

# Academic Physician *Quarterly*

A DEPARTMENT OF MEDICINE BULLETIN



**UF** UNIVERSITY of  
**FLORIDA**  
College of Medicine  
Jacksonville

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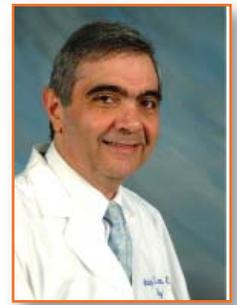
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## CHAIRMAN'S MESSAGE

Dear colleagues:

I hope you had happy holidays with your family and friends.

It is not often that we encounter "100%" in our life. Therefore, it was especially gratifying for me to see our residents achieve this percentage in their National exams. I am pleased to report that the entire 2010 graduating class of residents has passed the Internal Medicine Board Exams. The 100% pass rate is a testament to their hard work as well as a testament to the quality of the faculty who supervise and teach them.



In this issue, we have a Focus topic by Dr. Nauman Chaudary of the Division of Pulmonary, Critical Care and Sleep Medicine who discusses the need for hemodynamic monitoring in the critically ill patient and reviews the various techniques currently available for assessing hemodynamic function. Since this submission Dr. Chaudary has relocated to join his family in Mississippi.

Our main challenges in the next year are to enhance our patient satisfaction scores and achieve meaningful use of electronic medical records. I am confident we will easily achieve these goals given the dedication and commitment of our faculty and trainees.

Let's welcome the New Year with a new sense of optimism and high expectations.

Cheers to the New Year.

Arshag D. Mooradian, M.D.  
Professor of Medicine  
Chairman, Department of Medicine



**Nauman Chaudary, M.D.**

**Assistant Professor of Medicine**

**Division of Pulmonary, Critical Care & Sleep Medicine**

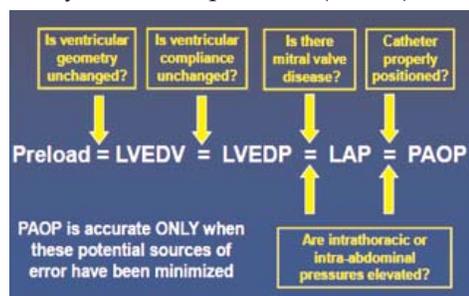
## Hemodynamic Monitoring: What's New?

In critically ill patients preload, contractility, after-load, and oxygen transport are commonly abnormal. Inadequate resuscitation and failure to restore cellular oxygen delivery and organ perfusion result in multiple system organ failure (MSOF) and death. Optimization of cardiopulmonary function during critical illness reduces organ failure and improves survival. Accurate assessment of hemodynamic function and goal-directed resuscitation is essential to improving patient outcome.

### Current Monitoring Technologies

**Pulmonary artery catheter (PAC)** was originally described by Swan & Ganz in 1972. This was considered as the “gold standard” for the next two decades. It allowed assessment of preload with measurements of pulmonary artery occlusion pressure (PAOP), central venous pressure (CVP).

Contractility was measured by Cardiac output (CO) and after-load was calculated as systemic vascular resistance (SVR). In intermittent thermodilution, CO is measured by the “thermodilution curve” following the injection of iced saline. Accuracy is dependent upon multiple factors including respiratory cycles, injection technique, regular heart rate, proper catheter positioning, transducer calibration, accurate waveform interpretation i.e. knowledgeable physician and nurse. The limitations of the PAC include that it requires an invasive right heart catheter. There are risks of pneumothorax, hemothorax, arrhythmia and infection. PAC use is also based upon several assumptions i.e. intermittent measurements reflect a



patient’s continuously changing hemodynamic state, PAOP & CVP accurately reflect end-diastolic volume and Ventricular compliance is unchanging.

**Continuous thermodilution** utilizes pulsed thermal energy technology and provides an updated hemodynamic assessment every 60 seconds. This reduces measurement variability, automates CO measurement, averages respiratory cycle variation, standardizes injection technique and provides a constantly updated assessment of patient response to resuscitation leading to more efficient, goal-directed resuscitation.

