Shaukat Khanum Memorial Cancer Hospital & Research Centre

Pharmacy Newsletter

Volume XII, Issue # 4, 2022

Issued By:

Drug Information Centre, SKMT

P&TC Updates:

Pharmacy & Therapeutics Committee (P&TC) has approved the following drugs during 2022 at SKMCH&RC:

1. **Apixaban Tablet –** as regular formulary item.
2. **Alectinib Capsule –** as regular formulary item (restricted by cost).
3. **Pegylated Filgrastim 6 mg Injection –** as a regular formulary item**.**
4. **Thiotepa Injection** - as a regular formulary item (2 patients per year).

Drugs deleted from Formulary

1. **Ranitidine** (All dosage forms).

Drugs Recalled

1. **Famotidine Syrup** (Specific brands) – Only applicable to the Lahore site, as other sites did not procure recalled brands.

Drug Strength Alert

Lignocaine with Adrenaline Injections

There has been a recent change in brands for the Lignocaine and Adrenaline, combination. The existing concentration is of Xyloaid with adrenaline (Lignocaine/Adrenaline (2% /1:200,000 having adrenaline 0.0005% w/v)), whereas the new formulation available as a substitute, is Xylex with Adrenaline (Lignocaine/Adrenaline (2% /1:100,000 having adrenaline 0.001% w/v)).

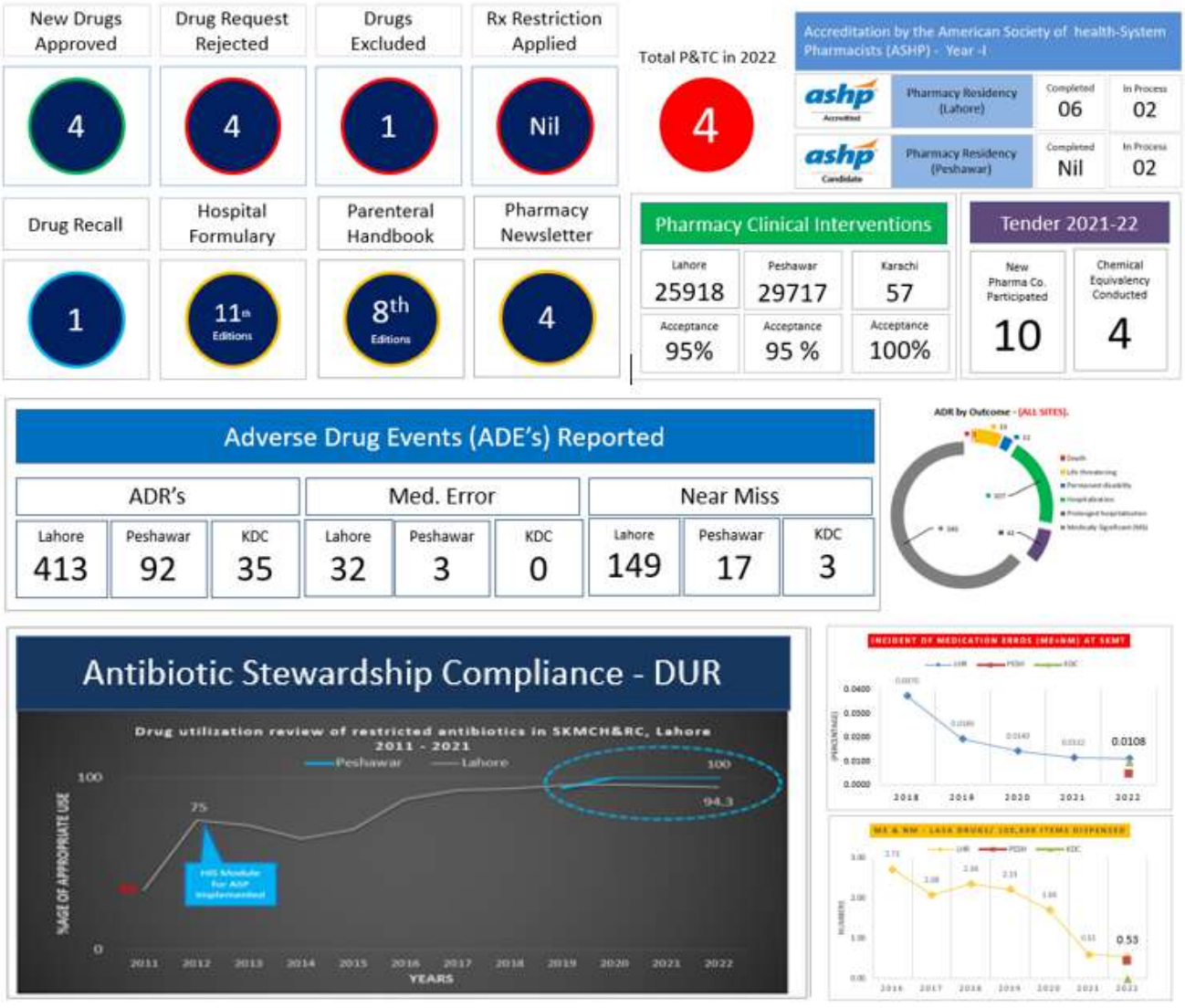
Dosing: *Local infiltration anaesthesia or nerve block*: Dosage of lignocaine / adrenaline varies with procedure, degree of anaesthesia needed, vascularity of tissue, duration of anaesthesia required, and physical condition of patient. Maximum dose of lignocaine (with adrenaline): 7 mg/kg (up to 500 mg).

