MUNSON MEDICAL CENTER
MUNSON HEALTHCARE

PHARMACY & THERAPEUTICS COMMITTEE

Meeting Minutes
July 8, 2024

Medical Staff:

☒ *Walt Noble, MD P&T Interim Chair* ☐ *Rachel Cleminson DO* ☐ *Christopher LaFond, MD* ☐ *Sound, DO*
☒ *Todd Adams, DO* ☐ *William Britton, MD* ☐ *Erika McMahon, MD* ☐ *Jason Schreiber, DO*
☐ *Kelly Clark, MD*

Hospital Staff:

☒ *Butch Bowlby, RPh, MSA* ☐ *Aimee Cloud, PharmD BCOP* ☒ *Wendy Hunt, RN* ☒ *Trevor Warner, PharmD*
☐ *Heather Tolfree, PharmD* ☒ *Cathi Cornelius, PharmD* ☐ *Tami Putney, RN* ☒ *Emily Warner, PharmD*
☐ *Matt Satkowiak, PharmD* ☒ *Brad Beaman, PharmD* ☐ *Karin Kain, RN* ☐ *PGY1*
☒ *Julie Botsford, PharmD* ☒ *Nick Torney, PharmD* ☐ *Chris Geetings, RN* ☐ *PGY2*
☒ *Philip DiMondo, PharmD* ☐ *Jeff Durkin, RPh* ☒ *Heidi Swensson, Sr Clinical Informaticist* ☐
☐ *Fletcher Corbett, Mgr Accreditation Compliance*

Guests:

AGENDA ITEM	DISCUSSION	ACTION / CONCLUSION / RECOMMENDATION	RESPONSIBLE PARTY
Call to Order	Called the meeting was called to order at 12:17pm		
A. Welcome: Additions/ Corrections to Agenda	Members were welcomed and asked for any additions or corrections to the agenda. There were no corrections. No new conflicts of interest were reported.		
B. P&T Minutes	Members were asked to approve the MMC P&T Committee meeting minutes from June 2024 (link)	Approved, Motion by P DiMondo. Second by B Beaman. All attendees in favor.	P DiMondo
C. Ancillary Meeting Minutes	1. MMC P&T Subcommittee (link) 2. MHC System P&T Meeting Minutes (6/2024) (link)	Approved, Motion by P DiMondo. Second by B Beaman. All attendees in favor.	1. P DiMondo 2. C Cornelius
D. Consent Agenda Policies/Items	1. MMC Policy Updates: a. Guidelines for Pharmacologic Stress Testing using Regadenson (attached) b. Rabies Prophylaxis Post Exposure Procedure (attached) 2. MHC Policy*: a. Topical Patch Policy (attached)	Approved, Motion by P DiMondo. Second by B Beaman. All attendees in favor.	1. P DiMondo 2. C Cornelius
New/Old Business			
E. DART PowerPlan (attached)	Emily Warner, previous NICU lead pharmacist, current Pharmacy Informaticist; presented a new PowerPlan that she developed with the NICU providers for dexamethasone tapering to aid in vent weaning. All questions were answered. Powerplan is currently live and in use.	Educational purposes only; no actions necessary	E Warner, PharmD
F. Sympathetic Storm Reference Guideline (attached)	Trevor Warner, Critical Care lead pharmacist, presented and updated (last was 2015) Sympatheic storm reference guide that is linked in Cerner to traumatic brain injury PowerPlans. Updates were reviewed and approved by TBI PowerPlan owners/providers. All questions were answered. Trevor will work with Clinical Informatics to get this updated document linked in Cerner.	Approved, Motion by T Warner. Second by C Cornelius. All attendees in favor.	T Warner, PharmD
G. Eptifibatide Reversal* (attached)	Philip DiMondo reviewed SBAR regarding Eptifibatide reversal recommendations. Currently not on our reversal guideline due to limited use; now Eptifibatide being used more common due to neurointerventional therapies. Recommendations to reverse Eptifibatide like we currently do for Aspirin or P2Y12 medications; with Desmopressin. Guideline will be updated this week as well as in policy stat. all questions answered.	Previously approved at System P&T June 2024	P DiMondo, PharmD
H. Pharmacist Insulin Pump Reference Guidelines (attached)	Cathi Cornelius, Medication Utilization Specialist; reviewed new pharmacist insulin pump reference and guideline. As pump availability, utilization and technology has advanced; having this resource to assist pharmacists to help manage insulin pump during transitions of care is vital. Cathi will provide department education regarding this resource, all question answered.	Approved, Motion by C Cornelius. Second by P DiMondo. All attendees in favor.	C Cornelius, PharmD
I. Buprenorphine for Opioid Dependence (attached)	Julie Botsford, Medication Safety Officer, discussed a new and advanced therapy for treatment of patients with opioid dependance. Using a microdosing strategy of buprenorphine to offset the risk of withdrawal; this therapy has shown clinical benefit in reduction of opioid use in this patient population. It was recommended to have hospitalist leadership engagement and	Approved, Motion by J Botsford. Second by Dr Noble. All attendees in favor.	J Botsford, PharmD

AGENDA ITEM	DISCUSSION	ACTION / CONCLUSION / RECOMMENDATION	RESPONSIBLE PARTY
	endorsement in this therapy before a PowerPlan is created. All questions were answered.		
MUE/DUE Progress Updates			
Therapeutic Interchanges			
Policies for Approval			
Formulary Changes			
Marketplace Status			
J. Drugs Shortages (attached)	Educational Purposes only; no actions necessary	Educational Purposes only; no actions necessary	B Beaman
K. Drug Recalls			
Periodic Reports			
L. Medication Safety/ Adverse Reaction/ Error Reduction/ ISMP Reports			
M. Pharmacist Interventions (attached)	Kudos to those staff on the top 10 list!	For informational purposes only.	H Tolfree
N. Antimicrobial/Pain/ Anticoagulation Stewardship Team			
O. High-Risk and or Hazardous Medications			
P. FDA Reports			
Q. Automated Dispensing Cabinet Override List			
R. Floorstock Medication Lists			
Annual Reports			
Evaluate Meeting			
Next Meeting	The next meeting is scheduled for 8/05/2024 via Microsoft Teams.		
Adjournment	There being no further business, the meeting was adjourned at 1:15pm.		

Consent Agenda Item

Status **Pending** PolicyStat ID **15161572**

Origination	2/18/2014
Last Approved	N/A
Effective	Upon Approval
Last Revised	6/27/2024
Next Review	3 years after approval

Owner	Amie Smith: Mgr Diagnostic Heart and Vascular Service Line
Area/ Department	Cardiac Diagnostic Suite
Applicability	MHC Hospital System w/out KMHC (MMC, Cadillac, Charlevoix, Grayling, Manistee, Otsego, POMH)
Tags	Guideline

Guidelines for Pharmacologic Stress Testing Using Regadenson

Purpose

The purpose of this protocol is to provide guidance in the administration of ~~Lexiscan (Regadenoson)~~Regadenson, which is used to induce vasodilation and increase coronary blood perfusion of the patient to aid in the diagnosis of coronary artery disease. ~~Lexiscan~~Regadenson with ~~Cardiolite~~Tc99m Sestamibi stress testing is given to any outpatients or inpatient if ordered by a ~~Provider~~provider. ~~Lexiscan~~Regadenson is given when any reason prevents a patient from reaching an adequate level of physical exercise in which to sufficiently increase the myocardial blood flow for the purpose of evaluation of coronary artery disease.

Guideline

Approved Personnel

A. All ~~Lexiscan~~Regadenson Stress Tests may be performed by a Physician, Physician Assistant (PA), Nurse Practitioner (NP), ~~Certified Exercise Specialist or Exercise Physiologist. If a~~

certified ~~Exercise Specialist or Exercise Physiologist~~exercise specialist or exercise physiologist. If a certified exercise specialist or exercise physiologist is performing the test without a ~~Physician~~physician, PA, or NP in attendance, the ~~Supervising Physician~~supervising physician must be on the first floor of the facility (Traverse Heart & Vascular ~~(~~[THV]~~)~~ or in the Cardiac Diagnostic Suite (CDS) ~~Department~~department and immediately available if needed. There must be ~~**two Qualified Clinical Staff**~~**two qualified clinical staff** present during the stress portion of the exam when performing with only ~~Physician~~physician supervision. Nuclear Medicine ~~Technologist~~(NM) technologist and Echo Sonographer ~~is~~are included in appropriate personnel.

Medication Administration

A. Physicians, PA, NP, ~~Nurses~~nurses and Certified ~~Nuclear Medicine Technologists~~NM technologists, within their scope of practice, are approved to administer and provide documentation for Adenosine, ~~Lexiscan~~Regadenson, and Aminophylline. The Exercise Physiologist and Exercise Specialist has the ability to administer aminophylline.

Medication Review

A. Medication list is obtained from the patient, documented, reviewed, signed, timed and dated by ~~Nuclear Medicine Technologist~~NM technologist, PA, NP or ~~Physician~~physician prior to all stress tests. Refer to the Guideline for Food/Medication Interaction with Chemical Exercise Testing for a list of medications or foods contraindicated for cardiac stress testing. Physicians will be consulted if necessary.

Code Status

A. Our general approach is that if the patient is a no code but agrees to an invasive cardiovascular procedure, then the CODE STATUS is changed to full code in order to allow us to address any acute complications that may occur during or related to the procedure.

B. The CODE STATUS remains full code until the cardiology team caring for the patient feels an appropriate amount of time has passed to ensure that there was no complication and the CODE STATUS is changed back to no code.

C. As stated in ~~consent form #2705, revised (10/16):~~the Confirmation of Informed Consent Cardiac Stress Test Form #2705;
I understand that my code status will be a FULL CODE allowing the doctor(s) to do whatever is needed to get me through the test/procedure and after the test/procedure for a period of time.

Contraindications

A. **Absolute Contraindications to ~~Lexiscan~~Regadenson Stress Testing**

1. Acute myocardial infarction (within two days)
2. Unstable angina
3. Active bronchospasm or audible wheezing

4. Severe chronic obstructive pulmonary disease (COPD) requiring chronic oxygen
5. Oral therapy with Persantine (dipyridamole) or Theophylline
6. Uncontrolled cardiac arrhythmias causing symptoms or hemodynamic compromise
7. Severe valvular stenosis
8. Aortic valve area ~~<~~less than 1~~.0~~ cm sq, mean gradient 40 mmHg or more.
9. Mitral valve area 1~~.0~~ cm sq or less, mean gradient 10 mmHg or more.
10. Pulmonic valve peak gradient 60 mmHg or more.
11. Uncontrolled symptomatic heart failure
12. Acute pulmonary embolus or pulmonary infarction
13. Acute myocarditis or pericarditis
14. Active endocarditis
15. Acute aortic dissection
16. Significant pericardial effusion
17. Sinus node dysfunction or high-degree atrioventricular block without pacemaker in place
18. Inability to obtain consent

B. **Relative contraindications to ~~Lexiscan~~Regadenson exercise testing**

1. Well controlled asthma or COPD without active bronchospasm
2. First degree atrioventricular (AV) block with pulse rate (PR~~->~~) greater than 220 msec
3. Bifasicular block
4. Severe (~~->~~greater than 70%) carotid stenosis
5. Left main coronary stenosis or its equivalent
6. Moderate stenotic valvular heart disease
7. Aortic valve area 1~~.0~~ to 1.4 cm sq, mean gradient 20 to 40 mmHg
8. Mitral valve area ~~<~~less than 1.5 cm sq., mean gradient ~~>~~greater than 5 mmHg
9. Pulmonic valve peak gradient 35 to 60 mmHg
10. Severe hypertension (systolic 220 mmHg and/or diastolic 110 mmHg)
11. Tachyarrhythmias or bradyarrhythmias, including atrial fibrillation with uncontrolled ventricular rate
12. Hypertrophic cardiomyopathy and other forms of outflow tract obstruction
13. Severe pulmonary hypertension
14. ~~RVSP > 60 mmHg~~Right ventricular systolic pressure (RVSP) greater than 60 mmHg
15. Mental or physical impairment leading to inability to cooperate
16. Seizure Disorder~~.~~

Physiologic Effects of ~~Lexiscan~~Regadenson

A. Potent vasodilation
B. Increase in heart rate due to vagal inhibition
C. Potential bradycardia and AV block

Patient Preparation

A. Patient should not take anything by mouth (NPO) 2-4 hours before test.
B. Food or drinks containing caffeine should be withheld for at least 12 to 24 hours prior to the exam.
C. Drugs containing Theophylline should be discontinued at least 24 hours prior to the procedure.
D. Remind patients bring inhalers with them if needed. The CDS department will have Albuterol stocked in the stress lab for use if needed.

