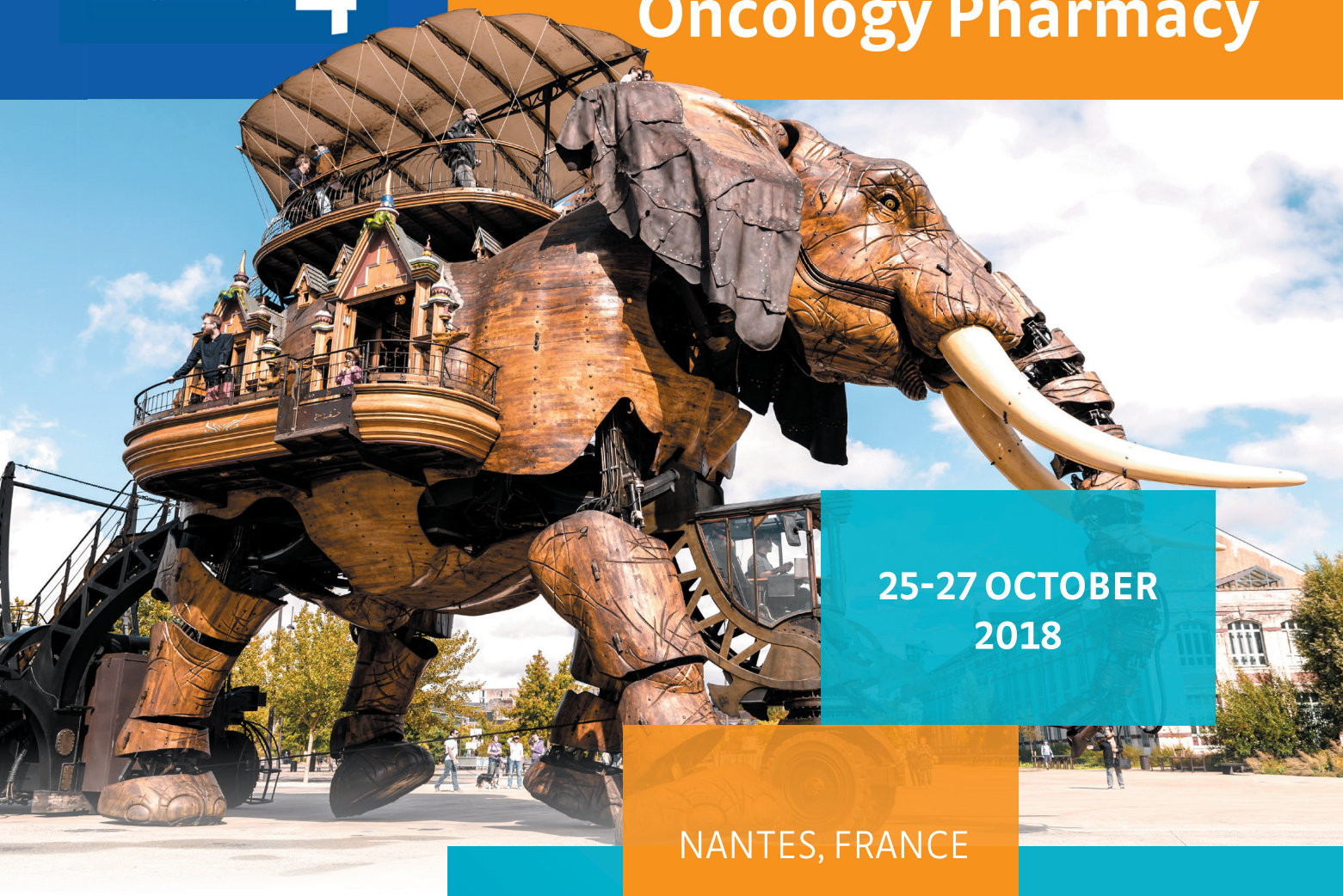
ECOP 4

European Conference of Oncology Pharmacy

4th European Conference of Oncology Pharmacy



25-27 OCTOBER 2018

NANTES, FRANCE

ESOP

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PROCEEDINGS BOOK

European Journal of
ONCOLOGY PHARMACY
ESOP

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LETTER OF WELCOME

On behalf of the European Society of Oncology Pharmacy (ESOP) and the Organising Committee, we warmly welcome you to the 4th European Conference of Oncology Pharmacy (ECOP4) in Nantes, France, 25-27 October 2018.

The objective of this unique Conference is to promote the highest standards of pharmaceutical care in the management and support of patients with tumours. The programme aims to equip oncology pharmacy practitioners with knowledge about recent developments, advance the effectiveness of healthcare delivery and increase the quality of patient care.

State-of-the-art advances in research, patient management and practice will be showcased in keynote lectures, scientific symposia and poster sessions in two well-defined tracks: clinical and practical.

ECOP4 will address the challenges and opportunities in oncology pharmacy and bring together colleagues and partners to exchange, debate and network. As the healthcare landscape continues to evolve, close cooperation between oncology physicians and oncology pharmacists is essential for optimal patient care.

The last three ECOP meetings have reiterated the importance and value of such exchanges. We will strive not only to meet the success of the former three conferences but also to exceed it especially in the quality of the scientific education.

ECOP meetings provide a distinct setting for such a multi-professional and multidisciplinary approach in oncology thus ensuring efficient and effective use of economic resources but also significant improvements to patient safety.

Last but not least, we are pleased this Conference is held in Nantes – a culturally lively and innovative city, also home to the iconic mechanical Great Elephant, a testament to Nantes as a driver of invention and scientific progress and, therefore, a perfect host for ECOP4.

We are delighted to be welcoming you to the incredibly diverse city of Nantes for a stimulating and enjoyable ECOP4 to learn, share and network.

Kind regards,
Mirjam Crul (Scientific Chair)
Mikael Daouphars (Conference Chair)
Klaus Meier (President of ESOP)

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CONFERENCE COMMITTEES

Organising Committee

Mirjam Crul (The Netherlands), Scientific Chair
Mikael Daouphars (France), Conference Chair
Ahmet Bosnak (Turkey)
Alain Astier (France)
Klaus Meier (Germany)
Camille Groos (Luxembourg)

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Camille Groos (Luxembourg)	Sherif Kamal (Egypt)
Irena Netikova (Czech Republic)	Vesna Pavlica (Croatia)

ACCREDITATION INFORMATION

The **4th edition of the European Conference of Oncology Pharmacy (ECOP4), Nantes, France, 25/10/2018-27/10/2018** has been accredited by the European Accreditation Council for Continuing Medical Education (EACCME®) with **13** European CME credits (ECMEC®s). Each medical specialist should claim only those hours of credit that he/she actually spent in the educational activity.

Through an agreement between the Union Européenne des Médecins Spécialistes and the American Medical Association, physicians may convert EACCME® credits to an equivalent number of *AMA PRA Category 1 Credits™*. Information on the process to convert EACCME® credit to AMA credit can be found at www.ama-assn.org/education/earn-credit-participation-international-activities.

Live educational activities, occurring outside of Canada, recognised by the UEMS-EACCME® for ECMEC®s are deemed to be Accredited Group Learning Activities (Section 1) as defined by theMaintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada.

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GENERAL INFORMATION

The 4th European Conference of Oncology Pharmacy (ECOP4) is organised by the European CanCer Organisation (ECCO) on behalf of the European Society of Oncology Pharmacy (ESOP).

Conference Secretariat

c/o ECCO - the European CanCer Organisation
Avenue E Mounier 83
BE-1200 Brussels, Belgium
E-mail: ecop4@ecco-org.eu

Conference Venue

La Cité - Nantes Events Center
5 rue de Valmy
BP 24102
44041 Nantes cedex, France
+33 (0)2 51 88 20 00
https://lacite-nantes.fr

Badges

For security reasons, delegates are requested to wear their badge at all times during the Conference. Delegates having lost their badge can obtain a new badge at the registration desk. A replacement fee of 75 EUR per participant will be charged.

Catering

Lunch:

Lunches, courtesy of the organisers, will be offered to delegates at the following times:

Thursday 25 October 2018 from 13:00 to 14:00
Friday 26 October 2018 from 13:00 to 14:00

Coffee Breaks:

Coffee breaks, courtesy of the organisers, have been scheduled as follows:

Thursday 25 October 2018 from 16:00 to 16:15
Friday 26 October 2018 from 10:30 to 11:00
Friday 26 October 2018 from 15:30 to 16:30
Saturday 27 October 2018 from 11:30 to 12:30

All delegates are invited to attend the official **ECOP4 Exhibitor's Welcome Reception** to enjoy networking with peers and some light refreshments. This reception will be held on Friday 25 October 2018, from 18:00–19:30.
All catering will be served in the Exhibition area.

Certificate of Attendance

Certificates of Attendance will be accessible upon completion of an online Conference Satisfaction Survey. On the last day of the Conference you will receive an email link to the questionnaire which also provides the link for you to print your Certificate of Attendance.

We kindly ask you to keep your Conference badge as you will need the unique badge code to print your Certificate of Attendance. The Conference Secretariat will not mail Certificates of Attendance to participants after the Conference. For information on CME accreditation see page 2.

City Information

All delegates will receive practical information about Nantes, including a city map, in their Conference bag.

Cloakroom

A cloakroom is located adjacent to the Auditorium in the 'Upper Foyer' and will be available free of charge.

Cloakroom Opening Hours

Thursday 25 October 2018 from 08:00 to 20:15
Friday 26 October 2018 from 08:00 to 18:15
Saturday 27 October 2018 from 08:00 to 14:30

Exhibition

The ECOP4 Exhibition is an essential part of the Conference and provides an opportunity to network and review important innovations.
The exhibition will be held in the 'Mezzanine' area. Entrance is free for registered delegates but limited to oncology pharmacists, oncology professionals, press and exhibitors.

Exhibition Opening Hours:

Thursday 25 October 2018 from 10:30 to 19:30
Friday 26 October 2018 from 10:00 to 17:15
Saturday 27 October 2018 from 08:30 to 12:30

For the exhibition floorplan and list of exhibitors, please see the exhibition section (page 70) of this Proceedings Book.

First Aid

No dedicated first aid room is available in the Conference Centre. In case of a medical emergency, please refer to the ECOP registration desk in the Mezzanine area of the Conference centre.

Industry Sponsored Satellite Symposia

Industry Sponsored Satellite Symposia are taking place during ECOP4. For schedules, see the Programme Overview section on page 6.

Internet Wi-Fi Access

General Wi-Fi access is available throughout the Conference centre. For access, activate the Wi-Fi network on your laptop or device, select the network listed as **ECOP4**, and enter the user name and password: **ecop2018**.

Insurance

The organisers do not accept liability for individual medical, travel or personal insurance. Participants are strongly advised to make their own arrangements regarding health and travel insurance. The organisers of the ECOP4 accept no responsibility for loss due to theft or negligence.

Language and Translation

The official language of the Conference is English. Simultaneous translation will not be provided.

Lost and Found

All enquiries should be directed to the ECOP4 registration helpdesk in the exhibition area. The organisers accept no responsibility for loss due to theft or negligence.

Non-smoking

There will be a strict non-smoking policy within all areas of the facilities used by the Conference.

Opening Lecture

The Opening Lecture is free for all registered participants. Please refer to the Scientific Programme for further details.

Passport and Visa

A valid passport and/or identity card is required for entry into Nantes, France. A visa may be required for participants from some countries. For specific information, please contact your local French Embassy at least three months prior to your departure to join us in Nantes.

Poster Sessions

Posters are displayed in Area R2, which is located on the mezzanine level next to the Exhibition.

Posters will be on display in the dedicated poster area of the Conference and during all poster sessions.

On Thursday 25 October 2018 from 08:30 onwards, poster presenters will be allowed access to the poster area to mount their poster on their assigned poster number. For assistance, please check with the ECOP4 Staff onsite.

Posters must be removed on Friday 26 October by 17:15 and on Saturday 27 October 2018 by 12:30. Please note that any posters remaining after this time will be removed by the organisers and cannot be reclaimed. Presenting authors are kindly requested to be present at their poster for poster defense during assigned poster viewing and coffee breaks.

The Best Poster Award recognises outstanding posters presented at ECOP4. All posters will be evaluated by a committee and the winner will be notified during the Conference. The award will be presented in the Closing Session. The winner must reconfirm his/her presence at the Conference and at the ceremony.

Registration

The ECOP4 is open to all registered participants. Your official name badge is required for admission to the Conference Centre and all Conference events. For security reasons, participants are requested to wear their badge at all times.

Registration Opening Hours (Mezzanine Level in Area R2):

Thursday 25 October 2018 from 08:00 to 20:00
Friday 26 October 2018 from 08:00 to 18:00
Saturday 27 October 2018 from 08:00 to 13:30

The registration package includes:

- Entry to all scientific sessions and exhibition
- Entry to all Satellite Symposia organised during the Conference
- Proceedings Book
- Official lunch and coffee breaks during the Conference
- Conference bag
- Attendance at the Exhibitor's Welcome Reception on Thursday 25 October 2018 at 18:00 in the Exhibition area

Social Media

Twitter is available during the Conference – tweet, network and follow updates using hashtag **#ECOP4**.

Speaker Preview Room

The Speaker Preview Room is located in Room I in the 'Upper Foyer'.

Speakers are requested to bring their PowerPoint presentations to the Speaker Preview Room at least three hours before their session starts or one day in advance if the session starts early in the morning. To ensure the smooth running of the sessions and avoid lengthy breaks in between speakers, the use of own laptops in the session rooms is actively discouraged.

Speaker Preview Room Opening Hours:

Thursday 25 October 2018 from 08:00 to 17:30
Friday 26 October 2018 from 08:00 to 16:30
Saturday 27 October 2018 from 08:00 to 13:00

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ESOP PROFILE

The European Society of Oncology Pharmacy, founded in 2000 in Prague, is the largest organisation of Oncology Pharmacists in the world with a membership of 3553 members from 70 countries. ESOP is a full member of the European CanCer Organisation (ECCO) and since 2013 a non-commercial consulting Society for the European Medical Agency (EMA).

Aim and Objectives

The aim of ESOP is to support optimal treatment for cancer patients.

The objectives are to develop and promote clinical and oncology pharmacy practice through:

1 Education and training;
2 Safe handling and administration of drugs;
3 Quality management;
4 Research and development; and,
5 Pharmaceutical care.

Cooperation – The Oncology Team

The pharmacy as coordination centre of cytostatic therapy implements the quality management of the oncology pharmacy service and takes responsibilities in patient care and personnel protection regarding all areas of cytostatic therapy.

The pharmacy collects and processes all medical and toxicological data relevant to cytostatics, as well as accompanying and supportive measures, if possible.

Regarding the fact, that the situation of the oncology patient must be viewed upon as a whole, and that his needs and desires play an important factor we are aware that focusing on the cytostatic treatment alone is not enough. We realise, that we also need to focus on a variety of other things, such as appropriate diet, adequate analgesic medication and correct anti-emetic scheme, and understand that we cannot ignore the social and psychological problems that the patient may experience by his or her situation.

The Patient in the Focus

In view of the fact that financial resources have become limited, it is necessary to intensify our pharmaceutical services in order to increase cost-effectiveness, to help ensuring adequate medical treatment and to prevent quality loss.

We achieve this through multi-professional cooperation in improving outcomes for cancer patients in Europe through the adoption and the implementation of essential requirements for quality cancer care in Europe as well as in the introduction of a standardized counselling tool for the promotion of adherence in oral cancer drugs.

Ljubljana Declaration 2006

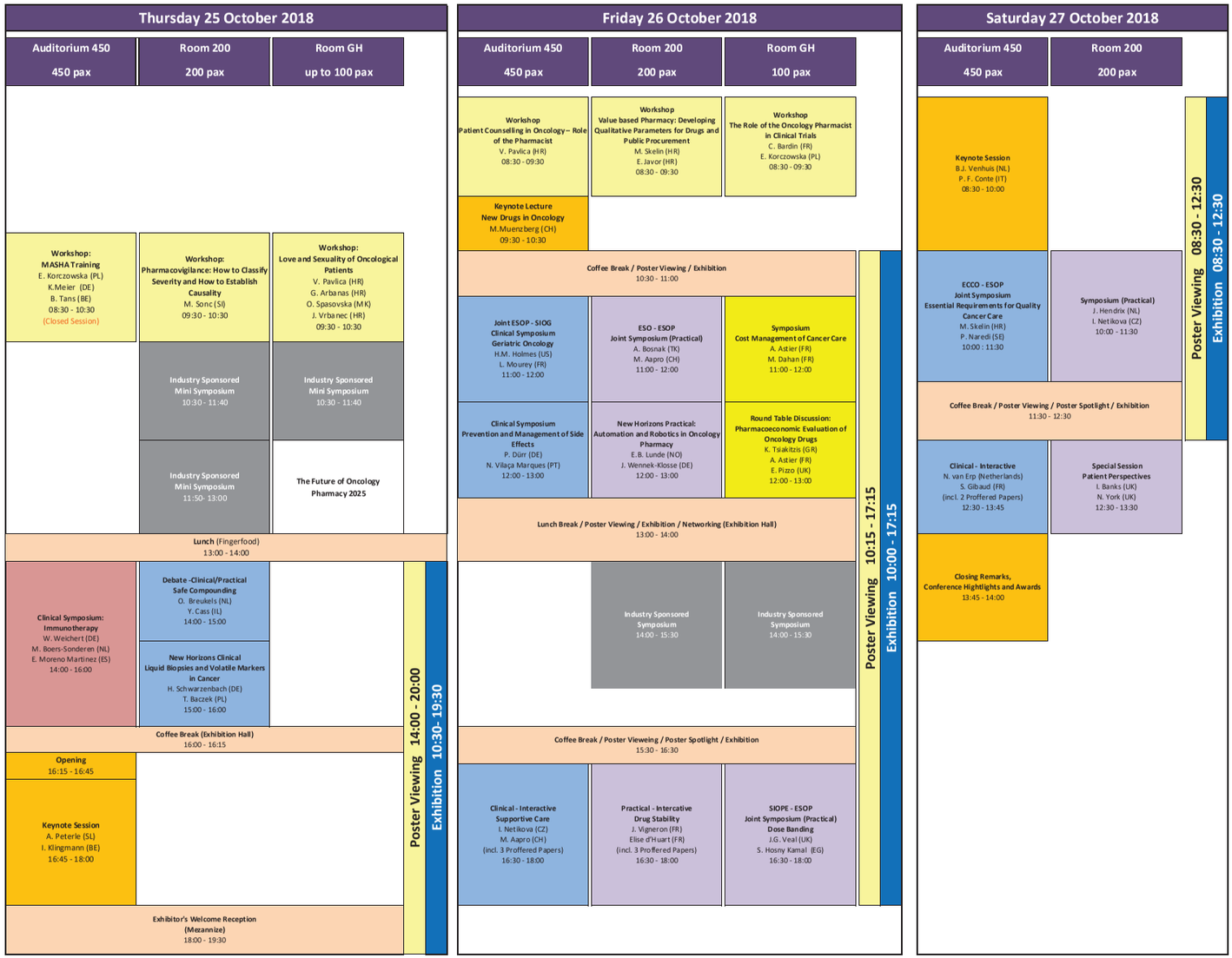
"The close co-operation between oncology physicians and oncology pharmacists is vital for optimal patient care. The multi-professional approach will deliver best practice to patients within a clinical governance framework. Professional, close and timely collaboration will ensure economic use of resources and improve patient safety."

Our Goals: Quality Standards, Continuous Education and Certification

Since the first publication in 1996 in this year the sixth edition of Quality Standards for the Oncology Pharmacy Service (QuapoS) – going to be translated into 29 languages – presents the considerable changes which have taken place with respect to the positioning of this service. They are in use to promote the standardisation of national principles and to speak with one single voice in Europe. The beneficiary of these efforts will always be the patient who will appreciate.

Specific Activities

Since 11 years the ESOP Master Class in oncology pharmacy practice is a yearly event in order to provide continuing education in oncology for hospital pharmacists, whose duties require them to be experts on cytotoxic drug preparation, handling and administration (including risk management) and for clinical pharmacists, so they can give patients the best possible care and support. The European Journal of Oncology Pharmacy (EJOP) has been launched with its mission to satisfy these desires for better quality and to open new horizons. www.esop.eu



For the latest ECOP4 Programme Overview, please visit ecco-org.eu/ECOP4

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SCIENTIFIC PROGRAMME

Thursday 25 October 2018

Workshop: MASHA Training (closed session – invitation only)

08:30 - 10:30 — Auditorium

Coordinator: E. Korczowska (Poland)
Coordinator: Klaus Meier (Germany)
Coordinator: Birgit Tans (Belgium)

Workshop: Pharmacovigilance: How to Classify Severity and How to Establish Causality

09:30 - 10:30 — Room 200

Coordinator: M. Sonc (Slovenia)

Workshop: Love and Sexuality of Oncological Patients

09:30 - 10:30 — Room GH

Coordinator: V. Pavlica (Croatia)
Sexual problems in people with lung cancer and breast cancer and how to treat them
Speaker: G. Arbanas (Croatia)
Quality of life for patients treated with rectal cancer
Speaker: O. Spasovska (Macedonia)
Effects of oncologic disease and treatment on patients sexuality
Speaker: J. Vrbanec (Croatia)

Industry Sponsored Mini Symposium

10:30 - 11:40 — Room 200

Industry Sponsored Mini Symposium

10:30 - 11:40 — Room GH

Industry Sponsored Mini Symposium

11:50 - 13:00 — Room 200

Clinical Symposium: Immunotherapy

14:00 - 16:00 — Auditorium

Chair: A. Astier (France)

14:00 **Future directions for immunotherapy: The quest for biomarkers**
Speaker: W. Weichert (Germany)

14:30 **Current concepts in the management of immunotherapy related side-effects**
Speaker: M. Boers-Sonderen (Netherlands)

15:00 **Immunotherapy in cancer; safety management in an ambulatory approach**
Speaker: E. Moreno Martinez (Spain)

15:30 **Questions & Answers**

Debate - Clinical / Practical: Safe Compounding

14:00 - 15:00		Room 200
	Moderator: K. Meier (Germany)	
14:00	**This house believes that occupational exposure can be effectively reduced using spikes with good handling procedures** Speaker: O. Breukels (Netherlands)	
14:20	**This house believes that occupational exposure can only be reduced further by using closed-system devices** Speaker: Y. Cass (Israel)	
14:40	**Conclusion and final statements** Speaker: E. Korczowska (Poland)	

New Horizons - Clinical: Liquid Biopsies and Volatile Markers in Cancer

15:00 - 16:00		Room 200
	Chair: V. Pavlica (Croatia)	
15:00	**Clinical significance of circulating DNA in breast cancer** Speaker: H. Schwarzenbach (Germany)	
15:25	**Diagnosis of leukemia in children via breath analysis** Speaker: T. Baczek (Poland)	
15:50	**Questions & Answers**	

Opening Address

16:15 - 16:45		Auditorium
	Chair: K. Meier (Germany) Co-Chair: M. Crul (Netherlands)	

Keynote Session

16:45 - 18:00		Auditorium
	Chair: K. Meier (Germany)	
16:45	**Title to be announced** Speaker: Alojz Peterle (Slovenia)	
17:15	**Patient participation in clinical trials and medicines development strategies** Speaker: I. Klingmann (Belgium)	
18:00	**Questions & Answers**	

Exhibitor‘s Reception / Poster Viewing

18:00 - 19:30	Exhibition Area Mezzanine

Friday 26 October 2018

Workshop: Patient Counselling in Oncology - The Role of the Pharmacist

08:30 - 09:30 — Auditorium

Coordinator: V. Pavlica (Croatia)

Workshop: Value Based Pharmacy: Developing Qualitative Parameters for Drugs and Public Procurement

08:30 - 09:30 — Room 200

Coordinator: M. Skelin (Croatia)

Workshop: The Role of the Oncology Pharmacist in Clinical Trials

08:30 - 09:30 — Room GH

Coordinator: C. Bardin (France)
Coordinator: E. Korczowska (Poland)

Keynote Lecture: New Therapies

09:30 - 10:30 — Auditorium

Chair: A. Bosnak (Turkey)

09:30 **New Drugs in Oncology**
Speaker: M. Muenzberg (Switzerland)

10:15 **Question & Answers**

Clinical Symposium: Geriatric Oncology - Joint ESOP - SIOG Symposium

11:00 - 12:00 — Auditorium

Chair: C. Groos (Luxembourg)

11:00 **Systemic cancer treatment in the elderly: Frailty assessment tools and who is fit for chemo?**
Speaker: H.M. Holmes (USA)

11:25 **Balancing between best treatment outcome and preserving quality of life**
Speaker: L. Mourey (France)

11:50 **Question & Answers**

Practical Symposium: ESO - ESOP Joint Symposium

11:00 - 12:00 — Room 200

Chair: K. Tsiakitzis (Greece)

11:00 **A new perspective, Clinical Oncology Pharmacy Service connected to the Pharmacy Faculties**
Speaker: A.S. Bosnak (Turkey)

11:25 **Multiprofessional education in oncology**
Speaker: M. Aapro (Switzerland)

11:50 **Questions & Answers**

Symposium: Cost Management of Cancer Care

11:00 - 12:00 — Room GH

Chair: K. Kongi (Estonia)

11:00 **Repositioning some old drugs as anticancer agents**
Speaker: A. Astier (France)

11:25 **The role of the French National Cancer Institute**
Speaker: M. Dahan (France)

11:50 **Questions & Answers**

Clinical Symposium: Prevention and Management of Side Effects

12:00 - 13:00		Auditorium
	Chair: A. Eberl (Slovenia)	
12:00	**Prevention and management of chemotherapy side-effects: are we doing enough?** Speaker: P. Dürr (Germany)	
12:25	**Adverse drug reactions to oral chemotherapy and patient education** Speaker: N. Vilaca Marques (Portugal)	
12:50	**Questions & Answers**	

New Horizons - Practical: Automation and Robotics in Oncology Pharmacy

12:00 - 13:00		Room 200
	Chair: T.A. Schöning (Germany)	
12:00	**Full automation of aseptic preparation of antineoplastics drugs: robotic experience** Speaker: E.B. Lunde (Norway)	
12:25	**Automated dispensing systems and oral chemotherapy** Speaker: J. Wennek-Klosse (Germany)	
12:50	**Question & Answers**	

Round Table Discussion: Pharmacoeconomic Evaluation of Oncology Drugs

12:00 - 13:00		Room GH
	Moderator: M. Daouphars (France)	
12:00	**Moving from traditional chemotherapy towards molecularly targeted therapies - Pharmacoeconomic impact of orphan drugs** Speaker: K. Tsiakitzis (Greece)	
12:20	**Biosimilar perspective** Speaker: A. Astier (France)	
12:40	**The role of decision making in pharmacoeconomics for oncological drugs** Speaker: E. Pizzo (United Kingdom)	

Industry Sponsored Symposium

14:00 - 15:30	Room 200

Industry Sponsored Symposium

14:00 - 15:30	Room GH

Posters in the Spotlight:

15:30 - 16:30	Poster Area R2

Chair/ Moderator: C. Bardin (France)

100: What is the best safety way in computerized system for hospital prescribers and pharmacists to switch to biosimilars? Evaluation with pertinent criteria helping
L. Sartfati (France)

102: Development of an analytical method to assess the occupational health risk of therapeutic monoclonal antibodies using liquid chromatography and high-resolution mass spectrometry
M. Klassen (Germany)

103: Improving the safety of pediatric cytotoxic drugs preparations: how to meet the challenge?
K. Morand (France)

Clinical Interactive Session: Supportive Care

16:30 - 18:00		Auditorium
	Chair: K. Kongi (Estonia)	
16:30	**Psychotropic drugs in oncological supportive care: Clinical experience** Speaker: I. Netikova (Czech Republic)	
16:50	**Cardiotoxicity of oncology drugs and measures to preserve cardiac function** Speaker: M. Aapro (Switzerland)	
17:10	**Proffered Paper: 10: CAR-T Cells: consequences for the hospital pharmacists** F. Cartier (France)	
17:25	**Proffered Paper: 20: Effectiveness and safety of perioperative treatment with epirubycin, oxaliplatin and capecitabin in patients with advanced gastroesophageal cancer** A. Munilla-Das (Spain)	
17:40	**Proffered Paper: 30: Development of an online drug-drug interaction resource to support safe prescription of oncolytics** N. Van Erp (Netherlands)	
17:55	**Question & Answers**	

Practical Interactive Session: Drug Stability

16:30 - 18:00		Room 200
	Chair: L. Horvath (Hungary)	
16:30	**Stability after reconstitution and dilution: Filling the GAP in the SmPC** Speaker: J. Vigneron (France)	
16:50	**Stability studies: how to perform, how to read, how to use** Speaker: E. d'Huart (France)	
17:10	**Proffered Paper: 40: Screening methods for leachables in syringes used in Hospital Pharmacy Production** R. Trittler (Germany)	
17:25	**Proffered Paper: 50: Prevalence and potential severity of antineoplastic drugs preparation errors detected during quality control of the process** M.B. Marzal Alfaro (Spain)	
17:40	**Proffered Paper: 60: Pemetrexed stability: additional information about microparticles** E. D'Huarte (France)	
17:55	**Questions & Answers**	

Practical Symposium: Joint SIOPE - ESOP Symposium: Dose Banding

16:30 - 18:00		Room GH
	Chair: S. Hosny Kamal (Egypt)	
16:30	**Utilising pharmacokinetic data to investigate the potential impact of dose banding for systemic therapy in a childhood cancer setting** Speaker: J.G. Veal (United Kingdom)	
17:00	**Dose banding in Pediatric Oncology** Speaker: S. Hosny Kamal (Egypt)	
17:30	**Discussion**	

Saturday 27 October 2018

Keynote Session

08:30 - 10:00		Auditorium
	Chair: C. Bardin (France)	
08:30	**Counterfeiting medicine: Start with the facts** Speaker: B.J. Venhuis (Netherlands)	
09:10	**Eventually true results: How statistics in clinical trials work** Speaker: P.F. Conte (Italy)	
09:50	**Questions & Answers**	

Symposium: ECCO-ESOP Joint Symposium: ERQCC

10:00 - 11:30		Auditorium
	Chair: M. Crul (Netherlands)	
10:00	**Title to be announced** Speaker: M. Skelin (Croatia)	
10:30	**Essential requirements in colorectal cancer care** Speaker: P. Naredi (Sweden)	
11:00	**Questions & Answers**	

Practical Symposium: Practical Oncology Pharmacy

10:00 - 11:30		Room 200
	Chair: A. Munilla (Spain)	
10:00	**Flat dosing versus weight based dosing of monoclonal antibodies** Speaker: J. Hendrix (Netherlands)	
10:25	**Cytostatics decontamination based on nanoparticles agent** Speaker: I. Netikova (Czech Republic)	
10:50	**Proffered Papers: 70: Evaluation of an intelligent video camera system in a pharmacy service: feedback on 2 years of experiences** M. Laplace (France)	
11:05	**Proffered Papers: 80: The antimicrobial activity of anticancer drugs: In vitro study of the most used anticancer molecules in chemotherapy** I. Bennani (Morocco)	
11:20	**Questions & Answers**	

Posters in the Spotlight:

11:30 - 12:30		Poster Area R2
	Chair/ Moderator: M. Daouphars (France)	
	104: Vorinostat represses neural markers in glioblastoma cells and induces transdifferenciation toward mural lineage T. Perez (France)	
	105: Potential drug cost savings associated with lymphoma clinical trials C. Herledan (France)	
	106: Evaluation of clinical pharmacist's contribution in a French cancer center: clinical impact and cost-saving M. Michard (France)	

107: Relationship between mutations in the HSD3B1 gene and response time to androgen deprivation therapy in the treatment of prostate cancer
S. Garcia Gil (Spain)

Clinical Interactive Session: Clinical Oncology Pharmacy Session

12:30 - 13:30		Auditorium
	Chair: I. Netikova (Czech Republic)	
12:30	**Pharmacological challenges and different dose optimization potentials of the two very distinct groups of targeted drugs: Nibs vs Mabs** Speaker: N. van Erp (Netherlands)	
12:50	**Arsenical derivatives as anticancer agents** Speaker: S. Gibaud (France)	
13:10	**Proffered Papers: 90: Impact of pharmaceutical interventions on costs in an ambulatory haematology-oncology unit** M. Boulin (France)	
13:25	**Proffered Papers: 100: CONEcT: Promoting therapeutic education in oral chemotherapy. From training to implementation of a program between primary and secondary care** M. Cordier (France)	

Special Session: Patient Perspectives

12:30 - 13:30		Room 200
	Chair: M. Crul (Netherlands)	
12:30	**At work and home with and after cancer** Speaker: I. Banks (United Kingdom)	
12:55	**Patient reported outcomes and patient reported adverse events** Speaker: N. York (United Kingdom)	
13:20	**Questions & Answers**	

Closing Remarks / Highlights and Awards

13:45 - 14:00		Auditorium
	Chair: K. Meier (Germany)	

For the latest ECOP4 Scientific Programme, please visit ecco-org.eu/ECOP4

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ABSTRACTS

Clinical Interactive Session: Supportive Care

1 CAR-T CELLS: CONSEQUENCES FOR THE HOSPITAL PHARMACISTS

F. Cartier[1], S. Kerob[1], C. Talarmin[2], I. Madelaine[1]

[1]*Hopital Saint Louis, Pharmacy, Paris, France*
[2]*Hopital Saint Louis, Cell Therapy Unit, Paris, France*

Background: Immunotherapies have become more and more prescribed in the past few years to treat blood cancers. In 2017, two CAR-T cells therapies have been approved by the FDA for the treatment of acute leukemia and lymphoma. In France, hospital pharmacies are responsible for the reception, storage and dispensation of the advanced therapy medicinal products (ATMP). Pharmacists are not yet used to deal with those drugs. As of march 2018, 6 clinical trials with 3 different CAR-T cells are active at our site, besides the expanded access program via the French ATU (temporary authorization).
Material and Methods: We report on this abstract the changes in our organization as we had to adapt our practices since the first patient infusion in June 2016.
Results: Pharmacists are responsible for managing CAR-T cells in our hospital and for another hospital. Since June 2016, 20 patients received CAR-T cells. 10 patients were included in a clinical trial, and 10 beneficiated of the ATU program. Reception: As the date of reception can be very flexible (15 to 21 days of manufacturing), we had to define a strict timetable to be sure that a pharmacists is able to make the reception of these specifics ATMP. We launched a pharmaceutical permanency with 4 pharmacists, in order to have always 2 pharmacists available on weekly days. At each reception, a double check is done with two pharmacists. Storage: after reception, CAR-T cells are stored in nitrogen tanks in the therapy cell unit of our site, with whom we made a partnership. Because the delay between reception and thawing process is more than 3 months for some patients, and because CAR-T cells have to be infused after a lymphodepletion (which starting date can vary especially in patient with heavy comorbidities), it is important not to store CAR-T cells in a dry shipper, but in nitrogen tank. Cryobags: due to the storage recommendations (<-130°C), drugs are available inside cryobags. Since the beginning, we had two cases of defective cryobags, leading sponsors to send us in emergency back-up CAR-T cells that were manufactured for patients. Since, we now take pictures of the cryobags when we receive it in case of a defect during or after the thawing. Traceability: Traceability of administration is made in a computer software in order to conserve documents 30 years.
Conclusion: CAR-T cells are new drugs that involve an evolution of hospital pharmacies practices. They are infused in patient often in poor condition, and it is difficult to establish a schedule for the reception and the thawing. Today, CAR-T cells are in majority available via clinical trials, but tomorrow, with the EMA approvals to come, more sites will face those problems and it is important for them to anticipate some aspects of the process.
NO CONFLICT OF INTEREST

2 EFFECTIVENESS AND SAFETY OF PERIOPERATIVE TREATMENT WITH EPIRUBYCIN, OXALIPLATIN AND CAPECITABIN IN PATIENTS WITH ADVANCED GASTROESOPHAGEAL CANCER

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Introduction: Gastric and esophageal tumors are the fourth and sixth most common cause of cancer death worldwide. Currently, there is no single standard regimen for the first-line treatment of advanced disease. In Europe, after the results of the Magic trial, the most widely used regimen is that which includes epirubicin, cisplatin and fluorouracil (ECF) administered in the perioperative setting.
Our aim is to review the effectiveness and safety data of the scheme with epirubicin (50 mg / m2, day 1), oxaliplatin (130 mg / m2, day1) and capecitabine (625 mg / m2, 12 hours, for 21 days) every 21 days, (EOX scheme), administered before and after surgery in patients with advanced gastroesophageal cancer.
Material and Methods: Observational, retrospective study that included patients with advanced gastroesophageal cancer treated in our center with the EOX scheme from October 2014 to March 2018. Data collected: sex and age, date of diagnosis, tumor location, TNM, cycles administered, adverse effects (AE) of chemotherapy (CTCAE v4.0), radiological response (RECIST criteria), types of surgery and resection results, incidence of disease after surgery and subsequent follow-up.
Results and Discussion: 10 patients reviewed, 8 male, mean age of 64 years [standard deviation (SD) 8.12; range 52–80], all with advanced disease. In six patients (60%) the tumor was located in the gastroesophageal junction and in the rest in stomach, lower esophagus and middle esophagus (2) respectively. Five patients (50%) had lymph node involvement. An average of 4.2 cycles of chemotherapy were administered before surgery (SD 1.53) and 1,5 cycles after (SD 1.36). 9 patients presented AE, only in two of them of grade 4 (neutropenia and anorexia respectively) and in two of them of grade 3 (palmar-plantar erythrodysesthesia and asthenia). A dose reduction was required in six patients (60%), only two delayed treatment and in no case its interruption. After neoadjuvant partial response was achieved in seven patients (70%) and stable disease in two others (20%). At the time of the analysis, nine patients had been operated and the remaining patient was pending intervention. In eight of them (80%) it was possible to eliminate all the tumor load identified in the preoperative period with free resection margins (surgery R0) and in one patient remained macroscopic residual tumor (R2). The mean disease-free interval after surgery was 7.8 months (SD 9.32, range 0–30) and overall median survival from diagnosis of 13.6 months (SD 9.54, range 2–34).
Conclusion: The EOX scheme presented results of effectiveness and safety comparable to those with cisplatin and fluorouracil in continuous intravenous perfusion, but with a better tolerability profile and comfort for the patient. Therefore, it is an excellent alternative for perioperative treatment in patients with advanced gastroesophageal cancer
NO CONFLICT OF INTEREST

3 DEVELOPMENT OF AN ONLINE DRUG-DRUG INTERACTION RESOURCE TO SUPPORT SAFE PRESCRIPTION OF ONCOLYTICS

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Introduction: Patients treated for cancer are at high risk of drug-drug interactions (DDIs), which affects nearly 60% of patients on therapy. We developed a freely available DDIs resource (www.cancer-druginteractions.org) to support anti-cancer drug prescribing, based on successful implementation for HIV (www.hiv-druginteractions.org) and hepatitis (www.hep-druginteractions.org) treatments.
Material and Method: A review of literature and registration documents was performed to evaluate the available evidence for potential DDIs of several oncolytics. Decision trees based on the FDA guideline on DDIs studies were used to assess the clinical relevance of DDIs. Comedications that are frequently used by cancer patients were selected. The interaction potential of drug combinations was classified using a straightforward 'traffic light' classification and quality of evidence was classified according to a derivative GRADE system. Advice on management of the interaction was included where appropriate. All records were reviewed by an expert panel of clinical pharmacologists.
Results and Discussion: Thus far, 32 targeted oncolytics for among others renal cell carcinoma, sarcoma, prostate cancer and chronic myeloid leukemia have been reviewed. These represent 22 targeted small molecules and 10 monoclonal antibodies (MoABs). Potential DDIs between the oncolytics and >400 comedications have been classified. From website launch on June 1st 2017 till March 1st 2018 9,682 queries were performed by 2,951 unique visitors from 33 different countries. 7,505 queries of the total of 9,682 queries were performed for targeted oncolytics and 2,177 queries for the targeted MoABs. 19,8% of the performed queries show a potential interaction which requires action of prescribers (see Table 1).
Conclusion: The DDIs checker currently includes comprehensive and ready-to-use advices for DDIs with targeted oncolytics for ten indications. The indications are due to be expanded in the upcoming months. The freely available, independently developed website with 'traffic light' classification will facilitate health care professionals' and patients' awareness of potential DDI between oncolytics and frequently used comedications.

Table 1 Overview of DDI queries

Interaction classification 'traffic light' (%)	
Green No clinically significant interaction	63.6
Yellow Interaction of weak/moderate intensity; no a priori dosage adjustment required	16.6
Amber Potential interaction which may require dosage adjustment or close monitoring	14.7
Red Do not co-administer	5.1

CONFLICT OF INTEREST
Advisory Board:
Amgen, Merck, ViiV, Servies
Corporate-sponsored Research:
ViiV, Gilead, Merck, Janssen-Cilag, Astellas, Novartis
Other Substantive Relationships:
Abbvie, Astellas, AstraZeneca, Boehringer Ingelheim, Bristol-Myers Squibb, Gilead, Ipsen, Janssen-Cilag, Pfizer, Roche, Sanofi

Practical Interactive Session: Drug Stability

4 SCREENING METHODS FOR LEACHABLES IN SYRINGES USED IN HOSPITAL PHARMACY PRODUCTION

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Introduction: Knowledge on leachables has become an important issue for hospital pharmacies due to the fact that a growing number of injectables is compounded for long term storage. To estimate the potential risk emerging from these substances, information on extractables is required at first. Little is known on the impact of leachables with respect to injectables produced in hospital pharmacies. Specific requirements for plastic immediate packaging materials have been included into the Pharmacopoeias. Such data, however, are hard to obtain from the manufacturers of the containers. Since leachable/extractable studies may be not economical this can result in ineconomic hospital pharmacy production. Therefore we wanted to investigate the capabilities of cheaper screening methods that can be performed in the hospital pharmacy lab or at cooperating labs such as the Pharmaceutical Institute of the University
Material and Methods: We used UV-Spectrometry, HPLC/DAD, LC-MS, GC-MS and developed-fingerprints for comparing extractables from different types of syringes used for hospital pharmacy production in Denmark, Germany, Spain and Switzerland.
Results and Discussion: Even with UV-Spectrometry a big variety between different types of syringes is visible. Our fingerprints with HPLC-DAD give further information and allow also analysis in presence of the active substances. With help of LC-MS and GC-MS we also could confirm structures of three extractables AO425, BHT and Dichlorobenzamide. If stability data is dependent of packaging material, a information as "PP-syringes" is not sufficient regarding the variety in practice. We found different fingerprints at different lots of syringes with the same product number and we found same fingerprints with syringes used in Spain, Switzerland and Germany. The characterisation with our refined fingerprints allows the transfer of stability data between different hospital pharmacys.
Conclusion: Screening methods can be a first step to obtain knowledge on extractables. They can be used to compare different syringes and also to control different lots of the same product. Hospital pharmacists from different countries should share their knowledge about identified extractables in primary package material. Without identification no quantification and without quantification no risk assessment is possible. Therefore the European L/E Group for Hospital Pharmacists was founded and can be contacted to find cooperation partners.
NO CONFLICT OF INTEREST

5 PREVALENCE AND POTENTIAL SEVERITY OF ANTINEOPLASTIC DRUGS PREPARATION ERRORS DETECTED DURING QUALITY CONTROL OF THE PROCESS

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Background: Antineoplastic preparation includes several stages that are vulnerable to opportunities for potentially harmful medication errors and it presents safety concerns because of its toxicity and narrow therapeutic window. To describe the prevalence, type and severity of medication errors during antineoplastic drug preparation, to identify improvement strategies.
Material and Methods: Design: Prospective, observational study, from April to June 2016.
Setting: Hazardous Preparation Unit of the Hospital Pharmacy Department in a 1300-bed tertiary teaching hospital.
Preparation errors were detected during the quality control of the process, made by a nurse who observed unobtrusively the preparation process and compared it with the order instructions.
A multidisciplinary team of pharmacists and clinicians categorized errors and their potential causes according to the Ruiz Jarabo 2008 classification and determined the severity of the potential adverse drug event (ADE) using the NCC-MERP index and the probability of causing an ADE (PAE). A kappa statistic was used to verify inter-observer agreement.
Results: Fourteen (2.47%) errors were intercepted in 566 preparations observed. The errors detected were classified as: insufficient dose (0.9%, 5/14), wrong fluid (0.5%, 3/14), wrong final volume (0.4%, 2/14), wrong protection from light (0.4%, 2/14), excessive dose (0.2%, 1/14) and wrong dose (0.2%, 1/14). According to the preparation process, 9 errors (64.3%) occurred in the dose measure subprocess, 3 errors (21.4%) in the fluid

selection and 2 (14.3%) in the final labelling and packaging subprocess.
Pharmacists categorized potential severity of ADEs as 50% minor (no damage or monitoring required), 43% moderate (temporary damage that required monitoring or treatment), and 7% serious (permanent harm). Clinicians classified potential severity as 71% minor, 7% moderate and 21% serious. The global consensus of pharmacists and clinicians categorized 65% of potential ADEs as minor, 14% as moderate and 21% as serious severity.
In the global evaluation of the PAE, two (14%) of the errors were assigned a PAE of 0.6, 3 (21%) a PAE of 0.4, 2 (14%) a PAE of 0.1, 3 (22%) a PAE of 0.01 and 4 (29%) a PAE of 0. The overall inter-rater agreement for the participants was strong for severity ($k = 0.67$; $P < 0.01$) and moderate for the PAE ($k = 0.60$; $P < 0.01$).
Conclusions: Although the identified error rate is very low and consistent with previous studies, the 35% of the preparation errors were assigned moderate-serious severity by pharmacists and clinicians. The probability of causing an ADE to the patient was higher than 40% in 35% of the errors detected. In order to improve preparation accuracy, new strategies such as automatized workflow management systems need to be implemented in the near future.
NO CONFLICT OF INTEREST

6 PEMETREXED STABILITY: ADDITIONAL INFORMATION ABOUT MICROPARTICLES.

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Introduction: Chemical stability of pemetrexed solutions diluted in 0.9% sodium chloride or 5% dextrose infusions bags at 2–8°C was determined by High Performance Liquid Chromatography (HPLC) for one month by different authors. However, the subvisual evaluation by nephelometry showed that the Nephelometric Turbidimetric Unit (NTU) increased with time after storage at 2–8°C. Therefore, the stability of pemetrexed solutions was limited to 24 hours according to the manufacturer's recommendations. The objective of this present work was to study the importance of the presence of microparticles and to evaluate the feasibility of using an administration line with a 0.2 mm micro-filter on pemetrexed infusions.
Material and Methods: As chemical stability has been previously demonstrated by HPLC, we used a more rapid analytical method based on ultraviolet detection. The analytical technique selected was Flow Injection Analysis (FIA) which uses an HPLC apparatus without separative column. The column is replaced by a tubing and the sample is pushed by ultra-pure water towards a Diode Array Detector. The method was validated (linearity, repeatability). To minimize the cost of the study, we prepared 5 mg/mL pemetrexed solutions in 25 mL exactly measured in non-PVC infusion bags. Five infusions were prepared for each solvent. After preparation, one mL was removed and analysed by FIA. Bags were stored at 2–8°C. On day 8, an infusion line with a 0.2 mm micro-filter was adapted on bags. One mL was taken and analysed by FIA to evaluate the concentration. On days 14, 21 and 28, one mL was taken after purging the line and samples were analysed by FIA to evaluate if the concentration is reduced by a potential microparticle after filtration.
Results: The method used for analysis was linear and repeatable. After the passage of the solutions in an administration line with a 0.2 mm micro-filter and analysis by FIA, we observed that 5 mg/mL pemetrexed solutions diluted in 0.9% sodium chloride or 5% dextrose, stored at 2–8°C, retained more than 95% of the initial concentration for each solvent, each bag, during 28 days.
Discussion-conclusion: In view of the results, the presence of microparticles observed in previous publications seems to have no importance for daily practice. The administration of pemetrexed solutions at 5 mg/mL in 0.9% sodium chloride bags or 5% dextrose bags, stored for 28 days at 2–8°C, using an administration set with an in-line 0.2 mm micro-filter, was perfectly feasible. These data allow advance preparation and minimize drug wastage.
NO CONFLICT OF INTEREST

Practical Symposium: Practical Oncology Pharmacy

7 EVALUATION OF AN INTELLIGENT VIDEO CAMERA SYSTEM IN A PHARMACY SERVICE: FEEDBACK ON 2 YEARS OF EXPERIENCES

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Background: The World Health Organization (WHO) supports a global initiative to reduce severe, avoidable medication-associated harm in all countries by 50% over the next 5 years. To improve security of compounding process, the IV workflow management system Drugcam®, an intelligent video camera system has been used on all our production since June 2015. The technology is able to recognize automatically vials and volumes into syringes during the critical stages of compounding combined with an a posteriori control (video recording)
The objective is to evaluate the performance of this tool to avoid errors of preparation and to understand their origins
Material and Methods: We analyzed retrospectively since June 2015 and until the end of 2017, the compounding errors stopped by Drugcam® and recorded in our quality management system.
Results: Over the study period, 68524 doses were prepared utilizing this new tool with a total of 104 (0.14%) errors detected by the IV workflow management system. Camera system detected in real time 88 deviation volume errors (87%), 10 wrong drugs (9.9%) and 2 (2%) label errors. 80% of quantitative errors are overdoses. 25% of these overdoses are caused by using a remaining vial.
These outcomes are very likely underestimated because the record is declarative. Drugcam® avoid in real time 1 serious error per week of compounding. Volume errors are in the majority with overdosages of more than 100% intercepted by the system. Video recording helps to understand the errors to prevent them. the reflex of automatically emptying an opened vial is a risk of overdose clearly identified.
Conclusions: Drugcam® with this new intelligent artificial technology detected and prevented dosings errors wich would not have been stopped with traditional methods in France (Double visual check). We are now learning to better understand the risk levels of this process. All errors will be detected during compounding with commercialization in France of vehicle bags with barcode
NO CONFLICT OF INTEREST

8 THE ANTIMICROBIAL ACTIVITY OF ANTICANCER DRUGS: IN VITRO STUDY OF THE MOST USED ANTICANCER MOLECULES IN CHEMOTHERAPY

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Background: The patient with cancer presents during the treatment a potential risk of microbiological contamination of the solutions to be injected, hence the importance of studying the microbiological quality of these solutions. Thus, the active ingredients contained in these solutions may also have bacteriostatic or bactericidal activity which would also contribute to the fight against bacterial infections. hence the objective of this work is to study the antimicrobial activity of certain anticancer molecules.
Materiel and Method: The microbiological study was carried out in the Laboratory of Bacteriology-Serology and Hygiene of Ibn Sina Hospital in RABAT. The drugs used for the study of antibacterial activity are: Cytarabine, Dacarbazine, Carboplatin, Bleomycin, Cyclophosphamide, Doxorubicin, Vincristine and Etoposide. The drugs represented in powder form were reconstituted with physiological sterile saline.
The bacterial strains used are commercialized strains such as: Escherichia coli, Enterococcus faecalis, Pseudomonas aeruginosa, Streptococcus mutans, Streptococcus pneumoniae, or clinically isolated strains such as: Staphylococcus aureus, Haemophilus influenzae, and yeasts. The chocolate and HD culture media were prepared and sterile "BLANK" antibiotic discs were used.
From an inoculum prepared for each strain, we flooded the culture media, and after we squeezed and then dried the Petri dishes to place discs with a flaming tong each time; control disks were imbibed with sterile physiological water. After placing discs, we soaked each disc with 10 μL of each drug using a micropipette and sterile commercial tips. The drugs were used with the initial concentrations indicated above. Finally, we incubated the dishes at 37 ° C for 24 hours.
Results: After incubation, we performed a reading of the results and we measured with a transparent rule the halos around the disks. The results are presented in the table:

Drugs Stains*	1	2	3	4	5	6	7	8
Escherichia coli	14	0	0	26	0	10	0	0
Enterococcus faecalis	22	0	0	0	0	16	22	0
Pseudomonas aeruginosa	10	0	0	7	0	◁	0	0
Streptococcus mutans	20	◁	0	10	0	0	24	0
Streptococcus pneumoniae	16	0	0	10	0	16	30	0
Staphylococcus aureus	18	0	0	20	0	14	26	0
Haemophilus influenzae	18	0	0	16	0	0	0	0
Levures	0	0	0	14	0	0	0	0

***1: Dacarbazine 2: Cyclophosphamide 3: Carboplatin 4: Bleomycin sulfate 5: Vincristine sulfate 6: Doxorubicin hydrochloride 7: Etoposide 8: Cytarabine**

Conclusion: Our study, this allowed us to confirm that some anticancer drugs have activity on bacteria and yeasts. Nevertheless, we could not search for minimal inhibitory concentrations for the molecules that showed a significant inhibition diameter in order to conclude on the activity of these molecules, which must be the objective of a subsequent study.
NO CONFLICT OF INTEREST

Clinical Interactive Session: Clinical Oncology Pharmacy Session

9 IMPACT OF PHARMACEUTICAL INTERVENTIONS ON COSTS IN AN AMBULATORY HAEMATOLOGY-ONCOLOGY UNIT

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Background: Data are lacking on pharmacists' financial impact in ambulatory haematology/oncology units. Supported by a grant from the French Health Ministry, we recently developed a patient-centred programme to improve health care of cancer patients receiving chemotherapeutic agents and to decrease preventable adverse drug events. The aim of our study is to estimate both clinical and financial impact of a fulltime of two clinical pharmacists in an ambulatory haematology/oncology unit.
Material and Methods: We performed a prospective pilot study over January 2018 in the ambulatory haematology/oncology unit of our teaching hospital. The totality of the interventions made by the two clinical pharmacists during clinical hours and accepted by the physicians was recorded. The clinical impact of pharmaceutical interventions was evaluated according to the multidimensional CLEO scale (nuisible, nul, minor, moderate, major, vital). From the economic model of a pharmaceutical intervention, the value of each intervention was estimated from cost savings, cost avoidance and cost of implementation of the two clinical pharmacists. Cost savings were calculated relative to the estimated reduction in the cost of drug therapy (use of less expensive drugs, discontinuance of a drug, conversion to a less expensive drug, including change of dose, dose interval, route, duration, or form of medication). Cost avoidance was calculated as the probability of an adverse drug event multiplied by the cost of the corresponding adverse drug event. The probability of occurrence of each adverse drug event was obtained from a computerised bibliographic search on Pubmed and Google Scholar. Data from studies with the highest level of evidence were systematically used. The cost of each adverse drug event was obtained from the French Diagnosis-Related Group prospective payment system. The yearly cost of employing a clinical pharmacist is €56,000.
Results: Sixty one pharmaceutical interventions were recorded during the study period. Their clinical impact was considered as minor, moderate, major, and vital in 20%, 28%, 46%, and 7%, respectively. Cost savings were €9,549. Cost avoidance was €12,285. The combined average yearly cost avoidance was €262,008, which is €131,004 per pharmacist. When the cost of employing a pharmacist was subtracted from the average yearly cost avoidance per pharmacist, this yielded a net benefit of €75,004. This value is underestimated as we were unable to calculate cost avoidance of 14 (23%) pharmaceutical interventions because of a lack of data in the literature.
Conclusion: A fulltime clinical pharmacist in an ambulatory haematology/oncology unit is both clinically and financially beneficial.
NO CONFLICT OF INTEREST

10 CONEcT: PROMOTING THERAPEUTIC EDUCATION IN ORAL CHEMOTHERAPY. FROM TRAINING TO IMPLEMENTATION OF A PROGRAM BETWEEN PRIMARY AND SECONDARY CARE

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Introduction: Oral chemotherapies and targeted therapies (OC) are becoming increasingly important in the management of cancer patients, with a transfer of responsibility from healthcare professionals to patients. Adherence to treatment and appropriate management of adverse effects are essential. Our regional cancer centre has deployed a therapeutic patient education (TPE) program since 2011. Objective: Based on the existing TPE program, the regional project CONEcT has been developed since 2014 with the support of the French National Cancer Institute (INCa). Objectives were to train healthcare professionals (HCPs) in TPE and OC, then to implement several local TPE offers for patients treated by OC in Normandy, based on an innovative coordination between primary and secondary care.
Materiel and method: A steering committee composed of 8 regional partners with expertise, defined the project's methodology, structured in 6 steps: (1) Identify and involve 2 experimental primary and secondary care sites (ES) on each 4 health territories, (2) Sensitize all the professionals (n = 80) of experimental sites on OC and TPE, (3) Train in each health territory 3 primary care and 2 hospital HCPs (n = 20) in TPE (WHO educational level 3), (4) Design a TPE program with experimental sites, (5) Implement the program on each health territory, (6) Evaluate the whole system.
Results and Discussion: Steps 1 to 3 were completed in 2015, with positive feedback from professionals. Development of the regional TPE program took place in 2016. This work was achieved in mid-December 2016 by obtaining the program agreement by the Regional Health Body (step 4). The deployment of the program is in progress with inclusion of patients (steps 5 and 6). In total, in 2017, 96 liberal and hospital health professionals were involved in the process. More than 20 meetings between professionals took place for the implementation and appropriation of the programme. 13 group patient workshops on treatment planning, adverse event management, nutrition were organized and 42 patients benefited from this care offer. Factors driving and hampering the implementation of the program and the coordination of primary and secondary care HCPs were identified allowing determining an implementation methodology and elements of transferability on the national territory. New sites are considered to join the programme CONEcT in 2018.
Conclusion: This innovative regional project is in a favourable context where TPE and care of people with cancer prove to be a priority carried out by public authorities, allowing to promote coordination of local actors in order to ensure the continuity of care between primary and secondary care.
NO CONFLICT OF INTEREST

Posters in the Spotlight: Poster in the Spotlight I

100 POSTER (BOARD 001) WHAT IS THE BEST SAFETY WAY IN COMPUTERIZED SYSTEM FOR HOSPITAL PRESCRIBERS AND PHARMACISTS TO SWITCH TO BIOSIMILARS? EVALUATION WITH PERTINENT CRITERIA HELPING

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Introduction: In France, MabtheraÒ is the first Biological Reference Drug (BRD) available as a biosimilar (Rituximab) in hematology. Our hospital policy encourages prescribers to treat at least 90% of all patients with the biosimilar (for patients already on treatment and de novo), with an estimated saving of 570000€/year. In 2018, our soft-

ware contained 92 protocols including rituximab with chemotherapy. To promote acceptance of biosimilars, switching prescription (automatic substitution) to biosimilar must be secure at all steps in the software. In case of proven pharmacovigilance, it should be possible to prescribe easily the BRD in return. Various options are possible to implement this change in the software. The aim of this study was to choose the best and safest way.

