P098 Subcutaneous daratumumab versus intravenous daratumumab for the treatment of patients with multiple myeloma: A time, motion and cost assessment study in a general hospital

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Abstract - Introduction
Daratumumab has been available since June 2019 as solution for intravenous infusion at a dose adjusted to weight. In December 2020, a new ready-to-use presentation is available which is administered subcutaneously (SC) at a fixed dose of 1800 mg.
We aim of our work was to compare, time, resource, the patient's perception and costs of intravenous route (IV) versus subcutaneous route (SC) use of daratumumab.

Abstract - Material and method
Patients with multiple myeloma receiving daratumumab were consecutively enrolled from January to December 2021. Data on resource use, tolerance, time, unused remnants and patient chair time were collected prospectively using patient, nurse, pharmacist, doctor and technicians survey. Costs were calculated by multiplying the resource use by its corresponding unit price (pharmaceuticals, materials, etc.), and indirect costs (unused remnants).

Abstract - Results and discussion
Between January 2021 and December 2021, three hundred twenty preparations of daratumumab were produced for twenty-nine patients. Age of patients were 68 years [36-87] and weight 73 kg [49-100]. Fifteen patients were men.
Fifteen patients switched IV to SC. 13 patients found the SC form convenient in terms of time saving and comfort. Two patients preferred the IV form. Nurses and doctors prefer the SC route, due to the shorter infusion time (4-6 minutes SC versus 240 to 360 minutes for IV), shorter patient chair time (turnover coefficient to 2.74 SC / IV), fixed dose and a low risk iatrogenic. But redness at the injection site was reported.
The overall cost of SC treatment was €1427113 compared with €1401098 for IV. The manufacture of SC was translated in a time saving of 4 min (SC: 2.5 ± 0.8 minutes versus IV: 6.3 ± 1.4 minutes), a gain in storage, a costs saving €1648 in consumable supplies. The total amount of drug saved was 7927 mg (unused remnants), which represented €29460.

Abstract - Conclusion
SC administration of daratumumab was associated with a substantial reduction in active healthcare professional time, patient chair time and unused remnants of cancer drugs.
Compared to rituximab and trastuzumab, the subcutaneous form of daratumumab is a real alternative to the IV route (same indication and same administration schedule).

P099 Evaluation of Mogamulizumab's dose-banding in an anticancer drug preparation unit

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Abstract - Introduction
In our university hospital specialized in dermatology, mogamulizumab is commonly prescribed for cutaneous T lymphoma. It's an expensive preparation (cost/patient weighing 68kg: €3,805 AGEPS central purchasing office, March 22). An internal study currently being published indicates 7 days of stability, allowing us to prepare in advance and to reattribute. In agreement with physicians, doses-banding (DB) at ± 10% until ± 12% for monoclonal antibodies (MA) have been proposed for prescription for several years. Our objective is to propose DB as an alternative to the usual posology 1 mg/kg dose.

Abstract - Material and method
Prescriptions were extracted from the oncology-prescribing software (Chimio®) since 2018. The last prescribed doses (PD) for each patient were selected. Knowing there is 20mg in a vial, three possible DB were established. After dose rounding, the difference between the PD and the DB has been calculated (σ). The percentages of prescriptions in DB and by rounding range: ± 5% [94.5; 105.4] ± 10% [89.5; 110.4] > ± 10% (≤ 89.4 and ≥ 110.5), have been presented.

Abstract - Results and discussion
1,015 cycles were administered for 71 patients, average 14 cycles/patient [1-40]. 42 different doses were manufactured [PD: 41 to 128 mg]. A 1st scenario defined 5 DB from 40mg to 120mg every 20mg:the differences are -18 to +20% (σ=7.8%). The 2nd scenario defined 10 DB from 40 mg to 130 mg every 10mg:the differences are -11% and +7% (σ=3.5%). To optimize the reallocation while having a maximum deviation of 12%, we limited the number of DB with a 3rd scenario combining the two previous ones.

