

Safety event reports

(a.k.a. incident reports)

Since the STARS incident reporting system (internal.bmc.org/stars/) went live on September 15, 2005 the number of incident reports has increased by 78%. This is not because we have had more incidents over the last few months. It is because we are doing a much better job of reporting. I applaud the BMC staff for the diligence and enthusiasm with which you have increased or begun to report incidents and I encourage everyone to participate in this process. You can reach the STARS online system from the BMC internal web page, under @ Work, Incident and Medication Safety.

A number of people have asked "what happens now?" The medical leadership will respond in a way that is consistent with the following concepts: transparency, culture of safety, and a just culture. Transparency means that we all actively work to make visible actual errors, near misses and circumstances with the potential for error. We are working toward transparency by reporting incidents on line, adding in information and responses from those involved, and giving access to front line management so that they can report back to staff. Since we have just closed the first quarter of use of the new system, you will soon be seeing summary information about incidents in forums such as Leadership for Change and Medical Dental Staff meetings. Please share and discuss this information with your peers and others.

A culture of safety refers to the relentless focus on fixing unsafe operating conditions and fixing them in a way that assures that the fixes stick. Band-aids or working around a system that is clearly broken is not a fix, and often leads to repeated errors. My commitment to you is to work diligently to decrease errors that are due to system failures.

"The single greatest impediment to error prevention in the medical industry is that we punish people for making mistakes." -- Dr. Lucian Leape

One particular question people have is how we can use this data to identify persons responsible for errors and hold them accountable. I strongly believe that individuals are not accountable for system failures.

Continued →

We will look for trends or patterns of occurrences that will show us where we have system failures, and talk with staff involved to find out why something went wrong. We will look to make improvements in processes that will prevent the same errors from happening again. I do believe that if we 'do the same things, in the same way, we will get the same outcomes.' This is a main characteristic of a just culture: individuals are not responsible for system failures, while they do have clear-cut accountability for actions under their control (their personal actions). The vast majority of errors are related to system failures; the problem is seldom the fault of an individual.

Thank you for 'reporting for learning.'

S Haas

THE INPATIENT TIMES

* * *CONTRIBUTORS* * *

Sheilah Bernard, Cardiology
Susan Doherty, Nursing
Linda Guy, Nursing
Susan Haas, Chief Medical Officer
Richard Kalish, Med Director, HealthNet
David Kornetsky, Geriatrics
Brian Lucey, Radiology
Chris Manasseh, Family Medicine
Patti McCabe, Nursing
Thomas Moore, Medicine
Jackie O'Shea, Nursing
Chris Shanahan, ITS
Cil Weekes, Nursing
Dana Whitney, Pharmacy

Jeff Greenwald, Editor

THE INPATIENT TIMES

ALL THE NEWS THAT MAKES YOU MORE FIT TO TREAT

VOL 13; JAN 2006

A PUBLICATION OF THE DEPARTMENT OF MEDICINE AND THE
HOSPITAL MEDICINE UNIT

BMC creates a Rapid Response Team

Sheilah Bernard, MD and Patti McCabe, RN announce the pilot phase of a Rapid Response team to start at BMC in late February. The team is composed of a critical care level nurse and a respiratory therapist who are deployed to an unstable patient before there is a full cardiopulmonary arrest.

The Rapid Response Team, one of six healthcare initiatives proposed by the Institute for Healthcare Improvement to 100K Lives Campaign (www.ihl.org) will be piloted on both campuses. The other initiatives (applying evidence-based care to myocardial infarction management, reducing adverse drug errors through the medication reconciliation process, reducing infections of central lines and surgical sites, and reducing incidence of ventilator-acquired pneumonias) are also being implemented on campus.

The concept is "to prevent a spark from turning into a fire". Only 7-8% of current cardiopulmonary arrests on BMC campus occur outside of the ICU's, in contrast to the 48% of arrests reported nationally in community hospitals. We know that 70% of all patients have significant changes in HR, BP or RR prior to code situations. Our goal is to bring critical care expertise to the patient who has these early warnings, to prevent the code situation.

