Under the Patronage of His Highness,
Sheikh Nasser Al-Mohamed Al-Ahmad Al-Sabah ,
the Prime Minister of the State of Kuwait, and the presence of
His Excellency Dr.Hilal Al-Sayer, the Minister of Health

The 3rd KUWAIT INTERNATIONAL PHARMACY CONFERENCE (KIPC 2011)

14 - 16 February, 2011

Medication Safety

The 3rd KUWAIT INTERNATIONAL PHARMACY CONFERENCE

ABSTRACT BOOK

http://www.hsc.edu.kw/fop/events/KIPC2011/

جامعة الكويت

The 3rd Kuwait International Pharmacy Conference

Medication Safety

February 14- 16, 2011
Under the Patronage of His Highness, Sheikh Nasser Al-Mohamed Al-Ahmad Al-Sabah, the Prime Minister of the State of Kuwait

ABSTRACT BOOK

His Highness
Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah
Amir of the State of Kuwait

His Highness
Sheikh Nawaf Al-Ahmad Al-Jaber Al-Sabah
Crown Prince of the State of Kuwait

His Highness
Sheikh Nasser Al-Mohammed Al-Ahmad Al-Sabah
Prime Minister of the State of Kuwait

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General Information

Conference Date & Venue

February 14th to 16th, 2011 at Al-Hashemi Grand Ball Room, Radisson Blu Hotel, Kuwait

Conference Inaugural Ceremony

February 14th, 2011 - 9.00 am
by HH the Prime Minister of Kuwait & opening by Minister of Health Dr. Hilal Al-Sayer

Plenary Lectures & Exhibitions

February 14th to 16th, 2011 at Al-Hashemi Grand Ball Room, Radisson Blu Hotel, Kuwait

Workshops

February 14th, 2011 from 5.00 pm to 6.30 pm at Failaka Hall & Warba Hall, Radisson Blu Hotel, Kuwait
February 15th, 2011 from 4.00 pm to 6.00 pm at Failaka Hall & Warba Hall, Radisson Blu Hotel, Kuwait

Registration Desk

For registration and any enquiries or assistance, please proceed to the Registration Desk at ground floor at Al-Hashemi Grand Ball Room, Radisson Blu Hotel, Kuwait

CME/CPD Credits

Registration Number:	118Ph0/Feb11
Title of Activity:	The 3rd Kuwait International Pharmacy Conference
Scheduling:	February 14th -16th, 2011
CME Provider:	Faculty of Pharmacy
CME Organizer:	Dr. Abdelmoneim Awad

CME/CPD Credits:

Category 1:

Lectures:	13 credits
Poster Presentations:	Presenting Author: 1 credit Co-author- 0.5 credit
Podium Presentations:	1.5 credits
Workshops:	2 credits

Category 2:

Poster Viewing :	2 credits

Chairman's Message

Dear Colleagues,

Welcome to the 3rd Kuwait International Pharmacy Conference, ***Medication Safety****, 14-16 February 2011. We are so glad that you have joined us for what promises to be an exciting 3 days here. This meeting is the place to get what you need to help guide you change your practice site toward safer system and to stimulate thinking to design greater research. We have a group of remarkable and engaging speakers to deliver our lectures and educational sessions. Our sessions will be focused on medication safety topics that of interest to pharmacists, physicians, educators, researchers and other attendees who will attend this meeting.*

The plenary sessions and workshops are related to basic and new knowledge about medication errors, new technology, selected topics on safety from pharmaceutical sciences perspectives, and updates on regional medication safety initiatives.

I am sure you will benefit from everything the conference has to offer. This is the only regular, bi-annual, meeting of pharmacy in Kuwait and only your active participation with us can make it a success.

Enjoy your stay in Kuwait!

With best wishes on behalf of the organizers.

Dr. Mohammad Waheedi
Organizing Committee Chair

The 3rd Kuwait International Pharmacy Conference

Organizing Committee

- Dr. Mohammed Waheedi (Chair)
- Dr. Abdelmoneim Awad (Co- Chair & Chair of Scientific Committee)
- Dr. Maitham Khajah (Co-Chair)
- Dr. Khaled Orabi
- Dr. Mohsen Hedaya
- Ms. Ahlam Al-Mudaf
- Ph. Marwa Al-Jassar (Pharmacy Administration- Ministry of Health)
- Ph. Mariam Al-Yaseen (Central Medical Store-Ministry of Health)
- Ph. Shaimaa Abdel-Meguid
- Ms. Sanaa Akroof
- Ms. Teena Sadan
- Ms. Noor Alkhuribat
- Ms. Nehad Kamal Nashat
- Ms. Farah Al-Ayadi (Services Department-Kuwait University)

Chairman with the Scientific Committee of KIPC 2011

Scientific Committee

- Dr. Abdelmoneim Awad; Department of Pharmacy Practice, Faculty of Pharmacy (Chair)
- Dr. Khaled Orabi; Department of Pharmaceutical Chemistry, Faculty of Pharmacy
- Dr. Mohsen Hedaya; Department of Pharmaceutics, Faculty of Pharmacy
- Dr. Maitham Khajah; Department of Applied Therapeutics, Faculty of Pharmacy

The 3rd Kuwait International Pharmacy Conference

Invited Speakers

Prof. David Westfall Bates
Keynote Speaker
Chief, General Internal Medicine and Primary Care Division
Brigham and Women's Hospital
Medical Director, Clinical and Quality Analysis
Partners HealthCare System, Inc.
Professor of Medicine
Harvard Medical School

Dr. Christian Hartman

UMass Memorial Medical Center
Worcester, Massachusetts
Medication Safety Officer
Residency Program Director – Medication Use Safety Residency (PGY2)
Manager-Inpatient, Pharmacy Department, USA

Prof. Salah M Blaih
Professor of Chemistry

Kent State University Trumbull

Dr. Michael R. Cohen
President, Institute for Safe Medication Practices, Horsham, PA

Adjunct Associate Professor of Pharmacy, Temple University, Philadelphia, PA
Assistant Editor, Hospital Pharmacy, Facts and Comparisons, St. Louis

Dr. Leslie R. Mackowiak
Director Horizon Clinicals

Vanderbilt University Medical Center
3401 West End Ave. Suite 690
Nashville TN

Dr. Christopher R. Fortier
Manager, Pharmacy Support & OR Services

Clinical Assistant Professor
Department of Pharmacy Services
Medical University of South Carolina
Ashley Avenue
Rutledge Tower Annex, Charleston, SC

Prof. Bill G. Felkey
Professor Emeritus of Healthcare Informatics

Pharmacy Care Systems
Dunstan Hall
Auburn University, Alabama

Prof. Roger Jelliffe
Professor USC Department of Medicine
Alcazar Street
Los Angeles CA

Prof. Richard Kingston
President, Regulatory and Scientific Affairs
SafetyCall™ International
8009 34th Ave South, Suite 875
Bloomington, MN 55425 &
Clinical Professor of Pharmacy, College of Pharmacy,
University of Minnesota

Prof. Marv Shepherd
Director
Center for Pharmacoeconomic Studies
College of Pharmacy
University of Texas
Austin, Texas

Prof. Saleh A. Bawazir
Professor of Clinical Pharmacy and Vice President for Drugs Affairs, Saudi Food and Drug Authority

Department of Clinical Pharmacy
College of Pharmacy, King Saud University
Riyadh, Saudi Arabia

Dr. Manal B Al-Zaidan
BSc(Pharm), PharmD candidate, Purdue University

Pharmacy Director, Al Amal Hospital. A/ Pharmacy Director, Heart Hospital,
Hamad Medical Corporation www.hmc.org.qa
Qatar

Program at a Glance

Monday February 14th, 2011	Tuesday February 15th, 2011	Wednesday February 16th, 2011
8:00 am – 5:00 pm Registration		
9.00 am – 9.45 am Opening Ceremony	9.00 am – 10.00 am Podium Presentations	9.00 am– 10.00 am Podium Presentations
9.45 am – 10.30 am Opening of Exhibitions	10.00 am – 11.00 am Plenary Lecture	10.00 am – 11.00 am Plenary Lecture
10.30 am – 11.15 am Keynote Lecture	11.00 am – 11.15 am Coffee Break	11.00 am – 11.15 am Coffee Break
11.15 am – 12.00 pm Plenary Lecture	11.15 am– 12.00 pm Plenary Lecture	11.15 am – 12.00 pm Plenary Lecture
12.00 pm – 1.00 pm Lunch and Poster Presentations	12.00 pm – 1.00 pm Lunch and Poster Presentations	12.00 pm – 1.00 pm Lunch and Poster Presentations
1.00 pm – 1.40 pm Plenary Lecture	1.00 pm – 1.45 pm Plenary Lecture	1.00 pm – 3.00 pm Plenary Lectures
1.45 pm – 2.25 pm Teleconference	1.45 pm – 3.00 pm Podium Presentations	3.00 pm – 3.15 pm Coffee Break
2.25 pm – 3.05 pm Plenary Lecture	3.00 pm – 3.15 pm Coffee Break	3.15 pm – 4.00 pm Podium Presentations
3.05 pm – 3.45 pm Plenary Lecture	3.15 pm – 4.00 pm Plenary Lecture	4.00 pm – 5.15 pm Plenary Lectures
3.45 pm – 4.00 pm Coffee Break	4.00 pm – 6.00 pm Parallel Workshops	5.15 pm – 6.00 pm Closing Remarks
4.00 pm – 4.45 pm Plenary Lecture		7.00 pm - 8.00 pm Farewell Dinner
5.00 pm – 6.30 pm Parallel Workshops		

The 3rd Kuwait International Pharmacy Conference

Scientific Program

Time	Topic	Speakers	Chair/Co-Chair
08:00 am - 05:00 pm	Registration		
09:00 am - 09:45 am	Opening Ceremony		Khalid Orabi
09.45 am – 10.30 am	Opening of Exhibitions		
10:30 am - 11:15 am	Using Health Information Technology to Improve Medication Safety	David Bates	Mohammed Waheedi
11:15 am - 12:00 pm	Medication Error Reporting Systems-I	Christian Hartman	Samuel Kombian
12:00 pm - 01:00 pm	Lunch and Poster Presentations		
01:00 pm - 01:40 pm	Medication error reporting systems-II MEDMARX	Salah Blaih	Samuel Kombian
01:45 pm - 02:25 pm	Medication Safety: Path to Success (Teleconference)	Michael Cohen	Mohammed Waheedi Fatma Jeragh
02:25 pm - 03:05 pm	Technology to Address Medication Errors: At prescribing Stage	Leslie Mackowiak	Mohammed Waheedi Fatma Jeragh
03:05 pm - 03:45 pm	Technology to address medication errors: At administration stage	Christopher Fortier	Mohsen Hedaya
03:45 pm - 04:00 pm	Coffee break		
04:00 pm – 04.45 pm	Technology to Address Medication Errors: At Preparation, Dispensing and Distribution Stages	Christopher Fortier	Mohsen Hedaya
05:00 pm - 06:30 pm	Parallel Workshops		
	The Role of Technology in Preventing Medication Errors	Bill Felkey	Failaka Hall
	Individualized Drug Therapy with a Laptop at the Bedside	Roger Jelliffe	Warba Hall

Time	Topic	Speakers	Chair/Co-Chair
08:00 am - 05:00 pm	Registration		
09:00 am – 10:00 am	Podium Presentations	3 Presentations	Maitham Khajah
10:00 am - 11:00 am	System quality improvement to prevent medication errors	Leslie Mackowiak	
11:00 am - 11:15 am	Coffee Break		
11:15 am - 12:00 pm	Practical Implications for the safe and effective clinical use of Botanicals: Toxicology, Safety, Interactions and Clinical Practice	Rick Kingston	Khaled Orabi
12:00 pm - 01:00 pm	Lunch and Poster Presentations		
01:00 pm - 01:45 pm	Examining the Regulatory Framework for Insuring Botanical Supplement Safety	Rick Kingston	
01:45 pm - 03:00 pm	Podium Presentations	4 Presentations	Oludotun Philips
03:00 pm - 03:15 pm	Coffee Break		
03:15 pm - 04:00 pm	Incorporating Medication Safety in the Education of Students of Health Professions	David Bates	Yunus Luqmani
04:00 pm - 06:00 pm	**Parallel Workshops**		
	1. Herbal Medicines	Rick Kingston	Failaka Hall
	2. Pharmacoeconomics and Drug Safety for Decision Makers	Marv Shepherd	Warba Hall
	3. Public Education	• Abdelmoneim Awad • Maitham Khajah • Fatma Jeragh • Eman Abahussain	Al-Hashemi Ball Room

Time	Topic	Speakers	Chair/Co-Chair
08:00 am - 05:00 pm	Registration		
09:00 am - 10:00 am	Podium Presentations	3 Presentations	Chair: Ivan Edafiogho Co-Chari: Abdullah Al-Bassam
10:00 am - 11:00 am	Worldwide Landscape of Fake Drugs and Products Assurance Methods	Marv Shepherd	Yunus Luqmani
11:00 am - 11:15 am	Coffee Break		
11:15 am - 12:00 pm	Regional drug safety, policy, regulations and procedures	Saleh Bawazir	Kamal Matar
12:00 pm - 01:00 pm	Lunch and Poster Presentation		
01:00 pm - 01:40 pm	Update on drug optimization in clinical settings	Roger Jelliffe	
01:40 pm - 02:20 pm	Pharmacogenomics and drug safety	Salah Blaih	Aly Nada
02:20 pm - 03:00 pm	Regional medication safety initiative	Manal Zaidan	
03:00 pm - 03:15 pm	Coffee Break		
03:15 pm - 04:00 pm	Podium Presentations	2 Presentations	Abdelazim Zaghloul
04:00 pm - 04:30 pm	The Use of Rules-Based Clinical Surveillance to Address National Patient Safety Goals and Medication Safety Standards	Christian Hartman	
04:30 pm – 05:15 pm	Achieving Next Level Patient Safety Through Participatory	Bill Felkey	Mohammad Waheedi
05:15 pm- 06:00 pm	Closing Ceremony		
07:00 pm - 08:00 pm	Farewell Dinner		

The 3rd Kuwait International Pharmacy Conference

Abstracts
Plenary Lectures

Prof. David W. Bates, MD, MSc

Professor of Medicine, Harvard Medical School,
and Professor of Health Policy and Management,
Harvard School of Public Health, USA

Using Health Information Technology to Improve Medication Safety

Medications are generally beneficial but can also cause substantial harm. The evidence regarding medication safety will be reviewed, with a focus on medication safety issues in hospitals. The epidemiology of the problem will discussed, with an emphasis on considering what prevention strategies may be most effective. While most of the evidence comes from developed countries, increasingly information is becoming available from transitional and developing countries, and this will also be reviewed. Several strategies involving information technology appear especially beneficial for preventing medication-related harm. These include computerized provider order entry linked with clinical decision support, implementation of bar-coding, use of intravenous "smart" pumps, computerized monitoring for adverse drug events, and implementation of computerized assistance for medication reconciliation. The evidence that each of these is beneficial will be discussed, along with specific issues in implementation relating to each. The future of medication safety in hospitals will also be discussed.

Dr. Christian Hartman

UMass Memorial Medical Center, Worcester, Massachusetts,
Medication Safety Officer
Residency Program Director – Medication Use Safety Residency (PGY2),
Manager-Inpatient, Pharmacy Department, USA

Medication Error Reporting Systems - I

Program Objectives:

-Describe methods and sources to internally capture medication error data.

-Explain the value of external (national) medication error data to improve the medication use process.

-Identify challenges to implementing technology for error reporting.

Presentation Abstract:

Medication error reporting has been the cornerstone to same patient care and the starting oint for most medication safety programs. The underlying just culture of an organization creates an environment for the reporting of errors and adverse events. Organizations have often struggled with the accurate collection the data, investigation, and development of quality improvement plans.

Organizations are tasked with managing both internal medication error reporting and external mandatory reporting. Prioritization and balance of collection strategies is needed when developing a reporting program.

Technology has moved medication error from the traditional paper-based report to an electronic format. New challenges arise when converting to electronic reporting and need to be addressed for a successful medication error reporting program.

Prof. Salah M. Blaih, Ph.D., R.Ph., FRSC

Department of Chemistry and Biochemistry,
Kent State University, Ohio, USA

Medication Error Reporting Systems-II MEDMARX

A medication error is any preventable event that may cause or lead to inappropriate medication use or harm to a patient. Medication errors occur for a vari¬ety of reasons. For example, mis¬communication of drug orders can involve poor handwriting, confusion between drugs with similar names, poor packaging design, and confu¬sion of metric or other dosing units. In the 2006 Institute of Medicine report, it was estimated that medication errors harm 1.5 million patients annually with 7,000 deaths.

MEDMARX® is a national, Internet-accessible database that hospitals and health care systems use to track and trend adverse drug reactions and medication errors. Between 2001 and 2008, USP analyzed medication error records submitted by facilities participating in its national medication error and adverse drug reactions reporting program, MEDMARX®. The data was compiled, summarized, and presented in an in-depth annual report. Information in the report included types of medication errors, causes, contributing factors, products involved, and actions taken. Since 2008, MEDMARX has been operated by Quantros (a provider of real-time quality, safety and risk management), in alliance with USP and recently with ISMP.

The USP's 2008 report identified 1,470 drugs involved in look-alike and/or sound-alike (LASA) errors. This analysis identified 798 drugs that were involved in LASA error with only one other product. Cefazolin, lisinopril , enalapril, and prednisone were among drugs associated with the greatest number of LASA drug pairs. Other drugs were paired with two or more drugs; for example, aripiprazole, lansoprazole, and omeprazole.

The leading types of error associated with LASA will be identified; the most common is administering an unauthorized/ wrong drug. Other errors were drugs prepared incorrectly, improper dose, wrong dosage forms and prescribing error. Staff involved in LASA errors will also be discussed. Slightly more than two thirds of the records were associated with the pharmacy department. Other involved staff members include nursing staff and prescribers. Selected cases involving LASA errors will be presented.

Prof. Michael R. Cohen, RPh, MS, ScD

Institute for Safe Medication Practice
Horsham, PA 19044

Medication safety: path to success

Description

The session will provide attendees with timely information needed to prevent medication errors and face some of the most challenging issues associated with today's medication use systems. Practical information and advice will be provided about prevention of major types of medications errors as reported to the ISMP Medication Error Reporting Program (MERP) in the United States. Discussion topics include identifying recent US initiatives that are addressing errors through implementation of health policy-level prevention strategies. Finally, information will be presented on the need to strategically focus error prevention strategies on being proactive in addressing the most vulnerable components of medication use, the drugs that have the greatest potential to cause harm, and the patients who are at greatest risk for a serious error.

Objectives:

1. Identify, discuss and recommend prevention methods for recently reported serious medication errors.
2. Identify system enhancements to prevent errors, detect errors before they reach a patient, or minimize the consequences of medication errors.
3. Identify recent US national initiatives to prevent medication errors.
4. Understand the value of focusing error reduction efforts on the system rather than individuals.

Prof. Leslie R. Mackowiak, RPh, M.S.

Director Horizon Clinicals, Vanderbilt University Medical Center
3401 West End Ave. Suite 690, Nashville TN

Technology to address medication errors: At prescribing stage.

Computerized Physician Order Entry, known as CPOE has been used in the United States since the 1970s. It came into more common use since the Institute of Medicine report, *To Err Is Human*, was published in 2000. (1) This publication suggested that one way to reduce medication errors was to use a computerized decision support system to help with physician ordering. Decision support includes any functionality within the application that provides guidance and/or incorporates knowledge to assist the clinician in entering complete, accurate and appropriate patient care orders. These systems have been primarily used in hospital inpatient systems but more recently are used in outpatient prescription writing as well. Today, approximately 20% of hospitals in the US use CPOE for inpatients. It is estimated that in 2009, 12% of outpatient prescriptions were sent electronically in the US.

Setting up a CPOE system requires a computer infrastructure that is fast, ubiquitous and reliable. Successful CPOE implementations require hospital and physician leadership, adequate financial resources and a dedicated project team. (2) A basic implementation of CPOE, simply automating order entry using an electronic system for ordering, improves error types stemming from misspelling and handwriting. To further reduce medication errors, typically computerized systems introduce increasingly complex types of decision support. These types of decision support can be passive or interactive. Passive decision support can be as simple as adding a brand drug name next to the generic drug name which adds confirmation of "right drug" to the selection. Interactive decision support can be implemented using commercial drug data bases for allergy or drug interaction checking or supported by complex software rules such as choosing a drug dose based on gestational age, weight, patient disease, renal function and setting. One of the key tools in decision support is the use of prebuilt sets of orders called order sets. They guide the physician based on disease or procedure to select standardized orders often based on evidenced based medicine. There are many variations of decision support used for both inpatient and outpatient computerized decision support systems will be discussed.

Outpatient prescribing done with a computer or e-prescribing, as it is commonly referred to, is increasing in the US, in part because of new government incentive plans. The goal is to stimulate the adoption of these systems by physicians by government support of the start up costs. The same decision support used for inpatient CPOE can be used in the outpatient setting. These systems also generally include a link to the patient's prescription insurance plans as different insurance companies include different drugs in their formularies. The ultimate goal is to link the patient's entire drug history record. Since patients can go to any outpatient pharmacy to get their prescription filled, patients may be on incorrect or inappropriate drugs but no one healthcare professional may be able to see this. This linking can further reduce medication errors.
Many studies have been done to support medication error reduction using CPOE. (3, 4) There have also been reports in the literature about CPOE increasing medication errors in hospitals. (5) These reports will also be discussed.

1. *Crossing the Quality Chasm: A New Health System for the 21st* Century, Washington. D.C. : Institute of Medicine, 2001.
2. From: AHA, First Consulting Group report: *Computerized Physician Order Entry: Costs, Benefits and Challenges, Jan 2003*
3. *Kuperman, G.J., Bobb, A., Payne T.H., Avery, A.J., Gandhi, T.K. , Burns, G., Classen, D.C. & Bates, D.W., (2007) Medication –related clinical decision support in computerized provider order entry systems: a review, Journal of the American Medical Informatics Association, 14, 29-40.*
4. *Kaushai, R., Shojania, K.G., Bates, D.W., (2003) Effects of Computerized Physician Order Entry and Clinical Decisions Support Systems on Medication Safety, Archives of Internal Medicine, 16 No. 12.*
5. Van Roose, F., Maat, B., Rademaker, C., Van Vught, A.J., Egberts A., Bollen, C., *The Effect of Computerized Physician Order Entry on Medication Prescription Errors and Clinical Outcome in Pediatric Intensive Care: A Systematic Review*, Pediatrics, *123, 1184-1190.*

Dr. Christopher R. Fortier, PharmD

Manager, Pharmacy Support & OR Services
Medical University of South Carolina Medical Center
Clinical Assistant Professor
South Carolina College of Pharmacy
Charleston, SC, USA

Technology to address medication errors: At administration stage

Medication errors at the administration phase of the medication-use process are documented to be as high as 38%. Barcode medication administration (BCMA) and smart infusion pump technologies have been implemented in the United States primarily over the last 10 years to specifically address these types of medication errors.