Material and Method: Several automatic substitution methods regarding the CHIMIO 5.8© software have been identified by brainstorming between 4 senior pharmacists responsible for the preparation unit. Relevant criteria related to critical steps of the process: prescription, pharmaceutical analysis, preparation and administration were defined: training not required, time-consuming action, easy-to-apply, securing steps, and then weighted according to their impact. Each methodology was assessed regarding these weighted criteria to select the best and safety one.

Results and Discussion: Only options that ensure a securing traceability were included: option A: in each protocol containing rituximab, there is no distinction between the rituximab BRD and biosimilar; option B: each protocol containing rituximab is modified to allow prescribers to switch from BRD to biosimilar and vice versa; option C: one protocol of rituximab alone is created to be added to each prescription. Following relevant criteria weighted (w) from 1 to 3 are selected: training not required (w = 1), time consuming (w = 2), easy-to-apply (w = 2), identification of the product while prescribing (w = 3), steps of the process secured (w = 3). All these criteria were applied for each step of the process. A score ranging from 0 (the worst) to 2 (the best) for these criteria was attributed to each methodology. A total score was calculated: methodology A: 43, methodology B: 82, methodology C: 66. Option B appears to be the most effective and safe.

Conclusion: This solution seems to be safe with rituximab switching, indeed few weeks after, the majority of patients have been well treated and no problem was encountered. This method should realize expected savings and should be applied for others biosimilar switch in oncology (trastuzumab….).

NO CONFLICT OF INTEREST

102 POSTER (BOARD 003) DEVELOPMENT OF AN ANALYTICAL METHOD TO ASSESS THE OCCUPATIONAL HEALTH RISK OF THERAPEUTIC MONOCLONAL ANTIBODIES USING LIQUID CHROMATOGRAPHY AND HIGH-RESOLUTION MASS SPECTROMETRY

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In the last decade biopharmaceuticals became more and more important but the risk assessment of biologics in occupational health perspective is not completed. Especially the role of therapeutic monoclonal antibodies (mAbs) for occupational safety is still discussed controversially. The major problem in this discussion is the lack of experimental data about the effects at long-term low dose exposure. Here, we are presenting the validation of a method based on liquid chromatography and high resolution mass spectrometry (HPLC-HRMS) that will be suitable for detection of airborne mAbs. The method is initially developed for three mAbs rituximab, trastuzumab and daratumumab.

An air sampling method was evaluated by using a polyvinylidene fluoride filter (47 mm diameter 0.22 µm pore size). The pump volume was adjusted to 2 L/min. The recovery rate after 4, 8 and 24 h was determined. Before analysis the sampled proteins were tryptically digested. Peptide analysis was carried out using an HPLC system (1260 Infinity series, Agilent Technologies) and a high resolution mass spectrometer (Agilent Technologies 6545 QTOF-MS). For quantification the most stable peptides were identified after adding H_2O_2 (1%; v/v), 1 M NaOH and 1 M HCl. The limit of detection (LOD) and the limit of quantification (LOQ) were determined.

Air sampling was simulated by doping filters with mAbs. The stability over time was examined for 4, 8 and 24 h. Recovery rates between 80% and 120% was obtained for all sampling intervals. The long-term stability of 24 h enables the possibility to use the method not only for personal air sampling but also for quality control of continuous processes such as the production of mAbs in bioreactors. The tryptic digest of a monoclonal antibody leads to a large number of different peptides, each with different tendencies to alteration. Therefore, mAbs were stressed to identify the most stable peptides for analysis. Peptide sequences LLIYDASNR (m/z 532.7904; z = 2) for daratumumab, LLIYSASFLYSGVPSR (m/z 886.9827; z = 2) for trastuzumab, FSGSGSGTSYSLTISR (m/z 803.8890; z = 2) for rituximab turned out as suitable candidates. Beside these signature peptides another stable peptide sequence DSTYSLSSTLTLSK (m/z 751.8828; z = 2) corresponding to all immunoglobulin G-like antibodies was used as sum peptide. The LOD and the LOQ were defined as signal-to-noise ratio (S/N) of 3 and 10 (Table 1).

Table 1: LOD and LOQ of investigated mAbs.

Peptide	LOD (µg/filter)	LOQ (µg/filter)
Rituximab	9.6	32.6
Trastuzumab	4.4	14.5
Daratumumab	1.4	4.7
Sum Parameter	24.6	78.5

A method based on LC-HRMS to detect airborne mAbs was successfully validated. Furthermore, a suitable personnel sampling method was identified. It is expected that airborne mAbs reach concentrations up to several micrograms per working shift. Thereby, our method achieves the relevant measurement range.

NO CONFLICT OF INTEREST

103 POSTER (BOARD 004) IMPROVING THE SAFETY OF PEDIATRIC CYTOTOXIC DRUGS PREPARATIONS: HOW TO MEET THE CHALLENGE?

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Introduction: Analytical control represents the "gold standard" method to ensure conformity of cytotoxic drugs and monoclonal antibodies preparations in adults. However, pediatric specificities lead pharmacists to adapt analytical methods and consider alternative post-production controls. The aim of this study was to evaluate the efficiency of our strategy to ensure children safety.

Material and Methods: The study period was 2016–2017. Analytical controls were performed by a UV/Raman. The acceptance range was ±15% of expected concentration. The global conformity rate (CR) corresponds to the percentage of preparations meeting this range. CR per molecule and containers were also studied. Non-conformities (NC) were evaluated and analyzed to identify causes. For drugs with no analytical control available, a camera allowed pharmacists to identify drug and volume withdrawn during production.

Results: Within the study period, 10489 chemotherapies were prepared and 8375 (80%) were analytically controlled. The global CR was 95.1%. Vincristine, cytarabine and methotrexate represent more than half of controls. For these 3 molecules the CR is slightly lower (93%). Others representative drugs shown better CR: doxorubicine (100%), asparaginase, etoposide and cyclophosphamide (97%). No difference was found between drugs prepared in syringes or bags. In case of non-conformity, when possible a second sampling or otherwise a complementary photographic control were performed. The global CR increased up to 97.6%. When analytical control was impossible, in case of preparations with final volume under 20 ml, clinical trial drugs, intrathecal chemotherapies and concentration under detection limit, photographic controls were performed.

Discussion: Reminders on good preparation practices for pharmacy technicians and adapted methods to determine high or low concentrations permitted to meet good CR. Global CR obtained with analytical control is satisfying with our acceptance range which is large. This study should be reproduced with an acceptance range restricted to ±10%. Photographic controls are a simple and efficient method to complete analytical controls; however it does not strictly ensure the quality of final preparation.

Conclusion: The implementation of quality controls for all pediatric cytotoxic drugs preparations requires solving many issues: low doses, low volumes, high or low concentrations. Our aim was to have one efficient control available for each cytotoxic preparation. Analytical and photographic control allowed us to partly reach this goal but still some issues persist to improve children safety.

NO CONFLICT OF INTEREST

Posters in the Spotlight: Poster in the Spotlight II

104 POSTER (BOARD 005) VORINOSTAT REPRESSES NEURAL MARKERS IN GLIOBLASTOMA CELLS AND INDUCES TRANSDIFFERENCIATION TOWARD MURAL LINEAGE

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Background: Glioblastoma multiforme (GBM) is the most frequent primitive brain tumor. GBM has a high recurrence and mortality. Cancer stem-like cells are arguably responsible of the great resistance of the tumor against chemotherapy and radiotherapy. In order to identify new therapeutic strategies targeting stem cells, and therefore to improve the overall survival rate of patients, we investigated the effects of a histone deacetylases inhibitor, the suberoylanilide hydroxamic acid (SAHA) or vorinostat on glioblastoma cells.
Material and Methods: We used murine (GL261) and human (U87 and GBM6 stem cells) cellular models. The cell proliferation was assessed by MTT tests, the migration by the 24 hours Transwell technic and by wound/healing tests. The expression levels of proteins of interest were assessed by Western Blot.
Results: Vorinostat inhibited the proliferation and the migration of the three cell lines mentioned above at levels below the EC_{50} (GL261: EC_{50} = 6,3 mM; U87: EC_{50} = 2,2 mM; GBM6: EC_{50} = 0,43 mM, respectively). Moreover, vorinostat, delivered at levels below the EC_{50}, decreased the expression rate of differenciation markers of astrocyte, neuronal and oligodendrocyte lineages (GFAP, b3 Tubuline and CNPase, respectively). It simultaneously increased the expression level of EGFR, PDGFR and SMA, all markers of the differentiation of the mural lineage. Finally, we studied the effects of vorinostat in association with temozolomid, first line treatement used against glioblastoma. Our *in vitro* cytotoxicity results in U87 cells showed a potentiation of the temozolomid activity in the EB1 over-expressed cells which is a factor of poor prognostic for patients carrying a glioblastoma.
Conclusions: Vorinostat has an antitumor effect on the glioblastoma cells. In addition to its anti-migration and anti-proliferation activities, it induces a trans differentiation of the glioblastoma cells from the neural to the mural lineage. According to the hierarchy model, this trans differentiation could allow to sensitise these cells to anti-cancer treatments. Moreover, the increase of EGFR and PDGFR suggests a potential positive association of the tyrosine kinase inhibitors of those receptors. The vorinostat could therefore represent an interesting therapeutic option that could be used for patients carrying a glioblastoma and that are in treatment failure.
NO CONFLICT OF INTEREST

105 POSTER (BOARD 006) POTENTIAL DRUG COST SAVINGS ASSOCIATED WITH LYMPHOMA CLINICAL TRIALS

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Introduction: The recent booming of expensive cancer therapies generates an exponential growth in health care expenses. In clinical trials, most investigational and some standard drugs are provided free of charge by industrial and academic sponsor. Therefore, public health insurances are not charged with the cost of standard treatment, which would have been administered if the patient was not enrolled in the trial. This study aims to evaluate potential cost savings associated with the enrolment of lymphoma patients in clinical trials for public health insurances.
Material and Method: This study was conducted in a French 1000-bed university hospital (Hospices Civils de Lyon, France). A retrospective screening was performed to identify all patients enrolled from January 01st, 2011 to December 31, 2016 in a phase III clinical trial evaluating a first or second line treatment of lymphoma. Only patients who received at least one provided cycle (active drug or placebo) were included. Costs savings were calculated by multiplying the number of whole cycles received by each patient by the cost of a standard treatment cycle. For each trial, the control arm treatment was used as standard treatment. Cost data was obtained using French National Health Insurance reimbursement rates.
Results: The 110 selected patients were enrolled in 15 clinical trials, among which 8 were academic trials (63.6% of patients). Evaluated drugs were first-line (7 trials) or second-line (8 trials) cancer therapies. In 5 trials (59 patients), the investigational drug was received in addition to an unprovided standard treatment, making any cost-saving impossible. For the 10 remaining trials (51 patients), enrolment led to the administration of 343 free of charge treatment cycles, generating 854 204 euros in cost savings for public health insurance. Cost savings per patient averaged 16 679 euros for 6.7 provided cycles, ranging from 73.8 euros (1 cycle) to 51 679 euros (7 cycles). Cost savings were mainly associated to rituximab (86.4%). Academic trials accounted for 18.6% of total cost savings, despite experimental drugs not being systematically provided.
Conclusion: Overall, enrolling lymphoma patients in clinical trials, whether industry-sponsored or academic lead to significant cost savings for public health insurances. The saving amounts reflect standard treatment costs, already expensive and set to considerably increase in the future when new generations of anticancer therapy are established as standard of care.
NO CONFLICT OF INTEREST

106 POSTER (BOARD 007) EVALUATION OF CLINICAL PHARMACIST'S CONTRIBUTION IN A FRENCH CANCER CENTER: CLINICAL IMPACT AND COST-SAVING

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The study's purpose was to evaluate the contribution of the clinical pharmacists in the chemotherapy production unit of Léon Bérard Center where 80,000 preparations are produced annually. The prescribing medication orders (PMO) are totally computer-based, leaving an inherent residual risk of error related to this tool. In the French Healthcare System (FHS) based on the activity payment mode "T2A", the expensive and innovative drugs are reimbursed on the accordance to the national guidelines of their proper use.
We conducted a prospective study from 2015 to 2018 to analyse the errors in medication prescriptions (EMP). The potential clinical impact of the interventions was quoted according to the Hatoum scale (1). A cost-saving evaluation of pharmacist's reported intervention according to the appropriate use of the antineoplastic drugs was conducted. The avoided costs were determined by estimating the average period of an antineoplastic treatment based on the pivotal studies. A formulary was completed for each intervention and a database was filled. Some results had to be excluded because of a failure in the coding system.
A total of 88,649 prescriptions were analysed. The estimated incidence of the EMP was 1.8%, i.e. 18 errors per 1000 PMO, with a significant or very significant potential clinical impact in 88.2% and 10.4% of cases respectively. A potential life-threatening impact was detected in 4 cases (0.25%). The average age of the patients was 62 years old. Eighty three percent of the interventions were related to solid tumors and 17% to hematological cancer. The most common type of error was related to antineoplastic drug dosage (64.2%). Eighteen percent of the EMP were directly linked to the PMO (inappropriate therapeutic protocol, non-respect of the multidisciplinary board meeting's decision, inadequate interval between two cycles). The other EMP were related to double-PMO (10.2%), a biological parameter as an altered glomerular filtration rate or a clinical disorder (4.7%) and an incorrect size/weight (2.5%). The pharmacist's intervention led to a modification in 85% and to a cancellation of the PMO in 15% of the cases. Inappropriate use of T2A antineoplastic agents (Rituximab, Bevacizumab, Liposomal Doxorubicin…) were stopped in 18 cases. In our FHS, this contributed to an estimated cost-saving of 314,871€. If an institution does not respect their contract with the health authorities regarding the appropriate use of drugs, there is a penalty fee that can be very important: up to 1 to 30% of the value of the annual reimbursement of the T2A drugs (24M€ in 2017 in our centre).
Significant health disorders can be avoided by preventing medical errors and a decrease in the healthcare costs can be managed by the clinical pharmacist's competence by preventing the misuse of the drugs.
(1) H.T. Hatoum and al, Drug Intell. Clin. Pharm. 22 (1988) 980–982.
NO CONFLICT OF INTEREST

107 POSTER (BOARD 008) RELATIONSHIP BETWEEN MUTATIONS IN THE HSD3B1 GENE AND RESPONSE TIME TO ANDROGEN DEPRIVATION THERAPY IN THE TREATMENT OF PROSTATE CANCER

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Background: *Chang et al. (2013)* described a variant (1245A> C) in the HSD3B1 gene that encodes 3β-hydroxysteroid dehydrogenase (3β-HSD), an isoenzyme expressed mainly in the peripheral prostatic tissue responsible for catalyzing the conversion of the androgen precursor dehydroepiandrosterone (DHEA) to Dehydrotestosterone (DHT). This allele leads to a reduction in the process of ubiquitination and degradation of the enzyme, producing, therefore, an increase in the amount of the enzyme with the consequent increase in the rate of conversion to DHT. This fact has recently been related (*Hearn et al* (2016)) with faster progressions to androgen deprivation (ADT).
The aim of the present study was to analyze the presence of mutations in the HSD3B1 gene with the efficacy of TDA in patients with prostate cancer.
Methods: Prospective, unicentre and observational study of one year was carried out. Subjects were patients diagnosed of prostate cancer who received treatment with ADT.
The rs1047303 of the HSD3B1 gene was analyzed. DNAg extraction was performed from a drop of blood according to the method *Ramos et al.* (2015). The characterization of the HSD3B1 gene was carried out using the *LightClycler* 480 platform and fluorescent probes specific for the HyProbe allele.
The effectiveness of the treatment and the influence of the polymorphisms was analyzed as progression free survival (PFS) using a log-rang and Kaplan-Meier statistical analysis by the *SPSS* computer program.
The patients signed an informed consent to carry out the genetic determination.
Results: 44 patients were included, with an average age of 71.6 years. Allele frequencies were: 0.59 for the wild-type allele and 0.41 for the mutated allele.
Mutated patients for the HSD3B1 gene present a median progression free survival to ADT lower than those with wild-type genotype; 24 and 57 months, respectively ($p = 0.038$).
Conclusions: Our results suggest that the presence of the mutated allele (1245A> C) of the HSD3B1 gene (40% of the studied populations), is shown as a negative predictive factor for ADD. This analysis provides the clinician responsible for the patients with a tool for personalizing the treatment, thus enabling WT patients to space their consultations, and conversely, in patients with a mutated genotype, a closer follow-up.
NO CONFLICT OF INTEREST

Poster Session: Automation/robotics

108 POSTER (BOARD 009) IMPLEMENTATION AND QUALIFICATION OF AN AUTOMATED COMPOUNDING SYSTEM IN A FRENCH ANTI-CANCER CENTER

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Introduction: Chemotherapy compounding in France is under hospital pharmacists responsibility. In order to deal with several risks related to the process and to face with an ever-growing activity, the Clinical Pharmacy Department of Gustave Roussy Institute (IGR) implemented recently for the first time in France, the automated device APOTECAchemo® (Loccioni) for Intravenous (IV) anti-cancer therapies compounding. Before implementing the robot in a routine setting, Installation (IQ), Operational (OQ) and Performance Qualification (PQ) have been performed. We describe hereafter the PQ performed.
Material and Method: According to Good Preparation Practices (GMP) requirements, the PQ has been performed in order to ensure the sterility of the automated compounding process. The protocol includes: Media Fill campaign; continuous air particle monitoring; microbiological surface and air contamination sampling; simulation of real drug preparations, for the gravimetric and analytical dosage verifications on reconstituted powder drugs, cyclophosphamide IV bags and 5-FU infusors.
Media Fill campaign allows to assess both the aseptic compounding process and to qualify the personnel. The protocol has been executed over three consecutive days on two shifts per day (one operator/shift). During each shift, 16 IV bags were prepared using growth medium TSB (Oxoid®) and prefilled 50, 100 and 250 mL 0.9% NaCl polyolefin IV bags (Freeflex®, Fresenius) in order to reproduce the production activity on routine setting. Testing preparations were incubated for 14 days at 30°C and inspected for turbidity every day. Acceptance criteria were no growth of microbiological organisms by visual inspection. A positive sample has been performed in order to confirm the reliability of the checking.
Airborne contamination was monitored with settle plates both during the compounding and at the end of each shift (respectively on 6 and 3 sampling points), while microbial surface contamination was evaluated with contact plates at the end of each day (on 13 sampling spots), for a total of 93 plates.
Results and Discussion: After 14 days, none of the 96 media-filled bags inspected showed turbidity. The results of the air and surface microbiological controls assess the compliance of the system with the GMP Grade A. Only one outlier was recorded (1/93 plates), resulted to be a false positive contaminated during the following plate manipulation.
The analytical control of dosages of reconstituted vials and IV therapies was compliant with the acceptance criteria (+/-10% of the requested dose); similar results were obtained for the gravimetric control performed with the infusors.
Conclusion: Performance qualification of the robot demonstrated the aseptic and reliable compounding process: The go live with real production started in February 2018, in accordance with GMP requirements.
NO CONFLICT OF INTEREST

109 POSTER (BOARD 010) AUTOMATED COMPOUNDING OF 5FU ELASTOMERIC PUMPS: FILLING ACCURACY USING TWO PERISTALTIC PUMPS

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Backgroung: Preparation of 5-fluorouracil (5FU) elastomeric pumps is hazardous (many manipulations), time-consuming and induces repetitive strain injury (RSI). To reduce these risks, we have developed an automated filling process based on two peristaltic pumps (one for the diluent, one for the cytotoxic drug).
The aim of this study was to determine accuracy of this new filling process.
Materials and methods: Two Repeater® pumps (A and B; Baxter H938099E) were used and calibrated with 50 mL syringes every morning before analysis. Pump A was used only for saline (from 10 mL to 265 mL) and pump B for the 5FU (in addition to the diluent, from 265 mL to 10 mL). These 2 pumps were connected together by a Y-connector with 2 one-way valves (ICU Medical CH-70). Elastomeric pump was plugged into the last way of the Y-connector. So, for the infuser filling, only 2 steps were needed, diluent filing with the first peristaltic pump and 5FU filling with the second peristaltic pump directly in the device.
In this study, the filling of three elastomeric pumps referenced in our center (Baxter 2C4063K 10 mL/h, Baxter 2C4009K 5 mL/h and Baxter 2C4008K 2 mL/h) and their equivalent (in time) from a competitor manufacturer (AMF AA2010-1 10 mL/h, AMF AA2004-1-S 4 mL/h and AMF AA2011-1-S 2,5 mL/h) were studied.
Accuracy was determined by calculating the total error (in %) which is the sum of the trueness and the precision of filled volume after gravimetric control. For one reference, measurements were performed for 3 different volumes, repeated 3 times at 3 moments of the day for a total of 27 measurements.
Results and Discussion: For all the evaluated volumes and references, total error made by the 2 peristaltic pumps during the filling step was below 2.5% (out of 324 measurements). This new filling process is true and precise.
Conclusion: Thus, using our new system based on 2 peristaltic pumps, the filling of elastomeric pumps for both manufacturers was very accurate. However, time saving, decrease of RSI and money-saving must be assessed before a routine use.
NO CONFLICT OF INTEREST

110 POSTER (BOARD 011) AUTOMATED PRODUCTION AND DOSE BANDING OF INJECTABLE ANTICANCER DRUGS

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Introduction: Against the backdrop of increasing demand of injectable anticancer drugs, the chemotherapy production unit of Mercy hospital undertook to optimize this activity. In most cases, the calculation of cytotoxic drug doses is based on body surface area (BSA) of humans. Another alternative is the dose banding. Standard doses are predetermined and manufactured in advance. The calculated dose for a patient is based on BSA and rounded up or down. The variation between standard and calculated doses is up to 5%. These two methods have been compared in several studies; no significant difference has been shown. Consequently, dose banding seems to be an alternative for drugs with broad therapeutic window or small interindividual variability. The setting up of dose banding at Mercy hospital is by means of a semiautomatic pump: DianaTM II (ICU Medical). This route was chosen to prevent musculoskeletal disorders.
Material and Method: The strategy was to study molecules to standardize, the semiautomatic pump and quality controls as sterile conditions are needed. The choice of molecules was based on selection criteria as annual consumption, stability and cost of product. Then doses and final forms were determined. An operational qualification and a step of production were realized with DianaTM II. A technical analysis about production time; and an economic analysis including labor, pump and consumable costs were assessed. These two studies were also operated on two other pumps: medOC® (ICU Medical) and Repeater® (Baxter) in order to compare them to DianaTM II. Finally, microbiological controls of the environment and a media fill test were carried out.
Results and Discussion: Three molecules were chosen: 5-fluorouracil (5-FU), irinotecan and oxaliplatin. Infusion bag is the determined final form for these molecules, 5-FU is also tested in its infusor form. For each preparation five standard doses cover over 80% of needs. The operational qualification of the DianaTM II pump demonstrated its accuracy and its repeatability. The content drug tests of infusion bags and infusors showed content uniformity. Technical assessment revealed that compared to manual production and the two other pumps, DianaTM II pump is the fastest way to produce infusion bags. For infusors, the manufacturing time of all pumps is similar but still faster than manual method. The economic valuation pointed out that DianaTM II pump is cheaper than the two others but more expensive than manual production (+13%). Lastly, quality controls proved that sterile conditions were respected.
Conclusion: The use of DianaTM II pump is justified. It is an accurate, safe and efficient equipment made for the transfer of hazardous drugs. The additional cost for one preparation is estimated around 0,95 €. Each year the increasing of standardized molecules will lead to the decreasing of the additional cost.
NO CONFLICT OF INTEREST

111 POSTER (BOARD 012) MICROBIOLOGICAL PERFORMANCE OF ROBOT-ASSISTED COMPOUNDING

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Introduction: Compounding of cytostatic drugs requires strict aseptic procedures of pharmacy technicians. In addition, technicians should not be exposed to toxic drugs during routine compounding. Moreover, we aim to minimize the amount of repetitive manual movements of compounding technicians as we want to prevent potential health injuries. Finally, reuse of vials of expensive biologicals may lower the costs of the treatment with these biologicals in our hospitals.
Towards these ends OLVG Hospital purchased a robotic system to automatically compound parenteral cytotoxic drugs (APOTECAchemo). Validation of this system is essential prior to compounding for patient use.
Method: The aseptic compounding of patient individual cytostatic solutions was simulated with media fills to qualify the performance, according to European GMP Annex 1. The performance qualification covered every single step of the aseptic process. This included dissolving, shaking, multi-dose vials and syringe reuse. There were environmental control measurements on critical places with settle plates, contact plates, active air sampling and particle counting. Ninety six simulation preparations were performed in 3 separate production batches, as required by GMP Annex 1. The LNA procedures were applied in a second study, where media fills were used to evaluate the microbiological shelf-life of commercial drug vials after puncturing. At day 1, 2, 3, 6, 7 and 8, 50 syringes of 15 ml were prepared from the same 50 vials. After preparation, vials were covered with an IVA seal upon unloading from the robot to protect against microbiological contamination. Negative and positive controls were included in the analysis.
Results: No microbiological contamination was found in any of the 96 media fill preparations. The particles and the active air samples were within the class A limits. Only the contact plates and settle plates placed on the right side of the loading area did not fully fulfil the class A criteria. We found an average of 3 CFU and 1,17 CFU, respectively.
We found no microbiological contamination in the 300 syringes that were prepared with repeated puncturing. Both negative and positive controls were negative and positive as required.
Conclusions: We conclude that robotically compounding meets the microbiological requirements of the European GMP. In our case, the settle plates and contact plates suggest a review of the current manual procedure during the loading phase. Our validation shows that the robot APOTECAchemo can perform individual compounding of parenteral solutions without risk of microbiological contamination. In addition, our robot can reuse vials repeatedly and safely.
NO CONFLICT OF INTEREST

112 POSTER (BOARD 013) ASSESSMENT OF DOSING ACCURACY DETERMINED USING GRAVIMETRIC CONTROL IN KIRO ONCOLOGY

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Background: An automated system for the preparation of intravenous chemotherapy drugs (KIRO Oncology, KIRO GRIFOLS, Spain) was installed in our hospital pharmacy. This system performs an "in process" gravimetric control associated with an identification of the drug to check the quality of final product before automatic release of the preparations. The aim of this study was to assess if KIRO Oncology's automatic release decisions based on gravimetric control agree with the dosing accuracy determined by means of analytical control with HPLC.
Material and Methods: A 25 mg/mL phenylephrine standard solution was prepared by weighing phenylephrine powder which was then diluted with water for injection. Forty nine preparations of six different standard solution volumes (9 for 0.6 mL; and 8 for 1; 5; 10; 20 and 48 mL) were prepared into 100 mL saline bags using KIRO Oncology, and released automatically when within the 90–110% dosing accuracy range. For each preparation a sample was taken after bag homogenization to determine phenylephrine concentration using HPLC-UV, method that was validated according to ICH guidelines, and calculate dosing accuracy of the preparations. Finally, percentage of preparations for which KIRO Oncology's release decision corresponded to HPLC-UV dosing accuracies within 90–110% was calculated.
Results: The release decision made by KIRO Oncology was confirmed by HPLC-UV for 84% of the preparations: 80% were released and 4% were rejected (two 0.6 mL preparations) by both methods. There was a discrepancy on the release decisions for 8 bags (16%): gravimetric control released the preparations whereas the HPLC control rejected them. These were two 0.6 mL (22%), four 1 mL (50%) and two 5 mL (25%) preparations within 85–90% dosing accuracy based on HPLC-UV. All 10 mL, 20 mL and 48 mL preparations were released by both control methods.
Conclusions: Gravimetric control used by KIRO Oncology is an acceptable method to determine dosing accuracy for the automatic release of preparations. However, variations up to 5% away from the acceptable dosing accuracy limits may appear between gravimetric control and HPLC-UV results for volumes 5 mL and lower. These variations may be related to methodological differences and were considered to be clinically acceptable.
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NO CONFLICT OF INTEREST

113 POSTER (BOARD 014) THE ASSESSMENT OF ENVIRONMENTAL AND CROSS CONTAMINATION IN PREPARING READY-TO-ADMINISTER CYTOTOXIC AGENTS BY A ROBOTIC SYSTEM.

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Introduction: In the OLVG hospital in Amsterdam, the robotic system APOTECAchemo was introduced in 2017 for preparing cytotoxic drugs and

(non-)cytotoxic monoclonal antibodies. Non-cytotoxic mAbs are often administrated in clinical wards such as rheumatology and gastro enterology, where personal protection measures to prevent exposure of health care staff to hazardous substances are less extensive than in the oncology department. Hence, cross-contamination or carry-over of cytotoxic traces to the outside of infusion bags with non-cytotoxic mAbs should be strictly avoided.
The aim of our study was to measure both (cross-)contamination as well as environmental contamination of 5-fluorouracil (5-FU) and cyclophosphamide (CP) during three to five days of drug compounding using the robotic system and compare it with the regular manual compounding procedure in a biological safety cabinet (BSC).
Materials and methods: Eighty infusion bags with 5-fluorouracil, cyclophosphamide or sodium chloride (as a dummy for non-cytotoxic mABs) were compounded using the robot and manually in a cross-over design. Wipe samples were taken from several locations, including gloves, infusion bags, carts, table, compounding area, loading area and BSC. These samples were analyzed for 5FU and CP concentrations using GC/MS/MS. Contamination was determined as traces of cytotoxic agents on the wiped surfaces in ng/cm^2. Cross-contamination was determined by measuring for traces of a previously prepared cytotoxic on the outside of a subsequent dummy sodium chloride preparation.
Results: The total contamination for infusion bags was 3.75% for the manually compounded bags and 2.5% for the bags compounded by the robotic system. For the manual compounding cross-contamination occurred on 2.5% of the prepared infusion bags. There was no cross-contamination found on the infusion bags compounded by the robotic system. Inside the compounding room, 9% of the environmental wipe samples were contaminated in case of manual production in comparison with 14% for robotic compounding. 57% of the contaminated environmental samples for the robotic system were taken after cleaning. Therefore the cleaning procedure for the robotic system was extended, after which contamination after daily cleaning was no longer detectable.
Conclusions: Comparison of both preparation methods showed that (cross-)contamination of infusion bags was lower by using the robotic system. Moreover, cross-contamination to non-cytotoxic preparations was completely absent when compounding with the robot. With regard to the environmental contamination, the initial cleaning procedure for the robot had to be optimized and extended to attain levels of contamination in the same order as with manual compounding.
NO CONFLICT OF INTEREST

Poster Session: Basic Research

114 POSTER (BOARD 015) ANTICANCER EFFECTS OF AG NANOPARTICLES CONJUGATED WITH THIOSEMICARBAZIDE ON BREAST CANCER CELL LINE

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Background: Thiosemicarbazones are compounds with great variety of biological properties. Currently, the principal aim of researchers is to enhance their antitumor activity. A metal complex of Ag nanoparticles (Ag NPs) – Thiosemicarbazide (TSC) has been synthesized and successfully characterized using various spectro-analytical techniques.
Material and Methods: The Ag NPs –TSC was determined by SEM, TEM and Fourier Transform Infra-Red (FTIR) spectroscopy analysis. The cytotoxicity effect of Ag NPs –TSC was performed using MTT assay toward human breast cancer *T47D* cells. Moreover, Ag NPs –TSC induced-apoptosis was assessed using Hoechst staining, *Caspase-3* assay and flow cytometry analysis.
Results: The TEM and SEM images revealed that the Ag NPs –TSC varied in morphology with mean size of 60 nm. FTIR showed that the Thiosemicarbazide conjugated to Ag nanoparticles. The MTT assay result of Ag NPs –TSC indicated that the cell viability was in a dose dependent manner. It was found that Ag NPs –TSC induce the apoptosis of *T47D* cell through an increase in *Caspase-3* and nuclear fragmentation. Moreover, the percentage of early and late apoptotic cancer cells was increased as compared to untreated cells.
Conclusion: Our investigation showed that the Ag NPs –TSC can inhibit the proliferation of *T47D* cells by triggering apoptosis pathway and suggesting a new approach for treatment the Breast cancer.
NO CONFLICT OF INTEREST

115 POSTER (BOARD 016) EVALUATION THE CYTOTOXICITY EFFECT OF BIOSYNTHESIZED SLIVER NANOPARTICLES USING LAURENCIA CASPICA EXTRACT AGAINST BREAST CANCER CELL LINE

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Background: Over the last few years, Silver nanoparticles (AgNPs) have attracted considerable attention owing to their anti-angiogenesis and anti-cancer activity. The aim of this study was to evaluate the cytotoxicity effects of biosynthesized AgNPs by using *Laurencia caspica* macroalgae on human breast cancer (T47D) cells.
Material and Method: In this study, the biosynthesis of AgNPs by using *Laurencia caspica* was evaluated. The characterization of developed AgNPs was performed by Ultraviolet-visible (UV-vis) spectroscopy, Fourier-transform infrared spectroscopy (FTIR), X-ray diffraction (XRD), Scanning Electron Microscopy (SEM), and Transmission Electron Microscopy (TEM). The T47D and MRC-5 cell lines were treated with various concentrations of fabricated AgNPs for 24 and 48 hours. The viability effect of cells and Half maximal inhibitory concentration) IC_{50} (were evaluated by MTT assay. The fabricated AgNPs were monitored characteristic surface Plasmon resonance peak at around 420 nm.
Results: The SEM and TEM results for size and morphological study of AgNPs was showed that the nanoparticles were spherical shape and ranging from 10 to 50 nm. The MTT results demonstrated that AgNPs significantly decreased the viability of cells in dose-and time-dependent manner. The IC_{50} value of nanoparticles for T47D and MRC-5 cell lines were calculated 29.37 mg/mL and 42.13 mg/mL during the 48 hours, respectively.
Concluion: Based on the current study, the biosynthesized AgNPs can more cytotoxic effect against breast cancer cells compared to the normal cells. Thus, they can be considered as a promising strategy for the treatment of breast cancer.
NO CONFLICT OF INTEREST

116 POSTER (BOARD 017) QUALITY OF LIFE OF PATIENTS WITH EARLY-STAGE BREAST CANCER ON HORMONAL TREATMENT

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Background: Reviewing the concept of quality of life (QoL) in the field of medical oncology and investigation of the factors influencing the QoL of women with breast cancer on hormonal treatment in the domains of the biomedical, psychological and social difficulties they may face.
Material and Methods: The study was conducted at Uni Hospital, Panagyurishte, on a sample of 49 women who had been diagnosed with breast cancer. The patients were tested at the beginning of their treatment and then once again, three months later. Their quality of life was assessed using the questionnaires QLQ-C30 and QLQ-BR23, developed by the European Organisation for Research and Treatment of Cancer and standardized for the Bulgarian population.
Results: The statistical data show that the QoL tested at the beginning of treatment is lower than the level assessed during the second implementation of the questionnaires, three months later. A significant improvement on almost all components of the questionnaires was observed. This would indicate that the type of treatment, along with the provided psychosocial help, have successfully improved the overall QoL of the patients during the treatment. The results also show that the QoL of the patients who had undergone hormonal therapy is higher than the QoL of the patients who had only received standard chemotherapy. This marked improvement leads to a higher adaptive functioning of the individual, thus contributing to a more successful treatment in general.
Conclusions: Quality of life is a concept which gives great insight into the way patients deal with a cancer diagnosis and the subsequent treatment. A deeper understanding of the concept would offer significant assistance to oncology specialists of various fields.
NO CONFLICT OF INTEREST

117 POSTER (BOARD 018) BARRIERS AND ENABLERS FOR IMPLEMENTING A MODEL OF ATTENTION AT HOME FOR CHEMOTHERAPY ADMINISTRATION IN BOGOTA D.C

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Background: This research reflects the problematics faced by different health systems in the diagnosis, treatment and palliation of cancer. Among the problems identified, there is a gradual increase in the number of cases per year directly associated with the aging of the population and a limited number of health care centers. Colombia is no stranger to these situations, which is why it's necessary to think of a strategy to solve these needs; the Attention at Home Model (AHM) emerges in other countries as a solution to the not oportune treatments cycles and as an improvement of the quality of life of cancer patients. Therefore, this research aims to know the perception of the health team and patients about the applicability of this model in Colombia.
Materials And Methods: A revision of the current regulations was carried out to analyze the viability of this model. In addition, a systematic review was carried out and a qualitative research study was implemented through focal groups to health professionals, patients and caregivers, and finally, the Tanahashi model was implemented to analyze the results.
Results: The review allowed to observe that the AHM implemented in other countries offered these services: patient education, nursing care, communication program, caregiver education and closer health care centers. In 80% of the articles the result in the improvement of the patients' quality of life was established as the greatest impact result. On the other hand, the revision of the regulations showed that it's not contemplated, but it isn't approved in Colombia either. Regarding the focal groups, a total of 62 barriers and 76 enablers were found. The barriers according to the analysis by the Tanahashi model correspond to the following attributes: 16 associated for contact, 31 for accessibility, 12 for acceptability and 10 related to availability.
Conclusions: Within the enablers expressed by the participants of the focal groups, those with the greatest impact are: improvement of the patients' quality of life, reduction of out of pocket expenses, reduction of travels, closeness to their family nucleus and the option of not losing daily life activities. Within the barriers found and analyzed by the Tanahashi method, the one that had the most relevance was related to accessibility to health systems for diagnosis, treatment and palliation of the disease.
NO CONFLICT OF INTEREST

Poster Session: Clinical pharmacy/pharmaceutical care

118 POSTER (BOARD 019) EVALUATION OF TRABECTEDIN SAFETY AND EFFECTIVENESS AT A TERTIARY CANCER CENTER AT QATAR: A RETROSPECTIVE ANALYSIS

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Background: Trabectedin is a is a potent marine-derived antineoplastic drug which binds to the minor groove of the DNA, bending DNA towards the major groove resulting in a changed conformation that interferes with several DNA transcription factors, repair pathways, and cell proliferation. Trabectedin was approved by the European Medicines Agency for the treatment of adult patients with advanced–stage soft tissue sarcomas in whom treatment with anthracyclines and ifosfamide has failed, or for those who are not candidates for these therapies. The purpose of this study was to comprehensively review available data on the safety and efficacy of trabectedin used as indicated for patients at a Tertiary Cancer Center at Qatar
Methods: A medication administration report generated in the electronic health record identified all patients who received trabectedin between November 1, 2015, and November 1, 2017. This retrospective chart review evaluated the indication of trabectedin use, compliance to administration protocol and the recommended monitoring parameters, the number of patients improved on the drug and continued treatment, the number of patients discontinued treatment due to side-effects and the reported side effects. Progress and discharged notes were utilized to report experienced side effects during trabectedin therapy. A total of 3 patients were reviewed.
Results: Total of 2 out of 3 patients who received trabectedin were receiving it for non-FDA and non-EMA, approved indications; metastatic rhabdomyosarcoma and ovarian cancer stage IV with poor prognosis. And only one patient received it as indicated for leiomyosarcoma of the left ureter with metastases to liver, lungs, and bone. None of the patients has continued the therapy due to development of serious side effects. One patient had stopped the medication after one cycle due to disease progression and transient hepatic toxicity, the other one had disease progression and developed 12% reduction in LVEF after 12 cycles of trabectedin, and the third patient deceased, had disease progression on trabectedin after the 10th cycle that was received through peripheral line which resulted in developing extravasation and left arm cellulitis requiring debridement. Regarding monitoring parameters, at baseline, the three patients had ECHO and Creatine Phosphokinase but it was not monitored during treatment as recommended
Conclusion: Utilizing this medication as indicated by performing the appropriate monitoring parameters as recommended can benefit patients who are receiving it. It is important to reinforce the intravenous administration via central intravenous line, the re-assessment of left ventricular ejection fraction by echocardiogram or multi-gated acquisition scan at 2- to 3-month intervals thereafter until therapy is discontinued, and CPK and LFTs levels prior to each administration of trabectedin.
NO CONFLICT OF INTEREST

119 POSTER (BOARD 020) TEMPORARY OR PERMANENT INTERRUPTIONS OF ANTI-PD1 FOR TOXICITY REASONS

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Background: Anti-PD1, nivolumab and pembrolizumab, are immune checkpoint inhibitors that potentiate the anti-tumor T-cell response. These immunotherapies are associated to new toxicities that require careful monitoring and, depending on their severity, can lead to temporary or permanent discontinuation[1]. This study aimed to assess temporary or permanent discontinuation of anti-PD1 for toxicity reasons.
Material and Method: This retrospective single-center observational study included all patients treated with nivolumab or pembrolizumab who have started their treatment between January 2015 and May 2017 at the Lyon Sud Teaching Hospital (Hospices Civils de Lyon, France), identified By clinical pharmacists in oncology using the pharmaceutical software dedicated to anticancer preparation. Patients were followed until November 2017. Immunotherapy-related toxicities and their management were collected from medical records.
Results and Discussion: A total of 278 patients with an average age of 63.8 years [26–93] were included. They were treated for melanoma (48%), non-small cell lung cancer (47%), clear cell renal cell carcinoma (3%), or refractory Hodgkin's lymphoma (2%) with nivolumab for 79% of them and pembrolizumab in 21% of cases. Median number of cycles was 5.5 [1–64]. 144 patients (51.7%) had at least one adverse event reported, the most common being dysthyroidism (11.9%), rash (9.4%), asthenia (9%), diarrhea (8.3%) and arthralgia (7.6%). Immunotherapy has been suspended for 21 patients (7.6%) and permanently stopped due to an adverse effect in 16 patients (5.8%) at a median of 69 and 61 days respectively after initiation of treatment. The median duration of temporary interruption was 20 days [4–120]. The main reasons for suspension of treatment were gastrointestinal toxicities (4 diarrheas and 2 colitis), renal toxicities (3 renal insufficiencies and 1 nephritis) and hepatic toxicities (4 cytolysis and/or cholestasis). The main reasons of discontinuing treatment are renal toxicities (5 nephritis), hepatic toxicities (2 hepatitis, 1 cholecystitis and 1 cholangitis) and 3 inflammatory pneumonitis. One case of erythroblastopenia and 1 acute necrotizing vasculitis were described and were responsible of a permanent discontinuation. No death has been reported.
Conclusion: More than 1 patient on 10 require a temporary or a permanently discontinuation of the anti-PD1 therapy for toxicity reasons. Early recognition and management of anti-PD1 side-effects are believed to be important in mitigating severity of these events and duration of the temporary discontinuation of these treatments. These results highlight the necessary of a general approach to toxicity management with a good communication between health professionals and patients to ensure the safe and appropriate use of anti-PD-1 agents.
1. Oncologist. 2016
NO CONFLICT OF INTEREST

120 POSTER (BOARD 021) USE AND SUPPLY PROCEDURE OF URIDINE TRIACETATE FOR ACCIDENTAL 5-FLUOROURACIL OVERDOSE: A CASE REPORT

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Background: Life-threatening 5-fluorouracil (5-FU) overdose mainly occur because of infusion pump errors. 5-FU-related toxicities include haematological, digestive and cutaneous features. Uridine triacetate (Vistogard®) is an antidote for 5-FU, approved by the Food and Drug Administration in 2015. It is available in France via an individual Authorization for Temporary Use (ATU) and is distributed by Wellstat Therapeutics Corporation (WTC™), based in the USA. We report the management and supply procedure using uridine triacetate for an accidental 5-FU overdose.
Material and Methods: A 64-year-old woman with a metastatic pancreatic adenocarcinoma was due to receive a FOLFOX therapy, consisting of oxaliplatin 85 mg/m2 as a 2 h infusion in Y with folinic acid 400 mg/m2, followed by 5-FU 400 mg/m2 bolus on day 1 and 5-FU 1200 mg/m2 as a 22 h infusion on day 1 and day 2. Due to a confusion between the infusion rate of 5-FU and oxaliplatin the patient received 1750 mg of 5-FU as a 2 h infusion instead of a 22 h. A dihydropyrimidine deshydrogenase (DPD) deficit had not been preemptively searched for. The patient was admitted in an intensive care unit for monitoring.
Results: Acute 5-FU toxicity is proportional to plasma 5-FU exposure, which depends on both dose and infusion rate. A severity score can be calculated: it was 4.4 in this patient. A score between 4.0 and 4.5 suggests a high probability of severe, life threatening toxicities. A DPD deficiency could worsen the prognosis. No immediate signs and symptoms were observed, but according to this severity score, we decided to begin treatment emergently. To obtain the antidote, an oral consent for an ATU needs to be granted. As it is not yet available in Europe, WTC™ must be contacted. It will confirm the need for treatment, depending on demographic characteristics and information about 5-FU overdose. The use of uridine triacetate is part of an open-label protocol. To administrate it as soon as possible is very important, as a profound therapeutic benefit can be obtained with a maximum delay of 96 hours after the 5-FU overdose. We received uridine triacetate 2 days after overdose. The regimen is of 10 g orally every 6 hours for 5 days. No complication was observed in this patient who was discharged from the hospital 4 days after the overdose and received a new FOLFOX therapy 12 days later without adverse event.
Conclusions: 46 hours elapsed between 5-FU overdose and antidote administration because of geographic and administrative constraints. A stock in France could shorten this delay to 24 hours (via drugs importers) and give the best chance for patients in this situation. New French recommandations advise to screen DPD deficiency before initiating any chemotherapy containing 5-FU or capecitabine and are going to change clinical practice. However, this wil not solve the problem of accidental 5-FU overdose.
NO CONFLICT OF INTEREST

121 POSTER (BOARD 022) PATIENTS TREATED WITH PD-1 CHECKPOINT INHIBITORS: IMMUNE-RELATED ADVERSE EVENTS TO INFLUENZA VACCINE

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Background: Cancer patients are at risk to develop complications when infected with seasonal influenza viruses, so it is recommended to vaccinate this population. A hypothesis maintains the influenza vaccine results in an overshooting immune response in patients undergoing PD-1 blockade. In this study, we aimed to evaluate the relationship between the presence of immune-related adverse events (irAEs) and influenza vaccine.
Material and Methods: We included 42 patients undergoing PD-1 blockade: mostly with non-small-cell lung cancer (n = 22), but also with melanoma (n = 10), renal cell carcinoma (n = 7), head-and-neck cancer (n = 2) and breast cancer (n = 1). Half of the patients (n = 21) were vaccinated with an inactive influenza vaccination between October 2017 and January 2018 and the other half (n = 21) performed as a control cohort. Through *Farmis-Oncofarm* and *Diraya* applications we analyzed the following parameters: age, sex, diagnosis, vaccination date (if applicable), start date of anti-PD-1 treatment and presence or absence of irAEs, such as pneumonia, colitis, hypothyroidism, liver or renal dysfunction, skin rash, vitiligo, type 1 diabetes, myasthenia gravis or neuropathy, among others.
Results: We included 42 patients, 27 men and 15 women, with a mean age of 64.2 years.
On the one hand, 21 patients were vaccinated: 20 in treatment with nivolumab and 1 with pembrolizumab. 11 patients had a diagnosis of non-small-cell lung cancer, 5 patients had melanoma, 3 patients had renal cell carcinoma and 2 had head-and-neck cancer. In total, 15 patients (71.4%) experienced an adverse event, and 9 of them (60%) were irAEs. The most common irAE reported were skin rashes, observed in four patients. Other irAEs reported, but only in one patient for each, were: nephritis, hypothyroidism, neuritis, liver dysfunction, renal dysfunction and psoriasis exacerbation. 4 patients did not experience any irAE and 2 patients stopped PD-1 inhibitor treatment during the study.
On the other hand, 21 patients were not vaccinated: 19 in treatment with nivolumab and 2 with pembrolizumab. 11 patients had a diagnosis of non-small-cell lung cancer, 5 patients had melanoma, 4 patients had renal cell carcinoma and 1 had breast cancer. In total, 16 patients (76.2%) experienced an adverse event, and 14 of them (87.5%) were irAEs. The most common irAEs reported were skin rashes (observed in 7 patients), hypothyroidism (5 patienst) and ocular toxicity (4 patients). Other irAEs reported were: pancreatitis, arthritis, pericarditis, liver dysfunction, and vitiligo. 5 patients did not experience any irAE.
Conclusions: No significant association between influenza vaccination and presence of irAEs was observed. Furthermore, the irAEs rate was higher in the control group. Evaluation in a larger population is required in order to understand mechanisms involved and its significance.
NO CONFLICT OF INTEREST

122 POSTER (BOARD 023) CLINICAL ONCOLOGY PHARMACY: IMPLEMENTATION AND DRUG-RELATED PROBLEMS

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Background: The drug-drug interactions (DDIs) are multiple between antineoplasics and regular medicines (RM). Cancer patients often receive multiple and concurrent medications and health care professionals are not always aware about others treatments 'patients. Clinical oncology pharmacy can resolve these problems. The purpose of this study is to develop the clinical oncology pharmacy and to evaluate the time required for this activity. Secondary objective is to assess the DDIs or drug-related problems (DRPs) between antineoplasics, RM and premedication treatment.
Material and Method: Study prospective, single-center from 17/07/01 to 17/10/31. Patients receiving oral or intravenous chemotherapy and hospitalized in day or week hospitals are included. In the first part of study (July-August), only patients of pneumology are included. All patients are include for September-October. Reconciliation medication and pharmaceutical consultation are realized. The pharmacist assesses the appropriateness, necessity, effectiveness, and safety of medication and intervenes when it is appropriate. Cancer treatment (side effects, process¼) is explained. A summary of the consultation is written and send to regular doctor and community pharmacies. Treatment (RM, chemotherapy and premedication) are analyzed with Drugs.com, Thériaque®, GPR®. Pharmaceutical interventions are classified according to a qualitative instrument developed by French Society of Clinical Pharmacy.
Results: A total of 72 pharmaceutical consultations is conducted: 44 pneumology patients, 15 hematology patients, 13 gastroenterology patients. The mean age of patients is 66 ± 11 years. 16 minutes per patient are required to achieve a reconciliation medication, 26 minutes for pharmaceutical analysis, 22 minutes for pharmaceutical consultations and 20 minutes to write a pharmaceutical note. Activities of clinical pharmacy represent 1h27 per patient approximately 120 h for 72 pharmaceutical consultations. 330 DRPs are detected: 149 RM, 100 between antineoplasics and RM, 81 between premedication and RM. The mean of RM is 7 ± 4 per patient. 304 of DRPs are DDIs: 98 antineoplasics/RM, 81 premedication/RM and 295 requiring a therapeutic monitoring. The most common drugs involved in DDIs antineoplasics/RM are: Cisplatin (n = 39), Carboplatin (n = 12) and Etoposide are most involved. DDIs antineoplasics; Nervous system drugs (n = 32), HMG-CoA reductase inhibitors (n = 19), proton pump inhibitors (n = 17).
Conclusion: Time for this activity is approximately 0.2 full-time equivalent. Clinical oncology pharmacy contributes to optimize safe of drugs. The pharmacists, by providing medication information to patients, contribute

to the improvement of patient adherence and seamless care. A secondary study is being planned to assess the clinical and economic impact.
NO CONFLICT OF INTEREST

123 POSTER (BOARD 024) TRASTUZUMAB-ASSOCIATED INFUSION-RELATED REACTIONS: COULD PATIENT MONITORING TIME AFTER INFUSION BE REDUCED?