An RN or MD deploys the Rapid Response Team to obtain an extra level of assistance in attending to an unstable patient. Our goals are to improve planning (assessment, treatment, and goals), communication (patient to RN/MD, RN to MD, MD to MD), and recognition of a deteriorating patient*. The parameters to activate the system include HR, BP, RR, active bleeding or mental status changes that are progressive and symptomatic. The RRT tool will be used to document the Situation, Background, Assessment and Response (called SBAR) by the RT, RN responder, staff RN and MD/PA.

Implementation of this team is expected to halve the number of arrests occurring outside of the ICU, reduce the number of arrests prior to transfer to the ICU, and reduce the number of post-surgical transfers back to the ICU. The RRT is not intended to replace the call to the house officer for change in condition, but rather to help patients in time of clinical instability. It is an opportunity to educate all staff in the management of the acutely ill patient by experienced caregivers, and to help anticipate change in level of care. The ability to provide 1:1 care will also aid other floor staff members

The RRT will be deployed as an order in SCM, which will activate RT and RN beepers automatically. Responders are expected to arrive within 10 minutes, by which time effective communications on the patient's situation and background can be prepared.

The pilot will be trialed on Newton 6W, SICU, Menino 5Wtele, 5WICU, 6W, and MICU. After review of the pilot, we expect to feedback information on patient outcome, look for lessons learned hospital-wide, share success stories, and use our data to drive further educational programs. Hospital-wide rollout is planned April 2006. Contact Dr. Bernard or Patti McCabe for details.

*P McCabe
S Bernard*

The Red Socks

Fall Prevention program at BMC

The Nursing Division has embarked on a new patient safety campaign related to falls prevention. After learning that other hospitals had tried a RED SOCKS Program with success, a pilot of the program was started at BMC.

What is the RED SOCKS Program?

Nurses assess all patients for their risk for falling using a Fall Assessment Tool. Patients who score high based on several indicators are placed on Falls Precautions and RNs, working together, try interventions to prevent patients from falling (move patient closer to desk, lower beds, alarm beds, frequent checks, etc).

One hospital came up with the idea that a visual aide would also help identify which patients are at risk and since all patients wear slip resistant socks while an inpatient, the idea was that if we put a different color sock on Fall Precaution patients, this would be a simple way to see (without looking at the chart or a wrist band) that this patient has been identified as a fall risk. The purpose of this program is to raise awareness to all staff as to which patients are on falls precautions and may need assistance. Hence, the idea for RED SOCKS, a bright color sock that is eye catching. ...And after all, this is Boston!

The RED SOCKS program began on 12/1/05 with three units participating as pilot units (6 west, 6 east and 4 west Menino). Prior to the 12/1/05 start date, signs were posted on the three pilots units stating "The RED SOCKS are Coming", to create awareness of the program. Word spread quickly. We then developed an easy to read one page educational sheet that was sent via payroll to unit in the institution.

In order to inform non-clinical services as well, Dave Maffeo and Bill Gauthier set up specific times for the housekeeping and food services staff to attend inservices on the program. In addition, staff from other disciplines showed up for our hourly inservices that were held prior to the kick-off. Word of mouth about the program has also been an effective means of communication.

Continued →

A kick off luncheon attended by Elaine Ullian CEO, Kathleen Davidson Vice President of Nursing, and Linda Guy, Director of Nursing was held on the 6th Floor Menino and the attendees included the staff of the three pilot units, managers, and BMC employees from various disciplines including physicians, care management, dietary, transport, housekeeping, and respiratory.

Now that the program is in full swing on the three pilot units, staff are wearing Red Falls Prevention buttons and are participating in the program by putting patients at risk on fall precautions and the patients then are wearing RED SOCKS (slip resistant socks) to identify them to staff. Physicians are commenting on how great this program is and are asking when it will be rolled out house wide.

A recent interaction between a housekeeper who does not normally work on the 6th floor and a patient who was wearing RED SOCKS and needed assistance back to bed was an "ah ha!" moment because she understood what the RED SOCKS meant and that she could help this patient in their time of need and she did.

The plan is to roll the program house wide. Opening Day will be on Valentines Day (everyone should wear red). Prior to opening day, our RED SOCKS Ambassadors will be distributing buttons and stocking all units with RED SOCKS and doing brief training so that everyone knows how to participate.