Continuous thermodilution accuracy may be decreased by irregular heart rate and/or rhythm, mitral valve disease, incorrect catheter placement, hyperthermia (> 41° Celsius). It is the most invasive and labor-intensive of the monitoring technologies demanding a thorough understanding of PAC monitoring principles. It provides a continuous assessment of preload (RVEDV, PAOP, CVP), contractility (CO), afterload (SVR, RVEF), oxygen transport balance (SvO<sub>2</sub>). It improves patient resuscitation and outcome and is appropriate for the most critically ill patients.

**Central venous oxygen saturation (ScVO<sub>2</sub>)** monitoring allows continuous assessment of oxygen transport balance without a PAC. Limitations of central venous oxygen saturation include requirement of an invasive indwelling catheter and ScVO<sub>2</sub> does not provide an accurate estimate of preload or a measurement of contractility. However, it allows earlier assessment and resuscitation.

**Arterial pulse contour** analysis estimates stroke volume from the arterial pressure waveform and was first described almost 100 years ago. CO is proportional to the area under the arterial pressure waveform. This was proposed as a less invasive alternative to the PAC. It requires only an arterial pressure catheter and a central venous catheter (CVC). Three different technologies are currently available: 1) Iced saline indicator calibration 2) Lithium indicator dilution calibration 3) Computer algorithm

Several different methods exist for applying ultrasound to hemodynamic monitoring 2-D echocardiography, Esophageal Doppler and Transcutaneous ultrasound.

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**2-D Echocardiography** provides information of cardiac structure and mechanical function. It is useful for assessing valvular anatomy and function as well as for aortic injury. It can identify the presence of pericardial fluid. It is also useful for assessing preload and contractility. Limitations of 2-D Echocardiography is that it is not a continuous monitoring technology. It provides information not available with other techniques.

**Esophageal Doppler** was first described as a method for measuring CO in 1971 based upon measurement of blood flow velocity in the descending aorta. It requires either measurement or estimation of cross-sectional aortic diameter. It provides “continuous” assessment of SV and CO, Corrected flow time (FTc) which is a preload estimate superior to PAOP and CVP in predicting preload recruitable increases in CO, peak flow velocity which is an estimate of ventricular contractility and total SVR which is estimated SVR based on aortic blood flow. Esophageal Doppler is generally feasible only for short-term, intermittent monitoring.

**Transcutaneous Ultrasound** utilizes continuous wave Doppler ultrasound coupled with specialized algorithms and signal processing to non-invasively assess hemodynamic function. A portable monitor allows measurements

in a variety of clinical settings. Transcutaneous Ultrasound provides “continuous” assessment of SV, CO, SVV, Corrected flow time (FTc), Peak flow velocity and SVR. It is feasible for short-term, intermittent monitoring limitations of ultrasound involve proper positioning of the transducer is essential, learning curve, operator technique and experience directly impact upon measurement accuracy. Transcutaneous ultrasound is a noninvasive alternative to a PAC. It provides continuous assessment of, preload (SV, SVV, FTc), contractility (CO, peak flow velocity) and afterload (SVR) (requires CVC). A viable option for intermittent hemodynamic assessment or screening patients for hemodynamic abnormalities.

### **Conclusions**

The currently available monitoring technologies vary in the cost and diversity of information provided. The more invasive techniques generally provide the most accurate and comprehensive data. Physicians must thoroughly understand the hemodynamic data obtained and utilize it in a goal directed fashion if the monitoring technology is to improve patient outcome.

