SOP Newsletter

Drug Information News From the School of Pharmacy Faculty Members

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In this edition:

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Dear Readers,

It is my pleasure to address you through the first issue of the SOP Newsletter.
This newsletter allows our faculty members to have the chance to write articles about the newest updates in pharmacy medical practice and advances in medical knowledge.
It also serves them as a continuing education tool.Since its establishment in year 2002, the School of pharmacy at LIU has always been dedicated to provide high standards of education to its students. Our dream is to serve our society, and to produce new generations of pharmacists, who are professional, skilled, knowledgeable, and are able to provide healthcare to their community. We put no borders to our students who come with great expectations from different regions of the country. We have designed a pharmacy curriculum which incorporates drug information, communication skills, ethics and professional training in order to serve our mission and fulfill our dream. Our students receive special attention at our school, where faculty members are available to guide and direct them throughout their years of study. The teamwork and expertise of all our faculty and staff are exemplary in their mission to prepare the students for a lifetime of learning, leadership, discovery and service. We give our students the chance to build their personalities and to develop their skills through many of the extracurricular activities such as the Pharmacy day, industrial visits, debate discussions in classes and outside classes with expert speakers, and recently through the pharmacy club. We accept criticism and advice from our students and collaborates, especially those who motivate us to change and implement new ideas and thoughts. Finally, I would like to encourage our students to work hard, engage in extracurricular activities and be optimistic because they are the real investment of the nation. We always aim to work towards a better future of healthcare and pharmacy practice.

Best regards,
Mohamad Rahal, PhD.
Dean of the School of Pharmacy

NEW DRUG OF THE MONTH

Dalal Hammoudi, MSc

FDA Approves Lymphoseek to Help Locate Lymph Nodes in Patients with Certain Cancers

Key Point: On March 13th, 2013, the U.S. Food and Drug Administration approved Lymphoseek® (Navidea Biopharmaceuticals), an injection of technetium Tc 99m tilmanocept. It is a radioactive diagnostic imaging agent, that helps physicians locate lymph nodes in patients with breast cancer or melanoma who are undergoing surgery to remove tumor-draining lymph nodes.

Finer points: Lymph nodes filter lymphatic fluid that flows from the body's tissues. This fluid may contain cancer cells, especially if it drains a part of the body harboring a tumor. By surgically removing and examining the lymph nodes that drain a tumor, it would be helpful to investigate tumor metastasis. The first lymph node close to the site of a tumor is called the sentinel lymph node, and if this lymph node does not contain cancer cells, it is very unlikely that cancer has spread to other areas of the body.

Lymphoseek is a new radiopharmaceutical that accumulates in lymphatic tissues by binding to a receptor (CD206) that resides on the surface of macrophage cells. The drug is injected at the site of the primary tumor and follows the drainage path of the tumor to sentinel node(s). After injection of the radioactive agent, an external, hand-held gamma radiation detector can be used to assist in the pre-operative localization of sentinel nodes. Lymph nodes in the potential drainage path of the tumor are identified by tracking the pathway of Lymphoseek. Results from two clinical trials of 332 patients with melanoma or breast cancer, showed that Lymphoseek and blue dye the comparator mapping agent had localized most lymph nodes, with a notable number of nodes localized only by Lymphoseek. The most common side effects identified in clinical trials were cellulitis, incision site pain, nausea, and seroma (a pocket of clear serous fluid developing near the surgical site); most side effects were mild or moderate in severity.

Oncologists generally believe that if the sentinel nodes show no sign of malignancy, the downstream nodes are likely to be clear of disease, and the surgical removal of other nearby lymph nodes is clinically unnecessary. The ability to rapidly locate and biopsy sentinel nodes by lymph node mapping agents provides vital information to the physician in determining if the cancer has spread or if it is localized to the site of the primary tumor and, therefore, enables surgical management to be tailored specifically to each patient's burden of disease.

" Lymphoseek is a lymph node imaging agent and not a cancer imaging drug "

What you need to know: Lymphoseek is a lymph node imaging agent that helps locate and biopsy lymph nodes and not a cancer imaging drug. Other FDA-approved drugs used for lymph node mapping include sulfur colloid (1974) and isosulfan blue (1981). In more than 30 years Lymphoseek is the first new drug approved for lymph node mapping.