As you can see, it is as easy as A, B, C.

A = AWARENESS

(watch out for those red socks players)

B = BE THERE FOR OUR PATIENTS

(never leave a red sock player alone)

C = CALL FOR HELP

(show our red socks players we care)

LET'S HIT A GRAND SLAM FOR OUR PATIENTS!!!

L Guy
S Doherty
C Weekes
J O'Shea

Understanding the Boston HealthNet

In late 1994, eight community health centers, Boston University Medical Center Hospital and Boston City Hospital began discussions concerning the development of a community health care network in Boston. Today, the network has grown to include fifteen Boston HealthNet (BHN) community health centers (CHCs), Boston Medical Center, and the Boston University School of Medicine.

The network's primary partner health centers are: Codman Square Health Center, Dorchester House Multi-Service Center, East Boston Neighborhood Health Center, Greater Roslindale Medical and Dental Center, Harvard Street Community Health Center, Health Care for the Homeless/McInnis Health Group, Mattapan Community Health Center, South Boston Community Health Center, Upham's Corner Health Center, and Whittier Street Health Center.

Harbor Health Services, Inc. (which includes Geiger-Gibson Community Health Center and Neponset Health Center, both in Dorchester), Manet Community Health Center in Quincy, Roxbury Comprehensive Community Health Center, and the South End Community Health Center are secondary partners which means they have a primary relationship with another hospital, but strong linkages with BMC. Manet's five sites extend Boston HealthNet's reach as far south as Hull, Massachusetts.

Boston HealthNet's 10 primary partner community health centers, those health centers that refer patients primarily to Boston Medical Center are responsible for approximately 800,000 patient visits annually. Seventy-one percent of their patients are racial and ethnic minorities and 31% speak a language other than English as their primary language. To meet the needs of such a diverse patient population these health centers employ 2,360 people, 65% of whom reside within their employer's service area. Interpreter services are also available in over 30 languages across our network's CHCs.

Community Physician Group Inpatient Rounder System

Continued →

In 1997, BHN established a Rounder System at BMC. The Rounder System brings together physicians from the health centers and the BMC Department of Family Medicine to care for patients from these sites while they are in the hospital, thereby, coordinating and enhancing the quality and continuity of care. When first established, the Rounder System included five health centers and BMC's Department of Family Medicine. Today, a total of twelve CHCs and Family Medicine participate in the Rounder System.

BHN's Associate Medical Director serves as a hospitalist for the Rounder system. The hospitalist and three rotating physicians from Family Medicine and the health centers share the Rounder service caseload. In addition, BHN employs two Nurse Partners who help coordinate inpatient care and discharge planning. A transitional care manager is also on staff to evaluate and manage patients with substance abuse problems and domestic violence issues. On average, there are 60 patients on the Rounder service each day.

In July 2002, the Rounder System began a teaching service for Family Medicine house staff on the B4 team. The teaching attending has the responsibility of supervising work rounds, providing bedside teaching and teaching rounds twice a week.

Last year, a new Physician Assistant service through the Department of Medicine was initiated for the Rounder System. The service is now available to provide additional coverage for BHN Rounder patients at East Newton who are deemed appropriate. The HealthNet attending works with the PA's to determine the level of care necessary.

In the summer of 2004, Boston HealthNet completed its fourth physician satisfaction survey of the Rounder System. Overall survey results continue to be very positive. Some highlights:

- 85% of respondents rated the Rounders' efficiency as good to excellent
- 85% of respondents rated the Rounders' clinical skills as good to excellent
- 83% of respondents believed the Rounder System has improved the quality of inpatient care and would recommend the adoption of a similar Rounder program for other primary care medical groups.

R Kalish
C Manasseh

Evaluating adrenal incidentalomas

CT and MR scans are now able to identify adrenal masses as small as 4-5 mm in diameter. These are seen in up to 8% of abdominal CT and MR studies even when no adrenal pathology is suspected. So we are seeing a new phenomenon: incidentally discovered adrenal masses, or "incidentalomas." Most of these masses are small (80% are < 2cm) and non-secretory. They can be adrenal adenomas or carcinomas, pheochromocytomas, cysts, myelolipomas, or metastases (especially lung, breast, melanoma, and lymphoma). Incidentalomas raise two questions: First, is the mass functioning (i.e., hormone secreting)? Second, is the mass benign or malignant?

