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

doi:10.1136/ejhpharm-2013-000276.226

S González-Piñeiro, MT Rabuñal-Alvarez, M Calvin-Lamas, B Feal-Cortizas, I Pedreira-Vázquez, I Martín-Herranz. *Complejo Hospitalario Universitario A Coruña, Pharmacy, A Coruña, Spain*

Background Storage conditions in the original blister guarantee certain conditions (light protection, humidity). Our hospital pharmacy has a Strokar (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: Acfol, Potasion 600 mg, Limovan 7.5 mg, Lioresal 10 mg and Levothroid 50 mcg.

Conclusions This new technology allows us to repackage drugs, maintaining the conditions of the original packaging, with a precut 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 managethe 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

doi:10.1136/ejhpharm-2013-000276.227

[1]JD Hecq, [2]M Godet, [3]J Jamart, [2]L Galanti. *[1]CHU UCL de Mont-Godinne, Pharmacy, Yvoir, Belgium; [2]CHU UCL de Mont-Godinne, Medical laboratory, Yvoir, Belgium; [3]CHU UCL de Mont-Godinne, Scientific suppor unit, Yvoir, Belgium*

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 ± 3°C and 16 stored in the freezer at –20°C, thawed by microwave following a standardised procedure and stored at 5 ± 3°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 take 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

doi:10.1136/ejhpharm-2013-000276.228

[1]C Bufarini, [1]A Marinozzi, [1]S Guglielmi, [2]M Milani, [2]E Omodeo Sale', [3]D Paolucci, [3]V Rosini. *[1]AO Ospedali Riuniti – University Ancona, Pharmacy, Ancona, Italy; [2]European Institute of Oncology, Pharmacy, Milan, Italy; [3]Loccioni Group, HumanCare, Moie di Maiolati (AN), Italy*

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.

Results The failure modes that show higher benefits in risk mitigation are the wrong drug and wrong dosage with a PRI decrease of 80% (from 50 to 10). Indeed the redundant controls (vision system, scale, photocells) on the loaded vials guarantee the compounding of the right drug. In addition, the drug is dosed with a calibrated syringe pump and independently verified with the scale. The other failure modes reported a risk reduction of 50% and on the whole the total PRI passes from 186 in case of the manual activity to 63 for the robotic one.

Conclusions The FMECA analysis shows an overall reduction of the PRIs of over 66% with the robotic compounding with respect to the manual production. Automation not only decreases the occurrence of dangerous events thanks to the complete control of every single step of the compounding process, but also develops an error detection system through independent verification processes.

No conflict of interest.

TCH-038 SHORTAGE OF STERILE CALCIUM GLUCONATE STOCK SOLUTION FOR PARENTERAL NUTRITION: WHAT IS THE ALTERNATIVE AND HOW MUCH DOES IT COST?

doi:10.1136/ejhpharm-2013-000276.229

[1]V Siorat, [1]S Serrano, [1]P Jorret, [1]P Vaconsin, [2]F Brion, [1]T Storme, [1]M Perrinet. *[1]AP-HP (Hôpital Robert Debré), Pharmacy, Paris, France; [2]Univ Paris Descartes, Clinical Pharmacy, Paris, France*

Background The Total Parenteral Nutrition (TPN) production facility of our children's hospital produces around 20,000 units per year with 2 Baxa EM2400 compounders. In June 2012, a shortage of the calcium source (10% sterile solution of calcium gluconate in 500 mL bottles) occurred. To overcome this problem, we first tried to import an alternative source but the administrative delay was too long. The only sources available within a month were 10 mL plastic or glass ampoules. The estimated consumption was around 300 ampoules per production day. To maintain efficiency and safety in the TPN facility, it was decided to produce calcium gluconate bags from 10 mL ampoules by sterilising filtration to maintain the safety of preparation.

Purpose To evaluate the additional cost incurred by setting up this production and the increased time required.

Materials and Methods The pharmacy prepared calcium gluconate bags (250 mL) from plastic ampoules after filtration (0.22 µm philtres (Sterivex Millipore), using a Repeater Pump (Baxter), in a laminar air flow cabinet. The cost of setting up a new procedure and of the compounding was evaluated in different categories (materials, checking, staff).