Sources: 1. Sondak, V.K., et al., Combined analysis of phase III trials evaluating [(9)(9)mTc]tilmanocept and vital blue dye for identification of sentinel lymph nodes in clinically node-negative cutaneous melanoma. Ann Surg Oncol, 2013. 20(2): p. 680-8.
2. Wallace, A.M., et al., Lymphoseek: a molecular radiopharmaceutical for sentinel node detection. Ann Surg Oncol, 2003. 10(5): p. 531-8.
3. The US Food and Drug Administration News and Events; News Release, March 13th, 2013.

UPDATES IN

CARDIOLOGY

Samar Younes, PharmD.

New Drugs in the Treatment of Patients with Homozygous Familial Hypercholesterolemia

Key point: Homozygous familial hypercholesterolemia (HoFH) is an inherited disorder caused mainly by mutations in both LDL-receptor alleles that causes severe elevations in total cholesterol and low-density lipoprotein cholesterol (LDL-C). Currently available lipid-modifying therapies rarely achieve optimal LDL-C concentrations in patients with HoFH, and thus they remain at high cardiovascular risk with substantially reduced life expectancy from premature cardiovascular diseases.

Finer points: Recently, two new orphan drugs Juxtapid (lomitapide) and Kynamro (mipomersen sodium) have been FDA approved to treat patients with HoFH. Juxtapid (lomitapide) was approved by the FDA on December 24, 2012; it's a microsomal triglyceride transfer protein inhibitor, approved to be used as adjunct to a low-fat diet and other lipid-lowering treatments in patients with HoFH. It is taken orally and side effects reported in clinical trials were, gastrointestinal side effects (diarrhea, nausea, vomiting, dyspepsia, abdominal pain) and increased liver enzymes.

Kynamro (mipomersen sodium) was approved by the FDA on January 29, 2013 for the same indication as Juxtapid. It inhibits synthesis of apoB by sequence-specific binding to its messenger ribonucleic acid (mRNA) resulting in degradation of the mRNA through enzyme-mediated pathways or disruption of mRNA function through binding alone. Mipomersen is administered once weekly by subcutaneous injection and the most common side effects associated with its use in the clinical trial were injection site reactions, flu-like symptoms, nausea, headache and elevations in liver enzymes.

The safety and effectiveness of Kynamro and Juxtapid have not been established in patients with hypercholesterolemia who do not have HoFH and their effect on cardiovascular morbidity and mortality has not been determined. Both drugs carry a Boxed Warning on the serious risk of liver toxicity because they are associated with liver enzyme abnormalities and accumulation of fat in the liver, which could lead to progressive liver disease with chronic use.

What you need to know: FDA approval of these two drugs is a great achievement for patients with HoFH who are in need for additional treatment options for this rare and often under-diagnosed disease to better help them manage it.

Sources: 1. "FDA approves new orphan drug Kynamro to treat inherited cholesterol disorder"US Food and Drug Administration (FDA)
2. Nordqvist J. New Orphan Drug Kynamro Approved For Inherited Cholesterol Disorder. Medical News Today. MediLexicon, Intl., 30 Jan. 2013 http://www.medicalnewstoday.com/articles/

DOSAGE FORMS

Nisreen Mourad, PharmD.

The Use of Nanoparticle Technology in Drug Design

Key point: The US National Science Foundation defines nanotechnology as research and technology development at the atomic, molecular, or macromolecular level, in the length scale of approximately 1–100 nm range, however the size of materials of interest can reach 1000 nm. Nanoparticle delivery systems have the ability to target the drug to the intended sites thus improving effectiveness, reducing side effects and, improving the properties of a drug while enhancing patient's compliance.

Finer points: The biomedical and pharmaceutical fields have been utilizing nanomaterials for various applications. Importantly in tumor-targeted delivery of drugs, where the goal of therapy is to ensure selective destruction of tumor cells while sparing normal tissue. Thus, increasing efficacy and reducing side effects. In development today are the nanovectors that are multi-functional nanoparticles, nanowires and nanotubes that offer drug delivery with targeted localized killing of cancerous and precancerous cells through thermal ablation. For this application, there is also the potential to integrate nano-surgical tools for the treatment of cancer. Furthermore, this technology shows promises in diagnostic approaches with the use of metal nanoparticles and a nano-electro-mechanical system (NEMS) such as the Lab-on-a-chip (LOC) that can minimize huge instruments, such as electrophoresis systems, into a single chip.

