UNIT-BASED PHARMACY SERVICES

JORDAN M POTTER, PHARMD

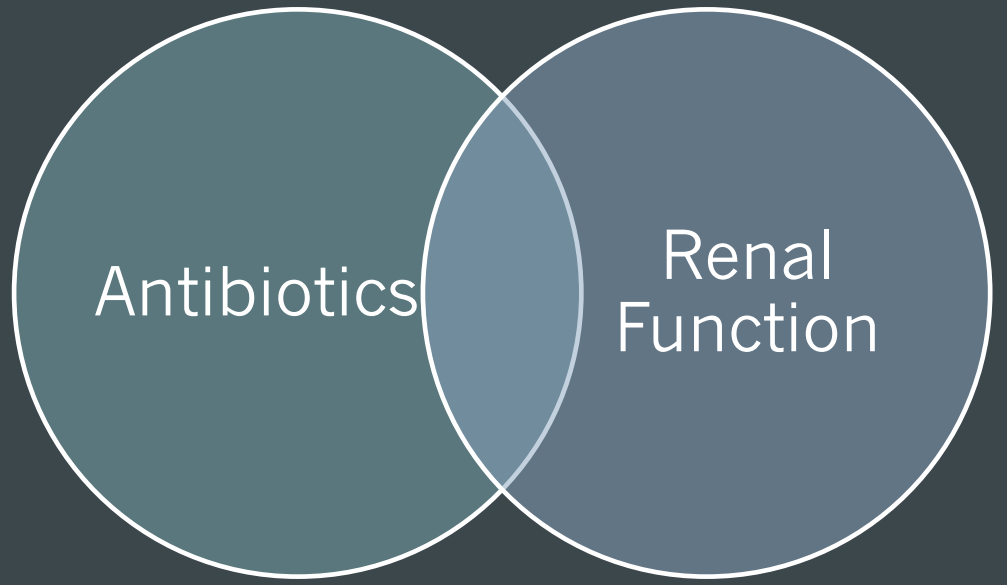
PHARMACY GRAND ROUNDS

BEAUMONT HOSPITAL, ROYAL OAK, MI

OBJECTIVES

- Review daily duties of unit-based pharmacists
- Recognize the importance of appropriate documentation
- Relate responsibilities to impact on patient care

AUTOMATIC RENAL DOSING OF ANTIMICROBIAL AGENTS



AUTOMATIC RENAL DOSING OF ANTIMICROBIAL AGENTS

Purpose: Allows pharmacists to change the dose and/or frequency of antimicrobial agents based on adult patients' renal function or renal replacement therapy

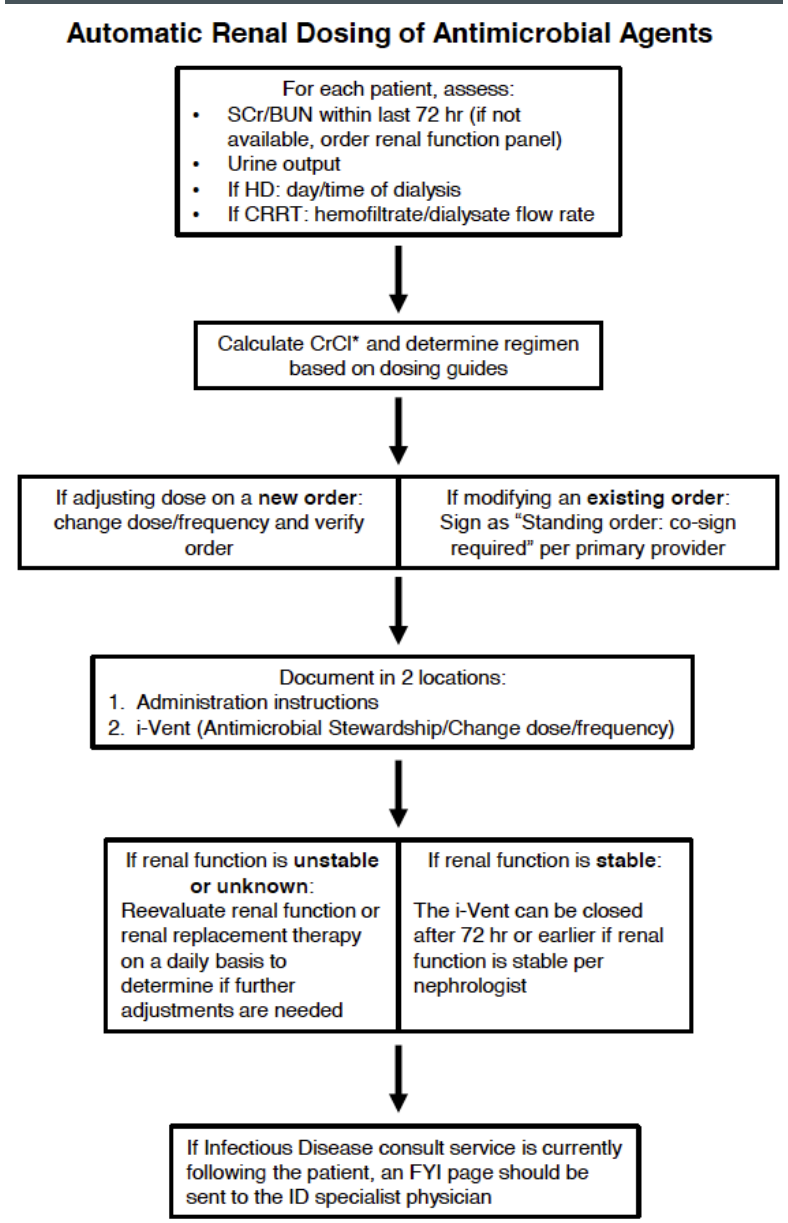
- Assess renal function in last 72 hours
  - Order Renal Function Panel per protocol, if necessary
  - Urine Output
  - Renal replacement therapy, if applicable

NOTE:

Pharmacists will calculate creatinine clearance (CrCl) based on the Cockcroft-Gault Equation to estimate the patient's renal function.

Est. CrCl = {([140 - age] x IBW*)/(72 x serum creatinine)} x (0.85 if female)
Use total body weight (TBW) if TBW < IBW and use ABW in obese patients (if TBW is >30% over IBW)

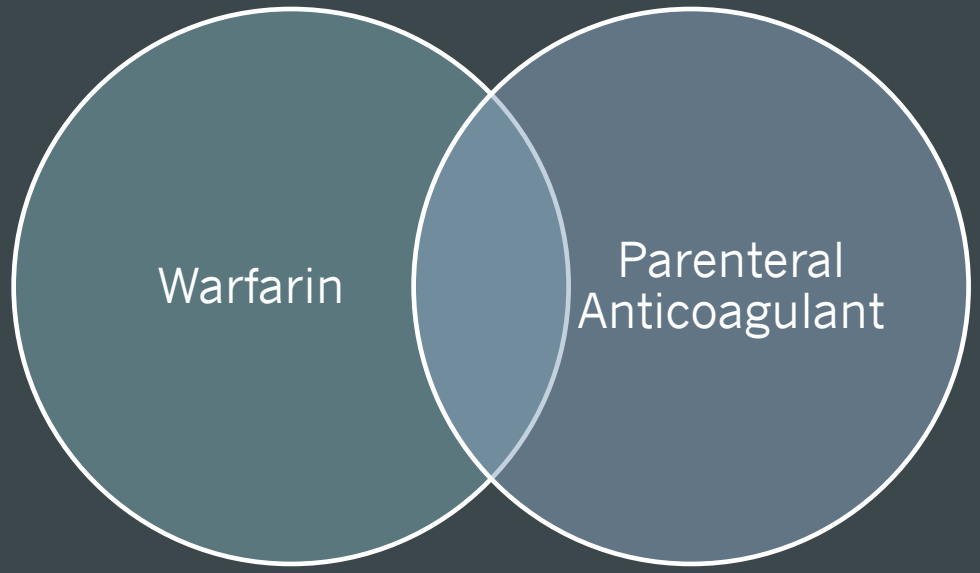
Adjusted Body Weight (ABW) = IBW + 0.4(TBW-IBW)
Ideal Body Weight (IBW) for men = 50 kg + 2.3 kg per inch over 5 feet
Ideal Body Weight (IBW) for women = 45 kg + 2.3 kg per inch over 5 feet



