Pharmacist Meeting

November 3, 2016

CRRT – order set confusion

11. Pre Blood Pump (PBP) Fluid and Flow Rate (white scale - minimum 800 ml/hr)
~~0.5% Trisodium Citrate at~~ Prismasate w/ Ca 2.5 mEq/L Lactoleal 1000 mL/hr ml/hr.

PSO# 1916
Physician Standing Order (1/16)

/TIME RED

CONTINUOUS RENAL REPLACEMENT THERAPY (CRRT) ORDERS

12. Dialysate Fluid and Flow Rate (Green Scale)

☒ Prismasate BGK 4/0/1.2 (Sodium 140mEq/L, Magnesium 1.2 mEq/L, Potassium 4 mEq/L, Chloride 110.2 mEq/L, Lactate 3 mEq/L, Bicarbonate 32 mEq/L, Glucose 110 mg/dl). Add Ca 2.5mEq/L

☐ Prismasate B22GK 4/0 (Sodium 140mEq/L, Magnesium 1.5 mEq/L, Potassium 4 mEq/L, Chloride 120.5 mEq/L, Lactate 3 mEq/L, Bicarbonate 22 mEq/L, Glucose 110 mg/dl).

Rate: 2000 ml/hr

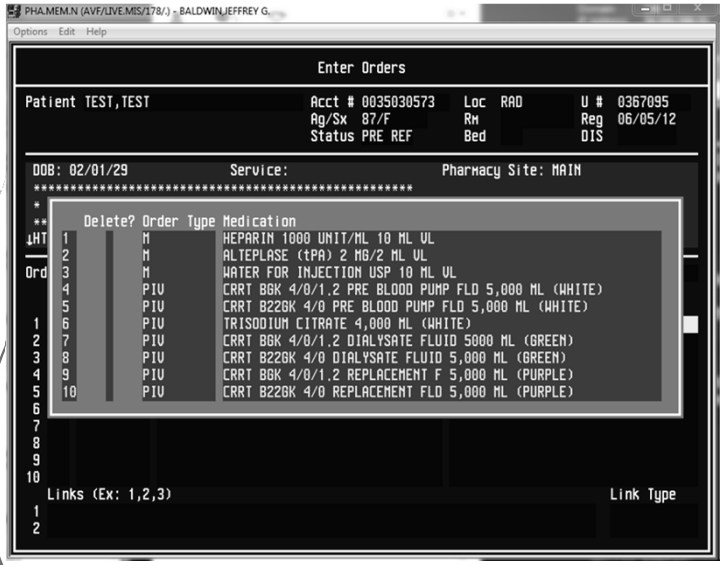
13. Replacement Fluid and Flow Rate (purple scale minimum 200 ml/hr Post Pre Filter)

☒ Prismasate BGK 4 / 0 / 1.2 (Sodium 140 mEq/L, Magnesium 1.2 mEq/L, Potassium 4 mEq/L, Chloride 110.2 mEq/L, lactate 3 mEq/L, Bicarbonate 32 mEq/L, Glucose 110 mg/dl). Add Ca 2.5mEq/L

☐ Prismasate B22GK 4 / 0 (Sodium 140 mEq/L, Magnesium 1.5 mEq /L, Potassium 4 mEq/L, Chloride 120.5 mEq/L, Lactate 3 mEq/L, Bicarbonate 22 mEq/L, Glucose 110 mg/dl).