Nanotechnology allowed advances in drug delivery systems such as, the Smart Drug Delivery Systems (SDDS). It is based on the release-on-demand strategy, allowing a drug carrier to liberate a drug only when it is required in response to a specific stimulation. The Multifunctional Drug Delivery System (MDDS) demonstrates also this technology. It represents the drug carrier that has multiple properties of prolonged blood circulation, passive or active localization at specific disease site, stimuli-sensitivity, ability to deliver drug into intracellular target organelles, and/or imaging ability.

Like any new innovation, certain problems with nanotechnology should be addressed such as drug loading efficiency in nanovehicles, complexity of nanocarriers, interface between synthetic materials and biological tissues/components as well as safety and ethical issues.

What you need to know: Predicting the future of nanotechnology in drug delivery systems is not simple, it might include neuro-electronic systems, nanorobots, cell repair machines and nanonephrology.

Sources: 1. DeVilliers M M., Aramwit P, Kwon, G S. Nanotechnology in Drug Delivery
2. Shastri V P, Altankov G, Lendlein A. Advances in Regenerative Medicine: Role of Nanotechnology, and Engineering Principles
3. Jia, L. Nanoparticle Formulation Increases Oral Bioavailability of Poorly Soluble Drugs: Approaches Experimental Evidences and Theory
4. Wim H De Long, Paul JA Borm. Drug delivery and nanoparticles: Applications and hazards. International Journal of Nanomedicine

ENDOCRINOLOGIC DISORDERS

Diana Malaeb, PharmD.

Overview of new drugs in the treatment of Diabetes Mellitus Type II

Key point: The prevalence of type 2 Diabetes Mellitus is increasing worldwide and by 2030, the Middle East is expected to have the greatest increase. This disease results from a complex interaction of genetic and environmental factors and places a heavy health and economic burden on many countries. If left untreated, patients are predisposed to acute and chronic complications.

Finer points: Many new drugs are recently approved for type II diabetes and include insulin degludec, dopamine agonists, and sodium glucose co-transporters inhibitors (SGLT2).

Insulin degludec, is a new generation of ultra-long-acting basal insulin, with a longer duration of action. It is given three times per week with a lower incidence of hypoglycemic events in both type 1 and type 2 diabetic patients. Its unique mechanism of action is based on multihexamer formation at physiological pH following subcutaneous injection.

" Drugs recently approved for type II diabetes and include insulin degludec, dopamine agonists, and sodium glucose co-transporters inhibitors (SGLT2) "

Also, timed dopamine agonists administration as bromocriptine within 2 hours of awakening has a novel mechanism in improving glycemic control, mainly via a sympatholytic activity within the central nervous system (CNS), resulting in a reduction in postmeal plasma glucose levels due to enhanced suppression of hepatic glucose production.

SGLT2 inhibitor selectively and reversibly blocks the SGLT2 receptor that prevents the reabsorption of glucose at the renal proximal tubule. Dapagliflozin is the lead agent in this new class of oral antidiabetic agents. When administered in doses of 5-100 mg/day, it increases urinary glucose excretion and improves glucose tolerance. Dapagliflozin leads to heavy glycosuria, and because glucose acts as an osmotic diuretic, this can lead to dehydration and possible subsequent rapid weight loss. The increased amount of glucose in the urine can also worsen infections already associated with diabetes, such as urinary tract infections.

What you need to know: Diabetes prevalence can be limited through intensive patient education that encompasses weight control, and regular exercise practice.

Sources: 1. Nasrallah S, Reynolds L. et al. Insulin Degludec, The New Generation Basal Insulin or Just another Basal Insulin? Clinical Medicine Insights. Endocrinology and Diabetes 2012:5 31–37.
2. Defronzo R, et al. Bromocriptine: A Sympatholytic, D2-dopamine Agonist for the Treatment of Type 2 Diabetes. Diabetes Care. 2011;34(4):789-794.
3. Shah N, Deeb W, Choksi et al. A Novel Sodium-glucose Cotransporter Type 2 Inhibitor for the Treatment of Type 2 Diabetes Mellitus. Pharmacotherapy. 2012; 32(1):80-94.