The dosing for usage is dependent on lignocaine, which is of the same concentration in both formulations.

Ref: Lexicomp Monograph, Lidocaine with adrenaline. https://online.lexi.com/lco/action/home [accessed Dec 2022]

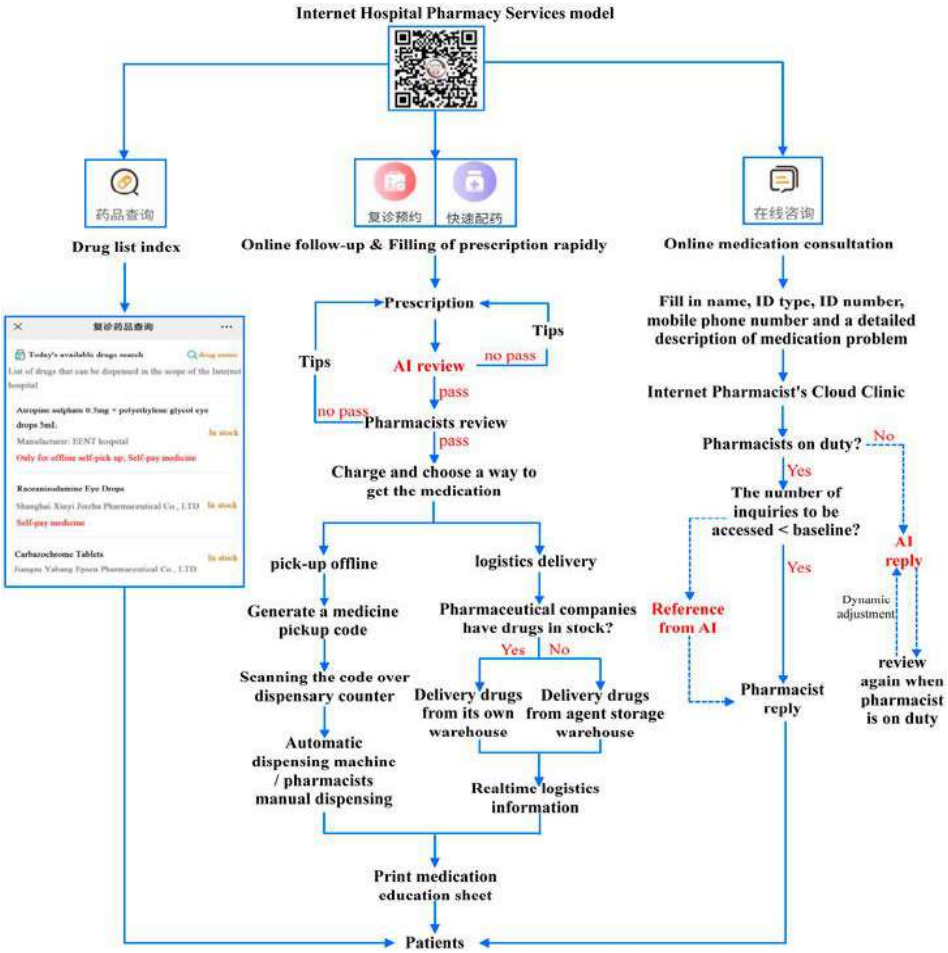
Medication Management & Use at SKMT

Summary of 2022



Artificial Intelligence:
Forecasting in Pharmacy

Artificial intelligence (AI) is rapidly changing the healthcare industry, and pharmacy is no exception. AI is being used in hospitals to help pharmacists streamline operations and provide a higher quality of care to patients. An internet-dependant, hospital pharmacy service model, based on AI was established in China during COVID-19. The study was carried out at the Eye and ENT Hospital of Fudan University. A hospital pharmacy service mode powered by AI was established. To review the prescriptions, initial prescription criteria was formulated, based on drug labels, clinical protocols and guidelines, clinical pathways, national formularies, and national prescription laws. A three step, AI preview was created, to assure the accuracy of prescriptions, give pharmacists a preview, and double-check when dispensing. The "medicine pickup code" - a Quick Response (QR) code that designates a particular offline self-pickup order. QR code was scanned through the window of an offline pharmacy or hospital. Patients or volunteers could obtain medicine without having to wait for the pharmacist or dispensing device to distribute them. Additionally, the pharmaceutical consultation feature was active. There were a number of limitations in the operations. Firstly, the operation interface, which was in Chinese and was not very user-friendly for foreigners. Secondly, elderly adults frequently require assistance from their family members to use pharmacy services at online hospitals. For future prospective, a new AI-based pharmacy service function such as "medication housekeeper" needs to be developed, including medication reminders (short messaging service, AI voice call reminders, *etc.*), medication records (check-in and clock-in, medication adherence records), and medication tracking.



Ref.: Bu, F., Sun, H., Li, L., Tang, F., Zhang, X., Yan, J., Ye, Z., & Huang, T. (2022). Artificial intelligence-based internet hospital pharmacy services in China: Perspective based on a case study. Frontiers in pharmacology, 13, 1027808. https://doi.org/10.3389/fphar.2022.1027808

Drugs Approved by FDA:

For treatment of cancer, in recent times

The table below provides a brief overview of new anticancer drugs or new indications approved by the Food and Drug Administration (FDA).