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Introduction: Trastuzumab is a humanized monoclonal antibody used for the treatment of HER2-overexpressing cancer. It is associated with infusion-related reactions (IRR), that are described in the literature with an incidence ranging from < 1% to 40% of the patients and a varying severity. The summary of product characteristics recommends monitoring the patient for 6 hours after the first dose and for 2 hours after subsequent infusions, which is difficult to achieve in practice. In our study, we report the incidence and the type of IRR in a real-life cohort of patients and discuss the relevance of a clinical monitoring after infusion.
Material and Method: We realised retrospective analysis on prospective data collected on patients who received trastuzumab in Georges Pompidou Hospital (Paris, France) between August 2003 and June 2017. Using the institutional database, we searched for computerized reports of incidents related to adverse effects. Data were analysed using descriptive statistics and medical notes documenting trastuzumab reactions rated according to the National Cancer Institute Common Terminology Criteria for Adverse Events, were reviewed.
Results and Discussion: The sample size consisted of 314 patients with a median age of 56 years (Q1-Q3, 45–65 years) at the first dose. Three reports of IRR were documented out of a total of 5,146 doses (i.e. 0,96% of patients and 0,06% of doses) for 3 different patients. The IRR occurred during the first, 12th and 15th administration, each time during an intravenous infusion. A severe high blood pressure (grade 3), bradycardia (grade 2), dyspnea (grade 2) and fever with chills (grade 1) were observed. Out of these 3 reports, one was post-imputed to premedication and not to trastuzumab. Regarding the two others, the infusion was stopped and patients received medical care. In one case, effects were moderate and treatment with trastuzumab could be continued. In the 2nd case, IRR appeared during the first administration and was graded as severe (grade 3). Trastuzumab was permanently discontinued. These results are similar to recent reviews: post-marketing surveillance data from the manufacturer showed that 0.3% of patients had severe IRR and a study found IRR in 1.8% of administrations (197 patients) mostly during the first dose and no IRR rated more than 2. Our study represents a reporting bias that underestimates the potential impact of mild-to-moderate adverse reactions.
Conclusion: These results confirm that severe trastuzumab-associated IRR are rare and usually appear during the infusion, especially the first one. No IRR has been reported after the infusion. Even if a prospective study should be conducted to confirm these results, we could consider reducing the patient's observation time after infusion and provide advice to the patients, in line with other medical team's recommendations.
NO CONFLICT OF INTEREST

124 POSTER (BOARD 025) EVALUATION OF SAFETY AND EFFICACY OF CRIZOTINIB AT A TERTIARY CANCER CENTER IN QATAR: A RETROSPECTIVE ANALYSIS

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Introduction: Crizotinib, a Receptor Tyrosine Kinase Inhibitor, blocks the activity of ALK or ROS1, reducing the growth & spread of cancer in ALK-positive or in ROS1-positive NSCLC.
Crizotinib is approved by FDA & EMA for the treatment of ALK or ROS1 positive metastatic NSCLC.
The recommended dose is 250 mg oral capsule twice daily. according to certain severe side effects, dosage adjustment or medication discontinuation might be required.
The most serious adverse reactions are hepatotoxicity, ILD, neutropenia. The most common adverse reactions are visual disturbance, GI toxicity edema, elevated transaminases, fatigue, and neuropathy.
Objective: This drug use evaluation aimed to review the appropriateness of prescribing, dosage adjustment and monitoring of Crizotinib from an efficacy and safety prospective.
Methods: Retrospective chart review of Crizotinib at the National Center for Cancer Care & Research from April 1, 2014 to November 1, 2017
Data collected included: patient demographics, diagnosis, mutation status, living status, previous treatments received, duration of crizotinib use, dosage adjustment, monitoring parameters & reported adverse effects.
Results: Data collection resulted in 13 patients.

Table 1: Summary of Crizotinib chart review

Indicator	N (%)
Gender Male	10, (76.9 %)
Age	Mean 50 Y
Diagnosis	NSCLC 13 (100%)
ALK status	13 (100%)
ROS1 Status	None
Living status	Alive 6 (46%) Deceased 3 (23%) Travelled/ Lost contact 4 (31%)
Previous lines of therapy	1st line 8 (61.5%) 2nd line 2 (15.4%) 3rd/4th line 3 (23.1)%
Duration of treatment	Mean 10.16 months Shortest 21 days Longest 43 months
Side effects	Asthenia/ Fatigue 2 (15.3%) Neuropathy 1 (7.6%) Decreased libido 1 (7.6%) Nausea 3 (23%) Vomiting 2 (15.3%) Constipation 2 (15.3%) Diarrhea 1 (7.6%) Decreased appetite 1 (7.6%) Heartburn 1 (7.6%) Hypokalemia 2 (15.3%) Nonketotic hyperosmolar hyperglycemia 1 (7.6%) Edema 2 (15.3%) Cardiac tamponade/pericardial effusion 1 (7.6%) Asymptomatic Bradycardia 1 (7.6%) Chest pain 1 (7.6%) Respiratory upper tract infections 2 (15.3%) Interstitial lung disease/ pneumonitis 1 (7.6%) Visual disturbance 4 (30.7%) Elevated liver enzymes 5 (38.4%) Hepatitis B Reactivation 1 (7.6%) Dermatological Toxicities 2 (15.3%) Cellulitis 2 (15.3%)
Dosage adjustment	Elevated LFTs 2 (15%) Dermatological toxicity 1 (7.6%)
Crizotinib discontinuation	Disease progression 3 (23%) Intolerability 3 (23%)
Actively on Crizotinib with stable disease	5 (38%)

Conclusion: Crizotinib is well tolerated with proper dosing and its usage can be encouraged as first line. As none of the patients included was given crizotinib as ROS positive, testing patients for ROS mutation is recommended. Close follow-up for toxicities (e.g. hematological, ocular, pulmonary), LFTs elevation, electrolytes imbalance, and proper dose adjustment accordingly; is recommended.
NO CONFLICT OF INTEREST

125 POSTER (BOARD 026) DRUG RELATED PROBLEMS IN PATIENTS WITH CANCER ENROLLED IN A CLINICAL TRIAL

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In clinical trials, administration of treatment (patient's usual treatment and self-medication) is strictly controlled to prevent risk of Drug Related Problems (DRP) i.e. interactions with the experimental drug. This is particularly important in ambulatory cancer patients with oral anticancer drugs, considering that mostly of them are polymedicated, with a high risk of drug-drug interactions (DDI). The objective of this study is to assess DRP and Pharmaceutical Interventions (PI) in adult cancer patients enrolled in clinical trials. Between july 2014 and march 2016, hospital pharmacists conducted patients interviews during dispensing experimental oral anticancer drugs. This study was based on a validated questionnaire consisting of 16 questions related to medical prescription, self-medication and use of Complementary and Alternative Medicines (CAM)[1]. A pharmaco-therapeutic prescription analysis was performed taking into account the prohibited treatments notified for each trial. The DRP were identified and the PI were classified according to the Société Française de Pharmacie Clinique coding. Over a period of 20 months, 109 patients were interviewed. 242 DRP were identified in 57 patients (52.3% of patients): one morphine overdose, 8 treatments not indicated (3.3%), 95 problems related to an inappropriate route and/or administration (39.3%) and 137 DDI (56.6%). Oral anticancer drug was involved in DRP for 16 patients (28.1%). These DRP led to PI with prescribers and/or patients: 129 interventions recommended additional therapeutic follow-up (53.3%) for example INR monitoring and 113 involved optimizing modalities of drug administration (46.7%) for example do not administer other medications at the same time as Diosmectite. The most reported drugs were antidiarrheals (30.2% of interactions), analgesics (20.7%), psycholeptics (16.1%) and drugs for acid disorders (15.1%). The experimental treatment was involved in 7.4% of DDI and CAM in 5.0% of interactions. More than one in two patients with cancer in a clinical trial encountered at least one DRP, consistent with Van Leeuween's study conducted in real-life patients[2]. DRP with the experimental cancer treatment was detected in less than one patient on ten. This could be explained by the strict framework of clinical research which often focuses only on experimental treatment. Despite the close follow-up of patients included in a clinical trial, pharmaco-therapeutic analysis of treatments by the pharmacist remains essential because follow-up is very focused on experimental treatment and may not take into account all other drugs as rigorously. Patients should also be alerted to the potential for drug-drug interactions of self-medication.

1- Roulet et al; pharmacoepidemiology and drug safety 2013
2- Van Leeuwen RFW et al. British Journal of Cancer. 2013; 108: 1071–
NO CONFLICT OF INTEREST

126 POSTER (BOARD 027) REAL LIFE RISK OF VENOUS THROMBOEMBOLIC EVENTS ASSOCIATED WITH IMMUNOMODULATOR DRUGS IN MULTIPLE MYELOMA PATIENTS

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Incidence of venous thromboembolism events (VTE) has been shown to increase significantly in myeloma patients, especially when treated with immunomodulatory drugs IMiDs (thalidomide, lenalidomide, pomalidomide), with a reported incidence up to 30%.[1,2] International guidelines recommend a prophylaxis strategy based on the personal risk factors and type of therapy: Low Molecular Weight Heparin (LWMH), Vitamin K antagonist (VKA), or Antiplatelet agent (APA)[1]. The aim of this study is to assess the incidence of VTE and describe the thromboprophylaxis strategy. This retrospective, observational study includes multiple myeloma patients treated with IMiDs between 2014 and 2017 in the Hematology department of Lyon Teaching Hospital (Hospices Civils de Lyon, France) and followed by the multidisciplinary care plan for cancer outpatients ONCORAL (ONCological care for outpatients with ORAL anticancer drugs). Data from IMiDs administration, thromboprophylaxis strategy (dose, duration of treatment) and VTE were collected from medical files. 213 patients received at least one IMiD, with a ratio men/women of 1.24 (118/95) and a mean age of 68 years. 215 IMiD treatments out of 284 (75.7%) concerned high risk thrombotic patients (having more than one thrombotic risk factor or receiving doxorubicin, a high dose of dexamethasone or multidrug therapy in addition with IMiD). Thirty seven VTE were reported (17.3%): 6 patients treated with thalidomide (14.0% of patients treated with thalidomide), 26 patients with lenalidomide (15.0% of patients treated with lenalidomide) and 5 patients with pomalidomide (7.4% of patients treated with pomalidomide). 59.5% (n = 22) of these events were deep vein thrombosis, 21.6% (n = 8) pulmonary embolism, 10.8% (n = 4) superficial vein thrombosis, 5.4% (n = 2) arteriovenous fistula thrombosis and 1 pre-occlusive portal thrombosis. 51.4% (n = 19/37) of these events occurred within 3 months after IMiD initiation. 32 out of 37 VTE occurred in patients with high risk of VTE and one patient was already treated with thromboprophylaxis agents before initiation of IMiD treatment. 37.5% of this high risk population (n = 12/32) were treated with LWMH, 46.9% (n = 15/32) only with APA, and 2 patients had no prophylaxis because of thrombopenia. The prophylaxis strategy was not detailed for 3 patients. 5 VTE occurred in low risk patients, all treated with lenalidomide and low dose dexamethasone, for which a prophylaxis strategy was still prescribed. On these 37 VTE, 13 patients have stopped IMiD treatment.
Despite the use of recommended thromboprophylaxis, VTE occurred in 17% of treated patients. Thromboprophylaxis drug adherence should be assessed in this context, according to the respective advantages and constraints of the different options (oral, injectable administration).

1 A Palumbo et al. Leukemia 2008
2 E M Boyele et al. Expert Review of Hematology.2014
NO CONFLICT OF INTEREST

127 POSTER (BOARD 028) ENCEPHALOPATHIES INDUCED BY IFOSFAMIDE: A 126 PATIENTS MONOCENTRIC RETROSPECTIVE STUDY.

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Background: Ifosfamide (IFM) is an oxazaphosphorine alkylating agent mainly used in lymphoma, sarcoma and germ cell tumors. This pro-drug produces a toxic metabolite: chloroacetaldehyde, causing encephalopathies. This is a known and common side effect according to the French National Hospital Drug Information Centre which describes associated risk factors: age, albumin < 35 g/l, creatinine >108 μM, radiotherapy or cisplatin pre-treatment and history of brain radiation therapy. The aim of our study was to investigate and analyze IFM-induced encephalopathies (IIE) and risk factors associated in our center in order to propose some recommendations.
Material and Methods: A single-center retrospective study was carried out during 18 months (2015 to 2017) to analyze patients treated by IFOSFAMIDE EG® in our cancer center. Data were collected by a multidisciplinary physician-pharmacist collaboration describing patients: age, indication, albumin, creatinine and PS (Performance Status) at the date of the cure, radiotherapy or cisplatin pre-treatment, history of brain radiation, IIE occurrence and consequences.
Results: One hundred and twenty-six patients received IFM: 43 were hospitalized in oncology department (sarcoma or germ cell tumors) and 83 in haematology department (76% non-Hodgkin's lymphomas). Eight episodes of IIE were found (6.3%), leading to death in 2 cases (1.6% of the whole cohort). All patients who developped IIE had Performance status (PS) ≥1 and 65% ≥2. The majority of patients (87.5%) had hematologic disease where IFM is frequently used as a second or third treatment line. The mean IFM dose received when IIE occurred was lower than those used in oncology. We did not consequently observed a dose-dependent effect in our series[1]. Regarding risk factors: 50% of IIE were observed in elderly patients (>65 yr), 12.5% patients had high creatininemia, history of brain radiation or cisplatin pre-treatment. Radiotherapy pre treatment concerned 37,5% of patients with EII. Lastly, most of IIE episodes (87.5%) were associated with a low albuminemia including 50% <30 g/l.
Conclusions: The main limitation of this study is the lack of drug-drug interaction analysis in particular the aprepitant co-prescription known as an additional risk factor of IIE. This retrospective study revealed an important incidence of IIE when albumin is low. This incidence could lead to local recommendations, even if a single center retrospective study led in 2010 concluded that albumin supplementation was not beneficial[2]. Precaution measures could be taken in prevention for this situation: collegial discussion or use of methylene blue as a primary prophylactic agent. Moreover, further studies should be conducted on this subject and on the albumin supplementation's benefits.

[1] M S. Highley, Journal of Analytical Oncology, 2015
[2] J.K. Kettle et al, Pharmacotherapy, 2010
NO CONFLICT OF INTEREST

128 POSTER (BOARD 029) BELIEFS AND USES OF COMPLEMENTARY TREATMENTS IN ONCOLOGY: WHAT DO PATIENTS THINK AND DO?

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1. The market of complementary and alternative therapies and particularly of complementary treatments (CT) grows up in France without strong regulation. The keen interest for natural products, the marketing advertisings and the media might explain this increase. In a Center For Cancer Care, the consumption of CT needs to be better monitored because of the drug interaction risks with conventional oncology medications. We performed a survey in order to evaluate patients 'practices and knowledge and understand their motivations. Then, the aim of the survey is to provide appropriate advice to the patients.
2. An anonymous survey was delivered to all patients consulting at the Center between June 5th and August 5th, 2017. It contained 13 closed questions, 5 opened questions and a comments/section for patients.
3. 275 responses were returned, completed by 22% of men and 78% of women, which is quite representative of the center population at this moment. The analysis shows that 84% of the patients who answered are currently on treatment against cancer. 66% of them receive an intravenous therapy. 50% of the patients consume CT and 31% of them started after the diagnosis of cancer. They use four types of CT: herbal drugs (53 patients), homeopathy (52), dietary supplements (52), and aromatherapy (36). Mostly, they expect three benefits: decreasing adverse effects (80), increasing quality of life (68) and strengthening immune defense system (63). Their own investigation (24%) or their relatives' advices (24%) are their main sources of information before starting a CT. Indeed, health professionals are consulted in only 25% of the cases. However, the majority of the patients (82) purchases their CT in pharmacies whereas some others buy them in organic shops (42) or on the Internet (25). The allocated budget for CT purchase differs according patients: from ten euros to few hundred euros per month. Patients seem quite aware of contraindications (59%) and side effects (66%) but they cannot list them. The analysis of their comments shows that a lot of patients ask for more advices and someone trained in hospital to explain them CT properties and their safe use in addition of conventional therapy.
4. The numerous responses obtained from the survey show the great interest of the patients for this subject. They are waiting for health professionals guidance and approval for their consumption of TC. While a dialogue is essential to enhance patient's confidence, health professionals are not adequately trained about CT. In the Center's pharmacy, we are creating communication tools in order to facilitate exchanges with the patients, but the lack of evidences and valid scientific data is currently the main issue to communicate safe information. That is why pharmacists and others health professionals have to be cautious when they provide their advices.

NO CONFLICT OF INTEREST

129 POSTER (BOARD 030) COLLABORATE FOR BETTER CARE: AN EXPERIENCE OF MULTIPROFESSIONAL CONSULTATIONS FOR PATIENTS WITH BRAIN TUMOURS

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Background: Due to increasing oral chemotherapies, one main purpose of the French Cancer Plan 2014–2019 is adapting healthcare organisations. Since 2016, a regional reference cancer centre for glioblastoma (primary central nervous system tumours), has set up tripartite primary prescription consultations in order to optimize therapeutic management of these patients suffering from brain tumours.
Material and Methods: Following the diagnosis of glioblastoma and the decision to treat, the patient is received during a "neuro-oncological course". Day, during which he benefits from a tripartite primary prescription consultation (oncologist, pharmacist, nurse) to initiate protocols: Temozolomide, STUPP scheme or PCV whose dosage regimen's complexity differs but requires appropriate support. After the initiation of oral chemotherapy treatment and explanations of the disease by the oncologist, a pharmaceutical interview is conducted. The purpose of this interview is presenting the treatment to the patient (molecules, dosage, medications use: rhythm, relationship to radiotherapy and food intake), checking the absence of drug-drug interactions on prescriptions, and explaining co-prescribed treatments. The pharmacist advises the patient of major iatrogenic risks (self-medication) and ensures he properly understands the treatment. Summary sheet and follow-up booklet are also given to him. The nurse then, intervenes to describe side effects, means of prevention and the measures to take if they occur. At last, the tripartite consultation report is integrated into the patient's computerized file.
Results: Since 2016, 96 patients (Sex ratio M/F: 1.5, average age = 57 years) have received a tripartite consultation. A caregiver was present in 8 out of 10 cases. The therapeutic strategy, and in particular treatment modalities, differ according to the chosen protocol. Thus, 11 patients received a consultation for Temozolomide alone, 82 patients for a STUPP scheme (Temozolomide combined with radiotherapy) and 3 patients for a PCV (Procarbazine, Belustine, Vincristine) (complex oral and injectable triple therapy involving drugs available in primary and secondary care). These pharmaceutical consultations are well integrated and appreciated by professionals thanks to facilitating elements: several trained pharmacists, dedicated weekly time slots, dedicated premises.
Conclusion: This multidisciplinary approach contributes to safe drug use and improved patient compliance: two essential elements in the management of glioblastoma due to the complexity of treatment and pathology and outpatient management. An evaluation of this practice is justified to demonstrate its impact and to better respond at the patient demand. A patient and caregiver satisfaction questionnaire was designed to obtain feedback on these consultations and their content.

NO CONFLICT OF INTEREST

130 POSTER (BOARD 031) HIGHLIGHTING PREDICTIVE FACTORS INFLUENCING EARLY DISCONTINUATION OF PALBOCICLIB TREATMENT

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Background: Palbociclib (PC) is a selective cyclin-dependent kinase 4/6 inhibitor approved in metastatic hormone responsive HER2-negative breast cancer. This oral cytostatic inevitably leads to an impact on bone marrow with a dose-dependent hematological toxicity. Its safety profile has demonstrated a reversibility of adverse effects, rare febrile neutropenia and allowed patients to maintain a good quality of life. However, hematological effects, especially neutropenia, can induce early end of treatment or longer duration of palbociclib-free periods compared to the recommended schedule. The main aim of this study is to assess the occurrence of early toxicity linked with a discontinuation of PC treatment within the first three cycles and try to identify predictive factors of premature discontinuation.
Material and Methods: This retrospective monocentric study was performed over 2016 and 2017. Data collected were: age, ECOG status, number of cycles received, early toxicity, previous cancer treatments, histological type, hormonal therapy class (fulvestrant or aromatase inhibitors), metastatic sites. A statistical analysis was performed to evaluate the predictive factors of progression or early toxicity.
Results: A total of 91 patients were included in the study. Among these patients, 54% are still treated by PC (median of 6.5 cycles), 31% have discontinued due to disease progression (median of 3.8 cycles) and 15% have stopped PC due to early grade 3–4 toxicity (≤ 3 cycles). Age, ECOG status, hormonal therapy class and histological type did not have a predictive impact on treatment discontinuation. In the ongoing treatment group, patients had received less cancer treatments prior to PC (1.2 versus 2.5, student test, p-value = 0.003). A cytotoxic chemotherapy received in the year before the initiation of PC is a predictive factor of a shorter duration of treatment (4.46 versus 6.03 cycles, student test, p-value = 0.03). Indeed, 69% of patients who stopped PC for early toxicity and 62% who stopped for progression received chemotherapy in the year before the introduction of PC versus 26% of patients ongoing treatment (chi-square test, p-value = 0.01). Bone metastasis were found in 100% of patients who discontinued PC prematurely for toxicity versus 61% in other patients.
Conclusions: This observational work shows that the major predictive factor of treatment discontinuation is a chemotherapy received within the year before the start of PC. Characteristics of bone metastasis sites should be more investigated to assess their impact on early toxicity. Further investigations are needed to identify patients with higher risk of early hematological toxicity during PC treatment. This population has a high-risk of premature treatment failure and can be managed by closer surveillance or early dose reduction to maintain a maximum intensity dose.

NO CONFLICT OF INTEREST

131 POSTER (BOARD 032) SENSITIVITY TO GRANULOCYTE COLONY STIMULATING FACTORS IN CANCER PATIENTS

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Background: Given the observation of greater sensitivity to granulocyte colony stimulating factors in certain patients, and the difficulty in determining the correct dosage to maintain neutrophils within the range of normal values, we carried out the following study, to analyze the factors that may influence the response to the administration of granulocyte colony stimulating factors and the adequacy of their use according to these parameters.
Material and Method: A population of oncological patients was studied over a period of 1 year (June 16 to June 17) receiving chemotherapy treatment (QT) at an Onco-Hematology Day Hospital.
We collected the following variables: sex,age,type of tumor,oncological treatment and oscillations in neutrophil levels,through a QT prescription program (Farmatools® 2.5), a laboratory program (Werfen® 2.0) and electronic medical records (Selene®).
Patients with oscillations in neutrophil levels higher than 24,000 cells/mm^3 with respect to the upper limit of normality and lower than 1,000 cells/mm^3 with respect to the lower limit of normality were selected.
Results and Discussion: A total of 1,357 patients and 29,667 laboratory tests were analyzed. In 21 patients (1.5%) significant oscillations were detected in the neutrophil figures among values lower or higher than the normal range. The median age of our population was 47 years (30–55 years), with 52.38% men and 47.62% women.
Germinal tumor was presented in 42.86%; breast cancer in 19.05%; bladder cancer in 14.29%; ovarian cancer in 9.52%; endometrial cancer in 4.76%; colon-rectum cancer in 4.76% and soft tissue sarcoma in 4.76%.
Most of the QT received was bleomycin (42.86%, germinal tumor), with grade III or IV neutropenia detected in all cases, which could have meant delays in the treatment.
The median of the oscillations in neutrophil values in patients with germinal tumor was 500 cells/mm^3 (100–1,600 cells/mm^3) and 63,600 cells/mm^3 (14,800–89,700 cells/mm^3) with respect to the lower and upper limit of normality respectively, with an average of 4 doses (3–5) administered filgrastim.
Conclusion: Patients with a germinal tumor showed the highest oscillations in the neutrophil figures, as well as greater sensitivity in response to filgrastim. They were mostly men, young and receiving treatment with bleomycin.
Taking into account that the current literature recommends not administering filgrastim in the days before the next QT cycle, and, given the sensitivity shown in this cohort of patients, we concluded that they should receive lower initial doses of filgrastim and monitor them more frequently to avoid neutropenia which can condition the healing of germ cell tumors.
NO CONFLICT OF INTEREST

132 POSTER (BOARD 033) TRIFLURIDINE-TIPIRACIL IN ELDERLY PATIENTS WITH ADVANCED COLORECTAL CANCER

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Introduction and Objectives: Colorectal cancer (CRC) is the second most common cancer cause of deathh in Spain. Trifluridine / tipiracil is a combination drug for the treatment of metastatic colorectal cancer (MCRC) who have already been treated with available therapies, including fluoropyrimidine, oxaliplatin and irinotecan based chemotherapy, anti-VEGF agents and Anti-EGFR agents. The overall survival benefit versus placebo is 1.8 months (5.3 vs 7.1 months). Objectives: To define the efficacy and safety of treatment with trifluridine / tipiracil in metastatic CRC under conditions of clinical practice in elederly.
Material and Methods: Retrospective analysis of patients treated with Trifluridine / tipiracil from April 2016 to February 2017. Demographic, clinical, treatment and toxicity data were collected through the Oncowin® program and the Diraya® Digital Single Health History (HSUD). SLP, OS at 7 month and OS were measured, as effectiveness variables. Toxicity was collected according to CTCAE v. 4.0.
Results: We identified 14 patients who received Trifluridine / tipiracil (8 women). Characteristics of patients: median age 61 years old; ECOG 0 in 11 patients, ECOG 1 in 2 patients, ECOG 2 in 1 patient. Primary tumor location was colon (n 10), rectum (n 4). All patients had received ≥ 3 previous treatment lines with fluoropyrimidine, oxaliplatin and irinotecan based chemotherapy and anti-VEGF agents. 8 of them, ras wild type, received Anti-EGFR agents.3 of them gemcitabine + capecitabine. After progression to TAS-102, 9 patients received further treatment lines: 6 with gemcitabine plus capecitabine, 1 regorafenib, 1 raltitrexed and 1 FOLFIRI plus bevacizumab. After a median follow-up of 9 months (1–10), 86% (12/14) of progressed with a PFS (median) 3,5 months (1,7–5 months). Actually 2 patients are in treatment with Trifluridine / tipiracil. The OS at 7 months is 71% (10/14). 3 patients are exitus, with a OS 1.7, 1.9 y 7.6 months. With a median of administered cycles of 4 (1–10), 36% (n 5) required dose reduction and 57% (8/14) were delayed in some treatment cycle. The safety profile was as follows: Toxicity of any grade is 100%. The most frequent toxicities were astenia G1-2 (n:4), nauseas/vómits G1-2 (n:8), diarrhea G1-2 (n:5), mucositis G1 (n:1) y neutropenia G2 (n:5).
Conclusion: In spite of the small number of patients and the retrospective nature of the study, the effectiveness and safety data of Trifluridine / tipiracil in clinical practice conditions are more or less favorable than those collected in the pivotal drug trial, Of similar patients in both groups (except for a larger number of native RAS tumors in our sample). The toxicity profile is acceptable by performing a proactive management.
NO CONFLICT OF INTEREST

133 POSTER (BOARD 034) IS FOTEMUSTINE AN OPTION, AFTER PROGRESSION TO BEVACIZUMAB IN HIGH GRADE GLIOBLASTOMA?

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Background: Patients with relapse of recurrent high-grade glioma (GAG), don't usually benefit from a second surgery or reirradiation. In patients pretreated with temozolomide, the prognosis remains poor, with a 9–15% progression-free survival (PFS) at 6 months, a median PFS of 2 months a 6 months of overall survival (OS). With the addition of bevacizumab or fotemustine (MTF), median PFS at 6 months of 40–50% and median OS of 9.2 and 8 months, respectively, were reached. FTM is a third generation nitrosourea with high liposolubility, which allows a high concentration of drug in CNS (central nervous system). There is no currently clinical trial showing a 3rd line treatment benefit in recurrent GAG. The aim of this study is to describe the clinical experience in our hospital with FTM in 3rd line.
Material and Methods: An observational, retrospective study was conducted in which all patients who had progressed to temozolomide and irinotecan plus bevacizumab were enrolled and received at least one cycle of fotemustine (TMF) from 2010 to the present. The treatment schedule consisted of: induction doses with 80 mg/m2 intravenously on days 1–15–30–45–60, 4 weeks rest, and then maintenance with 80 mg/m2 every 3 weeks. Demographic, clinical, and pharmacotherapeutic data were collected through the Oncowin program and the Diraya Digital Specialist Clinical History®. As variables of effectiveness were measured the SLP, SG and survival rate at 3 months. Adverse events grade ≥3 were recorded according to CTCAE version 4.0.
Results: In our center, a total of 7 GAG patients were treated with FTM, 5 women, with a median age of 41 years, who had progressed to temozolomide and irinotecan–bevacizumab (mean of 14 cycles). 42% (n = 3) were anaplastic astrocytomas and 58% (n = 4) multiform glioblastoma 100% of the patients had PS 0–1 at the beginning of treatment. To date, 6 of the 7 patients had progressed, with a median PFS of 1 month. The 3- month survival rate was 71.42%, and the median OS (5/7 deceased patients) was 3.3 months. No adverse events of grade ≥3 were reported.
Conclusions: Fotemustine in third line treatment of GAG shows moderate effectiveness, probably due to the advanced state of disease in this patients. Despite this, it is a well tolerated treatment, so it could be considered in the third line in patients with GAG with good functional status.
NO CONFLICT OF INTEREST

134 POSTER (BOARD 035) EFFECTIVENESS AND SAFETY OF GEMCITABIN - CAPECITABINE IN PATIENTS WITH METASTATIC COLORRECTAL CANCER

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Introduction: Patients with metastatic colorectal cancer (mCRC) who have progressed to all available therapies have two authorized tratment

options by the EMA regorafenib (REG) and the FDA trifluridine + tipiracil (TAS102), both with a limited efficacy against placebo and a not insignificant toxicity.
Objective: To describe the clinical experience in our hospital with gemcitabine plus capecitabine in patients with poly-treated CCRM and compare it with the efficacy data obtained for REG and TAS102, in order to incorporate our results into decision making.
Material and Method: A retrospective observational study was conducted where patients diagnosed with mCRC were treated with gemcitabine 1000 mg /m2 + capecitabine 1000 mg / m2/12 h 7 days, cycles every 14 days, after progression to ≥ 3 previous lines, from January 2015 to March 2016. Demographic data, diagnosis, ECOG, previous lines of treatment were collected,time of treatment and adverse reactions according to CTCAE see 4.0. The demographic, clinical and treatment data were collected through the Oncowin® program and the Diraya® Digital Single Health History (HSUD). The SLP and SG were measured as effectiveness variables and compared with the efficacy data of the pivotal tests of REG and TAS102.
Results: A total of 7 patients (5 men) with mCRC were treated with gemcitabine plus capecitabine. All had received ≥ 3 previous lines with bevacizumab, oxaliplatin, irinotecan and fluoropyrimidines and 2 of them also cetuximab for being RAS wild type. The median age was 65 years and the ECOG = 1 in 5 patients (1 ECOG = 0, 1 ECOG = 2), similar to the data from the REG and TAS102 trials (61 and 63 years, and ECOG 0-1 for both). The patients were a mean of 9.4 ± 5.59 weeks with the treatment, being 11.2 ± 9.2 weeks for REG and 12.7 ± 12 weeks for TAS102. According to our clinical practice, at the time of the analysis, 100% of the patients had progressed, with a median PFS of 2.8 months (1.86–4.6). 2 patients were exitus (2.4 and 4.7 months) and 5 are still alive, with a SG> of 6 months in 4 of them. For REG and TAS102, a median of OS of 6.4 and 7.1 months, respectively, and a median of PFS of 2 months were obtained for both. Regarding the grade 1-2 toxicity recorded, 2 patients hand-foot syndrome, nausea in 3 patients and asthenia in 4. Only 1 patient with anorexia grade 3 was registered. In the REG trial, 53% of the patients suffered some adverse event grade 3 and in that of TAS102 69%.
Conclusions: Despite the small number of patients and the retrospective nature of the study, the effectiveness data obtained in our practice with gemcitabine plus capecitabine are similar to those of the new drugs and it is a well tolerated treatment, so this could be considered scheme in patients with PS 0-1 who have progressed to all drugs active in mCRC
NO CONFLICT OF INTEREST

135 POSTER (BOARD 036) HYPOMAGNESEMIA IN PATIENTS TREATED WITH ESHAP THERAPY

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Background: Hypomagnesemia is a well-known side effect of cisplatin-based chemotherapy regimens. It is usually asymptomatic but, in some cases, it can cause serious clinical manifestations such as arrhythmia or convulsions. Recommendations on magnesium supplementation when using cisplatin to treat solid tumours are widely accepted. However, administration of magnesium during cisplatin continuous infusion in haematological malignancies is not so well established.
ESHAP (etoposide, cisplatin, cytarabine) is one of the chemotherapy protocols used in lymphoma treatment.
In this study we aim to assess the incidence and severity of hypomagnesemia during ESHAP administration.
Materials and methods: Observational, retrospective and longitudinal study. All patients treated with ESHAP from January 2000 to July 2017 were included. Magnesium levels before, during and after ESHAP administration were collected. Severity of hypomagnesemia was classified according to CTCAE 4.0.
Results: Thirty-four patients were included (56% males). Mean age (±SD) at initiation of therapy was 50 (±13) years.
Data of serum magnesium previous to chemotherapy initiation were available for 53% of patients. Hypomagnesemia was present in 56% of them, being grade 1 in all cases.
Once chemotherapy was initiated, 91% of patients developed hypomagnesemia. This was clinically relevant (≥ grade 3) in 30% of patients. In 17%, this was grade 4 (life-threatening consequences).
After one course of ESHAP, hypomagnesemia was present in 79% of patients and was clinically relevant in 11% patients. After the second course, 94% of patients presented hypomagnesemia (clinically relevant in 14% of patients).
Conclusions: ESHAP protocol may induce severe hypomagnesaemia. Patients receiving ESHAP should have their serum magnesium level monitored before starting and throughout the course of treatment. Magnesium supplementation could be helpful in preventing this adverse effect.
NO CONFLICT OF INTEREST

136 POSTER (BOARD 037) MEDICATION RECONCILIATION FOCUSING ON THE PATIENT IN CLINICAL TRIALS

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Background: Following the occurrence of major discrepancies due to the ignorance of the drug treatments taken by the patient in early phase clinical trials, the Clinical Trials Department has implemented medication reconciliation (MR) for patients in early phase clinical trials since September 2015. These are new drugs in oncology for which the risk of drug interactions is real and important.
Material and Method: A multi-professional meeting was held that was attended by physicians, pharmacists and nurses to discuss the procedures for setting up MR in clinical trials. It was agreed that nurses shall meet at the pharmacy via a shared agenda after the consultation. The patient interview is conducted by the pharmacist in a private room to ensure confidentiality. MR is performed within 1-2 days preceding the patient's first cycle to eliminate any risk of drug interactions and to respect the constraints of concomitant treatments imposed by the sponsor. We use at least 3 sources to do MR which are community pharmacy, patient and doctor. This medication report is compared to the treatments collected by the oncologist during the consultation. In order to assess our activity we created indicators in an Excel file. Once the reconciliation completed, a summary table with authorized or unauthorized treatments is sent to the doctors. It is up to them to decide if they have to continue these treatments or not and inform the patient. Then the MR file is saved in our Hopital Manager® computer software for traceability.
Results and Discussion: MR is currently done all over 40 clinical trials. From September 2015 to July 2017, we had an average of 9 MRs per month, i.e. 216 patients in total. We found on average 3,1 drugs traced on the computerized patient record (CPR), 6,1 drugs actually taken by the patient and 3,2 divergent treatments. Total duration of the MR is on average 32.4 minutes. MR was performed within 48 hours in 92% of cases and 3,3 sources were used. In 96% of cases, the pharmacy was contacted. On the total number of MR, 85.5% of drugs are authorized, 7.8% of drugs are prohibited and 6.7% treatments are to be monitored. 53% discrepancies were found (comparison CPR with MR). We found 26% of patients with at least one treatment to watch out of which 18% revealed by MR. 27% of patients with at least one prohibited treatment of which 20% revealed by MR. 93% of conciliations traced by computer.
Conclusion: Good multi-professional communication optimizes the care of the patient. MR is a time-consuming activity requiring available staff. In the pharmacy of clinical trials, pharmacy technicians were trained in collecting information and communicating with community pharmacies. The prescription analysis is performed by a pharmacy intern or a senior pharmacist. The short-term goal is to implement MR at discharge and to develop the city-hospital link.
NO CONFLICT OF INTEREST

137 POSTER (BOARD 038) EFFECTIVENESS OF PERTUZUMAB IN PATIENTS WITH HER2-POSITIVE METASTATIC BREAST CANCER

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Background: Pertuzumab, trastuzumab and docetaxel (PTD) is the first line standard treatment in patients with HER2-positive metastatic breast cancer. The efficacy of this drug combination was demonstrated in CLEOPATRA clinical trial. Nevertheless, population in this trial included only a 10% of patients with previous trastuzumab adjuvant therapy, that is a limitation of the interpretation of survival results and its application in the clinical practice. The aim of this study is to assess the progression-free survival (PFS) in patients treated with pertuzumab in real clinical practice.
Material and Methods: Observational retrospective study including all patients with HER2-positive metastatic breast cancer who started treatment with (PTD) from October 2014 to January 2018, the cuttoff for data collection was March 27, 2018. Data collected: sex, age, previous

treatment, start and end date of pertuzumab-trastuzumab treatment, date of progression and therapies after pertuzumab. PFS was analyzed for all patients and for the subgroups with or without previous exposure to trastuzumab, using the Kaplan-Meier analyses to estimate medians, and Log-Rank test to compare the subgroups curves.
Results: We analyse data from 20 women, mean age 52.5 years (30–75). 10 patients (50%) had received previous trastuzumab therapy. Four patients in the subgroup with previous trastuzumab and three patients in the subgroup without previous trastuzumab were still on treatment at the time of analysis (censored data). Six patients had died at the time of this analysis. The median PFS was 15.38 months for all 20 patients, with or without previous trastuzumab. The median PFS was 9.13 months in the trastuzumab group as compared with 22.36 months in the group without previous trastuzumab (z = 2.14; p = 0.0322). 10 patients had other breast-cancer therapies after progression: 40% trastuzumab/emtansine, 30% entered on clinical trial and 20% lapatinib/capecitabine.
Conclusions: Despite the small number of participants, treatment with pertuzumab, trastuzumab and docetaxel in patients with HER2-positive metastatic breast cancer without previous treatment with trastuzumab resulted in a significantly improved PFS as compared with that in patients with previous trastuzumab therapy. Studies with a large number of patients would be necessary to confirm this hyphotesis.
NO CONFLICT OF INTEREST

138 POSTER (BOARD 039) ADVANCED MELANOMA TREATMENT IN A THIRD LEVEL HOSPITAL: 5 YEARS OF EVOLUTION

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Background: Melanoma is one of the malignant tumors with an increased incidence in recent years, 2% annual increase in several European countries. It is also one of the leading causes of life-long cancer-related deaths (1–2%). Before 2010, advanced melanoma (AM) did not have any specific and effective therapy. The diagnosis carried a prognosis with a median overall survival of 6–9 months and less than 20% chance of surviving for 2 years. In recent years, there has been a revolution in the management of this disease with the development of highly effective new therapies, such as selective tyrosine kinase inhibitors (STKI), immune checkpoint blockers and other immunotherapy agents (IT) that have given our patients longer survival benefits.
The purpose of the research was to assess the 5 years evolution of AM treatment in a third level hospital and analyse effectiveness of treatment applied.
Material and Methods: Observational, descriptive, retrospective and longitudinal study of patients diagnosed with advanced melanoma in a general hospital of 650 beds. Medical record review and retrospective analysis (January 2011-December 2016) of prescriptions registered in the Integral Oncology Patient Information System in a teaching general hospital. We considered demographic data (age, sex) and response evaluation (5-year survival rate, progression free survival-PFS-, overall survival-OS-) for the analysis.
Results: 59 patients were diagnosed with AM in the period of the study, 36 (61%) men and 23 (39%) women, aged between 32 and 87 years.
Types of AM: 83% (49) skin, 3.4% (2) vagina, 3.4% (2) eye, 1.7% (1) head/neck, 1.7% (1) vulva, 1.7% (1) anus and 5.08% (3) unknown.
37.28% (22) received more than one line of treatment.
Median PFS was 49 days, median OS was 48 days.
5-year survival rate was 42.38%
OS (median) and PFS (median) subgroup analysis:

Therapy	PFS (days)	OS (days)
Chemotherapy	22	40.5
Selective tyrosine kinase inhibitors	808	194
Immunotherapy agents	298.5	561.5
Chemotherapy + Selective tyrosine kinase inhibitors + Immunotherapy agents	48	429
Chemotherapy + Immunotherapy agents	83	512
Selective tyrosine kinase inhibitors + Immunotherapy agents	96	222

Conclusions: Effectiveness in our series of patients reflect the progress in treatment of melanoma due to new drugs (selective tyrosine kinase inhibitors and immunotherapy agents), with an increase in survival rate (42.38% of patients alive in 5 years).
NO CONFLICT OF INTEREST

139 POSTER (BOARD 040) EFFICACY OF METOXALENE IN PATIENTS WITH GRAFT-VERSUS-HOST DISEASE AFTER ALLOGENEIC TRANSPLANTATION

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Backgroung: Graft-versus-host disease (GVHD) is a common complication of allogeneic allo-transplantation (allo-TPH) of bone marrow. The treatment of choice for chronic GVHD is systemic corticosteroids, although only a minority of patients maintain the response to this treatment indefinitely, using immunosuppressive drugs with variable but not free of adverse events. Photopheresis is a therapeutic procedure based on the biological effect of psoralen and ultraviolet light A. The purpose is to analyze the efficacy of metoxalene in patients undergoing allo-TPH with GVHD.
Materials and methods: Retrospective observational study of April 2016-September 2017. Main variable: adult patients treated with methoxalene as unauthorized medication in Spain for an indication not approved adult patients undergoing allo-TPH with GVHD. Treatment schedule: Methoxalene 0.1 mg / 5 ml weekly schedule for 4 weeks, then biweekly for 12 months. Secondary variables: demographic data (age, sex), diagnosis, type of aloTPH, type of GVHD (acute, chronic), medications and clinical manifestations (cutaneous and extracutaneous). Sources of information consulted: electronic medical records (Diraya®), pharmacotherapeutic history (Recipe XX1).
Results: A total of 9 patients with a mean age 49 ± 11 years were treated with metoxalene, 55.6% were women. The highest proportion of patients were diagnosed with leukemia (66.67%), myelodysplastic syndrome (22.22%) and lymphoma (11.11%). The majority of allo-TPH was from a related donor. Two patients had an initial debut with acute GVHD (mucosal and visceral) post allo-TPH. All patients developed chronic GVHD. Within the systemic treatments used in chronic GVHD, steroids with 88.89%, which was combined with 100% immunosuppressants. Photopheresis began at 27.22 ± 14.96 post-allo-TPH months. The mean initial immunosuppressive value was 4.44 ± 1.09 drugs, highlighting mycophenolate mofetil and sirolimus as the most prescribed. 100% of patients presented cutaneous lesions, and as extracutaneous lesions the majority in mucosae. One patient presented extensive chronic GVHD with cutaneous, visceral, ocular, articular and even hepatic involvement. A high rate of remission of cutaneous and mucosal lesions was obtained, which allowed the reduction or even suspension of immunosuppressive treatment, with a final average value of 1.22 ± 0.97 drugs.
Conclusions: Photopheresis with methoxalene reduces immunosuppressive treatment in most patients. It is a hopeful and effective treatment in chronic GVHD.
NO CONFLICT OF INTEREST

140 POSTER (BOARD 041) GLIOBLASTOMA MULTIFORM AND TRIPARTITES CONSULTATIONS: COLLECTION AND ANALYSIS OF TREATMENTS IN COMBINATION WITH TEMOZOLOMID DURING PHARMACEUTICAL INTERVIEWS

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Background: Glioblastoma multiform is the most common and most aggressive primary brain tumor. Its incidence is 40 cases over 100 000 people. After surgical excision of the tumor, the treatment is base on STUPP protocol: radio chemotherapy with temozolomid. This treatment is divided into two phases: a concomitant phase in which temozolomid is associated with radiotherapy. Then, a monotherapy phase in which temozolomid is administered alone (5 days each 28 days period). Concerning this pathology, tripartites consultations including a nurse of advanced practices, a neuro-oncologist doctor and a pharmacist have been set up in December 2015. A pharmaceutical analysis of treatments associated with the chemotherapy has been executed: usual treatments of patients or treatments yet started to treat glioblastoma (adjuvant treatment). This aims at securing the medicinal support of patients.

Material and Methods: The collection of treatments has been realized by patients interrogation, and by electronic medical record consultation
Results: This collection has been effected from December 2015 till March 2016. 41 patients have been included: 25 mens, and 16 womens. The middle age is 58.4 years. Drugs have been classified by ATC drug classes. Some drug classes are prescribed systematically: laxatives and antiemetics for the medicinal support of chemotherapy side effects.
A little drug interactions have been found, but an important oversight and vigilance is necessary for patients treated by anticoagulants and antiplatelet agents because temozolomide has platelet toxicity.
Conclusions: Care of patients suffering from glioblastoma multiform has been totally amended to ensure a better support. With the specific treatment of this tumor (temozolomid), a lot of drug classes are prescribed (especially concerning old people because of comorbidity). The analysis of results allowed to bring out drug interactions and precautions of use concerning certain drugs. So, the medicinal support for these patients is secure.
NO CONFLICT OF INTEREST

141 POSTER (BOARD 042) EVALUATION AND OPTIMISATION OF HOSPITAL DISCHARGE PRESCRIPTIONS PRACTICES IN ORDER TO SECURE PAEDIATRIC USE OF ORAL CHEMOTHERAPY

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Background: As part of a failure analysis of the pediatric oncology care pathway performed on November and December 2015, the evaluation of 100 hospital discharge prescriptions has shown that prescriptions forms were heterogeneous and that important information was missing most of the time. To secure this step of the pathway, physicians were made aware of risks induced by incomplete or unclear prescriptions. To help these prescribers to improve their practices, a standard prescription form was also developed and proposed. The objective of this study is to evaluate the improvement of hospital discharge prescription two years after our actions.
Material and Methods: Between January and February 2018, 100 discharge prescriptions were compared to the 100 prescriptions previously selected in 2015. Each prescription was analyzed to notice the presence or the absence of 20 regulatory details and essential information for pharmaceutical analysis and for at-home administration. Those details were separated in 3 categories: physician's details, patient's details, and oral chemotherapy's details. The proportion of computerized prescriptions was also notified.
Results: Concerning patient's details, age, weight and body surface area (BSA) were respectively reported in 21, 24 and 15% of prescriptions written in 2015, versus 56, 62 and 60% of cases in 2018. Concerning oral chemotherapy's details, chemotherapies' international nonproprerty name (INN) was reported in 51% of prescription in 2015 versus 71% in 2018. Route administration or galenic form was reported in 21% of cases in 2015 and in 53% of cases in 2018. Dose per body weight or per BSA was reported in 9% of cases in 2015 and in 38% of cases in 2018. Ongoing chemotherapy regimen was initially reported in 5% of cases in 2015 and in 41% of cases in 2018. Physician's details (name, title, clinical department and signature) were provided in more than 95% of cases in 2015; those details were provided in 100% of cases in 2018. Finally, 38% of prescriptions were computerized in 2015 versus 68% in 2018.
Conclusions: Those results confirm that hospital discharge prescriptions were more complete and clear after our actions. Complete information about patient and chemotherapy allow a better pharmaceutical analyze and increase error detection. Generalization of computerization reduces misreading risks at dispensation and administration times. Physicians' awareness led to a significant and lasting improvement of prescription practices and so the safety of the paediatric use of oral chemotherapy at hospital discharge.
NO CONFLICT OF INTEREST

142 POSTER (BOARD 043) EVALUATION OF MEDICATION ERRORS IN A PEDIATRIC ONCOLOGY WARD

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Background: Medication errors (ME) in a pediatric oncology setting had been described between 4–18% [1], whereby most of the ME occur during the prescription phase [2]. The aim of this project was to evaluate the number of ME at a pediatric oncology ward of a tertiary-care hospital in Kassel, Germany to guide the decision about the benefit of a clinical pharmacist to reduce ME.
Material and Methods: One clinical pharmacist screened the medical records for drug related problems during a period of 3 months twice a week. The data collection will be finished after submission of this abstract. Chemotherapy as well as supportive care medications were included. The criteria for an intervention were chosen by the ADKA DokuPIK classification on ME, e.g. double prescription, therapeutic drug monitoring not performed, inappropriate dose, contraindication or interaction [3].
Results and Discussion: During a period of 2 months the medications of nine hospitalized children and 319 drug doses were examined. An intervention rate of 24% was identified. The most common reasons were inappropriate doses/dosing intervals, followed by potential adverse reactions, contraindications and interactions. The drug associated most frequently with inappropriate doses was dimenhydrinate. This is particularly relevant as an overdosing with dimenhydrinate in children younger than three years bears the risk of adverse events such as seizures. Interactions occurred e.g. between granisetron and other medications with the potential of QT-interval prolongation or medications causing a serotonin syndrome. Furthermore, the most common reason for a contraindication was the use of metamizole which is contraindicated in patients with disorders of the bone marrow function, e.g. after chemotherapy.
Conclusion: On-ward participation of a clinical pharmacist can help to attain a safer medication process in hospitalized children with cancer. Therefore, it is recommended to implement a regular screening of the medications on this ward by a clinical pharmacist. The effect regarding the reduction of ME will be evaluated in a subsequent project.
1 Watts RG, Parsons K. Chemotherapy medication errors in a pediatric cancer treatment center: prospective characterization of error types and frequency and development of a quality improvement initiative to lower the error rate. Pediatr Blood Cancer 2013;60(8):1320–24.
2 Rinke ML, Shore AD, Morlock L, et al. Characteristics of pediatric chemotherapy medication errors in a national error reporting database. Cancer 2007;110(1):186–95.
3 Kantelhardt P, Langebrake C. Manual DokuPIK 2009.
NO CONFLICT OF INTEREST

143 POSTER (BOARD 044) WHY THE COLLABORATION BETWEEN ONCOLOGY PHARMACISTS AND COMMUNITY PHARMACISTS IS NECESSARY TO THE DISPENSING OF ORAL ANTICANCER AGENTS?