DOSES MANUFACTURED (PD) (mg)	DB PROPOSED (mg)	NUMBER PRESCRIBED	σ
Between 35 and 45	40	4	**7.93%**
Between 46 and 55	50	10	**3.4%**
Between 56 and 65	60	17	**3.8%**
Between 66 and 75	70	19	**3.4%**
Between 76 and 89	80	13	**3.98%**
Between 90 and 109	100	6	**5.8%**
Between 110 and 129	120	2	**4.4%**

The variations are +/-11% with an average of 4.1%: 65% of the preparations (n=46) have a variation of ≤± 5%, 32% (n= 23) of ≤± 10% and for 2.8% (n=2) of ± 11%.
These DB would save 25% of the vials used.

Abstract - Conclusion
The defined DB allow preparation for the majority of prescriptions in a range of ± 5% from the PD without exceeding the 12% agreed with the physicians for the MA. These DB have been accepted by the onco-dermatologists. They will lead to substantial savings (about -25%), facilitate the management of leftovers (5 doses/7 are multiples of 20 mg) and the reattribution of non-administered bags.

P100 Transarterial chemoembolization for hepatocellular carcinoma: proposition of new drug-eluting method using a Mixture Design

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Abstract - Introduction
Hepatocellular carcinoma represents the fifth common cancer worldwide and ranks third among cancer-related cancers death and its annual incidence is still increasing.The technique of chemoembolization is evolving consistent both in terms of administration technique and on the therapeutic side. Indeed, different indications of emergent treatment with different agents and different administration methods. The aim of this work is to propose a new method of drug elution for the preparation of a microemulsion loaded with doxorubicin used in the treatment of patients with hepatocellular carcinoma.

Abstract - Material and method
The method consists of preparing a microemulsion by mixing the chemotherapeutic solution (doxorubicin) (50 mg/vial) mixed with hydrosoluble iodine low osmolarity contrast product which is Iopromide (300 mg iodine/ml Ultravist) and lipiodol using a mixing design which makes it possible to give the emulsification range where the microemulsion is stable then the mixture is injected directly into the vacuum ampoule of the microemulsion The microemulsion stability is checked and validated by 3 methods: centrifugation, stability as a function of time and sensory analysis using a scoring scale.

Abstract - Results and discussion
The results obtained showed the optimum mixing point represented by the following proportions: 50 ml of chemotherapeutic solution (doxorubicin) (50 mg/vial) mixed with 2.5 ml of water-soluble iodine low osmolarity contrast product which is Iopromide (300 mg/ml Ultravist). emusification is carried out by adding lipiodol to the "doxorubicin/iopromide" mixture due to 2v/1v.
The centrifugation test showed that there is no phase shift after centrifugation. The stability as a function of time showed us a stability of the microemulsion at rest for more than 1 hour. The microemulsion is obtained in the form of a very homogeneous lipid solution without droplets or apparent air bubbles.

Abstract - Conclusion
The presented method is simple, selective and reliable, providing accuracy in the proportions of the preparation. The results obtained in all cases are good and the reliable agreement with the reported procedure proved that the proposed method can be considered as a useful alternative for the treatment of hepatocellular carcinoma and radiological follow-up provided by the contrast medium.

P101 Knowledge of the safe handling of medicine used in chemotherapy by pharmaceutical specialists in Latvia

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Abstract - Introduction
Nowadays oncology takes an important place in the group of chronic diseases. In response to increased demand for chemotherapy, safety measures should be in place to protect healthcare workers and the environment. Currently there are no requirements for handling cytostatic drugs and waste in Latvia, but according to international guidelines it must be strictly regulated. The Oncology Pharmacists Section of the Pharmacists' Society of Latvia conducted this survey with the aim to raise pharmacy specialist awareness about the safe handling of cytostatic and other drugs used in chemotherapy.

Abstract - Material and method
Descriptive, transversal study carried out through an anonymous Google Form survey from May to July 2021.
Pharmacists, pharmacy assistants and pharmacy students were invited to participate via social networks and e-mails.
The survey contains of 46 multiple choice questions divided in three parts: general information of the respondents' education, workplace and safety measures regarding cytostatics; the second and third part - specific questions for hospital pharmacy and for community pharmacy staff.
Each part was analyzed to describe participants' knowledge about cytotoxics.

