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NEWSLETTER

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Pharmacy Newsletter provides information regarding the decisions of P & TC, current concepts in drug therapy, warnings and cautions issued by various regulatory agencies, drug interactions, ADRs and matters related to drug usage.

Opinions expressed are of authors and does not necessarily represent AKUH's view/recommendations.

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Inside this Issue:

Inhalers & Global emissions:.....Page 1

Impact of Anticoagulation Management Clinics (AMC) at AKUH.....Page 2

TOX TOK! A Poisonous Candy for the children: Mothballs (Phenyl ki Goli).....Page 3

Warfarin – A High Alert Drug.....Page 4

Inhalers & Global emissions:

Miriam Kugele, Global Senior Manager, Environment & Sustainability

Air pollution in Pakistan is a major health concern with air quality in cities consistently above healthy levels. It is now well established that health care provision contributes a significant portion to global greenhouse gas emissions. Less well known is the fact that some treatments for respiratory illnesses can also contribute to climate change.

In particular, pressurised Metered Dose Inhalers (pMDI) use gases to deliver medications, which are potent greenhouse gases. Although chlorofluorocarbons (CFCs), which as ozone-depleting propellants, have largely been replaced by hydrofluoroalkanes, these propellant gases are also up to 3,350 times more potent than carbon dioxide as greenhouse gases.

A single pMDI, if fully used, can release as much greenhouse gas as a small car driven for 120 km; a single patient may use more than 12 inhalers a year.

Fortunately, there are alternatives. Some propellant inhalers are better than others for delivering the same type of drug, because either they use less propellant or a less damaging propellant. In most cases, dry powder-based inhalers (DPI) can be just as clinically effective as propellant inhalers and have a small fraction of the environmental impact.

A range of estimated carbon impacts of several common inhalers can be seen below:

Inhaler	Drug	Propellant	Global warming potential of propellant relative to CO ₂	Est. carbon footprint of propellant per device
Ventolin® Evohaler	Salbutamol	HFA134a	1300	24kg (estimated at 18.5g propellant)
Seretide® Evohaler	Salmeterol + Fluticasone Propionate	HFA134a	1300	12.95kg (estimated at 9.96g of propellant)
FosterNext®	Beclomethasone Dipropionate + Formoterol Fumarate	None - Dry Powder Inhaler	0	0kg

AKU is committed to reducing its carbon emissions towards achieving net zero carbon operations, and many measures will be taken which will have direct impact on improving air quality.

- Reducing the emissions and air pollution from energy generation and use, such as with renewable energy installations.
- Planning to electrify parts of the vehicle fleet.
- Improving incineration practices such as by removing incinerators from within health facilities and particulate control.

- Reviewing how inhalers are prescribed, dispensed, used, and disposed off.

In 2020, AKU started collecting data on which inhalers are dispensed from AKU pharmacies. As part of developing AKU's environment and decarbonization plan for all emissions areas, the AKU Pharmacy together with the Office for Environment and Sustainability and Pharmacy & Therapeutics Committee proposed various measures to reduce inhaler related emissions. These include, for example:

- An education programme to alert physicians and pharmacists to the relative impacts of different inhalers.
- Better understanding of prescription practices with the aim to make changes to favour lower carbon or propellant free inhaler alternatives where clinically appropriate.
- Developing guidelines for AKU physicians via AKU's Pharmacy and Therapeutics Committee; and guidance materials for patients via the Patient & Family Education (PFE) Committee.
- Engaging with manufacturers/suppliers to reduce propellants and costs for DPIs where possible.
- Collecting from patients and then disposing off inhalers in environmentally safe way.
- Sharing these learning points more widely with health professionals in countries where AKU works.
- Engaging the regulators e.g. Drug Regulatory Authority of Pakistan (DRAP) and Pharmacy & Poison Board, Kenya to initiate measures to reduce inhalers related emissions.