DERMATOLOGY **Sawsan AlHussein, PhD.**

Benign Viruses May Provide Cure for Acne

Key point: Acne is a popular or pustular eruption, involving the face, chest and back. Plugged follicles, increased sebum production, Propionibacterium acnes and inflammation are thought to promote acne. Acne lesions are divided into two main types: Non- inflammatory lesions (blackheads and whiteheads) and inflammatory lesions characterized by the presence of papules, pustules and nodules (cysts) Therapy should account for medical, financial and psychosocial factors. Mainly the treatment is continual and prolonged, since it is control – not cure- that is most often achieved.

Finer point: Researchers at the University of California, Los Angeles (UCLA) are investigating a potential powerful acne treatment, using benign viruses that kill acne-causing bacteria. This new research suggests that Propionibacterium acnes, the main cause of acne vulgaris has an enemy: a kind of virus called a bacteriophage, or phage. Phages inject their genetic material into bacteria, forcing them to make more and more new phages until they burst. 11 different phages that kill acne bacteria were studied at UCLA. This research found that unlike most phages, the ones capable of killing P. acnes are closely related to one another, with relatively little difference in their genetic makeup. Most of the phages were able to kill most strains of acne bacteria. They are programmed to target and kill specific bacteria, so P. acnes phages will attack only P. acnes bacteria.

What you need to know: Findings suggest that these properties make these phages ideal candidates for the development of a phage-based topical anti-acne therapy. The phages also make an enzyme that dissolves the cell walls of acne bacteria. This enzyme itself might make a good acne treatment.

Sources: 1. Habif T. et al. 2011. Skin disease: Diagnosis and treatment; chapter 4; page 102- 103. ELSEVIER 3rd edition 2011
2. Marinelli LJ, et al. 2012. Propionibacterium acnes bacteriophages display limited genetic diversity and broad killing activity against bacterial skin isolates. mBio 3(5):e00279-12. doi:10.1128/mBio.00279-12.

FDA DRUG NEWS

Jihan Safwan, PharmD.

FDA approvals in 2013

Therapeutic Area	Drug Name	Therapeutic Class	Indication
Cardiology / Vascular Diseases	Kynamro (Mipomersen sodium)	Genzyme	Homozygous familial hypercholesterolemia
Endocrinology	Nesina (Alogliptin)	DPP-4 inhibitor	Type II diabetes mellitus
Gastroenterology	Uceris (Budesonide)	Glucocorticoid Streoid	Ulcerative colitis
Genetic Disease	Kineret (Anakinra)	Interleukin 1 Receptor Antagonist	Cryopyrin-Associated Periodic Syndromes
Hematology	Ravicti (Glycerol Phenylbutyrate)	Nitrogen-Binding Agent	Pediatrics and adults with urea cycle disorders
Obstetrics/ Gynecology	Osphena (Ospemifene)	Selective Estrogen Receptor Modulator (SERM)	dyspareunia and vulvar and vaginal atrophy due to menopause
Oncology	Kadcyla (Ado-Trastu-zumab Emtansine)	Monoclonal antibody	HER2-positive metastatic breast cancer
	Pomalyst (Pomalidomide)	Anti-angiogenic	Relapsed and refractory multiple myeloma
	Stivarga (Regorafenib)	Multikinase inhibitor	Gastrointestinal stromal tumor
Vaccines	Flublok (Seasonal Influenza Vaccine)	Vaccine	Active immunization against influenza virus subtypes A and type
	VariZIG (Varicella Zoster Immune Globulin)	Immune Globulins	Post-exposure prophylaxis of varicella zoster (chickenpox)

Source: FDA Approved Drugs (2013). Retrieved on March 21, 2013, from: http://www.centerwatch.com/drug-information/fda-approvals/

INFECTIOUS DISEASES **Fadi Hdeab, PharmD.**

Association Between Colistin Dose and Microbiologic Outcomes in Patients With Multidrug-Resistant Gram-Negative Bacteremia

Key point: Increasingly, we are faced with gram negative rods with broad resistance to antibacterials (MDRGNR) causing serious infections. Colistin is more and more used for the treatment of MDRGNR. However, colistin dosing varies greatly and the optimal regimen is unknown.