Barcode medication administration was initially implemented within a few hospitals in the mid-1990's and was first used widespread by the Veterans Affairs system. Currently, only 27.9% of hospitals have implemented this technology in which studies have shown it can reduce medication administration errors between 50% and 90%. With over 20 different BCMA systems on the market, hospitals are seeking resources in order to assess institutional barcode readiness, to develop a stepwise implementation plan, and to better understand the pharmacy/nursing challenges.

Over the last couple years smart infusion pump implementation has grown to its current adoption rate of 56.2% nationally. Smart infusion pump technology focuses on bedside medication error prevention by providing an automatic safety-net during intravenous infusion pump delivery. Smart pumps feature software that incorporates institution-established dose limits, clinician warnings, and configurable settings for specific patient populations. Significant pharmacy hours for the initial planning and custom drug library development are critical for a successful implementation.

With BCMA and smart pumps representing such a change in the medication-use process, it is essential for pharmacy to have an efficient plan and timeline for leading the multidisciplinary implementation of the medication piece for both systems. Organizations must have a strategic plan that incorporates project management principles, change management standards, continuous quality improvement, and for the financial impact, not only the software, but also the devices and staffing resources required for an efficient transition.

Dr. Christopher R. Fortier, PharmD

Manager, Pharmacy Support & OR Services
Medical University of South Carolina Medical Center
Clinical Assistant Professor
South Carolina College of Pharmacy
Charleston, SC, USA

Technology to address medication errors: At preparation, dispensing, and distribution stages

With the increasing number of medications available on the market and the rise of patients using more drug regimens, hospital inpatient pharmacies have been shifting to the use of automation as a method to reduce the potential for medication errors. Automation addressing procurement/storage, medication retrieval, compounding, labeling, dose checking, and distribution to the patient care area has been incorporated into pharmacies across the United States in variable ways. Overall, these technologies not only enhance medication safety but also can create more efficiencies with the drug preparation, dispensing, and delivery processes.

Studies reveal that 11% to 21% of medication errors occur during the dispensing phase of the medication-use process. Therefore, hospitals initially adopted technologies and automation such as automated dispensing cabinets, robots, repackaging equipment, and TPN compounders to address these types of errors. Over the last couple years some organizations have begun implementing medication carousels, automated workflow systems, telepharmacy modules, IV robotics, and medication tracking systems as they work towards a completely closed-loop safety system. Many of these technologies possess functionally such as bar code technology, bidirectional interfaces, and system alerts to identify inaccuracies within the mediation preparation and dispensing processes.

The implementation of these systems has allowed for a reduction in medication errors as well as created improved efficiency, inventory management, and overall better patient outcomes. Most importantly, it has allowed some organizations to free up pharmacists time to provide a higher level of clinical pharmacy services while continuing with a high quality dispensing process.

Prof. Leslie R. Mackowiak, RPh, M.S.

Director Horizon Clinicals
Vanderbilt University Medical Center
3401 West End Ave. Suite 690
Nashville TN

System Quality Improvement to Prevent Medication Errors.

Medication safety is a journey, it's a lifelong journey. It is a never ending journey. There will always be more to do, to fix, to understand and to prevent. It requires constant feedback loops and monitoring. We must understand the impact of changing one part of the system on the other parts. If we don't understand all of the effects we can create "unintended" consequences that create new errors while we are trying to prevent an error. There is a lot of technology available today. It is important that we truly understand our errors, what is causing them and what these technologies truly prevent and more importantly what they don't prevent. Sometimes we are drawn to the new technology and expect it to be a miracle cure for our problems. Just like there not miracle drugs, there are not miracle technologies. We must factually assess our environments and understand what level of technology, process and people we currently have and what technology can be supported in the future. We need to review all the options for improving the steps in the medication process and decide where to begin and then understand where to go next.

Once we have technology in place, we need to have systems in place to monitor it. The good news is that technology produces data to help us better monitor our medication systems. Data can come from the natural outputs of a system or it can be derived from outputs of the system. Creating baselines of data can help us monitor the use of systems over time. Part of our original system implementation planning needs to include setting up monitoring systems.

We can also use medication safety incident reporting systems to monitor our technical as well as our non- technical processes.

Another valuable source of information in monitoring our systems comes from outside safety monitoring groups and from the literature. We must survey the literature to prevent errors in our systems that are reported by others.

We are developing pharmacy informatics experts in the US who can work with these systems. Pharmacists need to work with and learn from their IT colleagues. They need to develop the knowledge and skills to understand how to work with both pharmacy automation systems, system integration, project management and pharmacy data management systems.

New and better technology will continue to be introduced and we must develop the skills to assess the current state of our systems, the true problem that is causing errors and whether or not the new technology will truly solve the problem.

Prof. Richard Kingston

President, Regulatory and Scientific Affairs SafetyCall™ International
Bloomington, MN
&
Clinical Professor of Pharmacy
College of Pharmacy, University of Minnesota

Practical Implications for the safe and effective clinical use of Botanicals: Toxicology, Safety, Interactions and Clinical Practice

Botanical medicines remain one of the most abundant and available options for patients choosing self-medication and wellness strategies to maintain and/or improve their health. And, international use statistics confirm the widespread use of botanicals in most if not all world cultures. Unfortunately, professional guidance regarding their safe and effective use is the exception rather than the rule. And, in those circumstances where appropriate self-medication occurs, patients face challenges in assessing quality, understanding clinical indications, and anticipating the possibility of inadvertent unintended effects. Even with professional guidance, many of these same challenges are encountered. New information is emerging from clinical trials, and experience from postmarket surveillance both educates and confuses those seeking confirmation of safety or identification of safety issues. Considering the worldwide growth in the evidence based use of western pharmaceuticals, questions regarding potential interactions with herbal and other natural medicinal continues to impact consumer and healthcare professional confidence. Pharmacists remain one of the most accessible, and knowledgeable professionals uniquely qualified to advise patients and medical colleagues on potential risks and benefits of botanicals. This information is summarized with key science findings and take-home points.

Prof. Richard Kingston

President, Regulatory and Scientific Affairs SafetyCall™ International
Bloomington, MN
&
Clinical Professor of Pharmacy
College of Pharmacy, University of Minnesota

Examining the Regulatory Framework for Insuring Botanical Supplement Safety

The regulatory framework for monitoring the safe use of botanicals varies across cultures as well as within and across legal and regulatory jurisdictions. In many countries, botanicals share regulations with other non-botanical nutritionals while in some countries they are specifically singled out acknowledging their unique characteristics that impact safe use. And, in some jurisdictions, they are regulated similar to mainstream drugs. Regulations for use also impact formulation and product design leading to other challenges in monitoring and assessing safety. In the US, regulations focused on preserving brand loyalty and unique formulations have given rise to proprietary blends, an approach that maintains confidential business information but confounds postmarket surveillance and identification of dose response characteristics associated with development of dose-dependent adverse effects. These various approaches to regulating botanical medicines create both opportunity and challenges. A close examination of various regulatory approaches allows consideration of strategies that enhance safety and those that may comprise it.

Prof. David W. Bates, MD, MSc

Professor of Medicine, Harvard Medical School,
and Professor of Health Policy and Management,
Harvard School of Public Health
USA

Incorporating medication safety in the education of students of health professions

Delivering safe medication therapy is inherently a multidisciplinary endeavor, yet all too often the key disciplines—medicine, nursing, and pharmacy—do not communicate effectively. If medication safety is too improve substantially, all the key professions will need to incorporate education and training on this topic in their student education. While some of the content will differ—for example, in hospitals, physicians are primarily responsible for prescribing, nurses for administration and monitoring and pharmacists for dispensing, all professions need to understand the roles of the others, and for example pharmacists are increasingly involved in prescribing in many organizations. Education should include provision of information about the problem of medication safety, the stages of the medication use process, some of the interventions demonstrated to improve safety and discussion of the evidence about their effectiveness, among other topics, and training should include delivery of tools enabling improvement of communication among team members.

Prof. Marv Shepherd, Ph.D.

Director
Center for Pharmacoeconomic Studies
College of Pharmacy
University of Texas at Austin
Austin, Texas

Worldwide Landscape of Fake Drugs and Products Assurance Methods

The proliferation of counterfeit drug trade has been growing at an alarming rate for the last decade. Last year, fake drugs were found in 109 countries and found in both developed and developing countries. Based on the number of counterfeit drug incidents reported by the Pharmaceutical Securities Institute, the fake drug growth rate has been about 24% per year and involves a variety of therapeutic classes. This growth rate is in despite of increase in press coverage of the harm caused an increase in law enforcement efforts.

This presentation will give an overview of the growth of fake drugs geographically and give examples of the extent of the problem and the harm caused by counterfeits drugs. The presentation will list the characteristics of countries which have had a problem with fake drugs. The presentation will also present the relationship between drug diversion and drug counterfeiting and reasons why there is a proliferation of counterfeit drug trade. In addition, the presentation will present the mechanisms counterfeiters use to distribute their products including the growth of rogue pharmacy web sites and email solicitations of fake drugs. The presentation will give examples of the newer innovative methods used to combat the counterfeit drugs, including innovative covert authentication methods and “track and trace” techniques. Finally, the program will describe the need for worldwide cooperation to combat the problem.

Prof. Saleh A. Bawazir

Vice president for drug affairs
Head of Drug Sector
Saudi Food and Drug Authority (SFDA)
Riyadh, Saudi Arabia

Regional Drug Safety, Policy, Regulations and Procedures

In recent decades, modern medicine has been blessed with pharmaceuticals that are much more powerful than what it had before. Although this has given us the ability to provide much better medical care for patients, it has also resulted in the ability to do much greater harm. Data have indicated that 100,000 Americans die each year from adverse drug reaction (ADRs), and 1.5 million US hospitalizations each year result from ADRs.

New drugs are approved if their benefit out weight their risk as shown by clinical trials conducted by pharmaceutical companies prior to approval. However, these trials suffer from serious limitations include limited numbers of patients studied not enough to identify rare but serious ADRs, short duration , biased selection of patients, patients are likely to be more closely monitored and measurement of surrogate markers rather than disease outcome.

To protect public safety the GCC countries have established drug regulatory authorities (DRAs) to ensure the safety, quality and efficacy of marketed pharmaceutical products. In addition, these DRAs regulate manufacturing, distribution, promotional activities, preventing medication errors by evaluating proposed proprietary names, labeling and packaging.

To coordinate the activities between DRAs in the GCC states the health ministers approved a centralized program for drug registration in 1999. The program aims include unifying drug registration policy and procedures, establishing central committee for drug registration and strengthen postmarketing surveillance programs and information sharing.

The presentation will discuss the history and development of safety drug regulations in the GCC during the past century and challenges facing the GCC states to ensure drug safety and the integrity of their nations drug supply.

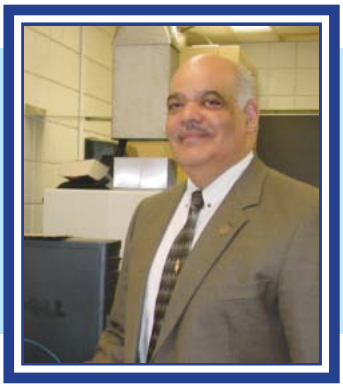
Prof. Roger W. Jelliffe, M.D.

Co-Director, USC Laboratory of Applied Pharmacokinetics, Los Angeles, CA, USA

Update on Drug Optimization in Clinical Settings

Optimization of drug dosage regimens is a most complex task. Therapeutic drug monitoring is no longer enough. One needs to make intelligent decisions about dosage regimens to hit desired target goals, which may differ for each patient according to his/her needs for and sensitivity to the drug. This requires good software for keeping track of the complex relations between the doses, the serum concentrations, and the effects, and control strategies to design dosage regimens to hit the target goals most precisely. Methods and software exist now to do this important job. These tools include:

1. **Describing drug variability optimally,** using nonparametric (NP) population models to capture past experience.
2. **Proper design** for therapeutic drug monitoring (TDM) policies. Measuring trough samples at steady state is definitely not a good thing to do ! D=optimal designs are currently a very well-known strategy for doing this.
3. **Set specific therapeutic target goals** – NOT a so-called therapeutic range. That is an illusion.
4. **Estimate creatinine clearance** (CCr) not just from a single sample, which is not useful for acutely ill unstable patients in whom renal function is changing rapidly, but from a pair of samples, and calculate the CCr which makes serum creatinine go from an initial value to a new value in a patient of stated age, gender, height and weight in a stated time
5. **Minimize drug variability optimally**, using multiple model (MM) dosage design, which hits targets with maximum precision.
6. **Use Bayesian analysis** to develop optimal individualized models of drug behavior in each patient. There are 4 methods now.
    a. Conventional maximum aposteriori probability (MAP) Bayesian estimation.
    b. MM Bayesian estimation for NP models.
    c. Hybrid Bayesian – a combination of MAP and MM which gives more precise parameter estimates, and which can also reach far outside the ranges of an NP pop model to capture an individual patient and provide a density for MM dosage design.
    d. Interacting MM (IMM) sequential Bayesian analysis, which permits parameter values to change during the period of data analysis if that is more likely. This tracks drug behavior best in unstable patients.
7. **Report assay errors properly**, weighting each measurement by the reciprocal of the assay variance at that concentration. Do NOT use percent coefficient of variation. This leads to significant errors such as censoring data below a selected value, which is not necessary, and it provides a good, well-known measure of the credibility of any data point, even all the way down to and including the blank.
8. **Outcomes of using individualized drug dosage**:
    a. Reduction of digoxin toxicity without loss of effect.
    b. Improved management of arrhythmias with lidocaine.
    c. Improved outcomes and reduced hospital stay and costs with aminoglycosides.
    d. Improved care of children having bone marrow transplants receiving Busulfan.
    e. Improved care of children having bone marrow transplants receiving Cyclosporine, with reduced hospital stay and very much reduced costs.



Prof. Salah M. Blaih, Ph.D., R.Ph., FRSC

Department of Chemistry and Biochemistry,
Kent State University, Ohio, USA

Pharmacogenomics and Drug Safety

An ideal drug is one that effectively treats or prevents disease and has no adverse effects. However, a medication is rarely effective and safe in all patients. The individual risk for drug toxicity is a product of the interaction of genes and the environment. Environmental variables include nutritional factors, concomitantly administered drug, and lifestyle influences such as smoking and other recreational habits. These factors act in concert with the individual genes that code for pharmacokinetics and pharmacodynamic characteristics of drugs.

Recent studies from US hospitals suggest that 6.7% or more than two million hospitalized patients experience ADRs, causing approximately 100,000 deaths per year.

Although most pharmacists and other health care professionals use the terms pharmacogenetics and pharmacogenomics interchangeably, the two terms actually have different meanings. Pharmacogenetics is an inherited variation in drug effects based on a single gene interaction with drugs. These single gene interactions can alter drug disposition, efficacy, safety, and tolerability. Pharmacogenomics represents the effect of a drug on gene expression OR the use of genomic technology to identify new drug targets.

Single Nucleotide Polymorphisms (SNPs) occur when there is a single nucleotide base change in the genome and are of a concern when there is a mistake in the "coding" region of the DNA that encodes a specific protein, enzyme, or receptor. In humans, CYP enzymes are responsible for metabolizing the vast majority of prescribed drugs. Among these, three (CYP2D6, CYP3A4, CYP2C9) are polymorphic and responsible for most ADRs.

Potential areas of concern will be discussed; for example, antidepressant therapy with SSRIs and TCAs as related to CYP2D6 polymorphism, anticoagulants and CYP2C9, and genetic testing in cancer therapeutics.

Dr. Manal Al Zaidan

BSc(Pharm), PharmD candidate, Purdue University
Pharmacy Director, Al Amal Hospital. A/ Pharmacy Director, Heart Hospital, Hamad Medical Corporation www.hmc.org.qa
Qatar

Regional Medication Safety Initiative

Hamad Medical Corporation (HMC) strives to foster a culture of quality within the profession of pharmacy that promotes a continuous systems analysis to develop best practices that will reduce medication errors, improve medication use and enhance patient care.

Our hospitals are dedicated to encourage voluntary reporting of patient safety work product and perform analysis and aggregate information to improve quality of care provided by the pharmacy workforce. Through analysis of collected patient safety work product data we provide recommendations for prevention of reported medication errors in order to improve patient safety and the delivery of quality health care.

We have identified medication safety as one of our priorities. Reducing error and harm from medicines through safe and quality use of medicines is an important element of our work and is helping us to achieve our objectives.

Our Medication Safety Program aims to improve the safety of medication usage. It mainly includes medication errors and near misses reporting, adverse drug reactions reporting, medication reconciliation, developing clinical pathways and guidelines, developing stat of the art sterile compounding section comply with USP797 chapter, developing preprinting orders for chemotherapy protocols, introducing pharmacy automation and conducting FMEAs.

In this presentation, we will share with you Al Amal Hospital and Heart Hospital Pharmacy departments experience in medication safety.

References:

- ASHP Guidelines on the safe use of automated dispensing devices. Am J Health Syst Pharm. 2010 Mar 15;67(6):483-90.
- Alliance for Patient Medication Safety (APMS) available from:http://medicationsafety.org/
- Australian commission on safety and quality in Health care available from: http://www.health.gov.au/internet/safety/publishing.nsf/Content/PriorityProgram-06
- Institute for Safe Medication Practices available from : http://www.ismp.org/

Dr. Christian Hartman

UMass Memorial Medical Center
Worcester, Massachusetts, Medication Safety Officer
Residency Program Director – Medication Use Safety Residency (PGY2),
Manager-Inpatient, Pharmacy Department
USA

The Use of Rules-Based Clinical Surveillance to Address National Patient Safety Goals and Medication Safety Standards

Program Objectives:

-Define clinical surveillance and electronic rules based ADE detection

-Discuss clinical surveillance literature and clinical trials

-Discuss application of real-time detection system that mitigate medication related harm

Presentation Abstract:

The Institute of Medicine suggests that at least 1.5 million preventable adverse drug events occur annually in the United States. Spontaneous reporting of ADEs has been found to identify only 1 in 20 ADEs signifying a need for more active methods of ADE detection. Further, increasing demands from regulatory agencies and national standards provide the basis for utilizing electronic detection systems to enhance the identification of potential adverse drug events.

Published literature suggests that the implementation of real-time electronic adverse drug event detection system provides enhanced capabilities for organizations to identify potential medication occurrences and mitigate harm. The utility of such systems to Joint Commission Medication Management Standards, National Patient Safety Goals, Core Measures, and other medication safety standards will be reviewed in detail.

Implementation of electronic adverse drug event detection and clinical surveillance systems can provide an added layer of adverse drug event detection and mitigation. Further, such systems can assist with the implementation of nationally recognized patient safety goals and medication safety standards.

Prof. Bill G. Felkey

Professor Emeritus of Health Informatics,
Auburn University

Achieving Next Level Patient Safety Through Participatory Healthcare

The best designed systems, operated by highly motivated professionals, can still fail if patients (and their family/friends caregivers) are not engaged and actively participating in their care management. Mobile telecommunication devices, home-based outcomes monitoring appliances, medication adherence aids, patient-focused decision tools and social networking support should all be utilized to increase the safety of health care systems. Moreover, we should realize that patients fail in their treatment regimens because they don›t know what to do, they don›t know how to do it, and/or they are not motivated to change behaviors and lifestyles. Point of decision information resources (with enhanced situational awareness) placed in mobile technologies and the encouragement available from resources like PatientsLikeMe.com can produce more timely, efficient, effective, and patient-centric support systems. Like many new challenges, these enhancements need to be done in addition to, not instead of current practices.

The 3rd Kuwait International Pharmacy Conference

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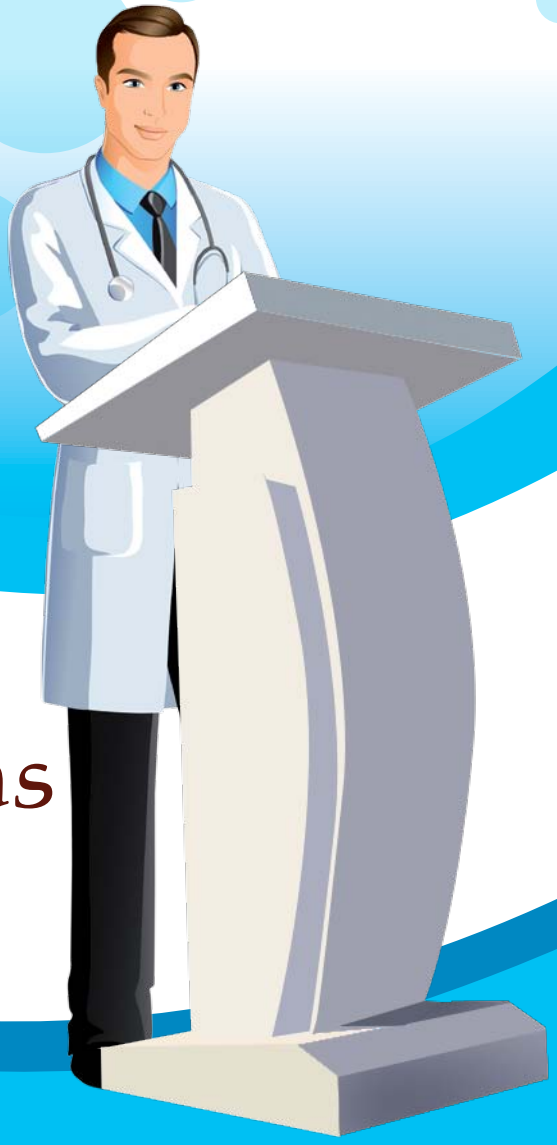

Abstracts
Podium Presentations

19: Podium

Implementing USP Chapter 797 in the Sterile Compounding Section at Al Amal Hospital, Qatar: It's Impact on Medication Safety

Al Zaidan MB
Pharmacy Director, Al Amal Hospital, Hamad Medical Corporation, Qatar

Introduction:
Compliance with USP Chapter 797 does not need to be complex or cumbersome, but it will require leadership, vigilance, and consistence from the Pharmacists and Technicians who carry out critical compounding activities on a duty basis, as well as their Managers and Supervisors.

