AMERICAN COLLEGE OF CLINICAL PHARMACY

ADULT MEDICINE PRN NEWSLETTER

FALL 2012 VOLUME 7, ISSUE 2

MESSAGE FROM THE CHAIR

AUTHOR: NANCY YUNKER PHARM.D., BCPS

"Coming together is a beginning. Keeping together is progress. Working together is success."
~ Henry Ford

Reflecting on the past year and my experiences as the Adult Medicine PRN chair, I echo the thoughts of Henry Ford. The Adult Medicine PRN officers started their term last October at the ACCP meeting in Pittsburgh and developed a vision of what to accomplish. We established a team of talented PRN members who volunteered their time and abilities to further this vision while promoting the core values of ACCP. We are working to finish our charges for a successful year. It is hard to believe that a year has almost elapsed and another group of officers is poised to further the growth of the Adult Medicine PRN.

Our PRN is made up of a diverse group of pharmacists who practice in a multitude of inpatient, outpatient, and other settings. However, we all work to promote and advance the practice of adult medicine. As I write this message, our membership stands at almost 1000 individuals. Over the past year, I have seen a huge growth in our student pharmacist and resident members; currently we have over 70 students and 80 residents who are interested in the practice of adult medicine. I challenge each of us to help guide and offer support to the newest members of our PRN, both now and in the course of their careers. Several of these individuals have also volunteered to participate in PRN committees. Thank you!

(continued on Page 2)

In this issue:

PRN OFFICERS

CHAIR: Nancy Yunker

CHAIR-ELECT: Jessica Starr

SECRETARY/TREASURER: Matt Pike

BOARD LIAISON: Krystal Haase

MEMBER SPOTLIGHT: ELI DEAL

AUTHOR: KIMBERLY HAMMONS PHARM.D.

I had the pleasure of chatting with Eli Deal to find out more about his journey into the field of pharmacy. For Eli, becoming a pharmacist was simply part of his life plan- it was fate. He remembers taking an occupational survey in the sixth grade which highlighted his strengths in science and math and steered him in the direction of pharmacy as a future career. As early as high school, he had the opportunity to shadow a variety of health care professionals and discovered that pharmacists appeared to have the greatest job satisfaction. So off to pharmacy school he went, completing the Doctor of Pharmacy program at the University of Missouri – Kansas City in 2004. He followed this with a two-year Pharmacotherapy

(continued on Page 3)

MESSAGE FROM THE CHAIR
(CONTINUED FROM PAGE 1)

Due to the results of a membership survey last year, our PRN developed two focus sessions this year for the Annual Meeting. One session was developed by our education committee and the other was developed in cooperation with the Infectious Disease PRN. On Monday afternoon, join your colleagues for programming developed by the members of the Adult Medicine PRN – "A Breath of Fresh Air: Updates in Chronic Obstructive Pulmonary Disease (COPD) Management". The faculty will address the role of long-term antibiotics in COPD management, new treatment options for stable COPD, and the treatment of co-morbid conditions in COPD, focusing on cardiovascular disease, osteoporosis, and depression. On Tuesday afternoon, mark your calendar for another two hour session that was developed by the members of the Adult Medicine and Infectious Disease PRNs entitled "Inpatient Management of the HIV patient." This session will discuss the fundamentals of HIV and resistance, how to recognize and respond to antiviral drug interactions, and clinical pearls for the inpatient management of HIV medications. I hope you will join us for these timely and exciting programs if you attend the Annual Meeting.

Two of our committees, the travel and training and the nominations committees, were charged with developing new criteria or revising old criteria for awards offered to our PRN members this year. The travel and training committee developed new criteria for Student Research and revised the Resident and Fellow Research Awards. I am happy to announce that the PRN will award both of these for the Annual Meeting as well as offer one of our members travel support in the form of registration for the meeting. We look forward to hearing the findings of our two research award recipients at our business meeting, and we have asked our travel award recipient to provide a reflection article on his experiences at the Annual Meeting in our next newsletter. The nominations committee was also extremely busy soliciting for other PRN awards and developing a slate of officers for the upcoming year, as well as soliciting nominations for other ACCP awards. We will recognize the winner of the PRN mentoring award at the business meeting in Florida. Speaking of ACCP honors, I am pleased to recognize that three of our PRN members will be awarded Fellow status in ACCP at the Annual Meeting. Please join me in congratulating Brian Hemstreet, Julie Murphy, and Shareen El-Ibiary, who will be recognized as Fellows for their sustained level of excellence in clinical pharmacy practice and/or research. While we will be honoring the great work and achievements of several of our members, other PRN awards continue to go unfilled. With the size of our membership, we have many excellent clinicians, educators and researchers, but we have struggled to obtain nominations for several awards despite the best efforts of our nominations committee for the past several years. I have asked the Chair of this committee, Lindsay Arnold, to discuss this issue at the business meeting and I challenge each of you to think of possible solutions to the issue. Should we continue to offer those awards or should we devote our efforts to promoting other awards in future years? A list of the awards offered this year can be found on the PRN website.

