Empowering SMART Pharmacist Program

In continuation of its sincere efforts to raise pharmacists’ competencies and improve the level of pharmaceutical services provided to the patients in various health units, the Directorate General of Medical Supplies (DGMS) has successfully launched the SMART Pharmacy Program since October 2017. The program is a model for the development of the continuing education system; it relies on innovative and modern teaching methods through the use of the profile of each pharmacist (portfolio), which contains the criteria of pharmaceutical competencies and quality indicators. The program is supervised by Accreditation Council for Pharmacy Education (ACPE).

Up till now 89 pharmacists from various health institutions including the Ministry of Health, SQUH, AFH (Armed Forces Hospital), Royal Oman Police and Diwan Hospital, were trained in Asthma and COPD, Diabetes, Hypertension and Dyslipidemia module of the SMART Pharmacist program as shown in the table below. Those trainees are in turn, trained a number of pharmacists in their health units.

The objectives of the program in increasing the ratios of all quality indicators of pharmaceutical services that were measured before and after implementation of the program are met.

In this issue..

- Smart Pharmacist
- Managing inappropriate Polypharmacy
- ADR and LAB investigations
- Pharmacist career and poison control centers
- Pharmaceutical care journey across Oman

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In asthma patients, the average use of salbutamol inhalers per week and the average Peak Flow Meter (PFM) indicators were also measured and the results indicate increased control and marked improvement in follow-up patients.

The pharmacists used a patient-centered approach in collaboration with other providers on the health care team to optimize patient health and medication outcome by using drug-related problems. After collection and analysis of the data for the drug-related problems the most common cause of the drug-related problems was found to be the dose selection leading to the treatment ineffectiveness and safety problems. In most of the cases, pharmacist interventions were accepted and implemented by the prescriber level and most of the cases were solved.

<table>
<thead>
<tr>
<th>Sr</th>
<th>Training courses</th>
<th>Number</th>
<th>Institution</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Asthma and COPD</td>
<td>35 pharmacists</td>
<td>MOH</td>
<td>1st-3rd October 2017</td>
</tr>
<tr>
<td></td>
<td>Patient Care Process</td>
<td></td>
<td></td>
<td>27th-28th June 2018</td>
</tr>
<tr>
<td></td>
<td>Diabetes, hypertension and dyslipidemia</td>
<td></td>
<td></td>
<td>11th -12th September 2019</td>
</tr>
<tr>
<td>2</td>
<td>Asthma and COPD</td>
<td>26 pharmacists</td>
<td>Private Sector MOH, SQUH, AFH ROP and Diwan Hospital</td>
<td>25th -26th June 2018</td>
</tr>
<tr>
<td>3</td>
<td>Diabetes, hypertension and dyslipidemia</td>
<td>28 pharmacists</td>
<td>MOH</td>
<td>11th -12th September 2019</td>
</tr>
</tbody>
</table>

**Total Number:** 89 Pharmacists
Celebrating World Pharmacist Day
25th of September

As designated in 2009 by the International Pharmaceutical Federation Council (FIP), 25 September marks the annual World Pharmacists Day. This year FIP selected the theme “Safe and effective medicines for all” for World Pharmacists Day. The theme for 2019 aims to promote pharmacists’ crucial role in safeguarding patient safety through improving medicines use and reducing medication errors.

The Directorate General of Medical Supplies and pharmacists in Health Units celebrates this day all over Oman, by arranging different awareness activities to the patients and the public about the Services provided by the pharmacists.

Apart from celebration activities made by health units, the celebration this year was expanded further by effective participation of various pharmaceutical care Departments and pharmacists from different health institutes, in Oman Health Exhibition and Conference which is an international annual event that highlights the continuous development of the healthcare sector in Oman. In the exhibition, the pharmacists presented their various pharmaceutical services as shown in the table below. The services presented by pharmacists were widely recognized and appreciated by the exhibition attendance.