Rate: 1500 ml/hr

CRRT – Pharmacy Set Changes



Protocol & Order Set Changes – Cardizem Drip Protocol

1. Continuous EKG monitoring.
2. Vital signs including blood pressure prior to administration, 15 minutes after each bolus and Q 1 hour X 2, then Q 4 hours during the infusion.
3. Initial dose 0.25 mg/kg (maximum 20 mg) IV bolus over 2 minutes. Heart rate should slow in 2-7 minutes. If patient is on beta-blocker or amiodarone, reduce dose by 50%.
4. Immediately follow bolus with Diltiazem drip (concentration = 1mg/1ml) at 10 mg/hr (10 ml/hr).
5. If HR > 120 after 30 minutes(following initial bolus and drip at 10 mg/hr) give additional loading dose of 0.35 mg/kg (maximum 25 mg) IV bolus over 2 minutes. Following bolus, increase drip by 5 mg/hr to 15 mg/hr (maximum dose).
6. If HR remains uncontrolled (> 120) after 1 hour with drip at 15 mg/hr, notify MD for further treatment.
7. If systolic BP drops below 90 mmHg, stop drug until systolic BP > 90. When systolic BP > 90, restart drip at 1/2 the previous rate unless the patient was symptomatic with the drop in BP. Hypotension has been shown to resolve in 1-3 hours.
8. If HR < 90 decrease infusion by 5 mg/hr and if HR < 80 decrease infusion rate by an additional 50%.
9. If HR < 60 at any point during infusion, stop the infusion and resume at 1/2 the previous rate when HR > 90. If at any point HR < 50, stop the infusion and notify MD for further instructions.
10. If patient converts to normal sinus rhythm (NSR) stop the infusion. If the patient's rhythm converts out of NSR and HR > 90 resume at previous rate. If the infusion has been stopped for > 2 hours a repeat bolus dose may be necessary - contact physician for orders if HR does not respond to the restarted infusion.

Colon Surgery Post-op Orders – Changes to limit APAP exposure

8. Analgesia:
If epidural in place:
- ▸ Follow ANESTHESIA STANDING ORDERS-PATIENT CONTROLLED ANALGESIA for epidural and nausea.
- ▸ Intiate PCA when epidural has been discontinued or if patient has no epidural.

☐ Morphine PCA:
Morphine (conc. = 1mg/ml) IV
PCA dose: 1mg
Lockout interval: 6 min
One hour limit: 8 mg

☐ Hydromorphone (Dilaudid) PCA:
Hydromorphone (conc. = 1mg/ml)
PCA dose: 0.2mg
Lockout interval: 10 min
One hr limit: 1.2 mg

Multi-modal Pain Options:
☐ Acetaminophen (Tylenol) 1 gm PO Q 6 hours.
☐ Gabapentin (Neurontin) 300 mg PO bid if ≥ 70 years old
☐ Gabapentin (Neurontin) 600 mg PO bid if < 70 years old

Moderate Pain (choose only one - if more than one box is checked only the first selection will be used)
*If scheduled Acetaminophen is ordered the Oxycodone without APAP option will be substituted.
☐ Hydrocodone 5 mg + Acetaminophen 1 tablet PO Q 4 hrs PRN moderate pain
☐ Oxycodone 5 mg + Acetaminophen 1 tablet PO Q 6 hrs PRN moderate pain
☐ Oxycodone 5 mg 1 tablet PO Q 6 hrs PRN moderate pain

Severe Pain (choose only one - if more than one box is checked only the first selection will be used)
*If scheduled Acetaminophen is ordered the Oxycodone without APAP option will be substituted.
☐ Hydrocodone 5 mg + Acetaminophen 2 tablets PO Q 4 hrs PRN severe pain
☐ Oxycodone 5 mg + Acetaminophen 2 tablets PO Q 6 hrs PRN severe pain
☐ Oxycodone 5 mg 2 tablets PO Q 6 hrs PRN severe pain

11. Fever:
☐ Acetaminophen (Tylenol) 650 mg PO/PR Q 4 hrs PRN. DO NOT GIVE if on scheduled Tylenol.

Pneumonia Order Set Changes

In the HCAP/HAP/VAP section:

1) Cefepime has replaced piperacillin/tazobactam (please keep in mind that cefepime can be automatically dose adjusted)
2) Non-ICU patients no longer receive a second gram negative agent
3) ICU patients will always receive tobramycin as a second agent regardless of renal function
   a. 7mg/kg dose for normal renal function (CrCl ≥ 60 mL/min)
   b. 5mg/kg dose for renal dysfunction (CrCl <60 mL/min)

