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Pharmaceutical Care Services Physician Orientation 2023-2024

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Pharmaceutical Services at UH

- Location: **UH B-134**; Open 24/7/365
- Extension: **2-5120, 2-5121, 2-3927**
- Pharmacy Staff (Registered Pharmacists-RPh & Pharmacy Technicians) are responsible for:
  - Reviewing all medication orders for appropriateness and completeness (RPh only)
  - Providing drug information to prescribers and nurse upon request (RPh only)
  - Clinical Pharmacist specialists (MICU, SICU, ED, Infectious disease, Ambulatory – cardiology, liver transplant, Investigational Studies) participate in direct patient care rounds and drug therapy management of the patients.
  - Handling, storage, security, preparing, compounding, and delivery of medications throughout UH
- This module is a quick overview of important pharmacy-related topics all UH prescribers should be aware of

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The Pharmacy and Therapeutics (P&T) Committee

Dr. Joseph Apuzzio – P&T Chairman

Pharmacy and Therapeutics Committee is:

- Advisory and Educational
- An advisory group of the medical staff
- Composed of physicians, pharmacists, and other health professionals selected with the guidance of the medical staff
- Serves as the organizational line of communication between the Medical Staff and the Pharmacy Department
- **The P&T Committee meetings are held the 3rd Wednesday of each month except August at 7:30 am to 9:00 am in UH D215.**

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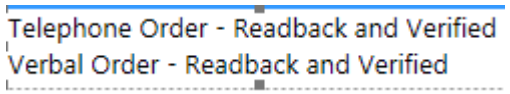
Verbal and Telephone Orders

- Verbal communication of orders is discouraged
- Use of secure text messaging for patient care orders is NOT permitted
- As approved by the Medical Executive Committee, nurses and registered pharmacists are allowed to accept verbal medical orders from prescribers
  - "**Read Back Verified by Repetition**"
  - Epic screenshot:



- Verbal orders for anti-neoplastic agents shall not be given or received under any circumstances
- All verbal orders must be authenticated (reviewed and countersigned) as soon as possible, or within 48 hours of receipt of order
- **For questionable orders**:
  - RPH will inform/clarify order with the ordering provider and inform the RN

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STAT/ NOW/PRN Medication Orders

STAT and NOW Medication Orders

- "**STAT**" orders for medications will be given immediately – **within 30-60 minutes**. The use of this term should be reserved for emergency situations
- "**NOW**" orders for medications will be administered **within 120 minutes**
- Most medications are stocked in the Pyxis dispensing cabinets on patient floors

PRN Medications

- All "PRN" orders must include specific indication
- **Invalid** order: Diphenhydramine 25 mg PO q4h PRN
- **Correct** order: Diphenhydramine 25 mg PO q4h PRN itching or sleep
- **Invalid** order: Hydralazine 10mg IV q4h PRN Hypertension
- **Correct** order: Hydralazine 10mg IV q4h PRN SBP>140

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IV and PO Standard Administration Time Schedules

- **IV Example:**
  - Q8H start at 0400 4-12-20...
  - Q8H start at 0600 6-14-22...
  - Q8H start at 0800 8-16-24...
- **PO Example:**
  - Three times a day
  - 1000-1400-1800

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Signed and held orders:

New (held) medication orders and specific instructions from a licensed independent practitioner to administer medication(s) to a patient in clearly defined circumstances that become active upon the release of the orders on specific date(s) and time(s).

Example:

- Oncology orders/treatment plans
- Post op order entered pre-op and to be released post op
- Ambulatory or Same Day Surgery order signed and held until the day of visit and released after patient is registered

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Proper Wasting of Controlled Medication Documentation

- Processing a controlled substance waste or a return requires a witness.
- A witness is necessary to document resolution of the discrepancy/waste. The witness will be prompted to enter their user ID and password in the automatic dispensing cabinets (Pyxis). Non-pyxis documentation occurs on the pink sheets sent from the C-2 safe.
- Applies to all C-II, C-III, C-IV and C-V medications
- e.g. Anesthesia providers
- Discrepancies must be resolved immediately

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Medication Samples Policy and Procedures

- All new sample medications must be approved by P&T Committee **PRIOR** to the requesting clinic stocking said medication.
- To add a new sample medication, the requesting clinic must complete and submit a "**Sample Medication Formulary Request**" form to the P & T committee
- Pharmacy Administration will **confiscate** medication samples throughout UH that have not been identified by the Pharmacy Department and/or have not been approved by P&T Committee.
- Watch for medication sample recalls
- High risk and look alike policy applies to the medication samples also
- Ambulatory clinics that store medication samples shall be identified. The following areas have been identified as the only areas where sample medications may be stored and dispensed:
    - **ACC**: F-Level Medicine (Dermatology, Endocrinology, UMD Care)
    - **ACC:** OB/GYN Clinic C-Level
- All medication samples will be logged in with the following information:
    - Name and strength of medication
    - Date received
    - Manufacturer and lot number
    - Expiration date of medication
    - Quantity of medication received
    - Balance
    - Signature of receiver

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Labeling Requirements for Sample Medications by MD

- Sample medications shall be labeled and dispensed in a standardized manner according to hospital policy, applicable law and regulation and standards of practice.

- *Dispensing labels will be supplied by the Pharmacy Department*.

- Each medication sample dispensed shall be properly labeled with a dispensing label to include but not limited to the following information:
    - Patient name and date
    - Instructions for administration e.g. Take one tablet by mouth twice a day
    - Name of medication and strength
    - Prescribing physician
    - Relevant auxiliary labels (indicated on top of each log sheet, supplied by the Pharmacy Department).
    - Sample medications to follow the hospital's high risk high alert/look alike sound alike, hazardous medication policy as applicable

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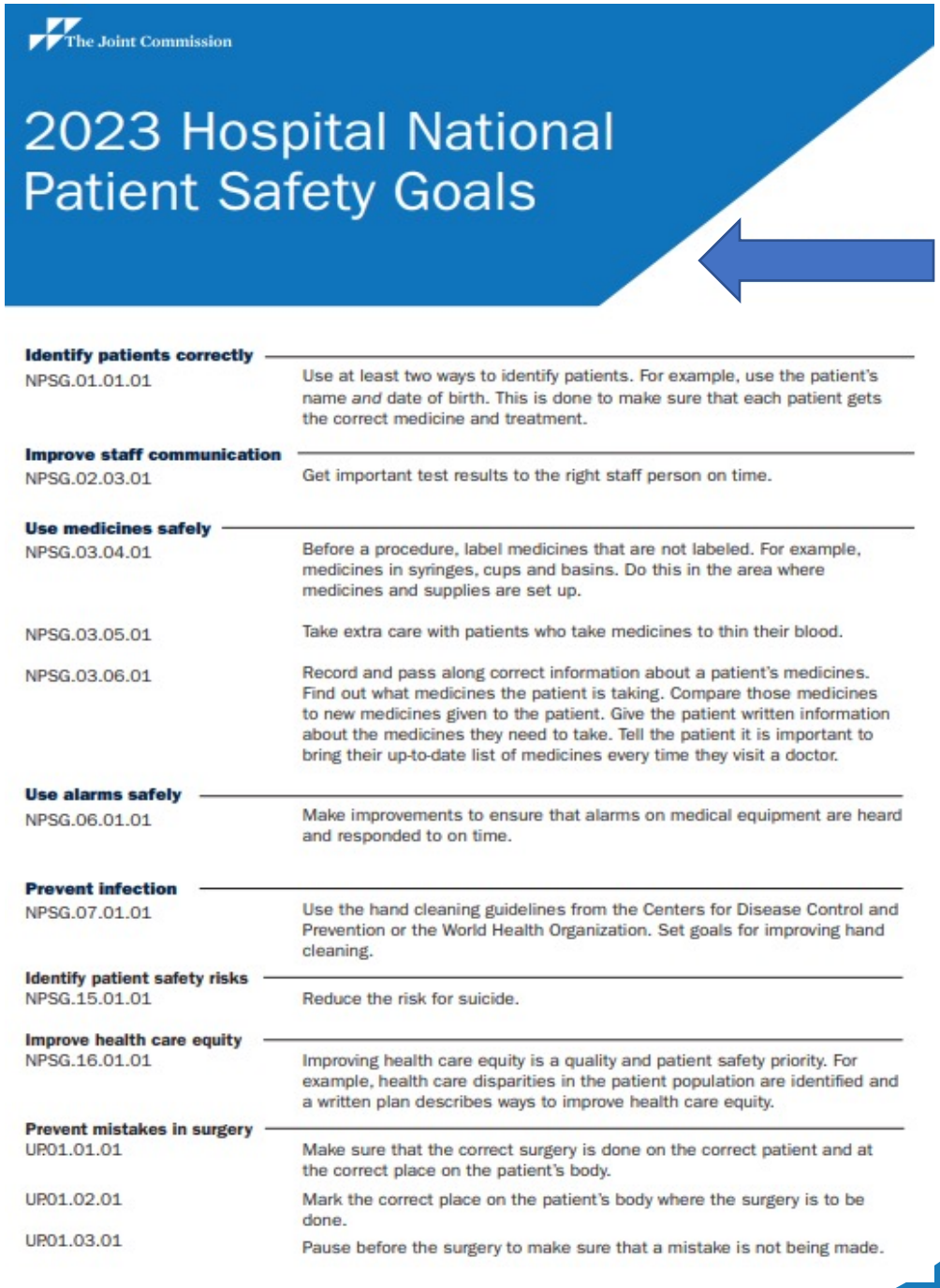
Medication Reconciliation

- It is a National Patient Safety Goal to accurately and completely reconcile medications across the continuum of care
- The purpose of The Joint Commission's National Patient Safety Goals (NPSGs) is to promote specific improvements in patient safety
- In-patient and out-patient–Ensure the medications the patient is taking prior to admission, during admission, and upon discharge are all appropriate and necessary

2023
National Patient Safety Goals



The Joint Commission

2023 Hospital National Patient Safety Goals

Identify patients correctly

NPSG.01.01.01 — Use at least two ways to identify patients. For example, use the patient's name *and* date of birth. This is done to make sure that each patient gets the correct medicine and treatment.

Improve staff communication

NPSG.02.03.01 — Get important test results to the right staff person on time.

Use medicines safely

NPSG.03.04.01 — Before a procedure, label medicines that are not labeled. For example, medicines in syringes, cups and basins. Do this in the area where medicines and supplies are set up.

NPSG.03.05.01 — Take extra care with patients who take medicines to thin their blood.

NPSG.03.06.01 — Record and pass along correct information about a patient's medicines. Find out what medicines the patient is taking. Compare those medicines to new medicines given to the patient. Give the patient written information about the medicines they need to take. Tell the patient it is important to bring their up-to-date list of medicines every time they visit a doctor.

Use alarms safely

NPSG.06.01.01 — Make improvements to ensure that alarms on medical equipment are heard and responded to on time.

Prevent infection

NPSG.07.01.01 — Use the hand cleaning guidelines from the Centers for Disease Control and Prevention or the World Health Organization. Set goals for improving hand cleaning.

Identify patient safety risks

NPSG.15.01.01 — Reduce the risk for suicide.

Improve health care equity

NPSG.16.01.01 — Improving health care equity is a quality and patient safety priority. For example, health care disparities in the patient population are identified and a written plan describes ways to improve health care equity.

Prevent mistakes in surgery

UP01.01.01 — Make sure that the correct surgery is done on the correct patient and at the correct place on the patient's body.

UP01.02.01 — Mark the correct place on the patient's body where the surgery is to be done.

UP01.03.01 — Pause before the surgery to make sure that a mistake is not being made.

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Auto-Verification in the Emergency Department

- **The Joint Commission (TJC) requires that a pharmacist reviews all medication orders or prescriptions, with limited exceptions**. These exceptions (outlined below) do allow for limited situations where prospective pharmacy review may not be feasible or required. TJC permits emergency departments to broadly apply these **exceptions which are intended to minimize treatment delay and patient backup**

    - Exception 1: allows medication ordered by a licensed independent practitioner to be administered by staff who are permitted to do so by virtue of education, training and organization policy (such as a registered nurse) and in accordance with law and regulation. A licensed independent practitioner is not required to remain at bedside when the medication is administered. However, a licensed independent practitioner must be available to provide immediate intervention should a patient experience an adverse drug event.