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In France, oral anticancer agents are almost entirely dispensed by community pharmacists (CP) who have requested more training about these drugs. In our French hospital, we developed pharmacist consultations realized by hospital pharmacists with oncology training (OP) for patients before they start a new oral anticancer agent in collaboration with the patient's CP. This study describes the optimization of the use of oral anticancer agents thanks to this collaboration.
To prepare the pharmacist consultation, the OP calls the patient's CP to obtain the patient's drugs list in order to identify drug interactions with the new anticancer agent. Vidal®, DDI Predictor®, Oncolien® databases are used to check drug interactions and the website of the Memorial Sloan Kettering Cancer Center for herbs interactions. During the consultation, the OP provides information about the new oral anticancer agent: name of the drug, dosage form and regimen, advice to prevent and manage side effects. To obtain the best medication history, the community pharmacy's drugs list established is compared with what the patient really takes (prescribed and non-prescribed drug or herbs). After the consultation, the OP completes and sends a report to the CP with a drug specific factsheet. This report contains a brief patient's medical history, information about the new treatment strategy, information about specific time intervals between administration and food intake, drug and herbs interactions identified and the potential modification of the patient's regular medicines. The collaboration between the OP and the CP is assessed by a questionnaire.
Over a period of one year, 90 patients received a pharmacist consultations and 62 community pharmacies were contacted. Thanks to the CP, the realization of the best possible medication history highlighted drug interactions in 36% of patients and required, for 4 patients, discontinuation of one drug of their regular medicines. On the other hand, with the information delivered by OP, 83% of the CP contacted were able to better advise the patient at the time of the oral anticancer agent dispensing: how to take the medication during or between meals (not always specified on the prescription) and to give advice to manage side effects. This information also helped them to know the indication of the drug and to be more vigilant about drug and herbs interactions. Information

provided was archived in 79% and shared with the community pharmacy's team in 76% of cases.
The collaboration established between the OP and the CP allowed us to optimize the use of oral anticancer agents by sharing information and knowledge. However, this collaboration could be improved with the implementation of the first dispensing of the oral anticancer agent by the OP at the hospital and then the following dispensing by the CP as suggested by the last French Cancer Plan.
NO CONFLICT OF INTEREST

144 POSTER (BOARD 045) NIVOLUMAB IN METASTATIC RENAL CELL CARCINOMA

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Introduction: Renal cell cancer (RCC) comprises approximately 3.8% of all new cancers. Approximately 90% of renal tumors are RCC, and approximately 80% of these are clear cell tumors. Nivolumab, a programmed death-1 checkpoint inhibitor, demonstrated encouraging overall survival in controlled studies in previously treated patients with advanced renal cell carcinoma.
The objective of this study is to describe the utilization of nivolumab for the treatment of metastatic RCC and to compare results with clinical trial phase 3, randomized CA209025.
Material and Method: Observational retrospective study of 100% patients were diagnosed with metastatic RCC and treated with nivolumab from January 2017 to March 2018. Data sources: electronic prescription program and electronic medical records. Variables collected: sex, age, previous treatment and number of prior lines of systemic therapies, performance status (PS), presence of cerebral/visceral/bone metastasis, number cycles, duration of treatment and discontinuation causes.
Results and Discussion: 8 patients, 75% were male. Age: [average (range)] 68 (51–78) years old. 75% patients had been treated with more than one drug. Of the 8 patients, 5 (62.5%) were heavily pre-treated, with 2/8 receiving 2 prior lines of therapy and 3/8 (37.5%) receiving 3 or 4 prior lines of therapy. Previous treatment: 5/8 (75%) pazopanib, 5/8 (75%) sunitinib, 5/8 (50%) axitinib, 1/8 (12.5%) sorafenib, 1/8 (12.5%) cabozantinib and 1/8 (12.5%) everolimus.
PS (starting therapy): 0 for 5 patients, 1 for 2 patients and 2 for one patient. 6/8 patients had visceral metastasis (lung, liver), 2/8 bone metastasis and 1/8 cerebral metastasis. 100% patients had been treated with nivolumab 3 mg/kg every two weeks until progression or unacceptable toxicity. Median follow-up from nivolumab start was 6.5 cycles [1–15]. The median duration of treatment at March 2018 was 3.43 months (0.3–7.7 + months). The treatment was interrupted in two patients: one treatment was interrupted by clinical progression after 6 cycles and another one was discontinued due to grade 4 hypothyroidism after 4 cycles. 6/8 (75%) patients continue with treatment without serious adverse events (grade 1–2).
Conclusion: Our study suggests that nivolumab is safety although our population was small.
Baseline characteristics were similar between our patients and CA209025 study.
In our study, the median duration of treatment was inferior to CA209025 study [5.5 months (0- 29.6 + months) in nivolumab-treated patients].
Nivolumab has emerged as a promising new therapy in advanced malignancies, and the first agent to show survival advantage in patients failing prior VEGFR-targeted therapy in metastatic RCC. Further studies with more patients are needed to evaluate and compare nivolumab with other drugs indicated for the treatment of advanced renal cell carcinoma.
NO CONFLICT OF INTEREST

145 POSTER (BOARD 046) CLINICAL BENEFIT AND SAFETY OF CARFILZOMIB IN MULTIPLE MYELOMA

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Introduction: Carfilzomib is indicated from 2nd line and more in multiple myeloma, associated with dexamethasone +/- lenalidomide. Pending price fixation, carfilzomib is used in a compassionate way. Recently, the French National Authority for Health has assessed theses indications and their places in the therapeutic strategy. This study assesses the use, the clinical benefit and the safety of carfilzomib into a public hospital of Paris in France.
Methods: The data were collected from 03/2014 to 01/2018 with two databases: Chimio® (time to treatment, dose) and medical record systems Middlecare® (age, number of previous therapy, concomitant treatment, reasons to stop carfilzomib, adverse events)
Results: During the studied period, 52 patients received carfilzomib. The median age was 63 years [31–81]. Carfilzomib was prescribed in average in 5th line [2–13]: 34 patients (65%) had received an autologous stem-cell transplantation, one patient an allogenic stem-cell transplantation and 4 patients both. For 20 patients (38%), carfilzomib was associated with dexamethasone, for 13 patients (25%) with pomalidomide and dexamethasone and for 10 patients (19%) with lenalidomide and dexamethasone. The dose was 20 mg/m^2 at C1J1 then 60 mg (flat dose) at each futher cycle for 42 patients (80%). The average time of treatment was 6,1 months [0,1–24] and 7 patients (13%) are still treated by carfilzomib. In average, the patients received 6,4 complete cycles of carfilzomib [1–19] and 8 patients (15%) received less than one cycle. Carfilzomib was stopped for 44 patients (85%): 24 patients (55%) for progression, 8 patients (18%) due to a toxicity related to carfilzomib and 5 patients died. For 10 of 24 patients with a progression (42%), the next treatment was daratumumab and dexamethasone. The principal adverse events were: hematologic toxicity with a grade 2 and more for 20 patients (38%), cardiac toxicity (dyspnea, heart failure) for 6 patients (12%), acute kidney failure for 3 patients, pulmonary toxicity (acute pulmonary failure) for 2 patients and thrombotic microangiopathy for 2 patients.
Conclusion: In only 57% of cases, carfilzomib was prescribed in the authorized indications (association with dexamethasone +/- lenalidomide). This study demonstrated the carfilzomib efficacy in real life for heavily treated patients. However, adverse events were significant. It still remains to determine its place in the therapeutic strategy compared to daratumumab, new monoclonal antibody used in the treatment of multiple myeloma.
NO CONFLICT OF INTEREST

146 POSTER (BOARD 047) PHARMACEUTICAL CONSULTATIONS: COMPARISON OF PATIENT BEHAVIOR IN ONCOLOGY AND HEMATOLOGY

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Prescription of oral targeted therapies in oncology and hematology has changed the patient care pathway. The patient has to manage his treatment at home, with the help of healthcare professionals, including the hospital pharmacist. Recently, pharmaceutical consultations (PC) have been developed. Theses consultations have multiple goals, as explaining the treatment, the adverse effects that can occur, in order to obtain drug adherence. In our hospital, we perform PC in different cancer areas such as oncology (melanoma, breast, thyroid¼) or hematology (chronic leukemia, lymphoma and myeloma). Two pharmacists, with the help of the pharmacy residents, do PC. The objective of the study is to compare patient behavior between oncology and hematology in order to adapt tools and means. After each consultation, pharmacists reported in the medical record system Middlecare®. Following data were extracted from 01/01/2015 to 31/12/2017: age, sex ratio, type of consultation, time and place of the consultation, number of drugs, pathology, use of self-medication, phytotherapy, drug-drug interaction, number of concomitant treatments, number of previous therapy, percentage of compliance and comprehension.
Data are presented below. Pharmacists did a total of 267 consultations. The consultation took place in the day hospital (73%), in a consultation desk (12%), in hospitalization (10%), and other (5%). The compliance percentage collected was 94.75.

	Oncology	Hematology
Average time	32[15 ; 90]	39,2 [10 ; 90]
Number of patients	85	90
Sex ratio	1,43	1,72
Median age	57 [17 ; 94]	68 [47 ; 91]
Consultation	114	153
Initiation	44	52
Follow-up	70	101
Number of drugs	18	4
Number of pathologies	10	7

Main pathologies	63 with melanoma	31 with chronic lymphoid leukemia and 26 with mantle cell lymphoma
Self-medication	15	1
Phytotherapy	15	1
Drug interaction	11	16
Average number of concomitant treatment	3,18	5,37
Median previous therapy	1	2
Perfect understanding	94 (84%)	82 (78%)
Partial understanding	8 (16%)	23 (22%)

Based on these data, we decide to adapt our PC. We have developed tools in hematology where patients are older, such as booklet and medicine care plan, useful for them.
On the other hand, in oncology where patients are younger, they are more attracted to alternative medicines such as phytotherapies, and self-medication. Those behaviors can lead to drug interactions, adding toxicity or decreasing plasmatic drug concentration.
NO CONFLICT OF INTEREST

147 POSTER (BOARD 048) PERSISTENCE TREATMENT ANALYSIS IN NON-CANDIDATE TO STEM CELL TRANSPLANT-PATIENTS WITH MULTIPLE MYELOMA

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Background: Significant advances has seen the past decade in multiple myeloma (MM), mainly attributed to the introduction of efficacious treatment regimens, from autologous stem cell transplant (ASCT) to new therapies like immunomodulators (thalidomide,lenalidomide and pomalidomide), proteasome inhibitors (bortezomib and carfilzomib) and CD38 antibodies (daratumumab). Since ASCT is not indicated in elderly patients, the role of an effective and safe treatment is crucial.
The objective is to assess persistence rates for treatments used in these elderly patients and the reason of treatment interruption.
Material and Methods: It's a cross-sectional study in september 2017. All patients older than 65 years non-candidate to ASCT in active treatment were included. Demographic and disease-related variables evaluated were: age,gender and monoclonal component increased.Related to treatments variables were:treatment lines,duration,persistence at 6 and 12 months. Persistence of first line treatments was assessed by a Kaplan-Meier analysis. Finally, treatment interruption reason was analyzed.
Qualitative variables are expressed as percentage(%) and quantitative as medians(Md) and interquartile range. Statistical program used was SPSS® 19 version.
Results: 23 patients were included. 56.5% were males. Median age was 77years(72–82). Monoclonal component in 40% of patients was IgG, 30,4% light chain and 36,1% IgA. We obtained 2,3 treatments lines/patient. Duration and persistence results are shown in Table 1.

Table 1.

Line treatment	Treatment Regimen	Patients per regimen and line(%)	Duration(Md)(days)	Persistence at 6 and 12 months(%)	
First line	MPV (melphalan, prednisone, bortezomib)	34,7	503 (167,75–1377,5)	87,5	50
First line	MP (melphalan, prednisone)	21,9	367 (229-458,5)	80	60
First line	VD (bortezomib, prednisone)	21,9	91 (45,5-304,5)	40	20
Second line	RD (lenalidomide, dexamethasone)	85	213 (123-487)	76,5	35,3
Third line	PocyDex* (pomalidomide, dexamethasone)	20	-	-	-
Fourth line	Krd*(Carfilzomib, lenalidomide dexamethasone)	33	-	-	-

*Due to a small sample size in these groups duration treatment and persistence couldn't be analyzed.

After Kaplan-Meier analysis,MPV showed more persistence than MP (p = 0,163) and VD (p = 0,018) as first line treatment.
Disease progression caused treatment interruption in 83,3% of cases. The other 16,7% was interrupted by toxicity, being haematologic side effects of lenalidomide(RD) the most common cause.
Conclusions: Results revealed MPV was the most common regimen treatment in first line and RD in second line. Furthermore, MPV showed the longest persistence among treatments. However, the more drugs are used the higher risk of side effects.
Disease progression was the most common reason of treatment interruption. Nevertheless due to side effects, lenalidomide should be used with caution.
This study could be a starting point to choose in real world the most effective and safe regimen treatment.
NO CONFLICT OF INTEREST

148 POSTER (BOARD 049) TREATMENT OUTCOME AND ADHERENCE TO IMATINIB AMONG NEWLY DIAGNOSED PATIENTS WITH CHRONIC MYELOID LEUKEMIA IN ETHIOPIA: A PROSPECTIVE COHORT STUDY

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Background: Imatinib (IM) has been shown to be highly efficacious in the treatment of chronic myeloid leukemia (CML) but continuous dosing and patient adherence are essential for the treatment success. The study aimed to assess the treatment outcome and adherence to IM in patients with CML.
Material and Methods: A prospective cohort study was conducted from October 1, 2016 to November 30, 2017 at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia. A total of 147 newly diagnosed patients were followed for three months. Data were collected using data abstraction format designed based on the appointment periods given for the patient. The 8-items Morisky Medication Adherence Scale was also used to determine their adherence status at the end of follow up period. Ethical clearance was obtained from AAU Ethics Review Board and written informed consent was taken from all study participants. Descriptive statistics were used to summarize the data while multivariable logistic regression was employed to explore associations among variables of interest. Data was analyzed using SPSS Version 21.
Results: Participants' median age at time of confirmed diagnosis was 36 years; with most of them in the age group of <40 years (64.6%). Significant number of patients (40.1%) developed hematologic toxicity of which 30.5% of them were Grade III-IV. Drug related adverse effects mainly cytopenia and skin rash were major reasons for temporary treatment discontinuation in 18.4% of study participants though treatment was also discontinued in two patients due to pregnancy. Platelet count <100x10^3cells/mm^3 at IM initiation and being female were significantly associated with temporary treatment discontinuation. Adherence rate to IM was found to be 55.1%. Those who lived in rural area, had low income, adverse effects and comorbidity were significantly associated with IM treatment non-adherence. Most (68.4%) patients missed their medication due to adverse effects. Complete hematologic remission (CHR) was achieved in 91.7% of the patients with median response period of 6 weeks. WBC count ≥20x10^3cells/mm^3 at initiation of IM (AOR = 0.32,95%CI:0.01–0.91) and peripheral blast count ≥3% (AOR = 0.33,95%CI:0.016–0.79) were predictors of CHR failure, whereas Morisky high adherent (AOR = 8.6,95%CI:4.32–11.1) was positively associated with CHR.
Conclusion: CHR was achieved in 91.7% of the patients and adherence was significantly associated with CHR. Overall treatment adherence is suboptimal. Thus, efforts should be made to improve adherence and further study is required to explore the cytogenetic and molecular responses.
NO CONFLICT OF INTEREST

149 POSTER (BOARD 050) THE FEEDING BEHAVIOR OF CANCER PATIENTS: A PROSPECTIVE STUDY

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Background: The side effects of cancer and / or its treatment greatly influence the eating behavior of patients. Some patients find it difficult to change their eating behavior even if they agree on their harmfulness. For others, these effects will help them decide to change their eating habits and adapt their risky behaviors.
Purpose: To make an assessment of the nutritional status of patients and to evaluate the food choice of cancer patients.
Materiels and methods: This is a descriptive, prospective, observational study conducted during a 6-month, based on an anonymous questionnaire by interviewing patients treated at the National Institute of Oncology. For all the patients interviewed, we were able to describe the socio-demographic, clinical and therapeutic characteristics as well as the nutritional data and eating habits of these patients.
Results: The socioeconomic characteristics of the patients in our study showed a predominance of women (65.6%) with an average age of 53.3 years, a low educational level (43.8%) and an urban tropism (93.2%). Objective BMI evaluation of patients' nutritional status showed that 43.6% of patients were malnourished or with a risk of undernutrition. 60.9% of patients reported that they did not receive advice on their diets and that no prior information was provided. However, 61.9% of patients followed a diet; some foods are spontaneously rejected by patients, such as meats including red meats (72.6%), dairy products (61.6%), eggs (11%), and other foods (41.1%).) such as salt, preserves, sausages or fried foods. Patients' awareness of the effect of these foods on their health and also the adverse effects of treatments are the main causes of changes in their eating habits.
Conclusion: The attention of the patients to the food choice can become a way to cope with the period of cancer and its treatment which, despite appearances, remains difficult to address. The change of habits relates to the choice of varieties on the one part and also in the quantities consumed on the other part, with a downward trend, or rejection of some foods.
NO CONFLICT OF INTEREST

150 POSTER (BOARD 051) MATERNAL ABVD CHEMOTHERAPY FOR HODGKIN LYMPHOMA IN A DICHORIONIC DIAMNIOTIC PREGNANCY

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Background: Hodgkin Lymphoma (HL) is the fourth most frequent hematological malignancy during pregnancy, with an incidence between 1 of 6000 to 1 to 1000. The treatment depends on disease stage, gestational age and fetal risk. ABVD (doxorubicin, bleomycin, vinblastine and dacarbazine) therapy is mostly used but data on fetal toxicity are limited. We report a case of twin pregnancy complicated by HL and treated with ABVD regimen.
Case report: A 41-year-old dichorionic diamniotic pregnant woman was diagnosed an advanced HL stage IIA at 27 weeks of gestation (WG). A multidisciplinary team agreed on using ABVD regimen at 28 WG (doxorubicin 48 mg, bleomycin 19.2 mg, vinblastine 10 mg, dacarbazine 730 mg at day 1 and 15 of a 28-day cycle). To prevent emesis, ondansetron was coadministered with 10 mg dexamethasone orally. The first cure was well tolerated. On day one of the second ABVD regimen, premature ruptured membranes required planning caesarean section at a gestational age of 32 weeks and 4 days. Four days after delivery, an echocardiographic control showed minor left cardiac dysfunction with left ventricular ejection fraction (LVEF) at 50% for one of the twins. No treatment was initiated, and the one-month echocardiographic control highlighted normalized cardiac function with a 48% LVEF without pulmonary hypertension.
Discussion: The treatment of HL in pregnancy may be urgent to initiate, and criteria for initiation should be considered with caution. The European Society of Medical Oncology recommends that chemotherapy should be avoided during the first trimester of pregnancy based on data showing the potential toxicity of chemotherapy on the organogenesis. In this case report, the heart failure diagnosed in the neonate could not be directly imputed to ABVD therapy. However, the disposition of doxorubicin may be influenced by the maternal physiological changes such as the activity of enzymes CYP2D6 and CYP3A4 and the function of transporters (e.g., P-glycoprotein). Doxorubicin is a substrate of these enzymes and its transfer to the placenta regulated by some transporters. However, drug-drug interactions might arise with treatments such as ondansetron that inhibit enzymes and/or transporters. Most studies reported that doxorubicin is safe because of its low placenta transfer (7.5% of the maternal level), a case of pregnancy treated with 3 cycles of R-CHOP (including doxorubicin at 50 mg/m2) reported a cardiomyopathy in a male infant after birth that was normalized after one month of treatment by enalapril.
Conclusion: Chemotherapy is known to be safely administered during pregnancy during the second and third semester although data on doxorubicin cardiotoxicity on fetus are inconsistent. This case report is an additional contribution to the data on fetal cardiotoxicity of doxorubicin in a dichorionic diamniotic pregnancy.
NO CONFLICT OF INTEREST

151 POSTER (BOARD 052) PHARMACEUTICAL INTERVENTIONS TO IMPROVE SAFETY OF CHEMOTHERAPY-TREATED CANCER PATIENTS: A CROSS-SECTIONAL STUDY

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Introduction: Cancer chemotherapy is a high-risk process. In our hospital, most of them are administered in a daily hospital. Nurses in a hospital call centre contact each patient 3 days before his visit and collect community laboratory results and clinical toxicity. These data in the electronic patient record help senior oncologists to anticipate a Computerised Prescription Order Entry (CPOE) a day before patient's visit. A systematic pharmaceutical analysis of CPOE is conducted by an oncology pharmacist, who consults all patient data. If any error is detected, the pharmacist ensures a pharmaceutical intervention (PI) toward the oncologist before the chemotherapy preparation, that can lead to changes in CPOE. The aim of this study was to assess PI's impact on the safety of chemotherapy prescriptions.
Material and Method: This prospective cross-sectional study was conducted in an 800-bed university hospital with oncology departments. All chemotherapy prescriptions were included and PI were collected prospectively during 1 month. PI's clinical impact was scored by an expert panel of oncologists and pharmacists, using Hatoum scale. Univariate and multivariate analysis were conducted in R software to identify factors associated with a higher frequency of PIs.
Results and Discussion: Of 1,346 prescriptions included, 129 required a PI (9.6% [CI95%: 8.1–11.3]), concerning 31 abnormal laboratory results (24.0% [CI95%: 17.1–32.5]), 16 non-update weights or patient height errors (12.4% [CI95%: 7.5–19.6]), 14 patient scheduling issues (10.9% [CI95%: 6.3–17.8]), 11 overdosages (8.5% [CI95%: 4.5–15.1]) and 57 other types (44.2% [CI95%: 35.5–53.2]). Most PIs were scored as having at least a significant impact for patient safety (69.8% [CI95%: 61.0–77.4]). The frequency of PIs was significantly associated with tumour site ($p = 0.04$) and weekday of prescription ($p = 0.005$). Multivariate analysis identified factors independently associated with PI's performance, including pancreas and biliary tract cancers (Odds Ratio OR = 2.8 [CI95%: 1.4–5.3]), ovary cancers (OR = 2.4 [CI95%: 1.2–4.8]) and head and neck cancers (OR = 2.4 [CI95%: 1.1–5.1]) and the day 1 of the protocol with a cytotoxic agent (OR = 3.7 [CI95%: 1.1–11.1]). Poor prognosis and platinum-based regimens could explain the more frequent occurrence of PIs in these cancers. Many PIs concerned the update of serum creatinine value to adjust the dose of carboplatin and avoid potential severe adverse events. A complete pharmaceutical analysis is time-consuming but these results could help oncology pharmacists to target patients and prescriptions at a higher risk of medication errors.

Conclusion: Oncology pharmacists have a critical role in the safety of chemotherapy prescriptions. The coordination between healthcare professionals and access to patient data is essential to improve PIs' relevance and clinical impact.
NO CONFLICT OF INTEREST

152 POSTER (BOARD 053) ASSESSMENT OF VACCINATION PRACTICES IN A CANCER CONTROL CENTRE

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Background: Hematopoietic stem cell grafts (HSCs) and chemotherapy are followed by a loss of T and B lymphocytes needed to maintain immune vaccine memory. It is therefore necessary to follow the most recent recommendations regarding vaccination and antibioprophylaxis, in order to best protect patients against infectious agents and ensure optimal therapeutic management.
The aim of this study, within a Cancer Control Centre, is first to assess the knowledge of the medical profession and the updating of the knowledge about vaccination for patients under chemotherapy or after allograft: live - attenuated vaccines versus non-living vaccines, post-chemotherapy or post-graft contraindications delays, recommended vaccines in post-graft and for the entourage, etc¼ then to develop an explanatory leaflet on the vaccination of these patients. This brochure will be sent to the general practitioners (GPs), who are the first prescribers of vaccines for these patients whose care is sometimes complex, to foster the relationship between primary and secondary care.
Material and Methods: -Development of an interactive online quiz (clinical cases, open-ended or multiple-choice questions) for the physicians of the centre to evaluate their knowledge about the vaccination of their patients under chemotherapy or allografted as well as their satisfaction with the transmission of information on the latest vaccine news.
-Elaborate of a brochure in pocket format containing the latest vaccine recommendations (priority vaccinations to be carried out, sources of available informations used, etc.) for the GPs and those of the centre.
-Drafting of an advice sheet on vaccines for the centre's patients.
Results: We are waiting for the first feedbacks to date of the interactive quiz which has been put online for one month. The doctors' brochure, which addresses post-graft and post-chemotherapy vaccination deadlines, possible contraindications (¼) and the patients' sheet are currently being finalised and will be adjusted according to the results of the quiz.
Conclusion: This approach will help to harmonize vaccination practices within the centre and optimize the care of these immunosuppressed patients. Transmission of the brochure to the GPs will improve continuity of care from secondary to primary care.
NO CONFLICT OF INTEREST

153 POSTER (BOARD 054) USE OF NIVOLUMAB AND PEMBROLIZUMAB IN A TERTIARY LEVEL HOSPITAL

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Introduction: The development and rapid uptake of checkpoint inhibitors, a modern form of immunotherapy, has resulted in changes to the way numerous cancers are managed. Nivolumab and pembrolizumab, programmed death 1 (PD-1) immune checkpoint inhibitor antibodies were approved for the following indications: advanced melanoma, non-small cell lung cancer (NSCLC), Hodgkin's lymphoma and urothelial carcinoma. Furthermore, nivolumab was approved for renal cell carcinoma (RCC) and squamous head and neck cancer (SCCHN). Our purpose is to analyze the evolution of number of patients treated with nivolumab and pembrolizumab.
Material and Method: A retrospective, observational and descriptive study was carried out which included all patients treated with nivolumab and pembrolizumab in the last 3 years (January 2015 to December 2017). Data sources: electronic prescription program and electronic medical records.
Results and Discussion: During the study period, the number of patients treated with nivolumab and pembrolizumab was increasingly. The table shows a growing number of patients over the course of these three years, especially between 2016 and 2017 due to new indications they have achieved. 23 patients were enrolled in clinical trials with nivolumab and 6 patients with pembrolizumab in 2017. Evolution from 2015 2017 is shown in the table.

	NIVOLUMAB			PEMBROLIZUMAB		
	2015	2016	2017	2015	2016	2017
NSCLC	5	35	47			14
NSCLC CT*	9	9	22	1	1	
Melanoma		1	5	2	4	8
Melanoma CT*					6	5
Breast cancer CT*					2	1
Urothelial carcinoma			2			7
Urothelial carcinoma CT*			1			
RCC			6			
SCCHN		1	2			
Total	14	46	85	3	13	35

*Clinical trial: CT
Conclusion: Immunotherapy is increasingly identified as the best option for a growing number of cancers, many of which were previously intractable. The greatest success so far has been with immune checkpoint inhibitors and the European Agency Medicine (EMA) has approved new indications for these agents recently. Immunotherapy usage is likely to increase as we recognize encouraging results with several other specific classes of agents. CT are essential in bringing new and potentially effective treatments to patients.
NO CONFLICT OF INTEREST

154 POSTER (BOARD 055) EVALUATION OF HPARMACEUTICAL CONSULTATION ACTIVITY AT THE INITIATION OF ORAL ANTICANCER TARGETED DRUGS IN A DAY-CARE HOSPITAL

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Background: Since 2013, a multidisciplinary program involving consultations and follow-up dedicated to patients beginning a treatment with oral targeted anticancer drugs, has been settled up. Pharmaceutical consultation (PC) had to optimize oncological care by several means: medication reconciliation, evaluating patient understanding and dealing information on treatments; it would also improve hospital-community connections.
Our objective was to review the pharmaceutical consultation activity and to assess its impact on care process of patients with cancer.
Material and Methods: PC was systematically proposed to patient initiating an oral anticancer treatment in ambulatory clinic. All data from patients involved in this program since December 2013 where collected and analyzed.
Results: 54 patients had a PC, 31 man and 23 women (sex –ratio : 1,3), mean duration of PC was 1 hour (including clinical and administrative time). Mean age was 72 years old [47–88 y]. Tumor localizations were : solid tumors (lung, bowel, breast,¼) (n = 49) and hematological cancer (n = 5). Anticancer treatment were mainly: erlotinib (n = 29), regorafenib (n = 8), palbociblib (n = 4), imatinib (n = 3), lenalidomide (n = 2), osimertinib (n = 2) ; capecitabine (n = 2), ibrutinib (n = 2), others (n = 5). On average, patient's chronical treatment was composed by 7 medications [1–17] and 74% had, at least, 5 drugs. Furthermore, 16% of patients practiced self-medication and 16% used complementary and alternative medicine. On A total of 46 medication issues were detected, 50% were an interaction between anticancer medication and chronic treatment. Pharmaceutical interventions consisted in proposing a clinical or biological monitoring (33%), optimizing administration or schedule (26%), stopping a treatment (22%) or adapting doses (11%). Patients stopped their treatment after a median duration of 3,7 months [0.3–34,5], drug toxicity was involved in 15% of cases.
Conclusion: PC allowed to detect at-risk situation related to anticancer and chronic treatment and probably reduced the risk of medication adverse event. With this in mind, these consultations may be extended to all initiation of an oral anticancer treatment and pharmaceutical follow-up.
NO CONFLICT OF INTEREST

155 POSTER (BOARD 056) CRUSHING ORAL ANTICANCER DRUGS: A BAD IDEA?

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Background: Healthcare professionals who are involved in the daily care of cancer patients, are faced with the growing issue using oral anticancer drugs in patients experiencing swallowing difficulties. The lack of commercially available oral liquid dosing forms might compromise initiating or prolonging necessary therapies in this patient population. Pharmacists are often challenged to provide liquid alternatives for oral drugs that have solely been made commercially as a solid formulation; therefore it is common practice to crush tablets or to prepare oral liquids from solid forms. When preparing liquids ex tempore, a number of requirements need to be fulfilled. In addition to chemical, physical and microbiological stability of the active ingredients, therapeutic and toxicological aspects should be the subject of review.
The goal was to develop a guide for healthcare providers in order to assist in providing scientific and up-to-date information for patients who are in need of special dosing forms.
Methods: A literature search in PubMed/Medline was conducted together with the registration documents and relevant phase I and II data from the pharmaceutical industry, U.S. Food and Drug Administration and European Medicines Agency were used as a source of information.
Results: An overview for healthcare providers was drafted. Sixty nine oral anticancer drugs that were available on the Belgian market at the moment of the development were included.
Conclusion: The development of a pocket guideline has increased the awareness and has been added to the standard of care as to improve safe medication use in patients with swallowing difficulties.
Source of Funding:
None
NO CONFLICT OF INTEREST

156 POSTER (BOARD 057) ASSESSMENT OF THE PROPER USE OF NIVOLUMAB: PRESCRIPTION, MONITORING AND MEDICO-ECONOMIC IMPACT

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Introduction: Nivolumab (Opdivo) is an anti-PD1 monoclonal antibody used after a first chemotherapy line for the treatment of Non-Small Cell Lung Cancer for BRAF wild-type Melanoma and in second line metastatic renal cell carcinoma since 2016. The monthly processing cost is approximately 5550€ euros.
Objective: The aim of our study is the assessment of the proper use of Nivolumab prescription in our hospital and the monitoring of the treatment.
Material and Methods: A retrospective study between July 2015 and march 2018 was conducted on 86 patients' files, using the patients' medical records and the Multidisciplinary Medical Decision (MMD) software. According to the Summary of Product Characteristics (SPC), the proper use requires a proper cancer localization, a WHO status < 2, and a limit of 20 mg/j of corticotherapy.
Results: 56 (65%) men, 30 (35%) of women were treated for a pulmonary cancer (91%): 49 patients (57%) with pulmonary adenocarcinomas and 23 (27%) with squamous cell carcinomas and 6 patients (7%) with large cell pulmonary cancer, only 2 patients were treated for a melanoma; and 6 (7%) patients were treated for renal cell carcinoma; 63 patients (73%) had WHO status between 0–1 and 23 patients ≥ 2 (27%). The proper use of Nivolumab was observed in 60 patients (70%). Regarding monitoring, 30 of them received more than 10 injections. 33 patients (35%) have interrupted the treatment, 30 of them did not respond well to the treatment. The main cause is a tumoral progression (67%). This implied a change of treatment, an alteration of the general state, a transit to palliative care or the death of the patient. 26 of them received less than 5 injections (14 of them already had a bad response criteria). The percentage of patients still receiving treatment is higher for patients whose proper use is respected (26/63 vs 7/23). 8 of the 86 (9%) patients did not follow an initial MMD. Only 15% of the patients see their treatment stopped because of a bad tolerance to the treatment (auto-immune). The biomarker PDL1 was never investigated, since it is not recommended by BMS, although it could lead to a better selection of patients.
Discussion: Access conditions set by SPC are not respected for 26/86 patients (30%) for a total of 215 injections. The cost of misuse represents around 600 000€ for a total of 3 200 000€ of expenses using this treatment.
Conclusion/perspectives: To improve the safety of patient care and reduce the economic impact of improper treatment, a listing of inclusion criteria and a monitoring leaflet could be handed to oncologists as a prescription assistance tool before multidisciplinary medical decision and during the treatment of the patient.
NO CONFLICT OF INTEREST

157 POSTER (BOARD 058) INTERACTIONS BETWEEN ITK DRUGS AND CHRONIC HOME MEDICATION IN A PHARMACEUTICAL CARE UNIT OF EXTERNAL PATIENTS

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Introduction: Tyrosine Kinase Inhibitors(ITK) treatment represents a revolution in the oncohematological treatment. However, the result of the treatment depends on the effective and safe use of them, since there are many interactions, that compromise its effectiveness and safety. The aim of this study is to analyse drug interactions between ITK and chronic home medication of the patients attended in a Pharmaceutical Care Unit of External Patients.
Material and Method: Observational study in which a cross-section was made to obtain patients under treatment with ITC, through the dispensing register program in hospital (PRISMA®). Chronic home medication data was obtained by Prescription V5 data and electronic prescription billing system (Mycroestrategy®). The collected data® were: ITC drug, age, sex, diagnoses, home treatment, interaction, type of interaction, category of evidence and effect produced. Micromedex® was the tool used to detect and classify the interactions.
Results and discussion: 77 patients were analyzed (56% men). Mean age: 62.7 years. The following diagnoses stand out: 33.8% of patients suffered from chronic myeloid leukemia, 15.6% from renal cell cancer and 13% from stomach cancer. 93.5% of patients had concomitant home treatment with ITK, with an average of 5 medications / person. A total of 372 treatment lines were analyzed and 41 interactions were recorded in 27 patients (1 out of every 3 affected patients. Interaction rate: 11%). The drugs frequently implicated were: gastric pH modifying drugs, drugs that prolong the QT interval and drugs that inhibit CYP3A4. 95% of the interactions were "mayor". The category of evidence was: 6 of excellent scientific evidence, 7 of good scientific evidence and 26 of sufficient scientific evidence. Pharmacological effect: Increase in concomitant drug levels (toxicity increase): 15/41. Decrease in ITC levels (decrease in effectiveness): 16/41. Others: increase in liver enzymes, prolongation of the QT interval and decrease in the effectiveness of the concomitant drug.
Conclusion: The number of detected interactions is limited although the proportion of patients affected is moderate. However, most of these interactions have no clinical significance. The pharmacist has an important role in optimization ITK therapy, so his participation in the multidisciplinary team must become from adviser on demand to a proactive role pharmaceutical care to patients under ITK therapy.
NO CONFLICT OF INTEREST

158 POSTER (BOARD 059) MEDICATION REVIEW IN CANCER PATIENTS TREATED WITH TAXANES

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Background: Paclitaxel (TXL) and docetaxel (TXT) are widely used in oncology, mainly in gynecology and urology. Both can be responsible for severe adverse events, even lethal. French Drug Agency (ANSM) and French National Cancer Institute (INCA) recommended, since July 2017, that pharmacists analyzed putative interactions between usually taken drugs by patients (as well as herbs) and taxanes. In this way, we implemented medication reporting since 09/2017 in our center. The objective of our study is to evaluate the interest of a medication review by pharmacists.
Material and Methods: A comparative monocentric study of two cohorts of patients treated with taxanes for prostate, breast, or gynecological

cancer was done. A reporting of drugs taken by patients (listed from the computerized patient file (Axigate®)) was retrospectively established for an historical cohort (patients treated with taxanes from 2016/09 to 2017/09). A prospective cohort of 29 patients, for whom a medication review was made from 2017/09 to 2018/02 was also studied. For this cohort, before taxane treatment, usual medications were identified in Axigate®. Patients were called by a pharmacist to identify drugs and herbs they took; their usual community pharmacies were also called in order to recover all prescriptions Drugs-taxanes interactions were studied using Thériaque® database for both cohort and bibliography available on Pubmed for taxanes-herbs interactions only for the second cohorte.
Results: The historical cohort included 57 patients (mean age 61 years [21; 87], 22 treated with TXT and 35 with TXL, average number of co-medications per patient: 4.7 [0; 20]). No interaction were identified for TXT treated patients and 16 non-recommended combinations involving TXL were identified (7 patients, no major interaction). The average number of drugs interactions per patient was 0.28. The prospective cohort included 29 patients (mean age 67 years [36; 89], 18 treated with TXT and 11 with TXL, average number of co-medications per patient: 8.1 [1; 17]). Pharmaceutical analysis revealed interactions in 23 patients: non-recommended combinations between drugs and taxanes (11 patients) and putative interactions with herbs (16 patients). The average number of drugs interactions per patient was 0.62 (0.86 by taking into account interactions with herbs).
Conclusions: Medication review by pharmacists, allowed to detect drugs associated drugs with taxanes twice as much per patient. Moreover, number of avoided interactions with drugs was also twice much per patient. We also identified putative herbs taxanes interactions that were hidden before. The next step will be to evaluate prospectively the impact of medication review on taxanes tolerance profiles.
NO CONFLICT OF INTEREST

159 POSTER (BOARD 060) MEDICATION RECONCILIATION IN ONCOLOGY INPATIENTS: IS IT EFFICIENT ? HOW TO IMPROVE ?

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Background: Medication reconciliation (MR) is considered to be an important strategy for increasing the safety of medication use. Incidence of cancer but also non-oncological diseases increase with age. More and more weakened patients, with comorbidities and poly-pharmacy may be hospitalized. The oncologist prescribes chemotherapeutic, supportive treatment and must also consider chronic therapies. Most of studies have been done in an outpatient setting. The aim of this study was to estimate MR efficiency in hospitalized oncological patients and ways to improve MR.
Material and Methods: A satellite unit pharmacy is established in an oncology ward (27 beds) of a large teaching hospital. Systematic medication reviews and MR were provided daily by a tandem pharmacy student/pharmacist. A 26 month evaluation was conducted. Patients with one or more treated comorbidity, duration of hospitalization furthermore than 24 hours, ECOG score <4 were considered as eligible for MR.
Results and Discussion: 2606 patients were hospitalized during the evaluation period and 772 were considered as eligible for MR (30%). 229 MR were conducted (30% of eligible patients). Reasons for non MR (543) were: lack of time (51%), patient unable to be interviewed (21%, e.g. cognitive disorders, evolution of ECOG score, psychological context, isolation for infection¼), MR already done (12%), rapid patient discharge (16%). The mean number of sources of information was 3.3 and main sources were: patient medication interview, previous patient hospitalization record, patient medications lists, pharmaceutical electronic record. The mean time to conduce a MR was 42 min (21 min for best possible medication history). 52% of MRs were done within 24 h of patient's stay. 76 unintended medication discrepancies (UMDs) were identified in 55 patients (24% of eligible patients): omissions (45), dose errors (22), wrong medications (6), others (3). Main concerned drugs were: cardiovascular (38%), alimentary tract and metabolism (21%), nervous system (12%), others (29%). The evaluation highlights the value to implement MR considering UMDs in 24% of eligible patients. MR is nevertheless an important time-consuming process and not all patients were reconciliated. It's necessary to have more precise selection criteria considering number and type of comorbidities, patient's provenance (home or other health care institution), therapeutic objective¼.
Conclusion: Because of the "fragility" of hospitalized cancer patients and associated poly-pharmacy, MR may contribute for increasing the safety of medication use. MR must be considered as a component of a global medication therapy management and must be integrate in the clinical pharmacy continuum. It's also an opportunity to integrate pharmaceutical interventions as adherence evaluation, or detection self-medication with complementary and alternative medicine.
NO CONFLICT OF INTEREST

160 POSTER (BOARD 061) EVALUATION OF THE SAFETY OF IMMUNE CHECKPOINT INHIBITORS IN PATIENTS WITH HIGH MICROSATELLITE INSTABILITY AT THE STATE OF QATAR

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Introduction and Background: Recently the FDA granted an accelerated approval for the use of two cancer immunotherapy for pembrolizumab for any solid tumor with microsatellite instability-high (MSI-H) was approved at May 23, 2017, and Nivolumab was also approved for MSI-H metastatic colorectal cancer at Aug 1, 2017. With the expanded use of immunotherapy in clinical practice, rarer side-effects are rising. We conducted this study to evaluate the safety profile of ICPi in MSI-H patients at the national center for cancer care and research at Qatar.
Method: All the patient receiving ICPi at NCCCR were reviewed for their MSI status. Patients with MSI-H were identified. Among all the patients receiving cancer immunotherapy during the period from 2015 till now; seven patients with MSI-H were recognized. All of them received pembrolizumab. We did a chart review for those patients with a focus on the safety outcome. ADR monitoring system was reviewed and any documented ADR was recognized.
Results: Out of the total cohort of patients receiving immune checkpoint inhibitors; 7 patients with MSI-H were identified. 2 patients diagnosed with metastatic gastric cancer, 2 patients with metastatic colon cancer, 2 patients with rectal cancer and 1 patient with metastatic recurrent endometrial cancer. None of the 7 patients received pembrolizumab as first line. 72% of the patients had multiple co-morbidities plus the primary diagnosis of metastatic cancer and 28% of the patients had no previous co-morbidities except the newly diagnosed cancer. With regard to selected baseline monitoring parameter before receiving pembrolizumab; 100% of the patients had baseline thyroid function test, and 72% patients had baseline ECHO. 43% (3 patients) of the patients still receiving pembrolizumab, 29% (2 patients) received only 1 dose then passed away, 14% (1 patient)stopped pembrolizumab because of disease progression and chose best supportive care, and 14% of the patients received 2 doses of pembrolizumab as neoadjuvant treatment.85% developed some sort of iADRs secondary to the drug and one patient passed away only 2 days after receiving pembrolizumab.
Only one patient had fatal adverse drug reaction in the form of grade 4 thrombocytopenia, Pancytopenia & pembrolizumab induced limbic encephalitis which unfortunately did not respond to steroids or IVIG. Apart from that, the Immune-related adverse effects were manageable by treatment break, steroids or antibiotics in case of drug-induced pneumonitis.
Conclusion: Screening patient for MSI-H is a new call for hope; offering those patients with a novel treatment with a good response chance.
The immune-related side effect can sometimes be unpredictable, rare and fatal so baseline, frequent monitoring and early management of these suspected or confirmed adverse effect is life-saving and it is a multidisciplinary responsibility.
NO CONFLICT OF INTEREST

161 POSTER (BOARD 062) DEVELOPMENT OF A MONITORING PROTOCOL INTEGRATED IN NIVOLUMAB'S PORTUGUESE COMMUNITY EARLY ACCESS PROGRAM

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Background: Nivolumab is a recently approved immunomodulator for locally advanced or metastatic squamous histology non-small cell lung

integrated on the the Early Access Program (PAP). Patients in this program should have had disease progression during or after receiving at least 1 systemic treatment for grade IIIB or IV lung cancer.
This work will focus on monitoring the frequency and degree of adverse effects of Nivolumab in patients integrated in PAP at CUF Descobertas Hospital (HCD) by the Pharmaceutical Services.
Objective: Develop a pharmacotherapeutic follow-up protocol in patients diagnosed with NSCLC, integrated in PAP, in order to evaluate the frequency and severity of Nivolumab adverse events.
Method: The Hospital Pharmacist collects and records the data of each patient included in the PAP, through the consultation of the biochemical parameters under analysis and the consultation of the patient's medical history. In order to do this, a model of "Pharmaco-therapeutic follow-up" was created, adjusted to the drug in question, with the specific data that must be collected and analyzed. For the Nivolumab, several parameters should be collected, including weight, Hbg, platelets, serum Cr, AST, ALT, total bilirubin, pO2, T3, T4, TSH and glycemia. To evaluate the effectiveness of the drug, the RECIST guidelines are followed.
Results / Discussion: Between February and June 2016, 4 patients integrated PAP in HCD. Of these patients, 3 showed few alterations in the biochemical parameters analyzed, and the major alteration was related to the glycemic levels. One of the patients enrolled in the study eventually died and only completed one course of treatment. A total of 19 treatment cycles and therefore the collection and recording of the data for the completion of the pharmacotherapeutic follow-up model were performed. Regarding the effectiveness of the drug, the decrease of tumor masses in 2 patients and 1 in steady state was observed through imaging tests.
Conclusion: The collection and analysis of certain parameters in patients undergoing additional monitoring therapy is a must for all health professionals because only this way can it be possible to make patients benefict from innovative drug in an efficient and safe way. It is also essential to disclose data that demonstrate or not the effectiveness of the drug.
NO CONFLICT OF INTEREST

162 POSTER (BOARD 063) COMPLEMENTARY AND ALTERNATIVE MEDICINE IN CANCER PATIENTS – ASSESSING THE NEED FOR INFORMATION

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Background: The number of cancer patients using complementary and alternative medicine (CAM) increases continuously. However, many patients do neither ask for information on this subject nor do they inform their oncologist about the concurrent use of CAM. Deploying and managing CAM properly is pivotal because serious health issues can arise from adverse effects of CAM or interactions between CAM and chemotherapy or CAM and other medication used for comorbidities. Assessing patients' needs and topics of interest in CAM is therefore vital and patients' counseling should include these topics.
Material and Methods: A pre-existing, validated questionnaire was adapted to local structures and demands. The questions were mainly related to cancer patients' knowledge and experience with CAM and issues they would like to discuss with their oncologist. The questionnaire comprises 17 questions (grouped in 5 categories) which were mostly to be answered by ticking one or multiple corresponding statements. The questionnaires were distributed by the nurses in the outpatient clinic during an 8 day period and returned anonymized.
Results: A total of 102 questionnaires were distributed. 90 questionnaires (88%) were returned of which 46% were duly completed. Participating patients were mostly male (57%), between 40–65 years old (50%) and suffered most often from urogenital (20%), lung (16%) or head-and-neck cancer (12%). About half of the patients (54%) stated that they had heard about CAM in connection with cancer treatment before. 41% of patients stated that they are interested in CAM. Nutrition (27%), herbal medicine (21%), exercising (21%) and psychological counseling (20%) are the topics most patients would like to be advised on.
Conclusion: The questionnaire was well received by the patients. According to our survey CAM and other supportive measures appear to be topics many patients are interested in and would appreciate being counseled on. Oncologists in both in– and outpatient clinics should routinely offer sound information on this subject.
NO CONFLICT OF INTEREST

163 POSTER (BOARD 064) THERAPEUTIC EDUCATION OF PATIENT WITH CANCER: WHAT IS THE PERCEPTION OF THE ROLE OF THE HOSPITAL PHARMACIST?