Kinetics
Aminoglycoside Reference
Antimicrobial Dosing – CRRT & IHD

HEALTHCARE ASSOCIATED/HOSPITAL ACQUIRED/VENTILATOR ASSOCIATED PNEUMONIA (HCAP/HAP/VAP)

Non-ICU Treatment
Preferred regimen
☐ Cefepime 1g IV Q 6 hrs **PLUS**
Vancomycin 1 gm IV now then Pharmacy to dose

Alternate regimen (Anaphylaxis to PCN, Severe Cephalosporin allergy)
☐ Aztreonam 2 gm IV Q 8 hrs **PLUS**
Vancomycin 1 gm IV now then Pharmacy to dose

ICU Treatment
Preferred regimen
☐ Cefepime 1g IV Q 6 hrs **PLUS**
Tobramycin Pharmacy to dose **PLUS**
Vancomycin 1 gm IV now then Pharmacy to dose

Alternate regimen (Anaphylaxis to PCN, Severe Cephalosporin allergy)
☐ Aztreonam 2 gm IV Q 8 hrs **PLUS**
Tobramycin Pharmacy to dose **PLUS**
Vancomycin 1 gm IV now then Pharmacy to dose

Suspected Aspiration
(check box below to add Metronidazole to any of above orders)
☐ Metronidazole 500 mg IV Q 8 hrs

P&T Updates

- New drug approvals
  - **Entyvio**
    - Integrin receptor antagonist indicated for the treatment of CD and UC in adults with moderately to severely active disease who have had an inadequate response with, or were intolerant to TNF agents, or had an inadequate response with, or dependence on corticosteroids.
    - Inhibits leukocyte binding to the endothelial surface of the GI tract and reduces the chronic inflammatory process present in UC
    - Restrictions: Outpatient use only for documented condition applicable to the FDA approved indication.
  - **Inflectra (biosimilar version of infliximab)**
    - See other slides…

P&T Updates – new formulary interchanges

- **Rexulti® (brexpiprazole)** – atypical antipsychotic
  - Similar MOA to aripiprazole (partial dopamine agonist)
  - Therapeutic interchange approved to sub orders to therapeutically equivalent dose of aripiprazole → see form web for details
- **Phenazopyridine products**
  - *Upcoming* therapeutic interchange to 95 mg products
  - Go live date unknown → must use up existing supplies
- **DPP-4 Inhibitors (Januvia®, etc.)**
  - *Upcoming* therapeutic interchange to alogliptin (Nesina®)
  - Go live date unknown → must use up existing supplies

P&T Updates – national P&T changes

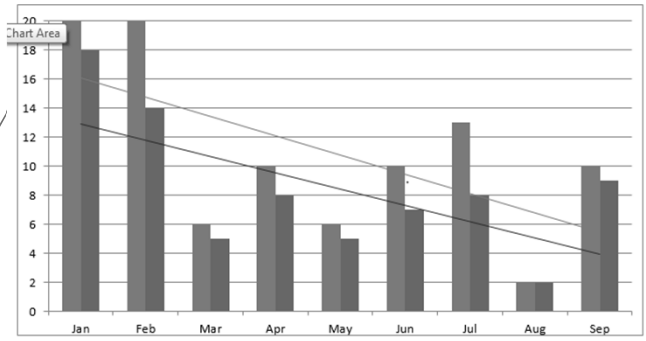
- **Cleviprex® (clevidipine)**
  - Removed from CHI formulary
- **Nipride® (nitroprusside)**
  - Removed from CHI formulary
    - *Facilities may keep limited stock for specific clinical indications*
- **Bladder Antimuscarinic Interchange**
  - CHI interchange differs slightly from what we approved in August
    - We will now keep trospium **&** oxybutynin IR, ER → form web updated
- **IV APAP**
  - "Formulary Restricted to 24 hours post-op" by CHI
    - Remains **NON-FORMULARY** at Memorial
- **Entresto® (sacubitril/valsartan)**
  - "New starts restricted to cardiology" – need for inpatient initiation not yet determined
  - Pioneer HF study – we will be a study site for this which will evaluate if inpatient initiation important