<table>
<thead>
<tr>
<th>Service</th>
<th>Presenter</th>
<th>Service</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit dose service</td>
<td>South Sharqiya region, Ibra Hospital &amp; Nizwa hospital</td>
<td>Antimicrobial stewardship</td>
<td>Sohar hospital &amp; Khoula hospital</td>
</tr>
<tr>
<td>Clinical pharmacy service</td>
<td>Khoula hospital</td>
<td>Pharmacist counseling</td>
<td>Hafit health center &amp; Barka P.C</td>
</tr>
<tr>
<td>Drug information service</td>
<td>Sultan Qaboos Hospital</td>
<td>Pharmacy lead diabetic clinic</td>
<td>Sumail hospital and polyclinic</td>
</tr>
<tr>
<td>Pharmacy lead warfarin clinic</td>
<td>Bousher polyclinic</td>
<td>Implementing Medication safety</td>
<td>Shinas Polyclinic,Khoula Hospital &amp; Ibri Hospital</td>
</tr>
</tbody>
</table>

Special thanks to … institutions that participated in the exhibition
OUTSTANDING ACHIEVEMENT BY OMANI PHARMACISTS

IHF AWARDS 2019 WINNERS:

Pharmacists from Royal Hospital and Sohar Hospital were presented the International Hospital Federation (IHF) Awards 2019 at a prestigious ceremony during the 43rd World Hospital Congress held in Muscat, Oman on 8,11.2020. The IHF Awards honors hospitals and health service provider organizations for innovation, excellence, outstanding achievements and best practices in areas that are worthy of international recognition.

Following an extensive review by the panel of judges composed of health leaders from around the world, 27 top entries from the four categories have been selected as winners.

Royal Hospital (Oman) is one of the Merit Awardees on their paper “Implementation of Lean in a Tertiary Care Public Hospital” the clinical pharmacist Jehan Al fanna was representing Royal Hospital team for receiving the award.

Sohar Hospital (Oman) is Merit Awarded for their research on “Multi-phasic project of Implementation of Antimicrobial stewardship program in the Sohar Hospital”. Pharmacists Dhia Rahmani, Alysha Alraisi, Adil Alblushi & Lab technician Eman Alraisa were representing Sohar team in receiving the award.

Sincere Congratulations to the above pharmacists for being merit awarded in this prestigious International competition.

LAB Investigations and ADRs Online Courses.

The Pharmaceutical care Department in DGMS organized two online courses and a workshop for each course in coordination with Dr. David Woods, Professional Practice Fellow/Clinical Adviser at the University of Otago.

I Laboratory Investigation Workshop:

The two days course was conducted on Laboratory Investigations, which is specially tailored to meet the needs of clinical pharmacists to interpret biochemical and clinical chemistry investigations. Moreover, to review the interpretation of electrolytes and other relevant blood parameters in the context of disease states, response to drug therapy and adverse drug reactions. 24 pharmacists from the below mentioned health units had attended and passed successfully the training courses & assessment.

<table>
<thead>
<tr>
<th>DGHS of North Batinah</th>
<th>Ibri hospital</th>
<th>Rustaq hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGHS of South Batinah</td>
<td>Khoula hospital (2 pharmacists)</td>
<td>Khasab hospital</td>
</tr>
<tr>
<td>DGHS of Muscat</td>
<td>Sohar hospital</td>
<td>Diba hospital</td>
</tr>
<tr>
<td>DGHS of North Sharqiya</td>
<td>Nahdha hospital</td>
<td>Bausher polyclinic</td>
</tr>
<tr>
<td>Royal Hospital (3 Pharmacists)</td>
<td>Sur hospital</td>
<td>Pharmaceutical Care DGMS</td>
</tr>
<tr>
<td>Nizwa hospital</td>
<td>Ibra hospital</td>
<td></td>
</tr>
</tbody>
</table>

II Adverse Drug Reactions and Drug Interactions:

The Second course was on topic of Adverse Drug Reactions and Drug Interactions, which focused on understanding the fundamental mechanisms and clinical significance of adverse drug reactions and drug interactions in clinical practice. The course also demonstrated categories of ADRs and drug interaction types. Participants in each course were provided by a series of e-learning materials and discussion forums. One-day seminar was conducted for each course, which presented by Dr. Woods and followed by a multiple-choice online assessment.
Managing Inappropriate Polypharmacy

Polypharmacy is one of a global and high-risk issue. The prevalence of Polypharmacy is increasing due to ageing population and increase in the chronic disease leading to co-morbidity.

The term Polypharmacy or multiple medications has different definitions, but the most common is the concurrent use of 5 or more medications including both prescription and nonprescription medications by a single individual. Polypharmacy is not just about the number of medications used, but also about the effectiveness, utility, and potential harm of each medication, both individually and in combination.