    - Exception 2: allows medication to be administered in an urgent situation when a delay in doing so would harm patient

Automated Dispensing Cabinet (ADC) Override

- **Override**: The process in which a qualified staff member such as a registered nurse, respiratory therapist, or physician, may remove a medication from the ADC, with a verbal order, for urgent or emergent use only and when delay would cause patient harm. Providers will then retrospectively order medication in the EMR.
    - *For example, adult patient post cardiac arrest is hypotensive requiring norepinephrine infusion. Physician is unable to leave patient bedside due to critical nature of the situation. Verbal order is given by physician to start norepinephrine infusion. RN overrides medication from ADC and physician enters the order in the EMR once patient condition stabilizes.*
- For a medication to be accessed through override, a request must be submitted via an override request form (on MCN) and brought to the appropriate committees outlined in the form

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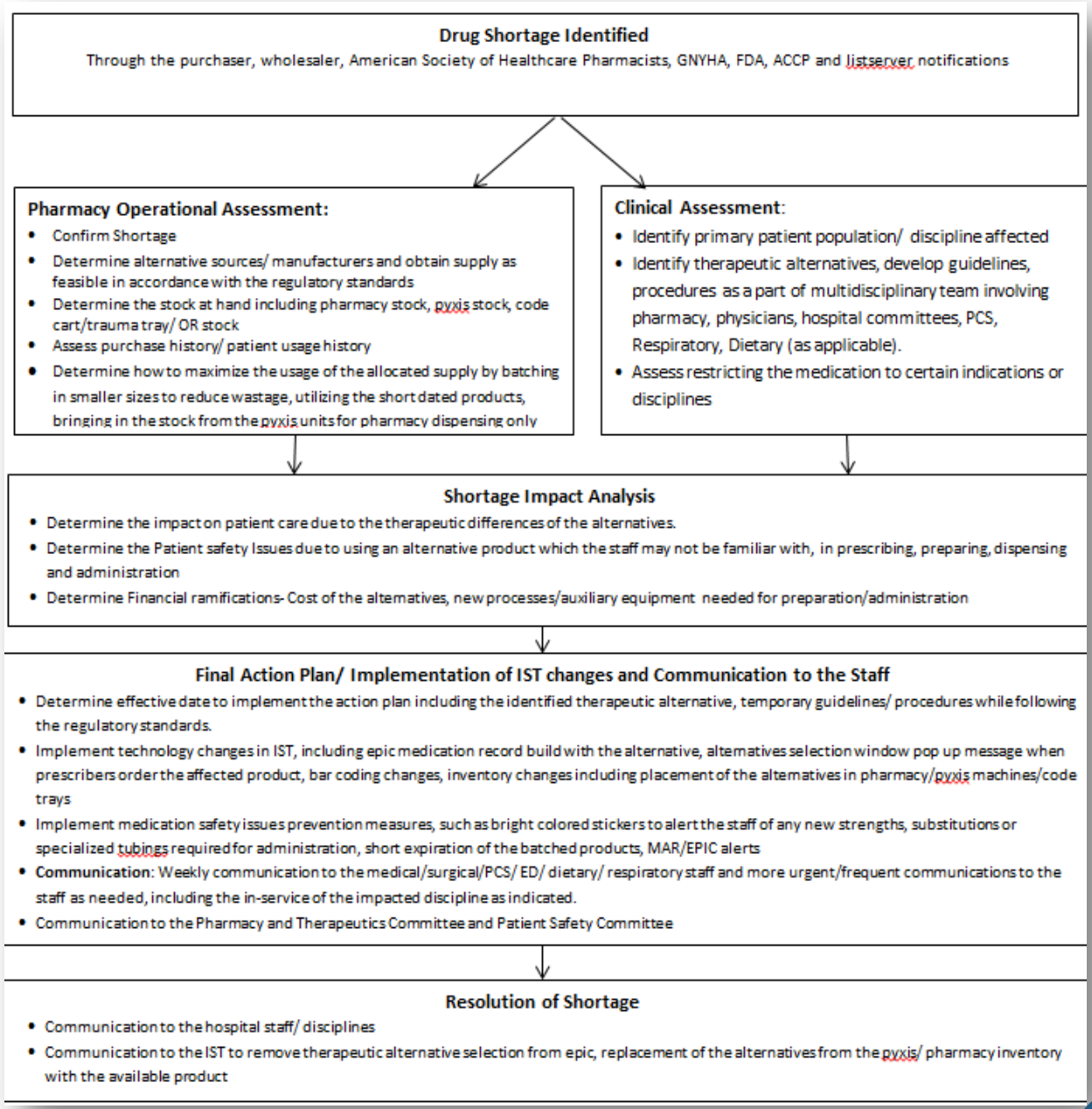
Drug Recall

Once informed, pharmacy staff confiscates all recalled medications from patient care areas

- e.g. Automated dispensing machine from the unit
- Drug recall retrospectively reported at the Pharmacy and Therapeutics Committee and Patient Safety Committee
- For Class1 recalls, pharmacy will notify healthcare providers and the inpatients who have received the recalled medication. Also, outpatients discharged up to 6 months prior to recall notice will also be communicated to the best of the institution's ability

Drug Shortages

- Greater than 350 drugs world-wide
- Listing of drug shortages e-mailed weekly for distribution to department chairs, house staff, nursing staff, and other ancillary services
- All drug shortages are reported to P&T Committee monthly
- For long term shortages, the Clinical Pharmacy team with help from medical staff will develop and implement medication substitution practices/protocols



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Patient's Own Medications

- Need a prescriber's orders
- Patients can use medications brought from home. **Must be appropriately labeled**
- Patients can self-administer medications (with written order)
    - Use the "Non-formulary Medication" Order in Epic to order a patient's own medication
- Physician cannot bring in patient's own medications
- Patient's own medications must be sent to the main pharmacy for verification and identification. Documented in EPIC

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Therapeutic Duplication

- All medication orders are reviewed for therapeutic duplication
- After the medication orders have been reviewed, all concerns, issues or questions are clarified with the individual prescriber before dispensing
- The clarification of concerns, issues or questions with the individual prescribers are documented
- TJC will cite organization for lack of clarification for therapeutic duplications e.g. analgesic medications
- Example:
  - Ondansetron 4mg IV q6h PRN Nausea & Vomiting
    Metoclopramide 10mg IV q6h PRN Nausea & Vomiting
  - Albuterol 2.5mg Neb q6h PRN SOB
    Ipratropium-Albuterol 3mL Neb q6h PRN SOB
  - Percocet 1 Tab PO q6h PRN Moderate Pain (4-6)
    Percocet 2 Tab PO q6h PRN Severe Pain (7-10)
    Morphine 1mg IV q2h PRN Severe Pain (7-10)

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Therapeutic Duplication

- Duplication will result in pharmacists calling the providers to clarify orders, it is easier and quicker to double check orders before signing
- It should be clear based on the order and patient condition which drug should be given
    - TJC does NOT want RN's prescribing
- PRN reasons must be specified
    - (hint: Epic give you a "hard stop" to put reasons)
- PRN pain orders **ALWAYS** need a pain scale
- Clear delineation!

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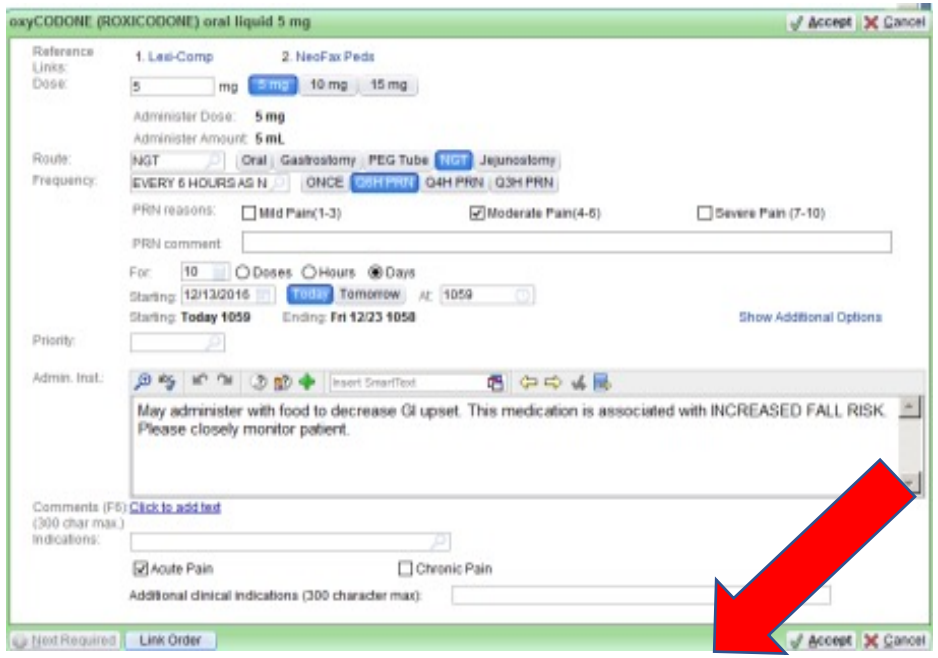
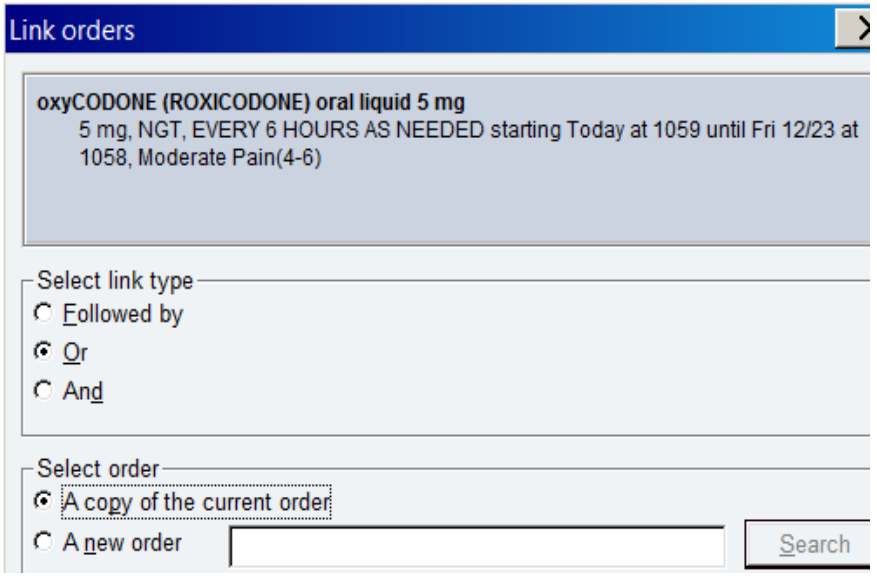
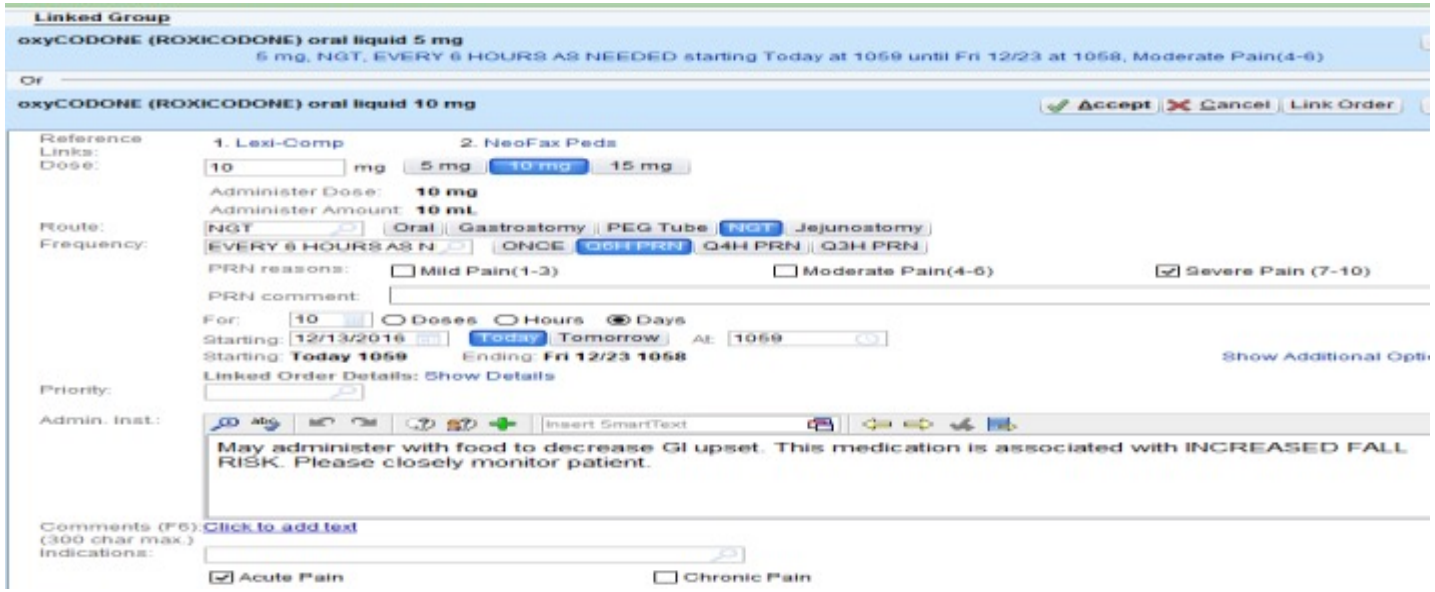
Therapeutic Duplication Link Orders







