PHARMACY & THERAPEUTICS
UPDATE

METHODIST

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Critical Drug Shortages

On-going shortages and strategies to minimize the impact to patient care for drugs with limited availability

Shortage: *Lidocaine, Bupivacaine injection with and without epinephrine*
Action: *alternative concentrations, sizes*

Shortage: *Acetazolamide injection*
Action: *use oral route when possible*

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If you have any questions or concerns, please contact the NMH Pharmacy Purchasing Department: 402-354-4337.

Warfarin Monitoring

To enhance the safety of anticoagulant administration during hospitalization, regulatory agencies recommend organizations establish procedures to assure baseline and ongoing monitoring. To assist with safe prescribing of warfarin, the Medical Executive Committee has approved a recommendation to obtain a baseline and daily INR while hospitalized. If the provider does not order these labs, the Committee approved the ability for pharmacists to order both a baseline and daily INR for new warfarin orders or when restarting home warfarin therapy, **even in patients for which there is not a consult for pharmacy to dose. The ordering prescriber will be notified in the event of the following situations:**

- **Baseline INR is >/=1.4 for patients not previously on warfarin**
- **Baseline INR is >/=3.5 for patients previously on warfarin**

Hypoglycemia Protocol Modification

The hypoglycemia treatment protocol will be modified in February to reflect the recent change in NMH Laboratory's critical glucose value in adults to 60mg/dL. The protocol may be ordered on individuals who are on diabetic medications or those experiencing a hypoglycemia event. The orders may be initiated based on the patient's condition simultaneously with the provider being notified (prior to waiting for provider's order). The following outlines the protocol highlights:

- **Blood Glucose (POC) as needed** for signs and symptoms of hypoglycemia **and 15min after carbohydrate source or medication administered**
- **Glucose <60mg/dL:** treat with Dextrose 50% IV 25 mL OR glucagon 1mg IV/IM/SQ. Notify provider as per critical result protocol. Repeat treatment as outlined in hypoglycemia parameters.
- **Glucose 60-70 mg/dL** administer 4 oz apple juice, 4oz non-diet soda, or glucose gel. If patient NPO or unable to tolerate oral intake, give Dextrose 50% 25mL IV or glucagon 1mg IV/IM/SQ. Repeat treatment as outlined in hypoglycemia parameters.
- **Hypoglycemia parameters:** After initial treatment of any glucose value < 70mg/dL**,** repeat POC glucose in 15 min; if result < 70mg/dL, continue treating as per protocol and re-checking glucose 15min after treatment until glucose > 70mg/dL.
- **Notify provider** of all treatments given and corresponding POC glucose re-check values.
- **Once glucose is within normal limits**, give 1 complex carbohydrate and 1 protein source (such as ½ sandwich OR 1 individual container of peanut butter and 3 packs of crackers) or patient meal if patient able to take orals to prevent recurrent hypoglycemia.
- **Following hypoglycemia treatment, notify provider for instruction on diabetic medication therapy.**

Antimicrobial Stewardship: Verigene Rapid Identification Technology

The Methodist Microbiology Lab introduced an FDA approved test called the Bloodstream Infection Test (performed by the Verigene® Gram-Positive or Gram-Negative Nucleic Acid Test) last fall. This is a qualitative, multiplexed *in vitro* diagnostic test which identifies genus, species and genetic antimicrobial resistance determinants for a broad panel of gram-positive *or* gram-negative bacteria directly from positive blood culture bottles, allowing rapid identification of pathogens and earlier transition to most appropriate therapy. Studies have shown that rapid pathogen identification can result in earlier time to active therapy, earlier time to most appropriate therapy, shorter hospital stay, and improved clinical outcomes. The utility and cost-effectiveness of such testing is dependent on clinicians reacting to the data in real time. **It is strongly recommended that the Verigene Blood Culture Identification (BCID) results be utilized for therapy decisions at the time they are available.**

List of Pathogens and Genes Detected*

Gram-positive bacteria	Gram-negative bacteria	Resistance Genes
Staphylococcus genus	*Escherichia coli*	mecA = methicillin (nafcillin) resistance
Staphylococcus aureus	*Klebsiella pneumoniae*	vanA = vancomycin resistance
Staphylococcus epidermidis	*Klebsiella oxytoca*	vanB = vancomycin resistance
Staphylococcus lugdunensis	*Pseudomonas aeruginosa*	CTX-M= ESBL
Streptococcus genus	*Serratia marcescens*	IMP = carbapenemase
Streptococcus anginosus Group	*Acinetobacter* genus	KPC = carbapenemase
Streptococcus agalactiae	*Citrobacter* genus	NDM = carbapenemase
Streptococcus pneumoniae	*Enterobacter* genus	OXA = carbapenemase
Streptococcus pyogenes	*Proteus* genus	VIM = carbapenemase
Enterococcus faecalis		
Enterococcus faecium		
Listeria genus		

*Information on which species are detected by the genus specific only assay can be found in full reference on bestcare.org or in Cerner Powerchart

When a positive blood culture bottle is identified by the automated instrument, a Gram stain along with a BCID Gram Negative or Positive Nucleic Acid test will be performed. BCID results will typically be available in Cerner within 3 hours of notification of a positive blood culture. Providers can view the results in Cerner by opening the micro result and scrolling to the BCID information. The gram stain will continue to the final ID and susceptibility stage as normal. Final susceptibilities will be available in 24-72 hours and should always be reviewed to determine if therapy adjustments need to be made.

To assist with interpretation of the BCID results, therapy guides for gram positive and gram negative organisms were developed. These recommendations are based on an analysis of the Methodist Hospital antibiogram and assembled by local providers. Note that certain infections are frequently polymicrobial in nature and the isolation of a single pathogen from the blood culture should not result in over-narrowing of therapy (e.g. complicated intra-abdominal infection often involves anaerobes and therapy active against these should generally be included until definitive cultures of the site of infection have returned).

Antimicrobial guides are located via a hyperlink in Powerchart 

as well as on bestcare.org. **https://www.hcfms.com/uploads/HCFMS_Uploads/Verigene-Intro-Therapeutic-Guide-updated-7_29.pdf.** An example of the guide is presented below.

Positive Pathogen Detected and Recommended Therapy Adult Dosing

*For all gram positive bacteremia - If endocarditis is concern, consult ID for consideration of gentamicin

Pathogen Detected	Preferred Therapy	Comments
Staphylococcus* genus** with negative *S. aureus* PCR, ***including S. epidermidis and ***excluding S. lugdunensis*** Blood Culture result:		
1 of 2 BCX positive	Consider withholding or discontinuing therapy as likely contaminant	In severely ill patients, consider starting/continuing therapy until more definitive results return.
2 of 2 BCX positive mecA negative	Nafcillin 2g q4h or 12g q24h	Cefazolin 2g q8h is an alternative
mecA positive	Vancomycin 15 mg/kg q12h	Pharmacokinetic dosing per pharmacy

A provider education video can be found at **https://www.youtube.com/watch?v=e-jaq1hd8xM&feature=youtu.be**

For more information about the program, contact Tess Karre, MD or Heidi Hausmann, MD.

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