Anti-cancer drug	Indications	Side effects	Trial approved	Price	Preparation location
Capmatinib **Brand Name. Tabrecta**	Mutated advanced NSCLC	Induces intestinal lung disease in patients with NSCLC MET 14 exon skipping mutation	Phase 2 clinical trials. May 6, 2020, based on initial overall response rate and duration of response in the GEOMETRY mono-1 trial (NCT02414139), a multicentre, non-randomized, open-label, multi-cohort study. No of patients=160	50mg x 56 tab = $10528	Novartis oncology. USA
Tepotinib **Brand Name; Tepmetko**	MNSCLC harboring MET exon 14 skipping alterations Advanced hepatocellular carcinoma	Pseudo acute kidney injury Peripheral edema (trial;NCTO-2864992)	FDA approved Tests (phase1 and 2) VISION trial (NCT02864992), a multicentre, non-randomized, open label, multicohort study enrolling 152 patients with advanced or metastatic NSCLC with MET exon 14 skipping alterations.	225mg x 30 tabs = $11563	Japan
Tazemetostate **Brand Name; Tazverik**	Locally advanced/metastatic epithelioid sarcoma. Follicular lymphoma (relapsed) Diffused large B-cell lymphoma (non-Hodgkin)	Pulmonary & Urinary toxicity.	Approved in June 2020 in USA by FDA,in 62 patients with epithelioid sarcoma (cohort 5) in an ongoing, phase 2 study (EZH-202; NCT02601950).	1mg= 5200£ 5mg= £153000	Launched in Japan (Eisai Co Ltd) 16th Aug 2021
Sotarasib **Brand Name; LumaKRAS**	For KRAS mutation including NSCLC. Colorectal cancer	Hepatotoxicity (increases AST & ALT) Decrease lymphocytes diarrhoea	FDA approval in May 2021 after the multicentre phase I and phase II CodeBreak100 clinical trials determined individual clinical trials [NCT01905657; NCT02578680]in 100 pts.	120mg x 240 tab = $20006	Firstly approved & prepared in Japan ministry of health & now available in 40 countries.
Lurbinededin **Brand Name; Zepzelca**	As 2nd line treatment of SCLC Relapsed SCLC	Embryo foetal toxicity hepatotoxicity	The Lancet Oncology May 2020 issue, monotherapy clinical data from an open-label, multi-centre, single-arm study in 105 adult platinum-sensitive and platinum-resistant patients with SCLC. Developed by pharma Mar in USA on 15th June 2021 through phase 1/ 2 trials.	4mg inj= $7602	Pharma Mar US
Ripretinib **Brand Name; QinLOCK**	PDGFRA driven cancer i.e. Gastro intestinal stromal tumor KIT driven cancer	Anaemia, palmer planter erythrodysesthesia syndrome	Approved on 15th May 2020 in Phase 3 INVICTUS trials, 2 & 1 (NCT03353753), an international, multi-Center, double-blind, placebo-controlled trial in 129 patients.	50mg x 90 tabs =$38240	Deciphera pharmaceuticals (China)