Equipment

A. The ~~Nuclear Medicine Technologist~~NM technologist is in charge of having the nuclear camera ready. The ~~Certified Exercise Specialist or Exercise Physiologist~~certified exercise specialist or exercise physiologist is responsible for having the stress lab ready for testing. This includes checking that the ~~Case~~case treadmill system is in working order and that the following items are available and current:
    1. ~~Lexiscan~~Regadenson Solution
    2. Blood pressure (BP) equipment
    3. Crash cart with defibrillator
    4. Pulse oximetery
    5. Medications including: ~~Nitroglycerine~~Nitroglycerin, Lidocaine, Aminophylline, and Atropine
    6. Patient's cardiology file
    7. Oxygen source
    8. Emesis basin/bag
    9. Tubing and cannula
    10. Intravenous (IV) supplies
    11. 0.~~09~~9% sodium chloride solution
    12. Interlink system vented solution set
    13. Interlink lever lock cannula
    14. 20 Gauge needles, 22 gauge, and/or 24 gauge
    15. Electrocardiography (EKG) monitoring equipment and electrodes
    16. The ~~Nuclear Medicine Technologist~~NM technologist is responsible for confirming

that the patient has an access site available for the stress test injections. If the patients IV needs to be disconnected, the ~~Nuclear Medicine Technologist~~NM technologist must clarify with the patients nurse that they can disconnect and reconnect with no issues. If there are concerns due to medications, it is the patients nurses responsibility to ensure there is an open port for the ~~Nuclear Medicine Technologist~~NM technologist to use prior to the patients arrival to be scanned.

~~Stock Lexiscan~~

Stock Regadenson

A. The CDS staff will stock ~~Lexiscan~~Regadenson to a par level of 10 in the department.
B. ~~Nuclear Medicine~~NM will chart ~~Lexiscan~~Regadenson dose, route, date and time.
C. ~~Nuclear Medicine~~NM will follow drug profile documentation for all approved drugs given by ~~Nuclear Medicine~~NM.
D. The CDS staff will fax replacement order for ~~Lexiscan~~Regadenson dose to pharmacy.
E. Pharmacy will deliver the ~~Lexiscan~~Regadenson to the CDS department.

THV Stock ~~Lexiscan~~Regadenson Addendum

A. ~~Nuclear Medicine Technologist will stock Lexiscan in Nuclear Medicine Hot Lab.~~NM technologist will stock Regadenson in NM Hot Lab.
B. ~~Nuclear Medicine~~NM will chart ~~Lexiscan does~~Regadenson dose, route, date, and time.
C. ~~Nuclear Medicine~~NM will follow drug profile documentation for all approved rugs given by ~~Nuclear Medicine~~NM department.
D. ~~Nuclear Medicine Technologist~~NM technologist will fax replacement order for ~~Lexiscan~~Regadenson, when needed, to pharmacy.
E. Pharmacy will deliver to THV every morning prior to testing.

~~Pre-testing~~

Pre-Testing

A. Clear ~~blood pressure~~BP history from all auto ~~B/P~~BP monitors ~~(refer to Guideline 077.G041)~~
B. Introduce yourself using AIDET skills.
C. Identify the patient using two patient ~~identifiers (required by Munson Medical Center (MMC) policy)~~identifier.
D. A consent form will be reviewed and signed by the patient and be witnessed to include the date and time of signature.
E. Take a brief physical history to include all medications and those taken within 36-48 hours of testing. Document on worksheet. Review contraindications listed above.
F. Prior to the chemical portion of the test, the patient will have an IV put in place by a ~~Nuclear~~

~~Technologist~~NM technologist. The ~~Nuclear Technologist~~NM technologist will use a peripheral vein using a 22-gauge or larger catheter or needle. The patient will then receive a resting ~~Cardiolite~~Tc99m Sestamibi injection and then will be sent to the patient holding area for a snack and/or water. They will receive their first ~~Cardiolite~~imaging scan approximately one hour later. Inpatients will receive ~~Cardiolite~~Tc99m Sestamibi dose in their room on the floor and brought down approximately ½ to 1 hour after injection.

G. Explain the chemical stress testing procedure to the patient in its entirety including when they will receive their second ~~Cardiolite~~Tc 99m Sestamibi injection (30 to 40 seconds into ~~Lexiscan~~Regadenson injection), and possible side effects.

H. Prep patient's skin for monitoring electrodes according to the standard electrode application procedure.

I. ~~Attached~~Attach the lead wires of the monitoring ~~electrocardiograph~~EKG and run the control 12 lead tracings. Various 12 lead EKGs may be obtained:

    1. 12 lead Supine/Sitting EKG with ~~blood pressure~~BP and heart rate.
    2. Rhythm strip supine with ~~blood pressure~~BP and heart rate.

J. It is the responsibility of the ~~Nuclear Medicine Technologist~~NM technologist to flush the patient's IV with normal saline prior to being stressed in any fashion, and then to flush the IV with normal saline following any injection.

K. ~~Nuclear Medicine Technologist~~NM technologist will also be responsible for discontinuing IV.

Pre-testing Review

A. Prior to ~~Lexiscan~~Regadenson use, lungs should be assessed by ~~Physician~~physician, ~~Physician Assistant~~PA, or ~~Nurse Practitioner~~NP for clearance to proceed with the test when the patient has a history of ~~Asthma~~asthma, COPD, ~~Emphysema~~emphysema, uses ~~Oxygen~~oxygen or uses inhalers regularly, if needed.

B. During pre-testing history intake, if the ~~Certified Exercise Specialist or Exercise Physiologist~~certified exercise specialist or exercise physiologist has any questions about proceeding with the exam, pre-testing EKG strips and patient history sheet will be taken to the ~~Physician~~physician, PA or NP for consent to proceed with exam.

Exercise (Chemical) Phase

A. Have the patient remain in supine or sitting position if unable to walk.

B. Have the patient get on the treadmill if they are able to walk at slow, flat pace.

C. Have ~~blood pressure~~BP cuff on patient before beginning test.

D. Instruct patient the ~~Lexiscan~~Regadenson administration will take approximately one minute and symptoms of chest pain and shortness of breath may occur. Inform patient to relay any symptoms they experience throughout the test.

E. Press exercise on ~~Case~~case. Start treadmill if patient able, or have patient begin squeezing stress ball or other stationary exercise.

F. The ~~Nuclear Medicine~~NM technologist will administer the IV ~~Lexiscan~~Regadenson.

G. The preferred method, during the infusion, the patient may perform low-level exercise such as:
    1. Sitting upright on the edge of the bed.
    2. Isometric hand grips or leg swings.
    3. Walking in place or slowly on a treadmill.

H. Monitor the patient's EKG rhythm, ST changes, ~~blood pressure~~BP, and symptoms.

I. Test end points are as follows:
    1. Severe systolic hypotension less than 80 mm/hg.
    2. Development of a symptomatic, persistent 2nd or 3rd degree heart block
    3. Wheezing
    4. Severe chest pain associated with ST depression of 2 mm or greater
    5. Signs of poor perfusion
    6. Technical problems with monitor
    7. Patient requests to stop

J. Press recovery after two minutes of exercise or at least two EKGs have printed in exercise phase.

Administration of ~~Lexiscan~~Regadenson - Start of Protocol

A. ~~Nuclear Medicine Technologist~~NM technologist will administer the ~~Lexiscan~~Regadenson. Peripheral IV is flushed with saline and prepared for injection. Five mL (0.4 mg) of ~~Lexiscan~~Regadenson is given over rapid injection 10-15 seconds, followed immediately by a 5 ml saline flush over 10-15 seconds. ~~Cardiolite~~Tc99m Sestamibi is injected 30-40 seconds after the saline flush.

Recovery Phase

A. Obtain an immediate 12 lead supine/sitting EKG, ~~blood pressure~~BP, and heart rate.

B. Continue a 12 lead EKG, ~~blood pressure~~BP, and heart rate every 2 minutes.

C. Continue monitoring patient for 4 to 6 minutes in recovery or until patient is symptom free or the EKG has returned to baseline.

D. Record any significant findings or symptoms on worksheet.

E. **Any significant findings will immediately be communicated to the ~~Supervising Physician~~supervising physician by the performing staff.**

F. If the ~~Physician~~physician feels that the patient is unstable or unable to be discharged from CDS, and may require further treatment outside the scope of practice of staff, the policy states that all outpatients will be taken to the emergency department (ED) for evaluation. If the patient is an inpatient from within the hospital, their ~~Nurse~~nurse will be notified of changes and the ~~Nurse~~nurse will come to the CDS for transport of the patient back to the unit.

G. Medical response team maybe notified if indicated or a code blue called.

H. Have the Aminophylline ready for the ~~Physician~~physician, ~~Nuclear Medicine Technologist~~NM technologist, NP, Nurse ~~or~~, PA, exercise physiologist or exercise specialist to administer if needed to counteract any adverse response. Standard dose is 50 to 100 mg over 30 to 60 seconds in doses ranging from 50 to 250mg via way IV push. In the case of severe hypotension, the patient should be placed in a supine position with the head tilted down if necessary, before administration of Aminophylline.

I. If 250mg of Aminophylline does not relieve chest pain symptoms within a few minutes, ~~Sublingual~~sublingual Nitroglycerine may be administered by the ~~Physician~~physician, NP, ~~Nurse or~~nurse, PA, exercise physiologist or exercise specialist. If the patient experiences chest pain after the ~~Attending Physician~~attending physician has left the stress lab, then the ~~Physician~~physician will be paged by the ~~Certified Exercise Specialist or Exercise Physiologist~~certified exercise specialist or exercise physiologist and given an update of the patient's condition.

J. Indications for administration of Aminophylline – A minimum of 2 minutes is preferred after ~~Cardiolite~~Tc 99m Sestamibi injection before reversal. Please refer to the Standard Work document for questions or further instructions.

Test End

A. Hit test end and fill in reason for termination of test.

B. Transfer EKG tracings to MUSE.

C. Print summary sheet and give all testing information with template to interpreting physician

D. Remove electrodes EXCEPT upper limb leads and lower left lead from the patient while making sure patient is stable. Notify ~~Nuclear Medicine~~NM that patient is ready for second scan. Note: DO NOT remove the intermittent lock or the IV tubing. ~~Nuclear Medicine~~NM needs to remove it after the stress scan to assure proper disposal because of trace amounts of ~~Cardiolite~~radioactive tracer in the tubing.

E. Give a copy of worksheet to ~~Nuclear Medicine~~NM.

Post Test

A. Verify all tracings made it in to Muse.

B. Insure information is logged, charged and billing information has been sent out.

   1. Charges will be placed on Powerchart by the CDS staff for ~~Lexiscan~~Regadenson test, which will create a panel charge of 4 units of Lexiscan and stress.