P&T Updates - MUE

OPIOID SAFETY – NALOXONE ADMINISTRATION

January – September 2016

Narcan Administration Events/Patients



P&T Updates – Policy Changes
Enoxaparin dose adjustments

Imagine better health.™

POLICY

Title: ANTICOAGULATION MANAGEMENT			
Page 1 of 3			
Policy Number: MM-05401		Date Last reviewed/Revised: 12/14	Valid Until: 12/17
Department(s) Affected: All Clinical Areas		Review Period: every 3 years	

OUTCOME: To reduce the likelihood of patient harm associated with the use of anticoagulation therapy.

PURPOSE:
To implement a defined anticoagulant management program to individualize the care provided to each patient receiving anticoagulant therapy.

Proposed edit: automatic adjustment of *ANY* prophylactic dose of LMWH – including 30 mg BID dosing

d. Low Molecular Weight Heparins (enoxaparin): Lovenox (enoxaparin) dosing protocol available for physician use. The hospital approved dosing for renal failure (CrCl < 30 ml/min), dosing in the elderly (age ≥ 70 yrs), and dosing in obese patients (BMI > 50 kg/m2) is as follows:
   i. Renal failure (prophylaxis): Doses of 40 mg daily are automatically reduced by pharmacy to 30 mg daily.
   ii. Renal failure (treatment dose): Pharmacy may automatically adjust patients with CrCL < 30 ml/min to 1 mg/kg once daily. If CrCl < 20 ml/min, pharmacy will order an anti-Xa level to determine if once daily dosing with enoxaparin is appropriate. Abnormal lab results will be communicated directly to physician.
   iii. Obesity (prophylaxis): Recommended dose of 40 mg BID.
   iv. Obesity (treatment): Actual body weight to be used for dosing in patients >150 kg. Anti-Xa levels will be monitored following 3rd dose to ensure adequate dosing for patients > 190 kg.

P&T Updates – Policy Changes
IV to PO Conversions

- Removed ICU as exclusion criteria
- Removed febrile neutropenia
  - These patients may be switched to oral **once afebrile** regardless of neutropenia status

CRITERIA FOR INCLUSION:

- Taking other oral medications by mouth
- Afebrile for at least 24 hours (T< 100.4)
- WBC that is normalizing (< 15K), or a known, non-infectious reason can be identified for WBC count (i.e., steroids) – *applies to antibiotics & antifungals only*
- Functioning GI tract (eating full liquids or better)
- ~~Non-ICU setting~~

CRITERIA FOR EXCLUSION:

- Patient has not yet received at least 24 hour duration of IV therapy
- ~~ICU~~
- NPO
- Active GI bleed – *applies to PPI's and H2 blockers only*
- ~~Febrile neutropenia – applies to antibiotics & antifungals only~~
- Patient with recent nausea or vomiting (antiemetic use within the last 24 hours)
- GI obstruction or non-functioning GI tract
- Inability to swallow

New Initiative – Relistor vs. Movantik

- **Movantik (naloxegol)**
  - *Therapeutic class:*
    Peripheral Mu-Opioid Receptor Antagonist (PAMORA)
  - *Indications:*
    Treatment of opioid-induced constipation (OIC) in adult patients with chronic non-cancer pain.
  - *Mechanism of action:*
    Binds to peripheral mu-opioid receptors in tissues such as the GI tract where it decreases the constipating effects of opioids – limited systemic side effects due to inability to cross the blood brain barrier
  - *Clinical Studies:*
    Two identical phase III studies investigated the efficacy and safety of naloxegol. KODIAC-04 (N=652) and KODIAC-05 (N=700) subjects were randomly assigned to receive a daily dose of 12.5 or 25 mg of naloxegol or placebo. The primary endpoint was the 12-week response rate. A shorter time to the first post-dose spontaneous bowel movement and a higher mean number of days per week with one or more spontaneous bowel movements were observed with 25 mg of naloxegol versus placebo in both studies and with 12.5 mg of naloxegol in KODIAC-05. Adverse events, primarily gastrointestinal, occurred most frequently in the groups treated with 25 mg of naloxegol. Overall, the studies showed that treatment with naloxegol achieved response rates that were increased by 10-15%, as compared to placebo, in patients with chronic non-cancer pain and opioid-induced constipation.
  - *Comparison to Relistor (methylnaltrexone):*
    Due to similar mechanisms of action on peripheral mu-opioid receptors, comparative safety and efficacy between naloxegol and methylnaltrexone may be questioned. While no head to head comparative trials have been performed the following data is available for both products:

Movantik vs. Relistor (injection)

	Naloxegol (Movantik)	Methylnaltrexone (Relistor)
Time to peak concentration	<2 hours with secondary plasma peak 0.4-3 hrs after initial peak	30 minutes
Efficacy Onset	**Median time to first SBM:** KODIAC-04: 25mg – 5.9 hrs 12.5 mg – 20.4 hrs KODIAC-05: 25 mg – 12 hrs 12.5 mg – 19.3 hrs	**% of patients with SBM within 4 hrs of first dose:** Study 1: Methylnaltrexone 12 mg daily - 33% (~50% of patients had SBM within 24 hours) Study 3: Methylnaltrexone 0.15 mg/kg – 62% Methylnaltrexone 0.3 mg/kg – 58% Study 4: Methylnaltrexone 0.15 mg/kg – 48%
Adverse Effects	Abdominal Pain: 12-21% Diarrhea: 6-9% Nausea: 7-8% flatulence 3-6% vomiting 3-5%	Abdominal Pain: 21-29% Nausea: 9-12% Diarrhea: 6% Flatulence: 13% Hyperhidrosis: 6% Dizziness: 7%
Cost (per dose)	$8.27	$95.16

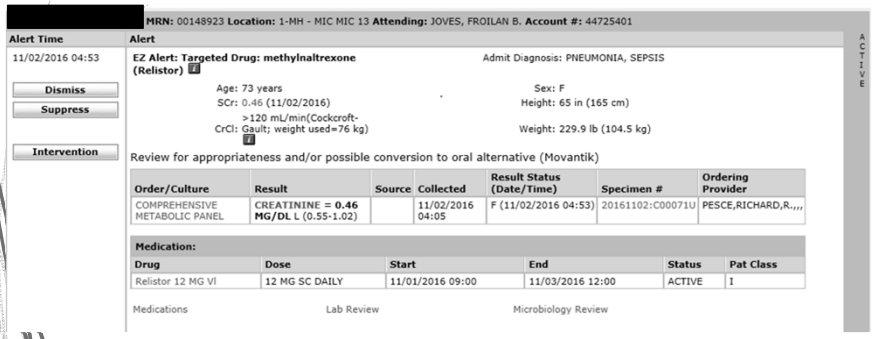
- **Note: Oral formulation of Relistor is also now approved although this is <u>NON-FORMULARY</u> at this time**
  - A therapeutic interchange to Movantik will likely be implemented in the coming months (more info on next slide)
  - If you receive orders now call and recommend Movantik as alternative

Movantik vs. Relistor (oral)

	Movantik (oral)	Relistor (oral)
Protein Binding	4.2%	11% to 15.3%
Elimination $t_{1/2}$	6-11 hrs.	15 hrs.
T_{max}	< 2 hrs.	1.5 hrs.
Drug Interactions	**Contraindicated – strong CYP3A4 Inhibitors** (most azole antifungals, many antivirals, clarithromycin, nefazodone, conivaptan, cobicistat, idelalisib, imatinib) – Concomitant use is not recommended. **Major:** CYP3A4 inducers (anti-seizure medications, barbiturates, rifampin, St. John's Wort) – Concomitant use is not recommended **Moderate – 3A4 inhibitors** (diltiazem, erythromycin, verapamil) Increased naloxegol concentrations; avoid concomitant use; if unavoidable, reduce dosage to 12.5 mg ONCE daily.	**Major:** selected opioid antagonists can increase withdrawal
Adverse Effects	Diarrhea, N/V, flatulence, arthralgia, headache, abdominal pain, GI perforation, withdrawals	Abdominal pain, flatulence, nausea, GI perforation, withdrawals
Dosing	25 mg po qam Take at least 1 hour before or 2 hours after the first meal of the day; Avoid grapefruit products	450 mg po qam Take with water 30 minutes prior to first meal of the day
Dose Adjustments	**Renal:** CrCl < 60 mL/min: 12.5 mg qam **Hepatic, severe:** avoid use	**Renal:** CrCl < 60 mL/min: 150 mg po qam **Hepatic, moderate to severe:** 150 mg qam
Time to First Bowel Movement	Avg: 6 hours (@25 mg); 20 hours (@12.5 mg)	Within 4 hours: 50.5% (450 mg); 47.8% (300 mg); 41.3% (150 mg)