The revised, 2008 USP 797 Chapter focuses on the employees involved in the compounding of compounded sterile products (CSPs) as the primary source of contamination and recommendations are specifically aimed to reduce this possibility. Accordingly the presentation will focus on the importance of assuring core competencies of pharmacy staff practicing sterile compounding required to perform their job in a safe and efficient manner.

This presentation will help leaders, managers and pharmacy staff in designing and operating a new room for compounding sterile preparations to meet the institution's needs and improve facility compliance with USP Chapter 797. This will ensure a safe work place and reduce the risk of contamination along with increased staff awareness of safe facility design.

However, we will share with you our experience of implementing medication safety program at the sterile compounding section.

References:

- USP releases revision of chapter on sterile compounding: new version of USP chapter 797 emphasizes personnel. Am J Health Syst Pharm. 2008 Jan 15;65(2):104, 111.
- Clean spaces. A look at the revised and reissued USP 797 pharmacy design regulation. Health Facil Manage. 2008 Oct;21(10):63-6.

Key Words: Compounded Sterile Products; USP

20: Podium

Saudi Arabia - Experience on Medication Safety

Aljadhey H
Medication Safety Research Chair, Department of Clinical Pharmacy, College of Pharmacy,
King Saud University, Saudi Arabia.

Introduction:

Background: Annually, medication errors harm at least 1.5 million United States residents, leading to at least 3.5 billion dollars in extra health care expenses to treat the error-related injuries. Studies are short to investigate the incidence and outcomes of adverse drug events in Gulf countries. Pharmacists could play a major role in ensuring the safe use of medications. In this presentation, I will discuss activities that can be undertaken by you to prevent medication errors. Topics to be discussed include causes of medication errors, preventing errors from look alike sound alike medications, error prone abbreviations, medication reconciliation during transitions in care, medication errors reporting.

Objectives:

By the end of this presentation, the participant will be able to:

1- Discuss the significance of medication errors

2- Differentiate between medication errors, adverse drug events, and adverse drug reactions

3- List common causes of medication errors that occur in hospitals

4- Discuss challenges facing initiatives to improve medication safety

5- List four activities in hospital setting to prevent medication errors

Key Words: Medication Errors; Adverse Drug Events

21: Podium

SWOT Analysis of the Newly Introduced Elective Course on Patients' Safety at the Health Sciences Center in Kuwait

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Kuwait University, Kuwait. [2]Department of Surgery, Faculty of Medicine, Kuwait University, Kuwait.

Introduction:
Hundreds of thousands of patients are harmed or die each year according to the World Health Organization due to unsafe care, or get injured inadvertently when seeking health care". At the core of teaching Ethics and Professionalism lies the understanding of the basic human right to safe health care and the concept of self regulation where the medical profession has to improve itself from within. Accordingly teaching medical errors in the curriculum aims to address issues of concern in both clinical practice and medical education and training focusing on a competency-based curriculum tailored to lifelong learning. The purpose of this study is to provide recommendations for future development and growth in teaching patients' safety modules based on a SWOT analysis of the first teaching experience in the Faculty of Medicine.

Methods:
Interviews of 10 key-informants who were all involved in the patients' safety module (4 enrolled students, clinicians, hospital administration, academic staff) were completed after the module ended in the academic year 2009- 2010. The SWOT framework (strengths, weaknesses, opportunities, and threats) was applied to categorize the emerging themes and provide a strategic direction for the future.

Results:
Informants reported that the main strength was the high motivation of staff and students alike. The main weakness was limiting the educational experience to elective students only. Opportunities reported were mostly the early introduction and exposure to concepts like prescribing, administration and monitoring of medication and secondly, understanding how best to report errors. The most commonly reported threat was the general poor patients' safety environment at the workplace.

Conclusions:
This research indicates that many unique opportunities exist for improving patients' safety understanding among the next generations of health care professionals through teaching of applied and clinically relevant ethics and professionalism topics.

Key Words: Patients Safety; Medication Errors; Ethics and Professionalism;

22: Podium

Antifibrotic efficacy of Green Tea Extract (GTE) in the Control of Hepatic Fibrosis Mediated by CCl4: A Histopathological Study

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[1]Department of Biological Sciences - Faculty of Science - Kuwait University [2]The Pharmaceutical Institute at Albany, Albany College of Pharmacy – New York - US

Introduction:
Background: Hepatic fibrosis remains one of the most destructive insult affecting lives worldwide. It occurs due to several factors and chronic alcoholism is the most common cause. Fibrosis also results from chronic viral hepatitis and autoimmune hepatitis. Other causes are blocked bile ducts and steatohepatitis, prolonged exposure to environmental toxins such as carbon tetrachloride (CCl4) can also lead to fibrosis. Almost half of the fibrosis/cirrhosis cases are without any established etiology and many attempts have been made to resolve this situation. The aim of this study is to emphasize the hepatoprotective effects of green tea extract on hepatic fibrosis in a rat liver CCl4 induced fibrosis histologically, ultrastructurally and biochemically.

Methods:
Green tea extract was prepared from dried green tea leaves and lyophilized. Twenty male albino rats weighing 200-250 g divided into four groups. GI. Control. GII. Received a daily dose of 50mg/kg GTE dissolved in physiological saline for 4 weeks. GIII. Received subcutaneous injection of 40% CCl4 (1ml/kg b.w.) for 4 weeks. GIV. Treated as in group III, then given GTE orally for 4 weeks.

Results:
Histologically and ultra structurally, animals in GIII have shown hepatic fibrosis with intermingled fibers located between cells. While in GIV, fibrotic lesion virtually disappeared after four weeks of treatment with GTE, thus, returning the architectures of liver tissue back to its normal status. This was supplemented by the fact that the hepatic enzymes (ALT) and (AST) also returned to their normal levels after treatment with GTE. The rats in GIV were also found to regain their normal body weight and their fur color, which had earlier weakened (GIII) due to weight loss. The autopsy results also showed the animal liver returning to normal shape and color.

Conclusions:
Green tea extract is very potent in treating hepatic fibrosis caused by CCl4 in an animal model.

Key Words: Hepatic Fibrosis; GTE; GPT;

23: Podium

Syringic Acid-Derived Proteasome Inhibitors: Molecular Modelling Assisted-Design

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[1]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Kuwait University, Kuwait; [2]Department of Biological Sciences, Faculty of Sciences, Kuwait University, Kuwait; [3]Department of Basic Pharmaceutical Sciences, Faculty of Pharmacy, University of Louisiana at Monroe, USA.

Introduction:
Growing understanding of the molecular events that mediate tumor growth and metastases has led to the development of rationally designed therapeutics. Promising strategies include proteasome inhibition. This report accounts on the design, synthesis and the anti-proteasome and anticancer activities evaluation of several syringic acid analogues with predetermined specificity to proteasome developed using in silico molecular modelling.

Methods:
Using Surflex-Dock program interfaced with SYBYL, the docking affinities of syringic acid and its proposed analogues to 20 S proteasome were studied. Analogues with high binding scores were considered for synthesis using standard chemical procedures. Anti-mitogenic effects of these analogues towards human colorectal, breast, lung and melanoma cancer cells as well as normal human fibroblast cells were studied.

Results:
Eighteen analogues were proposed, however, five analogues, di-3-methoxybenzyl ester and ether (D1), 3,5-dimethoxybenzyl ester (D2), 3-methoxybenzyl ester (D4), benzyl ester (D7), and dibenzyl ester and ether (D8) were selected for anti-mitogenic activity evaluation. Time and dose response studies indicated specific anti-proliferative effects on human melanoma cells (HTB66 and HTB68) with minimal effects on normal human fibroblast cells (CRL1554). The IC30 values of D2 towards HTB66 and HTB68 were 281 and 307 µg/ml, respectively. On the other hand, IC40 of D4 on HTB66 and HTB68 were 442 and 630 µg/ml, respectively. Moreover, IC50 values of D7 towards HTB66 and HTB68 were 274 and 290 µg/ml, respectively. The other two analogues (D1 and D8) did not show good anti-proliferative activity. The maximum growth inhibitory effect on CRL1554 was 5-22%.

Conclusions:
In silico molecular modeling is proven to be a powerful tool in rational drug design. Three analogues, with high docking scores were found to possess good anti-melanoma proliferative activity.

Acknowledgement: This project was supported by Kuwait University Research Grant No. PC02/09. Spectral analyses were carried out at Science Analytical Facilities, Faculty of Sciences, Kuwait University, supported by grant No. GS03/01.

Key Words: Syringic Acid; Molecular Modelling; Proteasome;

24: Podium

Type, Nature and Severity of Adverse Drug Reactions in Renally Impaired Patients

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[1]Department of Pharmacy Practice, RAKCOPS, RAK Medical and Health Sciences University, RAS Al- Khaimah, U.A.E.
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Introduction:
Background: Patients with impaired renal function are often prone to medication-related problems such as adverse drug reactions (ADRs). In these patients, the risk of ADRs can be increased by polypharmacy and multiple co-morbidities. Clinical Pharmacist can play a vital role in detection, monitoring, and reporting of ADRs in hospitals. Objective: The primary objective of the present study was to identify and monitor adverse drug reactions that occur in renally impaired patients and to evaluate the significance of ADRs.

Methods:
This was a prospective study carried out for a period of nine months. All the patients who were on regular hemodialysis and the inpatients either referred or admitted to the nephrology ward were consequently included and were followed until discharge. The study pharmacists intensively monitored the patients for adverse drug reactions during the hospital stay. The identified ADRs were assessed using different scales such as WHO Probability scale, Naranjo scale, Karch and Lasagna's scale. Predictability and preventability of ADRs were also determined.

Results:
A total of 369 patients (320 inpatients & 49 dialysis patients) were included in the study and monitored. A total of 45 ADRs were identified out of which 27 ADRs were found to be probable and 17 were found to be possible in nature. Out of 45 ADRs, eight ADRs accounted for reason for admission. Similarly 33 and 26 ADRs were found to be possible in nature when assessed by Karch & Lasagna's scale and Naranjo scale respectively. Of the 45 ADRs 18 were found to be mild in severity. A total of 26 ADRs were predictable in nature. Incidence of ADRs found to be 10.2% and the mortality rate was found to be 0.2%.

Conclusions:
A wide range of ADRs were noticed in patients with renal impairment and our study has systematically assessed the nature and severity of ADRs.

Key Words: Adverse Drug Reactions; Clinical Pharmacist; Renal Impairment;

25: Podium

Adverse effects of Tacrolimus-Based Immunosuppression Regimens in Renal Transplant Patients from Living Donors

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Introduction:
Background Renal transplantation is the treatment of choice for many patients with end-stage renal disease. With the steady improvement in graft and patient survival over past years, more patients are experiencing immunosuppression-related morbidity and potential mortality which is especially important in the long term. Tacrolimus (TAC) has been shown to be an effective alternative to cyclosporine for the prevention of rejection following solid organ transplantation TAC, though, has a low therapeutic index, and its use is associated with a range of adverse drug effects (ADEs). Data on TAC-induced ADEs are available in the United States and Europe. In Jordan, renal transplant patients receive grafts from living donors, mostly from first-degree relatives. The main objectives of this study were to estimate the prevalence of and the risk factors for the ADEs of tacrolimus-based immunosuppression in patients who obtained renal transplant from living donors.

Methods:
A multicenter cross-sectional observational study in 154 kidney transplant patients who received grafts from living donors.

Results:
Mean duration of TAC administration was 29±26 months. Mean trough TAC concentration was 7.20 ± 3.78 ng/mL. Large proportion of patients had hypertension (83%) and hyperlipidemia (53%); 27% had posttransplant diabetes mellitus. Patients had on average two chronic diseases.Tremor was present in 40%, neurologic toxicity in 45%, and anemia in 51.5% of patients. The average number of ADEs was 3.52 ± 1.57. In multivariate analysis some ADEs were related to tacrolimus concentration, duration of treatment, number of medications or medical problems. In linear regression analysis correlation was found, among the others, between diastolic blood pressure and tacrolimus concentration, and inverse correlation between erythrocyte count and duration of treatment.

Conclusions:
There is a significant prevalence of tacrolimus ADEs and supratherapeutic TAC blood concentrations in Jordanian renal transplant patients in spite of using low TAC doses and overall adequate renal function.

Key Words: Tacrolimus; Adverse effects; Renal transplant patients;

26: Podium

Prevention and Treatment of Coronary Heart Disease (CHD) in Type 2 Diabetes Mellitus: Adherence to International Diabetes Guidelines in Kuwait

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Introduction:
Clinical guidelines are beneficial in minimising the possibilities of providing unequal care to patients as they allow practitioners to provide consistent and efficient care to their patients, as well as keeping their decisions as close as possible to what scientific evidence really supports. The aim of the study was to evaluate the quality of prescribing in primary and secondary healthcare settings of patients with diabetes in Kuwait using a criterion-based approach with reference to international treatment guidelines, and to investigate gaps in clinical cessation.

Methods:
Collection of anonymised patients' data and the application of a previously validated 43-criteria Medication Assessment Tool (MATkw) designed to assess cardiovascular disease prevention and treatment in patients with type 2 diabetes. Comparative analysis was conducted between the following:

- Overall adherence between healthcare regions
- Primary and secondary health care settings
- Primary and secondary prevention patients
- Specialised polyclinics versus non-specialised polyclinics.
- Secondary health care settings
- Patients of age >55 years to < 74 and those < 55 years in relation to primary prevention.
- This cut off was used for comparison with other studies and it was also close to the mean
- age of the study sample
- Patients of age >55 years to < 74 and those < 55 years in relation to secondary
- prevention

Results:
A sample of 565 patients was selected using stratified systematic random sampling, of which 317 (56.1%) were females, with a mean (SD) age of 56.3 (9.6) years and mean (SD) body mass index (BMI) of 33.5 (6.8) kg/m2. A total number of 14483 guideline criteria were applied to the patients and a total adherence of 79.7% (CI: 78.7, 80.7) was found. Adherence was ranked as "high", "intermediate", and "low" according to arbitarty cut-offs used in previous projects. "Low" adherence was seen in: achievement of target blood pressure, use of fibrate (despite statin use) when triglyceride levels are 2.3-4.5mmol/L, use of sublingual glycerl trinitrate in secondary prevention and offering advice on smoking practice.

Conclusions:
A tool such as MATkw can be used to highlight areas for review and possible improvement, in the absence of intrinsic locally generated guidelines. With minor amendments the tool can be used in primary care from case record examination as a means of co-operation between pharmacists and general practitioners in clinical guideline implementation.

Key Words: Clinical Guidelines; Diabetes Mellitus; Cardiovascular Disease;

27: Podium

Clinical Pharmacokinetics of Digoxin: Evaluation of Blood Concentration in Patients with Congestive Heart Failure at Al-Amiri hospital - Kuwait.

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Introduction:
Digoxin is a cardiac glycoside widely used for the treatment of congestive heart failure, especially with atrial fibrillation. It has a narrow therapeutic index (0.5–2.0 ng/ml) and displays large inter- and intra-patient pharmacokinetics variability. Based on creatinine clearance (Clcr), several population methods (Paulson, Williams, Bauer, Hori and Konishi) have been developed for determining the digoxin dose. The aim of this study was to: (a) compare different methods for predicting digoxin level; (b) examine the effect of Clcr and spironolacton on the disposition of digoxin.

Methods:
169 inpatients were identified for whom a measured concentration (MC) was available. Clcr was calculated using Jellife, Cockcroft, Hull, Mawer, and Salazar equations. Based on Clcr, each method was used to predict digoxin Concentration (PC), which was compared with MC. Degree of agreement between PC and MC was assessed by the mean of difference between the PC and MC (mean prediction error, ME) and the mean of absolute deviation between the PC and MC (mean absolute prediction error, MAE). The MC/daily dose (D) ratio was determined, and the effect of Clcr and spironolacton on MC/D was examined.

Results:
The MC/D ratios of the patients with Clcr<50 ml/min were significantly higher than those of the patients with Clcr>50 ml/min. In contrast, there were no significant differences in the MC/D ratios between the spironolacton-treated patients and the non-treated patients even if the patients were classified according to the Clcr values. The ME (measures of bias) and the MAE (measures of precision) for the methods ranged from -0.923 to 0.002 and 0.187 to 1.486 ng/ml respectively. Using Jelliffe Clcr, the Konishi method gave the smallest values of ME and MAE which were 0.002 and 0.228 ng/ml respectively.

Conclusions:
Konishi method was the most reliable of those evaluated and could be applied initially in Kuwaiti hospital. However, a large number of patients PC were well above the MC, therefore, individualization of digoxin dose based on MC is of great need.

Key Words: Congestive heart failure; Digoxin; Pharmacokinetics prediction Model;

28: Podium

The Clinical Pharmacist Role in Anesthesia –A Double Blind Study

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Introduction:
Aim: This study was aimed at conducting and evaluating 2 different anesthetic methods used during a spinal fusion surgery to ensure better intraoperative hemodynamic stability and post operative pain control.

Methods:
A prospective, randomized, double blind study in patients scheduled for spinal fusion surgery, who were randomly allocated to two groups, G1 and G2, (n=15 per group), class I-II ASA. Both groups received pre-operatively midazolam, followed intra-operatively by propofol, sevoflurane, atracurium, and either remifentanil infusion 0.2 µg/kg/min (G1), or the same dose of remifentanil infusion and low doses of ketamine infusion 1 µg/kg/min (G2). Antidote medication and post operative morphine doses were given. HR, MAP, vital signs, surgical bleeding, urine output, duration of surgery and duration of anesthesia were recorded. In a 24 hr recovery period in a post-anesthesia care unit (PACU) the recovery time, the first pain score and analgesic requirements were measured.

Results:
Intra-operative HR and arterial BP were significantly less ($p<0.05$) in G1 as compared to G2. In the PACU the first pain scores were significantly less ($p< 0.05$) in G2 than in G1. The time for the first patient analgesia demand dose was greater in G2, as also morphine consumption which was greater in G1 than G2 ($p <0.05$). Other results were the same. None of the patients had any adverse drug reaction.

Conclusions:
Adding low doses of ketamine hydrochloride could be a routine therapy to improve the hemodynamic stability and reduce the postoperative morphine consumption during spinal fusion surgery.

Key Words: Clinical pharmacy; Anaesthesia; Drug combination;

29: Podium

A Novel Approach for PK/PD Modeling of the Antibiotic Effect

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Introduction:
To develop a PK/PD model that can predict the direct and indirect antibiotic effects.

Methods:
The time-kill study was performed by exposing isolates of E. coli to different concentrations of ciprofloxacin (0-0.45 mg/L), tobramycin (0-8.4 mg/L) and ceftriaxone (0-7 mg/L). During the study, 0.1 ml of bacterial culture was obtained every 15 min, diluted and incubated for 1-2 hr. The change in the bacterial growth rate due to the antibiotic exposure was determined. The slope of the log change in bacterial growth rate versus time of antibiotic exposure was taken as an indicator for total antibiotic effect. An inhibitory sigmoidal Emax PD model was used to describe the antibiotic concentration-effect relationship. This model was used to simulate the bacterial number versus time after antibiotic administration, and to predict mice survival. The model predicted results were compared with the mice survival after intranasal E coli challenge.

Results:
The slopes of log change in bacterial growth rate versus time of antibiotic exposure were fitted to the pharmacodynamic model equation, R2 were 0.960, 0.957 and 0.952 for ciprofloxacin, tobramycin and ceftriaxone, respectively. There were strong agreement between the model predicted mice percent survival and the mice survival results from the intranasal challenge experiment. For ciprofloxacin (1.25–20 mg/kg) the model predicted 0.15-100% survival versus 0.55-87% survival experimentally, while for tobramycin (25–400 mg/kg) the model predicted 4.63 to 99.5 % survival versus 22 to 96.47 % survival experimentally, and for ceftriaxone (25-400 mg/kg) the model predicted 6.74 to 99.99% survival versus 0.63 to 65.54% survival experimentally. Non-significant differences were found (P-values of 0.3290, 0.9378 and 0.7397 for ciprofloxacin, tobramycin and ceftriaxone, respectively).

Conclusions:
The proposed model allowed the prediction of the infected animal response to antibiotic treatment.

Key Words: PK/PD modelling; Antibiotic Effect; Time-Kill experiment;

30: Podium

Within Subject Variability in Aminoglycosides Pharmacokinetics in Patients with Cystic Fibrosis

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Introduction:
Patients with cystic fibrosis are now living longer, with a median predicted survival of 38.8 years in 2008. The majority of pulmonary infections in patients with cystic fibrosis involve P. aeruginosa, which is usually treated with a combination of ceftazidime and tobramycin. Due to the chronic nature of this condition, patients often receive multiple courses of aminoglycosides. A clinical pharmacokinetic monitoring service was introduced to the Glasgow Adult Cystic Fibrosis Unit in the early 1990s; the resulting database offers a unique opportunity to investigate within-subject variability (WSV) in aminoglycoside handling over a prolonged period of time. AIMS: To determine the nature and extent of WSV in aminoglycoside pharmacokinetics in patients with cystic fibrosis and to investigate the influence of patient demographics and clinical characteristics (covariates) on aminoglycoside pharmacokinetic parameters.

Methods:
The study involved a retrospective analysis of the aminoglycoside database for patients with cystic fibrosis and covered the period 1993 to 2009. The data were analysed by Nonlinear Mixed Effects Modelling using the program NONMEM (version 6) (1). One and two compartment models were compared and the influence of covariates, including a range of methods for estimating renal function, was examined. Within-subject variability was investigated with the assumption that one course of therapy represented one occasion.

Results:
A total of 2238 aminoglycoside concentrations were available from 166 patients aged 14 to 66 years, median 23 years. Concentrations ranged from 0.1 to 18 mg/L, with a median value of 2.8 mg/L. The number of occasions available ranged from 1 to 28 with a median of 5 occasions. A two compartment model provided a better fit of the data (Reduction in the objective function value (OFV = -166.1 compared to a one compartment model). The inclusion of WSV on clearance (CL) produced a further improvement in fit (OFV= -234.2). There was no further improvement when WSV was added to the volume of distribution of the central compartment (V1) model. The final covariate model for CL included creatinine clearance estimated by the Cockcroft and Gault equation (2), with the minimum serum creatinine concentration fixed to 60 µmol/L. Between-subject variability (BSV) in CL was 18.5% and WSV was 11%. V1 was best described using height, which reduced BSV from 16% to 12%. BSV could not be estimated for the peripheral volume (V2) or inter-compartment clearance (Q).

Conclusions:
Since unexplained within subject variability in the handling of aminoglycoside antibiotics in patients with cystic fibrosis is low, patients can be started on a previous individualised dosage regimen if a new course of therapy is required.