   2. Pharmacy will charge the CDS per dose when delivered to 2373.

C. File the signed face sheet, physician order, signed consent form, patient information sheet and signed ~~Medication~~medication list form in the front office.

D. The CDS staff transcribes the ~~Physician~~physician's dictation into MUSE and the ~~Reading Physician~~reading physician confirms report that is posted to Powerchart.

~~Traverse Heart & Vascular~~THV Post Test Addendum

A. The ~~Nuclear Medicine Technologist~~NM technologist is responsible for reviewing and selecting images for study and creating study using Syngo Dynamics. The ~~Exercise Physiologist~~exercise physiologist is responsible for entering stress data into the report, and completing the report in Syngo. After the report is completed, the ~~Exercise Physiologist~~exercise physiologist combines the completed exercise worksheet, EKG tracings, and signed consent form together and places in the "To Be Read" basket in the supervising provider area.

Interpretation

A. Type the interpretation after the ~~Physician~~physician has completed the template.

B. Verify the account number in ~~Muse~~MUSE, put in over-reader and confirm test.

C. Place typed report in appropriate physician basket for signature.

D. The reports will be distributed and posted to Powerchart, the electronic medical record (EMR).

~~References~~

- ~~P & T Sub-committee Approval 5/12/15~~

~~Siemens~~Document ID: 077.G036

Attachments

1551103490-logo.gif

Approval Signatures

Step Description	Approver	Date
MMC P&T Committee	Philip Dimondo: Clinical Pharmacist	Pending
Exec Dir Service Line - Cardiovascular	Timothy Nelson: Exec Dir Service Line - Cardiovascular	7/1/2024
Document Owner	Amie Smith: Mgr Diagnostic Heart and Vascular Service Line	6/27/2024

Applicability

Cadillac Hospital, Charlevoix Hospital, Grayling Hospital, Manistee Hospital, Munson Medical Center, Otsego Memorial Hospital, Paul Oliver Memorial Hospital

History

Draft saved by Millen, Heather: Coord Cardiac Diagnostics on 2/2/2024, 12:34PM EST

Edited by Millen, Heather: Coord Cardiac Diagnostics on 2/2/2024, 12:46PM EST

> added Exercise Physiologists and Exercise Specialists to administer Aminophylline

Draft saved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 4/15/2024, 2:48PM EDT

Edited by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 4/15/2024, 2:50PM EDT

> Instructions on where to find standard work for aminophylline administration

Last Approved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 4/15/2024, 2:50PM EDT

Last Approved by Nelson, Timothy: Exec Dir Service Line - Cardiovascular on 4/16/2024, 8:26AM EDT

Comment by Fries, Terri: Document Mgmt Spec on 4/26/2024, 2:49PM EDT

> @Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line I see you made a note about this being approved by P&T in 2015. Given the nature of the policy, I'm wondering if P&T needs to be included in the approval workflow?

Administrator override by Fries, Terri: Document Mgmt Spec on 4/26/2024, 2:50PM EDT

> Formatting and defined acronyms. Waiting for correct policy reference titles to be provided. Email sent on 4.26.24

Rejected by Fries, Terri: Document Mgmt Spec on 5/14/2024, 1:56PM EDT

> @Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line I see you made a note about this being approved by P&T in 2015. Given the nature of the policy, I'm wondering if P&T needs to be included in the approval workflow?
>
> Waiting for correct policy reference titles to be provided. Email sent on 4.26.24

Draft saved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/14/2024, 2:03PM EDT

Edited by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/14/2024, 2:03PM EDT

> Removed form numbers and P&T approval

Last Approved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/14/2024, 2:03PM EDT

Last Approved by Nelson, Timothy: Exec Dir Service Line - Cardiovascular on 5/14/2024, 2:36PM EDT

Draft saved by Fries, Terri: Document Mgmt Spec on 5/16/2024, 10:50AM EDT

Edited by Fries, Terri: Document Mgmt Spec on 5/16/2024, 11:07AM EDT

> Per email from S. Carlson on 5.14.24, pharmacy should be involved in any treatment which involves medications. I have updated the approval workflow to include MMC P&T. I have also updated spelling and defined acronyms

Last Approved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/21/2024, 7:45AM EDT

Last Approved by Nelson, Timothy: Exec Dir Service Line - Cardiovascular on 5/28/2024, 9:06AM EDT

Draft saved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/30/2024, 12:43PM EDT

Sent for re-approval by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/30/2024, 12:43PM EDT

> changed applicability

Last Approved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/30/2024, 12:43PM EDT

Draft saved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/30/2024, 12:45PM EDT

Sent for re-approval by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/30/2024, 12:45PM EDT

> changed applicability

Last Approved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/30/2024, 12:45PM EDT

Draft saved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/30/2024, 2:02PM EDT

Edited by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/30/2024, 2:04PM EDT

> Removed trailing zeros , fixed spelling errors, changed Lexiscan to Regadenson

Last Approved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 5/30/2024, 2:04PM EDT

Last Approved by Nelson, Timothy: Exec Dir Service Line - Cardiovascular on 6/18/2024, 9:12AM EDT

Comment by Dimondo, Philip: Clinical Pharmacist on 6/25/2024, 8:49AM EDT

> I have cut and pasted a few sections from above for correction:
>
> Line 1; we see the use of Lexiscan again; please note this as Lexiscan(R)/Regadenson; or just Regadenson to keep it simple.
> Line 2: how is the aminophyline being adminstered; IVPush, IM, IV Piggy Back. We know how its given; but since this is policy we should be clearer for joint commission have cut and pasted a few sections from above for correction:
>
> Line 1; we see the use of Lexiscan again; please note this as Lexiscan(R)/Regadenson; or just Regadenson to keep it simple.
> Line 2: how is the aminophyline being adminstered; IVPush, IM, IV Piggy Back. We know how its given; but since this is policy we should be clearer for joint comission reasons.
> If there are any other sections in this policy where drug administration is not clear, or if brand names are used. Please correct those as well.
> thanks
>
> A. NM technologist will administer the Regadenson. Peripheral IV is flushed with saline and prepared for injection. Five mL (0.4 mg) of Lexiscan is given over rapid injection 10-15 seconds, followed immediately by a 5 ml saline flush over 10-15 seconds. Cardiolite is injected 30-40 seconds after the saline flush.
> B. Have the Aminophylline ready for the physician, NM technologist, NP, Nurse, PA, exercise physiologist or exercise specialist to administer if needed to counteract any adverse response. Standard dose is 50 to 100 mg over 30 to 60 seconds in doses ranging from 50 to 250mg. In the case of severe hypotension, the patient should be placed in a supine position with the head tilted down if necessary, before administration of Aminophylline.
> If 250mg of Aminophylline does not relieve chest pain symptoms

Draft saved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 6/25/2024, 5:02PM EDT

Edited by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 6/25/2024, 5:04PM EDT

> Drug names all changed to generics. Route of aminophylline is clarified.

Last Approved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 6/25/2024, 5:04PM EDT

Last Approved by Nelson, Timothy: Exec Dir Service Line - Cardiovascular on 6/26/2024, 9:15AM EDT

Comment by Dimondo, Philip: Clinical Pharmacist on 6/27/2024, 1:34PM EDT

> no need to have parenthesis around Regadenson in first line of policy...
>
> The purpose of this protocol is to provide guidance in the administration of (Regadenson), which is used to induce vasodilation and increase coronary blood perfusion of the patient to aid in the diagnosis of coronary artery disease. Regadenson with Tc99m Sestamibi stress testing is given to any outpatients or inpatient if ordered by a provider. Regadenson is given when any reason prevents a patient from reaching an adequate level of physical exercise in which to sufficiently increase the myocardial blood flow for the purpose of evaluation of coronary artery disease.

Draft saved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 6/27/2024, 1:38PM EDT

Edited by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 6/27/2024, 1:41PM EDT

> Removed parentheses in first paragraph

Last Approved by Smith, Amie: Mgr Diagnostic Heart and Vascular Service Line on 6/27/2024, 1:41PM EDT

Last Approved by Nelson, Timothy: Exec Dir Service Line - Cardiovascular on 7/1/2024, 10:19AM EDT

Consent Agenda Item

Status **Draft** PolicyStat ID **16061462**

Origination	12/9/2020	Owner	Nicholas Torney: Clin Pharmacy Utilization Spec
Last Approved	N/A		
Effective	N/A	Area/ Department	Pharmacy
Last Revised	N/A	Applicability	MMC, KMHC, POMH
Next Review	N/A		

Rabies Prophylaxis Post-Exposure Procedure for Nursing and Pharmacy

Purpose

To provide a process for Rabies Prophylaxis Post-Exposure.

Procedure

At the discretion of the physician/provider, rabies immunization will be initiated for all bite exposures (unless rabies can be excluded), and for all non-bite exposures if the animal is suspected of having rabies per the Center for Disease Control (CDC) guidelines.

Nursing

A. Obtain information from the patient including:
    1. What species of animal.
    2. Was the animal captured.
    3. If known, has the animal been properly vaccinated against rabies.
    4. Obtain patient's rabies vaccination/immunization history; including year of occurrence.

B. Notify proper law enforcement agency.

C. Perform local wound care:
    1. Follow Universal Precautions.
    2. Thoroughly scrub wound with soap solution and flush with copious amounts of water.

3. Rinse with Betadine solutions.
4. If indicated, provide tetanus prophylaxis.
5. Provide measures (antibiotics as ordered) to control wound infection.

D. Immunize:
    1. Always refer to the most recent manufacturer's package circular for up-to-date instructions
    2. Administer Rabies Immune Globulin as soon as possible in accordance with instructions delineated in the package insert.
        a. If there is a visible bite present immune globulin should be administered intradermally around the site of the bite.
        b. The remainder of the immune globulin dose can be given into the lateral thighs and into the opposite deltoid as the vaccine.
    3. Human Diploid Cell Vaccine 1mL will be given on days 0, 3, 7, 14. Administered into the deltoid muscle.
        a. Prior to discharge from emergency care and after administration of first rabies vaccination patients will be a give a prescription for continuation of the vaccination series. Pharmacist will fill out and send with patient along with CDC Rabies Vaccine information sheet.
        b. If the patient plans to receive the remaining vaccine series at the Foster Family Community Health Center (FFCHC) Urgent Care, the pharmacist will fax a copy of the prescription to FFCHC Urgent Care (Fax Number: 231-935-8708) and to the Munson Medical Center (MMC) Pharmacy Buyers (Fax: 231-935-2767). Under fax speed dials select option 8 (Pharm Rabies Fax). This will send to both FFCHC and Pharmacy Buyers.
        c. Nurse or nurse designee will fax the bite report to the County Health Department
        d. FFCHC and MMC Pharmacy Buyers will coordinate vaccine acquisition and delivery.
    4. Observe patient for 20 minutes after injection for signs of anaphylactoid symptoms.

E. A clinical record will be generated for the initial visit and for each return visit for the immunization series.

F. Record vital signs for each visit and document the time, dose, and site of each injection and the initials of the nurse administering the injection. Follow guidelines set forth by the CDC.

Pharmacy

A. Verify need for rabies vaccine and/or rabies immune globulin
    1. ~~Type of bite, ability to quarantine, ability to send animal for testing~~
    2. ~~Previous immune globulin or vaccines~~
    3. ~~Time of bite – per the CDC there is no time limit for treatment. However, if it is~~

~~greater than 7 days post-exposure/bite, no immune globulin should be given.~~

(RIG)

1. Type of bite, ability to quarantine, ability to send animal for testing
2. Previous immune globulin or vaccines. **Note**: RIG is not recommended for use in persons with a history of complete rabies vaccination (preexposure or postexposure prophylaxis) and documentation of antibody response.
3. Timing of bite – per the CDC there is no time limit for treatment.
    a. If rabies vaccine was initiated without RIG, RIG may be administered through the seventh day after the administration of the first dose of the vaccine (day 0). Administration of RIG is not recommended after the seventh day post vaccine since an antibody response to the vaccine is expected during this time period.