Movantik vs. Relistor - Theradoc

- **EZ Alert created to identify patients on Relistor**
- **Suggest Movantik as alternative**
  - Enter as "New Therapy Recommendation"
  - New canned text available via form web link (accessed via rounds assistant) to populate the text of your CI
- **Future: may consider automatic interchange**



Stewardship Updates – Clindamycin, Cefazolin dosing

Cefazolin (Ancef®)			
CrCl (ml/min)	**UTI (no sepsis); Uncomplicated ABSSSI**	**All other indications**	**Treatment of confirmed GNR from a non-urinary source and MIC > 2**
> 30	1 gm IV Q 8 hrs	2 gm IV Q 8 hrs	Contact stewardship pharmacist as cefazolin may not be the best drug for the patient
10-30	1 gm IV Q 12 hrs	2 gm IV Q 12 hrs	
<10	1 gm IV Q 24 hrs		
HD	1 gm IV Q PM (For outpatient use: 2 gm IV post-HD only)		
CRRT	2 gm IV Q 12 hrs		

Note: The MIC > 2 comment in the last column only applies to gram-negative infections.
Continue using the dosing strategies listed in the first two columns for gram-positive infections.

Clindamycin (IV)		
Standard Dose	600mg IV q8h	No adjustment for renal dysfunction
Necrotizing fasciitis	900mg IV q8h	

Stewardship Updates - Biofire

Multiplex PCR System (BioFire) for rapid identification of blood pathogens
Utilizes polymerase chain reaction to amplify several different DNA sequences simultaneously to identify pathogens within 1 hour of blood culture growth identification.

Gram-Positive Bacteria

Enterococcus
Listeria monocytogenes
Staphylococcus
Staphylococcus aureus
Streptococcus
Streptococcus agalactiae
Streptococcus pneumoniae
Streptococcus pyogenes

Gram-Negative Bacteria

Acinetobacter baumannii
Haemophilus influenzae
Neisseria meningitidis
Pseudomonas aeruginosa
Enterobacteriaceae
Enterobacter cloacae complex
Escherichia coli
Klebsiella oxytoca
Klebsiella pneumoniae
Proteus
Serratia marcescens

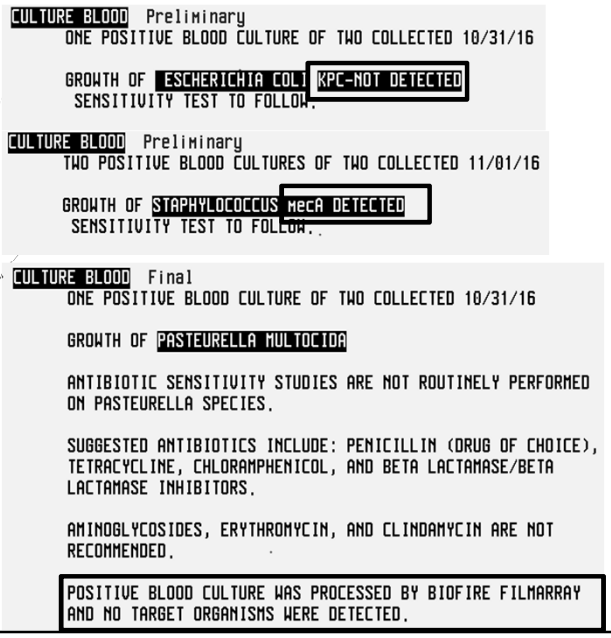
Yeast

Candida albicans
Candida glabrata
Candida krusei
Candida parapsilosis
Candida tropicalis