In closing, I would like to thank you for allowing me to serve you this past year. However, I would be remiss if I did not take this opportunity to personally thank all of the other PRN members who dedicated their time and energy on a PRN committee or as an officer. I would particularly like to recognize our Secretary/Treasurer Matthew Pike, Chair-elect Jessica Starr, and our past Chair Lindsay Arnold for all their input, hard work and support over the past year. It was truly a collaborative effort and they made my job easy. In addition, I commend the leaders of the PRN committees Asha Tata and Nicole Metzger (Travel and Training Committee), Lauren McCluggage and Julie Murphy (Walk Rounds Committee), Renee Holder (Listserv committee), and Melissa Badowski (joint ID/Adult Medicine Focus Session Committee) for jobs well done. As Helen Keller said "Alone we can do so little; together we can do so much" and that has truly been the case this year.

Finally, as this year winds to a close, I challenge and encourage each of you to take advantage of the opportunities next year to get involved with PRN activities. I know that I have benefited greatly by my experiences in the PRN both this past year as well as throughout my professional ACCP career. I hope to see many of you at the Annual Meeting in Hollywood Florida!

To Our Incoming 2012-2013 Officers…..

Chair:	**Jessica Starr Pharm.D., BCPS**
Chair-Elect:	**Rolee Pathak Das Pharm.D., BCPS**
Secretary/Treasurer:	**Jacqueline Olin Pharm.D., M.S., BCPS, CPP, CDE**

MEMBER SPOTLIGHT
(CONTINUED FROM PAGE 1)

Residency at Barnes-Jewish Hospital in 2006 . He stayed on as clinical faculty at Barnes-Jewish Hospital before advancing to his current role as the Program Director of the Pharmacotherapy Residency from which he graduated.

Eli likes the daily challenges and problem solving that come with being an Internal Medicine pharmacist. In particular, he enjoys the patient variety and the opportunities to assist in the management of a wide array of disease states. Within the scope of internal medicine, Eli's interests include diabetes, asthma/COPD, liver disease, and ID. He routinely attends patient rounds with one of twelve internal medicine teams where he influences patient care and has opportunities to educate medical and nursing staff. He finds educating others to be the most rewarding part of his job and recently was voted "Preceptor of the Year" by the 2011 residency class, a clear nod to his expertise. Other recent acknowledgements include runner-up for Best Paper at the 2010 ACCP Spring meeting with his presentation of "Incidence, Diagnosis, Medication Use and Outcomes of Patients with Class III (morbid) Obesity at a Single Academic Medical Center."

Eli joined the AMED PRN with the goal of increasing his involvement in pharmacy practice on a regional and national level. He believes that through sharing of ideas and practice changes, we can all have a role in growing pharmacy as a profession. Within his institution, Eli hopes to increase pharmacy staff education. The staff includes a variety of specialists who can share their expertise with their colleagues. He also desires to bridge the gap between pharmacy specialists, unit-based pharmacists and dispensing pharmacists in order to provide the best possible patient-centered care.

At the close of the interview, I asked Eli, "If you were not involved in pharmacy, where would you be today?" I think this question gives us a tiny glimpse into one's dreams. Eli's response was truly that. He said he'd prefer to be fly fishing in a tropical area. I suspect that among his many obligations, he does not escape for tropical fly fishing very often. And finally, to the most important or at least the most interesting question of the day, "If you could be any drug, what drug would you be and why?" And in keeping with his desire to educate and give back to others, his response fits perfectly; "A statin – there is nothing a statin can't help."