AUTOMATIC RENAL DOSING OF ANTIMICROBIAL AGENTS

1. Assess renal function and renal replacement therapy, if applicable
2. Calculate creatinine clearance and determine regimen
3. Adjust the order
    1. For NEW ORDERs: Change dose/frequency and verify
    2. For EXISTING ORDERs: Sign as "Standing order: co-sign required" per primary provider
    3. If Infectious Disease (ID) is consulted, send FYI page to ID specialist
4. Document in administration instructions and as an i-Vent
    1. "Antimicrobial Stewardship"; "Change dose/frequency"
5. Follow up
    1. If renal function UNSTABLE: Re-evaluate renal function or renal replacement therapy daily
    2. If renal function STABLE: Close i-Vent after 72 hours

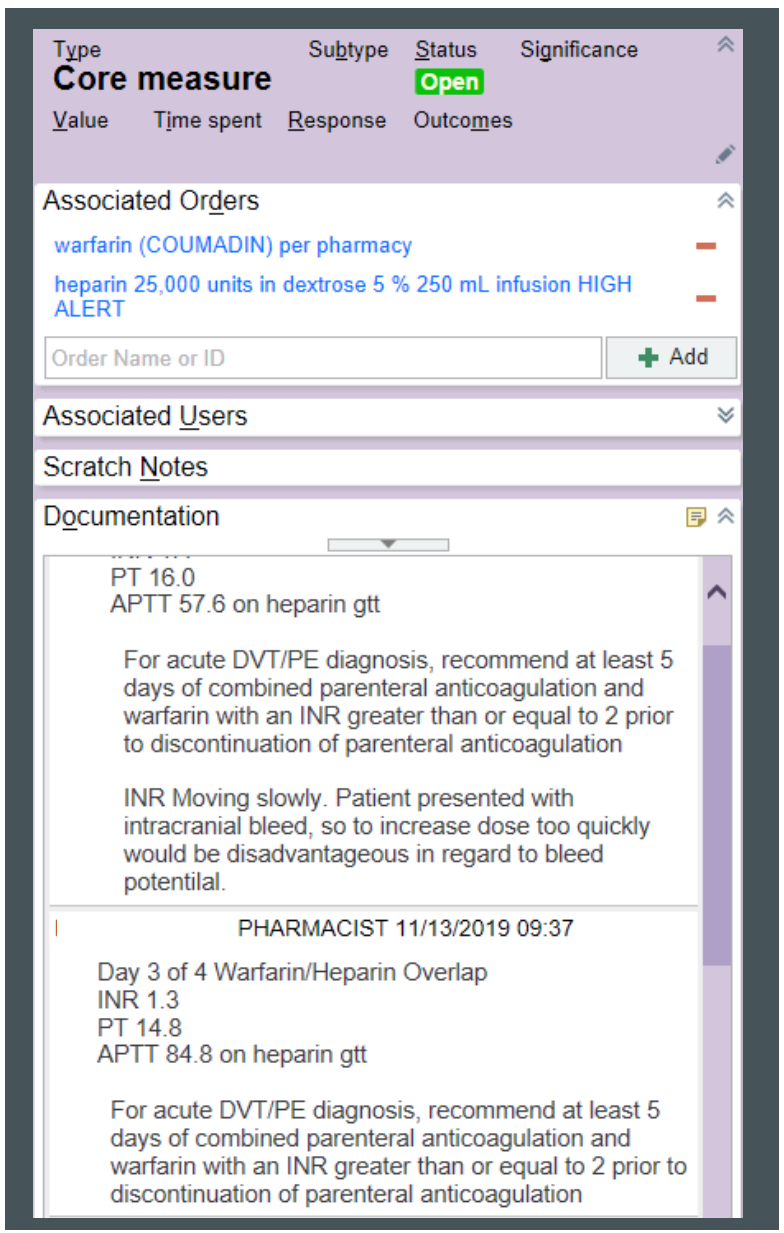
VTE-3 CORE MEASURE FOR OVERLAP THERAPY



VTE-3 CORE MEASURE FOR OVERLAP THERAPY

Purpose: Patients with acute VTE require overlap with a parenteral agent while warfarin reaches steady state

- Joint Commission Core Measure
- New pharmacy to dose warfarin consult for VTE
  - Pharmacists managing warfarin therapy for VTE will assess parenteral anticoagulation overlap
  - Open a “Core Measure” i-Vent on the parenteral agent
- Update i-Vent daily
- Place recommendations for overlap in initial warfarin note



VTE-3 CORE MEASURE FOR OVERLAP THERAPY

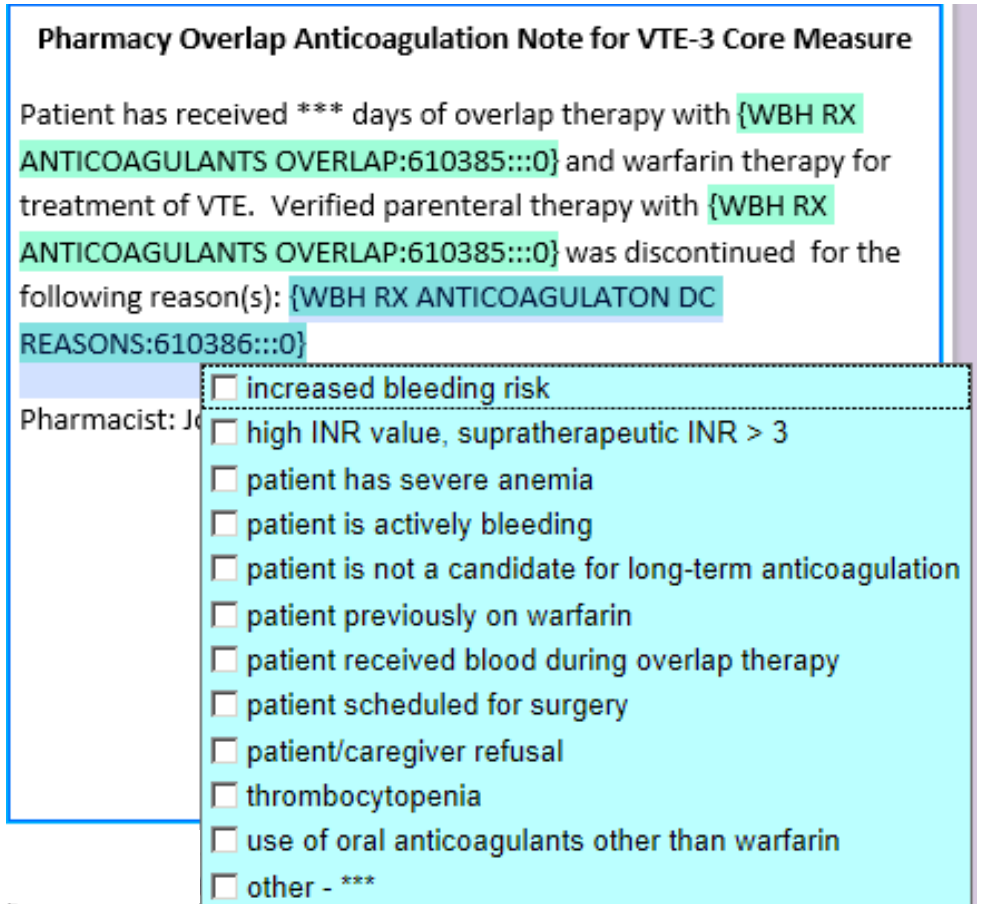
1. Identify warfarin consult for VTE (acute or history) with parenteral overlap
2. Open "Core Measure" i-Vent on parenteral agent
    1. "Day X of 4 warfarin/*parenteral* agent overlap"
        1. NOTE: The day that the i-Vent/overlap starts is DAY 0
    2. Record current monitoring parameters
        1. INR, PT, APTT
    3. "For acute DVT/PE diagnosis, recommend at least 5 days of combined parenteral anticoagulation and warfarin with an INR greater than or equal to 2 prior to discontinuation of parenteral anticoagulation"
        1. Also add this statement to the initial warfarin pharmacist progress note
3. Follow up
    1. Update daily while overlapping with parenteral therapy