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Background: Therapeutic patient education (TPE) is defined as a permanent process of care built around the patient. It involves awareness raising activities, information, self-learning and psychological support on the disease, treatment and prescribed care. The increasing incidence and chronic nature of the cancer pathology explains the development of therapeutic education in this area.
Material and Method: In this work, we carried out a survey to highlight the role that the hospital pharmacist can play in the therapeutic education of cancer patients. The first questionnaire was intended for patients by direct questioning during the retrocession of the chemotherapy drugs in the pharmacy of the military hospital Mohammed V Rabat -Morocco. Two other questionnaires for physicians and pharmacists working in our establishment.
Results: Patients surveyed (n = 46) had an average age of 50.86 years and a sex ratio of 1.6. More than half of the patients (56%) were unaware of the pharmacist's role in managing their pathology. No patient interviewed has ever benefited from a therapeutic education session. For pharmacists (n = 20), the results showed that 83% know the principles of therapeutic education, 55% have already participated in the therapeutic education of a cancer patient, 87% have not never received training on therapeutic education and 100% expressed a desire to do such training. Physicians in the oncology and other medical services (n = 21) were interviewed, no doctor had ever collaborated with a pharmacist through the cancer TPE and 50% considered this collaboration as essential for the correct management of cancer patients.
Conclusion: Currently the educational actions of the pharmacist to all patients and specifically the cancer patient are no longer to prove. Our study unfortunately shows an insufficient awareness of patients of the role that the pharmacist can play in the management of their pathology. It also shows the lack of training of pharmacists in TEP and the lack of the interdisciplinary collaboration for its good implementation. The role of the pharmacist can only be developed in the consciousness of belonging and collaboration with a multidisciplinary and synergistic network, centered on the treated patient and composed of all health professionals.
NO CONFLICT OF INTEREST

164 POSTER (BOARD 065) DRUG INTERACTIONS IN AMBULATORY CANCER PATIENTS

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Background: Cancer patient are at high risk for drug-drug interactions because of age related polymedication, over-the –counter drugs or concomitant alternative medicine. Because of the low therapeutic index of anticancer drugs, it is interesting to evaluate drug interactions in this frail population. Our objective was to evaluate the prevalence of drug interactions between cancer drugs and patient chronic medications in an ambulatory cancer care setting and to optimize medication in case of drug interactions.
Material and Method: Complete information on all patients' medications were prospectively collected by a pharmacist for patients treated by intravenous anticancer drugs. Patient treated with monoclonal antibodies were not included. Potential drug interactions were analyzed with the guide for drug interactions of the French Drug Agency and medical literature (Pubmed; www.ddi.predictor.org; www.mskcc.org.)
Results and Discussion: 60 patients were included, 87% were treated for an oncologic malignancy (58% for a breast cancer). Average age was 62 ± 11.5 years with a sex ratio of 0.43. On average, 2.75 sources were used to collect patient's medication (patient interview: 98%; community pharmacy: 73%). 23 drug interactions were collected; concerning 28% of patients (17/60). A treatment modification was proposed in 57% (12/21) for drug interactions (of which 66% were accepted by the physician). 7 drug interactions with phytotherapy (quinquina, passionflower, turmeric, garlic, ginkgo¼) were detected which were all discontinued. 3 drug interactions led to monitoring for potential side effects. Drug interactions

involved oxycodone, anticoagulants, proton pump inhibitors, statines, verapamil, aprepitan, antiepileptics.
Conclusion: Drugs interactions prospectively realized by pharmacist allow medication optimization in ambulatory cancer patients.
NO CONFLICT OF INTEREST

Poster Session: Computer and Software

165 POSTER (BOARD 066) FEEDBACK FROM ONCOLIEN® AND ONCOTUTO® USERS AFTER 19 MONTHS

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Background: The rise of oral cancer treatments has motivated health care professionals to support patients with their needs and questions. Many expert groups have written information sheets, specifically, the French Society of Oncology Pharmacy (SFPO), with Oncolien® sheets which guide professionals through this process of patient's support. SFPO has also developed educational videos (Oncotuto®) towards the same goal. After 19 months, the users of these free media and the way they made use of them are examined with regards to the quality and accessibility of the information supports, in order to further improve them and meet the users' expectations.
Material and Methods: An online survey has been sent to SFPO website suscribers and SFPO members by mail or Twitter®.
Results: Among the 44 interrogated professionals who answered the survey (68% of womens, 32% of mens, 72% members of SFPO), and whose ages are 36 years old in average (from 26 to 60), the majority are pharmacists (68% hospital pharmacists, 3% community pharmacist, 27% residents). Oncolien® is mostly known by both word-of-mouth among pharmacists (43%) and communications during the SFPO annual conference (30%), but far less by search engines and social networks (5%). The word-of-mouth communication medium is quite efficient in the pharmaceutical community (78%), but much less outside of it (17% to nurses and doctors). 21% of the users read them once a week. 35% of Oncolien® users print the sheets from SFPO website. They are mostly used for drug delivery (32.5%), consultations (20%) and prescription validation process (57%). Most of the users spend between 3 and 10 minutes on each sheet. The chapters which were reported as the most useful are those which concern drug-herb interactions. The pedagogical videos are less well-known and used (47% of the users have used them once). The most common application for them is the training of professionals. The viewing of these videos is more time-consuming than the reading of the sheets, but the electronic format is more adapted to training sessions. Their most significant advantage resides in the analysis of the interactions (allopathy and phytotherapy). The main drawbacks are the lack of updating and the uncertain availability of the platform (because of website hacking).
Conclusions: Oncolien® sheets are greatly appreciated for their practicality, intuitiveness and clarity, and are reported to meet the needs of the professionals. The ways of improvement suggested are: a format for smartphones and the addition of references used for the redaction of the sheets. Spreading the use of SFPO's tools requires the emphasis to be placed on communication (via search engines, social networks, medical school…) in order to reach a public wider than pharmacists. New projects are scheduled: Oncolien® sheets for patients and OncoDisp, a new tool for drug delivery.
NO CONFLICT OF INTEREST

166 POSTER (BOARD 067) HERB-DRUG INTERACTION (HDI) DETECTION COMPARISON BETWEEN AN INSTITUTIONAL AND A PUBLIC HDI DATABASE.

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Backround: Since several years, online Herb-Drug Interaction database emerged and proposed to check interaction between drugs and plants. Many of them have online free access, different target audience, and some of them have important scientific sources quoted. On health website for public audience, HDI can be easily checked by patient and can be reported to their pharmacist or physician.
The objective of this study is to compare HDI detection in two different database: An institutional and a public one.
Method: Drugs and plants history was from 20 patients in a week care hospitalization unit at the Paul Strauss Cancer Center. Each plant-drug doublet was analyzed in 10 different database. We therefore have a focus particularly on 2 of them: one from WebMD (Health public audience website), and the other one from the MSKCC website.
Results: 57,4% and 48,3% of total HDI detected in all 10 databases were also detected in the MSKCC and WebMD database respectively. 100% of herbs were mentioned in the WebMD database for 87,1% in the MSKCC database which is consistent with the relative detection of 65,9% for the MSKCC database and 48,3% for the WebMD database. Sensibility (True Positive / (True positive + False negative)) was also performed and is almost the same between the 2 databases (98.7% and 98.9% for WebMD and the MSKCC database). Scientific evidences from different sources were also quoted in the 2 database.
Conclusion: Even if the WebMD HDI database is for a public audience, informations that are given are quite similar than an institutional database such as from the MSKCC. Pharmacist and physician should be aware of this new information source and be able to return to the scientific evidences if necessary.
NO CONFLICT OF INTEREST

167 POSTER (BOARD 068) IMPLEMENTATION OF E-TOOL SUPPORTING PHARMACISTS AT COUNSELING ONCOLOGICAL PATIENTS AND DISPENSING OF ORAL ANTICANCER DRUGS IN SLOVENIA

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Background: Anticancer therapies are increasingly shifting from clinic-based infusions to orally-administered medications by patients and/or their informal caregivers, thereby changing patient and health professional roles, responsibilities, and priorities. With the narrow therapeutic range of orally available anticancer agents (OAA), patients are vulnerable to treatment failure and side effects due to medication errors, drug interactions and non-adherence. Thus, these patients need concerted counselling by both the oncologist and the community pharmacist. In Slovenia OAA are dispensed by community pharmacists.
Material and Methods: Within the EPIC project ("Empowering pharmacists to improve health care for oral chemotherapy patients: Establishment of a European best-practice model") online tool to support pharmacist counselling has been implemented in Slovenia. It was prepared based on German OAA database, later upgraded and modified based on proposals of working group, which was created at Slovene Chamber of Pharmacies.
Results: Online tool, which is available to registered pharmacists in Slovenia, consists of 2 main areas: monographs on the individual oral anticancer drugs and the patient area. The monographs contain an abstract from the SPC of OAAs, information about most important counselling points, side effects, directions of use and interactions. The patient area offers the possibility to create information sheets and intake plans for the patient. The patient area supports pharmacists in the consultation of patients and in the documentation of this activity. The online tool was introduced to community pharmacists in Slovenia and more than 10% of all pharmacists registered to use it. A survey conducted to evaluate participants' attitudes after registration shows, that pharmacists are satisfied with the helping tool, but a lack of time is hindering them to use the online tool regularly.
Conclusions: Pharmacists expressed great interest in the online tool. The online tool ensures that pharmacists could provide appropriate pharmaceutical care for cancer patients receiving OAAs. The proportion of community pharmacists who regularly counsel patients about oral anticancer therapy is not sufficient in view of the importance of the patients' self-efficacy to manage their therapy.
NO CONFLICT OF INTEREST

Poster Session: Cytotoxic Drug Preparation

168 POSTER (BOARD 069) SIMULATION TO ASSESS A VIDEO CONTROL'S ACTUAL PRODUCTION PERFORMANCE

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Background: Drugcam® is a new approach to control the chemotherapy preparations with an intelligent video system designed to assit the

pharmacy technician or the pharmacist throughout his entire drug preparation process. By providing a rapid and reliable detection of vials and syringes, this real-time artificial intelligence is able to control 100% of our production, with an in-process control and *a posteriori* inspection. We first aimed to estimate Drugcam's performance in real-life production by simulation and to compare it with the double human control. Furthermore, factors influencing the performance of both checking procedures were observed and preventive solutions will be envisaged to optimize our activity under the best conditions of safety.
Equipment and Methods: Each day during thirty days, between 11:30 am and 12:30 am, we controlled twenty different volumes contained in syringes. Those controls have been conducted in real production conditions (isolators, clean room) both by human visual inspection then by automated video control. Working conditions of the team have been observed and tasks disturbances and interruptions have been noted. For each syringe, a set of information has been collected: the syringe's model, the checking hour, the volume of product and the disturbances. A statistical analysis has been conducted to interpret results.
Result: With twenty four error throughout the six hundred volume controls the error rate for the visual human control is 4%. Seven checked volumes were superior to the expected volume (overdosing) and seventeen were inferior (underdosing). The error rate for Drugcam® is 0.17%. Only one error has been observed with a deviation of -1 mL wich led to a difference of -2.08% in comparison with the expected dosage. Among the disturbance factors, the type of syringe used is responsible of errrors: thirteen errors have been noticed with the 1 mL syringe and eight errors with the 10 mL syringe which represent higher error rates (11% and 7%) than with the other syringes.
The « permanent » staff members of the sterile injectable chemotherapy preparation units present an error rate of 5.3%, more important than the « non-permanent » ones (1.8%). More mistakes are done in the presence of a pharmacist than in its absence (13% against 4%).
Conclusion: Our studies justify the superiority of the Drugcam® system toward double human control. Moreover ; we witnessed the fact that the doube human control could possibly be disturbed by external factors whereas Drugcam® is not. Using Drugcam® is to be considered to establish preventive measures and reduce tasks interruptions or distubance factors thanks to video analysis.
NO CONFLICT OF INTEREST

169 POSTER (BOARD 070) OCCUPATIONAL EXPOSURE TO CYTOTOXIC DRUGS: EVALUATION ASSESSMENT OF ANTINEOPLASTIC SURFACE CONTAMINATION LEVELS IN THREE HOSPITALS

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Introduction: We performed a pilot study to evaluate in three different hospital organizations, the antineoplastic drug contamination surface all along the medication circuit, from the preparation to the dispensing process.
Material and Methods: In each hospital, wipe samples of equipment and floor were collected in three different places: in pharmacies, in the nurse preparation room and in the rooms of the patients, after cleaning at the beginning of the working day and at the end of each working day. The surface contamination levels with antineoplastic drugs, 5-fluorouracil (5FU) doxorubicin, gemcitabine, epirubicin, ifosfamide and cyclophosphamide were determined in 348 samples by UPLC MS/MS analysis.
Results and Discussion: More than 98% (297/300) wipe samples collected in the patient rooms were contaminated with at least one of the studied antineoplastic drugs, and less than 34% (16/48) in the pharmacy, and the preparation room.
Depending on the sampling spot and analyte, median concentrations ranged from 0 to 1.2 and from 0 to 1.7 pg cm-2; respectively after cleaning and after the working day in the preparation room; in the patient room, from 0 to 5.6 and from 0 to 16.8 pg cm-2; in the pharmacy, from 0 to 6 and from 0 to 29.5 pg cm-2, after cleaning and after the working day, respectively.
All sampling spots in the patient rooms have important contamination in particularly on IV poles with median concentrations of 5FU 276.2 pg cm-2 for example, but also in the floor close to the perfusion system especially for 5FU, gemcitabine, cyclophosphamide and ifosfamide, with median concentration ranged from 0.1 to 59.4; 0.7 to 23.1; 0.1 to 73.1 and 0 to 4.2 pg cm-2, respectively.
Conclusion: These preliminary results constitute a first step to describe the occupational exposure to antineoplastic drugs in three different hospitals. In a second step, these data must be explored in regard to different items such as training of medical workers, the use of safety equipment or the availability of devices for a safe handling and of personal protective equipment.
NO CONFLICT OF INTEREST

170 POSTER (BOARD 071) CLOSED-SYSTEM DRUG TRANSFER DEVICES: COMPARATIVE STUDY OF DIFFERENT MODELS

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Background: Closed System Drug Transfer Devices (CSTD) are medical devices used for hazardous drugs preparations to protect workers from aerosolization. These devices are usually used when the preparation can't be carried out in the regulatory conditions by the hospital pharmacy, for example, outside the opening hours of the preparation unit. In order to reference a CSTD in our hospital, a study about the effectiveness of the CSTD was performed to compare the various models available.
Material and Methods: An usability testing and a leak test confronted the different CSTD using pharmaceutical laboratories samples. For the usability test, three trained manipulators tested the CSTD and completed an analysis table with quality evaluation criterias (for example: facility of sampling or adaptability to the vials). For the leak test, we conducted a simulation test of Azacitidine's reconstitution and we examined surface contamination. We chose Azacitidine because this drug has to be frequently prepared in care units because of its short stability. In this test, Fluorescein solution 0.05% was used as the solvent and Azacitidine was replaced by an empty sterile vial. The empty vial was filled with Fluorescein solution through the CSTD, the solution was withdrawn with a syringue. Then, ultra violet lamp revealed Fluorescein spots respectively on the CSTD, on the gloves and the working area. First, we tested all the CSTD. We selected the best and we conducted ten simulations with these.
Results: We tested seven different devices: Phaseal®, Tevadaptor®, ChemoClave®, Equashield®, ChemoLock®, Viashield® and Qimono®. In total, we performed 21 usability tests and 37 leak tests. Three devices were selected after the usability test: Chemolock®, Tevadaptor® and Equashield®. The leak test showed no spots of Fluorescein neither on the gloves nor on the working area with the seven devices. But only three devices showed zero spots of Fluorescein® on the CSTD: Chemolock®, Tevadaptor® and Equashield®. When we repeated the test ten times with these 3 devices, we observed 6 spots after injection and 7 spots after withdrawal with Tevadaptor®, 3 after injection with Chemolock® and no spots with Equashield®. So, Equashield® passed all the tests positively. A correct sealing is the main characteristic feature of a CSTD because the first goal is the protection of the manipulator.
Conclusion: This study shows that it is possible to secure hazardous drugs preparations with CSTD but all devices are not equivalent. These tests lead to choose one device rather than another to secure the preparation in the care units when the pharmacy is not able to perform it. This study will be completed by another to dose cytotoxic drugs in surface samples.
NO CONFLICT OF INTEREST

171 POSTER (BOARD 072) FEASIBILITY ON IMPLEMENTATION OF FIVE NEW STANDARDIZED DOSES OF CHEMOTHERAPEUTIC AGENTS

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Background: Dose banding (DB) is a method where chemotherapy doses calculated on body surface area are rounded up or down to predetermined standard doses (SD) with variance limit of +/- 5%.
In our hospital, over 35,000 preparations of chemotherapy per year are compounded.
Since 4 years, we have implemented DB in our cytotoxic reconstitution unit for 6 chemotherapeutics agents (Paclitaxel, Gemciabine, Irinotecan, Oxaliplatine, Trastuzumab, Bevacizumab). Thereby, we have reduced patient waiting time and increased production capacity around 13% and at the same time regulated pharmacy workflow.
To expand this concept, we have conducted a feasibility study on the implement of 5 new drugs for DB.
Material and Methods: Drugs were selected using following criteria: frequency of preparation, daily consumption, percentage of preparations covered by each standardized dose, sufficient, long-term physicochemical stability after reconstitution and opportunity for cost savings. The selected molecules were: nivolumab, cetuximab, rituximab, pemetrexed, and bortezomib. We established an inventory of the prescriptions retrospectively for

a period of one year in order to highlight the most often prescribed doses. Data were extracted from CHIMIO® software and analyzed with Excel®.
Results: Standardization of doses of chemotherapy was deemed interesting if ≥ 80% of the doses were standardized with a minimum of 180 preparations per month (5% of the activity) in order to guarantee a good turnover of the batch. We have defined two others requirements: a maximum of 6 standardized doses per chemotherapeutic agent and a physicochemical stability higher than 14 days.
After analyzing prescriptions and stability, only 4 chemotherapeutics agents on 5 were eligible: nivolumab, rituximab, pemetrexed, and bortezomib, with a percentage of standardization of 84,5% (SD: 260 mg, 230 mg, 205 mg, 185 mg, 165 mg), 95,6% (SD: 1000 mg, 675 mg, 610 mg, 550 mg), 99% (SD: 1000 mg, 900 mg, 810 mg, 730 mg), 91,8% (SD: 2,54 mg, 2,3 mg, 2,05 mg) respectively. Physicochemical stability for Cetuximab is only 14 days versus 28 days for the others chemotherapeutics agents tested.
Conclusion: These results allows us to consider expanding the dose banding concept for 4 new chemotherapeutics agents in order to optimize the chemotherapy circuit in our institution.
This new project should be approved by the medical staff and some practical constraints as storage should be developed before implementation.
NO CONFLICT OF INTEREST

172 POSTER (BOARD 073) CYTOTOXIC CONTAMINATION DURING DRUG PREPARATIONS: OVERVIEW IN HOSPITALS IN THE REGION PAYS DE LA LOIRE

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Introduction: Cytotoxic preparations in pharmacy must be performed by skilled pharmacists, according to GMP guidelines and specific quality insurance systems, particularly in order to prevent environmental contamination. According to local hospital organization, these preparations can be performed either in validated safety cabinets or in isolators. A study, financially supported by the health authorities of the Region Pays de Loire (ARS Pays de Loire), has been done to determine initial levels of surface cytotoxic contamination at the ad hoc drug reconstitution units as compared to the residual ones measured after corrective actions.
Material and Method: Between 2010 and 2014, more than 270 surface wiping samples were done during two campaigns in the 16 different hospitals in Region Pays de Loire. Between the two campaigns, correctives actions, such as decontamination and handling cytotoxic vials with gloves, were performed. Wipe samples (10x10 cm) were taken from different surfaces in the drug reconstitution units (workbench in the hood or isolator, on the transport boxes, on the over wrapping of IVbag) 5FU, doxorubicine (Doxo) and cyclophosphamide (CP) were quantified on each sample, using LC-MS method (Bobin-Dubigeon et al. 2012).
Results and Discussion: This study allowed to describe the activity of all the hospitals implied in cytotoxic preparation in Region Pays de Loire. The cytotoxic preparation activities were very different between the establishments (annual total production ranged between1 to 8988, with 5FU mainly used). Means surface contamination outside hood or isolator were 0.708 (Q3 = 0.435 $ng.cm^{-2}$) and 0.129 (Q3 = 0.023 $ng.cm^{-2}$), for 5FU and CP, respectively; and were associated with low cleaning procedure and absence of decontamination before handling.
According to statistical analysis (ANCOVA), most important surface contamination of doxorubicin, adjusted to production, was quantified with hood rather than isolator (p = 0.0035, IC95% Hood-Isolator = 0.24[0.12; 0.36]). However, no difference statistical difference of global contamination was observed according the pharmacy equipment (hood or isolator).
Conclusion: This study focused on the level of surface contamination by cytotoxic in the pharmacy of the Region Pays de la Loire. The use of preparation protective equipment, hood or isolator, and standard operative procedures hasn't seemed to dramatically impact on the global level contamination of 5FU, doxorubicine and cyclophosphamide. Even if specific and systematic pre decontamination of each drug vial can improve the global chemical risk, manufacturers must improve their procedures to provide drug-free products from any contamination.
NO CONFLICT OF INTEREST

173 POSTER (BOARD 074) PUMP OR DIFFUSER FOR CHEMOTHERAPY ADMINISTRATION: WHICH ONE IS THE BEST ? PRACTICAL USE AND ECONOMIC STUDY

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The pharmacy prepares a mean of 650 fluorouracile (5FU) diffusers per year for home perfusion. Some of them ended before or after than the 44 hour diffusion. This resulted in some side effects for the patients and troubles in the disconnection time of the diffusers for the liberal nurses. Pharmacists and physicians were concerned to try to find solutions to solve these problems with the active electric device (AED). This study aimed to compare the practical use and the cost of the AED against the diffusers.
The AED were tested for one diffusion of 5FU. The producer of the AED trained the pharmacy technicians (PTs), the hospital nurses, the patients and the liberal nurses. Each participant graded the overall satisfaction. Evaluation grids were designed for each actor implied in the study. The economic evaluation was performed under the current legislation.
Six patients were included. The global satisfaction was an average of 8.8; 5.8; 5.2 and 7.3 / 10, respectively for the patients, the PTs, the hospital and liberal nurses.
Concerning the 6 patients, 2/6 considered the AED noisy and cumbersome. 6/6 were satisfied with the screen readability and the facility of the alert management. They felt safe while using the AED.
Concerning the 6 PTs, 6/6 reported the lack of batch number on the bag. They faced difficulties with filling the bag and so, the preparation time was longer. For 5/6, the air-purge was hard.
As far as the 6 hospital nurses are concerned, 5/6 assessed the AED as cumbersome and the programming as complex. However, 5/6 appreciated the readable screen and the ease of use.
For the liberal nurses, 2/6 did not return the grid. 4/6 highlighted how convenient the disconnection was. 3/6 judged the monitoring and the use as simple. 2/6 gave a bad grade for the screen readability and the cytotoxic waste elimination because of their complexities.
A cure using an AED costs 329 euros whereas a diffuser costs only 89 euros. So the Social Security System would lose yearly 156 000 euros for our hospital.
On the contrary of the PTs and the nurses, the patients were satisfied despite the noise and the weight of the device. The cost remains the major hurdle. The pump did not bring a significant plus-value compared to the diffuser. The AED would be more appropriate to patients dealing with diffusers problems. If the cost was lower, the pump would be more commonly used, especially, since a traceability all over the use is guaranteed.
NO CONFLICT OF INTEREST

174 POSTER (BOARD 075) DOSE BANDING: TIME AND COST SAVINGS BY RE-ASSIGNATION

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Background: In the Private Hospital of Confluence, over 35,000 preparations of chemotherapy per year are compounded. Since 4 years, to improve efficiency, and reduce patient waiting time, 6 chemotherapeutics agents has been proposed as dose-banding (DB) in our cytotoxic reconstitution unit. Actually 57% of chemotherapy drugs can be prescribed and administered in this way for Paclitaxel, Gemcitabine, Itinotecan, Oxaliplatine, Trastuzumab and Bevacizumab. Standardized doses are prepared in advance as ready to use chemotherapy in a specific isolator and can be assigned for appropriate patients.
The aim of this study was to evaluate the time and cost savings by the reattribution of non-administered standardized doses (SD).
Material and Methods: First of all, an inventory of non-administered and reassigned SD have been performed during 14 months (January 2017 to March 2018) with a specific form:
- SD non administered and dosage
- Reasons of non-administration
- Conformity of the non-administered preparation: clamped and closed tubing, packed preparation
- Preparation reassigned or destroyed

Then, a cost evaluation have been performed on the fabrication step including material, diluent and drug used. Cost savings by the reattribution of non-administered have been then evaluated.
Finally, data concerning the preparation time were extracted from CHIMIO® software.

Results: Since January 2017, 174 chemotherapeutic agents have been prepared but non- administered. Clinical troubles (temperature, change in general condition, adverse events) or biological disturbances are the main reasons respectively for 44,8% (78/174) and 29,3% (51/174) of non-administered preparations.
SD represented 53% (93/174) of them. All non-administered SD have been reassigned, covered by pharmaceutic controls, for another appropriate patient. Overall cost savings due to reattribution of the SD were 19 675€ HT.
The average time for preparing doses in isolator was estimated around 15 minutes per preparation. Pharmacy time saved by the reattribution of SD was evaluated to 23 hours of preparation for the period of analysis.
Conclusion: Dose-banding improved the ability of pharmacy services to reduce wastage by the re-assignation of chemotherapy when treatment are differed or non-administered. The benefits in costs savings are significant. Preparations, which were previously wasted, are actually used safely and directly for other patients. This concept can reduced patient waiting time for treatment and improved the compounding workload mainly during the daily peak period of production.
NO CONFLICT OF INTEREST

175 POSTER (BOARD 076) APPLICATION OF THE METHOD OF FAILURE MODE ANALYSIS, EFFECTS AND CRITICALITY IN RISK ANALYSIS IN ONCOLOGY PHARMACY

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Background: Hospital risks prevention and management is part of an ongoing process of quality improvement, aimed at reducing dysfunctions that may cause harm to patients.
The objective is the realization of a quality risk analysis and the assessment of the critical failures of the circuit of preparation of anticancer, in order to prioritize the measures to be implemented to fluidify this circuit.
Materiels and Methods: The study consisted in the analyzation of a quality risk type failure modes, effects and critical analysis (FMECA) which applies to the differents process of the chemotherapy circuit (prescription, pharmaceutical validation, cytotoxic preparation and administration.)
For each process, the risks of errors have been listed and analyzed according to their criticality using three parameters (gravity, frequency of appearance and detectabilty).
Results: We have identified 72 risks: 31 have an unacceptable level of criticality, 18 are acceptable under control, and 23 are acceptable. The process of medical prescription and the preparation of cytotoxic drugs are those with the highest proportion of risks. This is due not to the frequency of errors but to their severity which is related to errors in dosage, the conditions of preparations and the route of administration that has a fatal consequence for the health of the patient.
Conclusion: The identification and analysis of deficiencies allowed us to provide preventive and corrective measures depending on the criticality levels obtained such as (increased alertness and attention during the prescription with a check of the prescription before his release, control of preparation and prescription before their transfer to the service, see the prescribing doctor at the slightest doubt, a good coordination of services with the pharmacy, put a traceability record ¼).
NO CONFLICT OF INTEREST

176 POSTER (BOARD 077) COMPARISON OF CHEMOTHERAPY PROCESSES: EVALUATING PREPARATION TIMES UNDER DOUBLE-CHECKING AND COMPUTER-ASSISTED GRAVIMETRIC CONTROL

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Background: In a centralized preparation of cytotoxic drugs unit, the organization of production lines can be complex. In Argenteuil, gravimetric control in process (GC) was set up in order to improve performance, quality and security. To check whether this implementation of GC allowed or not an optimization of production, we compared the manufacturing times of each preparation under GC with times under double-checking.
Material and Methods: For double-checking, preparations were timed manually while times under GC were obtained by extracting the GC software. Preparations have been classified according to their characteristics. For each group, an average time of preparation (ATP) was calculated. To compare these ATP, standard normal distribution test and Student's t-test were used. For small samples, Fisher's test demonstrated the equality of the variances.
Results: 256 preparations and 5 pharmacy technicians (PT) were timed under GC against 244 preparations and 5 PT under double-checking. 7 groups of preparations have been defined. Across all categories of preparation, ATP differ significantly with a longer time for GC (5,9 min versus 6,91 min). ATP is 9.06 min (±2.36 min) for syringe with vial reconstitution, 5,84 min (± 2.05 min) for chemotherapy with one volume of ready-to-use cytotoxic drug and 9,54 min (± 2.71 min) for chemotherapy with reconstitution of one vial. Under double-checking, for these categories, ATP are respectively 6,1 min (±1,8 min), 4,6 min (± 1,6 min) and 7,4 min (± 1,9 min). Concerning these 3 groups, we note a significant difference with a superiority of manufacturing time under GC. ATP from other categories of preparation don't differ significantly. The step of taking drug from the vial is usually the most time consuming. Human factors and problems with GC software can also lead to a lengthening of preparation time.
Conclusion: Besides to improving security and quality of preparations, GC is accompanied by an increase of ATP for certain types of preparation. Although this increase appears relative compared to organizational benefits that GC offers, production remains perfectible. This study opens up some interesting prospects for improvement such as the development of a more appropriate training of PT and a change in the vision of organization production by working on key stages of the manufacturing process.
NO CONFLICT OF INTEREST

177 POSTER (BOARD 078) INTRAVENOUS PLERIXAFOR USE IN AUTOLOGOUS STEM CELL TRANSPLANTATION

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Background: Plerixafor is a selective CXCR4 antagonist used for hematopoietic stem cell mobilization for autologous stem cell transplantation in patients with multiple myeloma (MM) and non-Hodgkin's lymphoma (NHL). Subcutaneous (SC) plerixafor added to a granulocyte colony stimulating factor (G-CSF) regimen enhances autologous stem cell collection when mobilization failed with G-CSF and high-dose chemotherapy. However, kinetics analysis show a peak of intravenous (IV) CD34 cells at 10 hours after SC injection obliging the injection during the night whereas IV injection's peak is observed 4 to 6 hours later. This allows stem cell mobilization on the same day as apheresis and may improve stem cell collection. Moreover, IV plerixafor seems to be a good solution for patients with an elevated body mass index or with a major fat mass because mesanchymal stem cells might be of lower quality in this category of the population. In the literature, only one study of phase I/II described IV plerixafor injection [1]. The objective was to describe the use of IV plerixafor (administration, posology and efficacy) in an university hospital.
Material & Method: Retrospective analysis was realized in haematology unit of our hospital. All patients who received IV plerixafor for stem cell collection between September 2017 and February 2018 were included. Efficacy was defined by number of mobilized stem cells > 2.10^6 CD34 cells/kg collected.
Results: Sixteen patients have been included. Their characteristics are described in Table 1. Plerixafor is mixed in 50 mL of sodium chloride 0.9% for a final concentration of 20 mg/mL and administrated by IV infusion over one hour. Each patient was mobilized with IV plerixafor 0.24 mg/kg and G-CSF. Seven patients had received previously SC plerixafor. The percentage of responders was 93% (15/16). One patient failed collecting at least 2.10^6 CD34 cells/kg and only four patients didn't collected at least 3.10^6 CD34/kg. Nine patients had received more than one IV injection. The median number of apheresis day was 2.5 (range 1–4) and the average collection for all treated patients was $5.82.10^6$ CD34 cells/kg.
Conclusion: These results showed excellent efficacy of IV plerixafor to mobilize stem cell. Finally, IV plerixafor allowed a reduction in hospitalization duration, thereby decreasing cost for hospital.

Table 1. Patients characteristics

	Value
n	16
Weight (range), kg	72 (47-95)
Age, average (range), year	62 (23-75)
M/F, %	10/6, 63/37 %
Diagnosis	
MM, n (%)	10 (63%)
ALL, n (%)	1 (6%)
HL, n (%)	1 (6%)
NHL, n (%)	4 (25 %)
Prior chemotherapy regimens, n (%)	
1	7 (44 %)
2	0 (0%)
3	6 (38 %)
≥4	3 (18 %)

1. Cashen A. and al; Phase I/II Study of intravenous plerixafor added to a mobilization regimen of Granulocyte colony-stimulating factor in lymphoma patients undergoing autologous stem cell collection. Biology of blood and marrow transplantation ; 2017 Aug;23(8):1282-1289
NO CONFLICT OF INTEREST

178 POSTER (BOARD 079) CONTROL OF CHEMOTHERAPY PREPARATIONS AT THE CLINIC PEDIATRIC LEVEL: RELIABLE ANALYTICAL METHOD FOR THE CONTROL OF ANTHRACYCLINE PREPARATIONS

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Background: The treatment of pediatric cancer has greatly improved in recent decades, allowing this category of cancer to survive in the long term. However, many treatment regimens include anthracyclines (doxorubicin, daunorubicin, epirubicin and idarubicin) that are associated with risks related to side effects and high toxicity including cardiotoxicity. Where Rigorous and systematic control of chemotherapy preparations based on anthracycline in real time before dispensing seems essential. Indeed, despite all the precautions taken in a centralized unit, there is always a residual percentage of major or minor errors leading to nonconformities. The aim of this work is to present a simple, fast, accurate and highly selective spectrophotometric method that has been developed for the routine control of anthracycline-based cytotoxic preparations in a centralized preparation unit at the pediatric hospital level.
Materiel and Method: The spectra of doxorubicin, daunorubicin, epirubicin and idarubicin have been established, recorded, analyzed and the λ max is well defined. The calibration curves have been drawn which will be used to analyze the samples collected. The analytical method has been established and validated against parameters such as linearity, accuracy, precision according to the guidelines of the International Council for ICH Harmonization Q2.
Result and discussion: Linearity: A linear regression analysis of the least squares of the calibration curve was performed, and the calibration curves were linear over a range of 2–8 µg / ml. The correlation coefficients were 0.999.
Precision: Drug concentrations were measured three times a day at intervals of a few days. The standard deviation (RS) and the relative standard deviation (RSD) were calculated and the results are satisfactory (RSD < 0,1)
Accuracy: overlay studies were performed by the method of assaying the anthracyclin sample at a known amount of standard. the samples prepared according to claims 50, 100 and 150 of the marker were added and the results obtained are respectively: 100%, 101% and 101,5%.
Analysis of selected samples: Three samples for each drug were dissolved and diluted in their reconstitution solvents, so that the sample contained in the calibration curve. Absorbances were noted and values are derived from the calibration curve, the results are satisfactory (99–101%).
Conclusion: The method presented is simple, selective and reliable, providing satisfactory accuracy, with specific quantification and sensitivity. The results obtained in all cases are good and the reliable agreement with the reported procedure has proved that the proposed method can be considered as a useful alternative to other techniques and could be applied effectively in the hospital and clinical context.
NO CONFLICT OF INTEREST

179 POSTER (BOARD 080) VALIDATION OF A NEW PRODUCTION PROCESS OF INJECTABLE CHEMOTHERAPY IN DOSE-BANDING BY A SIMULATION

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Background: 6000 chemotherapy are prepared per year in our unit. Including the number of staff and chemotherapy, the activity is non-homogeneous and the waiting time for patients is too long. Patient and staff dissatisfaction's are enough to questioning the way of work. Dose-Banding (DB) and anticipated preparation have been suggested as alternative approaches. These processes already exist in France in authorized hospital, but it needs to be readjust to our hospital. The idea was to anticipate the fabrication of standardize drug's. A validation of the new process was necessary to evaluate the feasibility of the approach.
Material and Methods: Many criteria need to be respected to standardize a drug: stability, 5 doses covered at least 60% of the production, good frequency of prescription. Prescription book was used to select drugs: data were analyzed by spreadsheet. Drugs with sufficient long-term stability were selected according to *Stabilis*®. According to all information, drugs were pre-selected. Meetings with oncologists was informative and their approbation was necessary for DB. Doses were calculated by a spreadsheet file specially created to estimate standardized dose. A simulation tool was created: chemotherapy fabrications in real life, anticipate preparations in virtual life (IVL), anticipate chemotherapy delivered IVL, re-attributions IVL were reported day by day during 45 days. Statistical analyze will permit us to evaluate process efficiency.
Results: 6 drugs responded to all criteria: Bevacizumab, Carboplatine, Oxaliplatine, 5-FU, Paclitaxel, Trastuzumab. For each drugs 5 standardized doses were calculated (except Trastuzumab). 4 drugs were included in the simulation (*Bevacizumab, Oxaliplatine, Paclitaxel, Trastuzumab*). The results over 30 days were: 8% of the production was covered by anticipate fabrication (*40% of Oxaliplatine fabrication's could be covered by anticipate preparation, 40% for Paclitaxel, and 57% for Trastuzumab*), 76% of anticipate production was attributed and 9% of re-attribution. 1/5 patients received the first administration from pharmacy in less than 15 minutes during the simulation. Anticipate preparation could improve real benefits: patient and staff satisfaction's due to a time of waiting divide by 6 and a more homogeneous activity. Risks can't be neglect: storage (sterility, confusion), dose variation. More study need to be done to confirm the storage safety. The simulation permit us to wonder the real benefit of standardized dose. In view of results, anticipating preparation need to be further investigate without standardizing dose.
Conclusions: The simulation shows the process feasibility, evaluates the efficiency and refine it without generate any risk in the usual chemotherapy system. The next step will be to set up the process to respond to the activity increase and improving patient care.
NO CONFLICT OF INTEREST

180 POSTER (BOARD 081) IMPLEMENTATION OF QUALITY CONTROL OF CYTOTOXIC PREPARATION BY AN INTELLIGENT VIDEO CAMERA SYSTEM: REVIEW OF PREPARATION TIME AND PRODUCTIVITY AFTER 1 YEAR

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Introduction: The production unit of the Institut Paoli Calmettes (IPC, Marseille, France) prepares 60,000 preparations per year. A video control by Drugcam® technology was set up in production in January 2017 and rolled out to all activity in March 2017.
Drugcam® offers an innovative approach for controlling chemotherapy preparations by using an intelligent video system that provides automatic verifications of the process during the critical stages of preparation combined with a complete video recording of the preparation.
The aim of this study is to review preparation time and the impact on the productivity of the video control Drugcam® after one year of production.

Materiel and Method: The preparation time is calculated automatically by Drugcam®. It includes the initial reading of the preparation label to start the preparation scenario until the presentation of the preparation label at the end of preparation for the final verification of the correct preparation for the right patient.
Among our specificities impacting the preparation time, purged neutral solvent tubings are connected to all bags and air of bags is removed for monoclonal antibody preparations requiring transport by a pneumatic system.
The analysis of the preparation time is carried out over the period from March 2017 to February 2018 based on an extraction of Drugcam® data. The data is compared to our previous organization with human double visual control.
Results and Discussion: The average preparation time is 3'48 '' +/- 2'42 '' (n = 56588). Among the 16 technicians pharmacists, and outside the training period, the min and max average times are respectively 2'53 +/- 2'12 '' (n = 5951) and 4'44 '' +/- 2'59 '' (n = 2752).
This average time is 2'11 '' +/- 1'16 '' and 2'29" +/- 1'07 '' for 26.7% and 20.6% of preparations and corresponding to bags requiring 1 sampling with 1 and 2 ready to use vials respectively.

	Human double visual check	DrugCam®			
N	Average time	N	Average time	Variation (%)	
Bag requiring 1 sampling with 1 ready to use vial	281	01:38	15136	2:11	34%
Infusor 5FU 92ml	71	03:40	3288	04:44	29%
Syringe bortezomib	30	02:25	1791	03:14	34%
Bag pemetrexed	25	03:45	587	05:11	38%

The average preparation time is increased by approximately 30% to 40% depending on the preparations with control video.
Furthermore, implementing Drugcam® provides the possibility to reorganize staff by eliminating the human double control in favor of chemotherapy preparation time.
In practice, the productivity remains equivalent around 4 preparations / h / technician pharmacist between the double visual control and the video control.
Conclusion: The implementation of the video control with the technology Drugcam® allowed to secure the preparation of chemotherapies without impacting on the productivity.
NO CONFLICT OF INTEREST

181 POSTER (BOARD 082) STANDARDIZATION OF BLINATUMOMAB PREPARATION FOR SAVING COST

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Backgroung: Blinatumomab is a bispecific T-cell antibody targeting T-cells and CD19 positive B cells. Since 2015, this drug is indicated for relapsed or refractory B-precursor acute lymphoblastic leukemia after chemotherapy. According to the summary of product characteristics (SCP), one cycle of treatment is a 4-weeks intravenous continuous infusion followed by a 2-weeks treatment-free interval. Initial dose is 9 µg/day for 7 days and 28 µg/day on day 8 to 29. For all subsequent cycles, dose is 28 µg/day. Clinical trials demonstrated the importance of flatted plasmatic concentration: our regimen differs with 9 or 28 µg/day as initial dose and continuous infusion without therapeutic break. Blinatumomab is an expensive drug (APHP price: 2676 €/ 38.5 µg. 69.6 € = 1 µg). SCP describes complex manipulation based on an overfilled 0.9% NaCl bag and using overestimated number of vials: for 2 days, 2 vials are necessary (77 µg) instead 1 (38.5 µg) and for 4 days, 4 vials (154 µg) instead of 3 (115.5 µg). Pharmacists decided to standardize manipulation: all preparations are for 4 days instead alternating 4 and 3 days, NaCl is fixed for 250 mL and the number of vials is exactly calculated. With our preparation method, our final concentration is 0.43 µg/mL (very close to SCP, c = 0.46 µg/mL). Study aim is to estimate the economic benefits of this process.
Materials and Methods: This retrospective study included all patients who received their first and last administration between May 2016 and March 2018. Data have been extracted from the prescription software Chimio©. Duration of treatment and dosages were recorded. Number of vials used has been compared with the number of vials recommended by SCP. Economic impact has been calculated.
Results and Discussion: 575 bags were prepared for 28 patients with a median age of 49.8 years [23.1- 66.5]. Average duration of treatment of patients starting at 9 mg/day is 116.2 days [27.0–205.4] and 72.4 days [3.0–141.9] for patients starting with 28 mg/day. Global average duration of treatment is 100.8 days [17.7–118.5]. According to the pivotal study, average number of cycles per patient is 1.6 (67.2 days). Time duration of treatment is longer than in the pivotal study. 1631 vials have been used representing 4 367 818 €. According to SCP, 2210 vials should have been used (5 918 380 €). The saving cost is 1 550 562 € (22%).
Conclusion: Blinatumomab preparation is an expensive and complex manipulation: the preparation for 4 days allows to ensure continuity of treatment because the patient came before the end of the second bag on the week. For the nurses, programmation of the pump at the same rate flow 2.5 ml/h is easier and safer. For pharmacy technicians, this process is repeatable. Without following the SCP and with a fixed volume of NaCl, we used only the necessary vials without expensive waste. Economic impact is very impressive.
NO CONFLICT OF INTEREST

182 POSTER (BOARD 083) IMPLEMENTATION OF CENTRALIZED PREPARATION OF CYTOTOXIC DRUGS IN BULGARIA

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Background: Assessment of the implementation of the Regulation of the Ministry of Health of the Republic of Bulgaria for the introduction of centralized preparation of cytotoxic drugs in the hospital pharmacies of medical institutions with oncological and/or oncohematological departments two years after adoption of the change.
Material and Methods: A survey conducted by phone and online among the heads of hospital pharmacies of the respective medical institutions. Analysis of the results and comparison with the Ministry of Health's registry.
Results: Out of 40 hospitals with oncological and/or oncohematological departments, 18 were equipped with centralized preparation of cytotoxic drugs in the hospital pharmacies, compared to only 3 before the adoption of the regulation. Several others are in the process of reconstruction of the pharmacies and are expected to implement the regulation soon.
Conclusions: The introduction of centralized preparation of cytotoxic drugs in hospital pharmacies is not fully implemented but situation is more better than before adoption of the change of Regulation.
NO CONFLICT OF INTEREST

183 POSTER (BOARD 084) ANTICIPATION OF CHEMOTHERAPY PREPARATIONS IN A MOROCCAN ONCOLOGY INSTITUTE

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Background: In order to guarantee a better management of hospitalized patients in the medical oncology department, the pharmacy of the National Institute of Oncology of Rabat-Morocco has developed in recent years a system of anticipation of chemotherapy preparations for weekends and holidays. The objective is to present the system of anticipation of cytotoxic preparations and the results of six months of this practice.
Material and Method: The day before each holiday or every weekend, the pharmacist recovers from the oncology department the therapeutic protocols of the hospitalized patients. The preparations are done at the end of the ordinary activity according to the applicable good practices and by respecting the physicochemical stability protocol. The use of closed systems allows guaranteeing the microbiological stability of the preparation. We retrospectively analyzed the data on the anticipated preparations for a period of six months: from January 1, 2016 to June 30, 2016.
Results: During the study period, there were 591 anticipated preparations corresponding to 267 patients. The sex ratio was 1.05 and 56% of prescriptions prescribed two-day treatment. The most frequent preparations corresponded to Etoposide (27%) as part of the two protocols VP15-CDDP and BEACOPP followed by Ifosfamide (24%) as part of the protocol AI.
Conclusion: Apart from its interest in optimizing the care of hospitalized patients, anticipation system allows a rationalization of human and

material resources by eviction of the establishment of a guard system. Within our framework, the medical and paramedical teams as well as the pharmaceutical team have all expressed their total satisfaction with the implementation of this system.
NO CONFLICT OF INTEREST

Poster Session: Drug Stability

184 POSTER (BOARD 009) STABILIS®: NEW FUNCTION « RESEARCH TEAM »: A BRIDGE BETWEEN RESEARCHERS AND USERS

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Background: Stabilis® is an international database on stability and compatibility of drugs, created in 2001 and translated into 29 languages. Stabilis® has been constantly evolving. For continue helping users, in April 2017, a new function called "Research teams" was created. The objectives were to develop a first research team database and give the opportunity for users to propose stability or compatibility studies to the research teams.
Methods: All articles and posters selected by Stabilis® were used to collect information about the research teams: team name, postal address, city, country, continent, type of team (hospital, university, industrial) and email address. A photo of the team has been requested and the Google Map localisation searched. A characteristic sheet for each research team has been produced. An application procedure has been created for Stabilis® users to allow the proposal of new stability studies.
Results and Discussion: This new function was opened in April 2017 in its initial descriptive part and in September 2017 for the interactive part with users. New screens are available containing (1) the list of teams classified by country and by city with the number of publications and the year of the last publication. 595 teams were listed, (2) a file specific to each team, to visualize the publications and molecules studied, (3) a multicriteria search screen allowing for example by geographic research, by type of products tested, by molecule or dosage form, (4) a screen to ask to Stabilis® administrator for a new stability study, (5) a list of stability study proposals issued by Stabilis® users.
Based on the criterion "at least one publication during the last 5 years", 168 teams are still active, including 23 in France. Europe is today leader in number of teams and number of publications. In September 2017, the interactive part with users has been opened. Since the opening of this new function, six stability studies have been proposed by Stabilis® users: one stability study concerning ready to use solution (paracetamol), one concerning a reconstituted solution (ceftazidime/tazobactam), two stability studies of a mixture (lidocaine and octreotide, phloroglucinol, metoclopramide, trimebutine) and two stability studies of a drug in solution: etoposide and sodium thiosulfate.
Conclusion: This function is the first database of research teams involved in drugs stability and compatibility. It provides a link between users and researchers and has the potential to stimulate research in this field, which is one of the scientific and regulatory missions of the hospital pharmacist.
NO CONFLICT OF INTEREST

185 POSTER (BOARD 010) INTERACTIONS BETWEEN FIVE INJECTABLE ANTICANCER DRUGS AND PVC BAGS: EVALUATION OF THE ADSORPTION PHENOMENON AFTER RECONSTITUTION

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Introduction: During the reconstitution of a drug and during its storage, there are risks of interactions between it and the bag used for the preparation. PVC is a material used in the manufacture of a large part of chemotherapy infusion bags. It is subject to many interactions: sorption of drugs and release of phthalate additives.
Material and Method: Five anti-cancer drugs used in pediatric oncology were involved in our study. After reconstitution of the anticancer agents in PVC bags, the adsorption phenomenon between the container and the contents is evaluated by infrared spectroscopy by analysis of the inner surface of the PVC. Subsequently, for the anticancer agents which exhibited an adsorption-container-content interaction during the analysis by infrared spectroscopy, analysis was carried out by UV-Visible spectrophotometry. For the confirmation of the adsorption phenomenon, an analysis by UV-visible spectrophotometry is carried out in order to examine the kinetics of the concentration of reconstituted anticancer drugs.
Results and Discussion: After analysis by infrared spectroscopy, all the PVC bags gave a spectrum identical to the spectrum of the reference pocket, except the pockets used to reconstitute etoposide whose spectra showed 12 additional peaks. With the absorbances measured by UV-visible spectrophotometry at different times, the "Anova" statistical analysis shows that there is a significant difference in absorbances between T0 and all the other measurement times. On the other hand, from 24 hours on, there is no significant difference in absorbances between the different times. This testifies to the existence of a container-content interaction between etoposide and PVC.
Conclusion: Reconstitution of etoposide for intravenous infusion into a PVC bag should be used immediately. For etoposide preparations intended for storage beyond 24 hours, it is recommended to use a container other than the PVC bag. On the other hand, the other anticancer drugs remained compatible with the PVC bags throughout the duration of the study. So they can be reconstituted without hindrance in the PVC pockets. Hospital pharmacists in collaboration with chemists analysts should study this type of interaction for all materials and substances used in oncology to ensure better therapeutic efficacy.
NO CONFLICT OF INTEREST

187 POSTER (BOARD 012) DEVELOPMENT AND STABILITY OF A NEW ORAL PRESENTATION OF PROCARBAZINE IN PEDIATRICS

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Many drugs used in pediatric oncology are not labeled and adapted for pediatric use. Indeed, pediatric patients present difficulties to swallow caps; it can lead to major observance problems. Several protocols to treat gliomas in children contain procarbazine such as BBSFOP or TPCV. These protocols are commonly used in young children under 6 years old. To provide a solution to this situation, we propose the development of an oral suspension.
Suspension was produced from the commercial capsules powder of Procarbazine 50 mg. The stability of this presentation was assessing with RP-HPLC method with a C18 column and a tampon phosphate mobile phase with methanol (56:44) in isocratic condition with UV detection at 254 nm and 309 nm. Degradation products were study in forced degradation conditions according to the French Society of Oncological Pharmacy and to the European Society of Oncology Pharmacy recommendations. The stability of the suspension was followed for 1 month.
Procarbazine is poorly soluble in water (1.5 mg/ml) that is not compatible with dose used in pediatrics. A 10 mg/ml suspension was formulated to insure the best homogeneity to secure administration. All reagents selected in this suspension are safe and non-toxic for children. The preparation was made from commercial forms because the procarbazine pure with pharmaceutic's quality can't be purchased. To study the stability, the linearity plot was prepared with 5 concentration levels (20, 40, 60, 80 and 100 µg/mL of procarbazine) that respectively corresponding to 40, 80, 100, 120, 160 and 200% of tests suspension concentration. The 10 mg/mL suspension was the most suitable for the maximum permissible viscosity for an oral administration. The linearity was demonstrated by a correlation coefficient of 0,9998 (% Relatived Standard Deviation (RSD) = 0,05). The repeatability of the method was determined by performing method precision on another day and another analyst under the same experiment conditions. The %RSD was less than 2,2%. The Limit Of Detection and the Limit Of Quantification were determined at a signal to noise ratio of 3:1 and 10:1 respectively. The accuracy of the method was assessed by determination of recovery for three concentrations (corresponding to 60, 100 and 180% of concentration tests solution) covering the range of the method. The %RSD observed was less than 0,9%. The stability was studied during 50 days at 4°C. Three degradation products previously detected during forced degradation studies were observed and their concentration were followed. At 30 days storage at 4°C, pH and osmolality remained stable respectively at about 3,8 and 353 mOSM/L, the procarbazine concentration was conformed (variation less than 5% compared to the initial concentration).
We formulated a new galenic presentation of Procarbazine to ensure an accurate and safe dose for children administration.
NO CONFLICT OF INTEREST

188 POSTER (BOARD 013) INTEREST OF EXTENDING THE PHYSICOCHEMICAL STABILITY OF TEMOZOLOMIDE IN ROUTINE

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Background: Temozolomide (TMZ) is an alkylating agent used as a first-line treatment for glioblastoma in association with radiotherapy (STUPP). Despite the obvious advantages of the oral TMZ form, its intravenous formulation provides a reasonable alternative for patients suffering from swallowing problems. But, the low stability period of intravenous TMZ, after reconstitution of the lyophilized powder in water (14 h at 24°C and 24 h at 4°C) as recommended by the manufacturer, leads to significant organizational and financial consequences which may impact patient care specially during the week-ends. Hence, the aim of this study was to evaluate the stability of reconstituted TMZ in different solvents with different temperature conditions.
Material and Method: TMZ was studied in empty polypropylene infusion bags without light protection (SLB®) in 3 different solvents: water at 2.5 mg/mL (n = 18), 5% w/v glucose at 0.5 mg/mL (n = 10) and sodium chloride 0.9% at 0,5 mg/mL (n = 10). A stability indicating high performance liquid chromatography (HPLC) method was developed and validated according to the International Council for Harmonisation guidelines for the dosage of TMZ and its degradation products. The samples were stored at 4°C ± 1°C and 24°C ± 1°C, then extemporaneously analyzed at 0,1,2,3,7,10,14 and 21 days by HPLC. In parallel, the limpidity of the solutions was also assessed visually under white background.
Results and Discussion: At 4°C, TMZ was stable 7 days in water, at least 3 days in glucose and less than 24 h in NaCl. At 24°C, TMZ was stable 24 h in water, 2 days in glucose, and less than 24 h in NaCl. The storage at higher temperature (50°C) was associated with the redness of the solution along with the rapid degradation of TMZ (less than 24 h). From the qualitative point of view, the degradation of TMZ was accompanied by the apparition of 2 degradation products (DP1 and DP2) regardless to the nature of the solvent, with relative retention time of 0.4 min and 1.5 min respectively. As it was known, TMZ undergoes spontaneous hydrolysis under physiological pH to MTIC. MTIC represents the active molecule, it is a highly unstable compound rapidly degraded to AIC. Therefore, complementary mass spectrometry study will allow the identification of the degradation products, followed by the determination of their potential toxicity via *in silico* approach. A reversible precipitation was observed in one bag stored at 4°C. Extent studies are performed to explain this instability. Finally, no physicochemical incompatibility was observed with the bag component and the solvent studied.
Conclusion: In sum, given the positive results obtained at 4°C in water (7 days) and at 24°C and in glucose (2 days), a change in practices may improve the production unit organization and prevent financial loss. It's worth to verify the limpidity prior to each administration.
NO CONFLICT OF INTEREST