Is the mass functioning?

Most (85%) incidentalomas are non-functioning (i.e. non-secreting). However, the remainder may secrete cortisol, aldosterone, or catecholamines. *All* incidentalomas require a functional evaluation.

Screening for cortisol secretion: Look for clinical clues of cortisol excess (facial rounding, central obesity, thin skin, etc.); some masses, however, will secrete cortisol without causing clinical findings. We recommend that everyone with an incidentaloma be screened for cortisol excess with an *overnight dexamethasone test*. Administer 1mg of dexamethasone orally at 11 p.m. and have a fasting cortisol and ACTH level measured the next morning. Plasma cortisol level should be less than 5mcg/dl and the ACTH should be at or below the lower limit of normal.

Screening for aldosterone secretion: The classic features of hyperaldosteronism are hypertension and hypokalemia, but not all patients have hypokalemia. We screen all patients who have hypertension

C. difficile associated diarrhea: a review

Antibiotic-associated diarrhea is an increasingly common problem in hospitalized patients, increasing morbidity and mortality. *Clostridium difficile* was identified as a major cause of antibiotic-associated diarrhea in the late 1970's. *C. difficile* is a gram-positive anaerobic toxin-producing bacteria which is associated with 20-30% of antibiotic-associated diarrhea, 50-75% of antibiotic-associated colitis and > 90% of cases of antibiotic-associated pseudomembranous colitis. It produces two toxins (A and B) which cause colonic mucosal inflammation and colitis. Rates of C.

hypertension (either sustained or episodic), palpitations, and "spells" (headache, sweating, or a sense of anxiety or foreboding). We typically screen all incidentalomas by checking fractionated plasma metanephrines.

If any of these screening tests is positive, consult an endocrinologist for further recommendations. Imaging is not performed to diagnose a pheochromocytoma and should only be performed once there is biochemical evidence of a functioning tumor.

Is it benign or malignant?

Here, the size and appearance of the mass are important. Benign incidentalomas are typically <3 cm, round or oval with smooth margins. Imaging can characterize almost all adrenal masses using CT, MR and CT/PET. Adenomas are either lipid rich or lipid poor. Lipid rich adenomas have a Hounsfield Unit value of <10 on a non-contrast CT study. Adenomas, either lipid rich or poor, demonstrate washout 50% or more intravenous contrast on 10 minute delayed imaging compared to dynamic imaging at 60 seconds. MR imaging using in and out of phase sequences can detect lipid rich adenomas by the mass losing signal on the out of phase imaging. Adenomas are, at best, warm on CT/PET but never hot, as are metastases or carcinoma. Malignant imaging findings on CT or MR rely on identifying irregular borders of the mass with evidence of local invasion or metastatic disease outside of the adrenal gland.

What about biopsy?

Given the ability of imaging to characterize almost all adrenal masses, biopsy is now seldom performed. CT-guided biopsy cannot differentiate adrenal adenoma from adrenal carcinoma. Instead, the most common indication for biopsy today is to obtain tissue confirmation of metastases in a patient with known malignancy for complete staging purposes prior to treatment.

What if it's non-secretory and benign-looking?

Masses >4cm are generally removed because of the risk of cancer. Otherwise studies suggest repeat clinical exam, imaging, and hormone screen at 12 months. If screening is negative and there is no mass enlargement, further repeat testing is unlikely to be positive.

T Moore
B Lucey

determined that five of the eight centers had >50% of strains that were closely related, indicating a possible

Congratulations!

Over 1100 flu shots have been administered to inpatients so far this season, already surpassing our goal!

Keep vaccinating our inpatients, especially those at high risk!

Do you use pathways? Why not?