VTE-3 CORE MEASURE FOR OVERLAP THERAPY

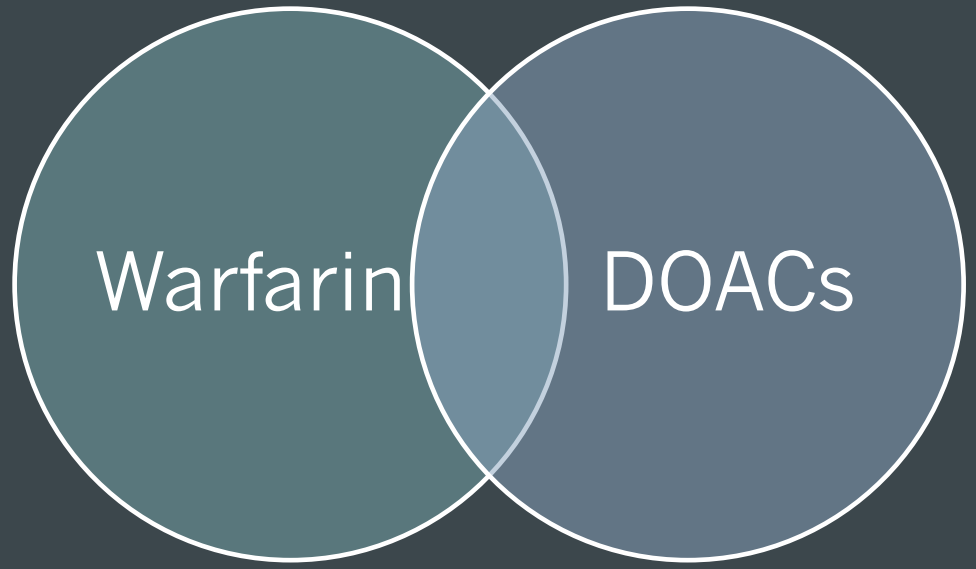
If parenteral agent discontinued, document the same day and contact prescriber, as necessary, IF:

1. Overlap is < 4 days
2. Overlap > 4 days but INR <2

".pharmacyoverlapanticoagulationnote"



ANTICOAGULANT PATIENT EDUCATION



ANTICOAGULATION PATIENT EDUCATION

Purpose: Provide education for high-risk medications to improve successful outcomes as a national patient safety goal

- Ensure patients can successfully utilize anticoagulants safely and efficaciously
- Timeframe: Education and documentation within 24-48 hours of therapy initiation
- On ALL oral anticoagulant orders, open "Patient Education" iVent
  - Use smart phrase "**.anticoagedu**" to assess the need for patient education
- Anticoagulant Teaching Service Pager: x52071
  - Available to page from 1000 to 1500

ANTICOAGULATION PATIENT EDUCATION

Responsibility	Warfarin	DOACs	SmartPhrase
Patient Education i-Vent	✓	✓	”.anticoagedu”
Education Required if:			
New Start	✓	✓	
Non-Compliance	✓	✓	
Benefit from Education	✓	✓	
Atrial Fibrillation	✓*	✓*	
VTE (Acute or history)	✓		
Hypercoagulable States	✓		
Completed Education:			
Patient Education i-Vent	✓	✓	”.pharmeducationnote”
Pharmacist Progress Note	✓	✓	”.pharmeducationnote”
Patient Education Tab	✓		

* If other condition met to require patient education (i.e. new start, non-compliance, etc.)

”.ANTICOAGEDU”

Open i-Vent upon order verification and use SmartPhrase to evaluate the need for education in the ”Patient Education” i-Vent

Anticoagulation Patient Education Assessment

Indication: paroxysmal atrial fibrillation
New start:Yes
Non-compliance noted: No
Dose change/may benefit from further education: No
Education required: Yes
Any barriers to education: No

”.PHARMEDUCATIONNOTE”

Place the following in the ”Patient Education” i-Vent and document in a “Pharmacist Progress Note”

Royal Oak Pharmacy - Patient Education

Anita Anticoagulant has received counseling on the appropriate use and potential adverse effects of the following medications: **Apixaban**. The patient has verbalized understanding of the information provided and received literature.

“Patient and family member present for education. Education provided and all questions regarding therapy were answered.”

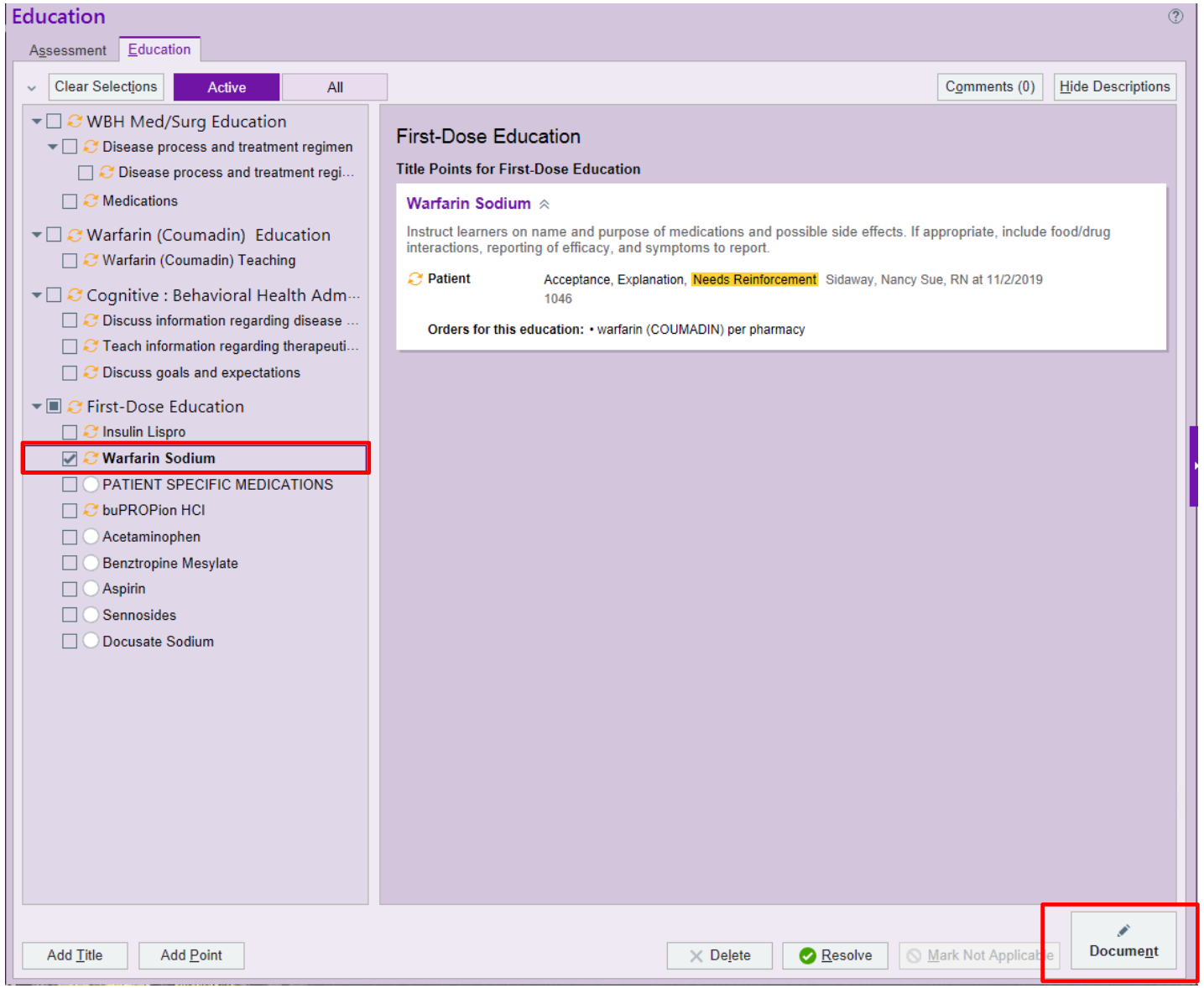
Pharmacist: **John Smith, PHARMACIST**

WARFARIN

Patient Education Documentation

1. I-Vent
2. Pharmacist Progress Note
3. **Education "Resolved"**

"Patient Education" Tab > "Warfarin (Coumadin) Education" > "Document"