189 POSTER (BOARD 014) PRACTICAL STABILTY STUDY OF 5-FLUOROURACIL SOLUTION

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Introduction: Cytotoxic drugs are known to be very toxic to the cells, primarily for those in the phase of division. In order to achieve the desired therapeutic effect with minimal side effects, it is necessary to provide the appropriate quality of the drug. In addition to industrial production, cytotoxic drugs often require reconstitution/dilution under the pharmacy conditions. As the stability of the cytotoxic drug, manufacturers specify a period of 24 hours after opening, seen only from the aspect of microbiological stability. Given that the manufacturer's recommendations do not consider the chemical stability of medicines, and the preparation and administration of medicinal products is carried out under aseptic conditions, the shelf-life of the preparation may be extended. Under the hospital pharmacy conditions, studies of the practical stability of 5-fluorouracil (5-FU) solution, concentration of 1.5 mg/ml, were carried out.
Materials: 5-Fluorouracil Ebewe®, solution for injection/infusion, 5000 mg/100 ml. Sodium chloride 0.9%, 500 ml. Acetonitrile, sodium dihydrogen phosphate, phosphoric acid, methanol, purified water were HPLC reagents with appropriate purity grade. Substrates: Columbia agar®, Mac Conkey agar®, Sabouraud dextrose agar® were used for microbiological stability tests of 5-FU solution.
Methods: Clearance testing and potentiometric determination of pH were used as physical stability tests, according to Ph. Eur. 9.0. For chemical testing, 5-FU content was determined by HPLC method. Method of microbiological testing was incubation of 5-FU solution into the substrates.
Results and Discussion: No physical instability of 5-FU solution was detected during observation period. The prepared 5-FU solution remained clear. By potentiometric pH determination, the test 5-FU solution had pH = 9.01 - 9.07, which corresponds to the pH value interval in which the drug is the most stable (USP35/NF30). 5-FU content was determined at appropriate time intervals (1st-5th, 7th, 10th and 28th day). The content of 5-FU in solution over time was 96.60% - 99.93%, indicating that the degradation of the active substance is small, and the solution can be considered chemically stable. The microbiological stability test was performed by seeding on the substrates on the 28th day of the test, to determine if the sterility of the preparation was preserved. After incubation at a temperature of 37°C for 24 to 48 hours, the substrates remained sterile. This confirmed the microbiological stability of the preparation.
Conclusion: Based on the results obtained, it can be concluded that the prepared 5-FU solution remained stable for 28 days.
NO CONFLICT OF INTEREST

Poster Session: Organisation and Management

191 POSTER (BOARD 016) CREATION OF A FAST-TRACK PATHWAY AS PART OF THE ADMINISTRATION OF SUBCUTANEOUS CHEMOTHERAPIES

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Background: Development of subcutaneous (SC) chemotherapies decreases the time patients spend in Outpatient Care Units (OCU). A fast-track pathway dedicated exclusively to SC administrations has been set up to optimize the management of these patients. The aim of this study is to describe the implementation of a fast-track pathway dedicated to SC administrations of azacitidine, bortezomib, rituximab and trastuzumab and the consequences on the management of patients in OCUs.
Material and Methods: The fast-track pathway is set up every day from 01:30pm to 04:30pm in OCUs. The validation of the cure is given the day before, which permits to prepare the syringes "in advance" and to send them to OCUs just before the arrival of the patient. A patient is taken care of every 30 min by a doctor/IDE pair, in a dedicated room, for consultation and SC injection. If a period of post-administration surveillance is necessary, a waiting room is dedicated to them. Two audits were conducted before and after the implementation of this circuit to estimate the time of care of all patients in OCUs. A patient satisfaction survey was also conducted.
Results: Before the creation of the fast-track pathway, a first audit (on 90 patients) revealed an average time (M) of 3h17 between the arrival of the patient and the beginning of the administration. This time includes: 1h32 between the arrival of the patient and the OK cure, 1 h for the preparation and 45 min between the end of the preparation and the beginning of the administration. After the introduction of the fast-track pathway, a second audit (on 89 patients) revealed a time M of 30 min between the arrival of the patient and the beginning of the administration for patients benefiting from this circuit (28 patients), as expected. This time M was 1h46 for patients out of this circuit (61 patients). This time includes: 38 min between the arrival of the patient and the OK cure, 24 min for the preparation and 44 min between the end of the preparation and the beginning of the administration. In 2017, the introduction of the fast-track pathway made it possible to anticipate 2,114 preparations, i.e. 16.2% of our production (n = 13,039 preparations). Only 4 preparations (0.2%) had to be destroyed because of improper storage of the syringe by the clinical service. The satisfaction survey revealed that all patients were satisfied by this organization.
Conclusions: The creation of a fast-track pathway dedicated to SC administrations allows for a global improvement in the care of patients with a significant decrease in their time of presence in OCUs (1.8 times shorter). The best distribution of patient flow allows for faster medical care and a decrease of simultaneous influx of OK cure. The fluidity of the chemotherapy production activity with the preparation in off-peak hours also decreases the pharmacy preparation time for all patients in OCUs.
NO CONFLICT OF INTEREST

192 POSTER (BOARD 017) MULTICENTER SURVEY OF CHEMOTHERAPY REGIMEN CHECKS FOR ORAL ANTICANCER AGENTS BY PHARMACISTS IN GENERAL HOSPITALS OF THE NATIONAL HOSPITAL ORGANIZATION IN JAPAN

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Introduction: Increasing patients of chemotherapy, all of pharmacists in hospitals must be confirm with chemotherapy regimen checks. Previous studies of items of chemotherapy regimen checks for by pharmacist is few reports that part of items of chemotherapy regimen checks. To this end, we examined chemotherapy regimen checks for oral anticancer agents by pharmacist in Japan.
Material and Method: We sent the questionnaire by E-mail which stated the prospectus to 33 general hospitals without cancer designated hospitals in department of pharmacy of National Health Organization at Kanto, Koshinetsu area in Japan. We got an answer by return the questionnaire. Data gathered included chemotherapy regimen checks for oral anticancer agents of item, completed rate and back ground characteristics of pharmacist in survey hospitals in 2016.
Results and Discussion: We obtained 100% completed the questionnaire in this survey. In prescription of outpatient (internal pharmacy), rate of chemotherapy regimen checks in survey hospitals was 41% and the results showed that dose, term, interval of anticancer agent and previous medical history was more than 90%, concomitant medications, evaluation of supportive medicine, urinalysis data, allergic history, medical history and labolatory data were less than 50%. In prescription of inpatient, rate of chemotherapy regimen checks in survey hospitals was 51% and the results showed that dose, term, interval of anticancer agent was more than 90%, evaluation of supportive medicine, concomitant medications, urinalysis data, allergic history and medical history was less than 50%. Defined items of chemotherapy regimen checks in survey hospitals was 9.
Conclusion: The present findings suggest that defined items of chemotherapy regimen checks for oral anticancer agent by pharmacist might improve the rate of carried out chemotherapy regimen checks and improved routine business. These findings might be helpful for improving chemotherapy in role of pharmacist.
NO CONFLICT OF INTEREST

193 POSTER (BOARD 018) A POINTS-BASED LICENSE TO SECURE THE USE OF ANTI-CANCER CHEMOTHERAPY AT THE REGIONAL HOSPITAL (RH) OF METZ-THIONVILLE: CREATION OF EDUCATIONAL TOOLS DEDICATED TO EACH HEALTH PROFESSIONAL

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Background: This work falls into the culture of securing and managing medical care in health institutions that treat cancer patients. This work is a multidisciplinary project that concerns all participants in the cancer chemotherapy process at the Metz-Thionville Hospital. Project of institutional formation at our RH acted as a driving force to create and develop educational tools.
Material and Methods: A regional expertise in e-learning education exists as well as the growing literature on this topic. It played key roles in the decision for elaborating educational tools by pharmacist and senior health manager with distance learning. The ADDIE method (analysis, design, development, implementation, evaluation) has structured the tools developments and the evaluation method. The training is dedicated to any newcomer at the RH. The first targeted professionals were doctors, nurses and junior pharmacist, in order to secure their chemotherapy practice, and to protect the patient and the environment.
Results: A welcome booklet and an evaluation based on the model of a points-based license were developed for health professionals. It contains all the skills required to secure the complete management of chemotherapy in relationship with validated documentary resources and a coaching by resource persons. An interdisciplinary group composed of pharmacists and health managers elaborated and validated several modules about these resources. Modules are already available for nurses in electronic version. Evaluation includes a test at the beginning of the training and after one month, then an other test after four months of activity within the care unit in order to evaluate 3 points: learn to know, learn to do, learn to be. This process assessed through a final scoring. If a minimum score of 8 points about 12 total points is not reached, the professional has to continue training. This process leads to a final grade.
Conclusion: This project secures and standardizes the practice of chemotherapy at the RH of Metz-Thionville. In the future, the access will be possible on an e-learning education platform. It will take place in the Continuing Professional Development (DPC) for each health professional.
NO CONFLICT OF INTEREST

194 POSTER (BOARD 019) REDUCING THE COST OF ORAL ANTICANCER TREATMENT IN COMPREHENSIVE CANCER CENTER: STOP WASTING

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Introduction: In France, the increasing use of highly expensive oral anticancer therapies (OAT) requires hospitals to review their cost management. During hospitalization, the French National Health Insurance (NHI) system only allows inpatients to consume the drugs dispensed by the hospital. Besides, even though most of the innovative and expensive intravenous chemotherapies are financed by NHI, this is not the case of OATs and the cost of these treatments, when dispensed to inpatients, is entirely supported by hospitals. OATs sold by pharmaceutical companies are delivered in a package with an average cost of €5,000 and containing doses for an entire month. This type of packages is not adapted for hospital use, where patients usually only stays for a few days. The doses not used during the stay have then to be disposed of, resulting in a large amount of waste. This study computes the number of wasted doses by analyzing patient consumption and deducts from it the overall cost of such waste for the hospital.
Material and Method: Data has been gathered to analyze OATs distribution in a French comprehensive cancer center pharmacy between January and December 2017. It contains information regarding the number of packages dispensed for each drug from the stock management software (Copilote®). Patient records have also been reviewed to understand what drugs have been prescribed and for what disease they've been prescribed (WinSimbad®). Finally, reasons for ending the treatment have been considered (DxCare®). Knowing the price of each drug, we were able to obtain the cost of waste by multiplying the price by the number of non-administered tablets remaining in the dispensed package after the end of the treatment.
Results-Discussion:107 OATs have been dispensed to inpatients. The average duration of treatment is 6 days [Min: 4 days, Max: 8 days]. More than 90% of prescriptions were indicated according to the European labeling. More than 95% of the end of treatments were induced by patients leaving the hospital. In 2017, the total cost of the OATs dispensed was €427,243. For this period, the cost of the wasted tablets was €346,648. The waste represents almost 80% of OATs' total cost and 4% of the institution's budget for drugs.
Conclusion: The large number of OATs' wasted is mainly due to packages containing way more doses than what patients need during their short stays at the hospital. After discharge, in most cases, the packages are almost full and the remaining tablets are not re-used for another patient and are therefore disposed of. One way to drastically reduce the waste would be to repack unit dose blister-packages before they are first dispensed. However, this measure might result in a decrease of the expiration date which could also cause drug waste and therefore it must be explored further. This study was limited the analysis of a single site.
NO CONFLICT OF INTEREST

Poster Session: Other

195 POSTER (BOARD 020) MEDICO-ECONOMIC IMPACTS OF USE OF SUBCUTANEOUS FORMULATIONS OF RITUXIMAB AND TRASTUZUMAB IN OUTPATIENT CARE UNITS

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Background: In Outpatient Care Units (OCU), the subcutaneous (SC) forms of Rituximab (R) and Trastuzumab (T) have modified patient care

pathway thanks to a more convenient and faster administration compared to intravenous forms (IV). The aim of this study is to evaluate the realized and potential medico-economic benefits in OCUs induced by the use of SC formulations of R and T.
Material and Methods: The evaluation criteria are quantitative: capacity gains linked to optimization of bed/chair rotation, optimization of time for the health care professional (HCP), consumables savings; and qualitative: patient preference. These criteria were calculated from the capacity of the OCU, the capacity of production of the Cytotoxic Preparation Unit (CPU), the activity of the OCU (number of episodes, chemotherapy with T and R (IV or SC), human resources and bed/chair occupation time in OCU). Data were obtained from chemotherapy prescription software, Medical Information System (PMSI) 2016, patient satisfaction surveys and interviews with hematologists, oncologists, nurses and pharmacists. Data modeling allowed the analysis of the gains and/or cost savings by using SC forms of R and T.
Results: In 2016, 5,200 chemotherapy sessions were performed in OCUs and 9,000 preparations were prepared by the CPU for OCUs. The use of SC forms resulted in a decrease in patient chair time. The mean patient chair time was longer for IV administration: 3 h versus 2 h (T) and 4 h versus 30 min (R). This allows to increase activity of 546 episodes/year (10.5%), or €220,000/year of additional revenue. For each episode, the time saving for medical staff is 6.8 min (T) and 16.1 min (R), or 101 h/year. The time saving for pharmacy preparation is 8.9 min (T) and 2.2 min (R), or 23 h/year. About cost saving, the gain in consumables is estimated at €4,700/year thanks to the use of SC forms of R and T. To go further, an increase in the conversion rate of T in SC forms from 41% (currently) to 85% (achievable goal by prescribers) would lead to a gain of 14 episodes/year (0.27%). The Patient Satisfaction Questionnaire showed preference for SC forms at 100% (n = 36). The main reason being the time savings. The SC form is also very well tolerated, the pain being considered bearable.
Conclusions: The use of R and T SC instead of IV in OCUs appears to have a benefit for all stakeholders. There are significant resources and cost savings due to SC administration with R and T. In our establishment, the SC formulations have allowed an increase of activity in episodes of 10.5% (or €220,000) in 2016. These benefits could be increased by organizational levers such as the creation of a fast-track pathway dedicated exclusively to SC administrations. Since 2017, a fast-track pathway has been created in OCUs allowing a significant increase of the capacity of the oncology day care unit and the rate of rotation on bed/chair.
NO CONFLICT OF INTEREST

196 POSTER (BOARD 021) PATIENTS WITH LUNG NEUROENDOCRINE TUMORS ON LANREOTIDE AUTOGEL: THE TUMOR GROWTH RATE TO ASSESS TUMOR ACTIVITY, A CASE-SERIES ANALYSIS

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Introduction: Neuroendocrine tumors (NET) are rare tumors, with an overall incidence of 6.98 cases per 100.000 persons per year. NET of the lung is the most frequent NET localization in the body and comprises 1/3 of all NET (exluding small cell lung cancer). The slow-growing character of NET makes it difficult to assess the impact of treatment on tumor growth. Tumor growth rate (TGR) could be a new way to evaluate tumor dynamics in NET.
Material and Methods: This retrospective case-series analysis was performed on 5 patients in Belgium (ages 82 [P1, male], 79 years [P2, male], 71 years [P3, female], 56 years [P4, female], 72 years [P5, male]) with lung NET stabilized on lanreotide Autogel / Somatuline Autogel® 120 mg/4 weeks (LAN). Tumor lesions at LAN therapy start (baseline) and after 102 (P1), 70 (P2), 62 (P3), 13 (P4), 14 months (P5) were identified by computed tomography (CT) and measured according to RECIST 1.0. TGR (% change in tumor volume/month) was calculated from the sum of the longest diameters (SLDs) of the target lesions before and after LAN therapy start. Analyses are descriptive.
Results and Discussion: At baseline, the 5 patients had well differentiated lung NET with Ki-67 <2%. The SLDs of the target lesions were 16.6, 54.9, 53.3, 45.6 and 23.2 mm, respectively, at baseline, versus 16.0, 50.2, 51.1, 44.0 and 23.0 mm after 102, 70, 62, 13 and 14 months of LAN therapy, meaning all were classified as stable disease (SD) according to RECIST 1.0 (-1.8%, -6.4%, -2.4%, -3,5% and -0,9%) decrease in tumor size). TGRs (% change in tumour volume/month) were 0.0% (P1), -0.1% (P2), -0.1% (P3), -0,4% (P4) and -0,1% (P5).
Conclusions: TGR assessment indicated that 4 out of the 5 NET regressed, whereas all 5 NET were classified as SD according to RECIST. Our results also suggest an anti-proliferative effect of LAN 120 mg/4 weeks in lung NET, but this needs to be confirmed in further clinical studies.
NO CONFLICT OF INTEREST

197 POSTER (BOARD 022) TIME AND MONEY: THE ISSUES OF SETTING UP A RITUXIMAB BIOSIMILAR IN HOSPITAL

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Background: Rituximab (Truxima® 500 mg/50 mL), the first intravenous (IV) biosimilar of Rituximab® (Mabthera 500 mg/50 mL), is available in our hospital (450 short-term beds) since January 2018. Rituximab has many therapeutic indications: blood cancers and others. Rituximab (Truxima®) costs 650€ vs. 789€ for Rituximab (Mabthera®). For certain indications, Rituximab (Mabthera®) is also available as a subcutaneous (SC) form which costs 1377€ (1400 mg/11.7 mL). In this study we review the issues introduced by a switch from Rituximab (Mabthera®) to its biosimilar product and quantify what cost savings can be expected.
Material and Methods: Using the Chimio software, we retrieved the list of patients who had been provided Rituximab (Mabthera) in 2017. Then, we carried out a survey among nurses and managers of the day hospital to see how this switch would be perceived. We also conducted a bibliographic review on perfusion duration of Rituximab. Cost savings and the increase of length of treatment were then computed assuming three different switching strategies:
* switch from Rituximab (Mabthera) to its biosimilar in both IV and SC,
* switch from Rituximab (Mabthera) to its biosimilar in IV and R-CHOP (Rituximab, Cyclophosphamide, Doxorubicine, Vincristine, Prednisone) SC treatment only,
* switch from Rituximab (Mabthera®) to its biosimilar in IV only.
Results: In 2017, 52 patients had been provided Rituximab (Mabthera®) for a total cost of 251 469€. The 15 nurses interviewed are opposed to the switch from Rituximab SC to Rituximab (Truxima®) IV (health workers' time constraints (45.5%), waste of time for patients (39.4%) and lower clinical tolerance (15.2%)) but agree to an IV to IV switch. Day hospital's managers also mentioned the problem of avoidance of bed-blocking. Therefore, we conducted a bibliographic review on perfusion duration of Rituximab. Several studies indicate that when the first infusion is well tolerated, all subsequent infusions may be administered over 90 minutes. Currently, the annual duration of all the infusions IV and SC of Rituximab is estimated at 500 hours (h). Therefore the reduction of all perfusion's durations will compensate the time lost due to a switch of Rituximab SC to Rituximab IV.

	Financial gain	Time saving
Switch in both IV and SC	51 688€	92 h
Switch in IV and R-CHOP SC treatment only	49 372€	101 h
Switch in IV only	31 715€	153 h

Conclusions: The cost savings that result from the switch from Rituximab (Mabthera®) to its biosimilar would be significant. This will only be possible if Rituximab infusions are administered over 90 minutes. A multidisciplinary working meeting will be organized to take a decision. The problem of lower clinical tolerance for patients will have to be assessed and considered.
NO CONFLICT OF INTEREST

198 POSTER (BOARD 023) MEDICO-ECONOMIC IMPACT OF THE EXPANSION OF IMMUNOTHERAPY IN NON-SMALL CELL LUNG CANCER IN AN ONCOLOGY AMBULATORY CARE UNIT

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Introduction: New immunotherapies are recently developed in second-line for non-small cell lung cancer (NSCLC) like Pembrolizumab and Nivolumab. With shorter cycle intervals and duration of administration, we've suspected they had an impact on the ambulatory care unit organization. The objective of the present study is to evaluate the evolution of activity level of the service before and after the use of these immunotherapies, in term of time and cost savings.
Materials and methods: Data regarding second-line prescriptions in NSCLC were collected retrospectively for the year 2014 (before use of immunotherapy) and 2017, thanks to the Chimio® software. For each patient, the following data were reported: treatment protocols, number and duration of chemotherapy sessions (CS).
The analyzed criteria were as follows:
- evolution of the number of CS between 2014 and 2017 and quantification of the gain in annual activity for 2017. Cost-saving was obtained by multiplying the number of CS by the reimbursement rate of an ambulatory CS (403.53 €);
- calculation of average duration of administration per CS for both years;
- extrapolation of the total duration of CS for 2017, with repartition of treatment protocols used in 2017, but taking into account the number of CS observed in 2014. The possible time-saving was converted in potential additional CS by dividing by the average CS duration in 2017. Cost-saving was calculated by multiplying additional CS by CS reimbursement rate.
Results and Discussion: In 2014, 48 patients (sex ratio M/W = 1.7, 62 ± 9 years) were treated with docetaxel, gemcitabine or pemetrexed, for a total of 293 CS. In 2017, 53 patients (sex-ratio M/W = 3.4, 62 ± 10 years) were mainly treated with N, P, docetaxel, gemcitabine or pemetrexed, for a total of 436 CS (70% of immunotherapy: 45% N and 25% P). This 149% increase in activity corresponded to a saving of 57,704 €. On the other hand, the average duration of administration per CS was 82.0 minutes in 2014 and decreased to 67.6 minutes in 2017. The total duration of CS in 2014 was 400 hours. Taking into account the number of CS observed in 2014 and the repartition of treatment protocols in 2017, the total duration of CS in 2017 would be 330 hours. This saving of 70 hours, would make possible to carry out 62 additional CS (28 CS of N, 15 of P and 19 CS of other chemotherapies), and would represent an additional income of 25,019 € (+ 21%).
Conclusion: According to this results, we observed a 149% increase in the number of CS between 2014 and 2017, which could be explained by the arrival of immunotherapies. Indeed, these therapies have a strong impact on the organization of ambulatory care units. It could enable to handle more patients and increase incomes, with the same amount of resources.
NO CONFLICT OF INTEREST

199 POSTER (BOARD 024) RISK ASSESSMENT OF OCCUPATIONAL EXPOSURE TO RESIDUAL CYTOTOXIC CONTAMINATION IN A FRENCH ONCOLOGY HOSPITAL DAY CARE

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Introduction: Antineoplastic drugs are commonly used in the treatment of cancer. Due to inherent cytotoxic, mutagenic and potentially reprotoxic properties, handling those drugs represents a risk of exposure for health care workers. Despite guidelines on handling hazardous drugs, risk of occupational exposure still remains. Cytotoxic surfaces contaminations are one of the main sources of contamination. The aim of this study was to assess the risk of occupational exposure to cytotoxic drugs for nurses involved in an oncology hospital day care unit.
Material and Method: Failure Modes and Effects and Critical Analysis (FMECA) were used to assess the risk [1]. Potential failure modes of the process were identified. The risk was quantified on the risk priority number (RPN) taking into account 4 parameters: failure gravity was determined on the mean environmental contamination, its occurrence based on the proportion of contaminated surfaces, the time of exposure based on the staff planning and the possibility of avoidance before the failure occurs based on the use of individual protective equipment determined by a survey. Platinum contaminations were measured by furnace atomic absorption spectroscopy [2]. Then, RPNs were calculated and used as an indicator to quantify the relevance of each failure mode and prioritize corrective measures (RPN<74: risk acceptable, 74<RPN<194: risk tolerable and RPN >194: unacceptable risk).
Results and Discussion: Over the 4 areas defined in the hospital day care, 18 failures modes were identified. A total of 164 workplace surfaces were analysed. 16.5% of contaminated samples (n = 27) were identified, the most critical area were patients toilet with 66% of contaminated samples (n = 8). Among the fifteen nurses included, surveys highlighted a large variability of handling and gloves wearing practices. The global analysis revealed a mean RPN of 49 corresponding to an acceptable risk with 64 in the chemotherapy administration area, 57 in the chemotherapy preparation area, 40 for the excreta management area, 25 in the adjacent area where no specific protective equipment is required. Over all failure modes analysed, the "management of patient alert" and the "filling and cleaning medicine trolley" were the most critical (RPN = 90). Three nurses have a risk tolerable under control (RPN max = 82). None unacceptable risk was identified. Regarding the disparity of RPNs and protective practices, specific sensitization focused on the chemical risk associated to handling antineoplastic drugs were conducted.
Conclusion: In order to anticipate and prevent occupational exposure, FMECA is a valuable tool to identify, prioritize and control potential failure modes for healthcare workers involved in the chemotherapy medication process before failures occur.
[1] Lê et al. Sci Total Environ. 2017
[2] Chappuy et al. J Hazard Mater. 2010
NO CONFLICT OF INTEREST

200 POSTER (BOARD 025) A NEW CHROMATOGRAPHIC METHOD FOR THERAPEUTIC MONITORING OF CAPECITABINE

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Introduction: The fluoropyrimidine derivative *Capecitabine* is an oral pro-drug form of the chemotherapeutic agent *5-Fluorouracil* - a pro-drug, which undergoes a three-step metabolic activation to become cytotoxic for the tumor target cells. As an oral chemotherapy medication, *Capecitabine* may be used alone or in combination with other drugs for the treatment of breast, gastric, and colorectal cancer. To be effective, however, the therapy with *Capecitabine* must be subject of incessant monitoring.
Therefore, the aim of our work was to develop and validate a new HPLC protocol for the quantification of *Capecitabine* in plasma samples at clinically relevant concentrations.
Materials and methods: Therapeutic drug monitoring has been performed by means of a Thermo Scientific Dionex UltiMate 3000 Analytical LC System, equipped with a VWD-3000 variable wavelength and a DAD-3000 Diode Array Detectors. System control and data analysis have been done out using a Thermo Scientific™ Chromeleon™ 7.2 Chromatography Data System software. The chromatographic analysis has been carried out by means of a mobile phase of methanol/buffer (water with 1% formic acid) in gradient mode on a reversed phase Thermo Scientific AQUASIL C18 (150 mm ´ 4.6 mm, 5 mm) analytical column. The eluate's composition has been monitored at a wavelength of 306 nm. Capecitabine (99.5% minimum purity) standard was purchased from Sigma-Aldrich.
Results and Discussion: Introducing gradient elution and optimizing the operating conditions, a total run cycle of 15 min was achieved. The specificity and selectivity of the method was demonstrated in the absence of endogenous interfering peaks at the retention time of the analyte in ten different lots of blank plasma. The established LOD and LOQ values allow us to conduct monitoring of *Capecitabine*, even after its systemic absorption.
Conclusions: In conclusion, we can reasonably claim, on the basis of the proven accuracy, repeatability, linearity/range, and specificity of the current HPLC method, that it can be successfully used for the purposes of the clinical pharmacokinetic studies and the therapeutic drug monitoring of *Capecitabine*.
NO CONFLICT OF INTEREST

201 POSTER (BOARD 026) THE APPLICATION OF NANOTECHNOLOGY TO ONCOLOGICAL PRACTICE

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Background: With a growing number of products on the market, nanotechnology applied to life sciences and in particular in the field of oncology are in a phase of scientific and technological growth.
Nanoscale technologies will bring great benefits to medicine: more potential, speed, reliability, all at lower costs.
Aim:
- To define progress in nanotechnology in the field of oncology,
- To characterize the market access of these new products.
- To identify the different issues opened by these new therapeutic approaches.

Materiels and methods: We conducted a review of the literature on the technological assessments already conducted on nanotechnology in oncology.
We identified also the new products, the new indications, with a particular focus on clinical efficacy, patient-related characteristics and the dynamics of technology.
Results: The applications of nanotechnologies to health are found at all stages of the health process, from prevention to monitoring using diagnostic and therapeutic systems.
With more than 78 products in clinical development or on the market. Oncology is the first therapeutic area in Nanomedicine. In this therapeutic area, the main segment concerns drug delivery systems that include liposomes (44 products), micelles (7), emulsions (6) and a heterogeneous set of nanoparticles including gold particles or polymeric particles that can reduce the toxicity of harmful compounds used in oncology
Conclusion: In the case of cancerous diseases, nanotechnology would be a new hope for future healing, which would not target the cancer area, destroying only cancer cells and not the holy tissue.
NO CONFLICT OF INTEREST

202 POSTER (BOARD 027) GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENCY DISCOVERED AFTER RASBURICASE: CASE REPORT

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Background: Glucose-6-phosphate dehydrogenase deficiency (G6PD-D) is a genetic disorder which occurs almost exclusively in males (particularly in African Americans and those from certain parts of Africa, Asia, and the Mediterranean). It is inherited as an X-linked recessive disorder. Among an estimated level of 400 million people worldwide with G6PD-D only few experience symptoms. Acute episodic haemolytic anemia can occur due to oxidant stress induced by exposure to certain drugs. We present the case of a patient whose G6PD-D was discovered during his treatment for Hodgkin lymphoma.
Material and Methods: The case concerns a 24-year-old patient with a left cervical adenopathy of approximately 3 cm size. The abdominopelvic CT scan showed diffuse mediastinal infiltration, consisting of multiple confluent nodular formations, some were hypodense and necrotic. The node biopsy concluded a diagnosis of Hodgkin's lymphoma stage IV. The patient was included in an escalated BEACOPP protocol consisting of bleomycin, etoposide, doxorubicin, cyclophosphamide, vincristine, procarbazine and prednisone. The biological evaluation on Day 1 showed a normal formula count, except for hemoglobin 12.4 g/dl.
Results: On Day 1 the patient received doxorubicin, etoposide, cyclophosphamide, procarbazine and prednisone. On days 2 and 3 the patient received etoposide, procarbazine and prednisone. Rasburicase was administered for the prophylaxis of acute hyperuricemia due to tumor lysis. Treatment was well tolerated but patient experienced dizziness on Day 4. The blood count showed a hemolytic anemia (hemoglobin: 5.7 g/dl) and hemolysis results were positive with a decrease of haptoglobin. Total bilirubin was elevated to 119 mmol/L with 25 mmol/L conjugated bilirubin. LDH was elevated to 515 IU/l. The blood smear showed hypersegmented polynuclear and an abnormality of the red blood cells with hemigost and bite-cell highly suggesting G6PD-D. No medical history of G6PD deficiency was known in this patient. The patient was hospitalized in an intensive care unit and received three red blood cell transfusions and erythropoietin therapy. G6PD enzyme activity was performed. A low level of G6PD enzyme was found confirming the diagnosis of G6PD-D.
Conclusions: Rasburicase is an uricolytic agent which catalyses the enzymatic oxidation of uric acid to allantoin, a water-soluble substance easily excreted by the kidney in the urine. Hemolytic anemia is likely to occur in G6PD-deficient patients due to their inability to break down hydrogen peroxide, which results from the oxidation of uric acid to allantoin. This clinical case raises the question of the search for G6PD-D in patients who may require the administration of Rasburicase in prophylaxis of tumor lysis syndrome, especially in patients from at-risk populations.
NO CONFLICT OF INTEREST

203 POSTER (BOARD 028) THE USE OF MEDICINAL PLANTS BY CANCER PATIENTS: MONOCENTRIC STUDY

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Introduction: The taking of medicinal plants in Morocco is a traditional practice, used by a large number of patients including cancer patients for the purpose of curing a disease or relieving its symptoms.
The study consists in evaluating the prevalence of the use of medicinal plants in patients with cancer, and to identify the different medicinal plants used.
Materials and methods: During a period of 4 month , We carried out a prospective prevalence study of the ethnopharmacological survey type using a direct interview with the patients treated at the National Institute of Oncology by through a multidimensional questionnaire.
Resultats: The female sex was mostly represented in our series (74%). The average age was 53.3 years old. 82% were illiterates with urban tropism. Our results show that 27% of patients were consumers of medicinal plants, these patients prefer to use PM as a powder mixed with hot water or honey in the majority of cases (72%), orally (97%). %) .The mode of use of PM differs according to the species used during the different periods of medical treatment. 61% of patients use PM when needed. The duration of treatment with PM in patients varies from one day to a few months. The patients consume different parts of the plant, they use in particular the specific organ which contains the active principle sought in the various organs of the plant: the root, the stem, the seeds and the leaves. The latter are the most used organ of the plant (48%). The analysis of our results also showed that the number of PM used in cancer patients interviewed at INO was 31 plants. Among these species, the dominance of Annona cherimola (59%) is noted, followed by Caralluma europea (58.4%), Aristolochia longa L (56.5%), Origanum compactum Benth (52.2%), Nigella sativa L (47.3%). %)., Marrubium vulgare L (45.8%), Allium sativum L. (12.3%) Patients used PM purchased from herbalists, the souk, supermarkets or sometimes ordered by internet from abroad. 77.8% of patients say they use medicinal plants to help them with cancer treatments. The percentage of observed AEs resulting from the use of these plants was 8%. These adverse effects were of variable severity and were divided between renal impairment and gastrointestinal disorders.
Conclusion: We have noticed that taking medicinal plants during cancer is a traditional practice that is very common in all cancer patients, which requires careful monitoring with early detection of this condition to avoid the occurrence of side effects.
NO CONFLICT OF INTEREST

204 POSTER (BOARD 029) MAJOR CUTANEOUS, HEMATOLOGIC AND DIGESTIVE TOXICITY WITH HIGH-DOSE METHOTREXATE: A RARE PEDIATRIC CASE REPORT

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High-dose methotrexate (HDMTX) has long been used to treat acute lymphoblastic leukemia. Here, we report the case of a child who received his first HDMTX and got a major toxicity which has affected both skin, blood and digestive system.

This study is based on the data available in the medical report and in the literature.
The patient is a 14-year-old boy, treated in CAALL-F01 protocol. He was treated with gabapentin and levetiracetam since 3 months after a cerebral thrombophlebitis. He already had 5 intrathecal injections of methotrexate (MTX), with no side effects noticed. He was hospitalized to get his first cure of HDMTX (5 g/m^2). Physicians were aware of the potential slow elimination of the MTX because of levetiracetam. Levofolinate was started at H42. The concentration of MTX in the blood was 1,12 µmol/L at H48, 0,34 at H72 and 0,2 at H96. The last concentration allowed the interruption of levofolinate and confirmed the MTX elimination. During the hospitalization, the biology stayed in the norms, except for the C-reactive protein, which roses from 5,2 to 43,2 mg/L. For the clinical aspect, a diarrhea was noticed, with Type-2 Norovirus found in the feces. At D4, erythroderma appeared on limbs. It was associated with cheilitis, rectal ulceration and pruritus at D5. He was admitted to hospital at D6, with grade IV folliculitis and mucositis. He had broad-spectrum antibiotics to prevent infections because of the severe aplasia and symptomatic treatments. The biology showed moderate cytolysis with mild cholestasis and sever thrombocytopenia requiring daily platelet transfusions. Corticoids, immunoglobulin infusion and albumin were added. At D17, anal bleeding and major ileitis with liver abscesses appeared, medical team added antifungal drugs with levofolinate and stopped corticoids. At D20, the biology showed high cytolysis and cholestasis, with hyperfibrinogenemia and low prothrombin time, they decided to transfer the boy in reanimation, fearing a disseminated intravascular coagulation. They stopped gabapentin and switched the antibiotics. He came back from reanimation at D25 and recovered at D30. This toxicity is really rare, with no similar case found in the literature. The combination of mucositis and cutaneous toxicity assess the role of MTX. We suspect an immune-allergic mechanism because the skin toxicity wasn't a Lyell's syndrome and MTX was totally eliminated. No interactions and no others drugs or alternative therapy seems to be involved in this event. The genetic is currently under study, and could bring us more information about the mechanism of this toxicity, maybe a genetic abnormality of metabolism of MTX. No reintroduction of HDMTX will be done.
Even if HDMTX appears to be safe, some rare toxicity can appears and threaten patient's life. These potentials events have to be known by physicians to manage them correctly.
NO CONFLICT OF INTEREST

205 POSTER (BOARD 030) SOUND-ALIKE AND LOOK-ALIKE: THE RISK MANAGEMENT STRATEGY

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Background: Similar-sounding (Sound-Alike) or similar-looking (Look-Alike) drugs are important risk factors for medication errors at the hospital level. The confusion between these drugs can have serious consequences for patients.
The objective of the study was to determine the similarities of the drugs Sound-Alike and Look-Alike in the oncology pediatric hospital and evaluate the severity of these confusions on the lives of patients.
Materiels and Methods: We have established a list of similarities in the names and medicines available from the oncology Children's Hospital stock which has been categorized similarity (primary or secondary packaging, labeling or by name). For each confusion possible, a severity score ranging from 1 to 5 was assigned depending on the risk to the patient (surveillance, hospitalization, sequelae, death ¼).
Results: 210 drugs were analyzed to determine which drugs are most at risk error. 49 pairs of drugs were noted at risk of confusion. Of these, 57% are Look-Alike drugs whose first identified cause of error is a similarity between secondary packaging (66%), then comes the defects of the dosages or the administration (35%) and defective primary packaging (31%). Confusions related to a Similarity between the drug names Sound-Alike account for 43% of the drug pairs noted.
It appears that the clinical consequences of confusions between close names within the same pharmacological class, but with different indications and dosages would be less serious (1 ≤score≤ 2) than during a confusion between very different pharmacotherapeutic classes or between drugs with therapeutic margins narrow (3 ≤score≤ 4)
Conclusion: The impact of mistakes of confusion on the lives of patients and particularly on children to bring health professionals to integrate the issue of (Look-Alike / Sound-Alike) into the risk management policy of the institution. Some measures can therefore be proposed: identify the drugs at risk and classify them separately, and also insist on the need to write legibly, to speak slowly and clearly when giving instructions, to read attentively to the ordinances, to carry out a double control of the dispensation and the administration for risky drugs, write the part of the name at risk in capital letters: eg VinCRistine / Vinblastine. Good cooperation between health professionals should help prevent risk of confusion and medication errors.
NO CONFLICT OF INTEREST

206 POSTER (BOARD 031) FROM MEDICAL DEVICE WITHDRAWAL TO GOOD DRUG ADMINISTRATION PRACTICES: EXAMPLE OF INTRAVESICAL INSTILLATION IN BLADDER CANCER TREATMENT

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Background: According to good practices of drug administration, adapters used in our hospital to connect Luer-Lock (LL) extensions to Urinary Catheters (UC) with a tapered end were withdrawn (from use). Before, urology department used them to perform IntraVesical Instillations (IVI) of Mitomycine C (MMC) chemotherapy or Bacillus Calmette-Guérin (BCG) immunotherapy. Use of UCs with a LL connector was proposed as an alternative but trials of these new Medical Devices (MD) showed finally a non-compliance to good practices of drug administration. In order to standardize and formalize MMC and BCG IVI practice and in accordance with new French guidelines, a work on appropriate IVI practice was performed.
Material and Methods: To fulfill this project, we formed a multidisciplinary workgroup composed of two urologists, the nurse manager, two pharmacists and two residents. We proceeded in three steps: bibliographic research of up to date IVI guidelines, observation of IVI in Urology service and finally meeting of the work group to approve an action plan.
Results: The latest French guidelines (Table 1) were generally followed in our hospital. Heterogeneous practices concerned the type of UC used and the unavaibility of a check-list.

Table 1: French Guidelines summarize

Communicate written documents to the patient for individual healthcare plan
Reduce fluid intakes at least 8 hours before IVI (+ urines alkalization in MMC IVI)
Check urinary culture is negative
Ask patient for adverse effects since the last IVI and verify the frequent adverse effects check-list
Atraumatic ureteral catheterization by urologist (or dedicated nurse)
For 6 hours after IVI, each urination should be in a sitting position (+ neutralization with bleach in MMC IVI)
Drink a lot (at least 2 liters per day) from 2 hours to 48 hours following IVI
Prescribe urinary culture and program next IVI
Every device used to prepare the solution (syringe, compress, drape, vial) should be eliminated in a dedicated container

Our workgroup approved the use of UCs with a LL connector (straight or coude tip) in order to secure IVIs. Two procedures were established: one for MMC and the other for BCG IVI practice. Those documents have been added to the electronic document management software. Along with those, we summarized the main steps and checks of IVI

realization in a "memo form" designed for the nurse team as well as an information sheet for patients. This sheet can be added to the electronic health record in order to trace delivered information.
Conclusion: Withdrawal of a MD revealed a misuse and led us to work on the good practices of drug administration. With a multidisciplinary workgroup, we standardized and formalized IVI practice in our hospital, allowing us to comply to French learned society guidelines. Considering continuous improvement, it would be interesting to evaluate practices a year from now.
NO CONFLICT OF INTEREST

207 POSTER (BOARD 032) EVOLUTION NUMBER OF LITIGATION CASES AND EXPENDITURE WITH MONOCLONAL ANTIBODIES FOR THE TREATMENT OF CANCER IN MINAS GERAIS-BRAZIL: A PRELIMINARY ANALYSIS FROM 2009 TO 2016

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Background: The last decade was marked by the widespread use of molecular biological agents in combination with chemotherapy regimens in the treatment of cancer. Such biological medicines have significantly increased the costs of oncological treatment, leading to concerns about the future sustainability of drug policies and as a consequence, health systems with universal access to health care. In Brazil, the four monoclonal antibodies BEVACIZUMAB(BEVA), CETUXIMAB(CETUX), PANITUMUMAB(PANIT) and REGORAFENIB(REGORA) compared in this study can only be used by the patient when there is a litigation against the State, since they are not incorporated into the Brazilian Health System.
Method: A retrospective descriptive study whose judicial information was extracted from the database of the Minas Gerais State Secretariat - SES-MG. The judicial actions were filed against the State of Minas Gerais for Cancer treatment and refer to the period from January 2009 to December 2016. The study was cut from the judicialized MoAbs (BEVA, CETUX, PANIT and REGORA) for the treatment of Colorectal Cancer (CCR). The cost of the treatments were calculated based on the prices of the Câmara de Regulação do Mercado de Medicamentos (CMED) ANVISA, taking into account the official dollar exchange rate of the Central Bank on January 31, 2018 and there was no adjustment for inflation.
Results and Discussion: Preliminary results showed that in the period between 2009 and 2016, 1024 lawsuits were filed against the State of Minas Gerais for cancer treatment, making 766 for BEVA, 206 for CETUX, 35 for PANIT and 17 for REGORA. The total cost obtained considering a 6-month overall survival for each patient was $ 22,260,536,00. In Brazil, the growing number of litigation and drug costs (BEVA, CETUX, PANIT and REGORA) per year is worrying, considering the increase of 5100% for judicial actions and 1899% for treatment costs in the period 2009 to 2016 (TABLE 1).
Conclusion: The exponential increase in lawsuits against the State of Minas Gerais demonstrates the growing pressure on the resources available to attend a reduced number of patients who are available to judicialize treatments outside universal health coverage, which is already a guaranteed right by the Brazilian constitution.
NO CONFLICT OF INTEREST

Table1. Evolution number of CCR litigation cases and expenditure on Beva, Cetux,Panit and Regora/ Year in Minas Gerais – Brazil, 2009-2016

Evolution number of CCR litigation cases and expenditure on Beva, Cetux,Panit and Regora/ Year in Minas Gerais – Brazil, 2009-2016											
	2009	2010	2011	2012	2013	2014	2015	2016	Total	% increase 2009 -2016
Bevacizumab	4	10	35	89	147	171	159	151	766	3775
Cetuximab	0	4	13	36	44	36	41	32	206	800
Panitumumab	0	0	0	2	3	6	8	16	35	800
Regorafenib	0	0	0	1	1	6	4	5	17	500
Total cases	4	14	48	128	195	219	212	204	1024	5100
total cost $ (dolar)	$220.471,00	$331.915,00	$ 1.122.915,00	$ 3.007.052,00	$ 4.350.203,00	$ 4.507.218,00	$ 4.533.324,00	$ 4.187.438,00	$ 22.260.536,00	1899

208 POSTER (BOARD 033) CYTOTOXIC EFFECT OF ERODIUM GUTTATUM A PLANT WITH ANTICANCER TRADITIONAL USE

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Introduction: Cytotoxicity is the property of a chemical or biological agent to be toxic to cells; herbal medicine is widely used in this sense. The aim of our study is to evaluate the cytotoxic activity of methanolic and aqueous extracts of *Erodium guttatum*, which has a traditional use in cancerous pathologies.
Material and Method: The extracts of the two plants are obtained after maceration in the solvent (96% methanol, distilled water) for 24 hours, at room temperature (25 ° C), followed by a double filtration on whatman paper and evaporated with Rotavapor. The cytotoxicity test (MIT) is based on a colorimetric test that reflects the ability of cells to reduce a yellow compound (terazolium) to violet compound (formazan). The activity was tested *in vitro* on two cell lines: RD (human cell line derived from a human rabdomyosarcoma) and L208 (continuous cell line of cells transfected with the poliovirus cellular receptor) with extract concentration ranging from 0,39 to 50 µg/ml. The reference substance used was methotrexate (MTX). The index of toxicity was to evaluate the cytotoxic index (IC).
Result and discussion: For the aqueous extract, the IC was 56.06 µg/ ml against L20B cells and 54.27 µg/ml against RD cells. On another side, for the methanolic extract, the IC was 51,57 mg/ml against L20B cells and 56,15 µg/ml against RD cells. The IC of reference substance (MTX) was respectively 47.10 and 69.58 mg/ml for L20B and RD cells. For both cell lines, the aqueous and methanolic extract follow the same profile of decreasing cell viability.
Conclusion: The study of the cytotoxic activity shows that both extract of Erodium guettatum used have a significant cytotoxic effect in comparison with the MTX. The effect remain very important but require further study.
NO CONFLICT OF INTEREST

209 POSTER (BOARD 034) CONTRIBUTION OF CLINICAL TRIALS TO THE AFFORDABILITY OF NEW MULTIPLE MYELOMA TREATMENTS: COMPARATIVE EVOLUTION BETWEEN 2014 AND 2016

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Background: Multiple myeloma is a pathology that accounts for approximately 10% of all hematologic tumors. Treating it has a growing economic impact on the pharmaceutical expenses of a hospital, due to the availability of new high-cost treatment. Participating in clinical trials may lead to a reduction in costs and contribute to better affordability for these new treatments. The objective of the study was to evaluate and compare the economic savings for the hospital from its participation in clinical trials for patients with multiple myeloma in 2014 and 2016.
Material and Methods: A retrospective study of clinical trials carried out at a tertiary hospital for multiple myeloma in 2014 and 2016. Pk-ensayos® management software was used to collect data on the number of clinical trials for this pathology, number of participants recruited, and research medications used. The direct cost of all approved drugs provided by the sponsors was calculated according to the acquisition price at our center in 2014 and 2016, respectively. Medications from previous phases of the research, which had no price assigned to them, could not be evaluated.
Results: In 2014, 80 patients were included in 27 clinical trials with 11 drugs of quantifiable cost provided by the sponsors, bringing the total cost to 1.496.159,22€. The average savings per year/patient were 18.702€. In 2016, 106 patients (32.5% more than in 2014) were included in 41 clinical trials (52% more than in 2014). The total cost for the 14 drugs evaluated that were provided by the sponsors, including the high costly new drugs carfilzomib, daratumumab and pembrolizumab, was 3.754.506,27€, bringing the average savings per year/patient to 35.419,87€.
The additional savings calculated for 2016 compared to 2014 was 2.258.347,05€.
Conclusion: The large number of clinical trials for multiple myeloma carried out at our hospital in recent years represents a significant and constant increase in savings for pharmaceutical expenses. Participating in clinical trials not only brings great clinical benefits to patients, improving patient access to new alternative therapies, but also offers great economic advantages that will help sustain the hospital budget.
NO CONFLICT OF INTEREST

210 POSTER (BOARD 035) USE OF eHEALTH IN THE ONCOHEMATOLOGICAL PATIENT

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Background: Information and communication technologies (ICTs) could bring about a revolution in disease management for oncology patients by promoting their empowerment and the real-time monitoring of their disease. We currently know very little about the application of ICTs in this patient group or indeed their level of interest in using these tools for greater management of their condition.
Our objective was to assess the ICT usage profile in oncohematological patients.
Material and Methods: A 29-item questionnaire was drawn up by a multidisciplinary team including pharmacists and oncologists. The questions were organized into three blocks. A: socio-demographic characteristics; B: use of ICTs when searching for health-related information; and C: usage preferences for health apps. Hematology–oncology patients receiving treatment between May and July 2017 were included.
Results: A total of 611 were included.
Patient socio-demographic characteristics: The average age was 57.8 years [19–91]. 61.9% were women, 40.7% had a university education and 45.1% regarded their overall state of health to be good.
Use of ICTs when searching for health-related information: 87.1% of subjects were interested in being informed about health-related matters. Of all subjects, 75.5% sought information from health professionals and 61.3% on the Internet. Before going to their doctor's appointment, 21.8% of patients looked up information about their disease and/or treatment on the Internet. After their appointment, up to 50.9% of participants referred to the Internet.
Usage preferences for health apps: 82.7% had a smartphone and 20.3% had a health app installed.
Conclusions: The oncohematological patients showed a great deal of interest in searching for health-related information by means of ICTs, especially using smartphones and apps. The issues that drew the most interest in terms of apps were appointment management, advice on disease management, and communication with health professionals.
NO CONFLICT OF INTEREST

Poster Session: Pharmacokinetics / Pharmacodynamics

211 POSTER (BOARD 036) A NEW RAPID AND SENSITIVE UPLC-MS ASSAY FOR THE DETERMINATION OF TAMOXIFEN AND ITS MAIN THREE METABOLITES IN PLASMA

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Introduction: Tamoxifen (TAM) is widely used as adjuvant therapy for estrogen receptor-positive breast cancer. However, inter-individual variabilities of treatment responses are commonly described due to the metabolism of that molecule, especially related to the gene polymorphisms of CY2D6. Tamoxifen is activated by cytochrome P450 particularly 2D6 and CYP2C9, resulting in the formation of active metabolites such as endoxifen (ENDO) and 4 hydroxytamoxifen (OHTAM), but also N desmethyl tamoxifen (NDTAM). Therefore, availability of an analytical

method to quantify tamoxifen and its metabolites would be an essential tool, for therapeutic drug monitoring to personalized treatment of tamoxifen.
Material and Method: Sample processing includes a precipitation step with formic acid 1% and acetonitrile to remove the most abundant plasma proteins. The separation was performed within 4.5 minutes using a gradient mobile phase consisting of ammonium formiate/acetonitrile applied on BEH C18 analytical column, with UPLC H-Class (Waters®) system. Tamoxifen and its metabolites were detected by mass spectrometry in the multiple reaction mode with (Xevo TQD Waters®). The method was validated according to the recommendations of the US Food and Drug Administration.
Results and Discussion: The method was linear ($r^2 > 0.99$) between 1 and 500 ng/mL for TAM and NDTAM; between 0.2 to 100 ng/mL for ENDO and between 0.1 to 50 ng/mL for OHTAM. The lower limits of detection and quantification were 0.5 and 1 ng/mL for TAM and NDTAM; 0.2 ng/mL for ENDO and 0.1 ng/mL for OHTAM, respectively. Within-day and between-day imprecisions were less than 11.0, 12.4, 11.1 and 12.2%, and inaccuracy did not exceed 4.7%, 4.1%, 2.9% and 10.1%, respectively for TAM, NDTAM, ENDO and OHTAM. The method also provided satisfactory results in terms of time stability and specificity. This method was applied in a clinical trial for pharmacokinetic study on tamoxifen and metabolites.
Conclusion: This new sensitive method for pharmacokinetic studies could be applied to the quantification of TAM and metabolites in plasma. This approach is particularly suitable to routinely monitor TAM plasmatic concentrations and adapted tamoxifen schedule administration, especially for poor or enhancer CY2D6 metabolizers.
NO CONFLICT OF INTEREST

212 POSTER (BOARD 037) DEVELOPMENT AND VALIDATION OF A WIPE SAMPLING PROCEDURE COUPLED TO UPLC MS/MS ANALYSIS FOR SIMULTANEOUS DETERMINATION OF 5-FLUOROURACIL, DOXORUBICIN, EPIRUBICIN, IFOSFAMIDE, GEMCITABINE AND CYCLOPHOSPHAMIDE ON SURFACE CONTAMINATION

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Introduction: A wipe sampling procedure followed by a simple ultra-performance liquid chromatography-mass spectrometry method was developed and validated for simultaneous quantification of six cytotoxic drugs (5-fluorouracil, doxorubicin, epirubicin, ifosfamide, cyclophosphamide and gemcitabine) for determination of the surface contamination.
Material and Method: Wiping was performed using Whatman© filter paper on different surfaces (10x10 cm), such as stainless steel, polypropylene and glass. After a solid-phase extraction of wiping filter paper extract, the separation was performed within 6.5 minutes using a gradient mobile phase consisting of 0.5% acetic acid/acetonitrile applied on a HSS T3 Waters® analytical column with UPLC H-Class (Waters®). The cytotoxic molecules were detected by mass spectrometry in the multiple reaction ion monitoring mode on Xevo TQD system (Waters®). The method was validated according to the recommendations of the US Food and Drug Administration.
Results and Discussion: The method was linear ($r^2 > 0.999$) between 2.5 and 200 ng per wiping sample for 5-FU, doxorubicin and epirubicin and between 0.2 to 40ng per wiping sample for cyclophosphamide, ifosfamide and gemcitabine. The lower limits of detection and quantification were 0.5ng and 2.5ng per wiping sample for epirubicin; 0.125 and 2.5ng for 5-FU and doxorubicin; 0.04 and 0.2ng for ifosfamide; 0.02 and 0.2 ng for cyclophosphamide and 0.01 to 0.2ng per wiping sample for gemcitabine. Within-day and between-day imprecisions were less than 14.0, 10.6, 11.1, 8.7, 11.2 and 10.9% for 5-fluorouracil, doxorubicin, epirubicin, ifosfamide cyclophosphamide and gemcitabine. The inaccuracies did not exceed 2.7, 10.9, 1.1, 4.5, 1.6 and 2.9% for the studied molecules, respectively. The method also provided satisfactory results in terms of time stability and specificity.
Conclusion: This new sensitive validated methodology for surface contamination studies was successfully applied on different places in a cancer research hospital. This approach is particularly suitable to assess occupational exposure risk to cytotoxic drugs.
NO CONFLICT OF INTEREST

213 POSTER (BOARD 038) ANALYSIS OF BEVACIZUMAB PLASMATIC CONCENTRATIONS IN THE TREATMENT OF METASTATIC COLORECTAL CANCER

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Background: *Caulet et al.* (2016) showed that metastatic colorectal cancer (mCRC) patients who have bevacizumab trough concentration above 15.5 mg/L at day 14 of treatment have longer survival. The aim of the present work was to describe and analyze plasmatic levels of bevacizumab in patients diagnosed of mCRC in a third-level hospital.
Material and Methods: A single-centre, prospective, observational, study of 5 month (January-May2017). All adult colorectal cancer patients treated with bevacizumab were included. Bevacizumab minimun concentrations (C_{min}) were collected and determination of concentrations was carried out with SHIKARIQ-BEVA® ELISA kit.
Other collected variables were: sex, age, anthropometics caracteristics (Body Mass Index;BMI), presence of extra-hepatic metastases, concomitant quimiotherapy and recieved dose of bevacizumab. Patients were requested to sign an informed consent for inclusion.
Results: The study included 4 patients, average age of 56.0 (54–63), of which 50.0% were male. 100% of patients received FOLFIRI as concomitant quimiotherapy and the average BMI of patients were 25.7 (22.7–36.5). All included patients had exta-hepatic metastases and the average logCEA was 1.14 (-0,04–2,97). The bevacizumab dosage was 5 mg/kg in all cases (average received dosage: 304.9 mg). A total of 19 determinations were carried out, with an average Ctrought of 24.02 mg/L (9.4–36.1). The average minimun and maximun C_{min} for the included patients were respectively 13.2 mg/L (6.4–32.3) and 35.2 mg/L (13.9–54.7). 50.0% of included patients did not reach a concentration higher than 15.5 mg/L after the first 14 days of treatment with bevacizumab, all of them has one or more of the high risk parameters identify by *Caulet* et al. (2016) (elevated basal CEA, extra-hepatic metastases, and high BMI).
Conclusions: Our results are preliminary and limited by the number of patients, but indicate the existence of a high variability in the bevacizumab trough concentration. They also show that patients who didn't reach levels above 15.5 mg/L present some characteristics related by Caulet et al. with a higher elimination rate of the drug. The recruitment of a greater number of patients and more longer follow-up will allow us to analyze the influence of these C_{min} in patients survival.
NO CONFLICT OF INTEREST

214 POSTER (BOARD 039) DETERMINATION OF SILENT INACTIVATION IN PEDIATRIC PATIENTS TREATED WITH ASPARAGINASE

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Background: About 10% of patients treated with asparaginase develop silent inactivation. The measurement of asparaginase activity levels is considered to best correlate with clinical effectiveness, finding as optimal trought activity levels higher than 100 UI/L[1].
The aim of the present work was to analyze and describe the levels of asparaginase activity in pediatric onco-hematologic patients.
Material and Methods: Multi-centre, prospective and observational with an expected duration of 32 month. Subjects were patients under 18 years old who received treatment with asparaginase.
Activity levels of asparaginase was done using the validated kit MAAT® from Medac.