B. Mixing Products

1. Rabies Vaccine
    a. All parts contained in the package, follow directions for mixing
    b. Remove needle used to mix and replace with IM needle
2. Rabies Immune Globulin (RIG)
    a. ~~20unit/kg based on actual body weight, round dose according to Adult Monoclonal Antibody, Biologic and Blood Product Dose Rounding Program Policy.~~20unit/kg based on actual body weight, round dose to the nearest 20 units. No more than the recommended dose should be given, as RIG might partially suppress active production of antibody response.
    b. Be aware that vials may have overfill and you may be able to obtain the full dose from fewer vials. Email Pharmacy-IS with the number of vials used for each patient.
    c. Draw dose into syringe of appropriate volume.
        i. Adult thigh = 3 mL
        ii. Adult shoulder = 2 mL
        iii. Pediatrics

Amounts of Medication

Location	Age	Amount
Deltoid muscle	6 to 15 yrs.	0.5 mL
Ventrogluteal	3 to 6 yrs. 6 to 15 yrs.	1.5 mL 1.5 to 2.0 mL
Dorsogluteal	6 to 15 yrs.	1.5 to 2.0 mL
Vastus lateralis	Birth to 1.5 yrs 1.5 to 3 yrs. 3 to 6 yrs. 6 to 15 yrs.	0.5 mL 1.0 mL 1.5 mL 1.5 to 2.0 mL

Amounts of Medication

Location	Age	Amount
Deltoid muscle	6 to 15 yrs.	0.5 mL
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Dorsogluteal	6 to 15 yrs.	1.5 to 2.0 mL
Vastus lateralis	Birth to 1.5 yrs 1.5 to 3 yrs. 3 to 6 yrs. 6 to 15 yrs.	0.5 mL 1.0 mL 1.5 mL 1.5 to 2.0 mL

C. Continued Vaccine Doses - follow instructions above under Nursing Process D, 3, (a - d)

D. Pharmacist to determine if 5th dose (Day 28) needed due to patient immunocompromised status, per CDC criteria:

1. Active treatment for solid tumor and hematologic malignancies
2. Hematologic malignancies associated with poor responses to COVID-19 vaccines regardless of current treatment status (e.g., chronic lymphocytic leukemia, non-Hodgkin lymphoma, multiple myeloma, acute leukemia)
3. Receipt of solid-organ transplant or an islet transplant and taking immunosuppressive therapy
4. Receipt of chimeric antigen receptor (CAR)-T-cell therapy or hematopoietic stem cell transplant (within 2 years of transplantation or taking immunosuppressive therapy)
5. Moderate or severe primary immunodeficiency (e.g., common variable immunodeficiency disease, severe combined immunodeficiency, DiGeorge syndrome, Wiskott-Aldrich syndrome)
6. Advanced or untreated HIV infection (people with HIV and CD4 cell counts less than 200/mm3, history of an AIDS-defining illness without immune reconstitution, or clinical manifestations of symptomatic HIV)
7. Active treatment with high-dose corticosteroids (i.e., 20 or more mg of prednisone or equivalent per day when administered for 2 or more weeks), alkylating agents, antimetabolites, transplant-related immunosuppressive drugs, cancer chemotherapeutic agents classified as severely immunosuppressive, tumor necrosis factor (TNF) blockers, and other biologic agents that are immunosuppressive or immunomodulatory
8. If yes to any of the above, Pharmacist to fill out follow up vaccine form to include additional vaccine* (Day 0, Day 3, Day 7, Day 14, *Day 28)

Kalkaska Memorial Health Center (KMHC)/Paul Oliver Memorial Hospital (POMH)

A. Pharmacist or nurse prepares the prescription, using the approved order template (Rabies Post Exposure Prophylaxis-p.pdf (mhc.net))

B. Vaccine prescription is communicated to the Infusion Center.

C. ~~(POHM Only) Vaccine prescription is communicated to the with the MMC Pharmacy Buyer.~~

D. ~~(POHM Only) Vaccine is sent to Infusion Center just prior to scheduled appointment by MMC~~

~~Pharmacy Buyer and charged to patient.~~

Author:
~~Lairyn Kenney~~Nicholas Torney, PharmD, ~~BCPS~~BCIDP

Approval Signatures

Step Description	Approver	Date
Document Owner	Nicholas Torney: Clin Pharmacy Utilization Spec	Pending

Applicability

Kalkaska Memorial Health Center, Munson Medical Center, Paul Oliver Memorial Hospital

History

Consent Agenda Item

Current Status: *Active*	**PolicyStat ID:** *9828654*
Origination:	*8/26/2011*
Effective:	*10/13/2021*
Last Approved:	*10/13/2021*
Last Revised:	*10/13/2021*
Next Review:	*10/12/2024*
Owner:	*Heather Tolfree: Mgr Pharmacy - CPS*
Area/Department:	*Pharmacy*
Standards & Regulations:	
Tags:	*Policy*
Applicability:	*MHC Hospital System w/KMHC (MMC, Cadillac, Charlevoix, Grayling, KMHC, Otsego, Manistee, POMH)*

MUNSON MEDICAL CENTER
MUNSON HEALTHCARE

Topical Patch Policy for MRI

Purpose

All topical patches for medication delivery shall be removed prior to Magnetic Resonance Imaging (MRI) procedures and replaced after the MRI at Munson Healthcare (MHC) Facilities. The purpose is to avoid inadvertent skin burning due to some patches that contain metal.

Procedure

Inpatient

MRI Patient Information and Assessment Form 4941

A. The nurse taking care of the patient shall remove all patches just prior to the patient transfer. A question on the Magnetic Resonance Imaging Patient Information/Assessment Form *Question 10 on the RN Radiology MRI Checklist* serves as a reminder for the nurse to remove all patches. This must be checked off and patches that were removed listed.

B. The MRI technologist will verify that all patches were removed by reviewing the Magnetic Resonance Imaging Patient Information/Assessment Form *RN Radiology MRI checklist*. When the patient arrives for the procedure, the MRI technologist will again inquire of the patient and/or caregivers for the presence of topical patches and will remove them prior to the procedure.

C. *A task will be sent to the nurse's PAL under CareSet when the patient has completed the MRI and has a topical patch as an active order that states "This patient has one or more topical patches ordered. Now that the MRI exam has been completed, replace TOPICAL PATCHES as needed".* Upon completion of the MRI exam, the nurse will review the patient's orders and replace patches as needed/indicated.

Outpatient

A. The registration staff will include a message about topical patches when scheduling patients for MRI. Patients will be instructed to bring an extra patch with them to replace the patch that will be removed immediately prior to the MRI procedure.

B. When the patient arrives for the procedure, the MRI technologist will again inquire of the patient and/or caregivers for the presence of topical patches and will remove them prior to the procedure.

Disposal of Topical Patches

A. Patches are disposed of in purple waste containers EXCEPT for controlled substances such as fentanyl (Duragesic®) and buprenorphine (Butrans®).

B. To dispose of controlled substance patches, fold and place in the ~~Cactus controlled substance~~ controlled substance waste receptacle. The disposal must be done with a witness and documented by both staff using the hospital-approved documentation process (Pyxis is the preferred method for documenting waste when Pyxis is available).

Author:
Julie Botsford, PharmD
~~Connor Anderson, PharmD/MBA Candidate 2021~~

Attachments

No Attachments

References

Transdermal patch administration and MRI-2020. Hosp Pharm 2022; 57:117-120.

Approval Signatures

Step Description	Approver	Date
System Policy Oversight Committee	Terri Fries: Document Mgmt Spec	10/13/2021
P&T Committees @ Each Site	Ronald Villamaria: Mgr Pharmacy	10/13/2021
P&T Committees @ Each Site	Jennifer Couillard: Mgr Pharmacy	9/15/2021
P&T Committees @ Each Site	Megan Willemstein: Dir Interim	9/8/2021
P&T Committees @ Each Site	Kirsten Copus: Mgr Pharmacy	8/10/2021
P&T Committees @ Each Site	Bruce Ahlich: Coord Clinical Pharmacy	7/6/2021
P&T Committees @ Each Site	William Evans: Mgr Pharmacy	6/29/2021
P&T Committees @ Each Site	Philip Dimondo: Clinical Pharmacist	6/14/2021
P&T Committees @ Each Site	Kay Hanna-Deluca: Pharmacy Director	6/1/2021
System Pharmacy Leadership Group	Heather Tolfree: Mgr Pharmacy	5/26/2021
Pharmacy Steering	Cathi Cornelius: Clin Pharmacy Utilization Spec	5/25/2021
Policy Owner	Heather Tolfree: Mgr Pharmacy	5/19/2021

Applicability

Cadillac Hospital, Charlevoix Hospital, Grayling Hospital, Kalkaska Memorial Health Center, Manistee Hospital, Munson Medical Center, Otsego Memorial Hospital, Paul Oliver Memorial Hospital

Unique Plan Description: NICU Dexamethasone Taper (DART) - M
Plan Selection Display: NICU Dexamethasone Taper (DART)
PlanType: Medical
Version: 2
Begin Effective Date: 2/13/2024 2/13/2024 9:50
End Effective Date: Current
Available at: ***MMC***

NICU Dexamethasone Taper - Initial
Medications

Parenteral Route(NOTE)*

- ☐ dexAMETHasone *NICU* IVPB Syringe
  0.075 mg/kg, IVPB, Syringe, q12hr, 6 dose/occurrence
- ☐ **+3 Days** dexAMETHasone *NICU* IVPB Syringe
  0.05 mg/kg, IVPB, Syringe, q12hr, Start T+3, 6 dose/occurrence
- ☐ **+6 Days** dexAMETHasone *NICU* IVPB Syringe
  0.025 mg/kg, IVPB, Syringe, q12hr, Start T+6, 4 dose/occurrence
- ☐ **+8 Days** dexAMETHasone *NICU* IVPB Syringe
  0.01 mg/kg, IVPB, Syringe, q12hr, Start T+8, 4 dose/occurrence

Enteral Route(NOTE)*

- ☐ dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL
  0.075 mg/kg =, Gastric Tube, Soln, q12hr, 6 dose/occurrence
- ☐ **+3 Days** dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL
  0.05 mg/kg =, Gastric Tube, Soln, q12hr, Start T+3, 6 dose/occurrence
- ☐ **+6 Days** dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL
  0.025 mg/kg =, Gastric Tube, Soln, q12hr, Start T+6, 4 dose/occurrence
- ☐ **+8 Days** dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL
  0.01 mg/kg =, Gastric Tube, Soln, q12hr, Start T+8, 4 dose/occurrence

System Auto-Generated

- ☐ Last Plan Review Date
  Pharmacy

Route Change - Second Step Start
Medications

Parenteral Route(NOTE)*

- ☐ dexAMETHasone *NICU* IVPB Syringe
  0.05 mg/kg, IVPB, Syringe, q12hr, 6 dose/occurrence
- ☐ **+3 Days** dexAMETHasone *NICU* IVPB Syringe
  0.025 mg/kg, IVPB, Syringe, q12hr, Start T+3, 4 dose/occurrence
- ☐ **+5 Days** dexAMETHasone *NICU* IVPB Syringe
  0.01 mg/kg, IVPB, Syringe, q12hr, Start T+5, 4 dose/occurrence

Enteral Route(NOTE)*

- ☐ dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL
  0.05 mg/kg =, Gastric Tube, Soln, q12hr, 6 dose/occurrence
- ☐ **+3 Days** dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL
  0.025 mg/kg =, Gastric Tube, Soln, q12hr, Start T+3, 4 dose/occurrence
- ☐ **+5 Days** dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL
  0.01 mg/kg =, Gastric Tube, Soln, q12hr, Start T+5, 4 dose/occurrence