Key Words: Aminoglycosides; Population Pharmacokinetic Modelling; ;

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Abstracts
Poster Presentations

31: Poster

Inborn errors of metabolism (IEMs) in children: The Pharmacist's extended role

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Introduction:
IEMs are rare inherited metabolic disorders of high prevalence in Kuwait due to consanguinity. Many of these disorders carry serious clinical consequences to the neonates such as irreversible mental retardation and developmental delay. Furthermore, many of the cardiac, hepatic and renal diseases are due to IEMs. The complexity, diversity and rarity of IEMs in children are potential barriers to comprehensive medical and pharmaceutical cares. In clinical practice, pharmacists are only involved in dispensing specialized medicines and dietary products to the affected infants, however with the recent introduction of the clinical pharmacy programs in the hospitals, the role of pharmacist should be modified.
Objectives
This presentation highlights some suggestions of the medical and pharmaceutical care services that can be provided by pharmacists to sick infants with IEMs within the clinical pharmacy program at the hospital.

Methods:
The role of pharmacist can be modified by involvement of pharmacist in the screening process of IEMs in clinical biochemical/genetic laboratories, reviewing medication charts of the affected children, implementing appropriate methods for dispensing the specialized medicines, individualizing drug doses according to infant's clinical status as in metabolic acidosis, and by counselling parents about the adverse drug reactions and the expected therapeutic efficacy. An example of the suggested extended pharmacist's role is the metabolic screening service provided by the Faculty of Pharmacy to the pediatric and maternity hospitals, Ministry of Health, Kuwait.

Results:
The metabolic screening service indicated 124 metabolic cases out of 1850 samples, distributed as 49 amino acid disorders, 31 organic acid disorders, 10 urea cycle disorders and 34 fatty acid oxidation defects.

Conclusions:
Pharmacist may be involved in collaboration with other health professionals in the healthcare of infants with IEMs. To achieve this goal, the pharmacist should be aware of the prescribed medicines and their possible adverse reactions. Also he/she should be educated of IEMs with respect to diagnosis, clinical presentation, treatment and management options.

Key Words: Inborn errors of Metabolism; Pharmaceutical Care; Role of Pharmacist;

32: Poster

Antiproliferative and Antibacterial Activity of Eminium spiculatum (Blume) Kuntze Grown in Jordan

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Introduction:
Eminium spiculcatum (Blume) (Araceae) is an indigenous plant species in Jordan is used as an anticancer agent. The objective of this study was to determine the chemical composition of E. spiculatum and evaluate its antimicrobial and antiproliferative activities.

Methods:
Ethanol extraction and column chromatography were used for the isolation. Antimicrobial activity was tested using the well-in-agar method against E. coli and resistant strains of S. aureus. Antiproliferative activity was evaluated by Sulphorhodamine B assay for an incubation time of 72 hours. In both methodologies, appropriate controls were used.

Results:
Luteolin, luteolin-7-O-glucoside, isoorientin, vitexin, chrysoeriol-7-O-glucoside and β-sitosterol were isolated and their structures were determined. Luteolin exhibited moderate antibacterial activity against E. Coli and resistant strains of S. aureus in concentration of 1µg/ml. For determination of the antiproliferative activity, MCF-7 and T47D cell lines were used. Luteolin demonstrated the highest inhibitory activity with IC50 values of 14.92 and 18.49 µM for MCF-7 and T47D, respectively.

Conclusions:
This research has provided evidence about the chemical composition, antimicrobial and antiproliferative effects of E. spiculatum and its constituents. No pronounced antibacterial activity was observed neither with the crude extract nor with the isolated compounds against the tested bacterial strains. Neither the crude extract, nor any of its constituents (except for luteolin) exhibited antiproliferative activity for cell lines that represent breast cancer. Luteolin should be further evaluated since it exhibited promising antiproliferative activity towards the breast cancer cell lines under investigation.

Key Words: Eminium Spiculcatum; Antiproliferative Activity; Flavonoids;

33: Poster

Antioxidant Defenses in Conocarpus lancifolius Under Variable Abiotic Stress Conditions

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Introduction:
Conocarpus lancifolius is an ornamental tree species cultivated in Kuwait with a high degree of tolerance to semi-arid conditions. Although the plant shows a remarkable growth rate under extreme conditions of drought and temperature, biochemical defense-related mechanisms remain unexplored. In the present study, influence of variable stress conditions on C lancifolius was studied and the antioxidant biochemical defense compounds such as ascorbic acid and phenolics were quantified.

Methods:
The plants were subjected to temperature stress from 10o C to 40^{o}C, salinity stress was 2-10%, polyethyleneglycol stress was10-60% while drought stress was imposed for 6 days. The plants were harvested after 14 days. Phenols were determined by Folin method while ascorbic acid was determined by iodometric method.

Results:
Total plant phenols increased significantly from 5.37 mg/g DW ± 0.059 (SE) in controls to 8.75 mg/g DW ±0.037 (SE) in drought imposed seedlings. A consistent increase in phenols was also observed with increasing temperature and under prolonged salt stress (288 h) conditions. However, concentration of phenols decreased with increasing percentages of polyethylene glycol (PEG). Temperature stress resulted in significant increase in ascorbic acid concentration from 5.33 µg/g FW ± 0.039 (SE) in 10^{o}C to 7.38 µg/g FW ± 0.030 (SE) in 40^{o}C treated seedlings at which growth was at its maximal. A consistent decrease in the concentration of ascorbic acid, however, was observed in water- deprived, PEG and salt-stressed seedlings.

Conclusions:
Antioxidant defenses are impacted by different abiotic stress imposed on the plant. Deposition of ascorbic acid in mesophyllic cells results from abiotic stress on the plant.

Key Words: Conocarpus lancifolius; Abiotic Stress Conditions; Plant phenols;

34: Poster

Knowledge and attitudes of pharmacy and medical students toward complementary and alternative medicine

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Introduction:
Complementary and alternative medicine (CAM) has been an attractive field for many patients to use. There is a noticeable global increase in CAM use among the public[1]. Hence, health care professionals should have an important role toward this new trend in health care. This study was designed to determine the use of CAM modalities among pharmacy and medical students, their knowledge, perceived effectiveness and harmfulness about CAM modalities, their general attitude toward CAM, and the perceived barriers to CAM use and the need for CAM education.

Methods:
A descriptive, cross-sectional survey was performed using a pre-tested questionnaire. The study population included a randomly selected 250 pharmacy and medical students (125 from each faculty) at Kuwait University. The selected students were contacted and given an explanation about the purpose of the research. Those who agreed to take part in the study were given the questionnaires and collected from them after being completed. The participants were asked to return the questionnaires anonymously. They were assured for confidentiality and gave written consent to participate in the study.

Results:
The response rate was 88.4%. CAM usage was reported by 55.2% of students, and mostly associated with females (OR:4.4; 95% CI: 1.7-11.3). Herbal products were the most commonly used (37.6%; 95% CI: 31.2-44.3%). Knowledge about 11 CAM modalities was generally poor, even for those which respondents claimed to know most about. The knowledge about herbal products was significantly better among pharmacy students (OR: 2.0; 95% CI: 1.1-3.6). Massage, herbal products and prayer/Qur'an reciting were perceived as being the most effective, while cauterization as the most harmful. Attitudes toward CAM were positive; with about 80.0% believing that CAM includes ideas and methods from which conventional medicine could benefit. Lack of trained professionals and lack of scientific evidence were the most perceived barriers for CAM implementation. About 90% admitted the importance of knowledge about CAM for them as future practitioners.

Conclusions:
The use of various CAM therapies was reported by the students, and the general attitude toward CAM was positive. Their knowledge, perceived effectiveness and harmfulness about CAM modalities were diverse. The students acknowledge the need to be well educated about CAM to better advise their patients in the future.

References:

1. Naidu S, Wilkinson JM, Simpson MD (2009). Attitudes of Australian pharmacists toward complementary and alternative medicines. Ann Pharmacother 39: 1456-1461.

Key Words: Complementary and alternative medicine; Pharmacy students; Medical

35: Poster

Culture of Safety in a Tertiary Hospital in Saudi Arabia

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Introduction:
Background: The culture in health care system could promote patient safety practices. By assessing the culture of safety one can design interventions aim to improve the patient safety in hospital. In Saudi Arabia, there were no study assessed the attitudes of health care professionals toward safety.

Objectives: To assess the culture of safety for nurses in a tertiary teaching hospital in Saudi Arabia.

Methods:
Cross-sectional survey was conducted in August 2010 in 800-bed tertiary hospital in Riyadh, Saudi Arabia. We surveyed a convenient sample of 492 nurses using validated instrument the Safety Attitudes Questionnaire (SAQ). SAQ assesses safety culture across six factors: teamwork climate, perceptions of management, safety climate, stress recognition, job satisfaction, and working conditions. Respondents could potentially score from 5 to 1 on a factor score. Scores ≥4 (most favorable attitudes) .A factor score between 4 - 3 their attitudes are (slightly favorable attitudes). A factor score of < 3 but > 2 (unfavorable attitudes) .A score between 2 - 1(very unfavorable attitudes). Descriptive statistics were used to analyze the results of the survey using SPSS statistical software.

Results:
492 surveys from nurses were included in the analyses. Female were the majority (93% female and 5% male). The age of participants were as follow: <30years 20.7%, 30-39years 32.9%, 40-49years 18.5%, 50 years or more 17.1%. The mean scores for all scales were in general slightly to most favorable attitudes, 4.2 for teamwork climate, 3.8 for perceptions of management, 4.2 for safety climate, 3.3 for stress recognition, 4.5 for job satisfaction, and 4.4 for working conditions.

Conclusions:
Culture of safety among nurses in Saudi Arabia hospital was good. Further studies are needed to compare the culture between hospitals in Saudi Arabia and between health care professionals.

Key Words: Culture of Safety; Safety attitudes questionnaire; Medication Safety;

36: Poster

Treating colorectal cancer: Patients' involvement and their expectations and experiences of chemotherapy

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Introduction:
Background: Colorectal cancer (CRC) is one of the most common cancers worldwide. The assessment of patient preference for cancer therapy or therapy outcomes has been promoted in the world of shared decision-making and evidence-based medicine. Knowing how patients value the outcomes and preferences of various treatment options for CRC is important to oncologists and policy makers in planning and introducing treatment interventions. However, there is limited evidence on relationship between patients' perception of treatment and decision-making.

Methods:
Qualitative study using semi-structured interviews in patients with colorectal cancer receiving chemotherapy. An interview schedule was used during interview, which consisted of open-ended questions related to their perceptions of chemotherapy and their role in treatment decision-making. Patients were recruited on the basis of their personal characteristics: gender, age, and stage of disease. This approach ensured wide reflections of patients' experiences and perceptions.

Results:
Twently-seven colorectal cancer patients were interviewed. Patients had both negative and positive perceptions about chemotherapy. These perceptions were centred on hope, treatment risks, anticipation and acceptability of treatment side effects, and willingness to take new medicines. Such perceptions seemed to influence their role in treatment decision-making. In terms of decision-making roles, patients fell into three categories: significant contribution (i.e. shared), passive, and no choice.

Conclusions:
The results indicate the types of risks and benefits that are important to patients with CRC. The findings provide a useful ground for healthcare professionals in order to prioritise issues that need to be discussed during treatment consultations.

Key Words: Colorectal Cancer; Chemotherapy; Semi-structured Interviews;

37: Poster

Adherence to Medication Safety Practices Recommendations in Developing Countries: Data from Saudi Arabia

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Introduction:
Background & Objective: Adverse drug events (ADEs) could increase mortality, morbidity, and health care costs. Annually, medication errors harm at least 1.5 million United States residents, leading to at least 3.5 billion dollars extra health care expenses to treat the error-related injuries The World Alliance for Patient Safety at the World Health Organization recommended implementation of certain basic applications in health care systems to improve medication safety. However, adherence to the WHO medication safety practices recommendations by developing countries is largely unknown. To our knowledge, no study has been conducted to assess the current applications of medication safety practices in Saudi Arabia. To assess the presence of core medication safety practices in Saudi Arabia hospitals

Methods:
A survey to assess medication safety practices in hospitals was developed. Major headings of the survey included look-alike, sound-alike medications, control of concentrated electrolyte solutions, transitions in care, information technology, drug information, and other medication safety practices. We selected stratified random samples of hospitals from all regions of Saudi Arabia. Hospitals in large cities were included as well as hospitals in small towns. Trained pharmacists visited each hospital to complete the survey.

Results:
Seventy eight hospitals (38 (49%) MOH, 14 (18%) non-MOH and 26 (33%) private hospitals) with capacity of up to 500 beds were included in the survey. Adherence to the currently recommended medication safety practice was low; only 22 (30%) had medication safety committee, 7 (9%) had medication safety coordinator, 6 (12%) had electronic error reporting system, 18 (24%) provided education on procedure for reconciling medications, 9 (12%) used medications bar coding and 18 (24%) involved pharmacists in hepatic or renal dosage adjustment. Common safety practices reported include unit dose system (90%), safe drug administration (83%) and prevention of accidental drug administration (86%).

Conclusions:
Core medication safety practices in Saudi Arabia hospitals are inadequate and this research have identified several areas for improvements.

Key Words: Look alike sound alike medications; Concentrated Electrolytes; Error

38: Poster

Community Pharmacists' Views and Attitudes to Continuing Professional Development (CPD) after a Diabetes Mellitus Type 2 CPD Support Package

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Introduction:
Background: The Royal Pharmaceutical Society of Great Britain is launching the implementation of mandatory continuous professional development (CPD) in the near future. It recommends that all pharmacists should practice CPD. In Scotland the NHS and Scottish Executive has released the Scottish Diabetes Framework. This discussed the need for a CPD strategy as a means of providing health care professionals an opportunity to update and refresh their knowledge. As a next step of improving health care professionals' education, their learning needs for diabetic care should be assessed. The aim was to establish the views and attitudes, of community pharmacists in Scotland providing structured pharmaceutical care to patients with diabetes mellitus type 2 to CPD and to establish if a package of CPD support would affect these views and attitudes.

Methods:
Comparison of the pharmacists' views and attitudes towards CPD using a six points Likert scale validated questionnaire before and after the intervention which involve a 30 active group pharmacists who received a CPD support package over the 12 month study period. The 30 control group pharmacists received no intervention. Any differences in their median responses were analysed. For the active group who used the CPD workbook, collation of the number of each competency and associated pharmacy activity identified as a CPD need was collated. The most and least common activities were summarised. Motivational and attitudinal questions to CPD were separately analysed. The usefulness of the CPD support package provided was investigated using a CPD support package questionnaire.

Results:
In general the motivation and attitude of the Scottish community pharmacists was positive towards CPD. There were a slight improvement in the views and attitude of the active group (n=24) compared to the control (n=28) but it was found to be statistically insignificant. The mean number (SD) of CPD linked activities identified by the active group participants who used the workbook (n=14) was 21.1 (3.6) and addressed by the participants was 19.8 (3.5) at twelve months. Most of the activities identified (n=295) by the workbook pharmacists as a learning need was found to be addressed (94%). Educational sessions, provision of literature on diabetes care and CPD competency workbooks were identified by the active group pharmacists as the most used and useful components of the CPD support package.

Conclusions:
In general our study showed that the participated had a positive view and attitudes toward CPD. Although there is limited data on the UK pharmacists' view, attitudes and participation in CPD, our study finding contributes to informing the forward pathway of the profession and acceptance of CPD within pharmacy. CPD workbooks appear not to be widely used CPD tool within the pharmacy profession in the UK. With mandatory CPD in near future, the use of CPD e-portfolios should be encouraged within community pharmacists. Further training and improvement in the use of CPD support is required to prepare the community pharmacists in delivering a high quality diabetes care services.

Key Words: Continuing professional development CPD; Pharmacist's views and

39: Poster

The impact of pharmacist intervention on patients' adherence to antidepressant medication and patient-reported outcomes

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Introduction:
Medications, regardless of effectiveness, do not work in patients who do not take them. Poor adherence to prescribed medication regimens has been a well recognized problem in all of medicine and patients with chronic conditions, such as depression, are less likely to follow prescription orders than those with acute conditions. In depression, several studies have reported a medication adherence rate of about 72% within the first month of treatment which drops sharply to about 43% after 6 months of treatment. Pharmacists may be able to help improve adherence rates yet no single review has examined the impact of pharmacist interventions on adherence to antidepressants. The aim of this study was to summarize the literature and determine whether pharmacist intervention will 1) improve adherence in depression; 2) improve patient-reported outcomes (PRO).

Methods:
A systematic review of the literature was conducted using the PubMed database to retrieve studies examining the impact of pharmacist interventions on adherence to antidepressants and on patient-reported outcomes, from 1990 to 2010. The following MESH terms were used: pharmacist intervention, medication intervention, depression, medication adherence, health-related quality of life, patient reported outcomes and antidepressants. A total of 25 papers were retrieved with 13 excluded on the basis of abstract or full-text review resulting in 12 studies suitable for inclusion.

Results:
The most common intervention strategy that pharmacists utilized was a combination of drug monitoring (baseline assessment and treatment follow-up), drug counseling by telephone and personal interviews, and patient education (about medication side effects).The results of these interventions were positive, improvement varying from 15% to 19% and also HRQL
improved to varying degrees.

Conclusions:
The studies support the roles of pharmacists in providing interventions to improve medication adherence in depression. The results can provide a basis for future studies examining the effectiveness of pharmacist interventions in depression.

Key Words: Pharmacist interventions; Adherence; Antidepressant medication and

40: Poster

The Description and Assessment of the Interview Process for Admission into a New School of Pharmacy in the USA

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Introduction:
Despite their widespread use, pharmacy school admission interviews often are unstructured and lack reliability. This paper describes our admissions process with an emphasis on the development of a semi structured admission interview designed to eliminate bias and provide valid information for admitting students to our school of pharmacy, with preliminary information about the interview's reliability and validity.

Methods:
After screening applications 227 applicants to University of Charleston School of pharmacy were interviewed for our class 2010 by at least two persons (faculty member and health care provider or practicing pharmacist). Interview scores were compiled and the intra- class correlation (ICC) between the interviewers' ratings was assessed. Then, the interview scores were correlated with undergraduate gradepoint averages (GPAs) and Pharmacy College Admissions Test (PCAT) scores. Hierarchical stepwise logistic regressions were run to test the model of predicting the admission status. The independent variables were GPA, PCAT and the total interview scores.

Results:
Inter-rater agreement for the overall interview scores were good to excellent (ICC = 0.644, $p < 0.001$). Scores on the semi-structured interview revealed weak correlations with cumulative GPA (-0.07, $p > 0.05$), PCAT composite (0.05, $p > 0.05$). The interview uniquely accounted for an additional 10% of the variance in admission status among students accepted and wait-listed, versus rejected ($F = 50.4$, $p < 0.001$).

Conclusions:
This initial psychometric investigation of the interview process in our school suggests that the interview may be a useful tool for assessing pharmacy school candidates. The Interview showed high levels of inter rater reliability, and discriminate validity. The weak correlations with other admission criteria suggest that the interview provided information about candidate credentials not obtained from those sources.

Key Words: Pharmacy School Admission; Pharmacy Examinations; Semi Structured

41: Poster

Design and validation of a Medication Assessment Tool (MAT) to evaluate the quality of medication use according to international guidelines in patients with type II diabetes mellitus in Kuwait

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Introduction:
Despite current advances in the medical and pharmacological treatments of diabetes, its incidence in Kuwait is on the rise, doubling during the last decade to reach 14.4% of the population in 2007. The quality of medication use in patients with type II diabetes has been studied in Scotland, UAE and Oman using a medication assessment tool (MAT), based only on criteria recommended by NICE and SIGN guidelines. One limitation identified when using the MAT in international setttings was that it needed further modification to embrace other internationally recognised guidelines that heterogeneous healthcare providers might recognise and access. Hence, to facilitate data collection within a clinical audit, a MATkw was developed and validated, using audit standards derived from international guidelines.

Methods:
The development of MATkw has undergone an iterative process that involved updating of guideline recommendations in previous MATs and creation of corresponding criteria. The tool was validated by an expert group by email as well as peer review before and after field-testing. The objectives were to establish face and content validity among diabete experts and to confirm the tool's fitness for purpose.

Results:
The MATkw was designed primarily from the recommendations for management of type 2 diabetes from the American Diabetes Associations' standard of medical care (ADA), the National institute for health and clinical excellence (NICE) and the Scottish Intercollegiate Guidelines Network (SIGN). The draft tool initially consisted of 55 criteria and was reduced to 43 criteria after the validation by an expert group and peer review. The criteria were conveniently grouped under five subheadings:(1) Secondary prevention of CHD, (2) Primary prevention of CHD, (3) Control of blood glucose, (4) Management of diabetes' complications and (5) Miscellaneous care issues. The feasibility of each criterion was field tested in a pilot study by applying the MATkw to patients (n = 20) in a primary care setting in Kuwait. An algorithm was produced following field testing as well as instructions, data rules and assumptions for the application of MATkw, in order to clarify individual criteria and ensure consistent interpretation and application of the audit tool to clinical documentation.

Conclusions:
Medication assessment tools have been shown to be valid instruments for use in a variety of care settings. MATkw provides a method for quality assurance of drug therapy use in clinical settings and may provide a means of establishing acceptable standards of medication adherence to international guidelines for diabetes care.

Key Words: Clinical Guidelines; Adherence; Quality of medication use;

42: Poster

Synthesis of functionalized enaminones in the development of safer anticonvulsants

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Introduction:
Enaminones are compounds possessing amino group linked to keto group through a carbon-carbon double bond. They are useful intermediates for the synthesis of several medicinal agents. Certain enaminones are known to have analgesic, anticonvulsant and anti-inflammatory activities. Our objective was to synthesize enaminone esters with di- or tri-substituted phenyl groups, and evaluate them for anticonvulsant effects in the development of safer anticonvulsant agents.

Methods:
Beta-diketo esters were prepared by three different synthetic routes, and the diketo esters were condensed with appropriate amino compounds to yield the functionalized enaminones (1-18). The enaminones were evaluated in vivo using standardized electrically-induced, and chemically-induced seizure models, and the rotorod test for neurotoxicity in mice and rats. The anticonvulsant profiles of the functionalized enaminones were compared to those of currently available anticonvulsants.

Results:
Six of the functionalized enaminones were class 1 anticonvulsants (active at 100 mg/kg dose), while three of the compounds were class 2 anticonvulsants (active below 300mg/kg dose) in the Antiepileptic Drug Development (ADD) program. The functionalized enaminones were devoid of neurotoxicity in the rotorod test, when compared to phenytoin and carbamazepine

Conclusions:
The functionalized enaminones carrying di- or tri-substituted phenyl groups afforded potent anticonvulsant agents in the in vivo evaluations. The functionalized enaminones 1 and 2 are desirable lead compounds in the development of potent anticonvulsant agents with minimal toxicity.
Acknowledgement: This work was supported by Kuwait University, Research Grant #PR01/08.