Antibiotic Resistance Genes

mecA – methicillin resistant
vanA/B – vancomycin resistant
KPC – carbapenem resistant

Biofire – Meditech examples



Vancomycin Dosing

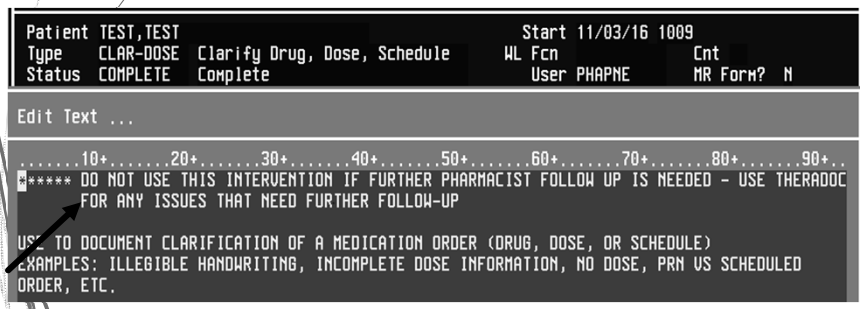
- **Patients with Osteomyelitis or other indications requiring longer term therapy (post hospitalization)**
  - Be cautious with aggressive dosing (Q 8 hr, etc.)
  - Be mindful of possible accumulation post discharge if aggressive dosing continued as home therapy
  - Watch for possible discharge orders and communicate with MD when necessary
- **Q 18 hr, Q 36 hr dosing intervals**
  - These can be problematic for post discharge orders (home therapy, etc.)

Competency Exams

- **TPN – due <u>now</u>**
- **Kinetics – to be released next week**
- **Coag – December**
- **Review sessions will follow each to review the results**

Theradoc

- **Intervention Documention**
  - DO NOT USE Meditech CI's to communicate issues (see below)
- **Logout issue**
  - May use CITRIX or use internet explorer directly
  - CHI is investigating the logout issue and we are hopeful this will be resolved soon
- **Password expiration – If you have an alternate network ID**

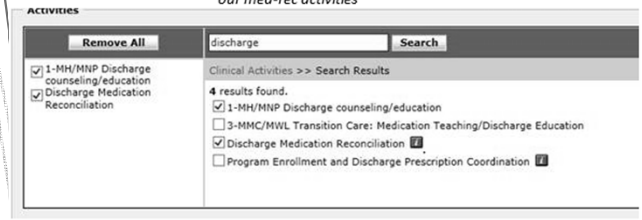


Theradoc – CI documentaion

Theradoc CI Observations:

- **IV to PO conversions:** I am working with Theradoc on some issues that we have discovered regarding the alert logic for their IV to PO rule. I believe this has detrimentally impacted our IV to PO numbers for the past two months. Continue to **NOT DISMISS** these alerts due to these not "re-firing" and behaving as expected.

- **Medication reconciliation activities** – we are now HEAVILY involved in med-rec activities and we need to make sure we are capturing this work
  - Discharge counseling/education – remember to use the 2 interventions below for any patient that you counsel at discharge
    - 1-MH/MNP Discharge counseling/education **(use this instead of the generic "General Medication Education" CI)**
    - Discharge Medication Reconciliation
      - *These can both be documented at the same time (see below) and this enables us to more accurately track our med-rec activities*



  - Home med clarifications, etc.
    - Please also use the "Admission Medication Reconciliation" for any home med clarifications that you are involved in clarifying (ED tech follow up calls, etc.)
  - Med-rec ADE Minor & Major
    - In addition to the above mentioned CI's also document any ADE preventions using either the minor or major CI's

Questions?