## GME CORNER



**Carlos Palacio, M.D., M.P.H.**

**Assistant Professor of Medicine,  
Division of General Internal  
Medicine**

**Associate Program Director,  
Internal Medicine Residency**

### **Recruitment, Epic Wars, and the Board Pass Rate**

Recruitment season is at full pace now. Thus far, we have had 3,826 applicants to the residency program of which 206 have received invitations; 85 categorical applicants and 24 preliminary applicants have been interviewed. The GME office and faculty have been busy arranging for and interviewing 8 applicants every Monday, Tuesday and

Thursday. Interviewees have come from a variety of different backgrounds including domestic allopathic and osteopathic programs as well as programs from the Caribbean, Cuba, Pakistan, Saudi Arabia, Jordan, Sudan, Syria, Libya, India, France, Poland, and Ireland. Regardless of where they are from, their qualifications are uniformly excellent. These applicants have expressed their positive impressions of the residency program on a consistent basis. They particularly comment about the overall good morale and professionalism of the residents they have met on evening dinners before their interview days.

The residents and chief residents have been instrumental in conveying first-hand knowledge of board review, autopsy conferences, didactics, student education, opportunities available for research and competitive fellowships, as well as the day-to-day workflow of the different serv-

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ices. Morning report's format has received very positive feedback (both in content and range of cases) as has the mega-team concept implemented during the first two months of the year. Many applicants have questions about the simulation center and are impressed to learn that mock codes, training in procedures, as well as training in giving bad news (using actors) are conducted there on a regular basis. Their inquiries have further touched on the EMR systems (particularly EPIC on the inpatient services) and Epic Wars which will create simulations of the new inpatient EMR. Two teams of residents from Medicine (Drs. Landa, Christman, Wilson, Ramlal, Hegde, Karmand, Tai, and Salahuddin) will become the first high-level expert

users. The applicants are leaving with an overall impression of a proactive, collegial residency program which has a wide range of patient pathology to learn from and which will prepare them for the next phase of their professional careers. This impression is solidified further by our latest year's 100% board pass rate, bringing the program's 3-year rolling pass rate to over 90%.

The contributions of the interns, residents, faculty and staff involved in this program should make this year's match a success that will build on the success of the last.

## A CLINICAL CASE

**Naeem Latif, MD, Laila Samian, MD, Fauzia Rana, MD**  
Department of Medical Oncology, and Breast Surgery,  
University of Florida College of Medicine, Jacksonville, FL.

### **Breast Cancer and HIV in the era of highly active antiretroviral therapy**

Breast cancer is the most common diagnosed malignancy and second leading cause of cancer related death among women today in United States. The incidence of HIV infection in women is rising and it results in suppression of immune system which increases the risk of malignancy. The number of women living with AIDS is also increasing due to HAART therapy. Therefore more women will be diagnosed with breast cancer in this cohort of patient population.

The acquired immunodeficiency (AIDS) defining neoplasms are Kaposi's sarcoma, non-Hodgkin lymphoma, and cervical cancer. There are malignancies, which are more prevalent in AIDS patients than general population, called non-AIDS defining cancers (NADCs) such as Hodgkin's lymphoma, squamous cell carcinoma of anus, liver cancer, head & neck and lung cancer. The data about breast cancer incidence and prognosis in HIV patients is limited and conflicting. We will present two cases of breast cancer in HIV infected patients and review literature.

#### **CASE ONE**

A 50 year old female presented to UF breast clinic with four years history of left breast mass and patient did not

seek medical attention due to lack of health insurance. She had no family history of breast or ovarian cancer and she was perimenopausal. Her past medical history was significant for HIV diagnosed 15 months ago, and she was not on HAART therapy due to normal CD 4 cell count and low viral load.

Physical examination revealed a large 9 x 9 cm left breast firm mobile mass and palpable bilateral axillary lymphadenopathy, the right breast and rest of physical examination was normal. Mammography showed multiple pleomorphic micro calcifications in the left upper outer breast in the region of palpable mass BIRADS 4. The PET/CT scan showed 4.2 x 2.5 x 2.2 cm soft tissue metabolically active neoplasm in the left breast and bilateral axillary lymphadenopathy without any other metastatic disease