DPI (Dry Powder inhalers)



pMDI (Pressurised metered dose inhalers)



Practice: <https://www.cmaj.ca/lookup/doi/10.1503/cmaj.211747>

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Impact of Anticoagulation Management Clinics (AMC) at AKUH

Ayesha Mughal, Pharmacist

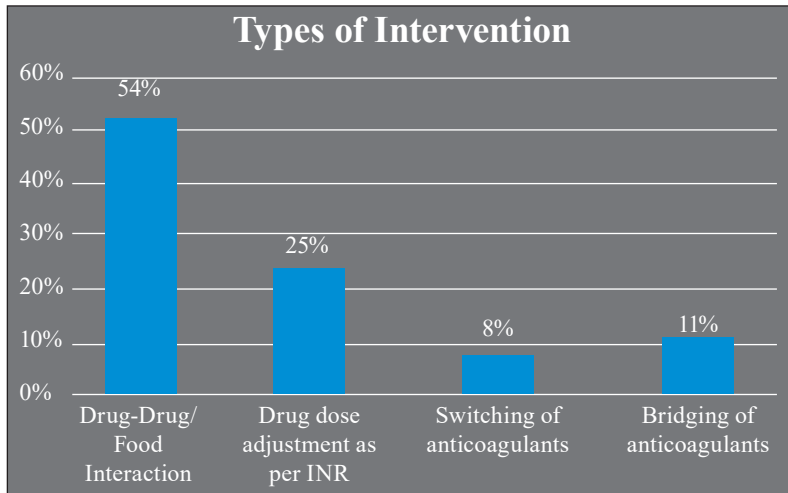
Anticoagulants (blood thinners) are used to treat and prevent certain medical conditions related to blood disorders. These drugs can cause major adverse drug events if misused or used without proper medical advice. Due to the complex dosing, strict monitoring, and patient non-compliance, the Joint Commission outlined the National Patient Safety Goal NPSG.03.05.01 regarding the rational use of anticoagulants.

The Anticoagulation Management Clinic is a specialized clinic at Aga Khan University Hospital in which the multidisciplinary team (Hematologist, Specialized Anticoagulation Pharmacist & Nurse) focuses on the monitoring and education of the patients receiving anticoagulation therapy. This clinic is held twice a week in Ibn-e-Zuhr building and accepts referrals from all services and follows patients in clinic, ER and over the phone if required.

As part of an Anticoagulation Management Service (AMS), anticoagulation pharmacists provide a range of care for both inpatients as well as ambulatory patients.

The clinic services includes:

- Rapid point of care INR testing in order to cut off the waiting time.
- Dosage adjustment as per the INR and increasing compliance of the patients towards their medication plan.
- Providing necessary education material about the use of anticoagulant medications, including side effects and potential drug and dietary interactions.
- Consultation with a specially trained pharmacist.
- Monitored anticoagulation management, including evaluation of side effects and drug/drug or drug/food interactions.



Total number of patients counseled in Year 2021 was 92 (Jan -Dec 2021) . Total number of interventions made by the pharmacist was 35.

Collaboration of pharmacists in anticoagulation clinics is safe, effective and results in significant improvements in overall management of the therapy with improving patient compliance and significant decrease in sub-therapeutic & supra-therapeutic cases with minimal adverse drug reactions.

TOX TOK! A Poisonous Candy for the children: Mothballs (Phenyl ki Goli)

Faqeeha Shakeel, Pharmacist

Naphthalene is a widely used industrial and household chemical available in the form of mothballs. But it has rarely been an agent of poisoning worldwide. Naphthalene balls ingestion after timely management generally results in good outcomes unless the patient is G6PD deficient.

Case: A “5 years old, 18 kg child was presented in ER with tachycardia, severe vomiting, slightly dizzy and a pungent smell coming from his mouth. Upon questioning, the mother said that the child has chewed mothballs placed in the cloth cupboard. The mother also induced vomiting immediately.”



Note: Pungent smell may indicate either mothball poisoning (as it has a pungent smell when exposed to air) or rodenticide poisoning (release phosphine gas).

Laboratory monitoring:

- Baseline CBC, electrolytes, liver function tests, renal function tests, urinalysis and urine dipstick test for hemoglobinuria were obtained.

Note: Ingestions of more than a single mothball should be followed for several days to rule out delayed hemolysis & Jaundice.

Management:

- There is no specific antidote and treatment is symptomatic & supportive.
- Activated charcoal was given to the patient as she was active.
Activated charcoal may be effective for many hours after a mothball ingestion because they dissolve slowly.
- Treated for nausea and vomiting with antiemetic (dimenhydrinate IV: 0.5 mg/kg/dose) .
- After 3 hours of observation, the child was discharged from emergency after being asymptomatic.