Tucatinib **Brand Name; Tukysa**	HER2-positive solid tumors i.e. breast cancer, colorectal cancer, brain metastasis	Palmor-planter erythrodysesthesia syndrome	In May 2020 through phase 2 & 3 US clinical trials (NCTO449924) Project Orbis, the U.S. Food and Drug Administration approved Tukysa (tucatinib) in combination with chemotherapy (trastuzumab and capecitabine clinical trial enrolling 612 patients with HER2-positive advanced metastatic breast cancer and had prior treatment with trastuzumab, pertuzumab and ado-trastuzumab emtansine (T-DM1).	150mg x 60tab =$11369	Initially by Array Biopharm (subsidary of Pfizer) & Subsequently developed by Seattle Genetics
Pralsetinib **Brand Name; Gavreto**	Papillary thyroid cancer NSCLC-positive Medullary thyroid carcinoma Solid tumors	QT prolongation HTN Increase AST	multi-cohort phase I/II ARROW trial resulted in FDA Accelerated Approval for two types of RET-altered. ARROW study (NCT03037385) in 62 patients.	100mg x 60tab =$10654	4th September 2020 based on results of multicenter, open label, multi cohort clinical trials (Arrown NCTO 3037385) By blue print medicine corporation & Roche (9th Nov 2021)
Avapritinib **Brand Name; Ayvakit**	Approved for PDGFRA exon 18 mutant GI stromal cancer Mast cell Leukaemia	Peripheral edema Lacrimation Hypophosphatemia Hyperbilirubinemia	Jan 2020 FDA approved Developed by blue print medicine navigator phase 1 clinical trials (NCTO 2508532) the registrational PIONEER trial, the largest randomized, placebo-controlled clinical study ever conducted in indolent SM.	25mg x 30 tab = $37089	Blue print medicine corporation in march 25th 2022 European commission is currently indicating it as monotherapy for aggressive systemic mastocytosis
Selpercatinib **Brand Name; Retevmo**	RET positive NSCLC Fusion-positive thyroid cancer Medullary thyroid cancer	Increase Glucose level, Decrease Ca level, Increase cholesterol level QT prolongation Hepatotoxicity Increased AST	Approved through phase 1 & 2 LIBRETTO-001 trials and Recently in May 8th 2020 approved by US FDA for Phase 3 trials LIBRETTO-431 (NCTO04194944) in 41 efficacy evaluable patients (95% CI, 28%-60%)	80mg x 60tab =$10855	Funded by Eli Lilly company & Bayer/Loxo oncology Blue print medicines

Ref: FDA Drug Approvals and Databases. https://www.fda.gov/drugs/development-approval-process-drugs/drug-approvals-and-databases [accessed Dec 2022]

Annual Drug Data Update in HIS for year 2022-23

The periodic up-gradation in HIS, of drug-data is essential to ensure that health informatics is updated, and therefore, optimum for management and decision-making, while treating our patients. Drug data update is based on a clinical decision support system (CDSS) and knowledge-based system (KBS) which has been updated in 2022. All necessary information including clinical monographs, chemotherapy protocols, oral chemo leaflets, and essential checks, were updated from Lexicomp, NCCN guidelines, etc.