The benefits of using pathways include:

1. SCM ordersets that help you put in the correct orders faster.
2. The ordersets are based on current national and local best practices guidelines.
3. The ordersets trigger the secretary to put a *paper pathway packet* in the vitals book. This packet contains:
 - a. The physician pathway with stage-by-stage guidelines for the care of your patient.
 - b. Discharge considerations so you may prepare yourself and your patient for a healthy discharge from the hospital.
 - c. Patient health and education forms (e.g. information about smoking cessation and heart disease), including a *Patient Pathway*, which explains what is happening at each stage.
4. When you discharge the patient *from the pathway*, you get handy reminders about discharge best practices, tailored to your patient's condition.

So use the pathways, everyday on every appropriate patient with ACS, Heart Failure, Chest Pain, ST Elevation MI, and Community Acquired Pneumonia. Remember, you can start the pathways *at any time* during the hospitalization to help take better care of your patients.

J Greenwald

Patients are the same outcome measure found on Boston Medical Center's Clinical Pathways for AMI, Heart Failure and Community Acquired Pneumonia.

Can't remember the etiologies of shunt physiology?

You need a CHEAP T.A.!

The finding of hypoxemia has a broad differential diagnosis. However, hypoxemia that is unresponsive to supplemental oxygen, referred to as 'shunt', has a narrow differential. A right to left shunt is the extreme of V/Q mismatch where some fraction of venous blood is not exposed to inhaled oxygen (V/Q=0) before circulating into the arterial blood stream. Although the differential diagnosis of shunt is narrow, it is hard to remember. I propose the pneumonic CHEAP TA to trigger your memory of things that cause shunt.

They are:

- C - consolidation (a large area of lung filled with pus, blood, or fluid, e.g. lobar pneumonia)
- H - heart shunts (intra-cardiac shunts, such as PFO, ASD, VSD, PDA)
- E - edema (cardiogenic and non-cardiogenic pulmonary edema)
- A - atelectasis (a collapsed lobe or lung)
- P - pulmonary embolism
- T - tension pneumothorax
- A - AVMs (or any extra-cardiac shunt such as pulmonary AVMs or hepatopulmonary syndrome)

There's nothing like a CHEAP TA to help you remember shunt!

D Kotton

Due to a national shortage of

consumer in layman's language why that measure is so important to their care and recovery when they have a heart attack, heart failure, or pneumonia.

Look at the website. It will be surprising and sobering when you realize how often practices known to give your patients the best chance of survival and recovery following a heart attack, heart failure or pneumonia are not at 100%.

What does it take to insure your patients get the best therapies? It takes systems that support your practice to make it happen. BMC has the systems. Use the Clinical Pathways and Admission Order Sets for ACS, Heart Failure and Community Acquired Pneumonia in your practice routinely and

variations in

**New Time Cut-offs for Requesting Blood
Draws by Phlebotomy**

Effective January 9th, lab orders with a priority of "7AM Phlebotomy Draw" will not be accepted after 05:25 AM. Users will receive a warning and will be required to change the priority or collection date.

If the priority of "Next Phlebotomy Draw" is selected, the system automatically places the order in the next appropriate phlebotomy round and displays the collection time for that round. The cut off times in SCM for each phlebotomy round are listed below.

<u>Phlebotomy Round</u>	<u>SCM Cut Off Time</u>
07:00 AM	05:25 AM
10:00 AM	09:25 AM
13:00 AM	12:25 PM
16:00 PM	15:25 PM
19:00 PM	18:25 PM
22:00 PM	21:25 PM
01:00 AM	00:25 AM
04:00 AM	03:25 AM

If you have additional questions regarding, you can contact Trisha Roderick (x41841). *C Shanahan*

MEDICARE PART D: IMPLICATIONS FOR INPATIENT CARE

The new Medicare Drug benefit, Medicare Part D, went into effect on January 1, 2006. While hailed by some as the most important advancement for Medicare beneficiaries since the inception of Medicare in 1965, many others have characterized the benefit as poorly designed with large gaps in coverage and of more benefit to drug companies than to Medicare beneficiaries. What cannot be disputed is the incredible complexity of the benefit, and the difficulty that beneficiaries are having in understanding what it is they need to do. Not all medications prescribed during a hospitalization are covered after discharge.