Abstract - Results and discussion
Overall 162 answers were collected. Nevertheless 80% of the participants have higher education, almost a third could not name any example of antineoplastics. Only half was in contact with cytotoxics at work, 20% had to deal with those drug utilization. Opinions divided: 24% answered that personal protective equipment is needed only in hospitals and 44% - if open primary package. Half of the specialists are aware of that patient's excreta is dangerous for about a week after chemo, 21% - only during chemo, although 25% believes that it is not dangerous. Majority of hospital pharmacists answered that they have specific safety instructions (67%), although in Latvia there is no legislation on cytostatic drug handling. 47% of community pharmacists would feel safer if cytostatics were supplied separately. Half thinks that any drug interactions is in physician's competence and that they are not educated enough to consult other staff about it; so 80% would like an additional training.

Abstract - Conclusion
In general, participants are aware that cytostatics affect both cancer and other cells in the body, and it is hazardous to the environment. However, the answers suggest that respondents may lack information on the safe handling of cytostatic drugs and the processes required. Pharmacy specialist training in this area would be beneficial.

P102 Implementation of dose-banding in our hospital: ready-to-infuse bags or standardized dose batches?

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Abstract - Introduction
In 2021, our chemotherapy production has increased by 13.9%. To face it and fluidify the circuit, we are considering dose banding (DB) as a solution. Two methods exist: the manufacture of standardized dose batches (SDB) and the use of ready-to-infuse bags (RIB). Our objective is to evaluate the relevance of the implementation of these DB methods for gemcitabine in our hospital.

Abstract - Material and method
We analyzed the regulatory context of DB (Good Manufacturing Practices). Gemcitabine prescriptions for 2021 were extracted via CHIMIO® to select dose range of standardization and to use the GERPAC dose banding tools (ADoC, ADoST, Detal, OSS).
Then a comparison between RIB and SDB was made:
- estimated cost of preparation
- time to prepare a gemcitabine bag (data from DRUGCAM®) versus the time needed to insert a tubing on a RIB
- necessary adaptations on CHIMIO®

Abstract - Results and discussion
RIB require no regulatory adjustment whereas SDB that are Hospital Pharmaceutical Preparations require an analytical control machine and a substantial change in the pharmacy's activities.
In 2021, 1348 bags of gemcitabine were prepared in our unit. The dose ranges chosen are ±100mg around the dose of existing gemcitabine RIB, the deviation is of 7.69% at most. Using this method, 93% of prescriptions could have been standardized.
The DB tools confirmed our choice of range and showed that a size of batches from 6 to 31 bags depending on the dose.
About the price, RIB would have cost around 41093€ in 2021 against 18866€ to prepare SDB.
For the preparation time, it takes an average of 255 seconds to prepare a gemcitabine bag against 45 seconds for a RIB, 78 hours by year saved.
SDB require the purchase of a specific module on CHIMIO® whereas for RIB the version 6.0 is sufficient.
SDB would entail more financial and organizational investements than RIB while we couldn't make large batches.

Abstract - Conclusion
We have decided to use gemcitabine RIB in view of its ease of implementation. RIB do not provide direct consumables savings but the time saved will benefit our activity. They also reduce the risk of infection, preparation errors, medicine waste, patient waiting time and make the circuit safer. SDB could be considered if the activity continues to increase to extend the DB to other molecules.

P103 Hazardous Drug and Antibiotic Residue Surface Contamination-Is there a need to reduce exposure?

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Abstract - Introduction
Exposure of hazardous drugs is a well-established risk. Regulatory agencies have provided guidance involving enhanced cleaning procedures and the use of closed system transfer devices to help minimize the risk to exposure. However, despite the potential for side effects involving use of antibiotics, guidance has not been provided for facilities to refer to reduce or minimize these risks. The purpose of this study was to identify the level of antibiotic and hazardous drug (HD) surface contamination in multiple wards to increase awareness for the need for enhanced controls involved in Ab use

Abstract - Material and method
HD contamination with the six hazardous drugs was measured by surface wipe sampling at three departments. Four separate trials were performed over the period of eight months (Apr-Dec 2021). In total, twelve locations, covering three departments were sampled. Closed system transfer devices were used in the preparation for HDs during the entirety of the evaluation.
Eight Abs were sampled on six different wards involving two locations at each ward at the same timepoints of the HD sampling trials. Enhanced cleaning was implemented following the first trial. CSTDs were not used in Ab handling.