Samples was taken to asses intermediate (day +7) and trough (day+14) levels of each asparaginase cycle.
The study had been approved by the hospital's Ethical Committee (CEIC). Legal-guardians were requested to sign an informed consent form prior to the inclusion.
Results: 5 patients were included during the five first months of study period, with an average age of 5.98 years (2–18), all of them were male. 80% of patients were diagnosed with acute lymphoblastic leukemia and the other patient with non-hodgkin lymphoma. All included patients recieved treatment with pegylated-asparaginase.
A total of 17 determinatios of activity levels were performed. 90% patients presented activity levels of asparaginase higher than 100 UI/L. However one of the patients, wich previously had suffer an hipersensibility reaction to E.coli derivated asparaginase (non-pegylated), didn't reach the optimal level of activity, showing in all of the determinations an activity level of 0 UI/L.
Conclusions: With the present work we wanted to show the preliminary results of asparaginase activity determination in the pediatric oncohaematologic patient. Of course, it will be necessary to include a higher number of patients to obtain conclusions about the rates of silent inactivation, impact on effectiveness, as well as toxicity associated with treatment in the study population.
[1] Van der Sluis et al. 2016Mar;101(3):279-85.
NO CONFLICT OF INTEREST

Poster Session: Pharmacotherapy

215 POSTER (BOARD 040) NIVOLUMAB IN ELDERLY PATIENTS WITH NSLC: EFFECTIVENES AND SAFETY

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Introduction: Elderly patients represent most of cancers diagnosed and deaths by age group. However, this subgroup of patients is under-represented in clinical trials. The aim of this study is to assess effectiveness and safety of Nivolumab in geriatric patients with Non-Small Cell Lung Cancer (NSLC).
Materiasl and methods: Elderly NSCL Patients (> 65 years) in treatment within 2016–2017 with Nivolumab were evaluated retrospectively.
Data collected were: demographic data (age and gender), indication, number of cycles received, previous treatments, reason for suspension, adverse effects (AE) and dosage adjustment.
The effectiveness endpoint was measured with length of treatment, interval to start a new treatment and Overall Survival (OS) assessed by Kapplan-Meir plots.
Data were obtained by the pharmacy dispensation program (ATHOS®) the oncology program (Farmis-Oncofarm®) and clinical charts.
Statistical analysis was performed using SPSS 21
Results: 23 patients were included from January 2016 to December 2017. 83% were male and the average age was 74 ± 5.12 years.
The average of cycles received was 11.52 (range:1–40). 60.87% of the patients required delaying treatment due to toxicity. A 17.4% presented grade 3–4 AE. In 4.34% of patients AE force to cease treatment (hepatic toxicity G3 and hypothyroidism). Most outlined AE were: asthenia 69.56%, dyspnea 43.48%, respiratory infections 43.48%, anorexia 43.48% cough 34.78%, hypothyroidism 21.74%, rash 17.4%, pruritus 17.4%, pyrexia 13.04%, arthralgias 13.04% and cephalea 4.34%.
Inmuno-related AE were: gastrointestinal (diarrhea 13,04%, constipation 17.4%, nauseas 17.4%, vomiting 4.34%), liver toxicity (hypertransaminasemia 8.69%, hyperbilirrubinemia 4.34%), pneumonitis 13.04% visual disturbances 8.69% and renal toxicity.
The median time of treatment by the time of this research was 5,09 months (95%CI = 1.99–8.20). The median time to initiate a new treatment was 11.93 months (95%CI = 10.27–13.59). At the end of the research 10 patients were still under treatment. Three of them had been in treatment for more than 12 months. Median OS was 9.59 months (56.52%).
Conclusions: The observed AEs are all described in the literature, although the incidence in our population differs and was higher than previously reported, especially grade 1–2 AE. In geriatric patients the most frequent were asthenia, cough, anorexia and dyspnea. In trials fatigue, nausea, anorexia and asthenia were more frequently described.
Regarding effectiveness, to a certain degree it was lower than that described in trials, although the results of the pivotal trials were somewhat disconcerting in terms of effectiveness by age groups, which may be due to the small number of patients included in the study.
However further studies are needed due to the limited sample extent.
NO CONFLICT OF INTEREST

216 POSTER (BOARD 041) ADVERSE REACTIONS OF INMUNO-ONCOLOGY ASSOCIATED WITH INFLUENZA VACCINE.

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Introduction: The aim of this study is to determine whether patients undergoing immuno-oncological treatment during 2016–2017, who have been administered the influenza vaccine, have a higher incidence of adverse events (AE).
Materials and methods: Retrospective study in which all patients who received immuno-oncological treatment during 2016–2017 were included. They were classified into two groups based on whether or not they had been vaccinated against flu and the most frequent AEs were collected. The information was obtained from Diraya®, Digital Single History of Health and Farmis-oncofarm®.
Results: 74 patients were included and split into two groups: Vaccinated (25): 24 treated with Nivolumab and 1 with Pembrolizumab, mean age 66.08 ± 9.93 years, 68% men; and non-vaccinated (49) 44 treated with Nivolumab and 5 with Pembrolizumab medium age 65.96 ± 12.5, 71.43% men).
In the vaccinated group, the most frequent AEs were cough 40%, dyspnea 32%, respiratory infections 32%, diarrhea 24%, hypothyroidism 20%, pruritus 20% and nausea 16%. 92% of the patients presented at least one G1-2 AE and 8% had G3-4 AEs.
In the group of non-vaccinated patients, AEs were asthenia 63.26%, anorexia 36.73%, pyrexia 28.57% rash 22.45%, arthromyalgia 16.32% and constipation 16.32%. 83.67% of the patients presented at least one G1-2 AE and 22.45% had G3-4 AEs.
Conclusion: We cannot conclude that there is a significant difference between adverse reactions presented by vaccinated patients versus non-vaccinated patients. In our case, the group of vaccinated patients had a higher percentage of AE, but less severe. In addition, the distribution of AEs was different in both groups. More studies with a larger population are needed in order to reach a conclusion.
NO CONFLICT OF INTEREST

217 POSTER (BOARD 042) EFFECTIVENESS AND SAFETY OF NIVOLUMAB IN ELDERLY PATIENTS WITH RENAL CELL CANCER

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Introduction: Elderly patients represent most of cancers diagnosed and deaths by age group. However, this subgroup of patients is under-represented in clinical trials. The aim of this study is to assess effectiveness and safety of Nivolumab in geriatric patients with Renal Cell Cancer.
Materials and methods: Elderly Renal Cell Cancer Patients (> 65 years) in treatment within 2016–2017 with Nivolumab were evaluated retrospectively.
Data collected were: demographic data (age and gender), indication, number of cycles received, previous treatments, reason for suspension, adverse effects (AE) and dosage adjustment.
The effectiveness endpoint was measured with duration of treatment and Overall Survival (OS) assessed by Kapplan-Meir plots.
Data were obtained by the pharmacy dispensation program (ATHOS®) the oncology program (Farmis-Oncofarm®) and clinical charts.
Statistical analysis was performed using SPSS 21®
Results: 8 patients were included from January 2016 to December 2017. 75% were male and the average age was 71.13 ± 2.64 years.
The average of cycles received was 9.25 (range:2–19). 75% of the patients required delaying treatment due to toxicity. A 25% presented grade 3–4 EA. In 12.5% of patients AE force to cease treatment.
Most outlined AE were: asthenia 62.5%, cough 50%, rash 37.5%, pruritus 37.5%, pyrexia 25%, dyspnea 12.5%, hypothyroidism 12.5% and arthralgias 12.5%.
Inmuno-related AE were: gastrointestinal (diarrhea 12,5%, constipation 12.5%, nauseas 12.5%, vomiting 12.5%), visual disturbances 12.5% and renal toxicity 12.5%.
The median time of treatment by the time the studio end was 10,94 months (95%CI = 4,84–9,526). At the end of the study 5 patients were still under treatment.
One of them had been in treatment for more than 24 months. Median OS was 7.031 months (87.5%).

Conclusions: The observed AEs are all described in the literature, although the incidence in our population differs and was higher than previously reported, especially grade 1-2 AEs. In geriatric patients the most frequent were asthenia, cough, rash and pruritus. In trials asthenia, nausea, pruritus and diarrhea were more frequently described.
Regarding effectiveness, to a certain degree it was lower than that described in trials, although the results of the pivotal trials were somewhat disconcerting in terms of effectiveness by age groups, which may be due to the small number of patients included in the study.
However further studies are needed due to the limited sample sized.
NO CONFLICT OF INTEREST

Poster Session: Pharmacotherapy

219 POSTER (BOARD 044) DESENSITIZATION TO OXALIPLATIN AFTER MILD-TO-MODERATE HYPERSENSITIVITY REACTION

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Introduction: Hypersensitivity reactions (HSR) caused by oxaliplatin (OP) have been reported with an incidence of 10–19% and may limit further therapeutic option. In our hospital, a desensitization protocol has been conducted for patients who developed mild-to-moderate HSR, in order to reintroduce OP. The desensitization protocol includes a gradual reintroduction of 3 small amounts of OP (1/1000, 1/100, and 1/10 of the full dose) to finish with target dose of OP, infused over a total of 6 hours. The aim of this study is to assess the safety and efficacy of this protocol.
Material and Method: All patients treated by desensitization protocol to OP, between January 2010 and February 2018, were included retrospectively. Patient medical reports and administration records were analysed in March 2018. HSR were graded according to European Society for Medical Oncology recommendations.
Results and Discussion: Twelve patients who developed Grade 2 HSR were included in the desensitization protocol to OP. The median age at the first HSR was 60 years (ranging from 24 to 83), and 10 patients (83%) were female. The median number of prior cycle of OP received was 10 ranging from 1 to 28. First HSR have occurred with OP administered by intravenous infusion for 10 patients (83%) and by hepatic arterial infusion for 2 patients (17%). For the 12 patients, a total of 22 cycles of desensitization protocol was conducted with 20 (90%) achieving full target doses without inducing recurrent HSR. Desensitization protocol was aborted in 2 patients because of HSR during the first cycle and the 8th cycle of desensitization and was discontinued in 1 patient died for another reason. Out of the 9 patients achieving successfully the desensitization protocol, 8 (89%) resumed regular OP-based-protocol at slower infusion rate and 1 (11%) continue to receive further desensitizations. At the resumption of OP at slower rate, 6 out of 8 patients (75%) developed recurrent HSR, mostly at the first cycle (4/6), and only two patients (25%) continued to receive OP without any further HSR. With a low occurrence of HSR during desensitization, the implemented protocol seems to be safe in patients previously sensitized and for whom therapeutic options are limited after several lines of treatment. But few patients were successfully desensitized for a long term and were able to resume the regular protocol without any further HSR. The safer option seems to continue the desensitization protocol until the onset of adverse events or disease progression. But desensitization is time and resources consuming and limits its long-term feasibility.
Conclusion: Desensitization protocol used in this study is safe and could provide a medium-term option to continue an effective OP-based regimen in the setting of HSR.
NO CONFLICT OF INTEREST

220 POSTER (BOARD 045) SIDE EFFECTS OF CHECKPOINT INHIBITORS: EXPECTATIONS, REALITY, AND TREATMENT

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Checkpoint inhibitors represent a class of monoclonal antibodies that target specfic molecules of human immune system.
Ipilimumab, nivolumab, and pembrolizumab have been in use for several years. Recently, atezolizumab, durvalumab, and avelumab have been also approved. Other molecules are investigated in clinical studies.
Whlie ipilimumab inhibits CTLA-4, nivolumab and pembrolizumab inhibit PD-1 and atezolizumab, avelumab, and durvalumab are inhibitors of the ligand of PD-1. Different mechanisms of action enable therapy based on a combination of two checkpoint inhibitors.
Patients treated by checkpoint inhibitors and especially those patients treated by their combination are at high risk of autoimmune adverse effect. Theoretically, these can occur in any organ in the body.
In patients treated in Masaryk Memorial Cancer Institute, the most frequent adverse autoimmune disorders include thyreoitis and pneumonitis. Autoimmune thyreoitis is diagnosed easily and its consequences can be treated by thyreoid hormone supplementation. Pneumonitis is harder to recognize because lung metastases and infectious pneumonia that are relatively frequent in cancer patients have to be excluded at first. In case of pneumonitis, diagnostic algorithms have been developed. Other examples of autoimmune disorders we encountered include hepatitis and colitis.
While Grade 1 autoimmune adverse effects are usually managed with treatment delay and increased watchfulness, Grade 2 adverse effects have to be treated with corticosteroids. If there is an improvement in the condition of the patient, initial intravenous administration can be switched to oral treatment at home setting and the dose tapered down in the course of several weeks. Grade 3-4 adverse effect often cannot be treated by corticosteroids only and other immunosuppressant has to be added, for instance mycophenolate mofetil.
Checkpoint inhibitors are a novel class of drugs. Their mechanism of action is promising and the number of patients who are treated with them because of melanoma, lung cancer, renal carcinoma, and other oncological diagnoses is growing. Autoimmune adverse effects of these drugs can not only lead to treatment delay or discontinuation, but they can also put the patient in immediate danger. Therefore, quick reaction of the multidisciplinary team and correct treatment are essential.
NO CONFLICT OF INTEREST

221 POSTER (BOARD 046) 8 YEARS OF SKIN TESTING FOR HYPERSENSITIVITY REACTIONS TO CHEMOTHERAPY

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Introduction: The increasing efficacy of treatments against cancer has increased the incidence of hypersensitivity reactions to chemotherapeutic agents as more cancer survivors are exposed to repeated courses of sensitizing agents. Patients in most cases may switch to an alternative drug but it is complicated when the offending medication is essential or the best treatment option. On the other hand, most of these agents are classified as hazardous by regulatory guidelines and therefore must be manipulated in controlled environment. We review the patients tested in our allergy department for hypersensitivity to chemotherapy and the different preparations elaborated in the pharmacy department.
Material and Method: Retrospective review of all preparations for skin prick and intradermal testing elaborated for the allergology department to proceed to hypersensitivity tests between July 2011 and February 2018. Pharmacy department database were consulted as well as electronic clinical records (Osabide Global).
Results and Discussion:
Oncology and hematology services derived 46 patients to the allergology service for systemic allergic reactions during administration. Pharmacy service has elaborated 136 tests with a total of 408 preparations (3 preparations per test on average).
There were 18 different drugs tested, 26 oxaliplatin, 23 cisplatin, 19 carboplatin, 6 rituximab, 4 irinotecan, 4 paclitaxel, 3 cetuximab, 3 metotrexate, 2 bendamustin, 2 lenalidomide, 1 bortezomib, 1 capecitabin, 1 carfilzomib, 1 denosumab, 1 fluorouracil, 1 gemcitabin 1 panitumumab and 1 zoledronic.
40% (18/46) tested positive, 11 oxaliplatin, 4 carboplatin, 2 cetuximab, 1 bendamustin, 1 bortezomib, 1 cisplatin and 1 irinotecan.
Conclusion: Hypersensitivity tests are useful in identifying those patients who could continue receiving their chemotherapy.
The most tested drugs were oxaliplatin, carboplatin and cisplatin as expected, but only 42% were positive for oxaliplatin, 21% for carboplatin and 5% for cisplatin.
Central elaboration within the pharmacy service made procedures compliant with hazardous manipulation guidelines minimizing the exposure risk for manipulators and patients.
NO CONFLICT OF INTEREST

222 POSTER (BOARD 047) SAFETY PROFILE ASSOCIATED TO IBRUTINIB IN CLINICAL PRACTICE

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Background: Ibrutinib is indicated as monotherapy in both first and second line treatment of chronic lymphocytic leukemia (CLL), mantle cell lymphoma (MCL) and Waldenstrom's macroglobulinemia (WM), in the latter case first line treatment only if immuno-chemotherapy is not considered appropriate. Our objective is to assess ibrutinib toxicity in clinical practice.
Material and Methods: Retrospective observational study of patients who started oral treatment with ibrutinib since January 2016. Data were obtained from the outpatient dispensing program Dipex® and by the review of medical records. The collected variables were: age (years), gender, indication (CLL, MCL, WM), treatment line, mean treatment duration (months), count of Hb (g/dL), leukocytes (x10^9/L), neutrophils (x10^9/L), lymphocytes (x10^9/L) and platelets (x10^9/L) levels, as well as the recording of all adverse events during treatment.
Results: We included 4 patients (3 males and 1 female) with an average age of 79 years who started treatment with ibrutinib monotherapy, none in the first line. 3 patients received doses of 420 mg/24 h, 2 of them for CLL and another for LCM, and one patient received a dose of 560 mg/day for the indication of WM. Mean duration of treatment was 11.75 months and baseline mean values of Hb, leukocytes, neutrophils, lymphocytes and platelets were 12.17 g/dL, 29.65 × 10^9/L, 3.56 × 10^9/L, 24.61 × 10^9/L and 155.5 × 10^9/L respectively. Regarding safety, 2 patients required hospitalization due to respiratory infection and a third presented low-grade fever with cough without requiring admission, which forced the temporary suspension of the drug in all of them. Patients resumed treatment at the same dose except one of them, who due to the presence of severe asthenia required a restart at lower doses (140 mg/24 h), up to a dose of 280 mg/24 h that is currently maintained. Only one patient did not require interruption or dose reduction of ibrutinib. In no case did they need supportive treatment to correct haematological levels alteration. Finally, one patient had recurrence of a basal cell carcinoma while another was diagnosed de novo, after starting treatment with ibrutinib.
Conclusions: Certain types of skin cancer have been reported as frequent during the post-marketing period. In our study, respiratory infections and neoplasms (basal cell carcinoma) were the major adverse effects associated with the use of ibrutinib, which in some cases required suspension and/or dose adjustment.
NO CONFLICT OF INTEREST

223 POSTER (BOARD 048) EFFICACY AND SAFETY OF TRIFLURIDINE/TIPIRACYL IN METASTATIC COLORECTAL CANCER

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Background: trifluridine/tipiracil is an oncology therapy indicated in adult patients with metastatic colorectal cancer (CCRm), that have been previously treated. Our objective is to assess the efficacy and safety of trifluridine/tipiracil in patients with CCRm.
Material and Methods: retrospective observational study of patients who started oral treatment with trifluridine/tipiracyl monotherapy from January 2016 until September 2017. Data were obtained from the outpatient dispensing program DIPEX® and by the review of medical records. All patients received an initial oral dose of 35 mg/m^2 administered twice daily for days 1 to 5 and 8 to 12 in cycles of 28 days. The efficacy criteria considered were the overall survival (OS) and progression-free survival (PFS), obtained by the Kaplan-Meier method and defined as the time from the initiation of the treatment to death from any cause or disease progression respectively. Patients who had not died or progressed at the end of the study were not included.
Results: 9 patients (6 males and 3 females) were included, with an average age of 67 years. All of them had a baseline functional status ECOG 1,and received an average of 3 previous treatment lines. 6 patients died during the period of study. Of the remaining 3, two maintain stable disease. During the treatment period with trifluridine/tipiracil, 6 patients suffered/experienced disease progression. The median OS was 4 months (95% IC 2,9–5,09) and median PFS was 4.1 months (95% IC 3,4–4,59). Dose reduction was required in 3 patients due to some episodes of uncontrollable vomiting, mucositis and intense asthenia respectively, which forced the suspension of the drug in the last.
Conclusions: OS and PFS data obtained in our study are lower than that published in the pivotal study RECOURSE (4 vs 7.1 months and 4.1 vs 5.3 months, respectively) with an acceptable safety profile. The small sample size is a limitation to our study, which could justify the differences found with respect to the pivotal study.
NO CONFLICT OF INTEREST

224 POSTER (BOARD 049) MANAGEMENT OF A PERSISTENT HICCUP IN A PATIENT WITH A FOLFIRINOX CHEMOTHERAPY REGIMEN

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Background: Anticancer drugs and in particular oxaliplatin, can be responsible for persistent hiccup, defined as hiccup lasting more than 48 hours. This report aims to describe the management of a persistent hiccup in a patient with a FOLFIRINOX chemotherapy regimen and to compare it to scientific literature.
Material and Methods: A 36-year-old man is admitted to the hospital to treat an obstructive jaundice. A cephalic pancreas adenocarcinoma is diagnosed. A neoadjuvant FOLFIRINOX chemotherapy regimen (5-fluoro-uracil, folinic acid, irinotecan and oxaliplatin) is started. After the first cycle, a very severe and persistent hiccup appears, leading to insomnia and complete anorexia. Anxiety disorders presented by the patient seem to worsen hiccup.
Results: A chlorpromazine-based treatment is prescribed (one tablet of 25 mg once a day). The patient could not swallow the tablet because of continuous nausea and vomiting. After a 14 kilograms weight loss and a grade 2 neutropenia, the patient is admitted to hospital. The dosage of chlorpromazine is increased to 25 mg three times daily. Chlorpromazine tablets are switched by oral syrup to ease patient's swallowing. After psychiatric consultation, an anxiety disorders' treatment is added (one tablet of hydroxyzine 25 mg three times a day). A decrease in the frequency of hiccups' episodes is observed. The chlorpromazine's dosage is reduced and then successfully discontinued.
Conclusions: Persistent hiccup can worsen patients' quality of life as it can be responsible for somatic disorders (e.g. anorexia, insomnia). There is a conflicting debate regarding the treatment of chemotherapy-related hiccup. In scientific literature, the use of alginate reflux suppressants, anti-acid drugs or anti-nausea drugs (metoclopramide, domperidone) has been studied. In the absence of efficacy with these drugs, neuroleptics such as haloperidol or chlorpromazine can be used. In this report, chlorpromazine has been shown to reduce hiccups' frequency. In France, none of these drugs is approved whereas in the United States chlorpromazine is approved in persistent hiccups. Some studies suggest that baclofen, pregabalin and gabapentin should be used as first line treatment instead of chlorpromazine.
NO CONFLICT OF INTEREST

225 POSTER (BOARD 050) RECENT APROACHES IN REFRACTORY FLT3-ITD ACUTE MYELOID LEUKAEMIA TREATMENT: A CASE REPORT

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Background: Acute myeloid leukaemia (AML) includes a heterogeneous group of blood cells disorders and is associated with chromosomal and genetic abnormalities. According to 2017 risk stratification criteria of ELN, NPM1 wt and high allelic ratio (>0,5) FLT3-ITD subtype of AML is classified as adverse risk.
Achieving complete response (CR) after induction chemotherapy (CT) anthracycline/cytarabine based, is the main goal for fit patients with AML. However, a considerable number of relapses in AML FLT3-ITD+ is usually seen and post remission therapies with CT and/or HSCT are commonly given to improve survival.
In Sept 2017, EMA approved an FLT3-inhibitor (midostaurin) as first line therapy for newly diagnosed FLT3-ITD AML in combination with CT and then as a single agent in maintenance therapy. Anecdotal data from recent studies indicate that sorafenib (another FLT3-inhibitor) used in r/r AML also led to a high response rate. Furthermore, clofarabine-cytarabine salvage therapy (CLARA) with sequential HSCT while in aplasia have been showing promising results in patients with r/r AML.
Material and Methods: Clinical file and literature review on PubMed.
Results: A 42-year-old male patient was diagnosed with FLT3-ITD (ratio = 0.75)/NPM1 wt AML in Jun 2017. He received standard induction CT without achieving CR according to IWG criteria. During the induction CT,

HLA-typing was performed and identified a HLA-matched sibling. HSCT in refractory AML has a dismal outcome in general, therefore a salvage regimen was proposed before performing HSCT. At this time, Aug 2017, no FLT3-inhibitor was approved in the context of r/r AML, therefore it was decided to add off-label sorafenib to the salvage regimen FLAG-IDA. After this salvage regimen, only PR was obtained and in Oct 2017 5-azacitidine plus sorafenib was given as a bridge-treatment until HSCT. Since CR was not achieved before HSCT, the patient underwent a sequential regimen, starting with CLARA CT and immediately followed by Bu2Cy1 RIC HSCT while in aplasia in Dec 2017.
Response evaluation at D+30 post-HSCT showed CR, undetectable FLT3-ITD and grade II GVHD (only skin) and sorafenib maintenance was started. At D+90, the patient is clinically well, complete donor DNA chimerism was achieved, has no signs of GVHD and continues maintenance with sorafenib which has been well tolerated.
Conclusions: As midostaurin had EMA marketing authorization after our patient underwent induction CT without achieving remission, an off-label salvage therapy with sorafenib was proposed taking in account the availability of a HLA-matched donor.
In our patient, transplanted with active disease, sorafenib and sequential CLARA plus RIC-HSCT regimen may have had an important effect in obtaining CR, suggesting that FLT3-inhibitors should be incorporated in the treatment of FLT3+ AML shortly in our daily practice.
NO CONFLICT OF INTEREST

226 POSTER (BOARD 051) ASSESSMENT OF A HOSPITAL PROTOCOL OF USE OF PLERIXAFOR

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Background: Plerixafor is a CXCR4 reversible selective antagonist indicated in combination with granulocyte-colony stimulating factor (G-CSF) to mobilize hematopoietic stem cells to the peripheral blood for collection and subsequent autologous transplantation in patients whose cells mobilize poorly and have a diagnosis of non-Hodgkin's lymphoma (NHL) and multiple myeloma (MM). We pretend to assess the compliance of the protocol of use of plerixafor in our hospital, where we classified our patients as bad cells mobilizers, or susceptible to receipt plerixafor, according to any of the following criteria: basal CD34<10 cells/mcL in apheresis previous day (day -1), CD34<1 $\times$ 10^6/Kg after first apheresis or CD34<2 $\times$ 10^6/Kg after two apheresis.
Material and Methods: Retrospective review of medical records, laboratory tests included, of patients who received plerixafor in our Hospital between June 2015 and March 2018. We analyzed CD34 concentration, number of doses and doses of plerixafor, number of apheresis days and concentration of recollected haematopoietic stem cells.
Results: Plerixafor has been used in 21 mobilizations and 19 patients mean age 55,5 [27–50]. According to protocol, indication was correct in 18 (94,7%) patients: 14 had NHL and 4 MM. Only one patient (5,3%) had Hodgkin's lymphoma and received treatment despite not meet protocol's criteria. All basal CD34 results were <10 cells/mcL (mean 4,73 [1,0–9,0]) in accordence with protocol, mean number of stem cells obtained after plerixafor was 3,54 $\times$ 10^6/Kg and 71,4% of patients obtained $\geq 2 \times 10^6$/Kg; versus 28,6% <2 $\times$ 10^6/Kg. 14 (87,5%) patients accomplished protocol and was not fulfilled by 2 (12,5%) patients: one due to a diagnosis not included in plerixafor's indication and the other due to a low stem cells collection. 3 patients were not evaluable due to absence of information in the medical records. We prepared in the pharmacy 32 subcutaneous exact dose injections with optimization of patient safety and efficiency of vials of plerixafor. The average dose was 18,06 mg according to the dosage schedule based on 0.24 mg/kg momentary body weight. Dose per patient was 1 expressed as median and 1,68 as average. Only one patient received 3 doses of plerixafor for the studied period.
Conclusion: Protocol of use of plerixafor was accomplished for nearly 90% of the occasions. The presence of a pharmacist for treatment validation has an important role to achieve protocol compliance.
NO CONFLICT OF INTEREST

227 POSTER (BOARD 052) EFFECTIVENESS AND SAFETY OF NIVOLUMAB IN PATIENTS WITH NON SMALL CELL LUNG CANCER

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Background: Nivolumab, an immune checkpoint inhibitor, is standard treatment for pre-treated advanced non-small cell lung cancer (NSCLC). The purpose of this study is to evaluate the effectiveness and safety of nivolumab in patients with NSCLC.
Material and Methods: Retrospective observational study of all patients with advanced NSCLC who started treatment with nivolumab from April 2016 to December 2017. Data collected from medical records and ONCOFARM sofftware: sex, age, ECOG Performance Status (PS), previous treatments, mean number of cycles administered, progression and death dates and adverse events. Progression-free survival (PFS) was estimated to assess effectiveness.
Results: 18 patients were included (14 were men and 4 were women), mean age was 59.7 years (42–74). ECOG PS was 1 for 14 patients (77.8%) and 0 for four patients (22.2%). 8 patients (57%) had nonsquamous histology. All patients had progressed during or after platinum-based chemotherapy. Median prior lines of therapy was 1 (1–4). Previous chemotherapy schemes were: pemetrexed/platinum + pemetrexed maintenance (n = 5), platinum/gemcitabine (n = 5), carboplatin/taxol (n = 4),, docetaxel/nintedanib (n = 2), docetaxel (n = 1) and nintedanib (n = 1). Five patients had death at the time of analysis. The mean number of cycles administered per patient was 4.3 (1–20) and mean treatment duration was 89 days (1–270) includiing 5 censored data of patients who were still on treatment. Median PFS was 62.5 days (10–232). Causes of treatment suspension: disease progression (n = 8), exitus (n = 2), and clinical worsening (n = 3). Most common related adverse events were: asthenia (n = 8), appetite decrease (n = 5), vomiting (n = 3) and joint pain (n = 3); other adverse drug reaction were aphonia, thorax pain, cold, fever, hearing loss, vertigo and diarrhea. Only one patient (5.6%) suffered >3 adverse events.
Conclusions: In our study, Median PFS was similar to the results of CheckMate 017 and 057 clinical trials, but the small sample size limits the comparison of the results. In general, treatment with nivolumab was safe and well tolerated.
NO CONFLICT OF INTEREST

228 POSTER (BOARD 053) EFFECTIVENESS AND SAFETY OF NAB-PACLITAXEL IN ADVANCED/ METASTASIC PANCREATIC CANCER

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Background: Gemcitabine therapy has been the standard first-line treatment for patients with unresectable locally advanced (LAPC) or metastatic pancreatic cancer (MPC). In a phase III trial, nab-paclitaxel plus gemcitabine improved overall survival (OS), progression –free survival (PFS) and response rate (RR) but adverse events were increased. Real life data of the effectiveness and safety of the combination nab-paclitaxel and gemcitabine will provide relevant information to validate the data that emerge from clinical trials
Purpose: To evaluate the effectiveness and safety of the combination nab-paclitaxel and gemcitabine in the first line of treatment of LAPC or MPC.
Material and Methods: We performed a retrospective observational study in a third level hospital. Patients diagnosed with LAPC or MPC treated with gemcitabine plus nab-paclitaxel from January 2015 to November 2016 were included. The data collected using the clinical records were: sex, age, ECOG, metastatic disease de novo o relapse, site of metastatic disease, at baseline level of Ca 19.9, line of treatment, dose reduction and adverse events. The effectiveness variables were PFS and OS (Kaplan-Meier method with G-STAT software).
Results and discussion: 25 patients were included (56% female) with a median age of 63 years (36–80). ECOG was 1 in 64% and 0 in 32%. 28% of patients had LAPC at the beginning of treatment. Metastatic disease was de novo in 72% and the most frequent location was the liver (63%). Level of Ca 19.9 was high in 92%. In 21 patients gemcitabine plus nab-paclitaxel were used in 1st line treatment while in the rest it was used in 2nd line. The median duration of treatment was 4.6 month (0.2–11.1) being the progression the main reason for suspension (60%). 84% of patients developed one or more adverse events (mean 2.2). More often reported adverse grade 1–3 were (none grade 4): asthenia (36%), diarrhea (32%), peripheral neuropathy (28%) and neutropenia (20%). Dose reductions for toxicity control were 40%.
The median PFS was 5.7 months (95% CI 4.2 to 7.2) and the median OS was 12.2 months (95% CI 9.3 to 14.9). Both were higher than that obtained in the pivotal trial (5.5 months and 8.5 months respectively) and it could be explained because in our study we included patients with LAPC, a group not represented in the trial.
Conclusion: Nab-paclitaxel plus gemcitabine have shown clinical activity as first line treatment in patients with LAPC or MPC. However, toxicity can limit its use in some patients.
NO CONFLICT OF INTEREST

229 POSTER (BOARD 054) IDELALISIB AS BRIDGE INTO AUTOLOGOUS STEM CELL TRANSPLANTATION IN RELAPSED FOLLICULAR LYMPHOMA

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Background: Follicular lymphoma (FL) is an indolent subtype of Non-Hodgkin Lymphoma (NHL). Diagnosis is made by a histological report using the WHO classification and grading criteria. Staging is carried out according to Ann Arbor (AA) classification system and for prognostic assessment, FLIPI Index and the more recently revised score FLIPI2 [incorporating β2 M, diameter of largest lymph node (LN), bone marrow (BM) involvement and Hgb level] have been established.
In September 2014, Idelalisib - a PI3Kd inhibitor that induces apoptosis and inhibits proliferation – obtained EMA approval in refractory FL after 2 lines of therapy. Idelalisib is known to cause neutropenia, hepatotoxicity, diarrhoea/colitis and pneumonitis. Moreover, in March 2016, emerging data from 3 ongoing trials suggested a related increased risk of serious infections and deaths during Idelalisib therapy, so patients should be monitored regularly (ie DNA CMV) and PCP prophylaxis is mandatory.
Material and Methods: Clinical file and literature review on PubMed.
Results: The authors report a case of a 62 year old male patient, that in June 2006 presented axillary, mediastinal and abdominal adenomegalies and normal blood count. Histology report from biopsy of axillary LN was suggestive of Grade 2 FL. LDH and b2 M were normal, no involvement of BM was reported, leading to classify this FL as AA III, FLIPI good, FLIPI2 low risk. In November 2006, 6 cycles of R-CVP plus radiotherapy (RT) were given and a complete response (CR) was obtained.
Patient relapsed in December 2009 with axillary adenopathy and was treated with R-CHOP until May 2010 obtaining partial response. After 6xR-CHOP, he started RT and in September 2010 was proposed for maintenance therapy with rituximab every 2 months for 2 years. During the next 4 years the patient decided not to be medically followed.
In July 2016 he attended our clinic due to dyspnoea and pleural effusion was noted. Re-staging of the relapsed NHL lead to an AA IV, FLIPI and FLIPI2 intermediate risk FL. A salvage treatment with 3xR-ESHAP was proposed with stem cell collection after the 2nd cycle. Evaluation of response at the end of 3rd cycle revealed stable disease.
In March 2017, with relapsed chemo-refractory FL, with 3 prior lines of treatment, Idelalisib was given. After 5 months of treatment he was asymptomatic, CT scan showed decrease of previous enlarged LN and no AE's to Idelalisib were noted. In this scenario, our patient was proposed to an ASCT, with BEAM conditioning regimen, that occurred in September 2017.
Conclusions: Our results support that despite being under additional monitoring by EMA, Idelalisib should still be considered in the treatment of FL. In our patient, Idelalisib showed important anti-lymphoma activity, with an acceptable toxicity, in a markedly relapsed/refractory FL, which enabled this patient to perform ASCT.
NO CONFLICT OF INTEREST

230 POSTER (BOARD 055) CASE REPORT: OFF-LABEL USE OF DECITABINE IN ACUTE MYELOID LEUKEMIA IN EDERLY UNDER 65 YEARS OLD

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Decitabine is only treatment available as first line for AML patients over 65years old not eligible to intensive standard chemotherapy. Several articles selected were brought to support off-label use of Decitabine for patients under 65years old. Prospected phase II-III studies has shown as Decitabine 10days regimen in monthly cycles treatment reported in AML patients with TP53 mutations a 100%complete remission versus 20–40%observed with standard chemotherapy, with 6months increase of OS 12.5 vs 6months. Welch at al. study, is how TP53mutations did not influence the allogeneic transplant outcome during Decitabine therapy in AML patients. Our aim is underline the positive outcomes of Decitabine in patients under 65years old.
The off-label use of Decitabine on these clinical conditions, is the result of lack of therapy as well as endorsed by low extra-hematological side effects vs others chemotherapies. To support this choice, we selected 4 cases: Females with a secondary AML with TP53mutated. According to patient's clinical response, Decitabine was administered at dose of 20 mg/mq/die, 5 or 10days regimen every 28 days.
53years old patient was treated from 6/2017–9/2017 with I.V. dose of Decitabine daily every 28days for an overall 35doses. The average dose was 32.6 mg/die (overall 986 mg,16.854,68€). The patient deceased on 9/2017 with stable disease no partial remission no progression. Periferal Blood Blastcount was stable 7000 blasts at the beginning of treatment, 4000 blasts at the end, bone marrow blast counts were not estimable.
52years old patient was treated from 6/2017-9/2017 with I.V. doses of Decitabine daily every 28days, for an overall 35 doses. The average dose was 32.6 mg/die (overall1171.4 mg,20023.91€). The patient progressed with 65%bone marrow blasts but achieved CR after salvage treatment with Venetoclax and deceased 1/2018 for toxicity of pre-transplant conditioning.
60years old patient after allogenic PEC transplant, was treated from 6/2017 to 9/2018 with I.V. doses of Decitabine daily for an overall 45 doses. The average dose was 32.4 mg/die (overall284mg485.7€). After a complete hematological remission with MRd negativity, she relapsed and switched to another off-label therapy with Venetoclax. Deceased 3/2018 for GvHD.
60years old patient with secondary post-allogenic CSE transplant AML was treated from 7/2017 to 11/2017 with I.V. injection of Decitabine daily for an overall 30 doses. The average dose was 32.4 mg/die (overall-1032mg17641€). After a complete hematological remission, the patient was eligible to haploidentical transplant and achieved MRd negativity.
50% of patients has responded with positive outcomes to the treatment, in one case the therapy has lead to MRd negativity. The impact of efficacy and sustainability of Decitabine for under 65years old patients has been confirmed byHealth Management and Ethics Commitee.
NO CONFLICT OF INTEREST

231 POSTER (BOARD 056) OFF-LABEL USE OF BEVACIZUMAB IN A RARE CASE OF PROGRESSIVE LOW GRADE DIFFUSE LEPTOMENINGEAL GLIOMATOSIS

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Leptomeningeal Gliomatosis (ORPHA251582): is a rare primary brain tumour who infiltrate glial neoplastic cells affecting the spinal cord, optic nerve, and white matter.
The aim of this study is focused on the long term management of therapy in paediatric patients.
Male patient, at the age of 15, presented symptoms as headache, visual disorders and asthenia on Oct-2008. The diagnosis of low grade diffuse Leptomeningeal Gliomatosis was confirmed by blood-chemistry and radiological examinations.
Since 2008 the chemotherapy treatment started following the SIOP LGG 2004 protocol, suspended in early 2009 due severe hematologic toxicity. Next step was a treatment with Temozolamide until the end of 2011.
No improvements were reported, until 2012 when the patient switch to Valproic Acid. Seizures blocking and the neoangiogenetic inhibition effects, brought to a clinical steady state. In fact, the routine radiological examinations during the following years confirmed a rather pathology stability.
In May-2016 were reported symptoms such as headache aphasia and vomit. Brain C.T. scan showed increased hydrocephalus.
In Jun-2017 progressive and slow cognitive impairment and worsening neurological conditions were reported.
In fact, Vinblastine therapy was started until NMR examinations in Oct-2017.
The exams showed minimal tumour progression both encephalic and spinal dissemination.
All the lines of therapies were used and considering the clinical conditions of the patient an off-label 3°-line drug therapy with Bevacizumab was started.
The posology was 10 mg/Kg every 2 weeks for an overall of 4450 mg from Dec-2017 to Mar-2018 ongoing.
The mean dose was 494,4 mg/die for an overall cost of 14.535€.
Currently the patient results stable and in good clinical conditions.
The study shows how was granted at least 10 years survival using on/off label treatments, although the complex and rare case report. This achievement was possible thanks to close and constructive collaboration between clinicians and hospital pharmacists.
We looking forward to gathering more reliable data such the study presented in order to improve the management of rare pathologies.

The ethics committee approved the off-label therapy with following bibliography as support:
Efficacy of bevacizumab plus irinotecan in children with recurrent low-grade gliomas-a Pediatric Brain tumor consortium study –S.Gururangan et Al (Neuro-Oncology 16(2), 310–317, 2014 doi:10.1093)
Confirmation of bevacizumab Activity, and maintenance of efficacy in Treatment after subsequent relapse in pediatric low-grade glioma –M.kalra et Al Pediatr Hematol Oncol _ Volume 37, Number 6, August 2015
Successful use of bevacizumab in an adult primary diffuse leptomeningeal glioneuronal tumor –A. Pellerino et Al J Neurosurg Sci. 2018 Apr;62(2):229–232. doi: 10.23736/S0390–5616.16.03804–2. Epub 2016 Sep 27
NO CONFLICT OF INTEREST

232 POSTER (BOARD 057) IDELALISIB SECURITY PROFILE IN PATIENTS WITH B LYMPHOID NEOPLASIA: OUR EXPERIENCE

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Background: Idelalisib is an oral inhibitor of phosphoinositide 3-kinase (PI3K) delta approved in combination with an anti-CD20 monoclonal antibody for chronic lymphocytic leukemia (CLL) treatment and monotherapy for relapsed follicular B-cell non-Hodgkin lymphoma (FL).
Our purpose is to analyse frecuency and severity of adverse events (AE) associated with idelalisib treatment in patients with B lymphoid neoplasia.
Material and Methods: Observational, retrospective, descriptive study. Inclussion criteria: adults (>18 years) that initiate treatment with idelalisib 150 mg each 12 hours in monotherapy or combinated with rituximab (depending on the indication in each neoplasia). Study period: November 2016-February 2018. Demographic variables: gender, age; clinical variables: diagnose and cytogenetics; therapy-related: previous treatments lines, treatment duration, adverse events, dose adjustment, treatment discontinuation and suspension. AE are clasified following 5.0 version of National Institute Cancer (NCI): Common Terminology Criteria for Adverse Events (CTCAE). Data was collected from clinical records and dispensation pharmacy program for ambulatory and hospitalized patients.
Results: 12 patients were included (7 male and 5 female), median age: 68,5 years (rank 53–86), diagnoses: CLL (75%), FL (25%). 33,3% presented poor prognosis citogenetycs (del17p). Idelalisib was indicated as a rescue treatment for all patients, median of previous treatment lines 3 (rank 1–4), median of treatment lenght, 4,7 months (rank 3–14,6).
Nine patients discontinuated idelalisib 150 mg/12 h for 41 days (rank 24–56): grade 4 transaminitis (n = 3), grade 3 transaminitis (n = 1), acute pancreatitis (n = 1), febrile neutropenia (n = 1), grade 3 neutropenia (n = 1), admission for an urinary infection (n = 1), diarrea and transaminitis (n = 1), admission for a respiratory infection (n = 1). All of them reinitiated idelalisib at 100 mg/12 h dose. By the time this study was closed, four of the nine patients that discontinuated, have suspended treatment: disease progression (n = 2), adverse events (n = 1, grade 4 transaminitis), exitus (n = 1). Three out of twelve required no dose adjustment and continue 150 mg/12 h.
Conclusions: The group of patients included in our study presented similar adverse events to those included in bibliography. Following the patients periodically allows AE detection and consider disruption in case it is necessary.
NO CONFLICT OF INTEREST

Poster Session: Quality assurance/ microbiology/analytics/stability

233 POSTER (BOARD 058) PHYSICOCHEMICAL STABILITY OF ETOPOSIDE DILUTED AT RANGE CONCENTRATIONS BETWEEN 0.38 AND 1.75 MG/ML IN POLYOLEFIN BAGS.

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Introduction: According to the manufacturers, the diluted solution of etoposide should not exceed a concentration of 0.4 mg/mL. Above 0.4 mg/mL, precipitation may occur. For high doses to be administrated or for patients requiring fluid restrictions, etoposide phosphate (Etopophos®) may be an option. However, Etopophos® shortage occurs frequently. The objective of this work was to study stability of etoposide solutions between 0.38 and 1.75 mg/mL, diluted in 0.9% sodium chloride or 5% glucose in polyolefin bags, stored at 25°C and between 2–8°C, during 61 days. This study also observed the impact of infusion volumetric pump on the physical and chemical stability of etoposide solutions.
Materiel & Methods: Chemical stability was analysed at day 0, 9, 16, 21, 28 and 61 by high performance liquid chromatography (HPLC) coupled to a photodiode array detector. The method has been validated according to the International Conference on Harmonisation (ICH) standards. Physical stability was evaluated by visual and subvisual inspection (turbidimetry by UV spectrophotometry). Two bags for each condition were prepared and analysed. pH value were evaluated at each day of analysis. The action of infusion volumetric pump on solutions has been evaluated at day 61.
Results: Etoposide solutions diluted at 0.38, 0.74 and 1.26 mg/mL in 5% glucose and stored at 25°C retained more than 95% of the initial concentration during 61 days and solutions at 1.75 mg/mL during 28 days.
Etoposide solutions diluted in 0.9% sodium chloride and stored at 25°C retained up to 95% of the initial concentration at day 16. A degradation product with relative retention at 0.27 was observed in these conditions. It increases progressively with concentrations and during the study, up to 10% of the total sum of the area peaks on chromatograms for the two solutions at 1.75 mg/mL at day 61.
The action of infusion volumetric pump on solutions has not caused any physical modifications.
Conclusion: Etoposide solutions diluted in 5% glucose in polyolefin bags at 0.38, 0.74 and 1.26 mg/mL were stable 61 days and solutions at 1.75 mg/mL were stable for 28 days at 25°C. These stability data propose an alternative when Etopophos is restricted. These results allow advance preparation and minimize drug wastage. Storage at 2–8°C and etoposide high concentration promote the precipitation of solutions. As precipitation may occur, it may be advisable to consider using an administration set with an in-line micro-filter. Storage at 25°C and 5% glucose as diluent are recommended for etoposide high concentration until 1.26 mg/mL and long term storage.
NO CONFLICT OF INTEREST

234 POSTER (BOARD 059) EXTENDED STABILITY OF A BIOSIMILAR OF RITUXIMAB (CT-P10)

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Introduction: Since a biosimilar was highly comparable to its princeps, it is likely to consider that its stability was alsocomparable. However, the extensive comparability exercise required to obtain marketing authorization does not include extended stability data (in-use stability). Therefore, it is crucial for the users to be sure that a biosimilar exhibits the same extended stability that its princeps.
Materials and Methods: The stability of the rituximab biosimilar CT-P10 (Celltrion), in 50 mL vials at a concentration of 10 mg/mL, and after dilution to final concentrations of 1 and 4 mg/mL and storage in polyolefin bags at 4 °C and 25 °C for 28 days was studied by several orthogonal and complementary methods.
Results: No significant change (as defined by a magnitude greater than the inter-batch variability) was observed, for each of the parameters characterizing physical and chemical stability, for the two concentrations and temperatures tested, or for any of the three batches tested. This implies that cold-chain rupture and exposure to room temperature up to 15 days both for vials and diluted bags have no deleterious consequence on the quality of the product.
Conclusion: These results are in excellent accordance with those we previously published on the rituximab originator, Mabthera® (1). Taking together with the very attractive price bargain obtained by biosimilars as compared to originator (-50 to -70%), this extended stability permits also safe in-advance preparation, dose-banding or flat-dose, that to avoid unnecessary delays in the management of the patient, improvement of the pharmacy and nurse workload and money saving by avoiding non justified losses of this expensive drug.
Our study is the first published on extended stability on a biosimilar of anticancer monoclonal antibody, confirming that high similarity of biosimilar vs its originator is also fully verified for its extended stability (2).

References.
(1). Paul M, Vieillard V, Jaccoulet E, Astier A. Long-term stability of diluted solutions of the monoclonal antibody rituximab. Int J Pharm 2012;436(1—2):282—90.
(2). V. Vieillard, M. Paul, T. Ibrahim, A. Astier. Extended stability of the rituximab biosimilar CT-P10 in its opened vials and after dilution and storage in polyolefine bags. Ann Pharm Fr 2017; 75 (6): 420–435.
CONFLICT OF INTEREST
Corporate-sponsored Research:
Research grant from Biogaran (France)

235 POSTER (BOARD 060) SURFACE CONTAMINATION BY ANTINEOPLASTIC AND WORKING PRACTICES IN AN ONCO-HEMATOLOGY OUT-PATIENT WARD: A TRANSVERSAL STUDY

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Background: Healthcare workers face serious health risks when exposed to hazardous drugs including antineoplastic drugs. Those are known for their risk of carcinogenic, mutagenic and reproductive toxic effects. Nowadays, no guidelines are available about occupational exposure limit and the follow up of surface contamination. In 2017, we conducted in Saint-Pierre La Réunion University Hospital a study to evaluate environmental contamination in the pharmacy centralized cytotoxic reconstitution unit (ISO 9001 certification).
In this study, environmental contamination by Cyclophosphamide (CP), Doxorubicin (DOXO) and Fluorouracil (FU) were evaluated in an onco-hematology outpatient ward to find ways to perform working practices.
Material and Methods: A transversal study was conducted. Immediately after nurses eliminate the perfusion lines from patient's central lane, surface samples were realized: on nurse's gloves (143 cm^2), on the floor under the infusion pole (400 cm^2) and on the nurse's trolley (400 cm^2). Wipe samples (Whatman filter) were quantified using UPLC MS/MS validated method. Limits of detection were respectively 0.125, 0.04 and 0.125 ng/sample for DOXO, CP and FU. The number, when quantifiable, of positive samples were presented. Chemotherapy protocols and nurse's Personal Protective Equipment (PPE) were collected.
Results: From 5th to 17th of January 2018, 51 samples were collected (17 samples/localization). Chemotherapy protocols were: 4 (24%) ABVD, 8 (47%) FEC, 1 (5%) LV5FU+Bevacizumab and 4 (24%) RCHOP. DOXO was not detected in any wipe samples. In total, we've found 10/17 (58%) positive contamination on nurse's gloves, 17/17 (100%) on the floor, 5/17 (29%) on trolleys. Table presents surface contamination by CP and FU by localization. Cross contaminations have been found for 13 (25%) samples (e.g. CP found on a localization while the chemotherapy protocol administered didn't contain CP): 1 (8%) on nurse's gloves, 10 (77%) on the floor and 2 (15%) on trolleys. Vinyl gloves were used 9 (53%) times and sterile latex gloves 8 (47%) times. Nurses never wear long sleeves, protective gowns and overshoes.