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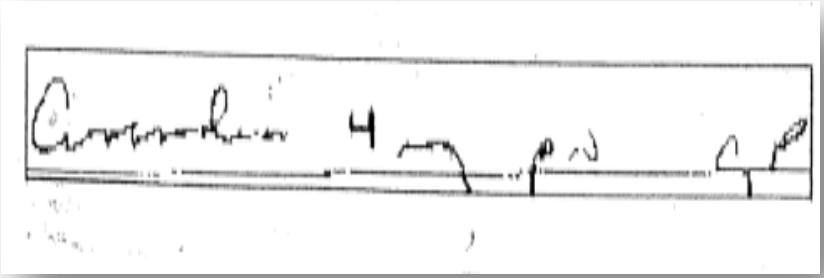
Look Alike/Sound Alike Medications (LASA)

- Lipid-based Amphotericin products vs. Conventional Forms of Amphotericin
- **DOP**amine and **DOBUT**amine
- Retrovir®(zidovudine) and Ritonavir
- Pitocin® (oxytocin) and Pitressin® (vasopressin)
- Insulin Products (e.g. insulin regular-NovoLIN R®, HumuLIN R®, insulin NPH- NovoLIN N®, HumuLIN N®, insulin aspart- NovoLOG®, insulin lispro- HumaLOG®, insulin glargine- Lantus®)
- Hydr**OXYzine** and Hydr**ALAZINE**
- Prescribers must indicate indications in Epic (hard stop)

to order LASA medications
- Epic gives warning to the physicians when LASA medications are ordered
- **Can you guess the medication in this handwritten old paper-based system order ?**

Note: TALLman Lettering



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High Risk/High Alert Medications (HRHA)

- Chemotherapeutic Agents
  (e.g. methotrexate, cisplatin, carboplatin, paclitaxel, docetaxel, vinblastine, vincristine)
- Heparin
- Neuromuscular Blocking Agents (e.g. vecuronium, rocuronium, succinylcholine, cisatracurium)
- Insulin Products (e.g. insulin regular-NovoLIN R®, HumuLIN R®, insulin NPH- NovoLIN N®, HumuLIN N®, insulin aspart- NovoLOG®, insulin lispro- HumaLOG®, insulin glargine- Lantus®)
- Epidural/Intrathecal medications
- Epic gives high risk high alert warnings when HRHA medications are ordered by the physicians

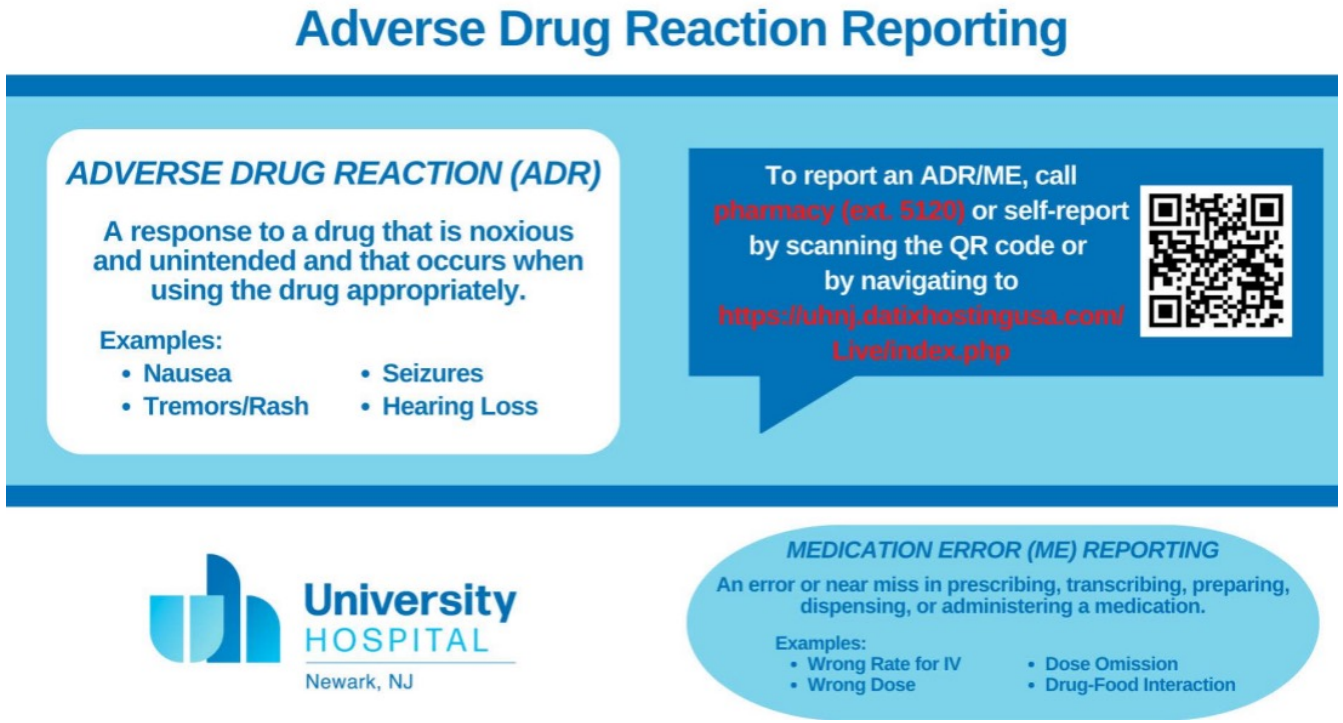
Adverse Drug Reaction/Medication Errors

- Adverse Drug Reaction (ADR): A response to a drug that is noxious and unintended and that occurs when using the drug appropriately.
- Preventable/Non- Preventable
- Medication Error (ME): An error or near miss in prescribing, transcribing, preparing, dispensing or administering a medication
- Safety Intelligence (SI): An electronic database maintained by Vizient®, in conjunction with University Hospital, for reporting, tracking, and trending patient care events.
- Available through available through clinical links website on all UH desktops

  https://uhclinicallinks.uhnj.org/

Adverse Drug Reaction/Medication Errors

- National average is 2% of all prescriptions/orders have an ADR
- Everyone has a **RESPONSIBILITY** to report
- There is IMMEDIATE notification to the practitioners
- The hospital reviews, assesses, identifies patterns and takes action to prevent any potential patient harm through the event reporting
- Root Cause analysis on events leading to patient harm



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Clinical Links

https://uhclinicallinks.uhnj.org/

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Order Sets

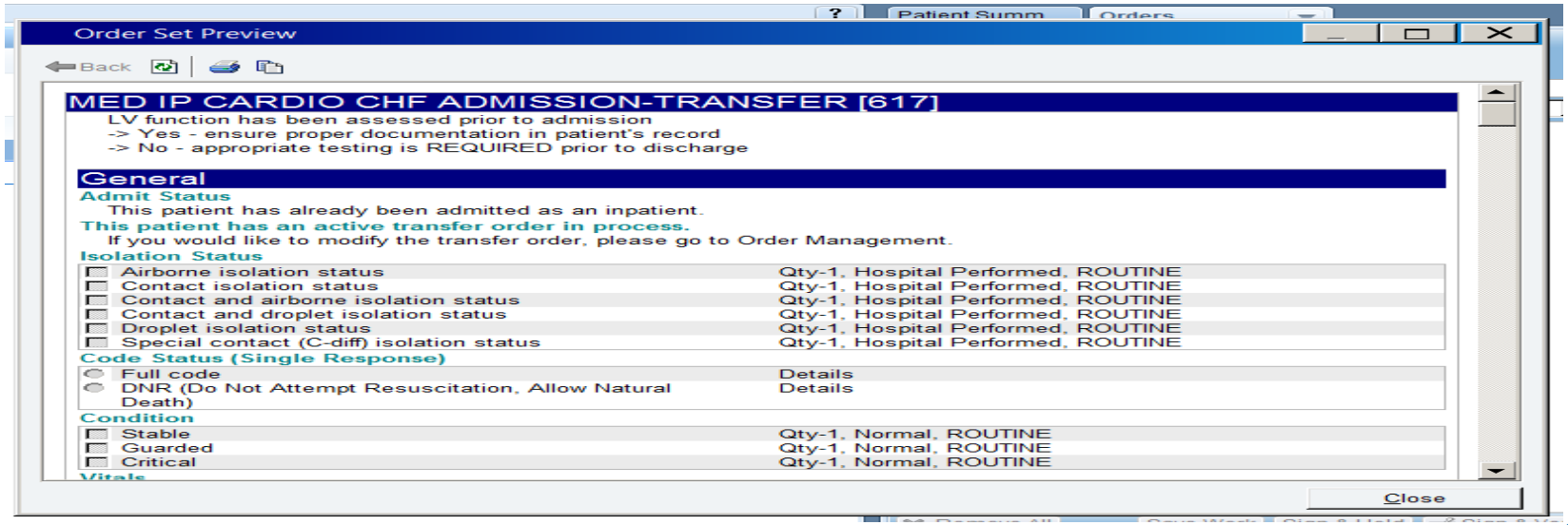
- A **protocol** requires the patient to meet certain clinical criteria, but there must be an order to initiate the protocol. Example: *ICU insulin infusion protocol*

- A **standing order** is an order that may be initiated without an initial order by the physicians or LIP by the nurse if the patient meets certain criteria. Example: Standing vitamin K or erythromycin ointment orders for newborn

- An **order set** is a list of individually selectable interventions or orders that the practitioner may choose from. Example: General Admission orderset, Sepsis orderset

Order Sets

- The order sets may be generated within a multidisciplinary process team
- Evidence based order sets have Physician Champion, Clinical Pharmacist, Nursing Representation and Multidisciplinary input as needed with a final approval from the hospital designated committee
- Sample order set