Ruxolitinib:

An Oral Janus kinase (JAK) inhibitor in the treatment of Neoplastic and Inflammatory Disorders

A Janus kinase inhibitor, also known as JAK inhibitor, are type of immune modulating medication, which inhibits the activity of one or more of the Janus kinase family of enzymes (JAK1, JAK2, JAK3, TYK2).

The FDA approved Ruxolitinib (Jakavi) as a new Myelofibrosis (MF) treatment that targets the Janus kinase (JAK)-signal transducer and activator of transcription (STAT) signalling pathway. Ruxolitinib is indicated for treating patients with intermediate or high-risk myelofibrosis, that occurs secondary to polycythemia vera (PV), and essential thrombocythemia (ET).

Ruxolitinib is an orally administered, selective JAK1 and JAK2 inhibitor. The drug is rapidly absorbed with an elimination half-life of approximately 3 hours.

In MF, blockade of overactive JAK2 signalling with ruxolitinib decreases the proliferation of hematopoietic stem cells, and blockade of overactive JAK1 and JAK2 signalling decreases the production of proinflammatory cytokines.

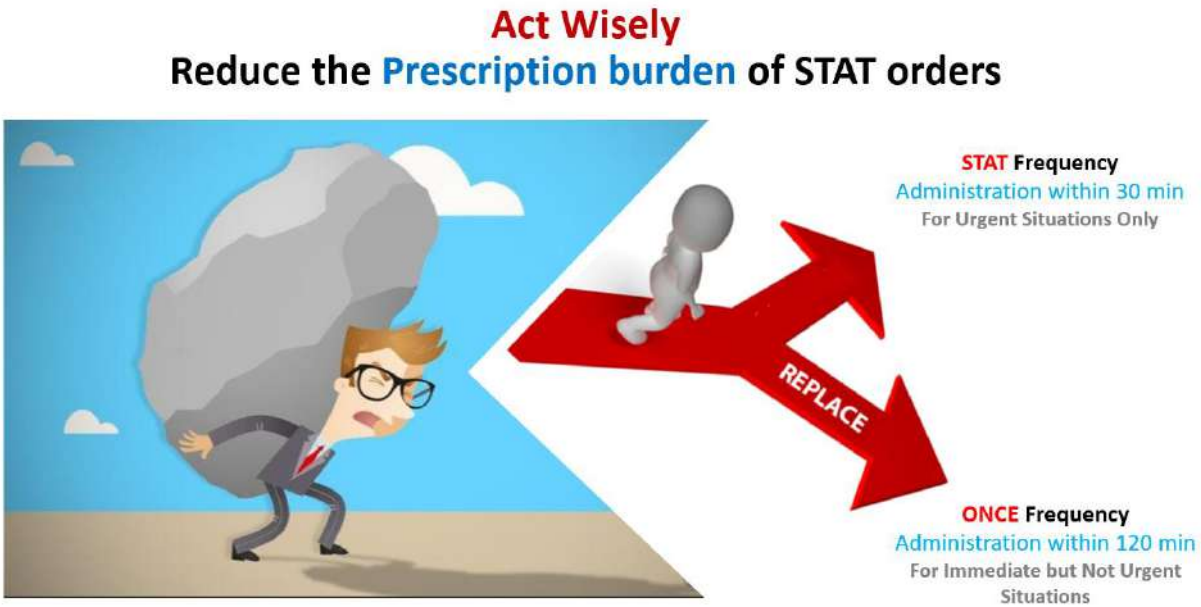
The starting dose of ruxolitinib is based on platelet count: 20 mg twice daily (BID) for patients with a platelet count > 200 × 10^9/L and 15 mg BID for patients with a platelet count between 100 × 10^9/L and 200 × 10^9/L. In patients with moderate or severe renal impairment or any degree of hepatic impairment, ruxolitinib must be initiated at a reduced dose.