Results 228 bags were produced during the 20 days on which we could not obtain the 500 mL bottles (19 batches of 12 bags).

The cost of one 250 mL compounded bag was €44.23 (materials: 25.5, checking: €5.73, staff: €13). In addition, developing the system cost €4,237.72. The overall additional cost was therefore €155.22/L.

Conclusions Despite a major additional cost, compounding calcium gluconate bags has ensured the continued production of TPN. From a risk assessment point of view, identification of several suppliers and increasing our stocks of the raw materials would make out-of-stock situations easier to manage in future.

No conflict of interest.

TCH-039 SIX SIGMA IN HEALTHCARE: AN APPLICATION IN THE MONITORING OF ALBUMIN

doi:10.1136/ejhpharm-2013-000276.230

[1]F Cimo, [1]P Marrone, [2]R Citati. *[1]ARNAS Civico Hospital, Pharmacy Operative Unity, Palermo, Italy; [2]University of Palermo, Engineering department, Palermo, Italy*

Background The high off-label use of albumin persuaded the pharmacy to introduce a request form that uses the internationals guidelines to assess whether the use of albumin is appropriate. This has resulted in a clear reduction in the costs.

Purpose To monitor the wards using six sigma methodology (a statistical concept that measures a process in terms of defects); to ensure that all procedures have been followed correctly.

Materials and Methods 696 forms for albumin prescriptions coming from 26 wards (August to December 2011) were analysed using Minitab software, which cheques the frequency of the best correct requests (type 1), partially correct requests (type 2) and incorrect requests (type 3). For each ward the β coefficient was used to connect the relationship between the ward and their requests. The wards were grouped into 4 ranges on confidence intervals for the odds ratio (OR) of a width equal to 0.3 called A,B,C,D and then a final logistic regression analysis was made.

Results The analysis showed that group A was the most efficient in terms of probability of obtaining better results, followed by groups D (OR 0.36), C (OR 0.19) and B (OR 0.09). The total number of requests received was: 43% type 1 (299/696); 26% type 2 (181/696); 31% type 3 (216/696). Group B showed the worst result with 51% type 3 requests (58% of the total requests for type 3). Using six sigma we have achieved a cost saving of about €15,000.

Conclusions The results encourage us to apply this methodology to other fields.

No conflict of interest.

TCH-040 STABILITY OF FROZEN CEFTAZIDIME SOLUTION IN POLYPROPYLENE SYRINGES FOR INTRAVITREAL INJECTION

doi:10.1136/ejhpharm-2013-000276.231

J Vigneron, A Daul, N Sobalak, H Zenier, I May, B Demoré. *Centre Hospitalier Universitaire de Brabois, Pharmacy, Vandoeuvre, France*

Background Ceftazidime is used for the treatment of endophthalmitis by intravitreal injection. For this emergency treatment, the syringes must be available immediately in the pharmacy. The stability at 2–8°C is limited and does not allow batch production.

Purpose To study the stability of ready-to-use ceftazidime solution at 20 mg/mL in 0.9% sodium chloride in polypropylene syringes after storage at –20°C, to allow preparation in advance.

Materials and Methods We used the High Performance Liquid Chromatography method published by Abdel Hamid ME *et al*, Farmaco 1998; 53: 132–138.

The analytical conditions were: Column C18 5µ 200 × 4.6 mm. Mobile phase (ammonium acetate buffer 0.1 M pH 7.5/acetonitrile 90/10), flow rate: 1 mL/mn, wavelength: 256 nm.

The HPLC method was validated according to ICH guidelines (linearity, repeatability, stability-indicating capability).

Syringes were stored at –20°C and 4°C to compare with the literature data.

Results Stability was defined according to ICH guideline Q1A: above 95% of the initial concentration of ceftazidime and concentration of degradation products less than 2%. After storage at 4°C, the ceftazidime concentration fell under 90% after 3 weeks and there was 65% of the initial concentration after 90 days.

The ceftazidime solution at 20 mg/mL was stable for 3 months at –20°C with more than 96% of the initial concentration and degradation products under 0.8%.

Conclusions Ceftazidime 20 mg/mL in 0.9% sodium chloride was stable for 3 months at –20°C. This allows batch preparation in advance and the immediate availability of the syringes to treat patients.

No conflict of interest.