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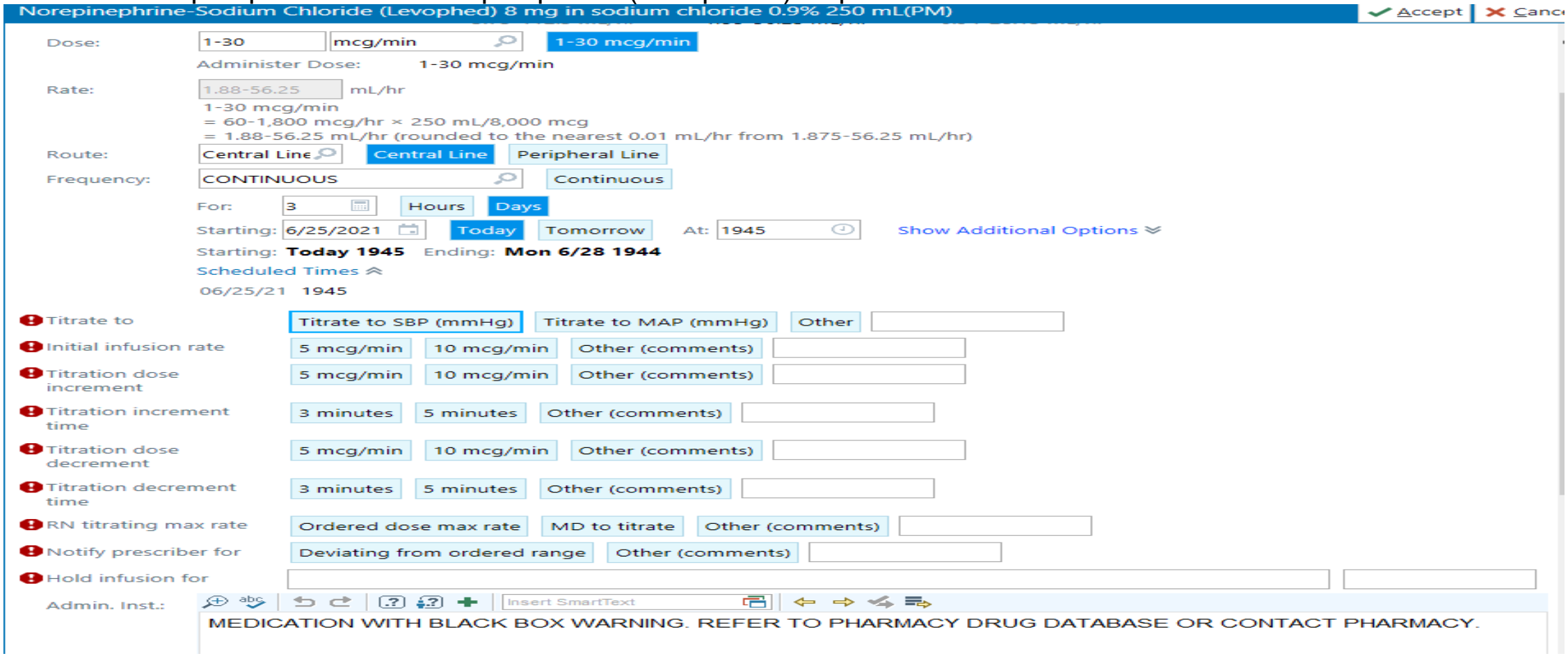
Titratable Infusions

- As with PRN medications, infusion titration orders MUST meet TJC requirements to provide all the required core elements
- Titrating medication orders elements shall include
- A. Medication name
- B. Medication route
- C. Initial or starting rate of infusion (dose/unit of time)
- D. Incremental units the rate or dose can be increased or decreased to achieve the goal
- E. Frequency for incremental/decrement doses/time (how often dose or rate can be increased or decreased)
- F. Maximum rate or dose of infusion.
- G. Objective clinical measure/ endpoint/goal (e.g. blood pressure, Richmond Agitation Sedation Scale -RASS score, Confusion Assessment Method- CAM score) to guide changes
- H. Condition on when to call Licensed Independent Practitioner (LIP)
- For example, a titrated medication order would say: Norepinephrine drip 8 mg/ 250 ml NS: Dose range: 1 - 30 mcg/min. Start at 5 mcg/min continuous IV. Titrate up or down by 5 mcg/min every 5 minutes until desired goal of MAP 60-65 mm Hg. Contact responsible LIP if at max dose and unable to titrate to goal or persistent MAP less than 55 mm Hg

Titratable Infusions

- Titratable Infusions have dosing questions which must be answered
  - Example questions for Norepinephrine (Levophed®) Drip:



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One and Done (One and Only)

CDC Initiative and TJC Regulatory Standard

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CDC Safety Guidelines

Facts:

Over the last decade, syringe reuse and misuse of medication vials have resulted in dozens of outbreaks and the need to alert over 150,000 patients to seek testing for blood-borne pathogens such as Hepatitis B & Hepatitis C virus and HIV.

Never administer medications from a single dose vial or IV bag to multiple patients.

- An IV bag with mixed medication is considered a single use/single patient product
- Anesthesia practice of mixing bags early in the day for multiple patient use is NEVER allowed
- Administration/infusion of “spiked bags” must begin within one hour of spiking
  - Bags must be dated and timed
  - Not dated and timed = out of compliance

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CDC Safety Guidelines

Single Dose Vial

- NOT determined by size
- Lacks preservation
- Used for single patient/single dose
- **Puncture only once and discard**

Multi-dose Vial

- Labeled accordingly (MDV)
- Contains preservative
- **Must be used within 28-days** of opening (UH policy 707-800-103)
- Must remain in the medication prep room to be considered multi-use/multi-patient. No other location or scenario is acceptable.

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Limit the use of Multi-Dose Vials and dedicate them to a single patient whenever possible. Once a Multi-Dose vial leaves the medication room and goes to a procedural area or patient room, it converts to a single use vial (one patient, one procedure)

ONE & DONE
=
ONE PATIENT, ONE PROCEDURE, AND DISCARD
(Discarding the vial is critical to meeting this standard.)

Multi-dose vials that are brought to the patient bedside should be dedicated to that patient only and discarded after single use. Use by dating is not applicable in these instances.

Bottom Line…

When in doubt
Throw it out!

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Adding New Drugs to the UH Formulary

- Any member of the Medical Staff may REQUEST the ADDITION of a drug to the formulary – request reviewed by the Pharmacy and Therapeutics Committee.
- For EACH drug, specific consideration is given to: pharmacologic classification, therapeutic indications, dosage forms available, bioavailability and pharmacokinetics, dosage range, known side effects and toxicities, advantages of the drug over similar agents, disadvantages of the drug compared to similar agents, therapeutic comparisons with other drugs or treatments, cost comparisons with other drugs or treatments and patient safety considerations
- REQUEST for DELETION of a drug from the formulary shall be submitted in writing to the Director of Pharmacy and the Pharmacy and Therapeutics Committee for action. Provide at least 3 weeks before the P&T Meeting
- Any additions/deletions to the formulary communicated through:
  - Quarterly Pharmacy Newsletter
  - Formulary Available electronically and hardcopy on the units

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New Drug Formulary Addition Form

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PHARMACEUTICAL CARE DIVISION – NEWARK CAMPUS

Formulary Addition Request Form
(To Be TYPED and Completed by the Requesting Attending Physician)

If you have any questions, please feel free to contact the Director of Pharmacy Services
(973)972-3443

MEDICATION DESCRIPTION / INFORMATION:

Generic name:
Proprietary (Trade) name (s):
Manufacturer:
Dosage form (s) and strength (s):
Drug Class:
Similar Drug(s) presently on Formulary:
"Look-alike" or "Sound-alike" drugs:

Mechanism of Action (s) (*describe **unique** pharmacologic properties, if any):*

INDICATIONS AND DOSING:

Indication (# patient/year)	Dose/ Frequency/ Duration	Specific Use Criteria (unusual adverse reactions / contraindications)

RISK ASSESSMENT:

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Non-Formulary Medications

- Use EPIC Drug Formulary selection
- Pharmacist will provide alternative therapy options
- Requires Approval from Pharmacy Procurement Supervisor, Department Chair, Director of Pharmaceutical Services, Chief Medical Officer, and UH Administrator
- Reviewed on case-by-case basis
- One-Time Non-Formulary Request Form (CPOM)

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Herbal (Natural) Products

- Herbal medicines are not permitted to be on the hospital formulary and shall be handled by special request (using non-formulary drug request form) only by the treating physician for those patients who require such medicines

- Pharmacist will not supply herbal medications. Individual situations will be evaluated on a case-by-case basis

- The Pharmacist cannot guarantee outcome, strength, dose or freedom from misbranding, mislabeling or tampering

#NJ ANTIBIOTICS AWARE
SMART USE, BEST CARE

UH Antimicrobial Stewardship Program: Overview

UH Earns State Recognition for Work with Antibiotics

The State Department of Health (DOH) has named University Hospital a Gold Award winner for its efforts to maximize the benefits of antibiotics in curing bacterial infections. The award was earned by the UH Antimicrobial Stewardship Team under the DOH's Antimicrobial Stewardship Recognition Program.

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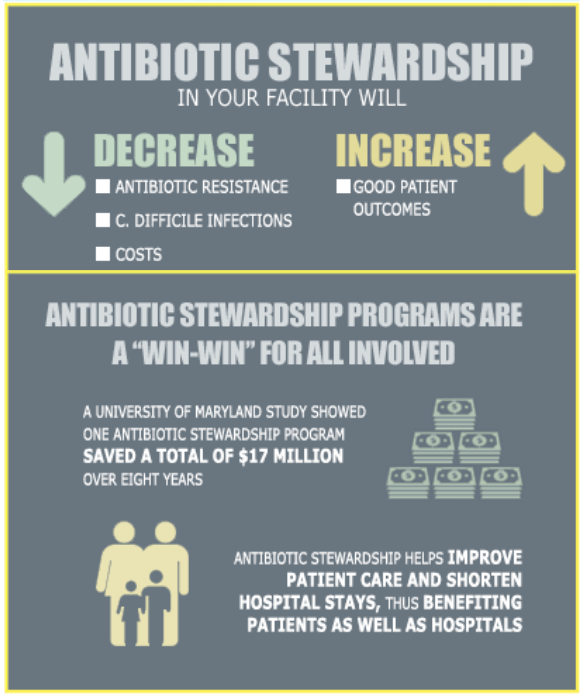
What is Antimicrobial Stewardship?

Coordinated strategies to improve the use of antimicrobial medications

- Assist in selection, dosing, and duration of antibiotic therapy
- Reduce broad-spectrum antibiotic use when appropriate
- Ultimately, improve patient outcomes and reduce hospital costs and duration of stays



https://www.cdc.gov/drugresistance/threat-report-2013/index.html

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How can Antimicrobial Stewardship Team help you?

- We can help you with…
  - Antibiotic coverage, spectrum, or indications
  - Issues with adverse effects, drug monitoring, or allergies
  - Antimicrobial dosing, pharmacokinetics, or pharmacodynamics, including dosing of vancomycin and aminoglycosides
  - Interpretation of microbiology results including susceptibility testing
  - Antibiotic drug interactions (e.g. Linezolid and SSRIs, amiodarone)
  - Approval with restricted antibiotics

Keep in mind…

- Pharmacist Consult does not substitute for formal Infectious Diseases consultation!

- On occasion, it is expected that a recommendation to seek formal consultation may be the outcome of an interaction with us.