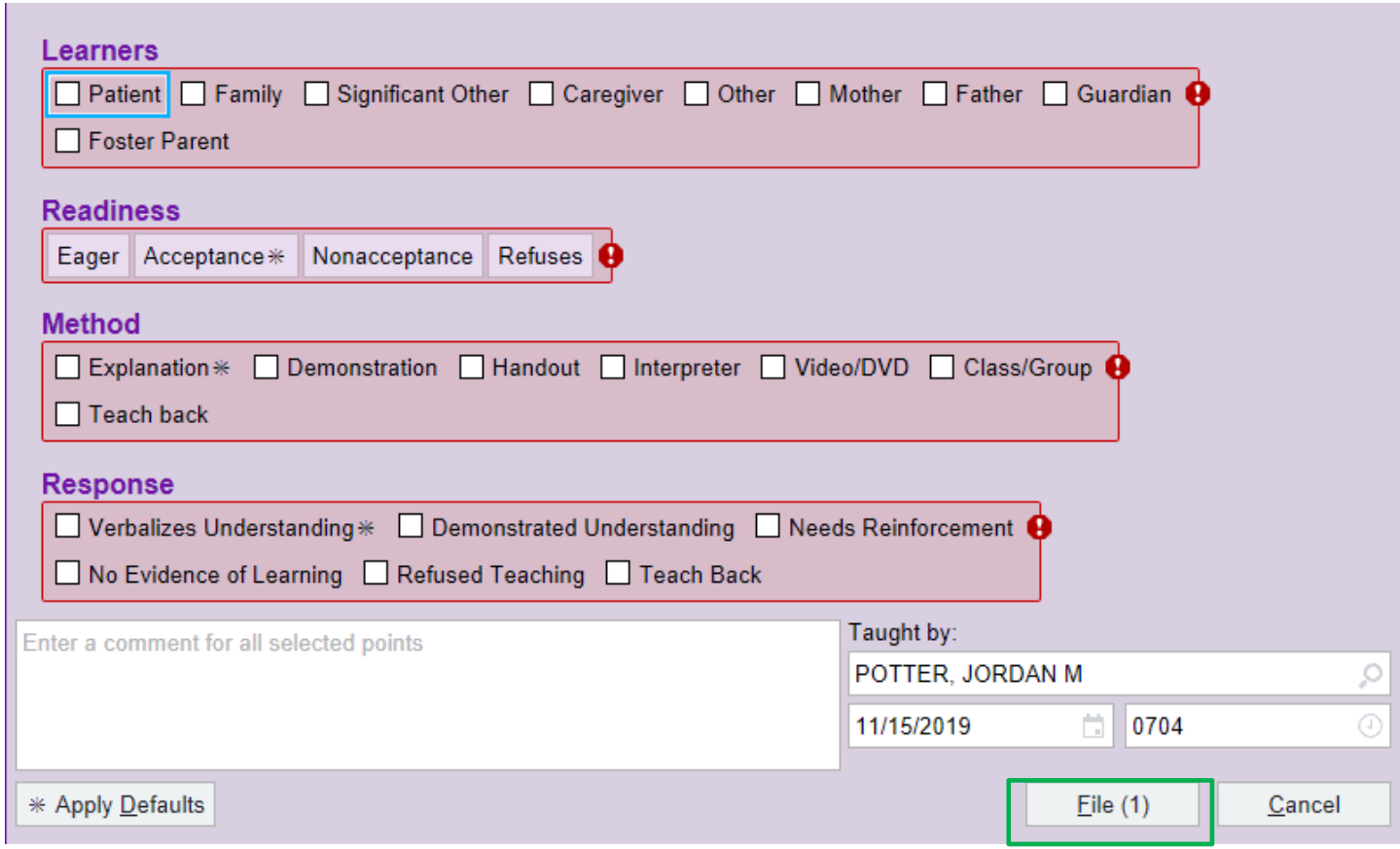


WARFARIN

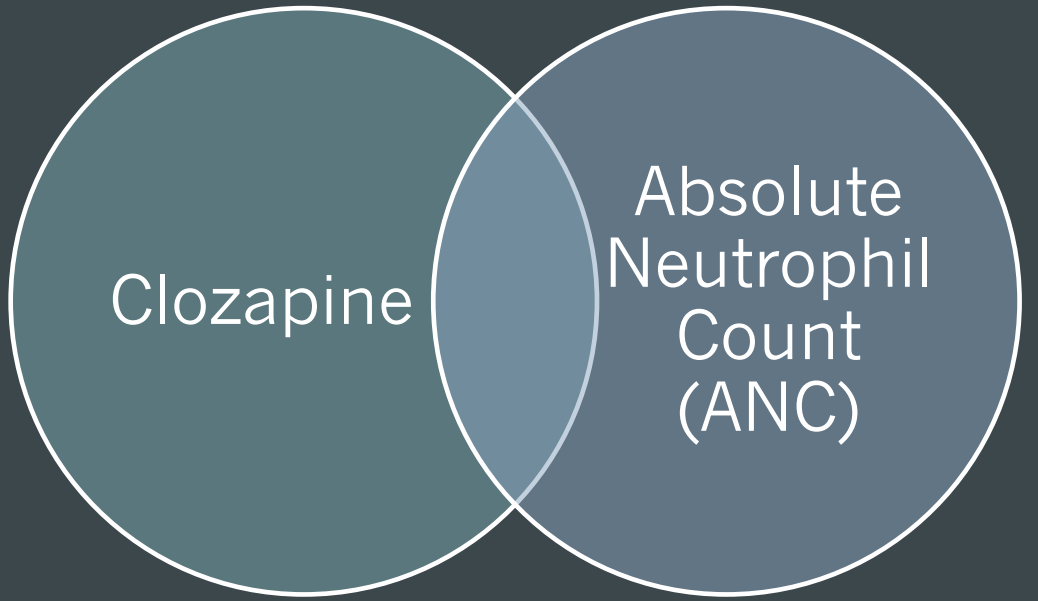
Patient Education Documentation

1. I-Vent
2. Pharmacist Progress Note
3. **Education “Resolved”**

“File” > “Resolve” > “Education Complete”