RECENT MEMBER ACCOMPLISHMENTS

- Nancy Toedter Williams Pharm.D., BCPS, BCNSP, FASHP was promoted to Associate Dean for Clinical Programs and Chair of the Department of Pharmacy Practice in the College of Pharmacy at Southwestern Oklahoma State University.
- Nicole Cieri Pharm.D. accepted a position as Assistant Clinical Professor at D'Youville College of Pharmacy.
- Matt Pike Pharm.D., BCPS recently received the "Friend of Nursing Award" at Carle Foundation Hospital– the first pharmacist to receive this award and the only two-time recipient.
- Heather Kehr Pharm.D. was promoted to Associate Professor of Pharmacy at Wingate University School of Pharmacy
- Stephanie Nichols Pharm.D., BCPS received the "Inpatient Specialist of the Year Award" from the Family Medicine Residency Teaching Service at Maine Medical Center– the first pharmacist there to receive this honor.
- Shareen El-Ibiary Pharm.D., BCPS, Julie Murphy Pharm.D., BCPS and Brian A. Hemstreet Pharm.D., BCPS were eacj awarded Fellowship status in ACCP for 2012.

PRN LISTSERV ETIQUETTE AND HELPFUL TIPS

AUTHOR: SHAILA SHETH PHARM.D.

You've used it at least once and read it at least once a week. It's also cited as one of the most significant benefits of joining a PRN. So here's a quick summary on the purpose of the PRN listserv and some tips on how to use it appropriately.

The listserv may be used for:

- Seeking and receiving advice on challenging questions and problems
- Assembling colleagues together at clinical meetings
- Sharing pertinent clinical information
- Assisting in the administrative work of the PRN and its advisers

The listserv should not be used for:

- Information concerning specific prices, charges, costs for products and/or services, sharing of fee structures or financial information that could suggest price collisions between competitors
- Endorsements that support or oppose a particular vendor or service provider based on the cost of those services

Additional tips to consider when using the listserv:

- All the messages you send should include a signature comprised of your name, affiliation, location, and email address
- Remember that the email list and its contents is public activity and is subject to the subpoena power of law enforcement agencies
- If you are planning on being out of the office and using the automatic email reply function, please set your subscription type to "NOMAIL" until you return. Visit the "Manage E-mail List Subscriptions" page (http://www.accp.com/lists/index.aspx) to manage your subscription settings.
- Unless members have requested a response be sent to the entire list please reply to the sender alone by selecting the "REPLY" button in your email system. If members have expressed interest in a question it is helpful to compile responses you've received before emailing the entire listserv. This can prevent our members' inboxes from being overwhelmed with emails!

RECENT MEMBER PUBLICATIONS

- Bae JP, **Dobesh PP**, Klepser DG, Anderson JD, Zagar AJ, McCollam PL, Tomlin ME. Adherence and dosing frequency of common medications for cardiovascular patients. ***Am J Manag Care*** 2012;18:139-146.
- **Stacy ZA, Dobesh PP**, **Trujillo TC, Dager WE**, Ripley T, Olson KL. Key articles and guidelines in the management of peripheral arterial disease. ***Pharmacotherapy*** 2011;31:176e-206e.
- **Anderson SL, Marrs JC**. Dapagliflozin for the treatment of type 2 diabetes. Ann Pharmacother 2012;46(4):590-8.
- **Marrs JC, Anderson SL**. Transitions of Care. In: Richardson M, Chant C, Chessman KH, Finks SW, Hemstreet BA, Hume AL, et al, eds. Pharmacotherapy Self-Assessment Program, 7th ed. Science and Practice of Pharmacotherapy. Lenexa, KS: American College of Clinical Pharmacy, 2011:103-20.
- **Cieri N,** Seyse S. Gastrointestinal bleeding following intravenous ibandronate administration. *Journal of Pharmacy Practice* 2012;25 (13):395-398.

GUIDELINE UPDATE

KEY UPDATES FROM THE 9TH EDITION OF THE ANTITHROMBOTIC THERAPY AND PREVENTION OF THROMBOSIS (CHEST) PRACTICE GUIDELINES

AUTHOR: ANGELA SHOGBON PHARM.D.

The 9th edition of the American College of Chest Physicians (ACCP) Evidence-Based Clinical Practice Guidelines for Antithrombotic Therapy and Prevention of Thrombosis have substantial changes from previous versions in relation to content and process of guideline development.[1] The 9th edition still utilized the Grades of Recommendations, Assessment, Development, and Evaluation (GRADE) system to rate the quality of evidence and strength of recommendations. However, an increased rigor was utilized in the methodology of the guideline development, resulting in fewer strong Grade 1 recommendations and Grade 2 recommendations.[1] Table 1 highlights some of the major innovations in the 9th edition of the CHEST guidelines. Overall, these changes have implications for practice and it is vital that pharmacists stay abreast of important updates, some of which may mirror current trends in practice, and others that may have new practice implications.