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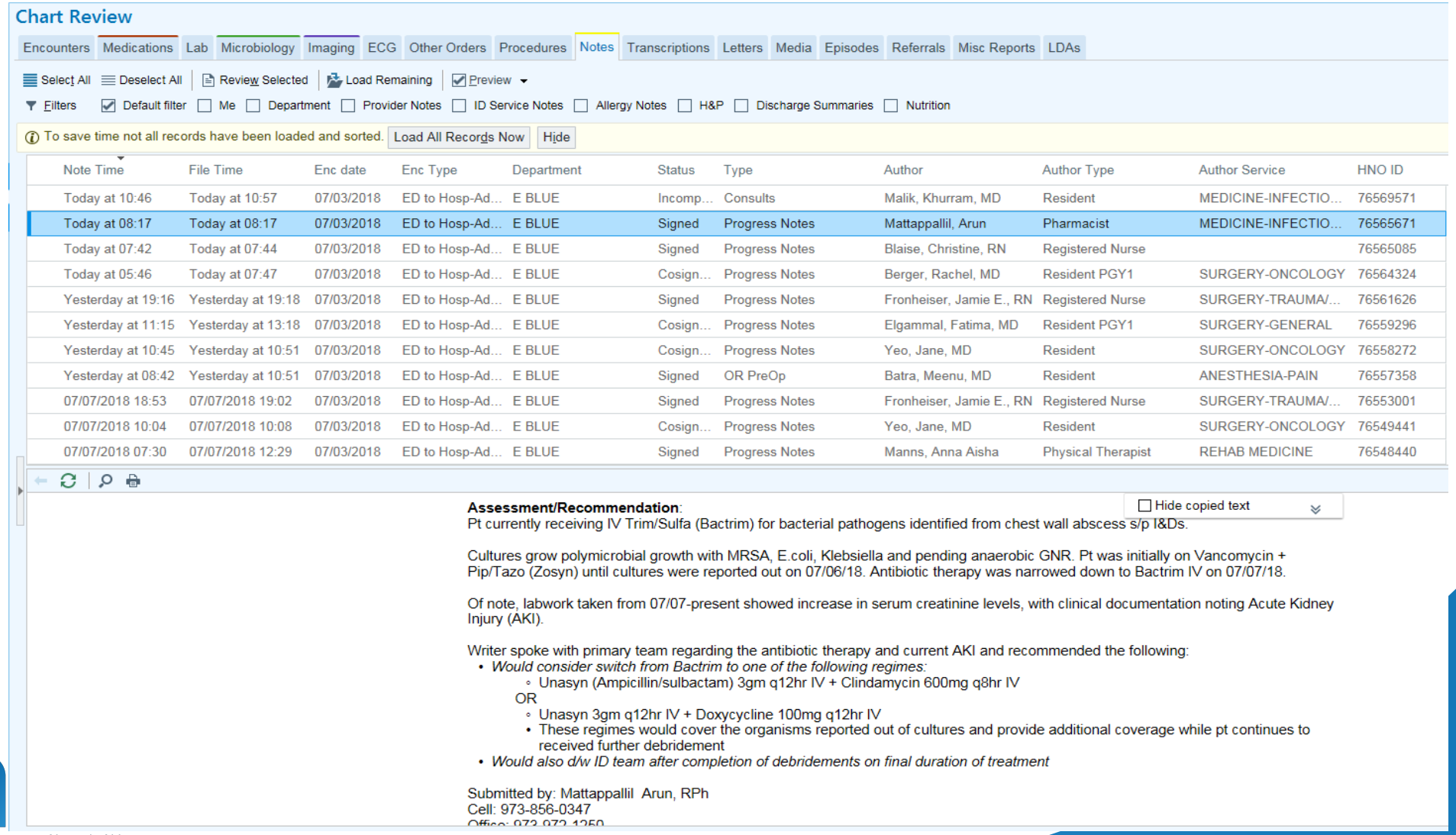
You may see a note from us on EPIC… Read them!



UH Infectious Disease Clinical Guidelines

UH Antimicrobial Stewardship Website

- The website can be accessed by either:
- http://uhclinicallinks.uhnj.org/
- Click the ICON with the name “UH Antimicrobial Stewardship Website”

OR

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Antimicrobial Stewardship Program (ASP)

- http://uhclinicallinks.uhnj.org/AMBS/uhnj.html

Can only be accessed on campus through a computer, smartphone or digital device linked to the UH/Rutgers networks.

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UH Infectious Disease Clinical Guidelines

UH Antibiograms

- The website can be accessed by either:
- http://uhclinicallinks.uhnj.org/
- Click the ICON with the name “UH Antibiograms”

OR

- http://uhclinicallinks.uhnj.org/Docs/UH%20Antibiograms.pdf

Can only be accessed on campus through a computer, smartphone or digital device linked to the UH/Rutgers networks.

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UH Infectious Disease Clinical Guidelines

- **Available on MCN Policy Manager**

- Click this icon available on most UH medical ward desktops

- Web Address (accessible anywhere on any device)
  - http://universityhospital.ellucid.com
  - Use CORE Login & Password or NetID & Password
- Type “ID” on the search bar and press “Enter” key

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UH Antimicrobial Stewardship Program Links

- Web Address (accessible anywhere on any device)
  - https://redcap.link/an0u53tp

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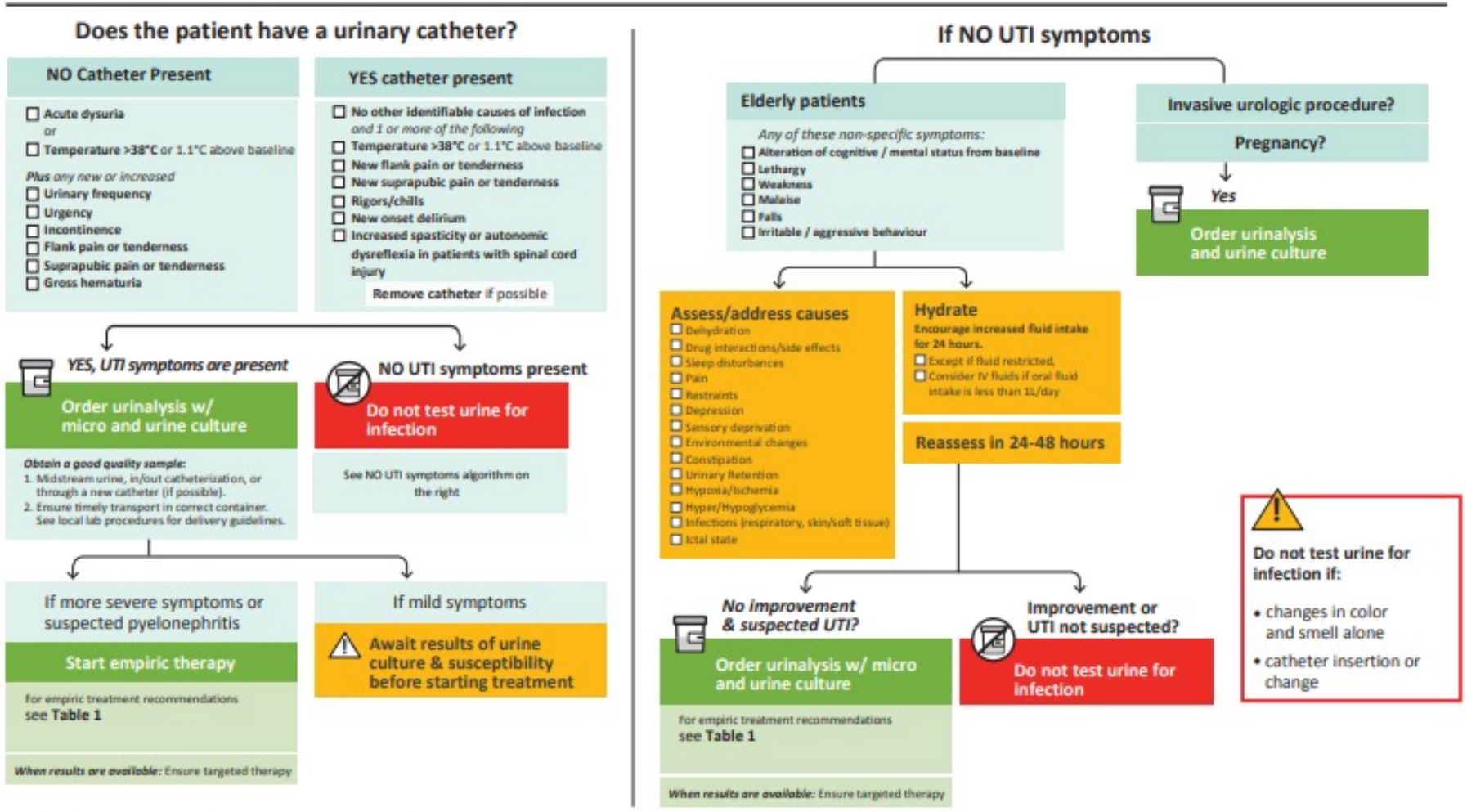
University Hospital Adult Urinary Tract Infection (UTI) Guideline

Evidence-based criteria for urine testing (modified with permission from Alberta Health Services)



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University Hospital Adult Urinary Tract Infection (UTI) Guideline

Empiric Treatment Considerations for Non-Pregnant Adults

A. Unless guided by current or prior urine culture results, consider these empiric options

- Cephalexin (Keflex®) PO
- Nitrofurantoin (Macrobid®) PO
- Sulfamethoxazole / trimethoprim (Bactrim DS®) PO
- Ciprofloxacin (Cipro®) PO/IV
- Fosfomycin (Monurol®) PO
- Ceftriaxone (IV)

Note: Additional diagnostic/treatment considerations are applicable to patients with nephrostomy tubes, urinary diversions such as ileal conduits and spinal cord injury patients. Would consider discussion with ID Consult service, in these instances, as needed.

B. Determine location/severity of UTI – this will determine duration of therapy

C. Table 1: Commonly used antibiotic dosing recommendations for non-pregnant adults

	Cephalexin (PO)	Nitrofurantoin (PO)	SMX/TMP (PO)	Ciprofloxacin (PO/IV)	Fosfomycin (PO)	Ceftriaxone (IV)
Recommended Indications and Treatment Duration (should be guided by the specific clinical situation and the response to therapy)						
Uncomplicated UTI/Cystitis	7 days (A)	5 days (P)	3 days (P)	3 days (P)	X1 dose (A)	**DO NOT USE**
Complicated UTI/Cystitis	**DO NOT USE**	10 days (P)	10 days (P)	10 days (P)	q48h – q72h x 3 doses (A)	**DO NOT USE**
Pyelonephritis	**DO NOT USE**	**DO NOT USE**	**DO NOT USE**	7-10 days (P)	**DO NOT USE**	10-14 days (A)
Dose Adjustments with Renal Impairment						
CrCl >50	500 mg q12h	100 mg q12h	1 DS tab (800/160) q12h	PO: 250-500 mg q12h IV: 400 mg q12h	3 grams	1 grams IV q12-24h
CrCl 30-50						
CrCl 10-29		**DO NOT USE**	1 DS tab (800/160) q24h	PO: 250-500 mg q24h IV: 400 mg q24h		
IHD	500 mg q24h				**DO NOT USE**	
CRRT	500 mg q12h		1 DS tab (800/160) q24h	PO: 250-500 mg q12h IV: 400 mg q12h		
Agent specific comments						
	Generally not used in men with cystitis if concerned for prostatitis	Activity against Enterococcus, VRE	Reasonable in men with cystitis, if concern of prostatitis	Preferred in men with cystitis, if concern for prostatitis	**Requires** calling micro lab to perform sensitivity testing on bacteria: Useful in patients with multi-drug resistant (eg: ESBLs) bacteria	
Cost	500 mg capsule= $0.10	100 mg tablet = $0.77	1 DS tablet = $0.05	500 mg tablet = $0.10	3 grams = $76	1 gram = $11