Finer points: This study retrospectively examined the use of parenterally administered colistin in the treatment of MDRGNR bacteremia. The primary objective was to determine if colistin dose (mg of colistin base activity/kg/day) independently predicts day-7 microbiological success. Secondary objectives included evaluation for an association between colistin dose and 7-day mortality, 28-day mortality, and the development of acute kidney insufficiency (AKI).

A total of 76 patients received colistin with 52 patients (68%) achieved 7-day microbiological success. The median colistin dose was significantly higher in patients who achieved microbiological success (2.9 vs 1.5 mg/kg/day; P = .011). The median colistin dose was also significantly higher among survivors at day 7 (2.7 vs 1.5 mg/kg/day; P = .007). However, no statistically significant difference was observed in mortality between the two groups at day 28.

On the other hand, (36%) of patients developed AKI during treatment, which was clearly associated with higher colistin dosage (3.8 vs 1.6 mg/kg/day; P < .001).

The number of days from the first positive blood culture to initiation of colistin was similar for both groups (approx. 2.8 days). Concomitant antibiotic use was common in both groups (overall, 71% in the treatment success group vs 75% in the treatment failure group). Concurrent use of carbapenems and aminogylcosides was similar, although tigecycline was used more often in the treatment failure group compared with the treatment success group (54% vs 31%). Other patient characteristics, such as gender, age, and comorbidity index were similar.

After adjusting for baseline severity of illness and concomitant tigecyline use, higher colistin dose independently correlated with microbiological success (adjusted odds ratio per 1 mg/kg/day = 1.74; 95% confidence interval, 1.11–2.71; P = .015).

What you need to know: Higher colistin dose independently predicted microbiological success, which may partially explain the similar association with 7-day mortality. However, higher colistin doses may also precipitate worsening renal function.

Source: Vicari G, et al. Association between colistin dose and microbiologic outcomes in patients with multidrug-resistant gram-negative bacteremia. Clin Infect Dis 2013;56 (3):398-404.

CARDIOVASCULAR DISORDERS

Michelle Cherfan, PharmD.

Higher Calcium Intake Increases Risk of Heart Disease and Early Death

Key point: It is well established that consumption of calcium-rich foods or calcium supplementation can help prevent osteopenia and osteoporosis. Few studies have shown an inverse correlation of dietary calcium intake on hypertension and stroke, leading some to speculate that calcium supplementation might reduce cardiovascular disease (CVD). However, studies examining the effect of calcium intake on cardiovascular mortality do not support this hypothesis and concerns have been raised about the potential adverse effect of high calcium intake on cardiovascular health.

Finer points: A study conducted by the National Institutes of Health investigated whether intake of dietary and supplemental calcium is associated with mortality from total CVD, heart disease, and cerebrovascular diseases.

The trial prospectively enrolled 388,229 men and women aged 50 to 71 years. Participants recorded their daily food composition and intake over 1 year, including use of multivitamins, calcium-containing antacids, and calcium supplements. Mean follow-up time was 12 years, with 7904 CVD deaths reported in men and 3874 reported in women. Supplements containing calcium were used by 51% of men and 70% of women.

In men, after adjusting for CVD risk factors, supplemental calcium (1000 mg daily vs no calcium supplementation) was associated with a 19% increase in CVD death, including heart disease death (RR, 1.19; 95% CI, 1.03-1.37) but not significantly with cerebrovascular disease death (RR, 1.14; 95% CI, 0.81-1.61). In women, supplemental calcium intake was not associated with CVD death (RR, 1.06; 95% CI, 0.96-1.18) or heart disease death (1.05; 0.93-1.18). Cerebrovascular mortality was not increased with calcium supplements in either men or woman. Dietary calcium intake was unrelated to CVD death in either men or women.

" High intake of supplemental calcium and not dietary calcium is associated with an excess risk of CVD "

What you need to know: This study suggests that high intake of supplemental calcium and not dietary calcium is associated with an excess risk of CVD death in men but not in women.

The consumption of calcium-rich foods, such as low- fat dairy products, beans, and green leafy vegetables, may be preferred over calcium supplements in men, unless otherwise clinically indicated. Additional studies are needed to investigate the effect of supplemental calcium use beyond bone health.