Table 1. Major Innovations in 9th Edition of ACCP Guidelines[1, 2]

1. Unconflicted methodologists as topic editors; conflicted experts did not participate in the final process of making recommendations
2. Many "evidence profile" and "summary of findings" tables
3. Quantitative specification of values and preferences based on systematic review of relevant evidence as well as formal preference rating exercises
4. Inclusion of aspirin as an option for prevention of venous thromboembolism (VTE) in select patients undergoing major orthopedic surgery
5. New insights into evidence (e.g. asymptomatic thrombosis, aspirin)
6. Division of prevention of VTE into three major areas: nonsurgical patients, orthopedic surgical patients and non-orthopedic surgical patients
7. New article addressing diagnosis of deep vein thrombosis.
8. Inclusion of new antithrombotic therapies
9. Detailed risk factors and recommendations associated with long-distance travel and VTE

Given the widespread use of oral vitamin K antagonist (VKA) therapy with warfarin in both inpatient and outpatient settings, the following table provides a summary of some of the key changes in the "Evidence-based management of anticoagulant therapy".

(continued on Page 6)

References

1. Guyatt GH, Akl EA, Crowther M, et al. Introduction to the ninth edition: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest* 2012;141(2 Suppl):48S–52S.
2. ACCP Antithrombotic Guidelines, 9th Ed, Now available: new developments. Available at: http://www.chestnet.org/accp/guidelines/accp-antithrombotic-guidelines-9th-ed-now-available. Accessed August 20, 2012.
3. Ansell J, Hirsh J, Hylek E et al. Pharmacology and management of the vitamin K antagonists: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition). *Chest* 2008;133(6 Suppl):160S-198S.
4. Holbrook A, Schulman S, Witt DM, et al. Evidence-based management of anticoagulant therapy: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest* 2012;141(2 Suppl):e152S–e84S.

KEY UPDATES FROM THE 9TH EDITION OF THE ANTITHROMBOTIC THERAPY AND PREVENTION OF THROMBOSIS (CHEST) PRACTICE GUIDELINES

(CONTINUED FROM PAGE 5)

ACCP 8th edition (2008)[3]	ACCP 9th edition (2012)[4]
Loading dose of VKA Recommend initiation of oral anticoagulation with warfarin doses of 5 mg or 10 mg daily for the first 1 or 2 days for most individuals, with subsequent dosing based on the international normalized ratio (INR) response (Grade 1B) Avoid loading doses (i.e. > 10 mg) of warfarin	In patients treated as outpatients, suggest initiating VKA therapy with warfarin 10 mg daily for the first 2 days, followed by dosing based on the INR, rather than starting with the estimated maintenance dose (Grade 2C) Loading doses of warfarin may be considered when rapid achievement of therapeutic INR is needed and considered safe; avoids the inconvenience and pain of prolonged administration of subcutaneous low-molecular-weight heparin (LMWH)
Monitoring frequency of VKA therapy For patients receiving a stable dose of oral anticoagulants, suggest monitoring at an interval no longer than every 4 weeks (Grade 2C)	In patients with consistently stable INRs, suggest INR testing frequency of up to 12 weeks rather than every 4 weeks (Grade 2B); stable INR is defined as at least 3 months of consistent results with no need to adjust warfarin dosing
Routine use of vitamin K supplementation Suggest the use of low dose vitamin K supplementation to manage variable INRs (Grade 2B)	Suggest against routine use of vitamin K supplementation to increase time in therapeutic range or improve clinical outcomes (Grade 2C) due to lack of evidence to support such vitamin K supplementation
Use of decision support tools for VKA dosing No GRADE recommendation	Suggest use of validated decision support tools (such as paper nomograms or computerized dosing programs) for maintenance dosing of VKA therapy, rather than no decision support (Grade 2C)
Drug Interactions Addressed drug interactions with warfarin therapy, but did not include a GRADE recommendation regarding significant drug interactions	Suggest avoiding concomitant treatment with nonsteroidal anti-inflammatory drugs (NSAIDs) and certain antibiotics (Grade 2C); avoid antiplatelets, except where benefit is known or highly likely to be greater than harm from bleeding (Grade 2C)
Management of nontherapeutic INRs with vitamin K, FFP, PCC and rVIIa therapy No significant bleeding - With INRs above goal but < 5.0, no vitamin K therapy is indicated; with INR ≥ 5.0 but < 9.0, administer vitamin K if risk of bleeding is high or if more rapid reversal of INR is needed; with INR ≥ 9.0, oral vitamin K can be administered Serious bleeding at any INR elevation – give vitamin K 10 mg by slow IV infusion, supplemented with FFP, PCC or rVIIa depending on the urgency of the situation (Grade 1C) Life threatening bleed – give FFP, PCC or rVIIa supplemented with vitamin K 10 mg by slow IV infusion	Suggest against routine use of vitamin K in patients with INRs between 4.5 and 10 who have no evidence of bleeding (Grade 2B); with INRs > 10 and no evidence of bleeding, suggest oral vitamin K be administered (Grade 2C) With VKA-associated major bleeding, suggest rapid reversal with four-factor prothrombin complex concentrate (PCC) rather than with FFP (Grade 2C) and suggest additional use of vitamin K 5 to 10 mg by slow IV infusion (Grade 2C)