	FU (pg/cm^2)		CP (pg/cm^2)	
	Median	Range	Median	Range
Total	1291.56	[1.65-7271.11]	124.32	[0.01-746.24]
Gloves	40.92	[21.64-103.90]	6.83	[2.16-500.99]
Floor	1247.80	[192-5336.72]	116.95	[14.77-746.24]
Trolley	2.84	[1.65-7271.11]	0.54	[0.01-22.07]

Conclusions: This study allowed us a review of environmental contamination by antineoplastic in an onco-hematology outpatient ward. The floor is the most localization contamined by CP and FU. Several improvements could be effected for cleaning procedures and health care workers' PPE. Furthermore, introduction of closet-system connectors to limit the risk of contamination will be investigated. A re-evaluation of surface contamination should be conducted to follow the implemented measures.
NO CONFLICT OF INTEREST

236 POSTER (BOARD 061) QUALITY CONTROL OF CYTOTOXIC INFUSIONS DISTURBED BY A CHANGE OF INFUSION BAG: A CASE REPORT.

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Background: Our hospital pharmacy produces in average of thirty thousand infusions a year. This production is performed under a biological safety cabinet. A quality control is carried out for drugs which have a UV-spectrum. The analytical method is Flow Injection Analysis (FIA) with detection by photodiode array detector. Criteria of concentration acceptance were established with ± 10% of the theoretical concentration. Usually these drugs are prepared with polyolefine infusions bags (Easyflex®). However, due to an Easyflex® shortage, infusions bags were changed by a multilayer container (Viaflo®). With this new container, cyclophosphamide (CPM) concentrations show an increase of 10% despite a same manufacturing process.
The objective of this work was to study the influence of different containers on cyclophosphamide concentration measured by FIA.
Material and Methods: Thirty infusions were prepared using three different infusion bags. The first infusion bag was composed by multilayer container (Viaflo®), the second by low-density polyethylene (Ecoflac®) and the third by polyolefine (Easyflex®).
Vials of cyclophosphamide 1 g were reconstituted with 50 mL of 0.9% sodium chloride. CPM was injected into 0.9% sodium chloride 250 mL infusion bags. Then 1 mL samples were withdrawn to be analyzed by FIA, to determine cyclophosphamide concentration (UV detection at 205 nm). For each infusion bag, the overfilling volume was measured and taken into account to calculate cyclophosphamide concentration.
Results and Discussion: Mean cyclophosphamide concentration values were at 1058 mg/L (n = 10) for Viaflo® infusions, 936 mg/L (n = 10) for Ecoflac® infusions and 948 mg/L (n = 10) for Easyflex® infusions. An ANOVA test showed that there is a significant difference in mean cyclophosphamide concentration according infusion bag used ($\alpha = 0.05$ and $p < 0.0001$). Cyclophosphamide concentrations were much higher for the Viaflo® infusion bags. This difference could be explained by *e*-caprolactam, a component release by the multilayer infusion bag (I. Desideri, s.d.).
Conclusion: Viaflo® infusion bag disturb outcomes of cyclophosphamide dosage with a concentration artificially increased about 10%. FIA method cannot be used to quantify CPM at this concentration and at wavelength to 205 nm.
The main risk is to measure an artificially cyclophosphamide concentration increased. The influence of this component with other wavelengths should be evaluated.
References:
I. Desideri et al. Are commercially multi-dose formulations the best solution? A spectroscopical quality study of cyclophosphamide. European journal of hospital pharmacy. Mar 2016, 23 (Suppl 1) A206-A207.
NO CONFLICT OF INTEREST

237 POSTER (BOARD 062) RELIABLE AND INSTANTANEOUS ANALYTICAL METHOD FOR CONTROL OF VINBLASTIN AND VINCRISTIN IN CHEMOTHERAPY PREPARATIONS BY A UV-VIS SPECTROPHOTOMETRY

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Background: The systematic control of chemotherapy preparations in real time before dispensing is an activity that is admittedly not compulsory but seems indispensable. Despite all the precautions taken in a centralized unit, there is still a residual percentage of major or minor errors leading to nonconformities. Analytical-type control combining qualitative and quantitative analysis seems to be the best alternative for this control, despite its cost and difficulties of implementation. The aim of this work is to present a simple, fast, precise and highly selective spectrophotometric method that has been developed for the routine control of cytotoxic preparations based on vinblastin and vincristin at a centralized preparation unit. Level of a pediatric hospital allowing a rapid and reliable analysis of these cytotoxic drugs prescribed within our institution.
Materiel and Method: The spectra of vinblastin and vincristin have been established, recorded, analyzed and the l max is well defined.

The calibration curves have been drawn which will be used to analyze the samples collected. The analytical method has been established and validated against parameters such as linearity, accuracy, precision according to the guidelines of the International Council for ICH Harmonization Q2.
Result and discussion: Linearity: A linear regression analysis of the least squares of the calibration curve was performed, and the calibration curves were linear over a range of 2–20 μg/ml. The correlation coefficients were 0.999.
Precision: Drug concentrations were measured three times a day at intervals of a few days. The standard deviation (RS) and the relative standard deviation (RSD) were calculated and the results are satisfactory (RSD < 0,1)
Accuracy: overlay studies were performed by the method of assaying a vinblastin and vincristin sample at a known amount of standard. the samples prepared according to claims 50, 100 and 150 of the marker were added and the results obtained are respectively: 100%, 101% and 101,5%.
Analysis of selected samples: Three samples for each drug were dissolved and diluted in their reconstitution solvents, so that the sample contained in the calibration curve. Absorbances were noted and values are derived from the calibration curve, the results are satisfactory (99,6%).
Conclusion: The method presented is simple, selective and reliable, providing satisfactory accuracy, with specific quantification and sensitivity. The results obtained in all cases are good and the reliable agreement with the reported procedure has proved that the proposed method can be considered as a useful alternative to other techniques and could be applied effectively in the hospital and clinical context.
NO CONFLICT OF INTEREST

238 POSTER (BOARD 063) SAFETY ANALYSIS OF CHEMOTHERAPY PROCESS USING FAILURE MODES, EFFECTS AND CRITICALITY ANALYSIS (FMECA) SECURITY APPROACH

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Introduction: The study purpose was to perform a risk analysis of the chemotherapy process in Léon Bérard Center, one of the 20 Cancer Centers in France. In this centralized unit of chemotherapy production, 80 000 preparations are produced annually. The main goal was to identify residual risks in a system totally computerized (from prescription to administration) that may be the target of additional actions.
Material and Method: A multidisciplinary working group was created including pharmacists, pharmacy technicians, informatic technicians, nurses and doctors. The area involved pediatric and adult oncology, routine and clinical trials problematics.
The group analyzed the process of chemotherapy step by step, according to the failure modes, effects and criticality analysis (FMECA) method. The failure modes were defined and their criticality indexes were calculated on the basis of the likelihood of occurrence (scale 1 to 5), the potential severity for the patients (scale 1 to 5) and the detection probability (scale 1 to 5). Criticality indexes were compared and the acceptability of residual risks was evaluated. Safety strategies were identified and prioritized.
Results: Through consensus, the group defined the chemotherapy process: 1/ Conception of prescription or medication informatic support 2/ Prescription 3/ Pharmacy clinical validation 4/ Editing preparation support 5 /Supply chain of chemotherapy production 6/ Chemotherapy and materials picking 7/ Chemotherapy production 8/ Chemotherapy delivery 9/ Chemotherapy Storage 10/ Chemotherapy administration.
In this process, 69 failure modes were identified: 29 were classified as "high risk (criticality indices = 60 by failure) and unacceptable", 23 "acceptable under control" and 17 "acceptable".
During 7 meetings, the group put forward safety actions on the 29 failures modes classified as "high risk unacceptable". Seventeen recommendations were prioritized and developed over a 12-months period. This led to reorganization and new operating procedures (9), awareness campaign to nursing staff (2), continuing education on "never events" (1), development of an electronic record of preparation state (in preparation, delivery ongoing or administrated) (1), working groups on specific thematic (3). Other improvements, such as barcode medication technology were scheduled in a near future because of more complex feasibility.
Conclusions: FMECA is a useful approach, associated with a strong improvement in our chemotherapy process but additional developments involving information technologies also contributes to a major risk reduction.
NO CONFLICT OF INTEREST

239 POSTER (BOARD 064) STABILITY OF ANTICANCER DRUGS IN PROGRESS AND AFTER RECONSTITUTION: SEARCH FOR PHYSICOCHEMICAL INCOMPATIBILITIES

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Background: Physico-chemical incompatibility reactions can occur between two drugs but also between a drug and a solvent, adjuvant, container or medical device. Incompatibilities usually occur before the drugs reach the general circulation of the patient, mainly in a pocket or infusion line.
The aim of the study is to look for physicochemical incompatibilities of some anticancer drugs with respect to certain metal ions that can be derived from a drug and a solvent, an adjuvant, a container or a medical device during the preparation or administration, in order to evaluate the physico-chemical incompatibility of certain anticancer agents with regard to certain metal cations.
Materials and methods: Our work was carried out in the laboratory of analytical chemistry of the Faculty of Medicine and Pharmacy of Rabat.
The ions studied: calcium ions (Ca2 +), copper (Cu2 +), iron (bivalent and trivalent), magnesium (Mg2 +) and zinc (Zn2 +).
After the preparation of the metal ion solutions and anticancer drugs (bleomycin, carboplatin, cisplatin, cyclophosphamide, cytarabine, dacarbazine, doxorubicin, epirubicin, ifosfamide, methotrexate and vinblastine) mixtures have been made, all of which are controlled by:
Visual examination: We observed with the naked eye, the tubes in which we mixed the ion and the drug and we limited ourselves to day 2 to observe the change in tubes.
Infrared spectroscopy: for the analysis of some mixtures especially the precipitates
UV-Visible Spectroscopy: used for the analysis of certain colorations.
Result: The summary of the results of the physicochemical reactions is presented by the following table:

Ions drugs	Fe^{2+}	Ca^{2+}	Mg^{2+}	Fe^{3+}	Cu^{2+}	Zn^{2+}
Etoposide	D_0 : Dis D_2	+ in D_1	+ in D_1	Red -	-	-
Carboplatine	-	-	-	Yellow	Skyblue	-
Cyclophosphamide	D_0 : Dis D1 : -	-	-	Yellow	Dis+ Skyblue	-
Cytarabine	+	-	-	Brick Red	Dark Blue	-
Vinblastine	-	-	D_0+ D_1±	Sellow	Skyblue	Dis in D_0
Dacarbazine	-	-	-	Yellow	Green	-
Doxorubicine (HCl)	Blackish	Suspension	Purple	Blackish	Purple	Red
Epirubicine						
Ifosfamide	-	-	-	Yellow	Skyblue	D_0+ D_1-
Cisplatine	-	-	-	Light yellow	blue	-
Méthotrexate	D_0 Dis D_1 +	Light yellow	Light yellow	D_0 Dis D_1 +	D_0 Dis and suspended particles	+ Yellow
Vincristine	-	-	-	-	-	-
Bléomycine sulfate	-	-	-	-	-	-

+: Precipitation
-: No precipitate
±: disappearance of the precipitate
Dis: Formation of a disorder
D0: the day of the reconstitution and the first test
D1: the day after the reconstitution or the day following the test
D2: Formations of J2 pellets that are dried and analyzed by IR

Conclusion: The results obtained indicate an incompatibility between the tested ion and the drug under working conditions. Thus, to confirm the absence or the presence of an incompatibility, the use of much more developed methods that will highlight the types of incompatibilities involved is of paramount importance.
NO CONFLICT OF INTEREST

240 POSTER (BOARD 065) INTRINSIC STABILITY AND DEGRADATION PATHWAYS OF BENDAMUSTINE IN INJECTABLE SOLUTION

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Background: Bendamustine (BEN) is a chemotherapy medication used for the treatment of chronic lymphocytic leukemia (CLL), indolent B-cell non-Hodgkin's lymphoma (NHL) and multiple myeloma (MM). The stability data provided by the manufacturer stated 8 h at 4°C for the lyophilized powder reconstituted with sterile water, 48 h and 3h30 for the diluted solution in sodium chloride respectively at 4°C and 25°C. As recommended by the International Council for Harmonisation (ICH), studies on a drug must be undertaken to establish the identification of its possible degradation products and for understanding the intrinsic stability of the drug molecule. In light of the interest of extending the physicochemical stability of drug product for patient care, the aim of this study was the assessment of the inherent stability characteristics of BEN under different stress conditions by using Liquid Chromatography-Multistage Mass Spectrometry along with high-resolution Mass Spectrometry (LC-HR-MS^n).
Material and Methods: BEN (purity > 98%) was purchased from Sigma Aldrich (St. Quentin Fallavier, France). Stock standard solutions were prepared by dissolving BEN in ultrapure water to obtain 1,25 mg/ml and then allocated in triplicate in hermetically sealed glass vials. The samples were exposed to different stress conditions: sodium hydroxide (0.01N and 0.1N), hydrogen chloride (0.1N and 1N), hydrogen peroxide (0.3% and 3%) and thermolysis (5°C and 25°C). An RP-HPLC-UV stability indicating method suitable for drug quantitation was developed and validated according to ICH Q2 (R1). The degradation products were identified using LC-HR-MS^n.
Results: BEN revealed to be fragile under basic, hydrolysis, temperature and oxidative conditions. Based on the knowledge of its fragmentation pattern, up to six degradation products (DP1 to DP6) were highlighted suggesting that the degradation of BEN occur via multiple reaction pathways among which, hydrolysis, eliminations, nucleophilic additions or N-dealkylation. Subsequently, the main degradation pathways of BEN were proposed.
Conclusions: Understanding the degradation pathways of BEN was the key factor to mitigate the degradation of the drug product and help to anticipate its degradation. In view of the degradation of the reconstituted BEN solution, measures should be taken to ensure compliance to good manufacturing practices during the reconstitution, dilution, storage, transport and administration of the drug. Finally, the absence of degradation product under acidic condition has to be pursued to improve the drug stability.
NO CONFLICT OF INTEREST

241 POSTER (BOARD 066) RAMAN SPECTROSCOPY A PROMISING TOOL FOR THE ANTINEOPLASTIC DRUG MONITORING: APPLICATION TO A NONINVASIVE QUANTIFICATION OF GEMCITABINE

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Background: Several approaches have been developed to secure the antineoplastic drug preparation process at hospital. Analytical control of final products including UV detection associated to direct flow injection analysis (FIA), liquid chromatography (HPLC), infrared or Raman spectroscopy (RS) is one of the most common approaches. Despite excellent analytical performances, these techniques required a sampling of preparation with risk of cytotoxic environmental contamination and therefore contribute to expose healthcare workers. The objective of this work was to evaluate the feasibility of Raman vibrational spectroscopy (RS) for *in situ* quantification of antineoplastic final product by direct measurement through the plastic bag. Gemcitabine (GEM) solutions were tested.
Material and Methods: Analyses were carried out with a MIRA portable Raman spectrometer equipped with a 785 nm laser diode and a 0.8 mm focal lens. The acquisitions were made between 400 and 2300 cm^{-1}. Gemcitabine was prepared at various concentrations, from 1 to 20 mg / mL by dilution with 0.9% NaCl and packaged in an empty bag. In order to interpret spectral data, multivariate analyses were performed using partial least square PLS regression. The performances of this technique also compared to the FIA / UV method used routinely in our laboratory.
Results: A total of 548 Raman spectra were acquired and divided in a calibration set (n = 430) to develop prediction model and a validation set (n = 118) to determine the performance of the model. The optimal model was obtained from spectral data pretreated by standard normal variate (r^2 = 0.9980) with a root mean square of cross validation of 0.28 mg/mL and a root mean square error of prediction of 0.65 mg/mL. Based on the predicted concentrations, the accuracy profile was calculated and showed a limit of quantification of 3.69 mg/mL. Despite optimization, some limitations were highlighted, especially a lack of sensibility for the low concentrations. In 2016, in our unit, 1628 plastic bags of GEM were produced and 97.3% could have been control by the RS method.
Conclusions: Due to its rapidity, easiness and the miniaturization of spectrometer, RS appeared to be a promising method to increase the security of the medication preparation process in hospitals but also provided substantial advantages to secure the activity for healthcare workers.
NO CONFLICT OF INTEREST

242 POSTER (BOARD 067) RAMAN SPECTROSCOPY A PROMISING TOOL FOR THE ANTINEOPLASTIC DRUG MONITORING: APPLICATION TO THE DISCRIMINATION AND THE QUANTIFICATION OF THREE DRUGS WITH SIMILAR CHEMICAL STRUCTURE

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Background: To ensure the physical and chemical quality of antineoplastic preparation, several quality control strategies have been developed like High performance liquid chromatography with UV detection (HPLC-UV), near infrared and UV spectroscopy or Raman spectroscopy with UV spectroscopy to guarantee the right drugs at the right concentration. Some molecules have a close structure, which could make the discrimination complex by spectroscopy UV. Moreover with HPLC-UV, some limitations are highlighted and especially for the robustness of the method. So, for molecule with a close structure, alternative methods have to be developed. The aim of this study was to evaluate the ability of a handheld Raman spectroscopy (RS) to control antineoplastic taxane preparations in order to ensure quality control.
Material and Methods: Cabazitaxel (CBX from 0.05 to 0.3 mg/mL), paclitaxel (PCX from0.24 to 1.02 mg/mL) and docetaxel (DCX from 0.2 to 1.0 mg/mL) samples were prepared in aseptic conditions by dilution in 0.9% NaCl at concentrations covered the entire range of therapeutic concentrations. All samples were transferred in glass vial to be analyzed by handheld RS at 785 nm with an acquisition time of 8 seconds. In order to interpret Raman spectral data, multivariate analyses were conducted. Qualitative and quantitative models were developed on a training set (n = 225) by partial least square (PLS) discriminant analysis and PLS regression. The predictive performances of the models were evaluated on independent samples of the test set (n = 135).
Results: The best discriminative analysis was obtained from spectral data pretreated by Derivate 1 and standard normal variate, for 5 latent variables. According to this model, all samples were correctly assigned. Concerning quantitative analysis, models were developed for each drug, the best model was selected for the lowest root mean square error of prediction (RMSEP) and the highest coefficient of determination (r^2). The RMSEP ranged from 0.12 mg/mL for CBX to 0.098 mg/mL for PCX with a minimal r^2 of 0.9936 for DCX. Based on the total error approach and the accuracy profile with 15% of acceptation limits, the linearity range was validated from 0.12 to 0.30 mg/mL for CBX, from 0.40 to 1.00 mg/mL for DCX and from 0.42 to 1.20 mg/mL for PCX.
Conclusion: Despite some limitations especially for the quantification of low concentrations, this study confirmed the ability of RS to discriminate and quantify these three drugs. In order to improve their performances, it would be therefore interesting to test other multivariate analysis approach such as machine learning. Due to its rapidity, its easiness and the miniaturization of spectrometer, RS appeared to be a promising method to increase the security of the medication preparation process in hospitals but also provided substantial advantages to secure the activity for healthcare workers.
NO CONFLICT OF INTEREST

243 POSTER (BOARD 068) HIGH-SPEED ANALYTICAL APPROACH TO THE DISCRIMINATION OF TAXANES BY FLOW-INJECTION ANALYSIS AND UV DETECTION IN HOSPITAL

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Introduction: To ensure the quality of cytostatic drugs prepared in our control unit, a quantitative and qualitative analytical control based on UV spectral properties was carried out for taxanes (cabazitaxel (CABX), docetaxel (DOCX) and paclitaxel (PACX)). Due to very high similarities, their discrimination by FIA-UV is challenging. DOCX and CABX have a close chemical structure (*i.e.* hydroxyl group (DOCX) and methoxy group (CABX)). The objective was to assess and validate the feasibility of a flow-injection analysis coupled to a UV detector associated to a basic spectral matching algorithm for the discrimination of three taxanes.
Material and Method: The samples (606 PACX, 84 DOCX, 47 CABX) were analysed at therapeutic concentrations (CABX 0.05–0.3 mg/mL, DOCX 0.2–1.0 mg/mL and PACX 0.24–1.02 mg/mL) by FIA-UV between 200 and 400 nm with a flow rate set at 1.5 mL/min in pure water. Optimal discrimination parameters (spectral pretreatment and analysed spectral range) were first performed by multivariate analysis of the spectra. These parameters were then transposed on Chromeleon® software. The software that contains a homemade spectral library (27 molecules, including 15 spectra for each) enables acquisition and processing of samples spectra. For each sample, 45 match scores were collected (ranging 0 for no correlation to 1000 for optimal correlation) with the first score standing for the best correlation. The relevance of match scores was analysed using a confusion matrix. For the validation, specificity and sensibility were assessed according to the highest score match.
Results and Discussion: From preliminary spectral analysis, the best spectral range was obtained between 230 and 300 nm. The pre-treatment spectra by first derivative raised sensibility as expected and yielded to better discrimination. For the relevance study, the first match showed a score significantly different from the other scores ($p < 0.001$) suggesting high precision of the match score. A hit threshold was determined for PACX (999.0), DOCX (999.7) and CABX (999.1) for our samples set, based on the confusion matrix and the match scores. In these conditions, excellent sensibility and specificity (100%) were reached for PACX, DOCX and CABX. In application, 129 real-life samples were analysed both by FIA and chromatography. No significant difference was detected in terms of discrimination showing the reliability of our approach.
Conclusion: FIA-UV associated to a basic spectral matching algorithm allows ultra-fast spectral discrimination of the taxanes (<0.3 min). Basic algorithms included in HPLC software are useful providing a rigorous selection of the spectral region of interest. This approach contributes to an efficient quality control facing high throughput production. Based on these results, our approach is very encouraging for the quality control of other cytotoxic drugs.
NO CONFLICT OF INTEREST

244 POSTER (BOARD 069) USE OF A RISK ANALYSIS METHOD TO IMPROVE SAFETY TO THE CHEMOTHERAPY CIRCUIT IN HOSPITAL

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Background: The centralization at the pharmacy, in confined and sterile work areas, has become the reference practice to limit risk, increase quality and pool resources in the production of hospital chemotherapy. Our study aimed to map the process of management of chemotherapy circuit at a referral oncology hospital: National Institute of Oncology Rabat Morocco and identify the susceptible points of being critical associated with this process by realizing a risk analysis using the Failure Modes, Effects and Criticality Analysis (FMEA) method, in order to validate a method that can be used periodically for risk management in the chemotherapy circuit at the hospital.
Materials and methods: The method used is FMEA for a priori inductive risk analysis which aims to identify potential system failures. These failures are analyzed to determine their criticality by establishing an index for each failure that will be scored and calculated using the formula: Criticality index = frequency × severity × detectability.
The rating of each criterion is based on predetermined rating tables.
Results: Process Mapping: The mapping of the process allowed identify 7 major actors: Prescription, Transmission to pharmacy, Pharmaceutical validation, Label production, Compounding of cytotoxic, Quality control, and Transportation of preparation to the patient.
Identification of the critical points: The most failures modes that were ranked between 210 and 504 on criticality index are considered as main critical points:

FAULT MODE	SCORE
Dosage determination error	504
Product exchange	448
Product omission	384
Dosage error	384
Failure to detect a dosage/product error	315
Chemical cross-contamination	245
Conditions of transportation	210

Implementation of improvement actions: Corrective and preventive improvement measures have been defined and implemented, such as: integration of remote control and monitoring computer devices to the chemotherapy circuit.
Conclusion: The continuous improvement of chemoterapy circuit remains an important topic for the institutions in view of the overall risks associated with the quality of these drugs, therefore to the medical treatment of the patient.
NO CONFLICT OF INTEREST

Poster Session: Supportive Care

245 POSTER (BOARD 070) PREVALENCE AND ADEQUACY OF THE PRESCRIPTION OF ENTERAL NUTRITION IN ONCOLOGICAL PATIENT

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Introduction: Enteral nutrition (EN)is a resource used in the global approach of the oncological patient although it does not always adapt to it in an optimal way. Therefore, the objective of our study was to know the prevalence and adequacy of the prescription of EN and its characteristics in patients with oncological pathologies.
Material&method: An observational retrospective study was carried out. All patients who received oncological treatment and who had at least one prescription of EN between January 2017 and January 2018 were selected. Patient selection was made through the prescription program PRISMA®. The primary co-variates were the prevalence of oncological patients in treatment with EN and the percentage of EN prescriptions that met the adequacy criteria for their prescription. The main reasons for prescribing EN are:cancerous cachexia due to enteritis secondary to chemotherapy and/or radiotherapy, special nutritional requirement and mechanical alterations of swallowing and/or transit. Therefore, it was considered appropriate to prescribe if body mass index (BMI)<20,diagnosis of lymphoma and clinically diagnosed dysphagia, respectively. The secondary variables were the distribution of the prescription of EN depending on the oncological pathology, type of treatment, main prescribed nutritional formula and daily average of units prescribed by patient. The sources of information were: the billing program Microstrategy® for data related to the prescription and Diraya-Clinical-Station®.
Results&discussion: In the study period,486 patients were attended at hospital. Of them,18.5%(90 patients) were in treatment with EN.64.4% were men and the average age was 64.3 years. 95% of the prescriptions (n = 115)were made under the indication cancerous cachexia associated or not to swallowing alterations, of which 19.1%(n = 22)were performed in patients with a proven clinical situation of cachexia. The second cause of prescription was the mechanical swallowing alterations associated or not to cancer cachexia that represented 18.1%(n = 22),checking their adequacy in all cases. In one patient it was

prescribed under the indication of special nutritional requirements for diagnosis of lymphoma. Digestive localization accounted for 50% of oncological patients with EN (20% with colon cancer and 30% with other locations belonging to the digestive system),followed by pulmonary cancer (14.4%patients).62.8% of prescriptions were made in patients who were under treatment with chemotherapy (n = 76). The most frequently prescribed nutritional formulas were hyperproteic-hypercaloric (62.4%). The average was 1.4 units per patient per day.
Conclusion: Most of EN are indicated by cachexia although it was rarely clinically diagnosed. Digestive localization accounts for half of patients. More than half of the prescribed formulas were hyperproteic-hypercaloric without adapting to necessities of the patients.
NO CONFLICT OF INTEREST

246 POSTER (BOARD 071) CAN FEAR OF INJECTION BE MANAGED BY AUTOINJECTORS? INTERNET SURVEY WITH HEALTH CARE PROFESSIONALS ABOUT NEUTROPENIC PATIENTS

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Introduction: Quality of life is more and more often considered as an important part of the therapeutic process. Many products are delivered in an injection. It is often taken into consideration, if it is possible to reduce patients' fear of making injections by themselves. Is it really vital for the patient? Finally, can it be managed by devices designed for auto injection with needle guards? Material and Method. A web based survey was prepared to assess the fear of injection, the needle and the need of autoinjector for pegfilgrastim and sent to respondents who accepted the invitation. We collected 40 answers (50% physicians, 50% nurses) in equal proportion from Germany, UK, Italy and France. The specialty split was 62,5% oncology, 37,5% hemato-oncology. They all declared that they were treating patients with neutropenia. There were asked questions about: participants characteristics, needle phobia, fear of injection and insertion of the visible needle, physicians' and nurses' assessment of significance of the fear, assessment of autoinjector need.
Results and Discussion: . Treatment with filgrastim or pegfilgrastim on daily basis was used by 75% of interviewed physicians and 55% of nurses. The average monthly number of patients was 39 (physicians 52, nurses – 26 patients/month). The respondents reported that 49% of patients were taking medication by themselves. 28% of respondents believe that majority of patients have concerns about the injection. The fear of neutropenic patients of inserting the visible needle into the subcutaneous tissue was of same frequency (28%). Interestingly, nurses more frequently declare that patients feel fear. We believe that nurses are closer to patients, observe more concerns than physicians on a daily basis. Both physicians and nurses report that hidden needle (not visible) is the solution for 50% of patients. Approximately 97% of respondents report that pegfilgrastim autoinjector can be a convenient solution for patients and 77% declares that patients' copayment will be accepted. The interviewed group was small and results are based on subjective evaluation. The result should be confirmed especially for quantitative conclusions.
Conclusion: Majority (86%) of physicians and nurses treating oncology and hemato-oncology patients met patients with the fear of inserting the visible needle which represents combined results of daily and sometimes basis of frequency. This fear can be minimized by autoinjector (opinion of 50% of participants) and pegfilgrastim autoinjector is perceived as a convenient solution by approximately 97% of respondents.
CONFLICT OF INTEREST
Corporate-sponsored Research:
The survey was sponsored by Accord Healthcare. Grzegorz Orlik, Joanna Górniewska-Matracka and Vishal Vekariya are employees of Accord Healthcare/Intas Group.

Poster Session: Supportive Care

248 POSTER (BOARD 073) EVALUATION OF THE MANAGEMENT OF PAIN AT THE ANTI- CANCER CENTER (CAC) OF SETIF - ALGERIA

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Introduction: Cancer pain is frequent, undervalued and complex, hence its specificity. It is often mistakenly regarded as a fatality, while many means of relieving it exist. It is in this context that this study was carried out, the main objective of which is to evaluate and clarify the state of the practices of the management of pain in cancer patients in order to identify the insufficiency And proposing measures to improve their quality of life.
Material and Methods: A prospective, cross-sectional study of 50 patients with cancer and pain syndrome was conducted over a period of 45 days (March 7 to April 21, 2016), at the Medical Oncology Service of the Anti-Cancer Center (CAC) of Sétif. As part of the study, a working protocol was developed based on a questionnaire for the physician, a questionnaire for the patients, and an analysis of patients records.
Results / discussion: The majority of patients (94%) had cancer-related pain, of which 44 (95.7%) were in stage IV. Using the DNA4 scale, the proportion of neurological pain was 24%. For the evaluation of the pain intensity of their patients, doctors often preferred the simplified verbal scale "EVS" in 82.2% (37 cases) of the cases. Based on the EVA scale, 10.9% of the patients had low intensity pain, 56.5% moderate intensity, and 32.6% severe intensity, although 04 patients had not received any analgesic treatment. The choice of treatment was adapted to the intensity of the pain for 20 patients (49%), whereas it was not for 18 patients (44%). Contraindicated combinations (Level II + Level III) were reported among 04 patients. Of the 12 patients with neurogenic pain, only 07 received treatment adapted to this type of pain (Prescription of Pregabalin). More than 51% of patients reported partial relief and 8.69% reported no relief, however (81.6%) of the patients were quite satisfied despite the high percentage of unrelieved painful situations.
Conclusion: The systematic search for a pain syndrome and its evaluation, the prescription and availability of adapted therapies as well as the training of personnel involved in the management of pain, are key and essential elements that go through the creation of a « Anti-pain unit » to optimize pain management for the cancer patients.
NO CONFLICT OF INTEREST

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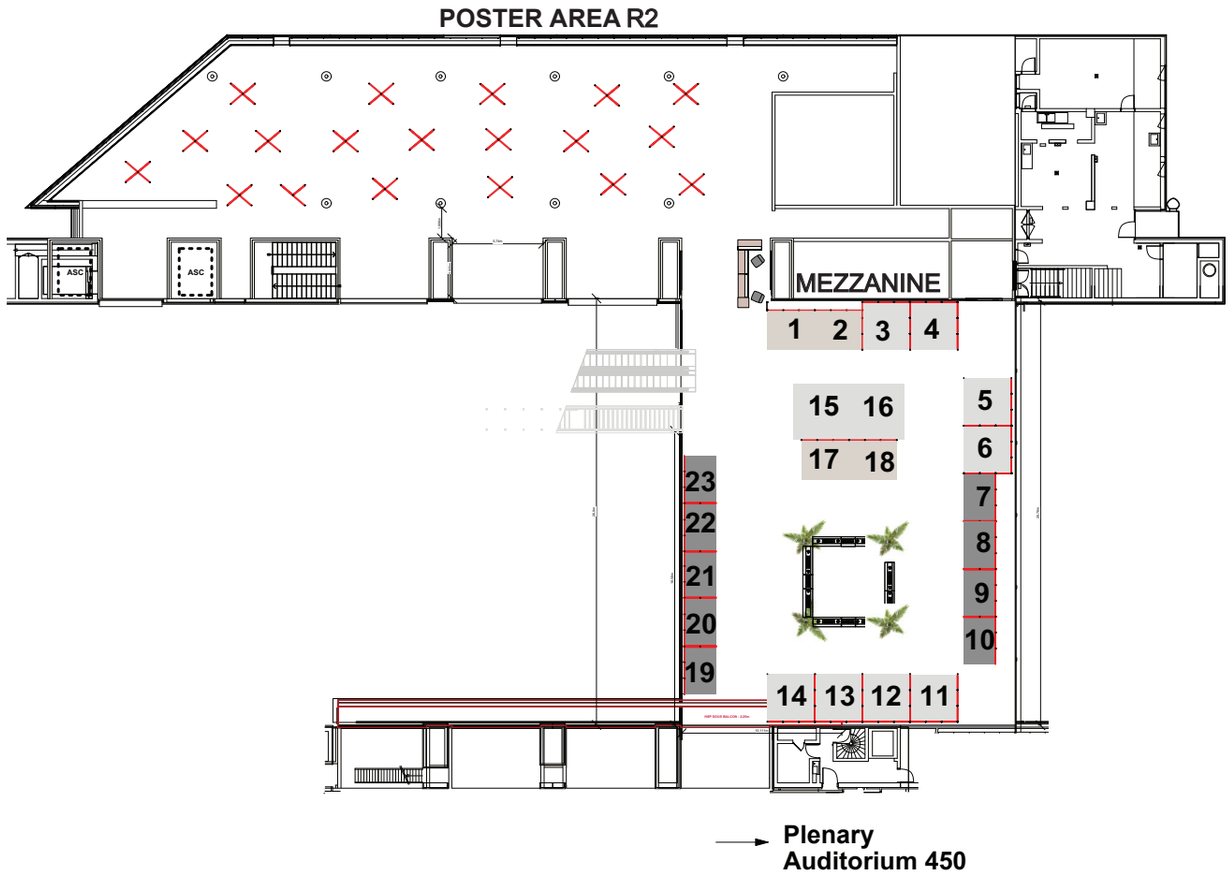

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Amgen Europe

www.amgenoncology.com

Amgen is committed to unlocking the potential of biology for patients suffering from serious illnesses by discovering, developing, manufacturing and delivering innovative human therapeutics. This approach begins by using tools like advanced human genetics to unravel the complexities of disease and understand the fundamentals of human biology.

Amgen focuses on areas of high unmet medical need and leverages its expertise to strive for solutions that improve health outcomes and dramatically improve people's lives. A biotechnology pioneer since 1980, Amgen has grown to be one of the world's leading independent biotechnology companies, has reached millions of patients around the world and is developing a pipeline of medicines with breakaway potential.

ARxIUM

www.arxium.com

ARxIUM, an industry leading developer of pharmacy automation, workflow, and consulting solutions. ARxIUM delivers best-in-class technology and unparalleled expertise focused on helping pharmacies of all sizes improve safety, productivity and efficiency. We provide scalable, comprehensive pharmacy solutions for every segment of the pharmacy market.

RIVA™, our fully automated IV compounding system, is used by hospital pharmacies to autom atically and accurately prepare IV syringes and bags. By automating the preparation of IV syringes and bags, RIVA addresses the issues of safety for the patient and the pharmacy technician, efficiency and effectiveness in the pharmacy and the challenges of a changing regulatory environment.

AstraZeneca

www.astrazeneca.com

AstraZeneca is a biopharmaceutical company dedicated to the research, development and commercialization of innovative medicines, particularly in the field of cardiovascular diseases, respiratory diseases and oncology and immuno-oncology.

AstraZeneca in oncology: Four cutting-edge scientific platforms in lung, ovarian, breast and blood cancers define AstraZeneca's portfolio of developing molecules and drugs in oncology: the mechanisms of proliferation and resistance of cancer cells, mechanisms of response to DNA repair pathway defect, conjugated antibodies and immuno-oncology. 36 molecules are currently under development in oncology and more than 30 associations of molecules are under study; six new drugs will be launched by 2020.

B. Braun Melsungen AG

www.bbraun.com

B. Braun is one of the world's leading manufacturers of medical devices and pharmaceutical products and services. With over 60,000 employees in 64 countries, B. Braun develops high quality product systems and services for users around the world. Every service provided by B. Braun incorporates its entire expertise and the company's deep understanding of users' needs.

In developing its products, product systems and services, B. Braun acts like a sparring partner. A companion who promotes developments through constructive dialog and the motivation to improve things. With its constantly growing portfolio of effective medical care solutions, B. Braun makes a substantial contribution towards protecting and improving people's health.

Bristol-Myers Squibb	Bristol-Myers Squibb

www.bms.com

Bristol-Myers Squibb is a differentiated company, led by our unique BioPharma strategy that leverages the reach and resources of a major pharma company paired with the entrepreneurial spirit and agility of a biotech firm. We work every day to deliver innovative medicines for patients with serious and life-threatening diseases.

Each day, our employees around the world work together for patients – it drives everything we do. We are focused on helping millions of patients around the world in disease areas such as oncology, cardiovascular, immunoscience and fibrosis. Through our R&D organization, we have built a sustainable pipeline of potential therapies, and actively partner to access external innovation to broaden and accelerate our work.

DuPont de Nemours (Luxembourg) s.à r.l	DUPONT®

www.tyvek.co.uk/isoclean

DuPont, a science company dedicated to solving challenging global problems, offers a wide range of proven science-based protective solutions that include the Tyvek® IsoClean® range of cleanroom garments, which have a long history of use in cleanrooms due to their excellent barrier to particles, microorganisms and chemical hazards (such as cytotoxic drugs). Tyvek® IsoClean® offers the ideal combination of protection, reliable quality, comfort and contamination control.

Equashield Medical Ltd.	EQUASHIELD

www.equashield.com

Equashield is a leading provider of a full range of manual and automated solutions to hospitals for the compounding and administration of hazardous drugs. Equashield's product suite includes EQUASHIELD II, its flagship Closed System Transfer Device (CSTD), and EQUASHIELD® Pro, the first ever closed system drug compounding robot. Equashield's CSTD is clinically-proven to protect healthcare professionals from hazardous drug exposure.

The globally awarded EQUASHIELD® II covers more routes of exposure than alternative systems by preventing contamination of syringe plungers and drug residuals on connector surfaces, as well as exposure to drug vapors. EQUASHIELD is in use by hundreds of hospitals and clinics around the world, and has been cleared by the FDA under the ONB product code.

EUREKAM	EUREKAM® TECHNOLOGIES

www.eurekam.fr

Eurekam was launched in 2012 with the purpose of reducing errors in the preparation of medical compounds. Using artificial intelligence and image analysis solutions to reduce these errors, the company has built an intelligent machine and software that oversees the necessary and crucial human activity in the compounding process.

Eurekam has developed an intelligent video system called DRUGCAM, capable of reducing medical error in the chemotherapy compounding process. DRUGCAM works in combination with a software module that monitors and evaluates compounding progress in real-time. The module automatically validates active substances used, doses to be injected, labeling of the drug-administration vehicle, and compounding elements (through barcode scanning).

EWHA Meditech Inc.	EWHA MEDITECH

www.anapa.com

EWHA has over 25 years of experience in Oncology /Anesthesia/ Pain management by distributing PCA/Infusion/Monitoring device to anesthesia department of the almost university and general hospitals in South Korea. EWHA co-developed the totally new technology disposable infusion device, ANAPA 15years ago. "CO2-powered Disposable Infusion Device", ANAPA is only manufactured by EWHA with various patents and proven performance over 15years, over 1,000,000pcs sold. Optimal solution (Accurate/Safety/Convenience) for chemotherapy and pain relief with superior mechanism than existing elastomeric, electronic and mechanical infusion devices. Application: Chemotherapy/ Antibiotic / Adjuvant therapy/ Acute & chronic pain management. CE/ISO13485/KGMP

Fresenius Kabi	FRESENIUS KABI caring for life

www.fresenius-kabi.com

Fresenius Kabi is a global healthcare company that specializes in lifesaving medicines and technologies for infusion, transfusion and clinical nutrition. The company's products and services are used to help care for critically and chronically ill patients. Fresenius Kabi's product portfolio comprises a comprehensive range of I.V. generic drugs, infusion therapies and clinical nutrition products as well as the medical devices for administering these products. Within transfusion technologies, Fresenius Kabi offers products for collection and processing of blood components and for therapeutic treatment of patient blood by apheresis systems. In the field of biosimilars, Fresenius Kabi develops products with a focus on oncology and autoimmune diseases.

ICU Medical, Inc.

www.icumed.com

Safely and efficiently deliver hazardous drugs to your patients with ICU Medical's full line of needlefr ee closed system transfer devices (CSTDs), industry-leading IV pumps, safety software, and other infusion technologies, providing you unmatched innovation, quality, and value.

IWATA LABEL Europe GmbH

www.iwatalabel.co.jp/en

IWATA LABEL Europe is the subsidiary operating in Germany who does the sales and marketing in Europe. IWATA LABEL is Japanese company with annual sales of over 50 million US dollars. This is about 50% of the pharmaceutical labeling market in Japan. Of this, 85% comes from label sales and 15% comes from labeling machine sales.

Each month IWATA LABEL Europe receives over 1,500 order for labels resulting in over 2 billion labels produced per year. The company offers not only normal labels but also top of the functional labels.

Jazz Pharma-ceuticals

www.jazzpharmaceuticals.com

Jazz Pharmaceuticals plc (Nasdaq: JAZZ) is an international biopharmaceutical company focused on improving patients' lives by identifying, developing and commercializing meaningful products that address unmet medical needs. The company has a diverse portfolio of products and product candidates with a focus in the areas of sleep and hematology/oncology. In these areas, Jazz Pharmaceuticals markets Xyrem® (sodium oxybate) oral solution, Erwinaze® (asparaginase Erwinia chrysanthemi), Defitelio® (defibrotide sodium) and Vyxeos™ (daunorubicin and cytarabine) liposome for injection in the U.S. and markets Erwinase® and Defitelio® (defibrotide) in certain countries outside the U.S.

Knoware SA/NV

www.knoware.be

Knoware SA/NV is a software company specialized in healthcare and hospital solutions. As editor of ComeoCare™ (formerly CytoWeb™), Knoware is the Belgian market leader in oncology and chemotherapy management software since 2013.

ComeoCare™ is a comprehensive web workflow solution managing the cures end-to-end, from the electronic prescription based on complex regimens, the preparation with gravimetric and camera control, up to the administration including bed-side scanning, IV pump monitoring, and closed-loop integration. It is highly flexible and supports full automatic integration with the administrative and patient file of the hospital using common protocols like HL7. ComeoCare is easy to use on any desktop, tablet and phone, and can be operational within short implementation time.

medac

www.medac.de

medac is a privately held, global pharmaceutical company with a growing pharmaceutical and diagnostics business. Medicinal products from medac support doctors and patients throughout the world in overcoming acute and chronic diseases in the indication areas of oncology, haematology, urology and autoimmune disorders.

In addition, medac develops and markets special diagnostic test systems. Since 1970 medac has been committed to unifying therapeutic and diagnostic areas under one roof.

Micrel Medical Devices

www.micrelmed.com

Micrel Medical Devices develops manufactures and markets a full range of ambulatory infusion solutions for both Hospital and Home Care.

The RythmicTM Perf + pumps range has been especially designed for Home Chemotherapy infusions to exceed the expected safety, reliability, accuracy and comfort for both the patients and the medical staff. Furthermore the Rythmic Perf + coupled with Micrelcare, a unique web-based remote monitoring platform, provides instant infusion feedback for a complete treatment traceability. Meet us at Booth #12.

Sandoz International GmbH

www.sandoz.com

Sandoz is a global leader in generic pharmaceuticals and biosimilars. As a division of the Novartis Group, our purpose is to discover new ways to improve and extend people's lives. We contribute to society's ability to support growing healthcare needs by pioneering novel approaches to help people around the world access high-quality medicine. Our portfolio of approximately 1000 molecules, covering all major therapeutic areas, accounted for 2017 sales of USD 10.1 billion. In 2017, our products reached well over 500 million patients. Sandoz is headquartered in Holzkirchen, in Germany's Greater Munich area.

TEVADAPTOR

www.tevadaptor.com

Tevadaptor® is a Closed System Drug Transfer Device for safe compounding and administration of hazardous drugs, minimizing risk of exposure to hazardous drug substances and risk of needle-stick injuries, protecting pharmacists, nurses and patients alike. Tevadaptor® has a patented double membrane system, Toxi-Guard, which keeps the drug sterile during all stages of preparation, handling and storage.

Tevadaptor® is FDA cleared under the ONB product code. Tevadaptor® components offer a complete portfolio of solutions

from preparation to administration of hazardous drugs, offering safety, ease of use and economical added value due to the product's intuitive design. Tevadaptor® has been in the market since 2005 and is currently distributed in more than 20 countries worldwide.

Vygon	

www.vygon.com

Vygon is a world leader in the creation of high technology single-use medical devices, distributed throughout the world by our dedicated network of 27 subsidiaries and 331 integrated distribution partners.

Vygon offers an extensive range of products suitable for use in the following clinical departments: Neonatology, nutrition & obstetrics; Intensive care; Anaesthesia & Emergency; Intravascular Therapies; and, Cardiovascular & Surgery.

Amgen-sponsored satellite symposium at the 4th Congress of ECOP

Join us for the Amgen-sponsored satellite symposium

Practical considerations:
supporting the evaluation and implementation of oncology biosimilars

Thursday 25 October 2018, 10.30–11.40
Room 200, La Cité, Nantes Events Center, Nantes, France

This symposium will outline the practical and critical factors that Hospital Pharmacists need to consider when assessing and implementing biosimilars into their practice.

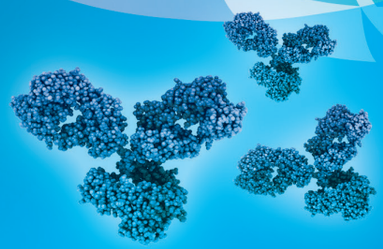
Symposium objectives:

- Summarise the current landscape of biosimilars
- Understand the impact of biosimilars on sustainable cancer care
- Examine practical considerations when evaluating biosimilars
- Discuss the challenges around the implementation of biosimilars

Programme

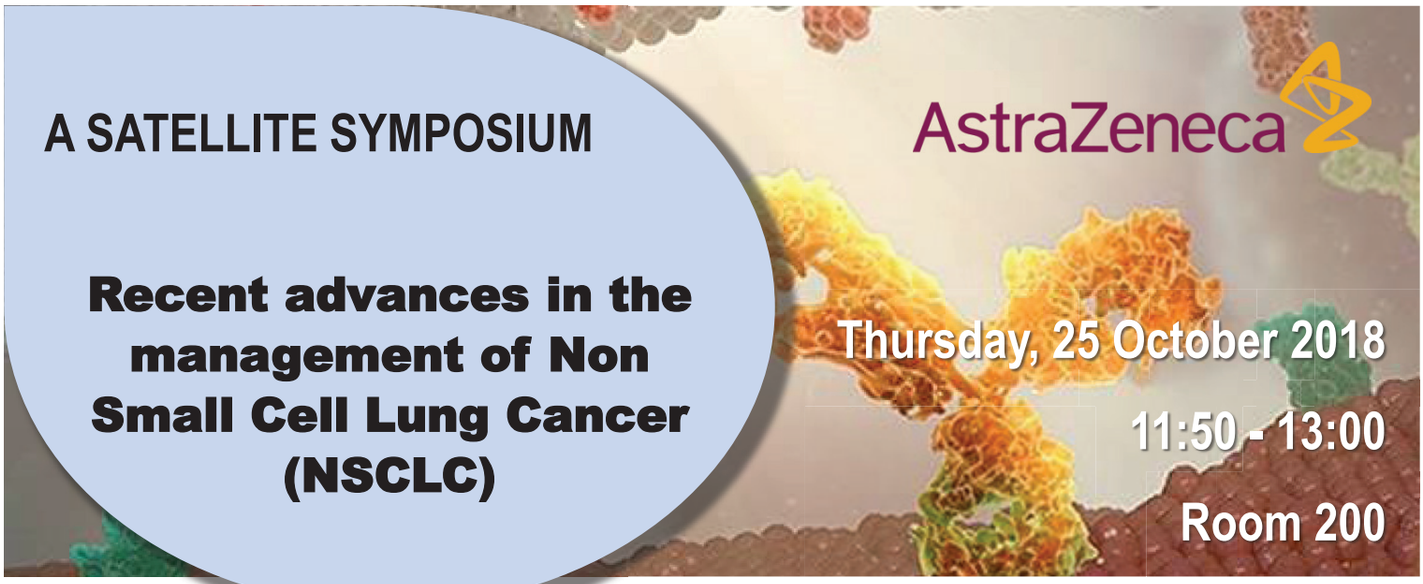
Chair: Irene Krämer (Germany)

Welcome and introduction: the evolving landscape of biosimilars	Irene Krämer (Germany)
A practical guide for the evaluation and selection	Niels Boone (The Netherlands)
Overcoming barriers to the implementation of biosimilars	Simon Cheesman (UK)
Concluding comments and close	Irene Krämer (Germany)



AMGEN BIOSIMILARS

Amgen (Europe) GmbH, 6343 Rotkreuz, Switzerland
Date of preparation: August 2018.



A SATELLITE SYMPOSIUM

AstraZeneca

Recent advances in the management of Non Small Cell Lung Cancer (NSCLC)

Thursday, 25 October 2018

11:50 - 13:00

Room 200

AGENDA

Chair and Moderator : Dr. François Lemare (France)

11:50 – 11:55 **Welcome and Introduction**

- Dr. François Lemare, Gustave Roussy, France

11:55 – 12:20 **Management of Unresectable Stage III NSCLC**

- Pr. Etienne Chatelut, IUCT Toulouse, France
- Dr. Maurice Pérol, Centre Leon Berard, Lyon, France
- Pr. Dick De Ruysscher, Maastricht University Medical Center, Netherlands

12:20 – 12:45 **Management of First-line EGFRm metastatic Stage IV NSCLC**

- Pr. Etienne Chatelut, IUCT Toulouse, France
- Pr. Jaafar Bennouna, University Hospital Nantes, France

12:45 – 13:00 **Round table : Q&A and closing remarks**

For more information about ECOP, go to www.ecco-org.eu/Events/ECOP4

Participate in the discussions with our experts

We'll see you there !

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JOIN US Friday 26th October 2018 - 14:00-15:30 - Room GH

SATELLITE SYMPOSIUM ON
4TH EUROPEAN CONFERENCE OF ONCOLOGY PHARMACY (ECOP4)

SAFE HANDLING OF ONCOLOGY DRUGS

Oncology drugs, even though they cure cancer stricken patients, represent health risks to the pharmacists and nurses handling them. Every day they work in oncology drug compounding or administration, the pharmacists and nurses risk getting exposed to a variety of hazardous drugs. This presentation will explain the nature of these risks, explain how these risks can be mitigated and how to select protective garments that protect the pharmacists and nurses from the residual risks in hospitals and pharmacies while at the same time protecting the oncology drugs from getting contaminated.

Steve Marnach
EMEA Training Manager & Critical Environments Sales and Marketing Specialist

ipp.dupont.com

Equashield invites you to join

our Satellite Symposium at ECOP 2018

Thursday October 25th at 10:30 Room GH

Introduction to the first and only CSTD compounding robot

Yaakov Cass, MSc. FRPharmS
Clinical oncology pharmacist and District Pharmacist
Emeritus for the Israeli Ministry of Health

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4th European Conference of Oncology Pharmacy

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