Key Words: Anticonvulsants; Enaminones; Synthesis;

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Glucosamine Sulphate Transdermal Gels: An alternative route for drug delivery

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Introduction:
Glucosamine (G) is known to be formulated in an oral dosage form, but it suffers from hepatic metabolism which greatly affects its bioavailability, in addition to its side effects on the GIT.
Objectives: The purpose of the study was to develop transdermal delivery systems of Glucosamine Sulphate (GS) using thermoreversible polymer, Pluronic F-127 (PF-127), and mucoadhesive polymer, sodium carboxymethylcellulose (Na CMC), in order to optimize its release profile and the overall clinical performance.

Methods:
Gel formulae were formulated and then subjected to rheological studies and in-vitro release. The effect of 10% dimethylsulfoxide (DMSO) on rat skin permeation was also studied.

Results:
Higuchi diffusion model was the best fitted model for the release results. PF127 and Na CMC gels showed high permeation results, and 25% PF-127 gel showed no skin irritation or histological change of skin layers.

Conclusions:
The results obtained suggest the feasibility of designing a successful transdermal delivery system providing constant (G) input and overcoming the disadvantages of oral administration.

Key Words: Glucosamine sulphate; Thermoreversible polymers; Mucoadhesive

44: Poster

Influence of Genetic Variations in Enzyme CYP2C19 and the Effect on the Pharmacokinetic Profile of Lansoprazole. Screening the Allele Frequencies of CYP2C19*1, CYP2C19*2 and CYP2C19*3 in the Jordanian Population

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Introduction:
The genetic polymorphism of specific genes in humans may alter the response to certain phramacological agents. This study attempts to evaluate the effect of different polymorphisms in genes encoding for CYP2C19 isozymes on the dose requirements of proton pump inhibitors (lansoprazol) among healthy Jordanian men. This study also aim as to relate the pharmacokinetics of orally administered lanzoprazole in healthy adult Jordanian men with CYP2C19 polymorphisms and determination of the percentage of CYP2C19 polymorphism in Jordanian population and the allelic frequency of CYP2C19*2 and CYP2C19*3.

Methods:
A total of 78 healthy Arab Jordanian volunteers (mean age 28.9 ± 7.0 years and weight 76.8 ± 7.9 kg) were included in this study from three different bioequivalence studies, written consent form were given for all volunteers in this study, one of these clinical studies which included 26 volunteers was done on lansoprazole 30mg oral tablet. Blood samples were taken at the following times after dosing to determine lansoprazole pharmacokinetic profile: 0, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 5, 6, 8, 10, 12 hours. The determination of lansoprazole plasma concentrations performed by means of a validated HPLC assay method at the laboratories of Jordan Centre of Pharmaceutical Research (JCPR). The method of analysis was developed and validated by JCPR based on published references (Dugger H.A et al., 2000, Karol M.D et al., 1995, Oliveira C et al., 2002). For each subject and each treatment, the following pharmacokinetic parameters were evaluated by non-compartmental analysis using the software Kinetica 2000 version 4.1, Innaphase Corporation, France. Healthy subjects by means of a medical and standard laboratory examinations, aged between 18-45 years, body weight within ± 10% of the ideal body mass index and who gave their informed consent in written form were included in this study.
Genotyping for CYP2C19*2, CYP2C19*3 was done for all 78 volunteers. A commercial kit (Wizard genomic DNA purification kit, Promega) was used to extract genomic DNA from whole blood samples. A well established PCR-RFLP test (Sonia M et al., 1994) is used in this study to detect the CYP2C19*2 and CYP2C19*3 alleles in all patients. The data of genotyping of all subjects used for screening the frequency of different genotypes and the allelic frequency of different polymorphisms in healthy Jordanian men. The pharmacokinetics and genotyping data for the study of lansoprazol was matched and compared to investigate presence of statistical differences in pharmaokinetic parameters. Quantitative variables are represented as mean (± standard deviations) and qualitative variables as percentages. For demographic and clinical data analysis, quantitative variables have been compared by using the Mann-Whitney test. For genotyping analysis between groups the differences were calculated by Mann-Whitney test. All calculations were performed with SPSS 15.0 for windows. A P value < 0.05 was considered as statistically

Results:
In Jordanian subjects, the allele frequencies of the CYP2C19*2 and CYP2C19*3 mutation were 0.16 and 0, respectively. The concentration-time curves in the two groups were fitted to a non-compartment model. In the homo extensive metabolisers and the intermediate metabolisers groups, the main kinetic parameters were as follows: Tmax significant. (2.1875±.777) and (2.54±1.87) h, Cmax (697.875±335) and (833.58±436.26) mg/L, T1/2 (1.3±0.43) and (2.38±1.64) h, Auc(0→∞) were (1684.9±888) and (3609.8±318)mg•h•L-1. A nonsignificant difference in AUC (0→∞), T1/2, k, Cmax values existed between the two groups (P<0.05).

Conclusions:
The Jordanian population showed similarities in CYP2C19 allele and genotype distribution pattern with some populations like West Asia, North America, Canada, Scandinavia and Africa.CYP2C19 allele and poor metaboliser genotype frequencies in the Jordanian population are distinct from populations' from East Asia like Chinese, Korean, Japanese, Malaysians, and Philipinos.CYP2C19 genotype is not the only major factor to influence the interindividual kinetic variability of lansoprazole in extensive and intermediate metabolisers phenotypes.

REFERENCES:

- Dugger HA, Carlson J.D, et al. Bioequivalence evaluation of lansoprazole 30mg capsules (lanfast and lanzor) in healthy volunteers. European Journal of Pharmaceutics and biopharmaceutics, 2001; 51.
- Karol M.D, Granneman K, Alexander K. Determination of lansoprazole and five metabolites in plasma by high performance liquid chromatography. Journal of Chromatography B, 1995; 182.
- Oliveira C, Astigarraga B, et al. Lansoprazole quantification in human plasma by liquid chromatography-electrospray tandem mass spectrometry. Journal of Chromatography B, 2003; 783.
- Sonia, F., de, Morais., Grant, R., Wilkinson,BI., Joyce, B., Koichi N.,Urs, A., Goldstein. The Major Genetic Defect Responsible for the Polymorphism of S-Mephenytoin Metabolism in Human. The Journal of Biological Chemistry, 1994; 269.

Key Words: CYP2C19 polymorphism; Lansoprazole; Jordanian Population;

45: Poster

Preparation and evaluation of indomethacin nanoemulsions for transdermal delivery

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Introduction:
Indomethacin is a well established anti-inflammatory, analgesic and antipyretic agent. Oral indomethacin administration suffers the drawbacks of potential gastrointestinal side effects and frequent dosing schedule. This study was undertaken to investigate nanoemulsion as a transdermal delivery system for indomethacin in a trial to ensure patient compliance and effective therapy.

Methods:
Six nanoemulsion formulas were prepared using Triacetin , Capryol 90 and Labrafil as oil ingredients, Tween 80 and Pluronic F 127 as surfactants and Transcutol and propylene glycol as co-surfactants. Indomethacin was incorporated as 2% wt/wt. The thermodynamic stability of the prepared nanoemulsions was assessed by subjecting them to centrifugation at 3500 rpm for 30 min, heating /cooling cycles between 4 and 25^{0}C and freeze-thaw cycles between -21 and 25^{0}C. The prepared formulas were evaluated for their particle size, refractive index, rheological properties and in vitro permeation. Morphology and dimensional distribution of the disperse phase have been characterized by transmission electron microscopy. The prepared systems were re-evaluated after storage for one year at ambient conditions. The bioavailability of indomethacin was determined after topical application of the selected formulas in male albino rats.

Results:
The Z-average globule size mean values ranged from 82.99 to 131.8 nm except for Pluronic based combinations which recorded larger particle sizes (3.8-5.3 µm). The polydispersity values were between 0.022 and 0.294. No significant changes in the refractive index were recorded on drug incorporation. The complete rheograms of the tested nanoemulsions proved thixotropic behavior. Differences in the in-vitro release and permeation results could be related to the particle size, as well as, degree of lipophilicity. Indomethacin incorporated in nanoemulsions exhibited higher C max and AUC (0-36h) values with respect to the commercial gel.

Conclusions:
The prepared nanoemulsions could be promising as a convenient delivery of indomethacin. The drug release could be tailored by proper selection of nanoemulsion components and concentrations.

Key Words: Nanoemulsion; Indomethacin; Transdermal;

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Development of controlled drug delivery system of antimicrobials for the local treatment of periodontal disease

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Introduction:
The aim of the study is development and characterization of a mucoadhesive controlled release formulation of metronidazole for use in the treatment of periodontal disease. The system was based on the ability of glycerol monooleate (GMO) to form a viscous liquid crystalline cubic phase when comes in contact with water. Metronidazole is formulated as a liquid suspension, which undergoes transformation to a release-controlling semi-solid gel on contact with aqueous fluids.

Methods:
Ethyl cellulose was added to GMO base to increase the viscosity of the cubic phase and to sustain the release of metronidazole from the cubic phase. The viscosity of the formulations was controlled by adding a small quantity of water that allowed the formation of low viscosity and easily injectable reversed micellar and lamellar phases of GMO. Propylene glycol was added to the formula to prevent the precipitation of ethyl cellulose and to decrease the viscosity. The formula characteristics are assessed by differential scanning calorimetry, viscosity measurements and particle size analysis. Polarized light microscope was used to observe the phase changes of the GMO.

Results:
The release exponent from the formulations was ranged from 0.4 to 0.55, indicating a diffusion controlled release mechanism. A formula contain 20% metronidazole, 10% propylene glycol ,5% water and 65% GMO that contain 7% ethyl cellulose was found to have the best drug release property and to be easily injectable at room temperature. The drug release results indicated that the best storage condition for the formula was at 4C° in dark place. There is no effect of the different additives on the mucoadhesive property of GMO.

Conclusions:
In conclusion, the metronidazole containing GMO liquid system described in this study can be administered easily by syringe and expected to form in the periodontal pocket a controlled release, biodegradable, mucoadhesive gel that enhance the removal of the anaerobic pathogen, thus improving the periodontal health.

Key Words: Periodontal Disease; Glycerol Monooleate; Mucoadhesive DDS;

47: Poster

Substance P and cocaine interactions in rats after cocaine

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Introduction:
We have previously reported that, in naïve rats, SP and cocaine employ similar mechanisms to modify excitatory synaptic transmission in the nucleus accumbens (Nac), a region implicated in substance use and abuse. Here we explored whether SP effects on these synaptic responses were altered in rats that have been sensitized to cocaine and whether SP could mimic cocaine in triggering hyperlocomotion in these rats.

Methods:
Rats were sensitized to cocaine using established protocol and subsequently challenged with cocaine or SP to determine any interaction. Nac slices were prepared from cocaine-sensitized rats and their age-matched saline-injected controls for electrophysiological studies.

Results:
Intraperitoneal injection of cocaine 15 mg/kg produced increased locomotor activity in rats by 408.5 ±85.9 % (n=5) which further increased to 733.1 ±157.8 % (n=5) above baseline activity after 1 week of sensitization to cocaine. A similar challenge with 10 mg/kg of SP after cocaine sensitization did not produce a significant change in locomotor activity (170.6 ±61 %; n=4). In the electrophysiological studies, 30 µM cocaine depressed the N-methyl-D-Aspartate (NMDA) receptor-mediated excitatory postsynaptic current (EPSC) by -49.4 ± 8.9% (n=3) and the non-NMDA receptor mediated response by -46.2 ± 5.6 %(n=4) in saline-injected age- matched control rats. In this group, SP and its active analog SP5-11 depressed the non-NMDA EPSC and NMDA EPSC by -35.0 ± 3.4 %(n=11) and -33.6 ± 3.8% (n=10) respectively. In the cocaine-sensitized rats, cocaine depressed the non-NMDA EPSC and the NMDA response by -57.3 ± 9.1 %(n=6) and -39.6 ± 6.3 %(n=4) respectively while SP5-11 depressed these responses by -45.9 ± 7.6 %(n=4) and -40.6 ± 4.6 %(n=10). In these cocaine-sensitized rats, cocaine's actions on non-NMDA and NMDA responses occluded those of SP5-11 (-45.1 ± 5.4%; n=7 versus -5.5 ± 12.3%; n=3 for former and -32.6 ± 6.8 %; n=4 versus -13.5 ± 7.2%; n=3 for latter).

Conclusions:
These studies show that SP does substitute for cocaine in inducing hyperlocomotion in cocaine-sensitized rats and that SP actions on glutamate-mediated synaptic responses are not altered by cocaine sensitization. These finding may have implications for the development of new agents to treat cocaine addiction.

Key Words: Addiction; Substance Abuse; Excitatory Synaptic transmission;

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Nigella sativa (Blackseed) Possesses Potent Immunomodulatory and NK Anti-Tumor Properties

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Introduction:
The search for natural immunomodulatory drugs holds a great hope for discovering effective remedies for preventing and treating a wide range of medical conditions. In this study, the potential immunomodulatory effects of Nigella sativa are investigated in light of splenocyte proliferation, macrophage function, and NK anti-tumor activity using BLAB/c and C57/BL6 primary cells.

Methods:
Splenocyte proliferation was assessed by [3H]-thymidine incorporation. ELISA was performed to assess cytokine secretion by splenocytes and macrophages, and Griess assay was performed to evaluate NO production by macrophages. Using YAC-1 lymphoma cells, the potential of Nigella sativa extract to promote the cytotoxic activity of NK cells was also examined by JAM assay.

Results:
Our findings reveal that the aqueous extract of Nigella sativa significantly enhances splenocyte proliferation in a dose-responsive manner. In addition, the aqueous extract of Nigella sativa favours the secretion of Th2, versus Th1, cytokines by splenocytes. The secretion of IL-6, TNFα, and NO; key pro-inflammatory mediators, by primary macrophages is significantly suppressed by the aqueous extract of Nigella sativa, indicating that Nigella sativa exerts anti-inflammatory effects in vitro. Finally, experimental evidence indicates that the aqueous extract of Nigella sativa significantly enhances NK cytotoxic activity against YAC-1 tumor cells, suggesting that the documented anti-tumor effects of Nigella sativa may be, at least in part, attributed to its ability to serve as a stimulant of NK anti-tumor activity.

Conclusions:
Our data present Nigella sativa as a traditionally used herb with potent immunomodulatory, anti-inflammatory, and anti-tumor properties. We anticipate that Nigella sativa ingredients may be employed as effective therapeutic agents in the regulation of diverse immune reactions implicated in various conditions and diseases such as cancer.

Key Words: Herbal Medicine; Immunomodulation; Anti-Tumor;

49: Poster

Effect of counseling on diabetic patients

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Introduction:
This study was performed to illustrate the importance of counseling –as a part of pharmaceutical care- in improving patient knowledge and so compliance. Diabetic patients were specifically selected as the sample for this research, for their special pharmaceutical care needs.

Methods:
Diabetes has become a death cause, in 2005, an estimated 1.1 million people world wide died from diabetes (WHO). 20 patients were recruited to perform this study due to limited time available, they were selected randomly from patients admitted to endocrinology department (Feb-May 2007), Al-Zahraa hospital, Cairo, Egypt. Children & type I diabetic patients were excluded. Patients were assessed on base line knowledge about drugs (name, dosage form, indication, dose, proper use, missing dose). Only 6 patients were managed to complete the study and were being re-assessed about their base line knowledge after one week of the pervious interview to test the effect of counseling on patient knowledge before and after counseling. Information was collected from patients using face to face interviews by structured questionnaire.

Results:
Results were calculated, evaluated, and statistically tested by SPSS program using paired t-test at $p< 0.05$. Patients knew about 27.76% of their medications' names before counseling& about 27.76% after(no significant difference), 72.2%of their medications' dosage forms before counseling& 100% after (no significant difference).
69.43%of their medications' indications before counseling& 100% after (no significant difference)
77.76% of their medications' doses before counseling &83.33% after (no significant difference)
47.2% of their medications' proper uses before counseling% & 100% after (significant difference)
38.86%of their medications' missing doses& 65.26% after (no significant difference)

Conclusions:
There is significant difference between patient knowledge concerning proper use of medications before and after counseling and No significant difference between other items included in this study; which may results from small number of patients included in this study. This indicates that counseling may improve patient knowledge and compliance which can in turn give maximum benefit from medications and decrease its side effects. Pharmacists are the best to offer this service as they have all information concerning best drug use.

Key Words: Patients' counseling; Diabetes; Interview;

50: Poster

COL-3 prevents the development of paclitaxel-induced painful neuropathy in mice.

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Introduction:
Paclitaxel is an effective chemotherapeutic agent used against solid tumors. However, its use is sometimes limited by the development of peripheral neuropathy including painful neuropathy. Currently, there are no clinically proven analgesics for the prevention or treatment of this neuropathic pain. COL-3 is a chemically modified tetracycline, which lack antibacterial but retain anti-inflammatory activities and has antitumor activities. COL-3 might protect against the development of paclitaxel-induced painful neuropathy.

Methods:
Different groups of BALB/c mice (11-15 animals per group) were treated for five days as follows: Vehicle only control group; COL-3 (40 mg/kg) orally; Paclitaxel (2 mg/kg,) i.p.; Paclitaxel + COL-3 (4, 20 or 40 mg/kg). The reaction latency times to thermal stimuli (hot-plate test) were recorded before treatment (baseline latency) and at 7 and 10 days after the first day of treatment.

Results:
Treatment with paclitaxel for 5 consecutive days produced heat hyperalgesia (reduction in reaction latency time to thermal stimuli compared to vehicle treated mice, $p<0.01$) at day 7 and 10 days post-first drug administration. On the other hand, administration of COL-3 (40 mg/kg) alone to naïve mice for 5 days did not alter the mice's reaction latency to thermal nociception. Mice which were treated with paclitaxel + COL-3 (40 mg/kg) had reaction latencies similar to vehicle treated mice, which were significantly higher than those of paclitaxel only-treated mice ($p<0.01$). However, reaction latency times of mice treated with paclitaxel plus lower doses of COL-3 (4 or 20 mg/kg) were lower than control animals ($p<0.01$), but the reaction latency of mice treated with COL-3 at 20 mg/kg was significantly higher than those of the paclitaxel alone group ($p<0.05$).

Conclusions:
In conclusion, our results indicate that COL-3 can prevent the development of paclitaxel-induced neuropathic hyperalgesia, thus, could be useful in the prevention of chemotherapy-induced painful neuropathy.

Key Words: Chemotherapy-induced neuropathic pain; Paclitaxel; Col-3;

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Tissue distribution and pharmacokinetics of selenium in mouse

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Introduction:
Selenium (Se) functions in the body as an important dietary antioxidant and essential component of the active sites of a number of enzymes. Dietary Se deficiency has been associated with a number of chronic diseases such as Keshan disease, cardiovascular diseases, cancer, asthma, arthritis and many others. The aim of the present study was to investigate Se distribution profile and pharmacokinetics in the mouse model.

Methods:
The animals (n= 92) received 0.25 µg/g Se orally for 5 days; (control = 18). Tissue harvesting and blood sample collections were performed 24 h after the last Se administration. This means that the first samples were collected 24 h following the first Se administration (at day 0) and the second samples 24 h following the second Se dose administration (after days 0 and 1). Se administration continued until the last dose which was on day 4 and the samples were collected on day 5 (24 h later). Samples of whole blood and various tissues comprising kidney, liver and brain were harvested from mice and then analysed for Se content using galvanostatic stripping chronopotentiometry (SCP) technique.

Results:
Se tissue concentrations (µg/kg) in mice showed that the maximum Se levels in most tissues were attained within 3- 4 days following administration. Se pharmacokinetic profile in the mouse model indicates that the element is slowly absorbed (Tmax= 4 days) from the gastrointestinal tract (GIT) and slowly eliminated from the body with a blood half-life of about 4.5 days.

Conclusions:
Se distributes in whole blood as well as into various tissues of the mouse with high concentrations in the kidney and liver and low levels in the blood and brain tissues. The absorption of Se from the GIT was very slow and the data suggest that the elimination of Se seems to be through the kidney at a very slow rate as well. The data of the present study thus suggest that Se remains in the mouse body for a long period of time.

Key Words: Selenium; Pharmacokinetics; Mouse;

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Sources of information used when prescribing for children. A cross sectional study of hospital based paediatricians.

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Introduction:
Due to the lack of properly tested medicines for children, there is little available information with regards to indications and dosing of medications in children.
OBJECTIVE: To collect data on sources where hospital based pediatricians obtain prescribing information when treating children and the extent of collaboration with the hospital pharmacist.

Methods:
Two hundred and fifty pediatricians in different hospitals within different cities in Jordan were asked to fill in a structured questionnaire regarding information sources used when prescribing for children.

Results:
Questionnaires were collected from 111 (44.4%) hospital based pediatricians, who had completed the questionnaire by the designated date. Most respondents (75.5%) reported that the British National Formulary (BNF) was the source that they most frequently used for drug information when prescribing for children. The BNF and the BNFc (British National Formulary for children) were found to be the most beneficial sources that contain sufficient information to aid pediatricians when prescribing for children. The majority (78%) reported having difficulties regarding drug prescribing for children. However, 44% of the participants claimed to be fully confident in their prescription for children. One of every five physicians (22%) claimed to consult with the hospital pharmacist when they face difficulties when prescribing for children. Fifty four percent of respondents reported that they received little or no education regarding prescribing for children during undergraduate and postgraduate (internship or residency) medical education, respectively.

Conclusions:
It is currently the source most frequently referred to by physicians. Further work should be done in the provision of useful information to pediatricians on pediatric drug therapy. More steps should be taking place to activate collaboration and interaction between pediatricians and pharmacists as well.

Key Words: Pediatricians; Prescribing; Children;

53: Poster

Identification of recombinant proteins and synthetic peptides of Mycobacterium tuberculosis-specific genomic regions for vaccine applications

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Introduction:
The comparative genomic studies have identified 11 regions of differences (RDs) between Mycobacterium tuberculosis, the causative agent of tuberculosis, and all of the vaccine strains of M. bovis BCG. These RDs are predicted to contain 89 open reading frames (ORFs). In this study, the vaccine potential of these ORFs was investigated by using recombinant proteins and synthetic peptides corresponding to them.