Ruxolitinib evaluation in a phase 1/2 clinical trial indicated that ruxolitinib provides significant clinical benefits, such as reduction of splenomegaly, improves debilitating symptoms, decreases in elevated cytokine levels, and the potential for improved survival.

Ref.: Roskoski Jr, R. (2022). Janus kinase (JAK) inhibitors in the treatment of neoplastic and inflammatory disorders. Pharmacological Research, 106362.
Verstovsek, S. Ruxolitinib: an oral Janus kinase 1 and Janus kinase 2 inhibitor in the management of myelofibrosis. Postgraduate medicine, 125(1), 128

Pharmacy Practices & HIS Updates

Frequency Revision



International Pharmacy Practice Residency Program (IPPRP)

Team Lahore – First ASHP Accredited Hospital in Pakistan

ashp Accredited

Omar Akhlaq Bhutta
Head of Department

Saba Mazhar
Residency Program Director

Shumaila Kausar
Preceptor Ambulatory Care
Preceptor in training, Quality & Patient Safety

Hassan Bin Rasheed
Preceptor Ambulatory Care

Salman Nasir
Preceptor Aseptic Services

Shoaib Shammas
Preceptor Aseptic Services & Parenteral Nutrition
Preceptor in training, Management & Leadership

Ehsan Elahi
Preceptor Medical Oncology Adult & Research Project Management

Saba Mazhar
Preceptor Orientation & Medical Oncology Pediatric

Muhammad Rehan Khan
Preceptor Infectious Diseases & Internal Medicine

Faiqa Malik
Preceptor Staffing Support &Aseptic Services

Adeel Siddiqui
Preceptor Research Project, Critical Care, Management & Surgical Services

Merium Fatima
Preceptor Aseptic Services & Parenteral Nutrition

Saleha Nadeem
Preceptor Medical Oncology Pediatric

Umar Javed
Preceptor Internal Medicine & Infectious Diseases

Hafiz Muhammad Usman
Preceptor Palliative care, Critical Care & Drug Information

Irfan Raza
Preceptor Quality & Patient Safety

Sabahat Mehmood
Preceptor Palliative Care

Zara Hashami
Preceptor-in-training Medical Oncology Pediatric

Irfan Sarwar
Preceptor Surgical Services

Aleshba Usman
Preceptor Medical Oncology Adult

Aymen Sheraz
Resident

Fatima Mela
Resident

Team Peshawar - First Time in KPK, Pakistan

ashp Candidate

Omar Akhlaq Bhutta
Head of Department

Sajjad Ullah
Residency Program Director (RPD)

Omar Akhlaq Bhutta
Preceptor Management And Leadership

Ghulam Mujtaba
Preceptor Management And Leadership, Critical Care & Research Project Management

Abdul Wahab
Preceptor Medical Oncology Pediatric

Madiha Kanwal
Preceptor Ambulatory Care & Drug Information

Fazli Dayyan
Preceptor Staffing Support & Medical Oncology Adult

Shakeel Ul Rehman
Preceptor Ambulatory Care

Muhammad Asif
Preceptor Quality & Patient Safety & Palliative Care

Sajjad Ullah
Preceptor Infectious Diseases & Palliative Care

Nuzhat Hamayun
Preceptor Aseptic Services & Medical Oncology Adult

Amjad Zafar
Preceptor Parenteral Nutrition

Amjad Anwar
Preceptorr-in-training Medical Oncology Pediatric

Soban Ahmad Khan
Preceptorr-in-training Critical Care

Ramsha Abid
Resident

Rida Wasi
Resident

Ms. Rida Wasi, has graduated Pharm-D from University of Peshawar. She is our FIRST ASHP resident. She got selected after vigorous process of screening among 150 candidates. Her devotion, motivation and performance in all learning experiences has been marvelous and extraordinary. She shows interests and performs proactively.

Ms. Ramsha Abid has graduated Pharm- D from COMSATS University Abbottabad Campus. She is our SECOND ASHP resident. Through IPPR, she is aiming to become a skillful pharmacist who showcases her skills in communicating with patients, and maintaining a secure, safe and organized pharmaceutical services in the region.