#### **CASE TWO**

A 55 years old presented with palpable left breast lump, core needle biopsy of the mass showed poorly differentiated invasive ductal carcinoma. The tumor was estrogen/progesterone receptor positive, Her2 neu positive 3+ by IHC and one lymph node positive for metastasis with extra capsular extension. Patient was treated with lumpectomy and axillary lymph node dissection. She was started on adjuvant chemotherapy consisting of Adriamycin and Cytosin, but with each chemotherapy cycle she became febrile neutropenic and requires hospitalization. After two cycles of chemotherapy she declined to

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continue further treatment due to poor tolerance and was started on Aromatase inhibitor. Six months later she presented with headache and confusion, MRI of the brain showed 15 mm contrast enhancing right parietal lobe mass. The excision biopsy of mass showed Toxoplasmosis with necrosis and micro calcification. Further workup revealed patient was HIV positive with high viral load and low CD4 count. Patient was started on HAART therapy for HIV infection and continued with hormonal therapy for breast cancer. Few months later patient developed malignant pericardial and pleural effusion secondary to metastatic breast cancer. She was treated with Taxotere, Carboplatin, and Herceptin with pegylated GCSF support. Patient had an excellent response to chemotherapy with complete resolution of pericardial and pleural effusion and there was no febrile neutropenia this time.

#### DISCUSSION

The breast cancer incidence in HIV patients is available through retrospective registry studies, and the limitations of these studies are inaccurate and incomplete reporting as well as under recognition of asymptomatic HIV infection in cancer patients. Reports from Africa and Western countries suggested that immune suppression was protective against the development of breast cancer. A statistically significant decrease in the incidence of breast cancer during the AIDS epidemic from Tanzania and Italy has

been reported. A possible explanation for this decrease is the high mortality rate in women with HIV infection in developing African countries. However there is also a hypothesis that the lack of immune response to breast cancer is protective.

In conclusion, there is no evidence that breast cancer incidence is higher among HIV-infected women than general population. However it appears that the natural history of breast cancer in the setting of HIV infection is worse than general population. This may be related to a biologically more aggressive breast cancer compounded by the inability to deliver full doses of systemic anti-cancer therapies in this patient population. Therefore physicians treating women with breast cancer and HIV infection must be aware of these potential complications of therapy. Treatment plans should include close monitoring of the CD4 count, viral load, chemotherapy-related toxicity, and prophylactic use of growth factor support.

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## RX UPDATES

By Jackie Sharpe, Pharm.D

### *Clostridium difficile: A Review of the Guidelines*

Reprinted with some editing from Drug Update, September 2010 with permission.

The Society for Healthcare Epidemiology of America (SHEA) and the Infectious Disease Society of America (IDSA) published practice guidelines for the management of Clostridium difficile infection (CDI) in adult patients in March 2010.

CDI is defined in the guidelines as the presence of symptoms (i.e., diarrhea) with either a positive C. difficile toxin test or colonoscopic evidence demonstrating pseudomembranous colitis. C. difficile is an anaerobic rod-shaped bacterium that forms hardy spores when exposed to

inhospitable environments thus enhancing its ability to be transmitted. The most frequent mode of transmission of C. difficile is person-to-person spread by the fecal-oral route. The spread of C. difficile is most prevalent in acute care facilities and long term care facilities.

The main risk factor for the development of CDI is prior antibiotic use and C. difficile comprises 15% to 25% of nosocomial antibiotic-associated diarrhea. Common symptoms of CDI include fever, cramping, abdominal pain, and leukocytosis. The presentation of C. difficile ranges from asymptomatic carriage to fatal pseudomembranous colitis. Less than 1% of CDI patients present with ileus and minimal diarrhea.

The new IDSA/SHEA guidelines make specific recommendations regarding testing of CDI. Presence of C. diffi-

Continued on Page 6

cile or its toxins should only be tested on unformed stool, unless ileus is suspected. There is no clinical utility defined in the guidelines for testing of CDI in asymptomatic patients or to test for a cure, and, therefore, neither is recommended. Repeat testing on the same episode of diarrhea is also discouraged.