Types of polypharmacy:

Appropriate polypharmacy: Prescribing of multiple medicines for an individual for complex conditions or for multiple conditions, where the medicines are prescribed according to the best evidence.

Inappropriate polypharmacy: Prescribing of multiple medicines inappropriately or where the intended benefit of the medication is not realized.

It has many causes such as:

- Increase incident of chronic conditions in elderly.
- Poor communication between patients and health care providers.
- Uses of OTC medications to treat Side effects.
- Patients visit multiple settings and specialists have different opinions on treatments.
- Lack of patient education

It is associated with number of adverse consequences for example.

- Increase the risk of drug interactions and adverse drug reactions.
- Decrease patient complains and adherence to the treatment regimens.
- Increase disease progression, treatment failure and hospitalization.
- Increase demand on health budgets and reduce the efficiency of care.
PREVENTING ERRORS WHEN ADMINISTERING DRUGS VIA AN ENTERAL FEEDING TUBE

Medication errors related to administering drugs via an enteral feeding tube administration are often the result of administering medications that are incompatible with administration via a tube, preparing the medications improperly, and/or administering a drug using improper administration techniques, which can lead to an occluded feeding tube, reduced drug effect, or drug toxicity. These potential adverse outcomes can lead to patient harm or even death.

The drug’s physical and chemical properties control its release and subsequent absorption. These very specific delivery mechanisms may be altered or destroyed if the drug is administered through a feeding tube, reducing its effectiveness or increasing the risk of toxicity.

Oral medications intended to be taken by mouth must be prepared for enteral administration. Tablets must be crushed and diluted, capsules must be opened so the contents can be diluted, and even many commercially available liquid forms of drugs should be further diluted before being administered enterally a practice not well known to all practitioners.

Many immediate-release tablets can be safely crushed into a fine powder and diluted prior to administration. But, sublingual, enteric-coated, and extended/delayed-release medications should not be crushed. In addition to destroying the drug’s protective coating, crushed enteric-coated tablets tend to clump and clog feeding tubes. Crushed sublingual or extended/delayed-release medications can lead to dangerous and erratic blood levels as well as dangerous side effects.

Using a commercially-available liquid form of the medication or other preparations used to make oral suspensions may seem like a safe alternative. Also, excipients in some oral solutions and suspensions, such as sweeteners, gums, stabilizers, and suspension agents, can increase viscosity and osmolality, causing diarrhea, clogged tubes, and/or undelivered medication left in the tube.

The most common improper administration techniques include mixing multiple drugs together to give at once and failing to flush the tube before giving the first drug and between subsequent drugs.

Mixing two or more drugs together, whether solid or liquid forms, creates a brand new, unknown entity with an unpredictable mechanism of release and bioavailability.

The crushed drug as well as liquid medications should be diluted.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Why not to be administer via NGT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbamazepine</td>
<td>Enteral feeding may decrease carbamazepine absorption. Carbamazepine may bind to the feeding tube.</td>
</tr>
<tr>
<td>Fluoroquinolones</td>
<td>Bind to the feeding tube. Differences in hydrophilicity.</td>
</tr>
<tr>
<td>Phenytoin</td>
<td>Decreased serum phenytoin concentrations associated with enteral feeding. Phenytoin binds to feeding tube.</td>
</tr>
<tr>
<td>Warfarin</td>
<td>Warfarin interacts with vitamin K content in enteral formulas. Feeding tube may compromise the amount of warfarin reaching the patient.</td>
</tr>
<tr>
<td>Bosentan, finasteride, miglustat capsules</td>
<td>Can expose nurses to powder that can cause serious birth defects.</td>
</tr>
<tr>
<td>Lansoprazole</td>
<td>Must not be crushed because they contain enteric-coated microgranules</td>
</tr>
<tr>
<td>Ciprofloxacin, Doxycycline</td>
<td>Chemical interaction drugs and feeds bind</td>
</tr>
<tr>
<td>All medications in don’t crush list</td>
<td>Enteric-coated or extended/delayed-release medications</td>
</tr>
</tbody>
</table>
Pharmacist Career & Poison Control Centers

Poison control center

The mission of the National Poison Center is to prevent poisonings, save lives, and limit injury from poisoning. In addition to saving lives, Poison Control decreases health care costs of poisoning cases.