Route Change - Third Step Start
Medications

Parenteral Route(NOTE)*

- ☐ dexAMETHasone *NICU* IVPB Syringe
  0.025 mg/kg, IVPB, Syringe, q12hr, 4 dose/occurrence
- ☐ **+2 Days** dexAMETHasone *NICU* IVPB Syringe
  0.01 mg/kg, IVPB, Syringe, q12hr, Start T+2, 4 dose/occurrence

Enteral Route(NOTE)*

- ☐ dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL
  0.025 mg/kg =, Gastric Tube, Soln, q12hr, 4 dose/occurrence

☐ **+2 Days** dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL
0.01 mg/kg =, Gastric Tube, Soln, q12hr, Start T+2, 4 dose/occurrence

Route Change - Fourth Step Start
Medications

Parenteral Route(NOTE)*

☐ dexAMETHasone *NICU* IVPB Syringe
0.01 mg/kg, IVPB, Syringe, q12hr, 4 dose/occurrence

Enteral Route(NOTE)*

☐ dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL
0.01 mg/kg =, Gastric Tube, Soln, q12hr, 4 dose/occurrence

NICU Dexamethasone Taper (DART), NICU Dexamethasone Taper - Initial (Initiated Pending)

Medications

		Parenteral Route	
☐		dexAMETHasone (dexAMETHasone *NICU* IVPB Syringe)	0.075 mg/kg, IVPB, Syringe, q12hr, 6 dose/occurrence
☐	+3 day	dexAMETHasone (dexAMETHasone *NICU* IVPB Syringe)	0.05 mg/kg, IVPB, Syringe, q12hr, Start T+3, 6 dose/occurrence
☐	+6 day	dexAMETHasone (dexAMETHasone *NICU* IVPB Syringe)	0.025 mg/kg, IVPB, Syringe, q12hr, Start T+6, 4 dose/occurrence
☐	+8 day	dexAMETHasone (dexAMETHasone *NICU* IVPB Syringe)	0.01 mg/kg, IVPB, Syringe, q12hr, Start T+8, 4 dose/occurrence
		Enteral Route	
☐		dexAMETHasone (dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL)	0.075 mg/kg =, Gastric Tube, Soln, q12hr, 6 dose/occurrence
☐	+3 day	dexAMETHasone (dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL)	0.05 mg/kg =, Gastric Tube, Soln, q12hr, Start T+3, 6 dose/occurrence
☐	+6 day	dexAMETHasone (dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL)	0.025 mg/kg =, Gastric Tube, Soln, q12hr, Start T+6, 4 dose/occurrence
☐	+8 day	dexAMETHasone (dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL)	0.01 mg/kg =, Gastric Tube, Soln, q12hr, Start T+8, 4 dose/occurrence

NICU Dexamethasone Taper (DART), Route Change - Second Step Start (Planned Pending)

Medications

		Parenteral Route	
☐		dexAMETHasone (dexAMETHasone *NICU* IVPB Syringe)	0.05 mg/kg, IVPB, Syringe, q12hr, 6 dose/occurrence
☐	+3 day	dexAMETHasone (dexAMETHasone *NICU* IVPB Syringe)	0.025 mg/kg, IVPB, Syringe, q12hr, Start T+3, 4 dose/occurrence
☐	+5 day	dexAMETHasone (dexAMETHasone *NICU* IVPB Syringe)	0.01 mg/kg, IVPB, Syringe, q12hr, Start T+5, 4 dose/occurrence
		Enteral Route	
☐		dexAMETHasone (dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL)	0.05 mg/kg =, Gastric Tube, Soln, q12hr, 6 dose/occurrence
☐	+3 day	dexAMETHasone (dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL)	0.025 mg/kg =, Gastric Tube, Soln, q12hr, Start T+3, 4 dose/occurrence
☐	+5 day	dexAMETHasone (dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL)	0.01 mg/kg =, Gastric Tube, Soln, q12hr, Start T+5, 4 dose/occurrence

NICU Dexamethasone Taper (DART), Route Change - Third Step Start (Planned Pending)

Medications

		Parenteral Route	
☐		dexAMETHasone (dexAMETHasone *NICU* IVPB Syringe)	0.025 mg/kg, IVPB, Syringe, q12hr, 4 dose/occurrence
☐	+2 day	dexAMETHasone (dexAMETHasone *NICU* IVPB Syringe)	0.01 mg/kg, IVPB, Syringe, q12hr, Start T+2, 4 dose/occurrence
		Enteral Route	
☐		dexAMETHasone (dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL)	0.025 mg/kg =, Gastric Tube, Soln, q12hr, 4 dose/occurrence
☐	+2 day	dexAMETHasone (dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL)	0.01 mg/kg =, Gastric Tube, Soln, q12hr, Start T+2, 4 dose/occurrence

NICU Dexamethasone Taper (DART), Route Change - Fourth Step Start (Planned Pending)

Medications

		Parenteral Route	
☐		dexAMETHasone (dexAMETHasone *NICU* IVPB Syringe)	0.01 mg/kg, IVPB, Syringe, q12hr, 4 dose/occurrence
		Enteral Route	
☐		dexAMETHasone (dexAMETHasone *NICU* Oral SOLN 0.5 mg/5 mL)	0.01 mg/kg =, Gastric Tube, Soln, q12hr, 4 dose/occurrence

Guidelines for the Diagnosis and Treatment of Paroxysmal Sympathetic Hyperactivity - "Sympathetic Storming"
Munson Medical Center (June 2020)

Background:

- **Paroxysmal sympathetic hyperactivity (PSH)** is the dissociation between the SNS and PSNS. It most commonly occurs after various causes of brain injury (traumatic/anoxic brain injury, cerebral vascular accident), and become more apparent after withdrawal from sedation and analgesic medications. PSH produces complications such as tachycardia, tachypnea, hyperthermia, and loss of muscle tone. No standardized set of diagnostic criteria has been established, but general agreement that PSH comprises of a collection of symptoms from a centrally mediated episodic increase in, or deregulation of sympathetic output (see below). Symptom onset typically occurs within first two weeks after brain injury. Episodes often have a rapid onset, frequently due to an identifiable trigger (ex ET tube suctioning, patient repositioning, pain, bladder/bowel distention, etc).
- **Considerations include:** 1) time of assessment relative to injury, 2) minimum number of clinical features, 3) duration, 4) etiology (traumatic brain injury, ischemic stroke, anoxic injury, intracerebral hemorrhage) 5) Clinical Feature Scale (CFS) + Diagnosis Likelihood Tool (DLT) score (PSH diagnostic likelihood – see table on page 3).

Diagnosis:

Clinical Presentation

Symptom	Definition
Tachycardia	>120 bpm (>100 bpm on beta blocker)
Tachypnea	>25 breaths/min
Fever	>38.3°C
Diaphoresis	Clinical judgment
Hypertension	Systolic >160 mmHg (>140 if on beta blocker)
Dystonia	Clinical judgment
Posturing	Clinical judgment

Differential Diagnosis

Disease state	Measurable differences
Infection	Patients with infection may also be experience storming. Storming can be diagnosed 72 hours after infection is cleared.
Neuroleptic malignant syndrome	High CPK, bradykinesia, and elevated white blood cell count. Causative agent can be identified, most often an antipsychotic or dopaminergic drug.
Malignant hyperthermia	Elevated CPK common, myoglobinuria, and hypotension
Increased ICP	Bradycardia present
Central fever	Hypertension and diaphoresis are usually not present
Autonomic dysreflexia	Bradycardia present
Seizure	Clinical symptoms and EEG for sub-clinical seizures
Agitation	Absence of persistent sympathetic symptoms
Other conditions	Narcotic withdrawal, serotonin syndrome, baclofen withdrawal, thyroid storm, pheochromocytoma

Supportive Care Treatment Considerations (ALL PATIENTS):

Non – Pharmacologic / Supportive Care Therapy
Control room environment (avoid triggers of PSH) - Cooler room temperature - Maintain quiet, low stimulation environment - Group patient care activities   ○ Consider pretreatment with an abortive therapy PRN agent (ex. benzodiazepine, see below) prior to significant care activities
Early implementation of enteral nutrition and maintain adequate hydration - TBI patients have up to 3x the baseline energy consumption during PSH as well as volume loss with diaphoresis
Utilize non-pharmacologic cooling techniques for fevers (cooling packs/blankets, fans, etc) - Paroxysm-associated fevers typically do not respond to acetaminophen
Maintain adequate bowel regimen (avoid abdominal distension, constipation)
Avoid use of antipsychotics - Lack of efficacy with PSH and may worsen cognitive recovery after TBI - Neuroleptic malignant syndrome is difficult to distinguish between PSH

Author: Dina Kennedy, PharmD, BCPSApproved: MMC P&T Committee- 3/2/2015, Reviewed: MMC P&T Subcommittee- 2/26/2015

Guidelines for the Diagnosis and Treatment of Paroxysmal Sympathetic Hyperactivity - "Sympathetic Storming"
Munson Medical Center (June 2020)

Abortive and Preventative Pharmacotherapy for PSH*

Medication	Classification	Target Symptoms	Initial Dose	Titration	Max Dose / Precautions
Preventative Therapy (Long-Term Therapy to Prevent PSH)					
Propranolol	Non-selective beta blocker	Hypertension, tachycardia, diaphoresis and possibly dystonia	20-60 mg PO q4-6 hrs	10 mg q8 hrs	640 mg/day
Labetalol			10-20 mg IV push q1 hr 100-200 mg oral q8 hr	10 mg per dose	300 mg/day
Clonidine	Alpha-2 agonist	Hypertension, tachycardia, dystonia, anxiety	0.1 mg PO q8-12 hrs	0.1-0.3 mg q8-12 hrs	2.4 mg/day
Dexmedetomidine	Alpha-2 agonist (centrally selective)		0.2 mcg/kg/hr	0.1 mg/kg/hr q15 min	1.5 mcg/kg/hr (ICU only, can be transitioned to clonidine)
Baclofen	GABA-B agonist	Spasticity, dystonia, clonus, post-traumatic pain (adjunct)	5 mg PO q8 hrs	5 mg q8 hrs every 3 days	80 mg/day
Bromocriptine	Dopamine agonist	Hyperpyrexia and diaphoresis	2.5-5 mg PO q8 hrs	2.5 mg q 2-3 days	40 mg/day *Can lower seizure threshold *CI in uncontrolled HTN
Abortive Therapy (Acute Treatment of PSH)					
Morphine*	Opioid agonist	Most features (tachycardia, HTN, allodynia)	2 -8 mg IV push 1-2 mg/hr IV infusion	1 mg per hour	8 mg/hr *Likely most effective opiate
Fentanyl			25 – 100 IV push 25-50 mcg/hr IV infusion	25 mcg per hour	300 mcg/hr Monitor breathing and sedation
Lorazepam	GABA-A agonist	Agitation, hypertension tachycardia, dystonia, spasticity (diazepam), and posturing	2-4 mg IV/PO q4-8 hrs	2 mg q8 hrs	Max single dose 4 mg
Diazepam			5-10 mg IV/PO q4-8 hrs	5 mg q8 hrs	60 mg/day
Midazolam			1-2 mg IV/PO q4-8 hrs	1 mg q8 hrs	20 mg/day If scheduled may be used as preventative
Propofol	GABA-A modulator	Most features / refractory symptoms	20 mcg/kg/min 10-20 mg bolus	5-10 mcg/kg/min	50 mcg/kg/min Intubated patients only Preventative while on continuous infusion

***Multimodal approach often required** *(ie medications from multiple different pharmacologic categories)*

Guidelines for the Diagnosis and Treatment of Paroxysmal Sympathetic Hyperactivity - "Sympathetic Storming"
Munson Medical Center (June 2020)

TABLE 1. PAROXYSMAL SYMPATHETIC HYPERACTIVITY—ASSESSMENT MEASURE

Clinical Feature Scale (CFS)

	0	1	2	3	Score
Heart rate	<100	100–119	120–139	≥140	
Respiratory rate	<18	18–23	24–29	≥30	
Systolic blood pressure	<140	140–159	160–179	≥180	
Temperature	<37	37–37.9	38–38.9	≥39.0	
Sweating	Nil	Mild	Moderate	Severe	
Posturing during episodes	Nil	Mild	Moderate	Severe	
			CFS subtotal		

Severity of clinical features	Nil	0	
	Mild	1–6	
	Moderate	7–12	
	Severe	≥13	

Diagnosis Likelihood Tool (DLT)

Clinical features occur simultaneously		
Episodes are paroxysmal in nature		
Sympathetic over-reactivity to normally non-painful stimuli		
Features persist ≥3 consecutive days		
Features persist ≥2 weeks post -brain injury		
Features persist despite treatment of alternative differential diagnoses		
Medication administered to decrease sympathetic features		
≥2 episodes daily		
Absence of parasympathetic features during episodes		
Absence of other presumed cause of features		
Antecedent acquired brain injury		
(Score 1 point for each feature present)	DLT subtotal	

Combined total (CFS + DLT)			

PSH diagnostic likelihood	Unlikely	<8	
	Possible	8–16	
	Probable	>17	

PSH, paroxysmal sympathetic hyperactivity.