Source: Xiao Q, Murphy RA, Houston DK, Harris TB, Chow WH, Park Y. Dietary and supplemental calcium intake and cardiovascular disease mortality: the National Institutes of Health-AARP Diet and Health Study. JAMA Intern Med. 2013 Feb 4:1-8.

NUTRITION AND SUPPLEMENTS

Marwan Akel, PharmD.

Is Any Supplement Neuroprotective?

Key point: The mainstay of the management of dementing illnesses is still symptomatic despite the advances in the understanding of the pathophysiology of the disease. Beside the prescription medications used to slow the progression of the disease, many reports have highlighted the use of some supplements as an aid for dementia. Of these options, ginkgo biloba, high dose B vitamin and docosahexaenoic acid (DHA) are the mostly used/discussed choices. Below are the results of some relevant research concerning supplements' role in stopping the progression of dementia.

Finer points: According to:" ginkgo biloba for cognitive impairment and dementia" the authors 'conclusion stated that the evidence that ginkgo has predictable and clinically significant benefit for people with dementia or cognitive impairment is inconsistent and unconvincing. This review included randomized, double-blind studies, in which extracts of ginkgo biloba at any strength and over any period were compared with placebo for their effects on people with acquired cognitive impairment, including dementia, of any degree of severity. The conclusion came as such due to the unsatisfactory methods, the small number of studies and patients and the publication bias.

Concerning vitamin B role in cognitive behavior, a study published in JAMA in 2008 entitled: High-dose B vitamin supplementation and cognitive decline in Alzheimer disease, showed that the regimen of high dose B vitamin supplements does not slow cognitive decline in individuals with mild to moderate AD. The duration of treatment was 18 months, it was a multicenter, randomized, and double blind controlled trial of high dose folate, Vit B6, and Vit B12 in 409 individuals with AD. The aim behind the use of Vit B in AD is to decrease the levels of hemocysteine. Vit B supplementation decreased homocysteine levels but did not improve cognitive behavior in the study population.

In order to determine if supplementation with DHA slows cognitive and functional decline in individuals with AD, a randomized trial published in 2010 in JAMA stated that supplementation with DHA compared with placebo did not slow the rate of cognitive and functional decline in patients with mild to moderate AD. The duration of the study was 18 months, a total of 402 individuals where assigned to take 2g/day of DHA or placebo. Moreover the rate of brain atrophy was not affect ted by treatment with DHA.

What you need to know: The debate about the use of supplements to slow the progression of dementing diseases will remain unclear and optional due to the absence of results of well designed conclusive trials.

Sources: 1. Birks J, Grimlye Evans J. Ginkgo biloba for cognitive impairment and dementia. Cochrane database Sust Rev 2007
2. Aisen PS, Schneider LS, Sano M. High dose B vitamin supplementation and cognitive decline in Alzheimer disease: a randomized controlled trial. JAMA 2008; 300(15): 1774
3. Quinn JF, Raman R, Thomas RG. Docosahexaenoic acid supplementation and cognitive decline in Alzheimer disease: a randomized trial. JAMA 2010; 304(17): 1903

PHARMACEUTICAL EDUCATION **Fida Drouby, PharmD.**

A Guide for Effective Clinical Teaching: An ASHP-Based Approach (Part 1)

Key point: The American Society of Health-System Pharmacists (ASHP) emphasizes on the increasingly significant role of clinical preceptors in educating pharmacy students and practitioners and the importance of preceptors' qualifications and training. These factors became a requirement for accreditation.