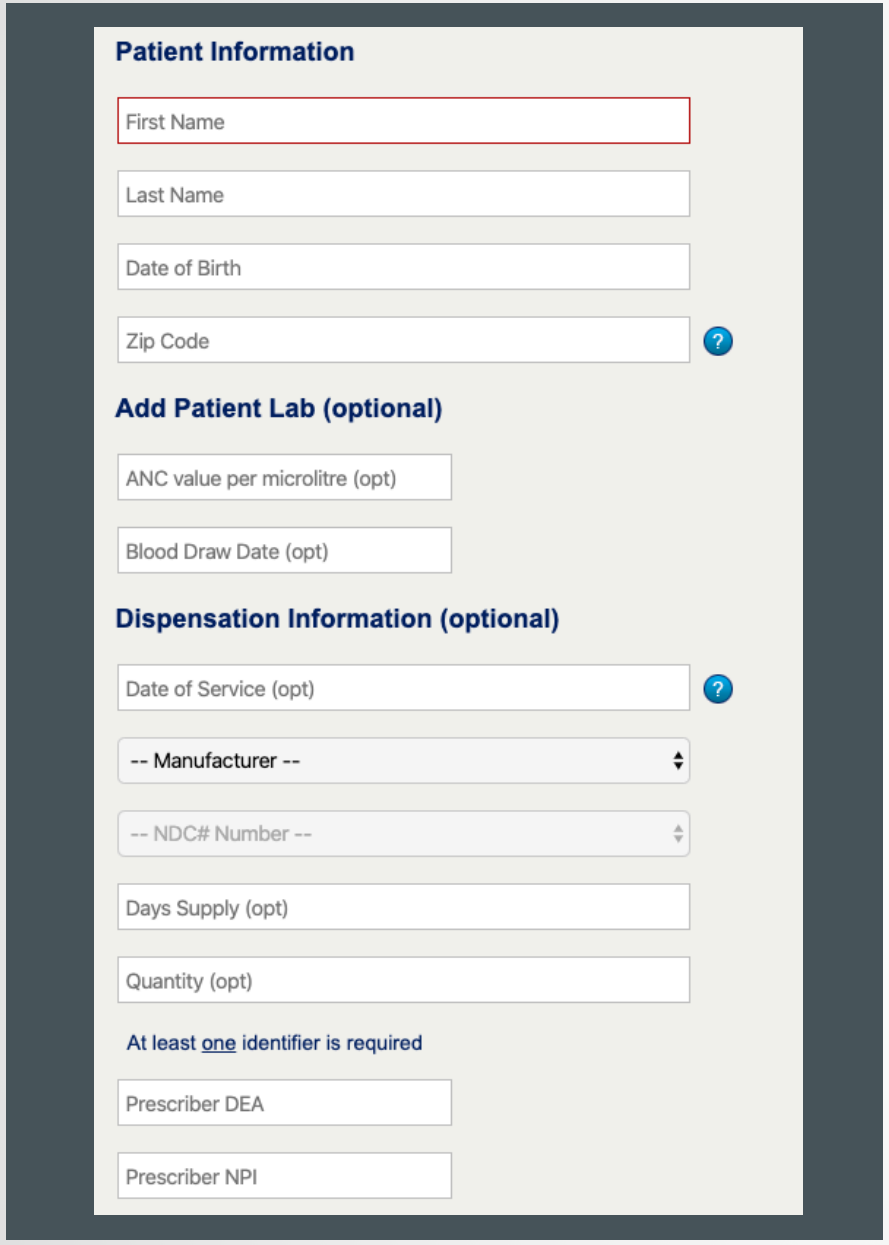
CLOZAPINE REMS

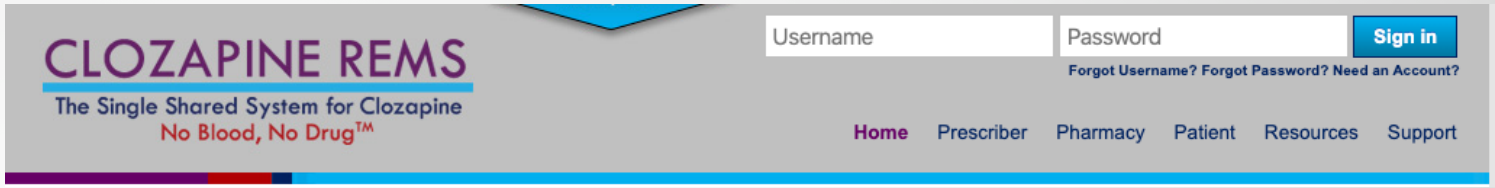


CLOZAPINE REMS

Purpose: clozapine can cause serious adverse events including neutropenia, which can lead to severe infections and death

- Clozapine (Clozaril) is an atypical antipsychotic
- Used for schizophrenia or schizoaffective disorder
- Only available through a risk evaluation and mitigation strategy (REMS) program
- Mitigate risk of severe neutropenia (ANC ≤ 0.5 bill/L)
- Clozapine REMS-certified prescriber must write all new prescriptions and enroll patient





- Upon order for clozapine, go to: ClozapineREMS.com
- Every pharmacist will need their own account:
  - Select “Need an Account?” > New User > Pharmacy Staff
  - Zip Code: 48073 NPI: 1356384697
- Click on “Pharmacies” tab > “Action” > “Eligibility Check”
  - Enter patient’s information to verify they are registered with REMS
    - First Name, Last Name, Date of Birth, Zip Code
      - Chart Review > All Reports > Facesheet
    - At least one provider identifier (DEA or NPI)
    - NPI can be looked up here: https://npiregistry.cms.hhs.gov/
- Alternatively, may call 844-267-8678

Clozapine Dose and Frequency: 25 mg qAM and 50 mg qHS (new start)

Eligible per clozapinerems.com: Yes
Patient ZIP: 48178
Physician NPI: Dr. Patel, 1972585248
Monitoring frequency: weekly

Lab Results

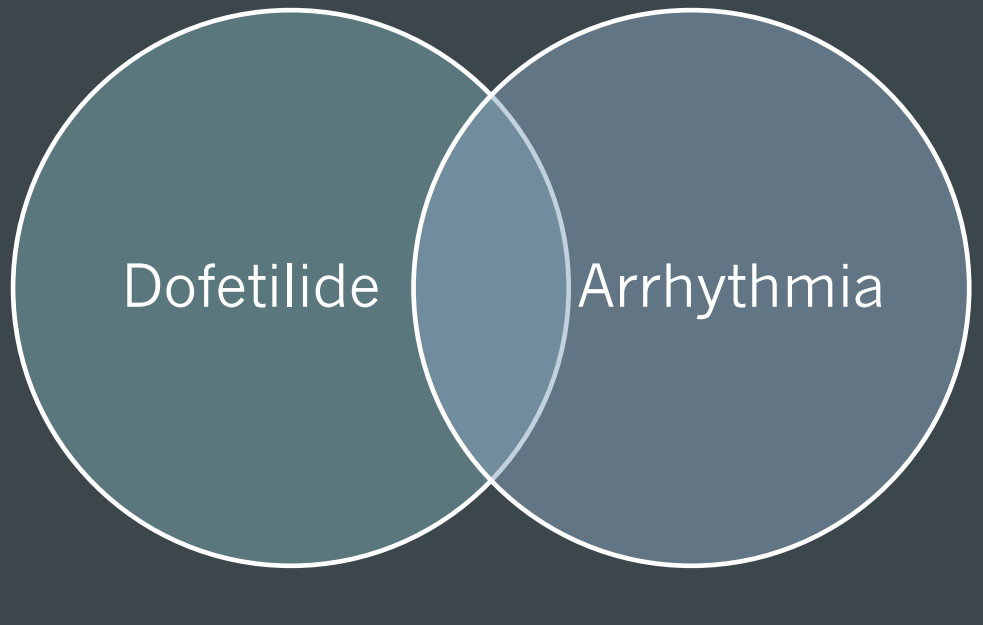
Component	Value	Date
NEUT	5.2	11/07/2019
NEUT	2.8	07/19/2019
NEUT	4.9	07/02/2019
NEUT	2.8	07/21/2018
NEUT	6.7	07/09/2018
NEUT	4.2	06/17/2018

Plan:
- **Next labs due: 11/14/2019**
- Ordered: Yes

Epic	REMS
5.2 bil/L	5200 per microlitre
"**Just move the decimal 3 places to the right**!"	