Methods:
Attempts were made to express RD genes in a heterologous host, i.e. Escherichia coli, and the purified recombinant proteins were tested for immunological reactivity. However, the recombinant protein methodology could not be applied to all the genes/proteins of RDs because of the problems associated with the expression and purification of mycobacterial proteins expressed in E. coli. Therefore, overlapping synthetic peptides (n= 1,648) covering all of the ORFs of the above RDs were synthesized and tested in cellular assays (protective Th1 and pathologic Th2 responses) using peripheral blood cells from HIV negative pulmonary tuberculosis patients and PPD+ healthy humans.

Results:
The strongest Th1-responses were induced by RD1 peptides and the highest Th2 responses were induced by RD12 and RD13 peptides. Further experiments showed that three proteins of RD1, i.e. PPE68, ESXA and ESXB, induced the best Th1 responses. These proteins also induced delayed type hypersensitivity responses in guinea-pigs infected with M. tuberculosis, but not in animals infected with other mycobacteria. The bioinformatics analysis for binding to human leukocyte antigen (HLA)-DR molecules revealed that all of these proteins were promiscuous HLA-DR binders. Further analysis of the individual peptides of these proteins showed that several peptides of ESXA and ESXB were HLA-DR binders and inducers of Th1-cell reactivity, whereas a single peptide of PPE68 was HLA-DR promiscuous and immunodominant for Th1-cell reactivity.

Conclusions:
The study has identified proteins and peptides of M. tuberculosis-specific RDs with potentials as new vaccine candidates against tuberculosis.
It was supported by Kuwait University Research Administration grant MI01/10.

Key Words: Tuberculosis; Vaccine; Region of difference;

54: Poster

Stability of Vitamin E/Acetate in Commercial and Experimental Cosmetic Formulations

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Introduction:
Background: Vitamin E (alpha-tocopherol) is one of the best established ingredient in OTC products of skin ageing. Vitamin E is a lipid-soluble antioxidant which plays key roles in protecting cell membranes from lipid peroxidation by free radicals and reducing photocarcinogesis. The vitamin is prone to oxidation, especially under frequent opening of the container by the user, at elevated temperature of storage. Therefore, the stability of T/TA (tocopherol/tocopherol acetate) in four marketed products (A, B, C and D) and two experimental cosmetic formulations (F1and F2) were investigated.

Methods:
F1 and F2 are cream-emulsion formulations, containing T and TA respectively. The commercial products contained only TA, without declaration of quantity. Sets of each formulation were stored at 2- 8ºC, 22-25ºC, and 37ºC and investigated for physical changes. Chemical stability was monitored by HPLC method (mobile phase of 3%v/v water/methanol at 1.5 ml/ min). The eluents were monitored at 290 nm and 283 nm for T and TA, respectively (Nada et al. 2010). Statistical analysis of the data was performed by t-test at $p < 0.05$.

Results:
Product-A stored at 37 ºC showed loss of consistency and color change. Product-C showed leakage after 5 months at 37 ºC with loss of content. Product-D was no longer homogenous in appearance after 5 months at 37 ºC. Experimental preparations maintained the initial consistency, homogeneity, color and appearance. The initial concentrations of commercial products A, B, C and D were 0.12, 0.68, 0.53, and 0.49%, respectively. The experimental formulations contained 0.57 and 0.58%w/w of T and TA, respectively. The stability progressively decreased upon storage at higher temperatures. TA-containing formulations showed higher stability compared to T. After storage for 20 weeks at 37 °C, F1 lost about 80%, while F2 lost only 10% of the initial concentration.

Conclusions:
Stability of T and TA is questionable during the use and storage of cosmetic products. Storage of vitamin-E products at 37 °C for 1-2 months results in appreciable loss of the vitamin.

Acknowledgement
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References
Nada, A, Krishnaiah YSR, Zaghloul A, Khattab I: Analysis of Vitamin E in Cosmetic Preparations by HPLC. Journal of Cosmetic Science 2010; 61(5):353-365.

Key Words: Tocopherol; Cosmetics; Stability;

55: Poster

Effective Control Of Blood Glucose Status And Toxicity In Streptozotocin-Induced Diabetic Rats By Orally Administration Of Pimpinella Tirupatiensis Aqueous Extract

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Introduction:
In Indian traditional system of medicine, herbal remedies are prescribed for the treatment of diseases including diabetes mellitus. In recent years, plants are being effectively tried in a variety of pathophysiological states. Pimpinella tirupatiensis is one of them and that made it a potential candidate for the treatment of diabetes mellitus. The present study was aimed to evaluate its therapeutic potential by assaying the activities of key enzymes of carbohydrate metabolism in streptozotocin-induced diabetic rats.

Methods:
The daily oral treatment of diabetic rats using Pimpinella tirupatiensis aqueous extract (750mg/kg body weight) for 30 days demonstrated a significant ($p<0.05$) decline in blood glucose levels and a significant ($p<0.05$) increase in plasma insulin level. The altered activities of the key enzymes of carbohydrate metabolism such as pyruvate kinase, lactate dehydrogenase, glucose-6-phosphatase, fructose-1,6-bisphosphatase, glucose-6-phosphate dehydrogenase, glycogen synthase and glycogen phosphorylase in liver and kidney tissues of diabetic rats were significantly ($p<0.05$) reverted to near normal levels by the administration of Pimpinella tirupatiensis aqueous extract.

Results:
Pimpinella tirupatiensis aqueous extract administration to diabetic rats improved hepatic glycogen content suggesting the antihyperglycemic potential of Pimpinella tirupatiensis aqueous extract in diabetic rats. The obtained results were compared with glibenclamide, a standard oral hypoglycemic drug.

Conclusions:
Thus, the modulatory effects of Pimpinella tirupatiensis aqueous extract on attenuating these enzymes activities may afford a promise for widespread use for treatment of diabetes in the future.

Key Words: Pimpinella tirupatiensis; Diabetes; STZ Rat;

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Novel 5-(1H-1,2,3-triazolyl)methyl Oxazolidinones as Anti-tubercular Agents

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Introduction:
Background: The rapid development and spread of multi-resistant strains of Mycobacterium tuberculosis (M. tb) and their global impact on the healthcare serve as impetus for the discovery of novel anti-tubercular drugs. Oxazolidinones are novel antibacterial agents with Gram-positive activity. Representative of this class, linezolid is active against M. tb. In this study, we investigated the anti-Mycobacterium activity of a series of novel 5-triazolylmethyl oxazolidinones.

Methods:
Syntheses of the compounds and their calculated log of partition coefficient (Clog P) values were previously reported from our laboratory. Compounds were screened against M. tb H37Rv in the dose response assay and reported as 90% inhibitory concentration (IC90, µg/ml). Mammalian Vero cell cytotoxicity assay to give CC50 (µg/ml) values, which allowed calculation of selectivity index (SI: ratio of CC50 / IC90); and preliminary bioavailability assays were performed. Bioassays were performed by the Tuberculosis Antimicrobial Acquisition and Coordinating Facility (TAACF, USA).

Results:
From the data, concise structure-activity relationships (SARs) were established. Analogs with alkylcarbonyl and arylcarbonyl groups at the piperazine 4-N-position displayed best activities with IC90 value ranges of <0.2 to 2.095 and <0.2 to 2.103 µg/ml, respectively. This is comparable to methanesulfonyl analog and linezolid. These compounds gave acceptable SI value ranges of >13.76 to >257.3. Among the heteroaryl analogs, furanylcarbonyl derivative was most active (IC90: <0.2 µg/ml, SI: >220.2), while others showed IC90: 0.209 to 1.389 µg/ml and SI: >34.98 to >217.3. However, the arylsulfonyl derivatives were inactive (IC90: 5.469 to >100 µg/ml, SI: >8.896). Nicotinoyl, isobutryl and morpholino analogs showed low to medium bioavailability and were selected for further testing in vivo.

Conclusions:
Triazolyl oxazolidinones showed potent activity against M. tb H37Rv with exciting SARs. Three compounds with acceptable bioavailability were selected for further in vivo testing.

Key Words: Anti-tubercular agents; Mycobacterium Tuberculosis; Oxazolidinones;

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Synthesis of a New Phenytoin Derivative and Study of Their Anti-inflammatory Activity.

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Introduction:
Inflammation is the complex biological response is a protective attempt to remove the injurious stimuli, most strongly implicated are prostaglandins (PGs), leukotrienes (LTs), histamine, bradykinin, platelet activity factor (PAF) and interleukins. Phenytoin is a drug used for treatment of antiepileptic. The non-steroidal antiinflammatory drugs have many side effects, the increase selectivity of compounds for COX2 to be fewer side effects.

Methods:
Phenytoin (5,5-diphenylimidazolidine-2,4-dione) was prepared from benzil and urea with sodium hydroxide in absolute ethanol. A derivative of phenytoin was prepared from a histidine acidified with hydrochloric acid in absolute ethanol and phenytoin to give phenytoin-3-histdine IUPAC name is (S)-3-(2-amino-3-(1H-imidazol-4-yl) propanoyl)-5,5-diphenylimidazolidine-2,4-dione. The identification was performed by measuring the melting point, IR spectra and CHN analysis. For determination the effect of drug on acute inflammation by carrageen induced inflammation model in mice was used. Inflammation was induced by sub-plantar injection of (1%) carrageenan in water. The volume of paw was measured by electronic digital micrometer at (0, 1.5, and 3 hour).

Results:
The phenytoin melting point 293 °C and Phenytoin-3-histidine decomposed at 248-250 °C. Appearance of a new band at 1460 (1/cm) for C-N bond between phenytoin and histidine. The CHN percentages show a reasonable good agreement with calculated results. Phenytoin derivative (with histidine) have anti-inflammatory activity at 1.5 and 3 hour with high significant ($p<0.001$) according to ANOVA t-test.

Conclusions:
The presence of imidazol ring in the compound increased the activity as anti-inflammatory agent, so it was resemble the tri-cyclic series of anti-inflammatory drugs like phenylbutazon and celecoxib. So it was predicted that phenytoin derivative will act as an anti-inflammatory agent by the same mechanism of the non-steroidal anti-inflammatory drugs, through inhibition of biosynthesis of prostaglandins by inhibiting COX-2 enzyme.

Key Words: Anti-inflammatory Agent; Phenytoin Derivative; COX-2 Inhibitor;

58: Poster

Natural product research in Bangladesh

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Introduction:
Background: Natural products, especially those derived from higher plants, have attracted scientists from ancient time because of their potential therapeutic values. Drug development from natural sources showed that natural products or natural product-derived drugs comprised about 28% of all new chemical entities launched to the market. These are originated from terrestrial plants, microbes, marine organisms, etc. However, until recently an insignificant part of the plants has been scientifically evaluated for their medicinal properties. Bangladesh is a rich repository of medicinal plants, many of which are widely used in the Ayurvedic, Unani, Herbal and other traditional systems of medicines. The study programs were initiated to investigate some of the traditionally used medicinal plants of Bangladesh for the discovery of novel drug candidates as well as to isolate and identify bioactive compounds from several microbial strains and marine samples.

Methods:
The samples were collected, properly authenticated and extracted with solvents of appropriate polarities. The concentrated extractives were then subjected to repeated separation and purification processes. The structures of the purified molecules were elucidated by extensive spectroscopic studies and chemical derivatization as required. The extractives were also subjected to appropriate assay techniques to establish the bioactivities.

Results:
In our laboratory, we have extensively studied 50 medicinal plants and several microbial strains that have resulted in the isolation and characterization of 150 compounds, including 50 new molecules. Terpenoids, alkaloids, flavonoids and glycosides were the major classes of constituents. The crude extractives and several purified molecules demonstrated statistically significant inhibition of growth of microorganisms as well as cytotoxicity, antioxidant and antidiabetic activities. On the other hand, usnic acid, a lead compound obtained from the lichen, Parmelia kamtschandalis, showed potent antimicrobial activity, whereas dehydroaltenusin and ovatodiolide extracted from a Streptomyces sp. And Anisomeles indica, respectively exhibited significant HIV-inhibitory effects.

Conclusions:
The series of studies which we conducted in our laboratory have resulted in the isolation and characterization of numerous chemically unique and biologically interesting secondary metabolites from medicinal plants, microbes and marine organisms. Some of these results are in conformity with the traditional and folk uses of the investigated plants

Key Words: Natural products; Ayurvedic; Usnic acid;

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Combination of Trigonella Foenum Graecum and Curcuma Longa Treatment to Prevent Histopathological Abnormalities in Liver Tissue of Alloxan Induced Type-1 Diabetes in Male Albino Rats

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Introduction:
Diabetes is emerging as a major healthcare problem throughout the world. About 100 million people around the world have been diagnosed with diabetes and by the year 2011, it is projected that 215 million people will have the disease. Currently there are over 150 million diabetics worldwide and this number is likely to increase to 300 million or more by the year 2025.Plants with antidiabetic activities provide useful sources for the development of drugs in the treatment of diabetes mellitus. Ayruvedic physicians have treated diabetes for thousands of years using combination of herbal formulations. The plants Trigonella foenum graecum (TFG) and Curcuma longa (CL) are well known and have been used traditionally as antidiabetic medicinal plants.

Methods:
The rats were divided into five groups. Group-I (Normal rats), Group-II (Diabetic untreated rats), Group-III (Diabetics + TFG),Group-IV (Diabetics+CL),Group-V (Diabetics +TFG+CL).TFG and CL extracts were orally administered at a concentration of 250 mg/kg b.w to normal and diabetic rats for 30 days.

Results:
The histopathological observation of liver in diabetic rats (Group-II) showed distortion in the arrangement of cells around the central vein. Hepatocytes showed degenerative changes (DGE) and widening of sinusoidal spaces (WSS). Periportal necrosis of hepatocytes near the portal area was also observed. The portal vessels were found dilated and congested. The capillaries were enlarged and the walls of vein and capillaries were thickened. Moreover, the veins and capillaries in the diabetic liver showed inflammation with a number of lymphocytes and accumulation of macrophages near the capillary, in case of groups III, IV and V regression of histopathological changes were observed in diabetic rats treated with TFG, CL and TGF + CL for 30 days respectively.

Conclusions:
Thus, this is a first report indicating that the functional deterioration of the liver tissue at an early stage of alloxan-diabetes in rats can be protected by oral administration of combination TFG and CL for 30 days.

Key Words: Trigonella foenum graecum (TFG), Curcuma longa (CL; Type-I Diabetes;

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Evaluation of antifungal potential of ozonized oil against some dermatophytes

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Introduction:
The antimicrobial efficacy of ozone against bacteria, fungi and viruses has been demonstrated by several investigators due to its strong oxidation reaction which occurs upon any collision between an ozone molecule and a molecule of oxidizeable cellular components, particularly those containing double bonds, sulfhydryl groups, and phenolic rings. Therefore, membrane phospholipids, intracellular enzymes, and genomic materials are targeted by ozone. These reactions result in cell damage and death of microorganisms. Ozone therapy has been more beneficial than some conventional therapeutic agents.

Methods:
Five dermatophytes species were tested; namely, Microsporum canis, M. gypseum, Trichophyton rubrum,, T. mentagrophytes, and T. interdigitales. The broth microdilution method was performed according to NCCLS M38-P guidelines (NCCLS, 1997) to determine the minimum inhibitory concentration (MIC). Terbinafine was used as antifungal reference drug for comparison. Keratinase assay was carried out according to Yu et al. (1968), urease activity according to Weatherburn (1967), amylase according to Kaufman and Tietz (1980), alkaline phosphatase according to Harsanyit and Dorn (1972), lipase according to Lott et al., (1986). Mycelial leakage of electrolytes and sugars was performed according to Emam (1982). Pathogenicity test was carried out using guinea pigs. The infected pigs were examined clinically and mycologically 30 days post ozone treatment and percent curing was estimated.

Results:
In this research the effect of ozonized oil on five fungi causing skin mycosis was evaluated. Ozonized oil induced a steady reduction in sporulation and mycelial leakage of electrolytes and sugars after treatment at the minimum inhibitory concentration (MIC). Ozonized oil applied at MIC was efficacious in producing high loss in enzyme activity reaching 78.97% and 83.64% for Microsporum canis, in the case of urease and amylase, respectively, and 94.10% and 58.96% for M. gypseum in the case of alkaline phosphatase and lipase, respectively. Application of ozonized oil achieved different degree of curing of guinea pigs infected with the tested dermatophytes depending on the species. The percentage recovery reached 100% in the case of M. gypseum on application of 2 µg/ml ozonized oil.

Conclusions:
The reached result is equivalent to that obtained by using 2 µg/ml terbinafine as antifungal reference drug and ozonized oil can be successfully used in treatment of skin mycosis.

Key Words: ozone; dermatophytes; enzymes;

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Biological and Phytochemical Study of *Centaurea aegyptiaca* Extract

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Introduction:
Various species of *Centaurea* are used as herbal remedies for their digestive, tonic, expectorant, antipyretic, and antidiarrheal effects. Some *Centaurea* species were reported to have analgesic, anti-inflammatory, antipyretic, antimicrobial, cytotoxic, and cardiotonic activities. However, the biological activities of *Centaurea aegyptiaca* have not been explored. This study aimed at evaluating the anticancer activity of *Centaurea aegyptiaca* extract and isolating the compound(s) that may be responsible for this activity.

Methods:
Centaurea aegyptiaca dried aerial parts were extracted with ethanol and ethyl acetate. The cytotoxic activity of both extracts were evaluated against different carcinoma cell lines according to Skehan et al.,1990's method. IC_{50} µgm/ml of the extracts were determined using doxorubicin as a standard cytotoxic agent. The alcoholic and ethyl acetate extracts were subjected to chromatographic separation. The isolated compounds were analyzed using different spectroscopic methods. Moreover, the cytotoxic activity of these compounds was evaluated against liver and larynx carcinoma cell lines.

Results:
The alcoholic extract of *Centaurea aegyptiaca* exhibited cytotoxic activities against liver, breast, cervix, colon, and larynx carcinoma cell lines. IC_{50} values were 0.40, 2.95, 4.30, 2.15, and 0.50, respectively. However, ethyl acetate extract exhibited cytotoxic activities against liver and larynx carcinoma cell lines only with IC_{50} of 3.88 and 7.18, respectively. Two sesquiterpene lactones were isolated and characterized. These sesquiterpene lactones exhibited potential cytotoxic activity against larynx carcinoma cell line with IC_{50} of 0.74 and 2.95.

Conclusions:
This study illustrated the potential cytotoxic activity of *Centaurea aegyptiaca* alcoholic extract against different carcinoma cell lines. However, the most potent cytotoxic effect was against liver and larynx carcinoma cell lines. Chemical investigation of *Centaurea aegyptiaca* extracts led to the isolation and identification of two sesquiterpene lactones. These compounds may have been responsible for the potential cytotoxic activity of *Centaurea aegyptiaca* extracts against larynx carcinoma cell line.

Acknowledgements: Spectral analyses were done at Kuwait University, Faculty of Science, Science Analytical Facilities, SAF, supported by Grant number GS01/03.

Key Words: Centaurea (Italic) aegyptiaca (Italic); Cytotoxicity; Sesquiterpenes;

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A validated LC-MS/MS method for the determination ofTamsolusin Hydrochloride in six pharmaceutical brands

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Introduction:
Tamsolusin hydrochloride is a selective alpha1-adrenoreceptor antagonist which has been recently prescribed for the treatment of patients with symptomatic benign prostatic hyperplasia. The rapid absorption of the immediate-release oral tamsolusin formulation has led to the development of modified-release once daily formulation to improve tolerability and prolong the drug's action. The purposes of this study were to develop a sensitive and specific liquid chromatography-tandem mass spectrometry (LC-MS/MS) method for measuring the drug's content in 6 brands of tamsolusin and for evaluating the in vitro bioavailability of these brands by determining the dissolution profiles under simulated gastric conditions.

Methods:
A triple quadruple tandem mass spectrometer (Micromass, UK) with a positive electrospray ionization probe coupled to Waters 2695 Separation Module was used. LC conditions were: Xterra® RP-C8 (150 x 4.6 mm, 5 µm) column and mobile phase of acetonitrile: water: formic acid (80:20:50microl v/v/v). MS/MS conditions were: MRM at m/z 410.4>148.62 (tamsolusin) and m/z 236.8>120.4 (procainamide, IS). Quantification was made using internal standard calibration. Standard curves were established at the concentration range 5-25 µg/ml. The content uniformity and dissolution studies were conducted using six brands, namely Contiflo OD (extended release capsule), Omnic (modified release capsule), Omnic OCAS (film coated tablet), Tamurex (prolonged release capsule), Tamsulin (capsule) and Bazetham MR (modified release capsule). The dissolution parameters were calculated from the dissolution profiles.

Results:
The established calibration curves showed good linearity (r: 0.99 ± 0.004), accuracy (97.5%) and precision (11%) over the concentration range 5-25 µg/ml of tamsolusin hydrochloride. The drug content of the six brands was in the range of 0.283-0.385 mg (dose = 0.4 mg), whereas the calculated dissolution parameters (C max, T max and % drug release) were: (1.96-7.50 µg/ml), (30-90 min) and (12.3-46.8%), respectively.

Conclusions:
The developed LC-MS/MS method was successful for the analysis of low-dose pharmaceutical brands of tamsolusin hydrochloride for both quality control and bioavailability assessment.

Key Words: Tamsolusin Hydrochloride; LC-MS/MS Method; Content Uniformity;

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Effect of indomethacin and prednisolone on tissue kallikrein activity in arthritic rats

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Introduction:
The kinin- forming components have been implicated in the pathophysiology of inflammatory conditions, and kinin is a powerful agent that can produce all the cardinal signs of inflammation. These components have been reported to be altered in inflammatory disorders. Objectives: To evaluate the tissue kallikrein activity in the synovial and paw tissues of control, non-treated adjuvant arthritic and adjuvant arthritic rats treated with either indomethacin or prednisolone.

Methods:
Thirty-two male Sprague Dawley rats were used in the study. Adjuvant arthritis was induced in twenty six (n=26) rats in the right knee by injecting 0.05 ml of a fine suspension of heat-killed mycobacterium tubercle bacilli in liquid paraffin (5 mg/ml). Ten rats were treated with Indomethacin (2.5 mg/kg given orally) and ten were treated with prednisolone (3.0 mg/kg given orally) for 9 days. The swelling of the knee joint was measured with a caliper. The synovial and paw tissue were removed and analyzed for tissue kallikrein activity.
Statistical analysis
Unpaired Student's t test was used to evaluate the significance of differences. When variances were heterogeneous, statistical analyses were used by Wilcoxon's rank sum test.