(P) = Preferred Option (A) = Alternative Option

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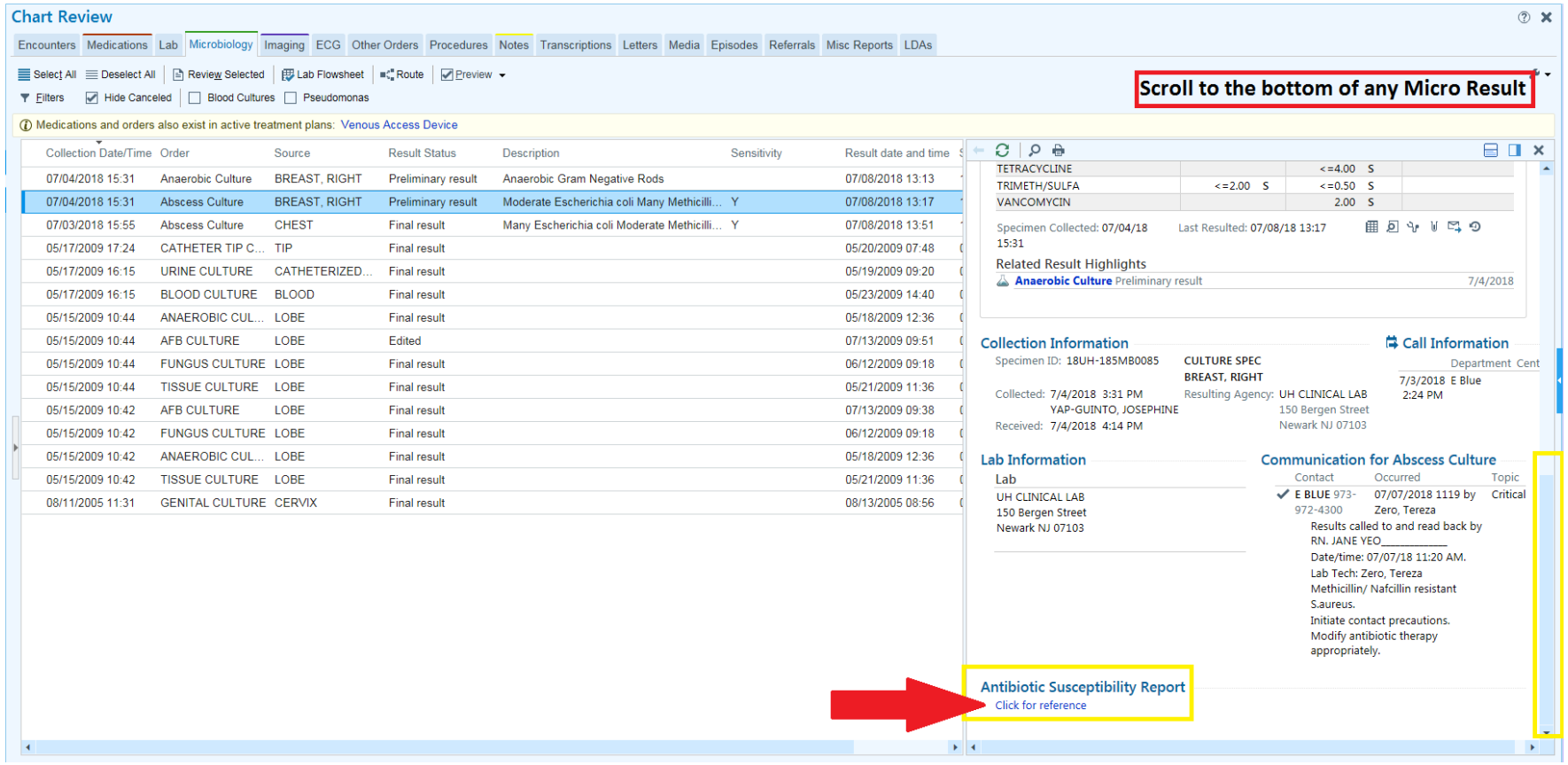
UH Antibiogram Location on Epic



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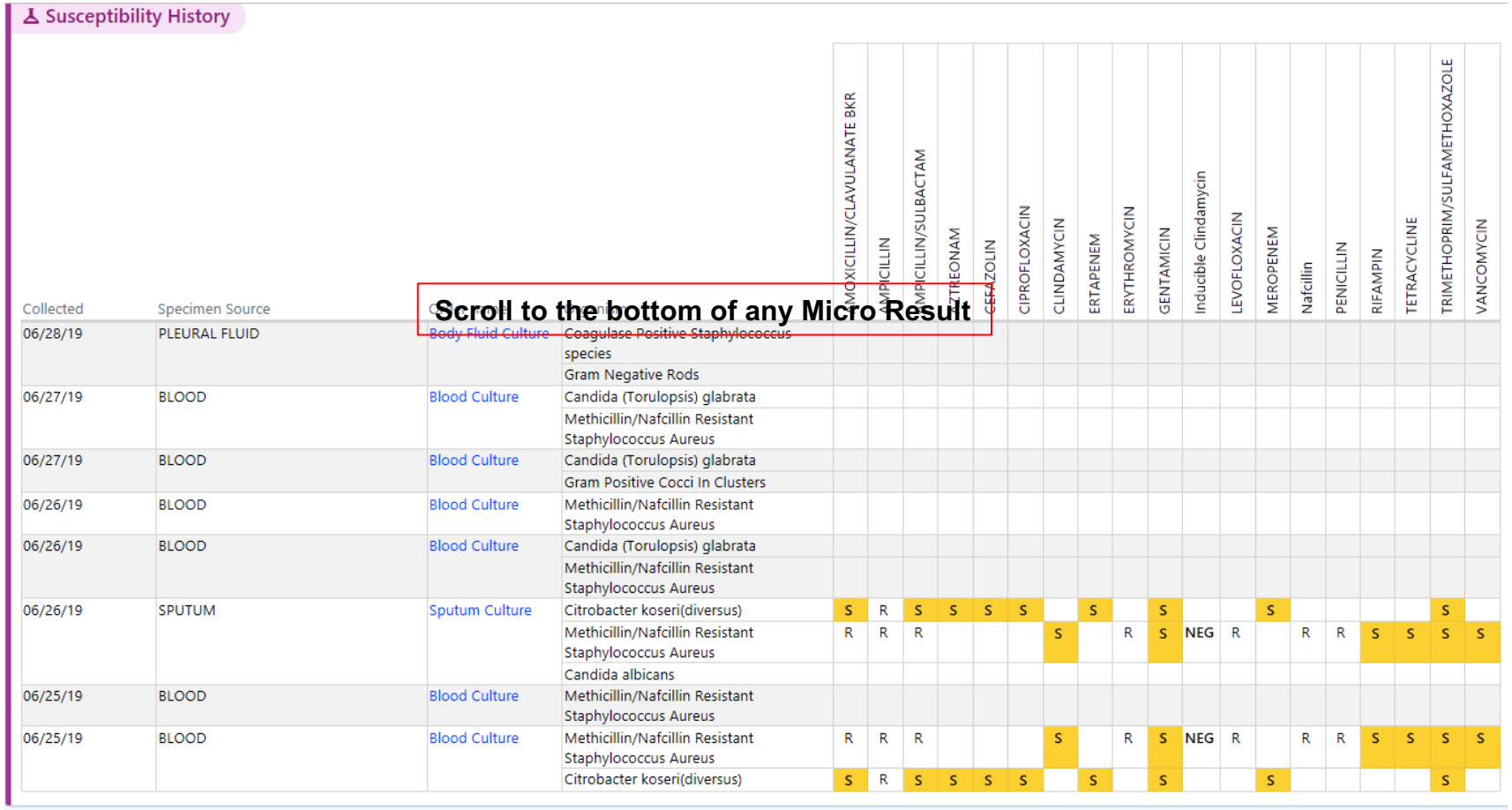
Patient Specific Antibiogram Location on Epic



Collected	Specimen Source	Culture	Organism	AMOXICILLIN/CLAVULANATE BKR	AMPICILLIN	AMPICILLIN/SULBACTAM	AZTREONAM	CEFAZOLIN	CIPROFLOXACIN	CLINDAMYCIN	ERTAPENEM	ERYTHROMYCIN	GENTAMICIN	Inducible Clindamycin	LEVOFLOXACIN	MEROPENEM	Nafcillin	PENICILLIN	RIFAMPIN	TETRACYCLINE	TRIMETHOPRIM/SULFAMETHOXAZOLE	VANCOMYCIN
06/28/19	PLEURAL FLUID	Body Fluid Culture	Coagulase Positive Staphylococcus species																			
			Gram Negative Rods																			
06/27/19	BLOOD	Blood Culture	Candida (Torulopsis) glabrata																			
			Methicillin/Nafcillin Resistant Staphylococcus Aureus																			
06/27/19	BLOOD	Blood Culture	Candida (Torulopsis) glabrata																			
			Gram Positive Cocci In Clusters																			
06/26/19	BLOOD	Blood Culture	Methicillin/Nafcillin Resistant Staphylococcus Aureus																			
06/26/19	BLOOD	Blood Culture	Candida (Torulopsis) glabrata																			
			Methicillin/Nafcillin Resistant Staphylococcus Aureus																			
06/26/19	SPUTUM	Sputum Culture	Citrobacter koseri(diversus)	S	R	S	S	S	S		S		S			S					S	
			Methicillin/Nafcillin Resistant Staphylococcus Aureus	R	R	R				S		R	S	NEG	R		R	R	S	S	S	S
			Candida albicans																			
06/25/19	BLOOD	Blood Culture	Methicillin/Nafcillin Resistant Staphylococcus Aureus																			
06/25/19	BLOOD	Blood Culture	Methicillin/Nafcillin Resistant Staphylococcus Aureus	R	R	R				S		R	S	NEG	R		R	R	S	S	S	S
			Citrobacter koseri(diversus)	S	R	S	S	S	S		S		S			S					S	

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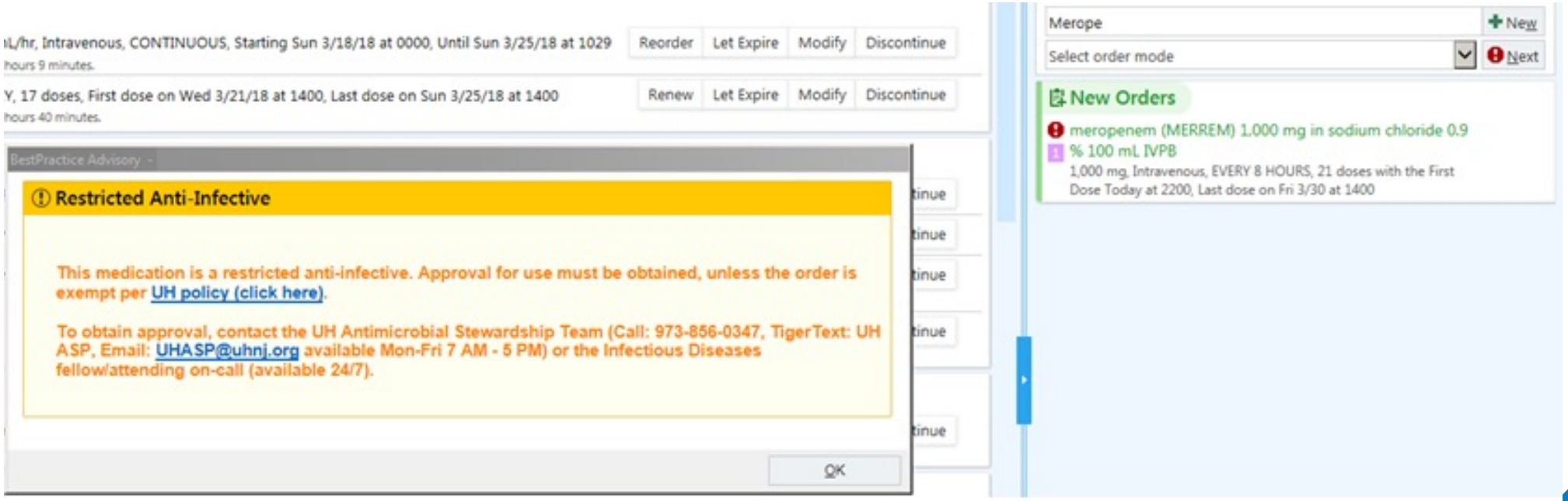
Seek review for approval, prior to order entry of restricted antibiotics!



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ORDER ENTRY, VERIFICATION, AND PROVISION OF RESTRICTED ANTI-INFECTIVES (12/2018)

Category I: High Restricted **Infectious Diseases Consultation and Approval must be requested, prior to use**		
Generic Name	**Rationale for Restriction****	**Criteria for Exemption**
Ceftaroline	1, 3	No Exemptions
Ceftazidime/avibactam	1, 4	
Cidofovir	1, 4	
Foscarnet	1, 4	
Pentamidine	1, 4	
Category II: Restricted **AP Approval must be requested, prior to use**		
Generic Name	**Rationale for Restriction****	**Criteria for Exemption**
Amphotericin B	1	No Exemptions
Liposomal amphotericin B	1	
Anidulafungin	4	
Aztreonam	1, 2	Unrestricted in any setting, when ordered by Obstetrics/Gynecology service providers
Colistimethate sodium	1, 4	No Exemptions
Daptomycin	4, 5	
Ertapenem	5, 6	
Fosfomycin	1	
Linezolid	4, 5	
Meropenem	5, 6	Unrestricted in any ICU setting **for 5 days only**
Micafungin	4	No Exemptions
*Non-formulary anti-infective**	1, 4	
Polymyxin B	1, 4	
Tigecycline	1, 4	
Voriconazole	4	
***Non-formulary anti-infective** • Order must be entered in accordance with policies/procedures for non-formulary medications		

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CLOSTRIDIUM DIFFICILE PANEL

Order: 107465586

Status: Final result
Visible to patient: No (not released)
Next appt: None

0 Result Notes

	Ref Range & Units	8 d ago
CLOSTRIDIUM DIFFICILE PCR	Negative	Positive !
CLOSTRIDIUM DIFFICILE TOXIN	Negative	Positive !
Clostridium Difficile Interpretation		

Comment: Positive for C. difficile toxin B gene by molecular PCR assay. Positive for C. difficile toxin by immunoassay. Contact isolation is required. Antibiotic treatment is typically indicated. Repeat testing within 14 days is not indicated."