The basics. All Medicare beneficiaries are eligible. In Massachusetts, beneficiaries may choose to sign up with one of 44 plans offered by 17 organizations. (Those in Medicare Advantage plans such as First Seniority must enroll in a plan offered by their HMO). While costs borne by the beneficiary vary from plan to plan, a standard plan requires payment of a \$250 annual deductible, a monthly premium, which averages \$37 nationally, and co-insurance or co-payments for each drug. After the deductible, the beneficiary pays 25% of the next \$2000 in drug costs. After that, the beneficiary reaches what is called the “donut hole,” with the beneficiary responsible for 100% of all costs until s/he spends another \$2,850. Once the \$2,850 is spent, the beneficiary becomes eligible for catastrophic coverage and pays 5% of the costs of further prescriptions for the rest of the calendar year. This translates into the beneficiary having to pay \$3,600 annually in drug costs plus the monthly premium before the catastrophic coverage begins.

Low-income beneficiaries. Those with low incomes and assets can have their premiums and out-of-pocket costs paid for, but they must apply for “extra help” through the Social Security Administration. While it is unclear whether benefits will outweigh costs for many eligible for Part D, those who qualify for full extra help will almost certainly benefit from enrolling. Dual eligibles—those with both Medicare and MassHealth (Medicaid) have been automatically

enrolled in a Medicare D Plan, with all costs covered except for a co-payment of between \$1 and \$5 depending on income and type of drug. Medicare beneficiaries who have been getting drugs through the Uncompensated Care Pool (Free Care), will be urged to enroll in a Part D Plan. The Pool will then act as an insurance “wrap,” covering co-pays, deductibles, and other gaps in coverage. The Pool cannot cover monthly premiums; they will be covered for BMC patients through a variety of mechanisms including some instances where BMC itself will pay the premiums.

Formularies. Each Drug Plan has its own formulary, with the requirement that at least 2 medications are available in every therapeutic class. If the beneficiary is on a drug not on the formulary, there are 3 alternatives: 1) the physician will need to find a substitute drug, 2) the physician will need to request an exception, or 3) the patient will need to change to a plan that has the drug on its formulary. There are, however, constraints on when a beneficiary can change plans.

Ramifications for the Inpatient Service. Medicare covers all medications while a beneficiary is an inpatient, but once discharged, only those on the Medicare D Plan’s formulary will be covered. For this reason, it is important to be conservative when making substitutions. If a medication needs to be substituted because it is not on the hospital formulary, you should, when appropriate, change the medication at discharge back to what was prescribed prior to the hospital admission. This will minimize the number of problems that patients will encounter when they go to their pharmacy to fill their prescriptions.

D Kornetsky

Want to write an article for
The Inpatient Times?
Contact: Jeff Greenwald

Making discharge medications safer: introducing the medication calendar

The vast majority of doctors and nurses have now undergone online training (on New Innovations for the MDs and on Health Stream for the RNs) to learn about medication reconciliation. This important initiative, which is part of the Institute for Healthcare Improvement’s 100K Lives Campaign, is designed to reduce the number of medication errors and adverse events that occur in the hospital and after discharge. A new component of the system that has been put in place is the medication calendar. This new form is a complete medication that is given to the patient at the time of discharge, in addition to the discharge summary, and contains the medication instructions in lay English rather than doctor jargon (e.g. 1 po qd is translated to 1 by mouth daily) to minimize patient confusion. It also indicates which medications are new or changed.

Every patient leaving the hospital on medication must have a medication calendar at the time of discharge. To create one for your patient, use the following simple steps:

1. Open a Logician update for your patient.
2. Type “discharge prescriptions” to bring up the appropriate update form. This is the ONLY form you should use for all discharges on Logician. Do not simply go to the MEDS tab on the desktop and do an update from there.
3. You will see the screen below. Press the MEDS tab and correct the medication list, discarding old medications and adding any new ones. When complete, this list should indicate ALL the medications, standing and prn, the patient should take upon discharge. Print the prescriptions from this page.
4. Press the “Add Comments “ to note any instructions you would like added (e.g. “take with food” or “for diabetes”) so the patient understands better why/how to take the medication.
5. Press the “Handout” tab. This will automatically print out a copy of the medication calendar to the same printer you printed the prescriptions on. Give this and the prescriptions to the nurse discharging your patient or put them in the patient’s chart.
6. Press the “Jump to list” tab to get a final list of the medications which you can cut and paste into your discharge summary in SoftMed directly.