DRUG-INDUCED GLYCEMIC ABNORMALITIES: AGENTS AND MECHANISMS

AUTHOR: CANDACE HOOPER PHARM. D.

Many pharmaceutical agents utilized in patient care have been shown to affect the body's glucose homeostasis.[1-3] Medication-related changes in serum glucose levels can present as either hypo- or hyperglycemic changes. Drug-induced glycemic alterations primarily affect diabetic patients.[1] Clinical signs and symptoms are classified based on severity. Also, clinical manifestations of these glycemic changes may vary between individuals.

Hypoglycemia

According to the American Diabetes Association (ADA) Workgroup, hypoglycemia is defined as episodes of low plasma glucose concentrations producing signs and symptoms that potentially expose individuals to harm.[1] In one study, approximately 20% of hospital admissions attributed to adverse drug events were related to hypoglycemia with a median length of hospital stay of four days.[3] The primary cause of drug-induced hypoglycemia is the use of antidiabetic agents (insulin and sulfonylureas). However, other agents can also have this adverse effect and are discussed below. Drug-induced hypoglycemia is caused by either stimulating insulin secretion, reducing insulin clearance, or interfering with glucose metabolism.[3] Some common symptoms associated with hypoglycemia include sweating, palpitations, hunger, confusion, tingling, headache, and cognitive impairment.[3, 4]

The following two tables highlight pharmacological agents that can precipitate glycemic changes in patients (both diabetic and non-diabetic) utilizing these drugs. Also, the tables identify patient populations in which these adverse effects have been reported, along with the underlying pathophysiological mechanisms involved. Table 1 describes non-antidiabetic agents associated with drug-induced hypoglycemia.

Hyperglycemia

Hyperglycemia is defined as a serum glucose concentration >180 mg/dL that persists for more than 2 hours.[5] Continued elevations in blood glucose concentrations can have dire consequences on patient outcomes including impaired immunological response, poor wound healing, and the development of macrovascular complications.[6, 7] Three common symptoms associated with hyperglycemia include polydipsia, polyuria, and polyphagia. Table 2 describes medications associated with drug-induced hyperglycemia.

Conclusion

Serum glucose concentrations can be affected by many drugs. Identifying the interfering agents is vital in the management of glycemic control. Close monitoring of patients utilizing these agents is warranted. Patients should be educated about the potential for certain medications to cause either hypoglycemia or hyperglycemia and ways to manage the symptoms. Clinicians should be cognizant of these potential adverse effects in diabetic patients and those in high-risk populations.

References:

1. Workgroup on Hypoglycemia, American Diabetes Association. Defining and reporting hypoglycemia in diabetes: a report from the American Diabetes Association Workgroup on Hypoglycemia. Diabetes Care 2005; 28:1245-9.
2. Kilbridge PM, Campbell UC, Cozart HB, et al. Automated surveillance for adverse drug events at a community hospital and an academic medical center. J Am Med Inform Assoc 2006; 13: 372-7.
3. Ben Salem C, Fathallah N, Hmouda H, et al. Drug-induced hypoglycaemia. Drug Saf 2011; 34: 21-45.
4. Vue MH, Setter SM. Drug-induced glucose alterations part 1: drug-induced hypoglycemia. Diabetes Spectrum 2011; 24:171-7.
5. Rehman A, Setter SM, Vue MH. Drug-induced glucose alterations part 2: drug-induced hyperglycemia. Diabetes Spectrum 2011; 24: 234-8.
6. Luna B, Feinglos MN. Drug-induced hyperglycemia. JAMA 2001; 286: 1945-8.
7. Nathan DM, Buse JB, Davidson MB, et al. Management of hyperglycemia in type 2 diabetes: a consensus algorithm for the initiation and adjustment of therapy: a consensus statement from the American Diabetes Association and the European Association for the Study of Diabetes. Diabetes Care 2006; 29: 1963-72.
8. Garg A, Grundy SM. Management of dyslipidemia in NIDDM. Diabetes Care 1990; 13:153-69.