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10. Thomas A, Greenwald BD. Paroxysmal Sympathetic Hyperactivity and Clinical Considerations for Patients with Acquired Brain Injuries. Am J Phys Med Rehabil. 2019; 98(1): 65-72.

Author: Trevor Warner, PharmD, BCCCO Approved: MMC P&T Committee TBD, Reviewed: MMC P&T Subcommittee- TBD

Eptifibatide Reversal

May 2024

SITUATION

- Eptifibatide is formulary agent GP2b3a at MHC
  - MMC Approved for use in PCI and Neurointerventional Thrombectomy
    - Bolus or Bolus + Continuous Infusion Therapy
- Eptifibatide Increases risk of Major Bleeding
  - Currently not listed on MHC Antithrombotic Bleeding Reversal Guideline

BACKGROUND

- Eptifibatide Incidence of Major Bleeding in SELECT Published Literature
  - *Bleeding resulting in discontinuation of the study drug was more frequent among patients receiving Eptifibatide than placebo (4.6% versus 0.9% in ESPRIT, 8% versus 1% in PURSUIT, 3.5% versus 1.9% in IMPACT II)*
- Eptifibatide Pharmacokinetics/Dynamics (Uptodate LexiDrug Index)
  - *Duration: Platelet function restored ~4 to 8 hours following discontinuation (Tardiff, 2001)*
  - *Half-life elimination: ~2.5 hours*
- Eptifibatide Reversal Strategies are limited in Published Literature
  - Guidelines for Reversal of Antithrombotics in ICH; NeuroCrit Care 2016
    - *Stop drug infusion, no platelets or DDAVP for reversal*
  - PI FDA Labeling:
    - *In patients undergoing percutaneous coronary interventions, patients receiving eptifibatide experience an increased incidence of major bleeding compared to those receiving placebo without a significant increase in transfusion requirement. Special care should be employed to minimize the risk of bleeding among these patients. If bleeding cannot be controlled with pressure, infusion of eptifibatide and concomitant heparin should be stopped immediately.*
  - Reiter RA, et al. . Desmopressin antagonizes the in vitro platelet dysfunction induced by GPIIb/IIIa inhibitors and aspirin. Blood. 2003;102:4594-4599.
    - *DDAVP (0.3 µg/kg in 50 mL physiologic saline) was infused over 30 minutes in Twenty healthy, nonsmoking, male volunteers (19 to 40 years, body mass index [BMI] 24 ± 3 kg/m^2)*
      - *DDAVP accelerated the normalization of CADP-CT and CEPI-CT after the stop of eptifibatide infusion with a maximum effect at 1.5 hours to 2 hours. DDAVP accelerates normalization of the in vitro platelet dysfunction induced by GPIIb/IIIa inhibitors (+/-aspirin)*

ASSESSMENT & RECOMMENDATION

- Increased use of Eptifibatide at MMC will lead to increase incidence of Major bleeding
- Add Eptifibatide to MHC Antithrombotic Reversal Guidelines
  - Mirror Recommendations Currently Deployed for Aspirin and p2Y12 Agents
    - No antidote available
    - For intracranial hemorrhage (ICH), may consider desmopressin (DDAVP) 0.4 mcg/kg **(ABW)** IV in 50 mL NS x 1 over 30 minutes (weak level of evidence).[1,2]
    - For patients with bleeding at sites where expanding blood volume is problematic (such as intraspinal, intraocular, retroperitoneal, intra-articular, pericardial, or intramuscular with compartment syndrome), may consider desmopressin 0.3 mcg/kg **(ABW)** IV in 50 mL NS x 1 over 30 minutes (weak level of evidence).
    - MHC pharmacists suggest max dose of 40 mcg. Actual body weight used to facilitate timely administration.
    - Caution: Serial doses associated with tachyphylaxis, hyponatremia, and seizures.
    - Platelet transfusion is <u>not</u> recommended for patients with <u>antiplatelet-associated</u> intracranial hemorrhage who will not undergo a neurosurgical procedure
    - Platelet transfusion for antiplatelet reversal is reserved for use prior to neurosurgery at the discretion of neurosurgeon

Insulin Pump Basics for Pharmacy Personnel

Background:

Insulin pumps contain rapid acting (or occasionally short acting i.e. regular) insulin that is typically infused continuously at a variable rate, with extra delivered as bolus doses in response to high blood glucose or carbohydrate intake.

Insulin pumps may or may not be used along with a continuous glucose monitor (CGM). Pumps may be fully integrated with the CGM, allowing for minute-to-minute automatic adjustment of insulin, including with some pumps automatic bolus administration; partially integrated, allowing for temporary reduction or suspension of insulin infusion when the blood glucose is perceived to be rapidly dropping or reaches a set threshold and automatic calculation (but not administration) of correctional doses; or independent, requiring the user to preprogram all basal and bolus doses and manually enter blood glucose values.

Definitions:

Basic Pump Settings -

Basal rate: the amount of "background" insulin infusion continuously. Expressed in units/hr. This rate may change at predetermined times daily.

Time Segments: Specific times in a personal profile that specific pump parameters or settings are active.

Basal Pattern and/or Personal Profile: a defined schedule of basal rates. Many pumps allow users to program a number of different basal patterns to adjust for various conditions that may impact insulin requirements (ex. Active Days, Work or School Days, Weekends, Sick Days). Personal Profiles include other settings as well (carb ratio, correction factor, etc)

Carb ratio (aka Insulin-to-Carbohydrate Ratio): The number of carbohydrates covered by one unit of insulin. Expressed as gram/unit. Used to calculate a Nutritional or Mealtime Bolus.

Correction Factor (aka Insulin Sensitivity Factor): The amount of blood glucose decrease expected with the administration of 1 unit of insulin. Expressed as mg/dL/unit. Used to calculate a Correction Bolus.

Target Glucose: A specific glucose goal used to calculate a correction bolus. This is not the same as the "target range" which is the ideal range of glucose for people with diabetes (typically 70-180mg/dL)

Correction bolus: A dose of insulin given in an attempt to decrease glucose to a predetermined target. 1 unit of insulin is given for every increment of the Correction Factor that the current glucose is over the Target Glucose.

Pump Components –

Infusion set/tubing: the tubing system that attaches to the end of the insulin cartridge or reservoir and connects the pump to the patient. Not used with tubeless pumps (ex. Omnipod)

Cannula: A tiny, flexible section of the infusion set that is inserted under the skin through which insulin is delivered.

Insertion device and/or Introducer Needle: A device used to insert the cannula subcutaneously. The needle is removed after insertion leaving just the soft cannula.

Cartridge or Reservoir: component that holds insulin within the pump. Most pumps utilize reservoirs that are filled by the patient (typically by transferring insulin from a vial utilizing a needle and syringe). A few may use prefilled insulin cartridges.

Continuous Glucose Monitor (CGM): a device that displays interstitial glucose values obtained from a subcutaneous sensor. The sensor connects wirelessly to a separate monitoring device, app, and/or the pump. CGM readings (interstitial) often lag changes in blood glucose, so fingerstick or venous blood glucose should be used if rapidly changing.

Advanced Pump Settings and Functionality –

Hybrid Closed Loop (HCL) or Automated Insulin Delivery (AID) – a system where an insulin pump can self adjust insulin delivery based solely on input from the CGM without user intervention or manual data entry.

Advance Hybrid Closed Loop (AHCL) – similar to a hybrid closed loop with the addition of the ability to deliver automatic correction boluses.

Artificial Pancreas – an investigational. device being developed to mimic the human pancreas through combining an insulin pump and CGM censor.

Insulin Duration – the amount of time that insulin is active and available in the body after a bolus is given. Used to calculate insulin on board.

Insulin Stacking – a phenomenon that occurs when multiple boluses of insulin are given in close proximity (i.e. repeat bolus while there is still insulin on board). Can lead to hypoglycemia

Low Glucose Suspend (LGS, aka Threshold Suspend) – Function that will shut off insulin delivery when CGM values drop below a given level. Usually accompanied by an audible alarm.

Predictive Low Glucose Suspend (PLGS) – Similar to LGS, but interrupts insulin delivery in response to predicted rather than actual glucose levels.

Reverse Correction (aka negative correction) – function of some pumps that will adjust (decrease) a nutritional bolus by a set factor if the blood glucose level at the time of the meal is below the target range.

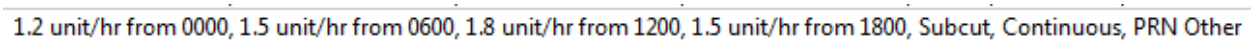
Temporary Rate – A pump feature that allows a short term adjustment to the basal rate (ex. may be used during exercise).

Time in Range – The amount of time a patient spends in the target range during a given period of time (1 day, 7 days, etc). Usually expressed as a percent.

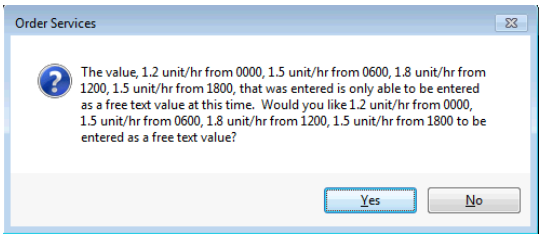
Medication History:

1. Type in "insulin pump" to see all options. Select Insulin PUMP – Insulin Type Utilized at Home and choose the sentence that corresponds to the type of insulin in the pump.
2. Three additional order sentences must be completed to document the patient's individual pump settings:
    - Insulin PUMP – Basal Rate
    - Insulin PUMP – Carb Ratio
    - Insulin PUMP – Insulin Sensitivity/Target
3. Predefined order sentences have been created for each order. The Dose field has entries with "underline" placeholders for values that need to be provided by patients/patients' caregivers.

4. Replace the underline characters with those values and remove any text that is not necessary, i.e. instances where patients only have two basal ranges



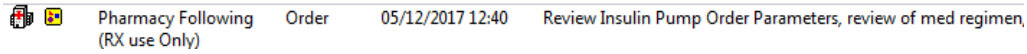
5. After replacing the underline characters, press the <enter> key. A message will be displayed asking if the value should be entered as a freetext dose. Select the <Yes> button.