Thank you for taking an extra minute to make sure your patients get the correct medications and understand how, when, and why they need to take them. It is just good patient care!

J Greenwald

Med Handout		Med List Total	
Step 1, Update Patients Meds		Step 2, Add any comments	
MEDS		<input type="radio"/> Check Translation <input type="radio"/> Add Comments	
Medication Name and Dosage		Instructions (Lay Terms)	Orig. Script to Check Transl
1	Klonopin 2 mg tabs	4 mg twice a day	4 MG BID
2	Propranolol hcl tabs 20 mg	1 by mouth twice a day	1 po bid
3	Protonix tabc 40 mg	1 by mouth once daily	1 po once daily
4	Folic acid tabs 1 mg	1 by mouth once daily	1 po once daily
5	Multivitamins tabs	1 by mouth once daily	1 po once daily
6	Thiamine hcl 100 mg tab	1 by mouth once daily	1 po once daily
7	Nicoderm cq 14 mg/24hr pt24	1 patch td once daily x7 days	1 patch TD once daily x7 days
8	Nicoderm cq 7 mg/24hr pt24	after completing 14mg/24h patches use 1 patch td once d	After completing 14mg/24h patc
9	Lactulose 10 gm/15ml syrup	take 2 tbsp twice a day goal is 3-4 soft bowel movement:	Take 2 tbsp BID goal is 3-4 soft
10	Calcium 500/60 tabs	1 tab by mouth three times a day	1 tab by mouth tid
11	Tramadol hcl 50 mg tab	1 tab by mouth twice a day as needed pain	1 tab po bid prn pain
12	Omeprazole 20 mg cptr	1 by mouth once daily	1 po once daily

Sweeter on steroids

Hyperglycemia on steroids... physicians see this in many patients, and should expect it in most, sure as the WBC elevation on tomorrow's CBC. Corticosteroids, which are commonly used in the treatment of acute respiratory illnesses, neurosurgical emergencies, post-transplant, and connective tissue diseases, have effects on carbohydrate metabolism that either exacerbate existing diabetes or cause "steroid diabetes." This should not be ignored, but rather treated as iatrogenic hyperglycemia, which has adverse effects on infection (prevention or treatment), wound healing, hydration status and electrolyte stability.

Like all new-onset, or newly-exacerbated, hyperglycemia, in order to diagnose and treat it properly, it is important to understand the pattern, effective treatments and natural history.

1) *What is the typical pattern of steroid-induced hyperglycemia?* Hyperglycemia induced by glucocorticosteroids is primarily an exaggeration of postprandial hyperglycemia. Most patients will not have significantly different fasting blood glucose levels when they are receiving corticosteroids, but will be progressively hyperglycemic as the day goes on and they eat meals.¹ The known physiology explains this somewhat, since corticosteroids inhibit insulin-stimulated glucose uptake in peripheral tissues and also increase hepatic glucose production.²

In the hospital, most patients on steroids who were previously well-controlled or nondiabetic, have a good A.M. glucose only to have marked hyperglycemia by late afternoon. The degree of elevation is correlated with previous glucose tolerance. Patients with pre-existing diabetes can have profound increases in blood glucose.

2) *What are reasonable treatment strategies?* "Sliding scale" is particularly ineffective in achieving safe, effective glycemic control in steroid-treated patients.

Therapy for corticosteroid-induced hyperglycemia should target postprandial hyperglycemia. If the patient is on insulin at home, like all Type 1 diabetics, they will require adjust-

Continued →

ment to allow for more nutritional coverage that increases as the day goes on. Some Type 2 patients may require only prandial oral agents (e.g. Repaglinide or Acarbose) or nutritional insulin (such as rapid-acting lispro), although no studies have been published comparing the effects of these agents in steroid-treated patients. When relatively short-acting steroids such as prednisone and hydrocortisone are used, the requirement for nutritional insulin at breakfast may be lower due to the diminished effect of the previous day's steroid dose. If between-meal or fasting glycemia cannot be sufficiently controlled with prandial agents or nutritional insulin alone, small to larger amounts of basal insulin, like glargine, may be added. More insulin resistant patients often do better on NPH BID as the basal insulin, with 80% of the total NPH dose given in the morning.