Results:
Indomethacin and prednisolone treatment resulted in a significant reduction ($p<0.001$) in knee swelling. In non-treated adjuvant rats, synovial tissue kallikrein levels were raised ($p<0.01$) than those of the controls. Prednisolone treatment resulted in reduction ($p<0.05$) and indomethacin treatment produced rise ($p<0.01$) in synovial tissue kallikrein levels. In non-treated arthritic rats, the paw tissue kallikrein levels were lower ($p<0.001$) than the control rats; whereas, prednisolone and indomethacin treated rats showed higher levels ($p<0.05$) of paw tissue kallikrein.

Conclusions:
The results of the investigation suggest that prednisolone and indomethacin differ in their actions in inflamed synovial tissue kallikrein and have similar effect in non-inflamed paw tissues.

Acknowledgements: This work was carried out in the Department of Pharmacology, School of Medical Sciences, USM, Malaysia and was supported by the Ministry of Science and Technology Malaysia. Miss Khor Lee Kean provided an excellent technical support.

Key Words: Tissue kallikrein; Adjuvant arthritis; Indomethacin;

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Clinical evaluation of the measured vancomycin trough concentration using Various population kinetic methods

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Introduction:
Background and Objectives: An appropriate vancomycin dosage regimen is required to achieve a maximum therapeutic effect. Various models (Ambrose; Bauer; Birt; Burton; Burton revised; Matzke; Rodvold) were developed to determine vancomycin dosage regimen based on estimation of vancomycin kinetic parameters such as vancomycin clearance (CLvanco) and volume distribution (Vd). These parameters display large inter- & intra-subject variabilities. The objective of this study was to compare the predictability of various models for estimating the measured trough concentration (Ctrough).

Methods:
127 inpatients were identified for whom a confirmed steady-state vancomycin Ctrough level was available (group1). A sub-group (n=76) of these patients (group 2) had at least one steady-state peak concentration (Cpeak) together with a second Ctrough level recorded in their profiles. For each published method, the calculated Clvanco and Vd were used to estimate Ctrough which was then compared with the measured Ctrough. For group 2, the first measured Ctrough and Cpeak levels were used to estimate the second Ctrough level which was then compared with the second measured Ctrough (individualized) level.

Results:
The seven published methods gave coefficient of determination(r2) values in the range of 0.111-0.279; bias, -2.91-6.56; precision, 6.54-10.38; predictions within 2.5 and 5 mg/L of the measured Ctrough were in the range of 11-30% and 27-55%, respectively; predictions within 25% and 50% of measured Ctrough were 14-35% and 39-55%, respectively. In group 2 only using the individualized method, the corresponding values were 0.743, 0.03; 2.99, 67% and 83%, 65 % and 87%, respectively. Of the published methods, the Birt and Burton revised methods performed best.

Conclusions:
The population methods studied for calculating vancomycin kinetic parameters varied widely in predicting Ctrough level compared with the measured concentration. Of these methods, the Birt and Burton revised models performed best, however, they were not sufficiently reliable to replace therapeutic drug monitoring of vancomycin as indicated by the results of the individualized method.

Key Words: Vancomycin; Clinical Pharmacokinetic; Trough Concentration;

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Preliminary phytochemical screening and antidiabetic activity of Clerodendrum phlomidis

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Introduction:
The petroleum ether, chloroform, ethanol and aqueous extracts of Clerodendrum phlomidis Linn dry leaves were screened for various phytoconstituents. Phytochemical analysis revealed the presence of secondary metabolites like phytosterols, triterpenoids, saponins, alkaloids, tannins and carbohydrates as a major phytoconstituents.

Methods:
Healthy adult albino mice either sex, weighing between (25-30 gms) starved overnight, were used for the determination of acute toxicity by adopting fixed dose method of CPCSEA, OECD guide line No.420 and 1/2 and 1/5 th of LD_{50} cut off values of the extract were taken as screening dose, i.e., 250 and 100 mg/kg, respectively.

Results:
The antidiabetic effect of ethanol extract of the leaves of *Clerodendrum phlomidis* L was investigated in alloxan-induced diabetic rats. The blood glucose levels were measured at 8^{th}, 16^{th} and 24^{th} day after the treatment. The ethanol extract of *Clerodendrum phlomidis* L (250 mg/kg) reduced the blood glucose level in alloxan-induced diabetic rats from 303.3 ± 6.7 to 136.7 ± 4.9 at 24th day intraperitonial administration (i.p) of the test extract ($P < 0.001$). The antidiabetic activity of *Clerodendrum phlomidis* L was compared with the reference drug insulin.

Conclusions:
In conclusion, the present studies indicated significant antidiabetic effects of the ethanol extract of *Clerodendrum phlomidis* L and support its traditional usuage in the control of diabetes and its complications. Further investigations to identify the active principle (s) are obviously needed together with a detailed evaluation of the mechanisms of the observed activities.

Key Words: Diabetes; Hypoglycemic agents; Clerodendrum phlomidis leaves extract;

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Antibacterial Activity of Propolis against Clinical Strains of Methicillin Resistant Staphylococcus aureus (MRSA)

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Introduction:
Propolis is a natural substance produced by bees upon collection of resins and exudates from plants. It is typically rich in flavonoids, phenolic acids and corresponding esters. In this study the aim was to detect if proposlis from Solomon Islands contained antibacterial and cytotoxic properties and could be used as a safe antimicrobial agent.

Methods:
Compounds were identified following analysis of their spectroscopic data (1D- and 2D-NMR, MS) and by comparison with the literature. The cytotoxic activity of ethanolic extracts of propolis (EEP) samples were tested against a series of cell lines including fibroblast areola and adipose (Mouse CH3/A connective tissue), human leukaemia T-cells (Jurkat), human foreskin (HS27), human melanoma skin (A375), human medullablastoma (L929), and rat-heart. The minimum inhibitory concentration (MIC) or antimicrobial activity of the extracts on a range of Gram+ve and Gram-ve bacteria was evaluated using an agar dilution assay performed according to recommendations of the British Society for Antimicrobial Chemotherapy (BSAC) guidelines.

Results:
Four compounds were identified as the prenylflavanones propolin H, G, D, and C. None of the fractions was active against Gram-ve bacteria. However, the MIC values against clinical strains of methicillin resistant Staphylococcus aureus (MRSA) ranged 0.967-15.25 µg/ml suggesting anti-MRSA activity of the extracts. Using NMR the most potent compound was found to be an unidentified geranylated flavonoid. This fraction was tested for cytotoxic properties on a range of cells and it showed cytotoxic properties at concentrations above 45 µg/ml (IC50 = 45 µg/ml) suggesting that the active compound at concentrations that inhibited MRSA did not show strong cytotoxic properties and was safe on the cell lines tested.

Conclusions:
The present study is the first to report the activity of propolis originating from the Pacific region against MRSA. The antimicrobial activity of prenylated flavonoids maybe due to their lipophilic prenyl groups; enabling rapid cell penetration; causing impairment to the function of the cell membrane and/or cell wall. It is possible that propolins may serve as templates for the development of compounds or for agents used in combined therapy of MRSA infections.

Key Words: Propolis; MRSA; Antimicrobial activity;

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Deprivation status and utilization of a non-NHS community pharmacy based cardiovascular risk assessment service

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Introduction:
Community pharmacy has an important role in helping tackle health inequalities. Recent work has indicated that if a cardiovascular disease risk assessment (CVRA) service is provided free of charge, recruitment across all socio-economic groups can be achieved. Whether a service that requires customer payment will attract such a broad range of individuals is unknown. The present study was undertaken to explore this.

Methods:
A walk-in CVRA service provided by a large, city centre Boots pharmacy with a catchment area from across South Wales and beyond was evaluated. Individuals aged 40 to 74 years were eligible and charged £10 to access the service. Data were collected for the period January 2008 to September 2009 and residential postcodes for individuals were allocated to one of five deprivation quintiles (Q1 = least deprived; Q5 = most deprived) using the Townsend Index.

Results:
A total of 132 adults had a CVRA and 124 (94%) could be allocated a deprivation quintile. Of the 124 service users there were 33 (27%) males, 117 (94%) Caucasians, 43 (35%) from Q1 and 26 (21%) from Q5. There were no significant differences in demographic characteristics, lifestyle or test results between Q1 and Q5 except the mean (± standard deviation) age for Q1 was higher (63 years ±7.1 v 56.9 years ±7.9, p = 0.001 Student's unpaired t-test) and the proportion of smokers in Q5 was higher (p = 0.026, Fisher's exact test). Four of 43 (9%) individuals from Q1 and 5/26 (19%) from Q5 were referred to their GP because of high (>20%) risk of CVD in the next 10 years (p > 0.05 Fisher's exact test).

Conclusions:
This study has shown that a community pharmacy CVRA service was accessed by individuals from the most deprived areas. However, males and non-Caucasians were under represented in the study.

Key Words: Cardiovascular risk assessment; Community Pharmacy; Screening Services;

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Drugs related issues raised from a cardiovascular risk assessment service based in a community pharmacy

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Introduction:
A cardiovascular risk assessment (CVRA) service has recently become available in many community pharmacies in the UK targeting people aged 40 to 74 year old in order to identify those at high risk. A convenient place, easy access and long opening hours are some of the advantages which have been identified for the community pharmacy to be chosen for this screening service. Could pharmacists take the opportunity and use their expertise to identify and resolve drug related issues affecting service users during the consultations? The objective of this study is to explore the drug related issues raised during such consultations with a community pharmacist as part of a CVRA service.

Methods:
The CVRA service was provided by Boots pharmacy in Merthyr Tydfil and Porthcawl, Wales, UK, from November 2009 to August 2010. As part of this service, the pharmacist provided a consultation to each individual specifically to discuss the results of the assessment. When the consultation was directed to a drug issue related discussion, documentation was made in the patient medication record (PMR). Ethics approval was obtained.

Results:
A total of 139 adults had a CVRA and about half (n = 71, 51%) were on one or more (up to seven) medications. Only 8 issues were reported in the PMR. The issues have been identified were lack of monitoring (n = 1), non-compliance (n = 2), inappropriate dose (n = 1), unnecessary therapy (n = 3), contra-indication (n = 1). Patients were advised on those issues but resolving the issues was not confirmed.

Conclusions:
As a result of having the CVRA in the pharmacy, the pharmacist identified drug safety issues for 8 patients who had not been aware of them before that visit. Although patients were advised on how to resolve those issues, it has not been confirmed whether or not they followed the advice.

Key Words: Cardiovascular risk assessment; Community Pharmacy; Drug Issues;

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The Use of Herbal Preparations as Complementary and Alternative Medicine (CAM) in a Sample of Patients with Diabetes Mellitus in Jordan

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Introduction:
The treatment of Diabetes Mellitus (DM) with complementary and alternative medicines (CAM) is increasingly practiced. Reports on the simultaneous use of plants together with the orthodox therapy are limited. Research studies indicate that, in both developed and developing countries, people turn to alternative therapies for symptomatic relief of the disease, control of the disease or to overcome the side effects associated with the use of anti-diabetic agents. This study aims to explore the prevalence, type, frequency, purpose and pattern of herbal preparation use as CAM in a cohort of patients with diabetes in Jordan.

Methods:
The study took the form of a cross-sectional survey of patients attending the outpatient departments at The National Centre for Diabetes, Endocrine and Genetics (NCDEG), in Amman. The method was based on semi-structured questionnaire. Interviewees were approached while waiting for their prescriptions in the pharmacy waiting area.

Results:
A total of 1000 diabetes patients were interviewed. Of the participants, 16.6% (n=166) reported using herbs. Most of CAM users were in the age group 51-60 years (n=73; 44.0%) and predominantly female (59.6%). 139 of the CAM users (83.7%) had at least obtained a high school degree. The majority of herbal medicine users (n=155, 93.4%) had obtained the herbal remedies from Jordan and used the plants in the form of infusion (n=156, 93.9%). Nearly all of the patients (95.2%) in this group had type II diabetes. The most common herbal product used was green tea (20.5%) followed by aniseed (19.9%) and ginger (18.7%).

Conclusions:
This study confirmed that there is an appreciable prevalence of herbal use among patients with diabetes in Jordan. However, the vast majority of patients lacks the appropriate awareness of potential risks and should be informed of possible adverse effects.

Key Words: Herbs; Diabetes; Jordan;

70: Poster

Pharmacy Student Perceptions of Public Health Roles and Responsibilities

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Introduction:
While pharmacists may not out rightly identify themselves as public health professionals, their activities encompass core public health functions, such as educating patients, promoting disease awareness, providing screening programs, and linking individuals to other health services. As initial instruction in pharmacy programs is often predominantly medication-oriented, it is important to expose undergraduates to the non-drug health activities of pharmacy practice. The objective of this study was to characterize pharmacy student perceptions towards pharmacist public health services roles and responsibilities.

Methods:
To mark October Breast Cancer Awareness Month (October 2009), the Qatar Pharmacy Undergraduate Society (QPhUS) coordinated and conducted its first public health activity, a series of campus events including invited guests from the National Cancer Society and the country's cancer care facility. The following week, all pharmacy undergraduate students were surveyed to assess their motivations, perceptions and anticipated comfort with various pharmacist-conducted public health activities.

Results:
Ninety-four percent (n=49) of the pharmacy undergraduate student body responded to the survey. Students considered knowledge of disease etiology and diagnosis necessary for pharmacists (97.9%), as well as the obligation to offer non-pharmacologic patient counseling (73.8%). When offered a list of medical conditions and public health issues and asked to assess the suitability of pharmacist involvement in promoting health awareness, students rated all highly, most notably education related to diabetes, smoking cessation, alcohol abuse, asthma, cardiovascular disease, and physical activity. Many (61.7%) anticipated comfort in communicating potentially culturally sensitive health matters (e.g. alcohol abuse, weight reduction) both to patients in their own practice site or as a spokesperson to the general public at large.

Conclusions:
Undergraduate pharmacy students in our College of Pharmacy expressed favourable attitudes towards public health roles of pharmacists.

Key Words: Pharmacy students; Public health; Qatar;

71: Poster

Pharmacovigilance in Qatar Hospitals

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Introduction:
It is well known that adverse drug reactions (ADRs) significantly contribute to emergency visits and hospital admissions, but ADRs experienced by in-patients are similarly associated with increased morbidity, mortality, and health costs. It is unclear to what degree suspected ADR reporting currently comprises patient safety initiatives in Qatar. A survey was conducted to characterize pharmacovigilance activity in Qatar hospitals.

Methods:
This is a prospective descriptive study. All in-patient health care settings in Qatar were identified and department of pharmacies were contacted. A systematic review of English language literature was conducted in pertinent electronic health databases using combination of predetermined key words and phrases: “pharmacovigilance”;“adverse events”; "hospital". A ten-item questionnaire developed from relevant retrieved articles was administered to ascertain current pharmacovigilance practices at these hospitals, including the process for reporting suspected ADRs, documentation and adjudication policies, health professional staff participation, communication and fate of ADR reports. If ADR forms were utilized, copies were obtained for comparison and assessed for content including patient demographic information, drug exposure and reaction data, patient management and outcome descriptions. Discrete variables will be reported as proportions.

Results:
Presently, ten hospitals exist in Qatar (5 private and 5 public. All (100%) public hospitals conduct suspected ADR reporting activity, but only 2 (40%) private. One common ADR reporting form is shared across the public hospitals and is a paper-based submission. The public hospital suspected ADR reporting form does not include causality or outcome assessments, unlike in private care settings. All hospitals’ ADR reports are aggregated the respective Pharmacy & Therapeutics committees and forwarded to the Supreme Council of Health. Few hospitals described formally relaying any summary information back to hospital staff.

Conclusions:
Pharmacovigilance activity exists in hospitals in Qatar, but would benefit from increased transparency and feedback to reporters and electronic submission capabilities to enhance participation. The scope of pharmacists practice should be expanded beyond administrative responsibilities to roles in actual detection of suspected ADRs at the point of care.

Key Words: Adverse drug reaction monitoring; Hospital; Qatar;

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Self-emulsified topical drug delivery system to improve thesolubility and bioavailability

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Introduction:
Dissolution is the rate limiting factor in absorption and bioavailability of poorly soluble drugs. This study aimed to increase the solubility and availability of piroxicam, a non-steroidal anti-inflammatory compound, through preparation of thermodynamically stable self-emulsified systems (SES). Characterization, stability and in-vivo assessment studies were performed.

Methods:
Included investigating the solubility of piroxicam in different oils, surfactants (S) and cosurfactants (CoS). The ingredients showing high solubility were used to prepare different SES. Triangular phase diagrams were plotted to outline the areas of microemulsion formation upon dilution with water. Formulations showing good emulsifications were evaluated for their particle size and shape, drug solubilization, viscosity, electric conductivity and in-vitro drug release. The accelerated and shelf-life stability of selected formulations was assessed. The passed formulations were subjected to pharmacological assessment studies in albino rats.

Results:
Indicated that oleic acid (solvent), Tween 80 (S), and propylene glycol (CoS) showed high solubility of piroxicam and used to prepare SES. The triangular phase diagrams showed that combination of 10% oil, 30-70% S, 20-60% CoS and 0.5% drug loading led to stable microemulsion formulation on dilution with 50% water. The particle size ranged from 100 to 500nm of nearly spherical shape, the viscosity ranged from 10000 to 45000 cp and the highest drug solubility (5.87 mg/ml) was obtained when the ratio of CoS:S was 0.29:1. The electric conductivity showed O/W microemulsion type upon dilution with water. The highest percent drug released (74.2%) was observed in formulation composed of 10% oil, 60% S and 30% CoS. The tested formulations showed stability towards accelerated and shelf-life conditions. The in-vivo studies showed that the analgesic and anti-inflammatory effects of these formulations were comparable to the market formulation (Feldine gel®).

Conclusions:
The incorporation of piroxicam in SES led to improvement in its solubility, in-vitro and in-vivo availability. The prepared formulations were stable and have high potential for analgesic anti-inflammatory effects on topical application.

Key Words: SEDDS; Piroxicam; Solubility and bioavailability;

The 3rd Kuwait International Pharmacy Conference

Workshops

Parallel Workshops

February 14, 2011- 04:00 pm - 06:00 pm

- ***The role of technology in preventing medication errors***
  Prof. Bill Felkey & Dr. Mohammad Waheedi
  Failaka Hall

- ***Individualized drug therapy with a laptop at the bedside***
  Prof. Roger Jelliffe.
  Warba Hall

February 15, 2011- 04:00 pm - 06:00 pm

- ***Herbal Medicines***
  Prof. Rick Kingston
  Failaka Hall

- ***Pharmacoeconomics and Drug Safety for Decision Makers***
  Prof. Marv Shepherd
  Warba Hall

- ***Public Education***
  Dr. Abdelmoneim Awad / Dr. Maitham Khajah/ Dr. Fatma Jeragh / Dr. Eman Abahussain
  Al-Hashemi Ball Room

The 3rd Kuwait International Pharmacy Conference

Abstracts -Workshops

February 14th, 2011- 05:00 pm - 06:30 pm

Prof. Bill Felkey & Dr. Mohammad Waheedi

The role of technology in preventing medication errors

Experts agree that solving the problem of medication error prevention is first and foremost a systems issue. The Institute of Medicine asserts that improvements in health care systems must create an environment that is safe for patients. Due to the digital convergence of information via electronic health records, greater situational awareness for all health care providers is now possible.

Moreover, the digitization of health care systems presents additional opportunities for more timely processing of information, more efficient operations, and more effective use of evidence-based resources at the point of decision making. Because integration friendly consumer electronics are now providing the opportunity for closed-loop (online, real-time) systems to process information ranging from the ICU to the patient home, participatory healthcare solutions can now become a reality. While all the pieces of the technology puzzle exist, the integration of these pieces into a cohesive health information system remains the biggest challenge.

February 14th , 2011- 05:00 pm - 06:30 pm

Prof. Roger Jelliffe, M.D.
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Individualizing Drug Therapy with a Laptop at the Bedside

Optimization of individualized drug dosage regimens is a very complex task. It is similar to the control of an aircraft in flight, or to keep a spacecraft in its proper trajectory. Therapeutic drug monitoring (TDM) by itself, with only intuitive adjustment of the dosage regimen, is not enough to do the job properly or optimally. One needs to make really informed decisions about dosage regimens to hit desired target goals, which will differ for each patient according to his/her needs for and sensitivity to the potentially toxic drug. This requires good software for keeping track of the complex relations between the doses, the serum concentrations, and the effects, and it especially requires good control strategies to design dosage regimens to hit the target goals most precisely. Methods and software exist now to do these important jobs. All this can now be done quite easily for many drugs with a laptop computer at the bedside or at the nurses' station. These software tools include:

9. **Describing drug variability optimally,** using nonparametric (NP) population models to capture past experience. In these models the parameter distributions are discrete rather than continuous, and use the mathematical theorems of Caratheodory, Lindsay, and Mallet. Because the distributions are discrete rather than continuous, as in parametric approaches. Things can look funny at first. However, think of what an ideal population model would be like if somehow one were able to scratch a patient's skin and read off the exact parameter values for each patient. The result would be a discrete distribution of the various model parameter values. How can we best approximate this obviously unattainable situation? We are compelled to give doses of the drug and to measure its serum concentrations and other responses. Here the nonparametric (NP) methods shine because they give the closest approximation to the ideal model described above. If the model has only two parameters, like volume of distribution and elimination rate constant, for example, then one can display this model as a scattergram of the two parameter distributions, with up to one point per subject, and with each point (support point) weighted by the estimate of its probability in the population, where the probabilities add up to 1.0.

10. **Proper experimental design** for therapeutic drug monitoring (TDM) protocols. Measuring trough samples at steady state is definitely not a good thing to do! D=optimal designs are currently a very well-known strategy for doing this [1]. In general, good TDM policy requires at least one sample for each model parameter to be estimated. Trough samples have been popular because the errors in the timing of the doses, and those in the timing of the serum samples make the least difference in the measured concentration. What has happened is that by doing this, one has deliberately chosen the least informative sample of all! Samples need to be obtained at times when their data contains maximum information about the patient's drug model. That is the only way one can do TDM to actually learn how the drug is behaving in the patient. There are so many population models made using only steady state trough samples. One wonders why, when optimal design strategies are so well known, except, apparently, in the NONMEM modeling community.

11. **Set specific therapeutic target goals** – NOT a so-called therapeutic range. That is an illusion. Therapeutic ranges are generally set by looking at the graphs of the relations between serum concentrations and effect, and then toxicity.

The range is therefore where most, but certainly not all, patients do reasonably well. There is no thought of optimizing a regimen for an individual patient. Think about the patient and what he/she needs. How sick is the patient? How much does the patient need the drug in question? If not much, then choose a low target goal and the gentle regimen to achieve it most precisely. If the patient is at greater risk, then one is justified in accepting a greater risk of adverse reactions to get the expected benefit of the drug. So use your clinical judgment and choose a target appropriate to the patient's needs, and perhaps your estimate of the MIC of the infecting organism.