What should you know about mothballs?

- The mothballs are used to kill moths and other fiber insects to protect clothing. Always place mothballs inside tightly closed containers with holes along with the clothing or materials.

- Wash and air out fabrics immediately after storage and before use; they should no longer have a strong mothball smell.
- Store the unused portion of the box in a sealed plastic bag in a locked, childproof cabinet.

Take Home Message:

Mothballs are pesticides and volatilize slowly when placed in open air. Mothballs usually contain one of two active ingredients: naphthalene or paradichlorobenzene. Exposure to large quantities of naphthalene or paradichlorobenzene can lead to headaches, nausea, vomiting, diarrhea, eye/nose irritation and coughing. Moreover, if someone is exposed for an extended duration, they can have more serious effects like liver and kidney damage.

Warfarin – A High Alert Drug

Qurat-Ul-Ain Amir Butt, Pharmacist

Warfarin is an oral anticoagulant that acts as a vitamin K antagonist.

INDICATIONS: It is used for the prevention and treatment of venous and arterial thrombosis and embolism in patients with venous thromboembolic (VTE) disease, atrial fibrillation, prosthetic heart valves, tissue heart valves, or incidence of myocardial infarction.

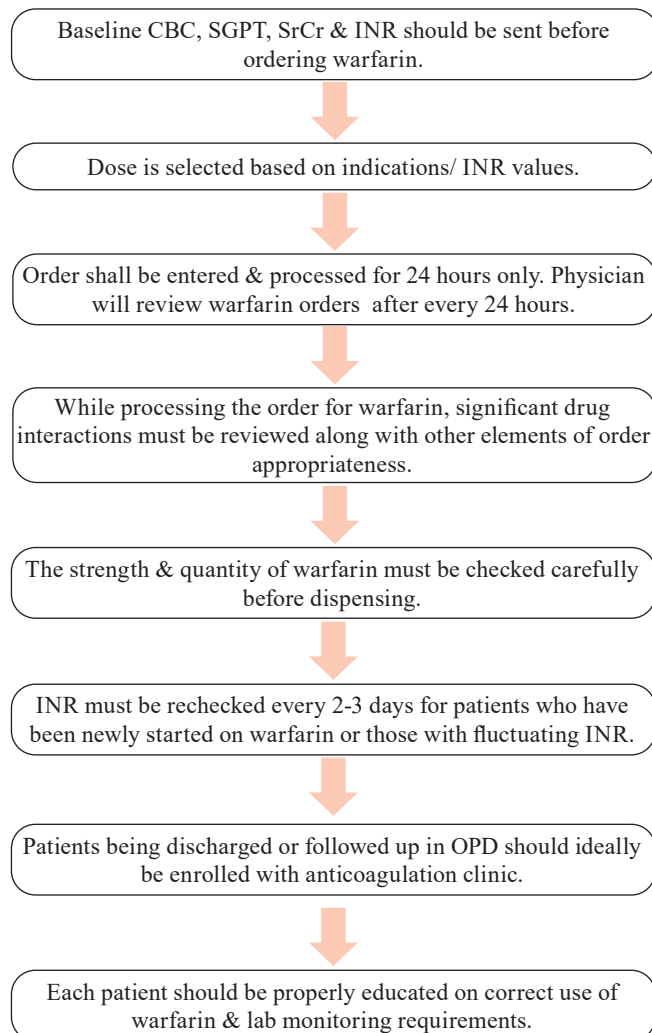
Warfarin tablets available at AKU

TABLET STRENGTH	COLOR
1 mg	Pink
2.5 mg	Green
5 mg	Light orange

Key Elements of Patient Education Regarding Warfarin

Identification of generic/brand names. Visual recognition of drug & tablet strength.
Purpose & expected duration of therapy.
Dosing & administration.
What to do if a dose is missed.
Importance of PT & INR monitoring.
Recognition of signs & symptoms of bleeding or thromboembolism & what to do if it happens.
Dietary considerations & potential for drug-drug & drug-food interactions.
Avoidance of pregnancy.
Importance of informing other health care providers that warfarin has been prescribed.

Steps for Warfarin Ordering



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