Atezolizumab Subcutaneous formulation demonstrates positive Phase III results

Atezolizumab (Tecentriq) is a monoclonal antibody designed to bind with a protein called programmed death ligand-1 (PD-L1). The study showed non-inferior levels of Tecentriq in the blood (pharmacokinetics), when injected subcutaneously compared with intravenous (IV) infusion in cancer immunotherapy-naive patients with locally advanced or metastatic non-small cell lung cancer (NSCLC) for whom prior platinum therapy has failed. The safety profile of the subcutaneous formulation was consistent with that of IV Tecentriq (Atezolizumab).

Administering Tecentriq subcutaneously reduces the treatment time to 3-8 minutes per injection compared with 30-60 minutes for standard IV infusion. By reducing the administration time, this new Tecentriq formulation could help save time for patients and healthcare systems. Multiple oncology studies suggest that most cancer patients prefer to receive treatment subcutaneously due to reduced pain and discomfort, ease of administration and shorter duration of treatment as compared to IV infusion. The co-primary endpoints of the study are minimum levels of Tecentriq in the blood during a given dosing interval based on established pharmacokinetic measurements; observed serum C_{trough} and model-predicted area under the curve (AUC). Secondary endpoints include safety, immunogenicity, patient-reported outcomes, and efficacy. Eleven patients had subcutaneous local injection site reactions (mostly Gr 1 [11/12 (90.9%)]). The most common were injection site reaction, pain, and erythema.

Ref.: M. Burotto, E. Felip, Z. Zvirbule, L.A. Herraez Baranda, P. Chanu, S. Kshirsagar, V. Maiya, E. Pozzi, E. Restuccia, 1270P IMscin001: Phase Ib dose-finding study of subcutaneous atezolizumab in patients with locally advanced or metastatic non-small cell lung cancer (NSCLC),Annals of Oncology,Volume 31, Supplement 4,2020,

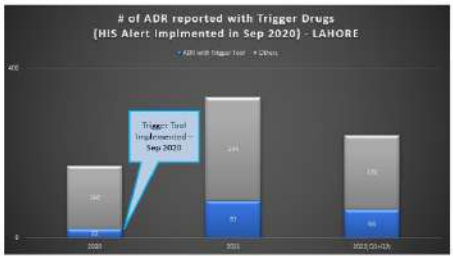
Trigger Drugs Tool

Different methods have been tried and tested to improve the reporting of adverse drug reactions (ADR) like, education of staff, ADR reporting alert in HIS, and patient's chart review. However, retrospective review of patient's chart has shown not much improvement in the reporting. Therefore, to prevent under reporting, a new method named trigger tool method has been developed. Alerts are generated for specific drugs for clinical pharmacists' team. The designated clinical pharmacy staff then reviews the patient's charts to check the rational of prescribing and whether there is an ADR. Specific drugs include Flumazenil, Naloxone, Hydrocortisone & Pheniramine and Acetylcysteine. Although current list of trigger drugs is limited and not all kinds of ADRs involve treatment with an antidote, but this method of identifying ADR is helpful for documenting missed potential ADRs.

Trigger Drugs – Email Alert!

Impact of trigger drug alert on ADR reporting

Cross Sectional Study



How can we prepare for national disasters in Pakistan?

Pakistan was hit by a catastrophic flood in one-third of its region, lately. Natural disasters are associated with underlying ailments such as communicable diseases, respiratory infections, diarrhea, cholera, typhoid, hepatitis, vector-borne diseases like dengue and malaria, and the worsening of chronic diseases due to poor management. This put our healthcare teams to deal with the overwhelmed crowd of patients suffering from psychological stress and pathological aspects of these disasters. In such cases we need pre-planning and disaster management policies to prepare the pharmacy team about what to do in situations like covid-lockdown or floods. Triage of low acuity patients, tele medication for uninterrupted patient care, emergency preparedness plans in hospital pharmacy, require participation of pharmacists in national emergency healthcare meetings and suggestions on medication management. The role of pharmacists in national disasters, MAR charts understanding and usage, development of optimized patient's portals, usage suitability of medicines and inventory management of fast-moving medicines required at the time of emergency, and research on exacerbation of chronic diseases at the times of natural disasters were some of the prominent steps adapted globally to meet emergency situations. In Pakistan, these amendments can be adopted officially in profession for serving the patients in floods, which affect a large population of the country. Higher proportion of infections and lack of emergency preparedness procedures are yet the need to be resolved.