Abstract - Results and discussion
Low level HD surface contamination was detected in 17 out of 288 samples taken during the trial. There were no high-level contamination samples detected during the evaluation. Enhanced cleaning was incorporated following Trial 1.
Ab surface contamination was detected in 263 of 384 (68%) of samples taken. Of these, 59 samples were deemed to be high level contamination. In general, contamination was detected in accordance with the reported usage of the Ab. Despite enhanced cleaning procedures, contamination was detected and increased in trials 3 and 4, when compared to the initial trials. All wards there was a higher median level of contamination on the floor, in comparison to the preparation table.
The highest levels of Ab contamination were seen with vancomycin and piperacillin, these results were similar between the different wards sampled. When low or no Ab contamination was detected, this could generally be explained by less or absence of use of these Abs.

Abstract - Conclusion
This work shows that guidance, involving the use of CSTDs and effective cleaning, has provided effective measures to help minimize or prevent the unintentional exposure of healthcare workers to HD surface residue. But current institutional cleaning may not be sufficient and controls such as CSTDs or guidance require updating to reduce workers and patients to potentially harmful Ab surface residue

P104 Surface contamination with antineoplastic drugs over 8 years in one hospital pharmacy unit working with isolator technology

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Abstract - Introduction
A large part of antineoplastic drug (AD) is still prescribed for parenteral infusion. Because of personalized dosage, the preparation of injectable AD is made by hospital pharmacies. AD are known with carcinogenic, mutagenic and reprotoxic properties and handling conditions during preparation step must be safe to protect staff from occupational exposure. This requires regular chemical contamination monitoring in the injectable cytotoxic drug work area by surface sampling. The present study reports and assesses the surface contamination by AD detected over 8 years of sampling.

Abstract - Material and method
- 8 wipes samples were taken each year at one time, at the end of daily activity and before cleaning,
- 2 samples inside the isolators: handling surface and isolator's gloves, 3 samples outside the isolators: bench picking, door handle and sealing bench, 2 samples on product: etoposide bag and overwraps bag and 1 sample outside the working area: pass-through.
- Analyzed by high performance liquid chromatography technique combined with tandem mass spectrometry able to detect 17 cytotoxic agents,
- Surface contaminations were summarized in a report for each year, and introduced to the staff.

Abstract - Results and discussion
The main source of surface contamination was found inside the isolator where majority of AD were detected despite the efforts applied to limit cross-contamination.
All sampling located inside the isolator were contaminated each year by cyclophosphamide and regularly by irinotecan, ifosfamide, etoposide, cytarabine and gemcitabine. Surface concentration was 1.8ng/cm2 for cyclophosphamide, it was higher than on any other site (0.2ng/cm² on bench picking and 0.07ng/cm² on sealing bench).
The other sampling sites were contaminated in a variable way, cyclophosphamide was most frequently measured. AD were never detected on overwraps bag except in 2022. Note that all sampling located outside the working area were negative according to the detection thresholds.
These results were in part encouraging with the absence of surface contamination on the overwraps bag. However, the frequency of cleaning procedures as well as detergents efficacy remain questionable especially for cyclophosphamide.

Abstract - Conclusion
Surface contamination by AD was frequently found inside the isolators but rarely outside. Residual surface contamination observed did not allow to quantify occupational exposure of pharmacy staff. A continue effort for improve the daily cleaning procedures as well as ensuring a high-level of staff protective equipment should limit the occupational exposure including outside the isolator.

P105 Process improvement strategy for preparation of immunotherapy from freeze-dried BCG in the Central pharmacy of the University Medical Centre Maribor

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Abstract - Introduction
Following a shortage of the commercially available BCG-medac (instillation set)®, which was previously used by the urology nurses, BCG culture SSI® (freeze-dried preparation) was introduced, and due to a potential risk for live bacteria transmission and the risk of serious or even fatal infections if not handled appropriately, safety questions and concerns were raised, by both nurses and pharmacists. After reconstitution, the dose should be administered in 4 hours. Since application of BCG immunotherapy in our clinic is only one day per week, optimization of BCG preparation was crucial.