Infection control is a large component in the prevention of CDI transmission within hospitals. Infection control recommendations include gloves and gown if entering the room of an infected patient, compliance with hand hygiene, and isolation rooms (or at least cohorting infected patients). The spore form of *C. difficile* is resistant to alcohol, therefore proper hand washing is essential to decreasing transmission.

Another component in the prevention of CDI is the judicious use of antibiotics. CDI is largely associated with previous antibiotic use. The guidelines recommend the discontinuation of the offending antibiotic once *C. difficile* is identified. The recommendations also state that the frequency and duration of antibiotics should be appropriately minimized to help reduce the CDI risk. The implementation of antimicrobial stewardship to help guide antibiotic use in the hospital setting is also recommended.

Treatment of an initial occurrence of CDI is dependent upon the severity of infection and is outlined in the Table.

SEVERITY	INITIAL REGIMEN
Mild to moderate CDI	Metronidazole 500 mg PO q8h x 10 to 14 days
Severe CDI	Vancomycin 125 mg PO q6h x 10 to 14 days
Severe, complicated CDI	Vancomycin 500 mg PO q6h (per rectum if ileus*) + Metronidazole 500 mg IV q8h

The offending antibiotic should be discontinued and medications that decrease peristalsis (i.e., loperamide, opiates) avoided. If the stool toxin test is negative the decision to continue or discontinue antibiotic therapy should be based on the clinical situation of each patient. Infections classified as severe include patients that are elderly (age not defined in the guidelines), higher peak white blood cells (>

15,000 cells/mm<sup>3</sup>), and rising serum creatinine levels (>1.5 times the premorbid level). Oral vancomycin may lead to shorter time to resolution of diarrhea compared to oral metronidazole in patients with severe CDI. Severe, complicated CDI includes patients with hypotension or shock, ileus, and/or toxic megacolon.

The first recurrence of CDI is typically treated with the same regimen as the initial occurrence of CDI. Treatment recommendations for the second or later recurrences of CDI include vancomycin with a tapered and/or pulse regimen. Approximately 6% to 25% of patients with CDI will experience at least one recurrence. An example of a vancomycin tapered regimen is as follows: vancomycin 125 mg q6h for 10 to 14 days → vancomycin 125 mg q12h for 7 days → vancomycin 125 mg daily for 7 days → vancomycin 125 mg every 48 to 72 hours for 2 to 8 weeks. The rationale behind the tapered regimen is to ensure eradication of the *C. difficile* spores without disrupting the normal GI flora.

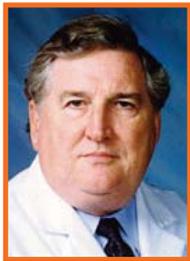
Probiotic use in CDI has been a common discussion topic. The utility of probiotics and their role in CDI is still to be determined. The guidelines conclude that available probiotics have limited data to support their use. The guidelines do not recommend the use of probiotics to prevent primary CDI at this time, and mention the possible risk of bloodstream infection (especially in immunocompromised patients who may receive these products).

In summary, infections with *C. difficile* are on the rise and prevention is key to controlling the spread. Stringent infection control measures and the judicious use of antibiotics can limit the number of patients who contract *C. difficile*. Patients presenting with CDI should be treated based on patient-specific factors and the severity of disease.

**REFERENCES**

SHEA-IDSA Guidelines. Clinical Practice Guidelines for Clostridium difficile Infection in Adults: 2010 Update by the Society for Healthcare Epidemiology of America (SHEA) and the Infection Diseases Society of America (IDSA). Infection Control and Hospital Epidemiology May 2010;31(5): 431-455.

### Dr. Malcolm Foster is elected as Master of the American College of Physicians



Dr. Malcolm Foster has been elected as Master of the American College of Physicians.

Dr. Foster has served the College for many years in various capacities and most recently was Governor of the Florida Chapter. This honor is in recognition of his years of stellar leadership in medicine. Dr. Foster has received numerous honors over his career such as Outstanding Clinical Teacher and the Laureate Award from the ACP-ASIM (Florida Chapter). He is currently the President of Duval County Medical society.