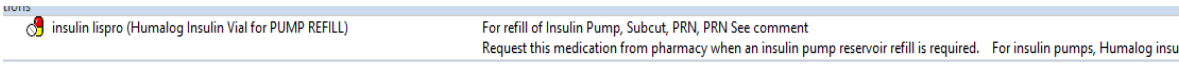
6. If patient uses a pump with closed loop functionality or automatic insulin adjustments (i.e. rates and ratios vary based on feedback from continuous glucose monitor), document total basal and bolus (both nutritional and correctional if available, otherwise combined total bolus insulin) delivered in last 24 hours AND the average for the last 7 days.
7. If unable to obtain pump settings, please enter task for floor pharmacist to follow up.
8. If all these steps are complete, the provider will be able to "continue" the order during medication reconciliation and the appropriate parameters will flow to the MAR. The provider will also be prompted at that time to order the insulin pump powerplan.

Medication Verification and Pharmacy Following Task:

1. Insulin Pump – Basal Range, Insulin Pump – Carbohydrate Ratio and Insulin Pump – Insulin Sensitivity/Target orders
    a. These orders will display in PharmNet but verification in PharmNet will not be available. Verification in PharmNet creates issues for the Discharge Med Rec process.
    b. However, since every medication order, aside from auto-verified orders, requires review by a pharmacist, a Pharmacy Following order will be included on the Insulin Pump PowerPlan.



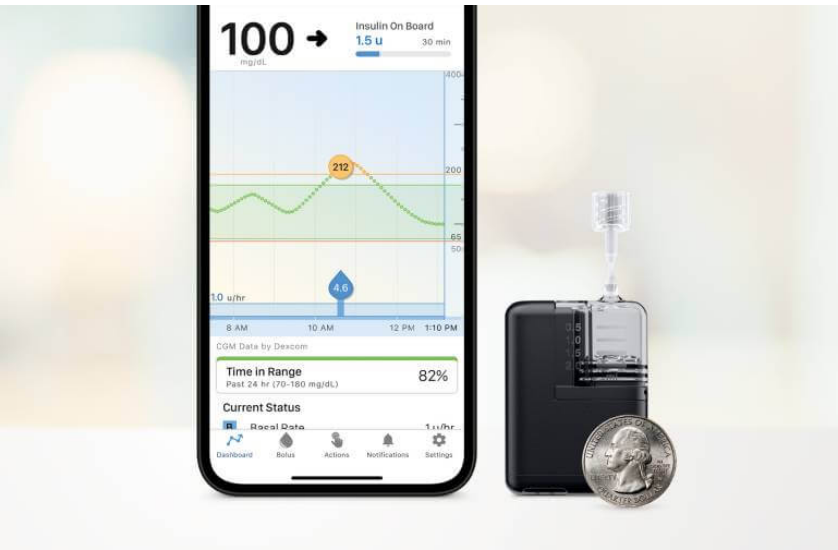
2. When completing the Pharmacy Following task:
    a. The pump setting orders should be reviewed, especially for settings with potential entry errors, i.e. trailing zeroes.
    b. Identify the insulin that is going to be utilized for refill of the insulin pump. All rapid acting insulin will be substituted to formulary Humalog, unless patient insists on using non-formulary insulin from home. Patients on U500 regular insulin MUST provide home supply.
        i. A Humalog Insulin Vial for Pump Refill order is included in the PowerPlan.



            1. The order comment on this order instructs the nurse to: “Request this medication from pharmacy when an insulin pump reservoir refill is required.”
        ii. Humalog insulin is interchangeable with Novolog, Apidra, or any other rapid acting insulin for insulin pump reservoir refills.
        iii. If a patient is using their home supply, ensure the product is identified and labeled.

Tandem Mobi Mini

www.tandemdiabetes.com



- Pump with tubing
- Insulin fill by user
- Automated mode option – Control-IQ
- Controlled by phone app
- To read manual mode settings:
    - From app dashboard screen, access settings (bottom for right icon in photo)
    - Tap “pump”
    - Tap “personal profiles”
    - Select the profile that is marked as active
    - Tap each “time segment” to see the basal rate, correction factor, carb ratio, and target BG that is active in that particular time segment
- Want more info?
    - From the dashboard screen, scroll down to see the Control-IQ status. If “on” smart pump technology is active
    - You can also see current setting (within current time block) from the dashboard
    - The icon next to the basal rate tells you if the pump is running the profile rate or if Control-IQ is modifying according to CGM activity

B	Basal insulin is programmed and being delivered.
B	Control-IQ technology is increasing basal insulin delivery.
B	Control-IQ technology is decreasing basal insulin delivery.
0	Basal insulin delivery is stopped and a basal rate of 0 u/hr is active.

- To turn off pump: press and hold gray button on pump for 20 seconds

6/2024

Minimed 780G, 770G, and 630G

www.medtronicdiabetes.com

- Pump with tubing
- Insulin fill by user
- Automated mode option SmartGuard (770G and 780G) with meal detection technology (780G) or manual mode only (630G)
- Settings may be accessed via pump or app
- If pump is in sleep mode, press any button to wake up device
    - Press center button to display screen lock message
    - Press and hold the upper right button (diamond shape) to unlock
- To read manual mode settings:
    - Hit the center button to go to the home screen
    - Use arrows to highlight and select the insulin vial icon
    - Select Basal > Basal Patterns
        - Each basal pattern will display the 24hr insulin total delivered
        - A check mark appears next to the currently active pattern
        - Select to active basal pattern to view details
    - Return to home screen
    - Select the gear icon
    - Select Bolus Wizard Setup
    - Scroll through the carb ratio, insulin sensitivity, and BG target screens
- When SmartGuard is active, a shield with the BG target will appear on home screen (see pic)
    - From pump home screen, select the graph icon
    - Select History > Summary
    - Select the time from you want to view (recommend at minimum 1 day and 7 day)
    - Scroll DOWN to see:
        - TDD – total insulin delivered
        - Basal – total number of units delivered as basal
        - Bolus – total number of units delivered as bolus

Ilet Bionic Pancreas

www.betabionics.com/ilet-bionic-pancreas/

- Pump with tubing
- Insulin fill by user (Humalog or Novolog) OR use a prefilled Fiasp Pump Cartridge
- Automated mode ONLY
- No manual mode
- Controlled by app or pump touchscreen
- To read history:
    - From pump home screen, select CGM value
    - Use arrows on top of touch screen to change time period displayed
    - Record 24 hour and 7 day average total daily dose (TDD) (bottom of screen)
    - To view BG target, from home screen select Setting > Therapy and read the CGM target
        - Higher = 130mg/dL
        - Usual = 120mg/dL
        - Lower = 110mg/dL
    - Note if Sleep CGM target is on and, if so, what the target is
- To turn pump off:
    - From home screen, tap Menu icon in upper left corner
    - Tap Settings icon
    - Tap Other
    - Select Shut Down
    - Swipe right to shut down device

6/2024

Tandem T:Slim X2

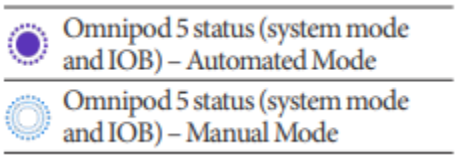
www.tandemdiabetes.com

- Pump with tubing
- Insulin fill by user
- Automated mode option (pump with Control-IQ) or manual mode only (pump with Basal-IQ)
- Controlled by app or pump touchscreen
- To unlock pump screen, tap 1-2-3 in sequential order
- To read settings:
    - From home screen, select Options > My Pump
    - If Control-IQ is on, pump is in hybrid closed loop mode
    - Select Personal Profiles
    - Select the currently active Personal Profile (the first one listed, marked as ON)
    - Scroll through to read the timed settings of basal rate, correction factor, carb ratio, and target blood glucose
    - If Control-IQ is active, record history:
        - From the home screen, select HISTORY (may need to scroll down to second page)
        - Tap Pump History
        - Select Delivery Summary to view total insulin delivery by basal and bolus types Today and 7 Day average
- To turn off pump:
    - Plug pump into power source
    - Hold Screen On/Quick Bolus button down (on the top edge of pump) for 30 seconds

Omnipod 5 and DASH

www.omnipod.com

- Tubeless pump
- Insulin fill by user
- Automated mode option (Omnipod 5) or manual only (Omnipod Dash)
- Controlled by phone app or Insulet-provided Controlled
- From the home screen, check the icon in the upper right corner of status bar
    - Purple icon = pump in automated mode
    - Clear blue icon = pump in manual mode



- To read settings:
    - To view basal settings (when in manual mode): using menu icon in upper left corner select Basal Programs
        - The top program is the currently active program; select and record timed settings
    - To view history (automated mode): select history from the menu. Read total insulin, basal and bolus percentages for today.
        - Use arrows next to date to scroll to view more daily data
    - To view bolus settings from menu, select Bolus and then Target Glucose & Correct Above, Insulin to Carb Ratio, and Correction Factor and scroll through each to view the setting and time segments

6/2024

Insulin Pump: Basic Trouble Shooting

- ☐ Check and tighten all connections
- ☐ Check tubing for air bubbles, cracks, or kinks
- ☐ Is infusion set or cannula dislodged from insertion site?
- ☐ Check insertion site for scars, lipodystrophy, irritation, infection
- ☐ Is cannula kinked or clogged (may need to remove and replace)?
- ☐ Is there adequate insulin in the reservoir? Has it been exposed to extreme heat or cold?
- ☐ Is pump in suspend mode?
- ☐ Do batteries need to be replaced or device charged?
- ☐ Is pump paired/communicating with CGM, phone app, and/or controlled device?

If all else fails, patient can call manufacturer's support line.

6/2024

Pearls for Transitioning Between Pump & SQ or IV Insulin

Pump to SQ basal/bolus

- Give first dose basal (Lantus) 2 hours BEFORE removing pump if possible, or ASAP in the event of pump failure
- Recommended SQ doses based on pump settings:
    - Total daily basal x 1.2 = recommended Lantus dose
        - Alternate:
          (TDD/2) x 1.2 = recommended Lantus dose
          TDD = total daily insulin dose administered via pump (basal and boluses)
    - Correctional scale
        - Correction factor 35mg/dL/unit and above: LOW Correctional Scale
        - Correction factor 20-34mg/dL/unit: MEDIUM Correctional Scale
        - Correction factor less than 20mg/dL/unit: HIGH Correctional Scale
    - Nutritional insulin should ALWAYS be ordered
        - Use same carb ratio

IV to Pump

- Drip can be discontinued as soon as pump is connected and functionality is verified (2 hour overlap not required)

SQ Basal/Bolus to Pump

- Resume pump at next scheduled basal insulin administration time
    - Initiating pump with basal insulin on board can lead to “stacking” of insulin and increase risk of hypoglycemia
    - Alternative: resume with bolus functionality only and suspend basal until next scheduled SQ time

Sublingual Buprenorphine Use Guidelines MHC

Purpose:

To outline literature supported use of sublingual buprenorphine for FDA approved indications as well as off label use to assist clinicians treating patients with opioid use disorder or chronic opioid dependence as part of a chronic pain diagnosis.

Definitions:

Opioid Use Disorder: Based on DSM-5 Criteria for Diagnosis of OUD[1] (See Appendix 1)

Chronic Persistent Opioid Dependence (CPOD)/Long term Opioid Therapy (LTOT) [2]

- A complex form of opioid dependence that persists after opioid cessation in patients who are receiving long-term opioid therapy (LTOT), disallowing a reversal to normal functional state.
- It is characterized as a distinct clinical entity compared to opioid dependence/OUD but without much biological difference.
- CPOD concept and buprenorphine treatment for physiological opioid dependence (not OUD) can be integrated into planned opioid tapering and treatment of ineffective LTOT.