A poison control center is a medical facility that is able to provide immediate, free, and expert treatment advice and assistance over the telephone in case of exposure to poisonous or hazardous substances. Poison control centers answer questions about potential poisons in addition to providing treatment management advice about household products, medicines, pesticides, plants, bites and stings, food poisoning, and fumes.

Pharmacists' role in poison prevention. Poison prevention education can be incorporated into many facets of pharmacy practices. The approach to preventing an unintentional poisoning will likely vary from that of intentional poisoning. However, in both situations, prevention begins with the identification of high-risk patients.

Poison Control Pharmacist

A poison control pharmacist is a pharmacist that works with medical professionals and sick patients on drugs and toxicity. You will usually find them working in a poison control center fielding calls from parents who have questions about their children ingesting certain things, or calls from a physician on certain medications. This position must use all the clinical knowledge they have acquired in making fast decisions and answering questions correctly to treat patients and deliver the right answers to clinicians and healthcare personnel.

Poison control pharmacists also develop action plans for handling poisonous and hazardous chemicals, toxins, or interactions with harmful drugs. They also conduct training and disseminate information on poison prevention and the toxicity of certain drugs and their combinations. Poison control pharmacists normally work in hospitals, poison control centers, at universities, and in consulting firms.

What skills are required for success as a poison control pharmacist?

- Be able to communicate with healthcare professionals and members of the public over the telephone during a crisis
- Have a working knowledge of crisis intervention techniques and procedures
- Have data entry and documentation skills
- A strong knowledge of pharmacology and toxicology

Education and Career

The world of pharmacy is continuously growing. There are a number of specialty careers options that enhance the level of interactivity when dealing with the pharmaceutical industry. If you are looking for a varied experience and want to have an additional challenge in this field, if you would like becoming a poison control pharmacist consider the following career options:

- CLINICAL TOXICOLOGY typically, the clinical toxicologist is a medically qualified graduate who has specialist knowledge of the adverse effects of drugs and other chemicals in humans – and especially how to treat patients who have been exposed to a toxic substance.
- Fellowship training programs can be found through the American Academy of Clinical Toxicology, but if you're interested in further advancement, the American Board of Applied Toxicology certifies non-physician clinical toxicologists.

Purified water (e.g., sterile water) is the preferred diluent for most drugs. Tap water is not advised, as it often contains chemical contaminants (e.g., heavy metals, medications) that might interact with the drug. The diluted medication should be drawn up into an oral syringe and dispensed to the nursing unit ready for administration.

Medication(s) should not be added directly to the feeding formula. Mixing drugs with the formula could cause drug-formula interactions, leading to tube blockages, altered bioavailability, and changes in bowel function. The feeding should be stopped and the tube flushed with at least 15 mL of purified water before and after administering each medication.
Pharmaceutical Care Journey across Oman

With the aim of standardizing the pharmaceutical care practice among all healthcare units in the Sultanate, the Directorate of Pharmaceutical Care team went on a mission across Oman during 2019, visiting different healthcare units in different governorates of the Sultanate, including; North & South Al Batinah, North & South Sharqiya, Al Wusta, Al Dakhiliya, Musandam, Dhofar & Muscat.

In collaboration with the health units, the visiting team assessed the pharmaceutical care service profile, discussed the challenges the pharmacists face in their daily practice and suggested some reasonable solutions to improve the practice. Furthermore, the team analyzed the findings to identify the gaps, categorized the situation, prioritized interventions & presented the most suitable recommendation to the concerned regulatory bodies, to take the necessary actions. After the analyzation, it was concluded that the biggest challenge most of the healthcare institutions in the Sultanate face is, staff shortage due to a variety of reasons. However, despite the shortage also, the pharmacy staff meticulously compensated for the shortage with enthusiasm, exerting tremendous efforts, productive teamwork and being flexible with the work schedules, even if it means working extra shifts & sacrificing their off days, which reflects the selflessness, nobility & high ethical standards of the pharmacy cadres across Oman.

Next year, the team plans to visit more health units including the ones in Buraimi & Dhahira governorate, and all the tertiary hospitals in Muscat to form the full picture of pharmacy practice in Oman. Also these institutions will be revisited in the future, to monitor the progress achieved as an outcome of the previous visits. This mission comes as a part of the many efforts the Directorate of Pharmaceutical Care in the Directorate General of Medical Supplies, committing to raise the level of the pharmaceutical care in Oman.