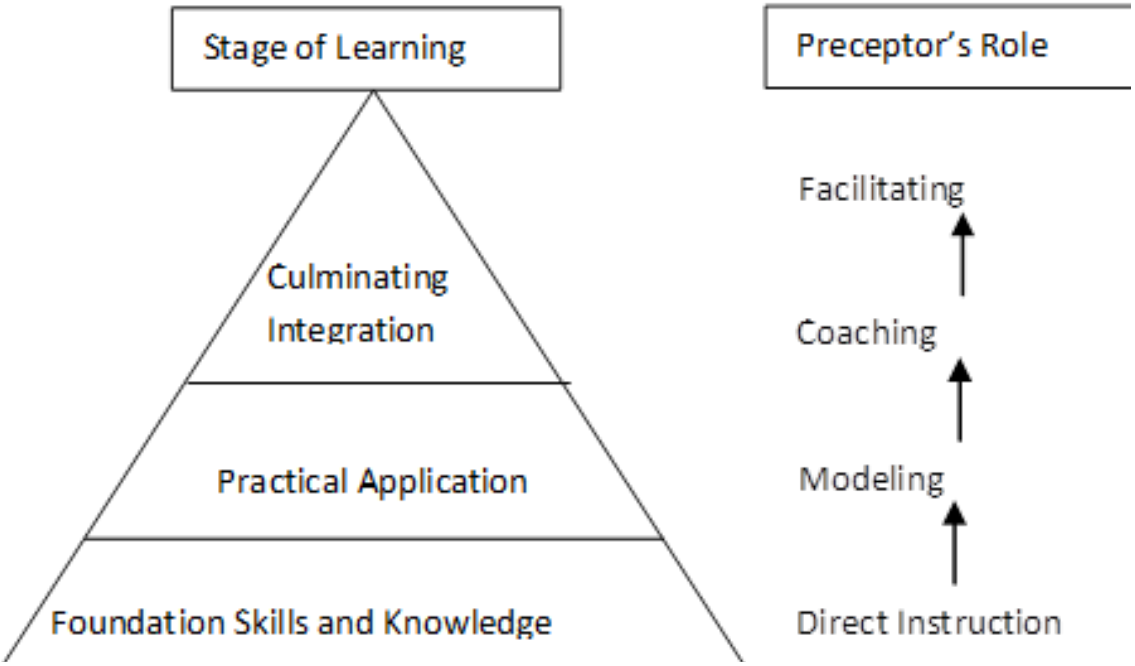
Finer points: The role of the clinical pharmacy director is to select appropriate candidates who meet the following standards:

1. Basic preceptor requirements (licensure, practice and teaching experience),
2. Preceptor's desire and skill for teaching, by mastering the four-steps teaching approach (direct instructing, modeling, coaching, and facilitating),
3. Adequately trained preceptor (learning the institution's teaching methods and the objectives of the pharmacy practice, assessing student's base knowledge and tailoring each student's experience to maximize the learning).

In the process of clinical teaching, preceptors should employ active learning strategies and cognitive learning – a process consisting of 6 levels:

(1) Knowledge: new facts
(2) Comprehension: understanding the new fact
(3) Application: use it to solve the case
(4) Analysis: breaking data to simple related parts
(5) Synthesis: creating something new to solve a complex problem
(6) Evaluation: assessing one's own work and that of peers

These six levels can be achieved, as described by Nimmo, via three-stage learning process: "the learning pyramid":



For effective clinical problem solving, the school must select the appropriate teaching strategy or preceptor role. This is accomplished by:
(1) Establishing the desired endpoint of a learner's experience,
(2) Assessing a learner's knowledge and skills on entry into the learning experience,
(3) Designing a plan to *individualizing* teaching strategies to meet a *learner's specific needs* in order to achieve the desired outcome *within the appropriate time frame.*
Therefore, within one teaching environment, a preceptor can set different endpoints for knowledge and competencies that each category of learners should achieve, and accordingly, employ multiple learning plans for different learners.

What you need to know: It is essential to design and apply a clinical learning program based on evidenced-based teaching approaches, with the ultimate goal of helping the students to become life-long active learners.

Sources: 1. Weitzel K, Walters E, Taylor J. Teaching clinical problem solving: A preceptor's guide. Am J Health-Sys Pharm. 2012; 69: 1588-99.
2. Richetti C, Jun A. Strategies and resources for successful preceptor development. Am J Health-Sys Pharm. 2011; 68: 1837-42.
3. Nimmo CM. Developing training materials and programs: creating educational objectives and assessing their attainment. In: Nimmo CM,

ONCOLOGIC DISEASES

Etwal BouRaad, PharmD.

Clinical Evidence for Aspirin's Efficacy as a Chemopreventive Agent: New possible mode of action

Key point: Prevention of prevalent diseases, such as cancer, through the daily ingestion of low cost drugs or vitamins has not generally met with great success. However, recent clinical data indicate that aspirin (acetylsalicylic acid, ASA) and its precursor, salicylate, may have potential for use in cancer prevention.