Congratulations to Dr. Foster for this honor.

### Musculoskeletal Ultrasound Intermediate Course & Interventional Cadaver Workshop

An intensive three-day course that features intensive hands on scanning and cadaveric injection workshops for Rheumatologists interested in expanding their basic musculoskeletal ultrasound skills

When: March 11-13, 2011

Where: Hyatt Regency Jacksonville Riverfront & UF Center for Simulation Education & Safety Research at Shands Jacksonville Medical Center

### Internal Medicine Residents' Board Exam Results: 100% Passed

An outstanding achievement! The entire 2010 graduating class of residents has passed the Internal Medicine Board Exam. This 100% pass rate is a testament to their hard work as well as the teaching and direction the faculty have given them.

Congratulations on this wonderful achievement.

### UF Endocrinology, Diabetes, & Metabolism at Emerson is now offering Medical Nutrition Therapy



The service is provided by Registered Dietitian and Certified Diabetes Educator, Meridith A. Smith. Most commercial insurances and all medicare patients with diabetes and non dialysis kidney disease are eligible every year for Medical Nutrition Therapy. Medical Nutrition Therapy is a separate benefit from Diabetes Self-Management classes.

Medical Nutrition Therapy is an essential and integral component of the medical management of diabetes and CKD. If you have questions about the program or how to make a referral, please contact Meridith Smith at 244-5295.

## UF & SHANDS BRAND

### UF and Shands Jacksonville Receive Designation as Patient Centered Medical Homes

The University of Florida and Shands Jacksonville have received designation as Patient Centered Medical Home (PCMH) providers, a program that recognizes practices that use systematic processes and information technology to enhance the quality of patient care. The National Committee for Quality Assurance (NCQA) Physician Practice Connections®, identifies physicians who deliver superior care using standards firmly rooted in medical evidence.

Combined, UF and Shands Jacksonville are the only or-

ganizations in Northeast Florida to receive this designation. Those clinics certified as PCMH include Brentwood Primary Care Center, UF College Park Family Practice Center, UF Commonwealth Family Medicine and Pediatric Center, Eastside Family Practice Center, UF Murray Hill Family Practice Center, and UF Soutel Family Practice and Pediatric Center.

The Patient Centered Medical Home provider program recognizes physician practices that strengthen the physician-patient relationship by replacing episodic care with long-term coordinated care, in which each patient has an ongoing relationship with a personal physician who leads a team that takes collective responsibility for patient care.

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The personal physician oversees all of the patient’s health-care needs throughout all stages of life including acute care, chronic care, preventive services and end-of-life care.

The process is facilitated by registries, information technology, health information exchange and other means to assure



Dr. Robert C. Nuss and Dr. Kenyatta Lee, Assistant Medical Director of UF Soutel Family Practice and Pediatric Center

that patients get the appropriate care when and where they need and want it. Nearly 10,000 physicians nationwide have been recognized as Patient Centered Medical Home providers.

“This program holds significant promise for better quality healthcare by encouraging physicians and patients to take a more interactive, collabora-

tive role in their care,” said Eric Stewart, MD, Assistant Professor, Department of Community Health and Family Medicine, University of Florida College of Medicine-Jacksonville.

“Care is further enhanced through open scheduling, expanded office hours and improved communication between patients, physicians and staff.”

Having a regular source of care and continuous care with the same physician over time has been associated with better health outcomes and lower total costs. There is also substantial evidence that increased use of primary care physicians resulted in reduced hospitalizations and reduced spending for other non-primary-care specialist services with improvements in morbidity and mortality rates. (Source: Case for Change to the PCMH Model, American Dietetic Association)

“This focus on the whole patient is really the key to improved long-term healthcare,” said Jim Burkhart, CEO of Shands Jacksonville. “Encouraging patients to build an ongoing relationship with their physician and taking a more interactive, accountable team approach to patient care will go a long way to helping our residents improve their health.”

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