12. **Estimate creatinine clearance** (CCr) not just from a single serum creatinine (SCr) sample, which is not useful for acutely ill unstable patients with rapidly changing renal function, but from a pair of SCr samples, and calculate the CCr which makes serum creatinine go from an initial value to a new value in a patient of stated age, gender, height and weight in a stated time [2].
13. **Minimize drug variability optimally,** using multiple model (MM) dosage design, which hits targets with maximum precision [3]. The multiple support points in the NP population model will generate multiple predictions of future serum concentrations when given a candidate dosage regimen. Each prediction is weighted by the probability of the support point giving that prediction. In this way it is easy to calculate the weighted squared error of the failure of that regimen to hit the target. Then it is similarly easy to find the regimen that hits the target with the least error. In this way one can now develop maximally precise dosage regimens to hit specific target goals. This is MM dosage design. It is very similar to the control strategies used in flight control and spacecraft guidance systems.
14. **Use Bayesian analysis** to develop optimal individualized models of drug behavior in each patient. There are 4 methods now.
    a. **Conventional maximum aposteriori probability (MAP) Bayesian estimation.** This is what almost everyone uses. It finds the most likely compromise between the population parameter values and their variances, and the patient's serum concentrations and their variances. One of the big problems here is that the assay variances are not considered (see 7 below). In this way the MAP Bayesian estimate finds only the singly most likely version of the patient. The action taken (the dosage regimen) is based only on the single most likely version of the patient, and not at all on the full Bayesian posterior parameter distributions.
    b. **MM Bayesian estimation for NP models.** Here each population support point is analyzed in terms of its ability to predict the patient's serum data. Those points that predict them well become much more likely. Their Bayesian posterior probability becomes much increased. Other points (most of the points) predict the patient's data poorly, and their Bayesian posterior probability becomes much less. In this way, usually only a few points survive this procedure, and the Bayesian posterior joint parameter density usually consists of only a few points, maybe up to a dozen or so. This now provides another density for subsequent MM dosage design for the new adjusted regimen, once again, with maximum precision, usually much greater than that achieved using the population model alone, as we have learned a lot about the patient from the TDM we have done, and we can see graphically, in plots, just how much more precisely we now know the patient, and the best regimen to be given.
    c. **Hybrid Bayesian** – a combination of MAP and MM which gives more precise parameter estimates, and which can also reach far outside the ranges of an NP pop model to capture an individual patient and provide a density for MM dosage design. There are two problems with MM Bayesian estimation. One is that the patient may lie in a region of the population model having only a few support points, resulting in poor precision in the estimation of the Bayesian posterior densities. The other problem is that the patient may lie entirely outside the stated range of the population parameter values, and a very poor fit will result which will not be at all useful. Because of this, we developed a Bayesian approach combining the best features of both the MAP and the MM approaches. First, a MAP Bayesian analysis is done. Now we know the general region where the patient's parameter values will lie. We then add 15 extra support points in the region to form a (currently) 4 by 4 grid. This density is added to the population model to provide an augmented population model. The 16 grid points are given 50% probability and the original population model the other 50%. This approach provides many more useful support points when the patient is in a region of few such points.
    Further, the hybrid Bayesian method can be used to analyze patents whose parameter values lie far outside the original range. This can require judicious downweighting of the MAP Bayesian prior and similar downweighting

of the percent relationships probability of the population prior and upweighting of the probability of the 16 point grid. In this way we have been able to use a population model of digoxin and to get good fits on data of dogs on digoxin whose weights ranged from 76 kg (similar to adult humans) down to 9 kg (similar to many children). It nay well be that this procedure can be used to manage the TDM of children using this approach, until enough children have been studied to permit a proper population model to be made for them. Then, having such a population model for children, one might use the hybrid approach to manage data of newborn infants, once again, until a proper population model can be made for them.

d. **Interacting MM (IMM) sequential Bayesian analysis**. This tool comes from the aerospace community where it is used to track objects taking evasive action. It permits parameter values to change during the period of data analysis if that is more likely. This is new. All other pharmacokinetic analyses regard parameter values are as fixed and unchanging throughout the period of data analysis. This IMM method tracks drug drug behavior best behavior best in unstable patients [4,5].

15. **Report assay errors properly**, weighting each measurement by the reciprocal of the assay variance at that concentration. Do NOT use percent coefficient of variation. This leads to significant errors such as censoring data below a selected value (the so-called lower limit of quantification or detection). This is not necessary. The reciprocal of the assay variance provides a good, well-known measure of the credibility of any data point, even all the way down to and including the blank. There is no need to censor low data any more [6].
16. **Outcomes of individualizing drug dosage regimens:**
    a. Reduction of digoxin toxicity without loss of effect.
    b. Improved management of arrhythmias with lidocaine.
    c. Improved outcomes and reduced hospital stay and costs with aminoglycosides.
    d. Improved care of children having bone marrow transplants receiving Busulfan.
    e. Improved care of children having bone marrow transplants receiving Cyclosporine, with reduced hospital stay and very much reduced costs.

References:

1. D'Argenio D: Optimal Sampling Times for Pharmacokinetic Experiments. J. Pharmacokin. Biopharmacol., 9: 739-756, 1981.
2. Jelliffe R: Estimation of Creatinine Clearance in Patients with Unstable Renal Function, without a Urine Specimen. Am. J. Nephrology, 22: 320-324, 2002.
3. Jelliffe R, Bayard D, Milman M, Van Guilder M, and Schumitzky A: Achieving Target Goals most Precisely using Nonparametric Compartmental Models and «Multiple Model» Design of Dosage Regimens. Therap. Drug Monit. 22: 346-353, 2000.
4. Bayard D, and Jelliffe R: A Bayesian Approach to Tracking Patients having Changing Pharmacokinetic Parameters. J. Pharmacokin. Pharmacodyn. 31 (1): 75-107, 2004.
5. Macdonald I, Staatz C, Jelliffe R, and Thomson A: Evaluation and Comparison of Simple Multiple Model, Richer Data Multiple Model, and Sequential Interacting Multiple Model (IMM) Bayesian Analyses of Gentamicin and Vancomycin Data Collected From Patients Undergoing Cardiothoracic Surgery. Ther. Drug Monit. 30:67–74, 2008.
6. Jelliffe RW, Schumitzky A, Van Guilder M, Liu M, Hu L, Maire P, Gomis P, Barbaut X, and Tahani B: Individualizing Drug Dosage Regimens: Roles of Population Pharmacokinetic and Dynamic Models, Bayesian Fitting, and Adaptive Control. Therapeutic Drug Monitoring, 15: 380-393, 1993.

February 15th , 2011- 04:00 pm - 06:00 pm

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&
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Herbal Medicines

Despite the major medical advances of western medicine which includes the development of new life saving drugs and medical devices, the majority of the world's population still rely on botanical medicines as their front line treatment option for most, if not all, medical conditions. The lack of availability of these relatively newer pharmaceutical treatment modalities in various countries contributes to reliance on older well known and culturally entrenched botanical medicines, yet in some more advanced world venues that have access to both new and old modalities, botanical use for medicinal benefit may thrive. Still, those clinicians recommending, using and relying solely on newer, mainstream pharmaceuticals with standardized dosage forms, often find themselves reluctant to include botanical medicines in their patient treatment plans and protocols due to a myriad of reasons that may either be supported or unsupported by science or evidence based science. Mainstream clinicians may also be less familiar or knowledgeable, regarding potential benefits of various botanical medicines, especially those marketed and "detailed" exclusively to consumers rather than medical practitioners. This session will first focus on providing a review of the top 10 botanical medicines and the supporting evidence for benefit which is often a good first step in helping mainstream medical providers understand and appreciate the potential benefit their patients can receive if these natural medicinals are considered as first line, "low ramp" tools for routine use. The second focus area will examine the reasons behind hesitancy for mainstream practitioners to embrace the use of these age old botanical medicines as treatment options for patients to achieve various medical and wellness goals. And lastly, the session will solicit input from participants regarding methods of successful integration of botanicals as therapeutic options for their patients with various medical and health related needs.

February 15th, 2011- 04:00 pm - 06:00 pm

Prof. Marv Shepherd
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Austin, Texas

Pharmacoeconomics and Drug Safety for Decision Makers

This program describes the concerns health care decision makers have with interpreting economic analyses. It will present the types of data and economic analyses health care decision makers have less confidence with and what types of data and information decision makers desire. Safety monitoring will be the presented and the need to use of retrospective Phase Four data. A list of the most recent drugs the U.S. FDA has had to withdraw from the market due to safety concerns will be presented. In addition, the program will present the use of incremental cost-effectiveness analysis, give an example and present the advantages and limitations.

February 15th , 2011- 04:00 pm - 06:00 pm

Dr. Abdelmoneim Awad, Dr. Maitham Khajah, Dr. Fatma Jeragh and Dr. Eman Abahussain
Department of Pharmacy Practice, Faculty of Pharmacy, Kuwait University
Department of Applied Therapeutics, Faculty of Pharmacy, Kuwait University

Public Education

The objectives of the public workshop are to initiate constructive dialogue and information sharing amongst the audience regarding the irrational use of medications and its complications, and to deliver key messages for improving safe use of medications by the public.

The 3rd Kuwait International Pharmacy Conference

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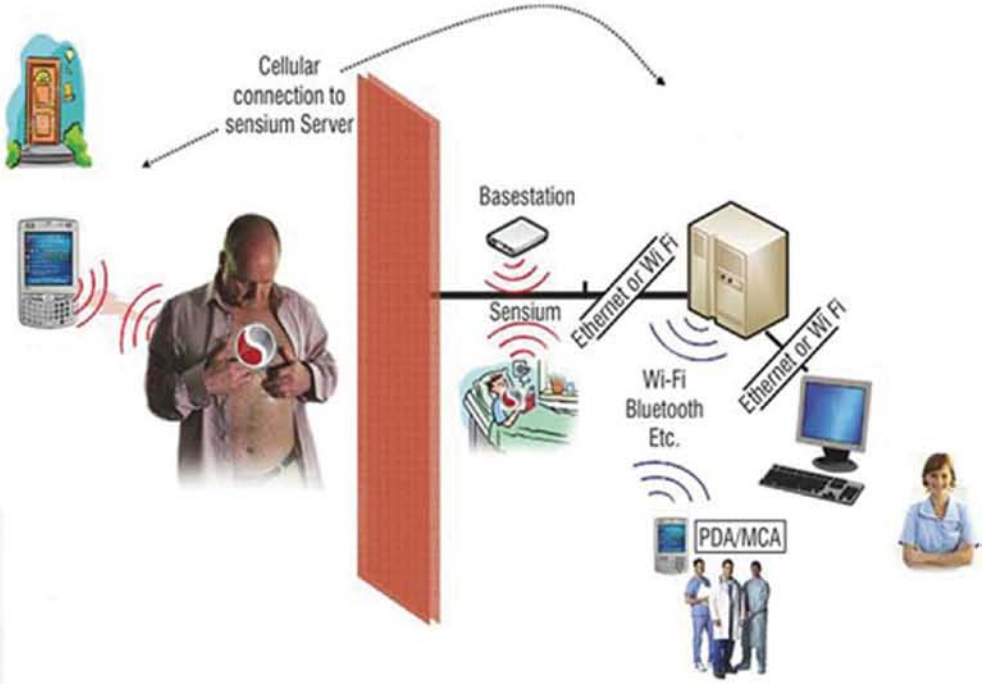

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References:

1- A. Jurjus, B. Atiyeh, et al: Pharmacological modulations of wound healing in experimental burns. Burns, 2007;33:892-907

2- Wu CH, Chang GY, et al: Wound healing effects of porcine placental extracts on rats with thermal injury. Br. J Dermatol 2003; 148: 236-245.

3- B. Atiyeh, C Amm, K El Musa: Improved scar quality following primary and secondary healing of cutaneous wounds. Aesthetic Plast. Surg 2003; 27:411-417.

4- B. Atiyeh, J. Ioannovich, et al; The efficacy of moisture retentive ointment in the management of cutaneous wounds and ulcers: a multicenter clinical trial. Indian J Plast Surg 2003; 36:89-98

5- B. Atiyeh et al. A new approach to local burn wound care: Moist exposed therapy. A multiphase, multicenter study. J Surg. Wound Care 2003; 2:18-27.

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المطـوع Al Mutawa

اسم تتناقله الأجيال..

بعد الحرب العالمية الأولى التي أنهكت العالم بأسره بما خلفته من انهيارات إقتصادية في شتى البقاع تأسست شركة علي عبدالوهاب في عام 1918 م, وقد عرف عنها الصدق في التعامل وتقديم الخدمة المتميزة للعملاء مما أكسبها سمعة طيبة وساهم ذلك في نموها بشكل سريع, حيث أن علاقاتها الجيدة مع العملاء والشركات كان من أهم أسباب نجاحها, وبذلك وضعت الشركة حجر الاساس في بناء إسمها التاريخي العريق الذي استطاع بمنتجاته الدخول في كل بيت من بيوت الكويت التي كانت في ذلك الوقت تهفو للصعود باقتصادها, ولله الحمد كان لها ما أرادت.

في عام 1947 م قامت شركة علي عبدالوهاب بإنشاء إدارة الأدوية والتي كانت ومازالت تلبي حاجة السوق المحلي من خدمات صحية وطبية, فعندما كانت الكويت تؤسس اول وأكبر مستشفى فيها بعام 1947 م وهو المستشفى الأميري برعاية كريمة من صاحب السمو الشيخ أحمد الجابر الصباح رحمه الله الذي اوكل إلى شركة علي عبدالوهاب بأمر سامي تجهيز المستشفى بكافة الاحتياجات الطبية اللازمة من معدات وأسرة وأجهزة الأشعة وأدوية وغير ذلك.

واستمرت الشركة بتزويد احتياجات دولة الكويت آنذاك بكافة الاحتياجات الطبية, ومع تطور الدولة الحديثة وتأسيس وزارة الصحة, أصبحت مشاركة شركة علي عبدالوهاب عن طريق المناقصات المعلنة للراغبين التي تطرحها وزارة الصحة بتقديم الخدمات الطبية في دولة الكويت بشكل عام, صدق في الأداء وصدق في العطاء وثقة في النفس ذلك ماحذا بشركة علي عبدالوهاب إلى تأسيس قسم الأدوية وطلب الحصول على رخصة أول مورد للأدوية واول ترخيص لمستودع طبي, وحصلنا ولله الحمد على الترخيص رقم (1) الذي يسمح لنا باستيراد وتوزيع وتجهيز دولة الكويت كافة بكافة الاحتياجات الطبية والصيدلانية, ولا ننسى ذلك الشرف الذي حبانا إياه حضرة صاحب السمو الشيخ أحمد الجابر الصباح رحمه الله أمير الكويت آنذاك بتكليفه الأميري لنا لتجهيز المستشفى الأميري وأصبحت شركة علي عبدالوهاب تقريباً المجهزين الوحيدين للحكومة في ذلك الوقت.

وأصبحت شركة علي عبدالوهاب وأولاده وشركاهم مع نهاية العقد الخامس لها تمثل العديد من الشركات العالمية المتخصصة في مجالات عدة, فنحن في شركة علي عبدالوهاب وأولاده وشركاهم نقوم برعاية العديد من البرامج الطبية الموجهة والحالات المرضية لمساعدة بعض الحالات المستعصية كعلاج حالات الإصابة بالأمراض السرطانية والتهاب الكبد بالإضافة إلى المشاركة بالحملات التوعوية الصحية.

واستمرت شركة علي عبدالوهاب بتواجدها والسعي وراء خدمة المستهلك حتى أثناء فترة الغزو العراقي الغاشم على دولة الكويت, حيث ظلت مخازنها مفتوحة تقوم بخدمة الشعب الكويتي الأبي وتلبي احتياجات القاصي والداني فكان لها أثر بالغ في خدمة الوطن وعدم قطع أصنافها إيماناً منها بدورها في خدمة المجتمع, وخلال تلك الفترة التي استمرت سبعة اشهر لم ولن تقفل بابها يوماً عن زبائنها وعملائها فكانت مثالاً للوفاء المتناهي, وسطر لها التاريخ أنبل المثل بإيمانها لفكرتها وهدفها بالعطاء.

وانتهت فترة الغزو بحمد الله في 26/2/1991 م لتعود لنا الكويت حرة أبية يستعصى ثنيها عنوة أو غدراً, لتواصل شركة علي عبدالوهاب إشراقتها بانطلاقة مفعمة بالحيوية المعهودة والعطاء الغير محدود لهذا الوطن, فكانت أول شركة تبدأ باستيراد الأدوية والمستحضرات الطبية والصيدلانية, وواصلت ما بدأته بالسرعة في تقديم الخدمة حيث طلبت أول طلبية للأدوية في الأسبوع الأول من شهر مارس 1991 م مباشرة بعد التحرير الميمون, مشمرة عن سواعد الجد والهمة.

وانتعشت بعد ذلك بالتوسع في قسم الأدوية الذي جمع نخبة من موظفيها المتخصصين من صيادلة وأطباء وفنيين وموزعين وإداريين ومحاسبين وغيرهم يعملون جميعهم بصورة متناغمة في مركب واحد كفريق, جنباً إلى جنب يسعون جميعا للقمة, زادهم في ذلك التدريب المستمر الذي توفره لهم إدارة الأدوية بصورة منتظمة للإرتقاء بمستوى الخدمة المقدمة للعملاء, كما وتقوم إدارة الأدوية بتنظيم برامج تدريبية في فترة الصيف لطلبة كلية الصيدلة بجامعة الكويت بالتنسيق مع إدارة الكلية, حيث تكمل لهم الجانب النظري بالجانب العملي داخل صيدليات الشركة, كما تساهم إدارة الأدوية بالأنشطة الصحية التثقيفية المتنوعة التي تنظمها وزارة الصحة أو الهيئات الطبية التي ترتقي بالمستوى الصحي التثقيفي الاجتماعي بشكل عام, إن هذا التنوع الفريد في تقديم الخدمات أكسب إدارة الأدوية للشركة هذه السمعة الطيبة وهو ذاته الذي حذا بالعديد من الشركات الطبية العالمية بالتوجه إلى شركة علي عبدالوهاب وأولاده وشركاهم لتصبح وكيلهم في الكويت, ولله الحمد أصبحت شركة علي عبدالوهاب وأولاده وشركاهم وكيل حصري لنخبة من الوكالات التجارية من كبرى الشركات الدوائية العالمية لتلبية احتياجات جميع فئات المجتمع, كما وتساهم الشركة بمساعدة بعض الحالات المرضية المستعصية التي يحتاج علاجها تكلفة باهظة مثل الأمراض السرطانية والتهاب الكبد الوبائي وتوجت الشركة نشاطها بدخولها في مجال إدارة الصيدليات الأهلية, فافتتحت باكورة سلسلة صيدلياتها بتاريخ 1993 م لتنخرط بهذا النشاط التجاري الرائد ويصبح عدد صيدلياتها ما يربو عن (20) صيدلية موزعة في المناطق الرئيسية لدولة الكويت تؤدي جميعها نفس مستوى الخدمة التي يطمح لها العميل , كما تم في الشهر السابع من عام 2010 الإستحواذ على حصة 64 % من شركة صفوان للتجارة العامة و المقاولات و التي بدورها تمثل العديد من كبريات الشركات الدوائية و الأجهزة الطبية العالمية.

كما أن شركة علي عبدالوهاب تعتز بتمثيلها للعديد من الشركات العالمية المتخصصة بالأدوية والتجهيزات الطبية مثل:

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وجاء عام 2005 ليشهد ادراج الشركة التي تعتبر الأولى في مجالها في بورصة الكويت ، والجدير بالذكر أن الشركة تمكنت من تحقيق جزاء كبيرا من رؤيتها بتوسيع رقعة انتشارها على المستوى المحلي منذ عام 2003. ثم عادت لتخترق السوق العراقية من خلال خطة طموحة تستهدف افتتاح المزيد من الفروع .

وتتميز مجموعة منتجات الشركة بالتنوع والتباين حيث تتضمن الأدوية الصيدلانية والمعدات الطبية وأجهزة التشخيص والمكملات الغذائية ومنتجات الرعاية الصحية الشخصية ومستحضرات التجميل وغيرها، كما تغطي أنشطة الشركة كافة المجالات العلاجية مثل القلب والأوعية الدموية والعيون ورعاية الأطفال والتنقية الحيوية والاسنان وغيرها.

وفي شهر يوليو من عام 2010، استحوذت شركة علي عبد الوهاب واولاده وشركاهم على شركة صفوان، وتصنف شركة علي عبد الوهاب واولاده وشركاهم كواحدة من اكبر الشركات التجارية المعروفة في الكويت حيث يرجع تاريخ عملها لحوالي 92 سنة ماضية. وتعمل في قطاع الادوية منذ عام 1949.

وتمثل شركة علي عبد الوهاب وأولاده وشركاهم باعتبارها أحد رواد مختلف القطاعات التجارية في الكويت ، الشركات التي تتمتع بشهرة عالمية في مجال الادوية والصيدليات والرياضة والموضة والأجهزة المنزلية والأثاث والعقارات وغيرها من ثم، فتعتبر كل من شركة على عبد الوهاب واولاده وشركاهم وصفوان للتجارة أكبر جهة توزيع أدوية للصيدليات بالتجزئة في الكويت .

ومن المعروف أن شركة علي عبدالوهاب واولاده وشركاهم وكيلا حصريا في الكويت لاهم العلامات التجارية العالمية وفي مقدمتها "بروكتر اند جامبل Procter & Gamble Inc " و" كلوروكس Clorox Products " الرائدتين في بيع المنتجات الاستهلاكية، الى جانب شركة "روش Hoffmann La Roche & Co. " احدى اكبر شركات الصناعات الدوائية في العالم، وفي المفروشات والاثاث الراقي فتمثل" سنشري Century "و" باسيت Bassette " الامريكيتين و شركة" كولمان Coleman International Inc.الامريكية .

وللشركة وكالة كل من شركتي "بوش" و "سيمنز" BOSCH & SIEMENS الرائدتين في عالم الاجهزة الكهربائية إلى جانب "نولتي" Nolte Kitchen الالمانية لتجهيز المطابخ بالاضافة إلى كونها وكيلا للعلامة التجارية الرياضية الرائدة "ذا اثليتس فوت" The Athlete's Foot ومحلات "شوبكس نيويورك" Shoebox New York للاحذية والاكسسوارات النسائية الراقية وايضا نادي اللياقة البدنية للسيدات كرفز Curves.

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