Sometimes, patients don't finish their treatment and return units left to the Pharmacy Department. Units returned must be discarded, so it is a loss to the Pharmacy Department.

Purpose To evaluate how much the Pharmacy Department loses when multidose packaged drugs for viral diseases are returned to the outpatient area.

Materials and Methods A single-centre retrospective observational study was carried out in the outpatient area of the Pharmacy Service of the Hospital Clínico Universitario de Valladolid over 10 months, between June 2011 and March 2012. The following information was collected in structured tables: name of medicine, number of units returned, price to book value per unit and total value.

Results 7,764 units of drugs for viral diseases were returned during the study period. Of these units, 90% were recovered by the Pharmacy Department to be dispensed to other patients. However, 10% cannot be reused due to multidose packaging.

The return of drugs that can be reused is a gain in economic resources of 84.6% over the total value of returned drugs (€36.371).

Furthermore, the average cost per unit of reused drugs is €4.4 vs. 7.3€ for non-reused. The combos are usually multidose packaged, when it is in these drugs where unitary repackaging would be more efficient.

Conclusions 10% of the units of drugs for viral diseases returned to the outpatient area must be discarded due to multidose packaging.

Unitary repackaging allows the Pharmacy Department to recover 84.6% of the cost of returned drugs in this area.

Combos, as well as being more expensive than other drugs, are mostly multidose packaged, preventing reuse.

No conflict of interest.

TCH-035 REPACKAGING OF DRUGS IN UNIT DOSES USING AN AUTOMATIC BLISTER PRECUTTING SYSTEM

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Background Storage conditions in the original blister guarantee certain conditions (light protection, humidity). Our hospital pharmacy has a Stokar (manual repackaging machine) and, since 2011, a Blispack (automatic repackaging). Repackaging is carried out by a pharmacy technician for 7 hours/day, from Monday to Friday.

Purpose To describe the activity of the BlisPack.

Materials and Methods Descriptive observational study. Study period: 12 months (May/2011-April/2012). Variables studied: repackaged pharmaceutical specialties, number of unit doses repackaged, number of blister packs processed, number of blister packs rejected, monthly percentage of units repackaged with BlisPack. Data source: BlisPack ADM v1.1 computer application.

Results Number of different drugs repackaged: 118. Number of unit doses repackaged with BlisPack: 333352. Number of processed/rejected blisters: 18111/2873 (15.86%). Average monthly BlisPack unit doses repackaged: 27779. Average percentage of BlisPack repackaged: 40.10%. Monthly evolution of numbers of unit doses repackaged in BlisPack and percentage of unit doses repackaged in BlisPack versus total number of unit doses repackaged: May 2011 (22787 and 30.84%), June 2011 (11350 and 24.88%), July 2011 (30675 and 38.65%), August 2011 (24178 and 37.27%), September 2011 (19502 and 29.84%), October 2011 (27942 and 47.03%), November 2011 (31894 and 40.53%) December 2011 (25722 and 41%), January 2012 (25628 and 39.26%), February 2012 (24500 and 46.08%), March 2012 (41547 and 54.34%), April 2012 (47627 and 51.58%). The 5 drugs with greatest number of unit doses repackaged in BlisPack were: Acofol, Potasion 600 mg, Limovan 7.5 mg, Lioresal 10 mg and Levothroid 50 mcg.

Conclusions This new technology allows us to repack drugs, maintaining the conditions of the original packaging, with a pre-cut automatic blister that simplifies the process of repackaging. There has been a growth in the use of this system compared to traditional repackaging, implying that to manage the new repackaging BlisPack requires a learning curve and the acquisition of handling skills.

No conflict of interest.

TCH-036 RESULTS OF A SYSTEMATIC LONG-TERM STABILITY STUDY FOR READY-TO-USE INJECTABLE DRUGS PRODUCED BY A CENTRALIZED INTRAVENOUS ADMIXTURE SERVICE

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Background Injectable preparations other than parenteral nutrition admixture and injectable cytotoxic drugs could be prepared by Centralised IntraVenous Admixture Service (CIVAS) if the long-term stability of the drugs is known. However, this information is not always available.

Purpose To develop a programme of chemical drug stability analysis in collaboration between the hospital pharmacy, the medical laboratory and a Biostatistics Centre to determine the long-term stability of widely-used injectable anti-infectious and non-anti-infectious drugs.

Materials and Methods After setting up the High Performance Liquid Chromatography (HPLC) method, 25 drugs (10 anti-infectives, 4 anaesthetics, 2 propulsives, 2 detoxifying agents for antineoplastic treatment and 7 drugs with other properties) were reconstituted in a laminar air flow hood. 15 of them were stored directly at $5 \pm 3^{\circ}\text{C}$ and 16 stored in the freezer at -20°C , thawed by microwave following a standardised procedure and stored at $5 \pm 3^{\circ}\text{C}$ before use. The stability of the product was evaluated by regression analysis.

Results For each drug, long-term stability varied from 11 days to 70 days. The freeze-thaw treatment by microwave may extend the stability (from 30 to 120 days) and allow batch-scale production of intravenous drugs, less expensive in term of manpower and sterile devices than drug reconstitution on the ward. The results were published by 47 posters in international congresses and by 34 publications in national and international pharmaceutical journals.

Conclusions Our findings contribute to improving the number and variety of drugs that may be taken on by a CIVAS. This collaboration led to the foundation in 2009 of a drug stability research group at the University Hospital of Mont-Godinne that has already been awarded 4 prizes and nominations.

No conflict of interest.

TCH-037 RISK ASSESSMENT OF CYTOTOXIC DRUG COMPOUNDING: MANUAL VS. ROBOTIC

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Background Errors in cytotoxic drug compounding can cause serious harm to patients due to the low therapeutic ratio. Robots are intended to decrease the risk of medication errors through 100% verification and traceability of the entire production process.

Purpose This work is aimed at assessing the risk of medication errors in manual and automated compounding, taking into consideration the procedures and controls applied in both cases.

Materials and Methods The FMECA technique was applied to the procedures for the manual compounding defined in the Recommendations of the Italian Ministry of Health and to the compounding procedures of the APOTECaChemo robot. The analysis involved two Oncology Pharmacies working with automation in the daily routine since 2007 and 2011 respectively. 5 macro-failure modes for the compounding process were identified and the corresponding Priority Risk Indexes (PRIs) were calculated.