- Evaluate and document weekly ANC values
  - If not ordered, order CBC with differential per protocol and document result in "Order/monitor labs/levels" i-Vent
  - If lab comes back outside of acceptable range, pharmacist must notify and receive direction on further dose management and document in i-Vent
  - Report weekly ANC values to Clozapine REMS Program
- Click on "Pharmacies" tab > "Action" > "Add Lab"
  - Enter patient's information
    - First Name, Last Name, Date of Birth, Zip Code
      - Chart Review > All Reports > Facesheet
  - Add Patient Lab
    - ANC value per microlitre and Blood Draw Date
  - At least one provider identifier (DEA or NPI)

DOFETILIDE ADMINISTRATION



DOFETILIDE ADMINISTRATION

Purpose: minimize the risk of induced arrhythmia with initiation of dofetilide infections and death

- Dofetilide (Tikosyn) is used to convert patients with atrial fibrillation or atrial flutter to normal sinus rhythm (NSR)
- Use requires a minimum of 3 days of inpatient monitoring
  - Creatinine Clearance
  - Continuous electrocardiographic (ECG) monitoring
  - Cardiac Resuscitation
- Dosing based upon calculated CrCl and QTc

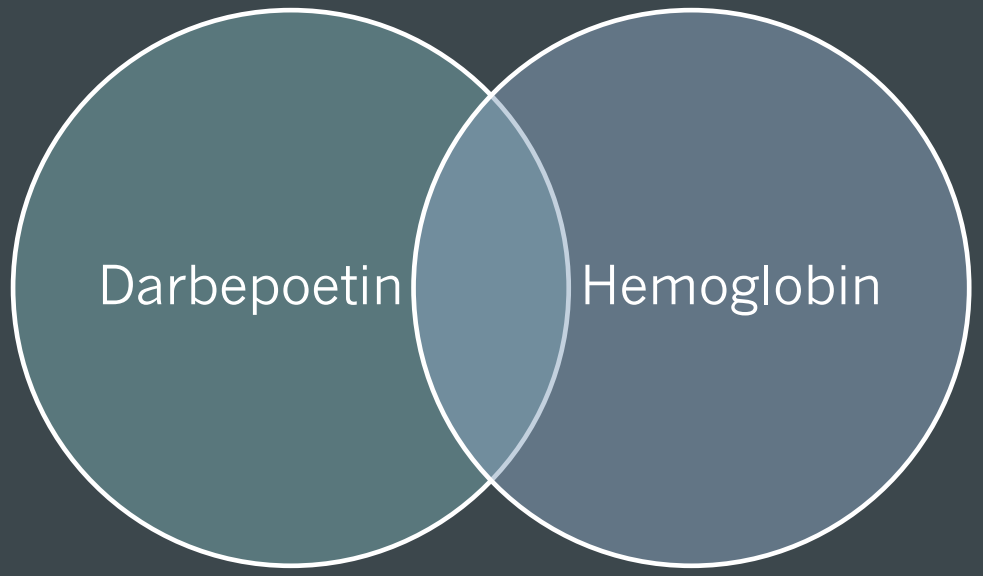
DOFETILIDE PHARMACIST RESPONSIBILITIES

1. Patient Flag for Dofetilide
2. Open i-Vent; Verify Correct Dose
3. Follow Up on Subsequent Doses

1. Upon receiving order for dofetilide, place a ”Patient Flag” in Epic on the patient’s profile indicating “Dofetilide Patient”
2. Open i-Vent to verify and record correct dose based on CrCl and verify labs (K^+/Mg^{2+}/Ca^{2+}) are within range
3. With each dose, pharmacist should verify that no interacting medications have been prescribed and that the QTc interval is recorded
4. Pharmacy provides patients with a 7-day supply and education is required prior to discharge

Calculated Creatinine Clearance	Dose
> 60 mL/min	500 mcg twice daily
40 – 60 mL/min	250 mcg twice daily
20 - 39 mL/min	125 mcg twice daily
< 20 mL/min	Dofetilide is contraindicated

DARBEPOETIN REPORT

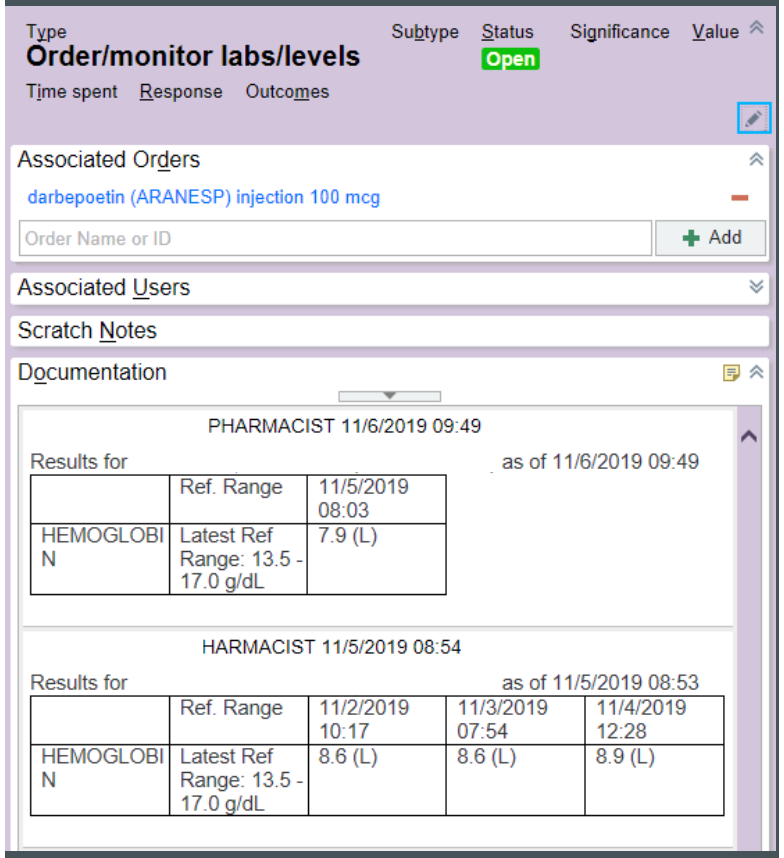


DARBEPOETIN REPORT

Purpose: Increased risk of cardiovascular events in patients receiving darbepoetin (Aranesp) and epoetin alpha (Procrit, Epogen)

- Darbepoetin is an erythrocyte-stimulating agent
- Darbepoetin doses are given at 1700 every Wednesday
- Within 48 hours of dose, patient's hemoglobin must be assessed
- If no Hgb ordered, order CBC per protocol to assess
- For CKD patients NOT ON DIALYSIS or ONCOLOGY patients
  - Initiation of therapy is permitted if Hgb < 10 g/dL
  - Hold dose if, within last 48 hours, Hgb ≥ 10 g/dL
- For CKD patients ON DIALYSIS (HD, PD, CRRT)
  - Initiation of therapy is permitted if Hgb < 10 g/dL
  - Hold dose if, within last 48 hours, Hgb ≥ 11 g/dL

DARBEPOETIN REPORT


Type
Order/monitor labs/levels
Subtype Status Significance Value
Open
Time spent Response Outcomes

Associated Orders
darbepoetin (ARANESP) injection 100 mcg
Order Name or ID
Add

Associated Users

Scratch Notes

Documentation

PHARMACIST 11/6/2019 09:49

Results for as of 11/6/2019 09:49

	Ref. Range	11/5/2019 08:03
HEMOGLOBIN	Latest Ref Range: 13.5 - 17.0 g/dL	7.9 (L)