Ongoing Staff Education

- ✓ **Patient Safety Culture**
- ✓ **Departmental Quality Improvement**
- ✓ **POIC Meeting**
- ✓ **Peer Review and CME sessions**

-

Certificate of Achievement – International Pharmacy Certification

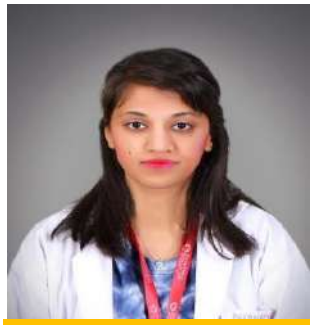
Adeel Siddiqui
Assistant Manager Pharmacy

Continuing professional development is essential in this day and age. At Shaukat Khanum Memorial Trust, Pharmacists are encouraged to pursue credentials and certifications, which helps them improve skill set and contribute to on-going patient care. Mr. Adeel Siddiqui, Assistant Manager Pharmacy & ASHP IPPR Preceptor for Surgical Services, at Shaukat Khanum Memorial Cancer Hospital & Research Centre, Lahore, has completed the Professional Certification from American Society of Health-System Pharmacists for Clinical Skills Certificate for International Pharmacy.

Link to this course is available online:

- Clinical Skills Certificate for International Pharmacy. ASHP. 2022. Available from: https://elearning.ashp.org/products/9004/clinical-skills-certificate-for-international-pharmacy

Board of Pharmacy Specialities – Board Certified Pharmacotherapy Specialists



Aleeshba Usman
Clinical Pharmacist

Ms. Aleesbha Usman, Clinical Pharmacist, at Shaukat Khanum Memorial Cancer Hospital & Research Centre, Lahore, has passed the Board of Pharmacy Specialities (BPS) exam for Pharmacotherapy and is our new Board-Certified Pharmacotherapy Specialists (BCPS) pharmacist.

Link to BPS page for further guidance is available online:

- Pharmacotherapy. Board of Pharmacy Specialties. BPS. 2022. Information available from: https://www.bpsweb.org/bps-specialties/pharmacotherapy/

Sharing is Caring- Presentations, Webinars, Conferences & Publications

The pharmacy department, as per tradition, has participated in various events and continued this trajectory, in the fourth quarter of 2022.

1. ASHP – Midyear 2022 Clinical Meeting and Exhibition, Las Vegas



Pharmacy residents from SKMCH&RC, Lahore, are going global. We are proud to see our international pharmacy practice residency program (IPPRP)'s pioneer resident, Mr. Fahad Javed, attending the American Society of Health-System Pharmacists (ASHP) Midyear 2022 Clinical Meeting and Exhibition, in Las Vegas, in United States of America, as part of his professional development. It is a proud moment for our Associate Director, Department of Pharmacy, Mr. Omar Akhlaq Bhutta and the ASHP Team, including the Residency Program Director, Ms. Saba Mazhar. At this event, our resident interacted with Mr. Paul W. Abramowitz, Chief Executive Officer of ASHP, Ms. Lynnae Mahaney, Senior Director at ASHP, and Mr. David J. Warner, Senior Director at ASHP. IPPRP residents are better trained to improve patient outcomes and deliver better patient care.

2. Publication


Assessment of Rivaroxaban versus Enoxaparin for Therapeutic Efficacy and Clinical Safety in Renally Compromised Cancer Patients

Assessment of Rivaroxaban versus Enoxaparin for Therapeutic Efficacy and Clinical Safety in Renally Compromised Cancer Patients, published in Journal of Xian Shiyou University, China.

Authors: Shakeel Ur Rehman, Abdul Wahab

3. 21st SKMCH Symposium, November 2022

Oncology Pharmacy Session



Remember to review patient's drug allergies in Hospital Information System

Feedback

To keep the Pharmacy Newsletter updated,
Please contact at druginfo@skm.org.pk