In the Intensive Care Unit, patients often have severe, transient and sometimes unpredictable elevations of blood glucose level associated with intravenous corticosteroid administration. In this case, the use of a variable-rate insulin infusion would be appropriate. A variable-rate insulin infusion allows for rapid increase or decrease in insulin delivery depending on the dose and hyperglycemic effect of the intravenous corticosteroid.

3) *How long will the steroids affect glycemic control?* The glycemic effect of glucocorticoids will be present as long as they are administered. Once they are stopped, the effect usually disappears in under 24 hours. In a study done by Greenstone and Shaw,³ measuring blood glucose response to alternate day prednisone dosing, patients exhibited hyperglycemia in the afternoons of the days when the steroids were given. Blood glucose levels normalized throughout the next day (the day off of steroids).

When steroid treatment extends beyond the hospital, the physician may have to be creative with outpatient regimens to treat steroid-induced postprandial hyperglycemia. If the steroid dose will be tapered, or stopped in the future, patients must be instructed on how to alter their regimen to prevent hypoglycemia.

Continued →

REFERENCES

- ¹ Paauw, DS. Case Study: A 60-Year-Old Woman With Type 2 Diabetes and COPD: Worsening Hyperglycemia Due to Prednisone. *Clinical Diabetes*. 18: 2, 2000.
- ² Grunflod C, Baird K, Van Obberghen E, Kahn CR: Glucocorticoid-induced insulin resistance in vitro: evidence for both receptor and post-receptor defects. *Endocrinol* 109:1723, 1981.
- ³ Greenstone MA, Shaw AB: Alternate day corticosteroid causes alternate day hyperglycemia. *Postgrad Med J* 63:761-64, 1987.

M McDonnell

Changes coming to Sunrise Clinical Manager!!!

Over the next few months you will start to here about new functionality being added to Sunrise Clinical Manager (SCM). One of the changes will be the revision of all the medication ordering forms. The Pharmacy Department is replacing their current Cerner application with a new GE Centricity system. One change that you will notice will be the reduction of the number of drug items available to order. You will have a limited number of available options when ordering a specific drug. Each individual dose will not be listed but all the available forms (tablet, solution, IV, etc) will continued to be displayed. When you order a warfarin tablet you will no longer see all six different strengths. You will only see one warfarin tablet and you can enter the dose requested in the required field. When you order IV gentamicin, you will have only one option compared to the 5 options that are currently available.

Another change you will see with in medication ordering module is a redesign of all the order forms. All medication order form will have multiple columns and they will fit on one page. Therefore the need to scroll will be reduced. These two changes will effect all individual drug items and all medications contained in Order Sets.

Continued →

Activation for the pharmacy changes is scheduled for mid-March 2006.

Currently, on-line documentation in Sunrise Clinical Manager is being worked on. The goal for this initiative is to have one central application for all inpatient documentation. In the future, residents will use SCM to create a patient's history and physical, discharge summary and all transfer notes. Daily progress notes will also be automated. Work is currently being done to map out the necessary data elements and design templates for clinical review.

The SCM documentation plans also involve nursing documentation. Flow sheets and data tracking forms will be included. Interfaces between monitoring devices and the on-line flow sheet are in the plans.

The project teams working on the documentation initiatives include residents, attendings, physician assistants, nurses, ITS specialists and ancillary staff. The plans are for a pilot in Pediatrics and Cardiothoracic surgery in the spring of 2006. Based on the success of the pilots, the SCM on-line documentation will be rolled out throughout the campus and across all services during the calendar year.

G Saunders

Interested in a career in academic Hospital Medicine?

**Come to the next meeting of
the Boston Association of
Academic Hospitalists in
Medicine!**

**Our next meeting is
February 6th.
It is open to Junior and Senior
Residents.**

Contact Jeff Greenwald