HARMACIST 11/5/2019 08:54

Results for as of 11/5/2019 08:53

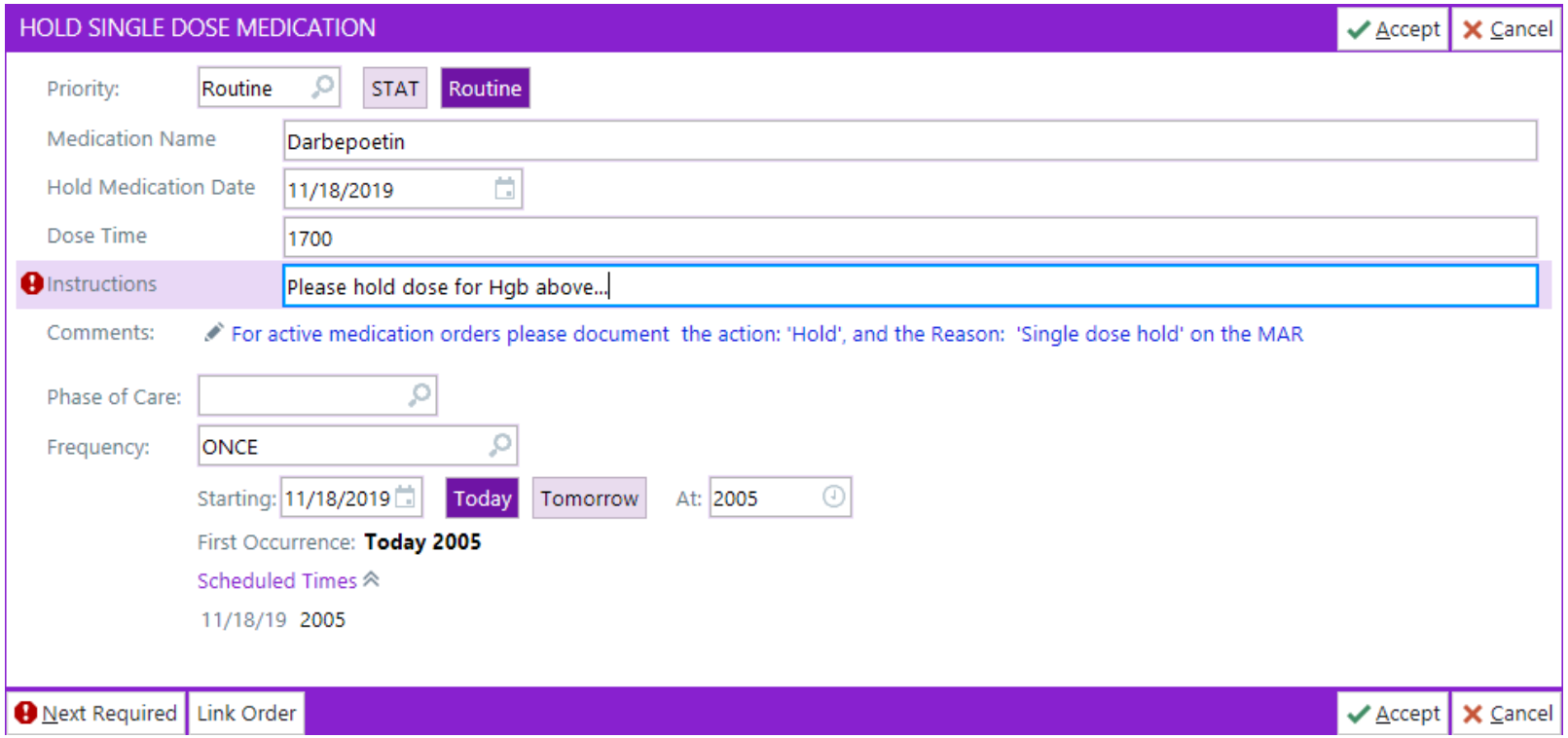
	Ref. Range	11/2/2019 10:17	11/3/2019 07:54	11/4/2019 12:28
HEMOGLOBIN	Latest Ref Range: 13.5 - 17.0 g/dL	8.6 (L)	8.6 (L)	8.9 (L)

- Open “Order/monitor labs/levels” i-Vent for any new darbepoetin orders
- Copy and paste most recent hemoglobin result for patient
- Within 48 hours of each Wednesday at 1700 run the RO Darbepoetin/HGB Report
  - My Reports > RO Darbepoetin/HGB Report
- For each result, document in the i-Vent the patient’s most recent hemoglobin result
  - If Hgb not within 48 hours of dose due, order CBC per protocol and assess result
  - State “OK to receive darbepoetin dose on MM/DD/YY”

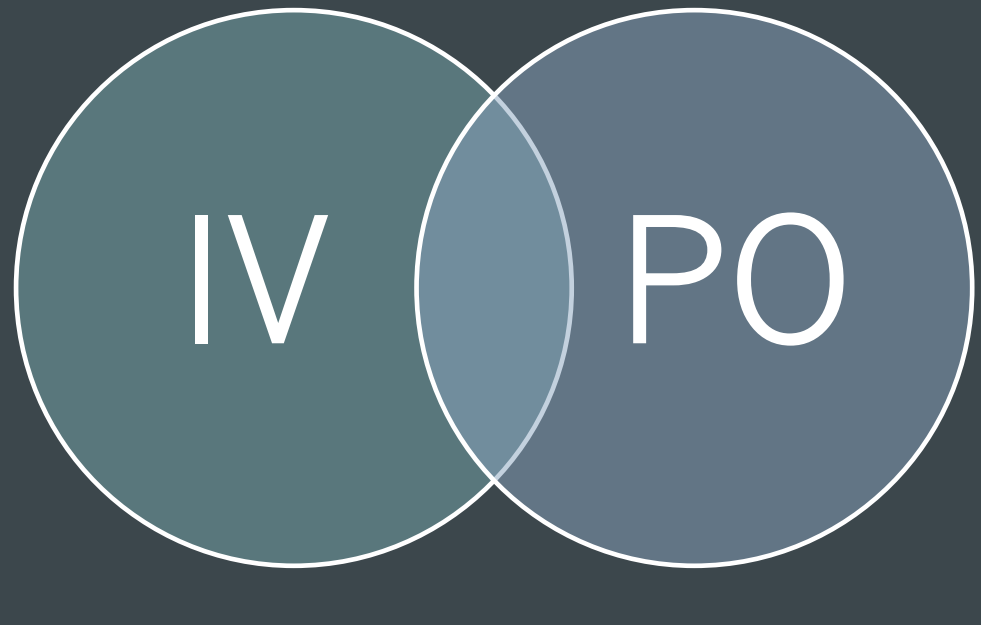
MEDICATION HOLD ORDER

If Hgb above acceptable range:

1. Page physician
2. State to nurse that patient does not qualify for dose
3. Place order to hold dose



IV TO PO



IV TO PO REPORT

Purpose: avoidance of the added risks associated with continued IV therapy, lower overall medication and associated costs to the patient and the hospital, and potentially reduce hospital length of stay

- A pharmacist will identify patients receiving parenteral formulations of select medications listed below and **automatically convert them** to an approved oral dosage form

Agents	Inclusion	Exclusion
All medications on list	• Adult patients • Adequate oral intake and enteral absorption • Tolerating at least full liquid diet or tube feeds • Receiving other meds PO or per tube	• Documentation of NPO status • Complete bowel rest, pre-operative or postoperative fasting • Active gastrointestinal bleeding • Nausea/vomiting • Conditions that affect gastrointestinal absorption • Mucositis/esophagitis/stomatitis • Dysphagia/risk of aspiration • Patient refuses oral medication
Anti-infectives	Above, plus: • One or more days of parenteral therapy • Stable and/or improving clinical status • Afebrile (all measurements < 38°C) for >24H WBC count normalizing	Above, plus: • ICU Patients • Meningitis, endocarditis, neutropenia, osteomyelitis or septic arthritis • Bacteremia- conversion to oral therapy requires approval by physician • **If the Infectious Disease service is consulted, the ID physician needs to approve the change**