Resulting Agency: UH CLINICAL LAB

Narrative — Performed by: UH CLINICAL LAB

Results should be interpreted in conjunction with information available from other relevant tests and the patient's clinical profile. If you have any questions, please call the Molecular Diagnostics Laboratory at (973) 972-3339 or 6544. The performance characteristics of the FDA approved PCR test were verified by the University Hospital Molecular Diagnostics Laboratory. This test is used for clinical purposes. The Laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988(CLIA-88) as qualified to perform high complexity clinical Laboratory testing.

Jie-gen Jiang M.D., Director

Specimen Collected: 03/28/21 16:16 Last Resulted: 03/29/21 17:36

CLOSTRIDIUM DIFFICILE PANEL

Order: 107560310

Status: Final result
Visible to patient: No (not released)
Next appt: 04/19/2021 at 08:30 AM in Cornea Ophthalmology (Mohammad Dastjerdi, MD)

0 Result Notes

	Ref Range & Units	4 d ago
CLOSTRIDIUM DIFFICILE PCR	Negative	Negative
CLOSTRIDIUM DIFFICILE TOXIN	Negative	Testing Not Indicated
Clostridium Difficile Interpretation		

Comment: "Negative for C. difficile toxin B gene by molecular PCR assay. Repeat testing within 7 days is not indicated."

Resulting Agency: UH CLINICAL LAB

Narrative — Performed by: UH CLINICAL LAB

Results should be interpreted in conjunction with information available from other relevant tests and the patient's clinical profile. If you have any questions, please call the Molecular Diagnostics Laboratory at (973) 972-3339 or 6544. The performance characteristics of the FDA approved PCR test were verified by the University Hospital Molecular Diagnostics Laboratory. This test is used for clinical purposes. The Laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988(CLIA-88) as qualified to perform high complexity clinical Laboratory testing.

Jie-gen Jiang M.D., Director

Specimen Collected: 04/01/21 13:45 Last Resulted: 04/02/21 14:11

CLOSTRIDIUM DIFFICILE PANEL

Order: 107465655

Status: Final result
Visible to patient: No (not released)
Next appt: None

0 Result Notes

	Ref Range & Units	10 d ago
CLOSTRIDIUM DIFFICILE PCR	Negative	Positive !
CLOSTRIDIUM DIFFICILE TOXIN	Negative	Negative
Clostridium Difficile Interpretation		

Comment: "Positive for C. difficile toxin B gene by molecular PCR assay. Results indicate colonization. Neither toxin A nor toxin B is detected by immunoassay in the specimen submitted. Contact isolation is required. Antibiotic treatment may be indicated in certain circumstances. Repeat testing within 14 days is not indicated."

Resulting Agency: UH CLINICAL LAB

Narrative — Performed by: UH CLINICAL LAB

Results should be interpreted in conjunction with information available from other relevant tests and the patient's clinical profile. If you have any questions, please call the Molecular Diagnostics Laboratory at (973) 972-3339 or 6544. The performance characteristics of the FDA approved PCR test were verified by the University Hospital Molecular Diagnostics Laboratory. This test is used for clinical purposes. The Laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988(CLIA-88) as qualified to perform high complexity clinical Laboratory testing.

Jie-gen Jiang M.D., Director

Specimen Collected: 03/26/21 16:18 Last Resulted: 03/29/21 17:35

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UH Antimicrobial Stewardship: Future Plans

- Pharmacy-based interventions
  - Vancomycin dosing
  - IV to oral conversion

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Antimicrobial Stewardship Team Contact Information:

- Call: 973-856-0347
- Email: UHASP@uhnj.org
- Epic Secure Chat: UH Infectious Disease Pharmacists
- Available: Mon-Fri 7 AM - 5 PM

Debra Chew, MD, MPH
Epic Secure Chat: Type my name
Cell: 973-650-8002

Arun Mattappallil, PharmD
Office: 973-972-1250
Epic Secure Chat: Type my name
Cell: 973-856-0347

Nadeem Baalbaki, PharmD, AAHIVP
Office: 973-972-4807
Epic Secure Chat: Type my name
Cell: 973-800-2189

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National Patient Safety Goal: Anticoagulants

1. Protocols & Guidelines:

a. heparin nomogram orderset,

b. Heparin Induced Thrombocytopenia orderset

c. Anticoagulant reversal guideline:
https://universityhospital.ellucid.com/documents/view/4163

d. UH Peri-Op anticoagulant guide:
https://universityhospital.ellucid.com/documents/view/4693

2. Baseline lab required prior to anticoagulant start

https://universityhospital.ellucid.com/documents/view/3665

Medication	Baseline labs within prior 72hrs
Apixaban	CBC, SCr, aPTT, LFT
Argatroban	CBC, aPTT, LFT
Bivalirudin	CBC, SCr, LFT, aPTT or ECT
Dabigatran	CBC, SCr
Enoxaparin	CBC, SCr
Heparin	CBC, aPTT or ECT
Rivaroxaban	CBC, SCr, LFT
Warfarin	CBC, PT/INR,

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National Patient Safety Goal: Anticoagulants

- A. Patient and family **education** required elements on anticoagulants (must document these elements discussed)

1. **Adherence** to dose & schedule
2. Importance of **f/u** appointments & lab testing
3. Drug-Drug or Drug food **interactions**
4. What to look for in **Adverse Drug Reactions**

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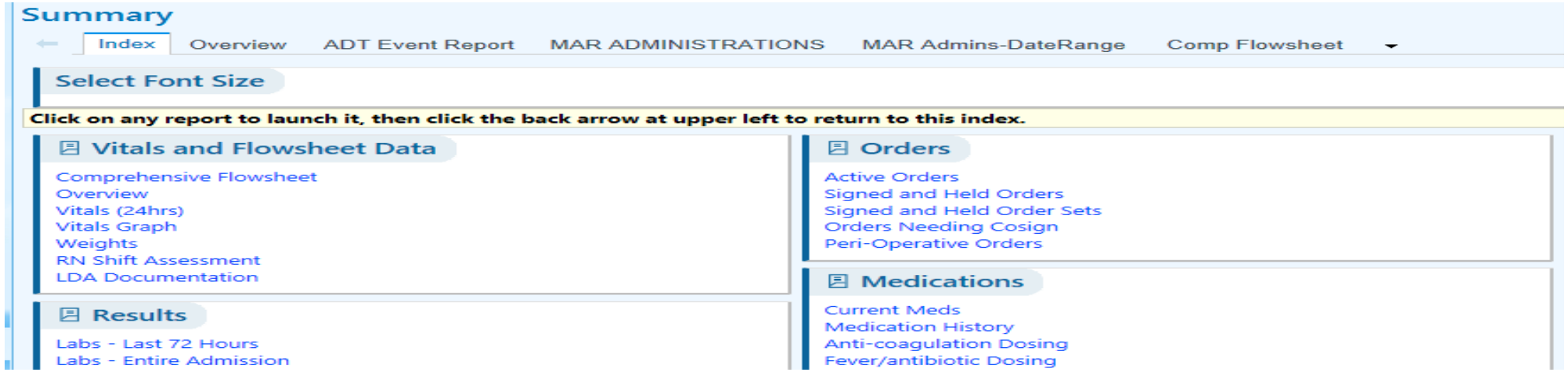
National Patient Safety Goal: Anticoagulants

Monitor Anticoagulant in EPIC for overview: summary>Index>medication-anti-coag



	ED EMER...	OPERATING ROOM E LEVEL			E POST ANEST. CARE				G BLUE PCU						
	06/25 0700 - 06/26 0659						06/26		06/27 0700 - 06/28 0659					06/28	
Time:	0930	0948	1000	1115	1714	0603	1211	2140	1141	1324	1711	0615	0616	1223	
Anticoagulants															
Warfarin (mg)								2.5			2.5				Warfarin (mg)
Increase INR agent															
CeFAZolin INJ (mg)			2,000	2,000											CeFAZolin I...
CefePIME IV (mg)							1,000		1,000					1,000	CefePIME I...
Decrease INR agent															
Sodium Chloride 0.9 % Soln (mL)		1x													Sodium Chl...
Labs															
INR	2.5					2.8				2.6		2.3			INR
APTT	35.4					47.8				50.9		47.3			APTT
PLT	120				85	90				93			106		PLT
SCr	7.5				7.6	8.6				7.5			9.2		SCr

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IV to Oral/ feeding tube Interchange Policy:

- **Purpose**
  - Ensure appropriate use of IV medications
  - Minimize risk of IV catheter-related infections
  - Maximize patient quality of life
  - Optimize cost effectiveness

- **IV to PO/feeding tube Medications**
  - Acetaminophen (Ofirmev®) to 975mg PO/via tube q6h
  - Digoxin (Lanoxin®)
  - Famotidine (Pepcid®)
  - Folic acid
  - Fosphenytoin (Cerebyx®)/ phenytoin (Dilantin®)
  - Levetiracetam (Keppra®)
  - Levothyroxine (Synthroid®)
  - Metoclopramide (Reglan®)
  - Multivitamin
  - Pantoprazole (Protonix®)
  - Thiamine < 200mg
  - Antibiotics are **not automatic** (azithromycin, ciprofloxacin, clindamycin, doxycycline, fluconazole, levofloxacin, linezolid, metronidazole, rifampin, voriconazole, trimethoprim/sulfamethoxazole)

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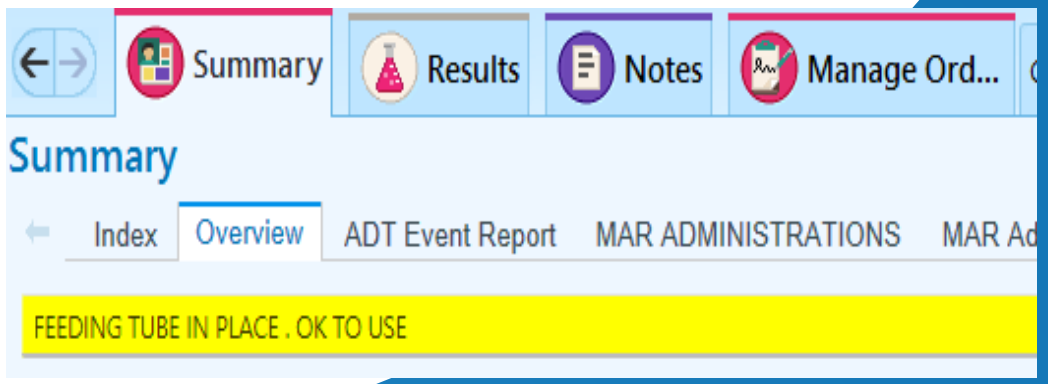
Automatic Oral to Feeding tube route & vice versa

- Once Feeding tube placement is confirmed (X-ray)
- Order “Feeding tube OK to use: ? Inserted tube type” – type ‘OK’

Feeding tube placement confirmed, ok to use.