Abstract - Material and method
Two different approaches for preparation of freeze-dried BCG immunotherapy were tested. First approach was performed in aseptic unit of pharmacy in a cyto laminar air flow cabinet. We were filling seperate syringes with sterile saline for reconstitution and dilution just prior of reconstitution of freeze-dried BCG. Second approach was performed in a cyto laminar-air-flow cabinet in separate room, using prefilled syringes with 50 ml sterile saline, prepared with BAXA peristaltic pump in the aseptic unit of pharmacy. Preparation time and safety concerns were compared between this two approaches.

Abstract - Results and discussion
During shortage of the prefinished product BCG-Medac (instillation set)®, we tried two different approaches of shortening the preparation time. By filling syringes for reconstitution and syringe for dilution we manage to prepare BCG immunotherapy for aproximately 5 patients in a single day. A big issue was also cross contamination concerns, since BCG immunotherapy was prepared in aseptic unit of pharmacy. By using second approach with prefilled syringe with 50 ml of sterile saline, we manage to prepare BCG immunotherapy for all schedulled patients for BCG immunotherapy (aproximately 15 patients). The average time needed for a single preparation of a 50 ml BCG dose went down from approximately 20 to 5 minutes. The next step in the optimization process would be to train pharmacy technicians to replace both pharmacists preparing the product right now with a pharmacist overseeing the manufacturing process further lowering the cost of BCG immunotherapy preparation for the hospital.

Abstract - Conclusion
The trickiness of BCG immunotherapy preparation due to a long preparation time and a relatively short time for application means that preparing the BCG immunotherapy in hospitals remains a hot topic in drug preparation. Optimization and shortening the time of the preparation process means more patients can be treated weekly as well as less exposure time for pharmacy staff.

P106 Management of Oncolytic viruses in hospital pharmacy: an experience from a French Cancer Centre

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Abstract - Introduction
Oncolytic viruses (OV) immunotherapy is a new approach to treating cancers. A variety of native and genetically modified viruses (GMO) have been developed as oncolytic agents.The GMO ones are considered as in vivo Gene Therapy Medicinal Products (GTPM). OV promote anti-tumour responses through a dual mechanism of action that is dependent on selective tumour cell killing and the induction of systemic anti-tumour immunity. Many clinical trials are conducted worldwide, Imlygic® is the first OV with EMA authorization. The project aims to describe the pharmacy experience with this new therapies.

Abstract - Material and method
We conducted a retrospective study from 2019 to 2022, in a university hospital including OV clinical trials. The data were collected from our traceability software PharmEssai® (JK concept™) and trials documentations.

Results and Discussion

From december 2019 to April 2022, 8 OV clinical trials (phase I: 1, phase I/II: 4, phase II: 3) had been set up on our site.45 patients enrolled: all had unresectable advanced or metastatic tumors, relapsing after conventional therapies. All these clinical trials are still ongoing.

Abstract - Results and discussion
Trained pharmacy technicians in dedicated biological safety cabinet class II prepare the syringes. According to the biohazard classification of the OV, special safety measures to prevent cross-contamination and technician exposure are needed.The intra-tumoral administration, superficial or deep, is echo guided, considering the tumors' localization. The pharmacy prepares as many syringes as there are tumors to inject. Many tumors can be injected at the same time. The dose and the volume of OV depend on the tumor size. An interventional radiologist and an operating room are mandatory.
Intravenous (IV) and intrahepatic injections could also be used. These new therapies require an optimized organization considering the short product stability (< 5 hours). Moreover, the patient has to be isolated. Most of the time, the product is injected on an outpatient basis.

Abstract - Conclusion
A multidisciplinary intra-tumoral meeting (including OV) is organized to screen eligible patients and a multidisciplinary approach with good coordination between the pharmacy and the clinical department is required to manage OV trials.