Finer points: A meta-analysis of nine trials include data from >23,000 patients who regularly took aspirin (at least ≥ 75 mg/day) demonstrated nearly 20% decreased risk in overall cancer mortality after a 20-year follow-up period, with most of the benefit occurring after five years of aspirin use(hazard ratio 0.66, p = 0.003). The reduction of cancers was most significant for esophageal and colorectal cancers, but an overall gastrointestinal (GI) cancer reduction was observed for patients with >10 years of follow-up (representing a larger pool of patients). In another recent meta-analysis, 51 trials (representing ~77,500 patients) of daily aspirin versus no aspirin were evaluated for cancer death and adverse effects. Aspirin reduced the risk of cancer death and colorectal cancer (odds ratio = 0.58), and lymphoma (odds ratio = 0.61).

The Nurses' Health Study and the Health Professionals Follow-up Study set out to determine if there was a pharmacogenetic contribution to the sensitivity of colorectal cancers to aspirin. From the ~170,000 participants, there were 964 colorectal cancer samples that were tested for mutations in PIK3CA (exons 9 and 20), KRAS (codons 12 and 13), and BRAF (codon 600). Mutations of PIK3CA, primarily activating mutations for PI3 kinase, correlated with reduced probability of death with aspirin use (hazard ratio 0.18). Aspirin, or perhaps salicylate, may have another important pharmacological activity that is separate from the cyclooxygenase inhibitory activity.

What you need to know: Clinical data are accumulating that support the use of aspirin in the prevention of adenocarcinoma.

" Clinical data are accumulating that support the use of aspirin in the prevention of adenocarcinoma "

Prospective trials would provide definitive evidence of aspirin's cancer prevention efficacy and determine if the risk of potential adverse effects, like bleeding, is genuinely mitigated with long-term use.

Sources: 1. Rothwell PM, Fowkes FG, Belch JF, et al. Effect of daily aspirin on long-term risk of death due to cancer: analysis of individual patient data from randomized trials. Lancet 2011;377(9759):31-41
2. Rothwell PM, Price JF, Fowkes FG, et al. Short-term effects of daily aspirin on cancer incidence, mortality, and non-vascular death: analysis of the time course of risks and benefits in 51 randomized controlled trials. Lancet 2012;379(9826):1602-12
3. Liao X, Lochhead P, Nishihara R, et al. Aspirin use, tumor PIK3CA mutation, and colorectal-cancer survival. N Engl J Med 2012;367(17):1596-606

ANNOUNECEMENTS

On behalf of the whole body of the School of Pharmacy at LIU we would like to:

- Congratulate **Dr. Faraj Saade** for passing the Board Certified Pharmacotherapy Specialists (BCPS) Examination which is certified by the American Colleges of Clinical Pharmacy (ACCP).
- Congratulate **Dr. Sawsan El Hussein** for her marriage.
- Congratulate **Dr. Bahia Chahine** and **Dr. Lina Jadid** for joining the LIU SOP faculty as part-time faculty members starting this spring 2013 semester.
- Congratulate **Dr. Fida Drouby** on her engagement.
- Congratulate **Dr. Marwan Akel** on his engagement.
- Thank **Dr. Rouba Ead** for all of her hard work, her outstanding leadership role, and contributions to the school of pharmacy. We wish you all the best in the path you choose to follow next.

Events:

- Launching the E library and workshop for hospital pharmacists on Thursday the 11th of April, 2013 at LIU Beirut campus.
- Hosting a dinner for hospital pharmacists attending the E-library workshop, on Thursday the 11th of April, 2013 at Leila restaurant.
- Attending the pharmaceutical & food supplements 2013 congress: Health Insights 3 that will take place from the 23rd to 25th April 2013 at Hilton Beirut - Habtoor grand hotel .
- OPL pharmacy day on Sunday the 12th of May, 2013.
- Hosting deans and members of the executive committee of scientific society of faculties of pharmacy in the Arab world. It will take place from the 22nd till the 24th of May, 2013 at LIU- Bekaa campus.
- SOP PHARMACY DAY on Friday the 24th of May, 2013 at LIU Bekaa Campus.
- Commencement on Friday the 5th of July, 2013 at LIU Bekaa - campus.