- PLEASE dc above order when tube is removed to prevent continual med route change to enteral routes by Rx

- Triggers workflow downstream: banner visible during verification
- Rx automatically changes active meds to appropriate formulation for the route
- Authorized by Pharmacy & Therapeutics (P&T) Committee: Per protocol



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Automatic Stop Order Policy

- Unless a physician orders for a specific duration of therapy all drugs (see 2.4 specific exemptions) will expire after 30 days

2.1) No medication Order can be written for longer than 30 days.
2.2) No “Duration of Hospital Stay” orders can be written.
2.3) No “Continuation of all medications” or “resume previous orders” can be written.
2.4) Specific Exemptions.
  a) ALL controlled medications (CII-V) -240 hours (10 days) exception IV infusions as specified under 2(m)
  b) Warfarin - 24 hours
  c) Steroids 240 hours (10 days)
  d) For potassium replacement refer to policy 707-600-157
  e) Oral phosphate supplements: 72 hours
  f) Antibiotics orders: 7 days (168 hours) unless specified below:
    a) IV Piperacillin-Tazobactam: (3 days (72 hours)
    b) Post-operative prophylactic antibiotics (e.g. SCIP)

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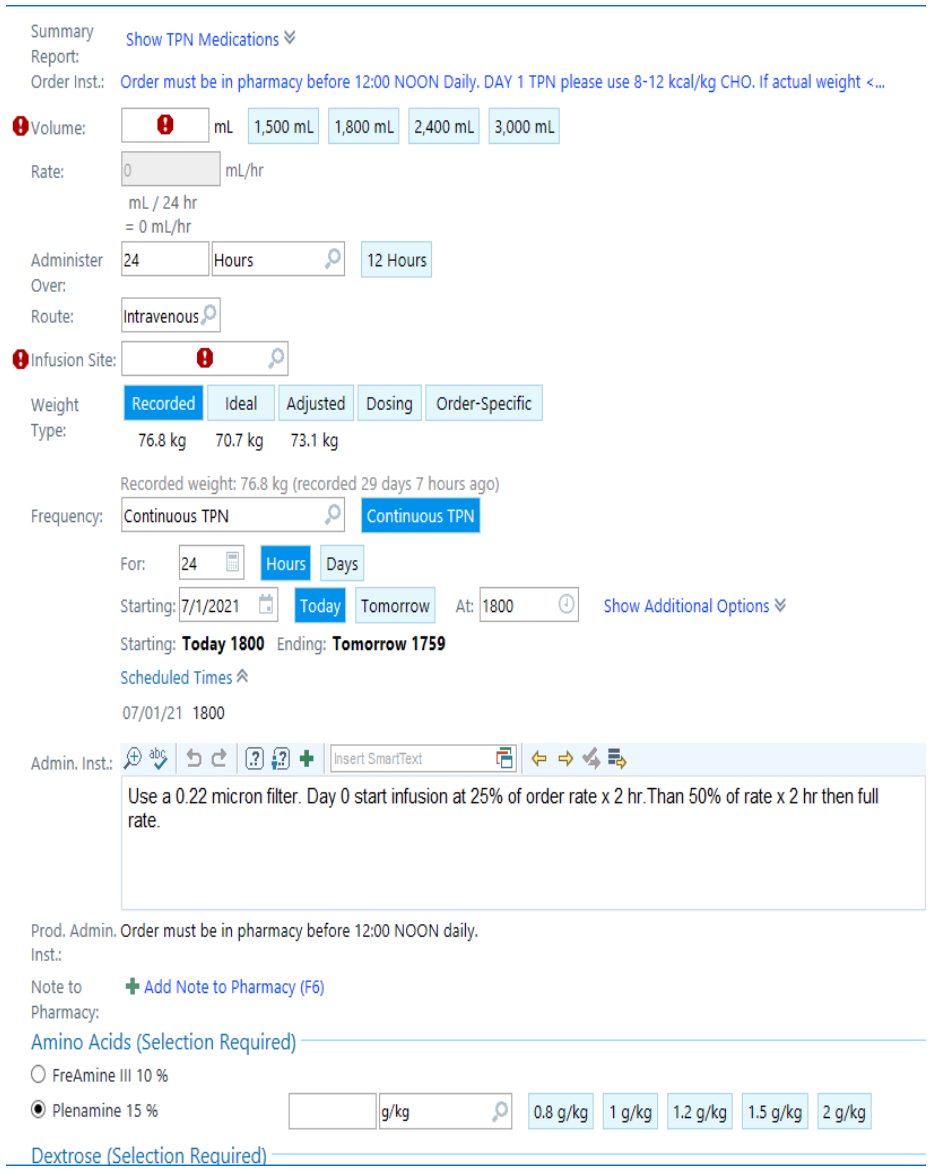
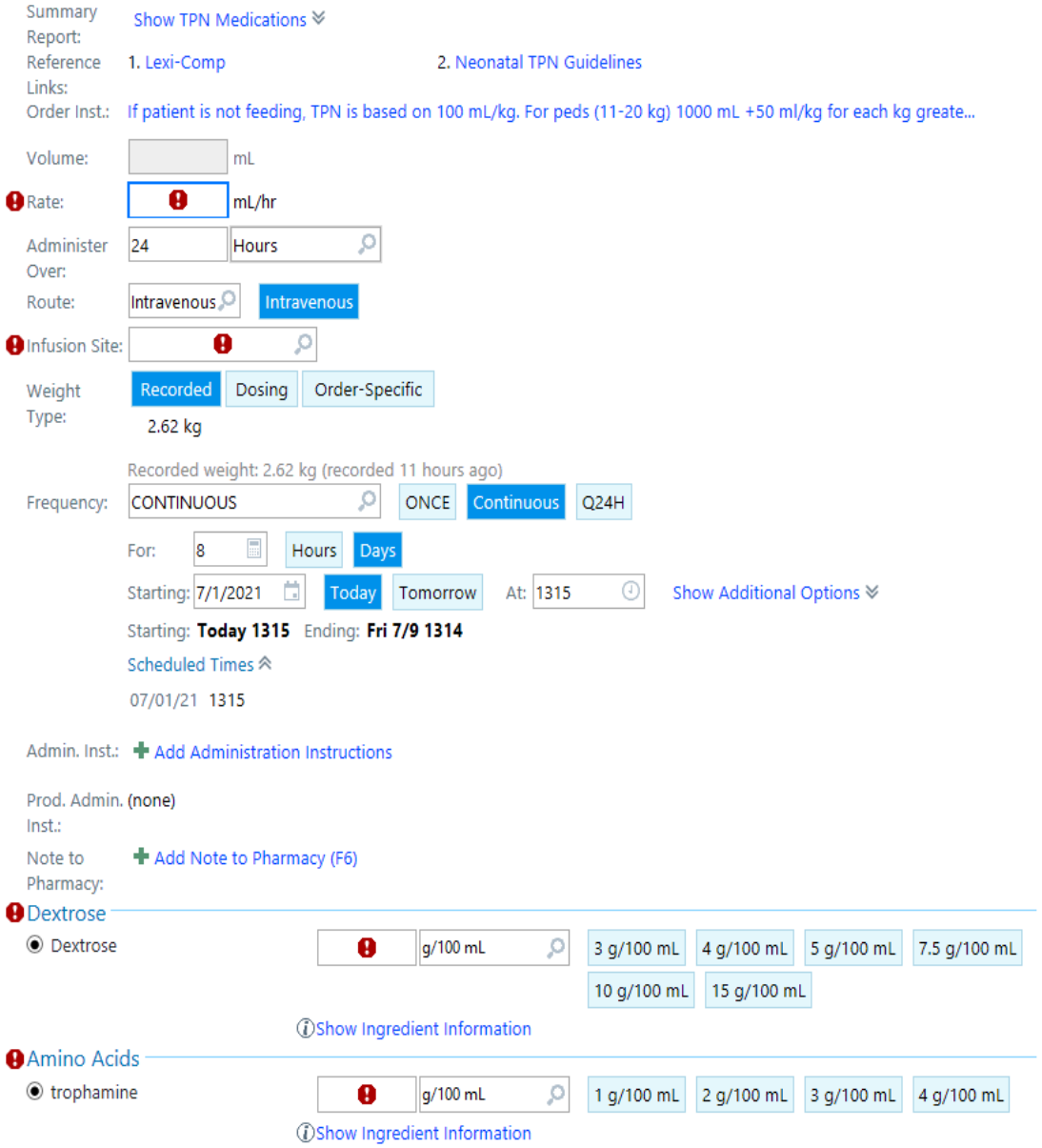
Automatic Stop Order Policy continued

g) Intravenous solution with or without additives shall be valid for 72 hours from time written unless specified.
h) Ketorolac injectable and tablet 5 days (not renewable).
i) Sodium polystyrene sulfonate 24 hours.
j) Nebulizer Medications (3 days)
k) Low Molecular Weight Heparin (e.g. enoxaparin) and Heparin Subcutaneous 30 days
l) Albumin order 24 hours
m) All IV drips (e.g. midazolam, Fentanyl, Morphine sulfate, PCA, dopamine, dobutamine etc.) shall be valid for 72 hours from time written unless specified.
n) All orders for ondansetron shall be valid for 48hours from the time written unless specified.
o) IV acetaminophen- 4doses, subsequent doses need anesthesia approval
p) Filgrastim (5 days)
q) Calcitonin injection- 24 hours

Total Parenteral Nutrition (TPN) Orders

- All neonatal TPN orders can be written for up to 8 days (if starting on a Tuesday, otherwise any subsequent changes are valid until the following Tuesday) or sooner if specified.
- All Adult TPN orders can be written for 24 hours.
- All TPN orders must be received in the Pharmacy (B-134) no later than 12 noon daily.
- The TPN orders are mixed by an outside contracted company. We send our daily orders to them and they deliver the prepared bags to the pharmacy after 200pm. Once we receive the prepared bags, we send them up to the floors.
- Changes or modifications to the TPNs made after 12 noon will be effective the following day.
- “Starter TPN” is available for Neonates (Called “Starter Nutrition”) and Adults (Clinimix®)





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Total Parenteral Nutrition Orders (Adult)

Total Parenteral Nutrition Orders (Neonatal)

Chemotherapy Orders

- Outpatient Chemotherapy/Biotherapy orders are prepared and administered Monday-Friday 8am-4:30pm (except holidays)
- Inpatient Chemotherapy/Biotherapy orders are prepared and administered during the same time, but off-hour exceptions for emergency circumstances can be accommodated.
- Phone extension for Chemotherapy Satellite Pharmacy: **2-6847**

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Chemotherapy Orders

- All Chemotherapy/Biotherapy orders must be entered via CPOE, and must be signed by a credentialed oncologist or attending with privileges to order chemotherapy.
- Out-patients orders must be signed no later than 2 PM the day prior to the patient's scheduled treatment, while
- In-patient chemo administration orders must be signed no later than 10 AM the day of chemotherapy administration except in case of oncologic emergencies that require prompt treatment.

Healthy Heart Program at UH

- Multidisciplinary team consisting of Cardiologist, HF APN, Pharm D, Case Manager, Social Worker, Respiratory therapist, and a Registered dietician.
- Multidisciplinary rounds occur three days a week on Monday, Wednesday, and Friday on the following floors:
  I. I-Blue
  II. I-Yellow 1
  III. I-Yellow 2
- Patients with a diagnosis of systolic or diastolic heart failure are evaluated by the multidisciplinary team to ensure all guideline directed therapy and care plans are being followed, where appropriate.
- Medication reconciliation is completed and patients are provided education on their medication changes as well as their disease state.
- Assist patients in obtaining medications at discharge by communicating with outpatient pharmacies and insurance companies

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Healthy Heart Program at UH

- For resources including updated guidelines, order sets & policies, and educational materials please visit:
    - http://uhclinicallinks.uhnj.org/ and select Heart Failure ToolKit

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Propofol is a control medication at UH

UH Pharmacy Department rolled out a policy to treat propofol as a controlled medication across all UH units and departments on May 2nd, 2023

- Propofol is documented and wasted according UH policy for controlled substances and need a witness for inventory and wasting

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Useful Websites

- Clinical Pharmacology: https://www.clinicalkey.com/pharmacology/
- Lexicomp: https://online.lexi.com
- UH Policies and Procedures: https://universityhospital.ellucid.com/userLogin
- UH Net: http://www.uhnj.org/uhnetweb/

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Questions?

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