DRUG-INDUCED GLYCEMIC ABNORMALITIES: AGENTS AND MECHANISMS

(CONTINUED FROM PAGE 7)

Table 1: Non-Diabetes Agents Associated with Hypoglycemia[3, 4]

Agent	Population/Setting	Mechanisms
Salicylates (aspirin, aminosalicyclic acid, magnesium salicylate)	Diabetic patients* or patients taking high dose salicylates	Displace sulfonylureas from binding site, ↑ insulin secretion in type 2 diabetics, and ↑ insulin sensitivity
	Children (≤ 2 years old): aspirin overdose	Influence glucose metabolism by ↓ hepatic gluconeogenesis and ↑ insulin secretion
Fluoroquinolones	Diabetic patients* or chronic renal failure	High affinity for ATP- sensitive potassium channels in pancreatic β cells, leading to insulin secretion
Antimalarials (quinine, mefloquine, hydroxychloroquine)	Dose-dependent effect; mainly occurs in pregnant women administered quinine Other affected populations: renal failure, children, and malnourished	Stimulate insulin release from pancreas through activation of voltage-sensitive calcium channels
β-Blockers	Diabetic patients; non-diabetic patients with renal disease, poor nutrition, or liver disease	Enhanced insulin action à↑ peripheral glucose uptake by muscles, inhibition of glucose production, and inhibition of lipolysis
Antiarrhythmics (disopyramide, quinidine)	Disopyramide: older age, impaired renal function, hepatic disease Quinidine: children, pregnant women, and renal failure	Disopyramide: inhibits β-cell ATP-sensitive potassium channels and stimulates insulin secretion Quinidine: ↑ plasma insulin concentrations
ACE Inhibitors	Diabetic patients*	Improve blood flow and microcirculation in skeletal muscle and improve insulin sensitivity
Fibrates	Diabetic patients*	Displace sulfonylureas from protein binding sites
Antidepressants (SSRI, SNRI, TCA)	Diabetic and non-diabetic patients	↑ insulin sensitivity
Pentamidine	Longer treatment duration, high dosage, impaired renal function, AIDS	Induces early cytolytic release of insulin
Ethanol	Diabetic patients* and intoxicated patients	Impairs gluconeogenesis and increases insulin secretion

DRUG-INDUCED GLYCEMIC ABNORMALITIES: AGENTS AND MECHANISMS

(CONTINUED FROM PAGE 8)

*Diabetic patients with concomitant use of hypoglycemic agents (insulin secretagogues and/or insulin)

Abbreviations: SSRI = selective serotonin reuptake inhibitors; SNRI = serotonin-norepinephrine reuptake inhibitors; TCA = tricyclic antidepressants; AIDS = Acquired Immunodeficiency Syndrome

Table 2: Pharmacological Agents Associated with Hyperglycemia[5-8]

Thiazide and Thiazide-like Diuretics	Patients treated with agents	↓ total body potassium and ↓ insulin secretion
β-Blockers	Patients treated with agents	Impair release of insulin from pancreatic β-cells
Protease Inhibitors	Patients treated with agents	↑ insulin resistance
Atypical Antipsychotics (clozapine, olanzapine, paliperidone, quetiapine, risperdone)	Patients treated with agents	Insulin resistance; direct β-cell inhibition via 5-hydroxytryptamine (HT_{1A}) receptor à ↓ insulin secretion
Glucocorticoids	Short term and long term use	↓ glucose transport in fat and muscle
Nicotinic Acid	Patients treated with agent	↑ insulin resistance
Calcineurin Inhibitors (cyclosporine, sirolimus, tacrolimus)	Older age, non-white ethnicity, glucocorticoid therapy	Inhibit pancreatic islet β-cell expansion promoted by calcineurin

to all of our AMED PRN contributors this year:

- Christy Burrows-Grandstaff
- Nicole Cieri
- Kimberly Hammons
- Rolee Pathak Das
- Beth Resman-Targhoff (and Candace Hooper)
- Shaila Sheth
- Angela Shogbon
- Nancy Yunker