Buprenorphine Pharmacology/Pharmacokinetics[3]

- Partial Mu opioid receptor agonist with high binding affinity
- Weak kappa opioid receptor antagonist
- Hepatic metabolism with ~70% eliminated via feces
- Sublingual time to peak: 30 – 60 minutes
- Sublingual terminal half-life: ~37 hours
- Oral absorption is minimal, all tablets should be allowed to dissolve under the tongue (can take up to 10 minutes)
- If patient swallows tablet prior to it dissolving, recommend repeating the dose

Formulations available at MHC

- Buprenorphine 0.5 mg sublingual tablet (quarter tablet)
- Buprenorphine 2 mg sublingual tablet
- Buprenorphine 8 mg sublingual tablet
- Buprenorphine/Naloxone 2 mg/0.5 mg sublingual tablet
- Buprenorphine/Naloxone 8 mg/2 mg sublingual tablet

FDA Labeled Indications

- SL tablet: Medically supervised withdrawal and maintenance treatment of opioid use disorder
- Buccal Film, transdermal patch (not on formulary): Management of severe and persistent pain that requires an extended treatment period with a daily opioid analgesic and for which alternative treatment options are inadequate.

Current Use at MMC

- Pain management (off label because SL tabs are being utilized)
  - Pain currently uncontrolled or under controlled on current multimodal therapy.
  - High Opioid Risk Tool score that may limit use of full opioid agonists.
  - Patient meets full diagnostic criteria for OUD or is *suspected* of having OUD in addition to having pain.
  - Patient exhibiting characteristics of CPOD and has been on LTOT. Continuation of LTOT is determined not to be in the patient's best interest (ex. anticipated risks outweigh benefits, no outpatient providers available to continue opioid therapy, functional improvements have not been gained or have worsened)
  - Patients on buprenorphine upon admission that also have pain (Refer to PolicyStat MHC Perioperative Buprenorphine Guideline for additional information about perioperative recommendations.)
- Opioid Use Disorder (OUD)
  - Patient meets full diagnostic criteria for OUD and is typically at MMC with co-morbid problems for which they are being treated. They are either initiated on buprenorphine or continued from home.

Buprenorphine Dosing Strategies for Patients new to buprenorphine

1. Classic Buprenorphine Initiation[4,5,6,7]
   - Discontinue full opioid agonist on Day 1
   - Wait for 3-4 dosing intervals.
   - One dosing interval is:
     - ~12 hours for short acting opioids
     - ~24 hours for long acting opioids
     - ~72 hours for methadone opioids
   - May be prolonged in setting of renal or hepatic dysfunction.
   - Typically start buprenorphine once Clinical Opioid Withdrawal Score (COWS) >12
   - Start buprenorphine/naloxone per Adult Acute Opioid Withdrawal and Treatment Induction with Buprenorphine PowerPlan
   - Considerations
     - Buprenorphine may induce withdrawal symptoms if given too close to last dose of opioid.
     - Could be more uncomfortable for patient as they must experience withdrawal symptoms as full opioid agonist (FOA) is cleared from their system without anything to replace it.

2. Microdosing Initiation[4,5,6,7]
    - Continue full opioid agonist during titration phase.
    - Titrate buprenorphine based on available set schedules.
    - Microdosing reduces the risk of precipitating withdrawal, potentially increasing patient compliance.
    - Quarter tablets are prepared and packaged in the Pharmacy as needed.
        - Standard Microdosing (33 quarter tablet doses)

Day	Dose/Frequency	Total Daily Dose
1	0.5 mg once daily	0.5 mg
2	0.5 mg BID	1 mg
3	0.5 mg q6hr	2 mg
4	0.5 mg, 0.5 mg, 1 mg, 1 mg given q6hrs	3 mg
5	1 mg q6hr	4 mg
6	1.5 mg q6hr	6 mg
7	2 mg q6hr	8 mg (Stop other opioids)

        - Slow Microdosing (41 quarter tablet doses)

Day	Dose/Frequency	Total Daily Dose
1	0.5 mg once daily	0.5 mg
2	0.5 mg BID	1 mg
3	0.5 mg q8hr	1.5 mg
4	0.5 mg q6hr	2 mg
5	0.5 mg, 0.5 mg, 0.5 mg, 1 mg given q6hr	2.5 mg
6	0.5 mg, 0.5 mg, 1 mg, 1 mg given q6hr	3 mg
7	1 mg q6hr	4 mg
8	1.5 mg q6hr	6 mg
9	2 mg q6hr	8 mg (Stop other opioids)

        - Rapid Microdosing (24 quarter tablet doses)

Day	Dose/frequency	Total Daily Dose
1	0.5 mg q6hr	2 mg
2	1 mg q6hr	4 mg
3	1.5 mg q6hr	6 mg
4	2 mg q6hr	8 mg (Stop other opioids)

    - Additional dose adjustments likely will be needed based on patient response.
    - Utilize COWS to monitor severity of withdrawal once initial titration phase completed and FOA is discontinued.
    - If patient continues to show symptoms of withdrawal, increase the dose of buprenorphine by 4-8 mg per day.
    - Many patients will require total daily dose of 16 to 24 mg divided q6-8hrs.
    - Some patients may be able to start the titration phase while in the hospital and finish at home.

3. Regulatory requirements (Refer to Policy Stat Methadone and Buprenorphine Authorized Use for Opioid Dependence)
4. Discharge planning considerations.
    - Coordination with PCP and/or buprenorphine prescriber is essential.
    - Consider insurance coverage or barriers to obtaining prescriptions, including stigma associated with buprenorphine.
    - This is an evolving treatment. Patient specific considerations should be made to address hospital length of stay concerns. There are many successful examples of home titrations.

References:

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3. Buprenorphine. Lexi-Drugs. Up To Date Lexidrug. UpToDate Inc. Https://online.lexi.com. Accessed June 13, 2024
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5. Moe J et al. Short communication: Systemiatic review on effectiveness of micro-induction approacheds to buprenorphine initation. Addictive Behaviors 2021; 114: 106740.
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Appendix 1: DSM-5 Criteria for Opioid Use Disorder (OUD)

Diagnostic Criteria*
These criteria not considered to be met for those individuals taking opioids solely under appropriate medical supervision.

Check all that apply

	Opioids are often taken in larger amounts or over a longer period of time than Intended.
	There is a persistent desire or unsuccessful efforts to cut down or control opioid use.
	A great deal of time is spent in activities necessary to obtain the opioid. use the opioid, or recover from its effects.
	Craving or a strong desire to use opioids.
	Recurrent opioid use resulting in failure to fulfill major role obligations at work. school or home.
	Continued opioid use despite having persistent or recurrent social or Interpersonal problems caused or exacerbated by the effects of opioids.
	Important social, occupational, or recreational activities are given up or reduced because of opioid use.
	Recurrent opioid use in situations in which it is physically hazardous
	Continued use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by opioids.
	*Tolerance. as defined by either of the following: a) A need for markedly Increased amounts of opioids to achieve intoxication or desired effect b) Markedly diminished effect with continued use of the same amount of an opioid
	*Withdrawal, as manifested by either of the following: a) The characteristic opioid withdrawal syndrome b) The same (or a closely relate-d) substance are taken to relieve or avoid withdrawal symptoms

Total Number Boxes Checked: _____

Severity:

Mild: 2-3 symptoms.

Moderate: 4-5 symptoms.

Severe: 6 or more symptoms

J. Drug Shortages

July 3rd, 2024

Drug Name	Strength	Dosage Form	Notes	**Estimated** date of Recovery	Safety Memo
Acyclovir	1000mg	Inj	Supply of 500mg vials improved		
Albuterol	5mg/mL, 2.5mg/0.5mL	Bottle/nebs	Utilize 3mL. Intermittent supply of 0.5mL available	Unknown	
Alteplase	2mg/2mL	Inj	Batching from larger bottle	July 2024	
Bupivacaine with epinephrine	All formulations	Inj	0.25%w epi supplies exhausted. Utilize plain bupivacaine Virtual kits available for OR	July 2024	
Ciprofloxacin	0.2%	Otic	Utilize Ciprofloxacin 0.3% drops	Unknown	
Clindamycin	900mg	IV Vial	RESOLVED		
Cyclopentolate	1% & 2%	Ophth	Supply available. Working to switch back		
Dextrose	50%	Syringes/Vials	Pharmacy compounding or utilize Dextrose 10%	October 2024	
Diazepam	10mg	Inj	RESOLVED		
Dronabinol	2.5mg & 5mg	Cap	RESOLVED		
Epoetin (Retacrit)	2000 unit	Inj	Intermittently available	July 2024	
Hydrocodone/APAP	7.5mg/325mg/15mL	Elixir	RESOLVED		
Lidocaine 1%	Sterile-Pak	Inj	Utilizing 2% in OB & ER	Unknown	
Lorazepam	2mg/mL	Inj	RESOLVED		
Nalbuphine	10mg	Inj	Supply improving	July 2024	
Oxacillin	2gm	Inj	Use continuous infusion where applicable	Unknown	
Racepinephrine	2.25%	Neb	Injectable Epinephrine being used via nebulization	Unknown	
Tetracaine	0.5%	Ophth	RESOLVED		

M. Pharmacist Interventions

Andy Biskupski

Drug Therapy Optimization

Patient presents with seizure like activity found to have new sinus thrombosis and was heparin neuro intervention protocol Noticed patient was still on tamoxifen, notified hospitalist and tamoxifen stopped.

Heidi Davidson

Drug Therapy Optimization

7 yo f 20.4kg, ordered iv acetaminophen 1g IVPB q6h, called provider and got order changed to weight based dosing of Acetaminophen 300mg IVPB q6h..

Dana Ferrand

Drug Therapy Optimization

Reviewing patient with urea ordered for persistent hyponatremia. Older female on citalopram - recommended holding if concern for SIADH given mult risk factors. Provider discontinued citalopram.

Ryan Freye

Drug Therapy Optimization

Patient on oxycodone ER with AKI requiring iHD. Oxycodone ER not recommended in this setting, LM for provider to stop and utilize only IR. Provider discontinued order.

Christopher Nastally

Discharge Assistance

Worked with Pulmonology provider to coordinate on a Friday safe discharge home on NaCl 7% inhalation TID at MMC amb Rx ensuring we had stock for 7 day supply from inpatient Rx (bridge for their mail order Rx), and that Rx was covered to allow discharge.

Kyle Neilly

Drug Therapy Optimization

Patient on pantoprazole and dasatinib. Patient has ALL and not optimally controlled, likely due to noncompliance. PPIs and dasatinib is contraindicated (X interaction), need acidic PH for good absorption of dasatinib. Recommended d/c PPI. Provider agreed.

Kyle Neilly

Drug Therapy Optimization

Patient on Tacrolimus for liver/renal transplant. Nurse held dose without calling due to difficulty swallowing tablets. Called RN and they report that suspension would be better for patient. Changed to suspension to avoid missing anymore doses.

Kyle Neilly

Drug Therapy Optimization

Patient to OR for bowel perf. Started on Zosyn and Fluconazole post op. Patient intubated and transferred to ICU. Patient also being started on amiodarone. Recommended micafungin instead of fluconazole if plan to stay on amiodarone. Provider agreed.

Kyle Neilly

Drug Therapy Optimization

Patient has Hx of pancreatic cancer and severe N/V w/ poor intake. Pt day before with a K of 2.3 and received K per protocol. No repeat K ordered after 24 hrs. Altered provider. Provider to order repeat K level.

Nate Richards

Anticoagulation

Order came through for heparin 40 unit/kg bolus. Recent Anti-xa was 1.0. Called RN and she misread the Anti-xa as 0.1 instead of 1.0. Caught her before she increased the drip rate on the heparin and voided the bolus.