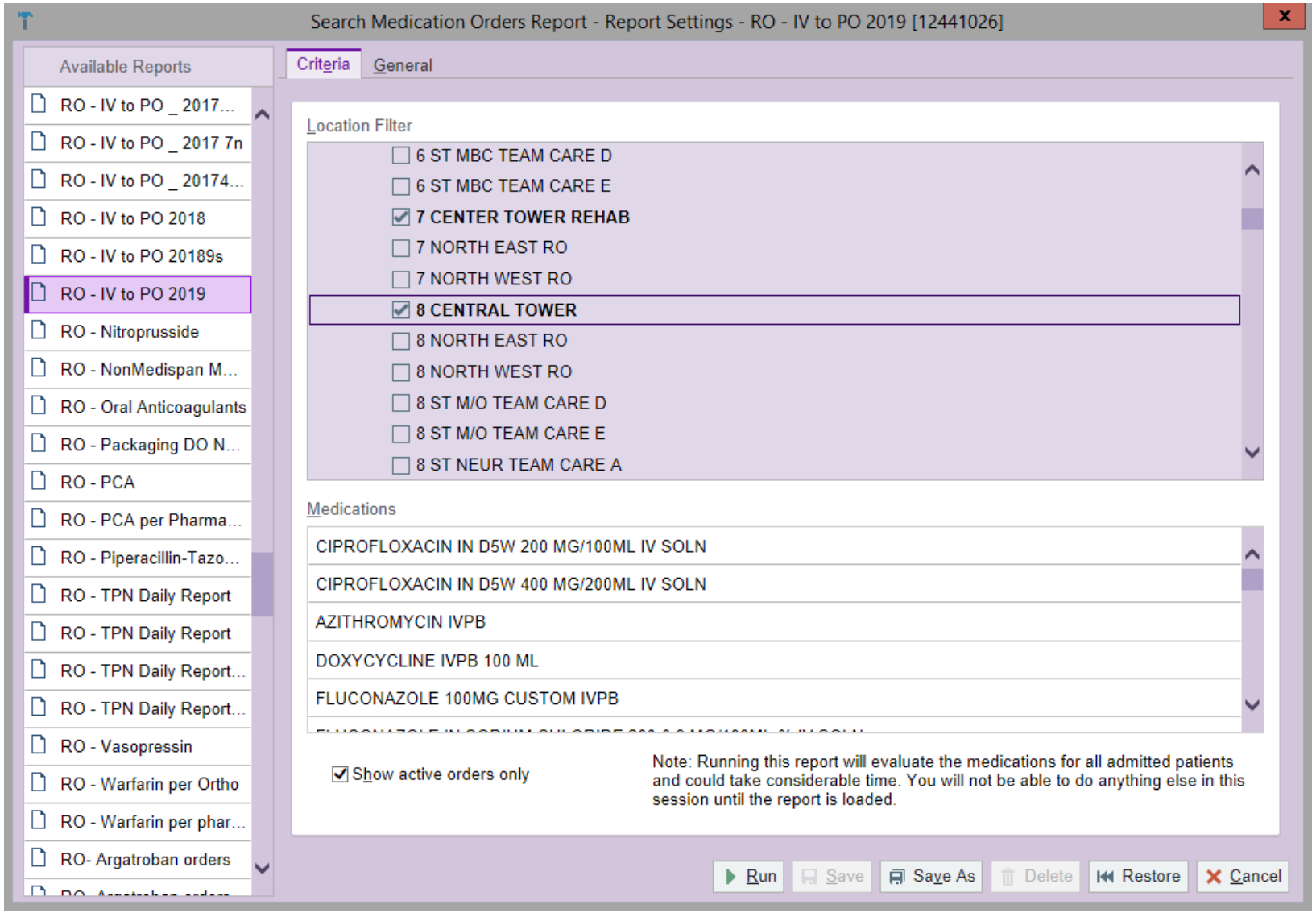
IV TO PO I-VENTS AND REPORT

Famotidine (Pepcid) Pantoprazole (Protonix)
Acetaminophen (Ofirmev)
Brivaracetam (Briviact) Lacosamide (Vimpat) Levetiracetam (Keppra) Phenytoin (Dilantin)
Folic Acid/MVI in 1,000mL IV infusion +/- thiamine
Azithromycin Ciprofloxacin Doxycycline Fluconazole Levofloxacin Linezolid Metronidazole Moxifloxacin Tedizolid

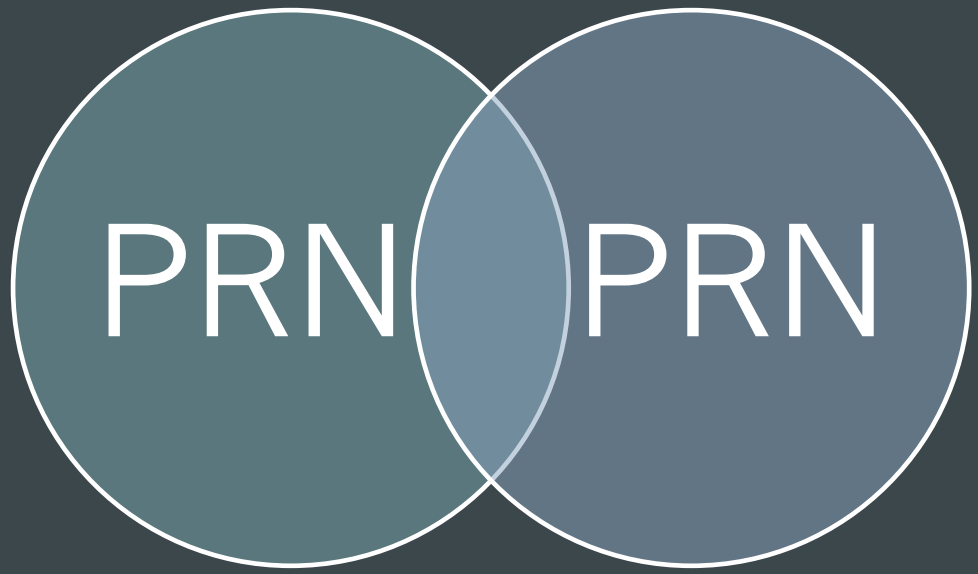
- Open “IV to PO” i-Vent for any IV to PO medication orders upon verification
- Run IV to PO 2019 under “Search Medication Orders” to capture any potential missed i-Vents
- Address potential changes when reviewing i-Vents
- If patient is eligible for conversion the pharmacist will discontinue the IV formulation and change to PO
- The pharmacist will input an I-Vent and a comment in the administration instructions noting that a conversion per standing order was implemented and close i-Vent

IV TO PO I-VENTS AND REPORT

Famotidine (Pepcid) Pantoprazole (Protonix)
Acetaminophen (Ofirmev)
Brivaracetam (Briviact) Lacosamide (Vimpat) Levetiracetam (Keppra) Phenytoin (Dilantin)
Folic Acid/MVI in 1,000mL IV infusion +/- thiamine
Azithromycin Ciprofloxacin Doxycycline Fluconazole Levofloxacin Linezolid Metronidazole Moxifloxacin Tedizolid



DUPLICATE PRN



DUPLICATE PRN

- Library > Search > “Duplicate PRN” > Run ”Royal Oak Rx – Duplicate PRN Reasons” Report
- Assess list of your respective floors
- Identify any PRN medications with the same PRN indication listed and page ordering physician to reconcile, as appropriate
- Acceptable PRN medications would include:
  - Linked Orders (L1, L1, L1)
  - Orders input by respiratory therapists (i.e. albuterol)
  - Different routes of administration
  - Admin instructions differentiate which to be given first

NON-FORMULARY

NON-FORMULARY MEDICATIONS

- Upon receiving an order for a non-formulary medication do the following:
  - Ask yourself (or the provider), ”is it necessary?”
  - See if the patient has received the medication as an inpatient before
  - Call Central Pharmacy to see if medication is available on the non-formulary shelf
    - If not available, ask if outpatient has or if patient can bring from home
- Once questions above have been assessed and drug is determined to be necessary, call Charge Pharmacist for approval
  - Only to be approved by Charge Pharmacist/Supervisor
- If not deemed necessary, page/call provider with therapeutic alternative and document in “Therapeutic Substitution” i-Vent

NON-FORMULARY MEDICATIONS

- If approved, place new order for medication
  - May require database lookup
- Once verified the medication needs to be labeled with an LOA label (patient supply) or a regular label (if hospital supply)
- Place i-Vent with approval information, route through which drug was obtained, and storage location (if kept in 6CN)
- Fill out Non-Formulary Drug Request Sheet and Fax

NON-FORMULARY MEDICATIONS

Beaumont Hospital, Royal Oak - Department of Pharmaceutical Services

Patient Specific Non-Formulary Drug Request

Pharmacy Purchasing, Ext. 80224

All fields are REQUIRED

*Date: _____

*Patient: _____ *11-Digit MRN: _____ *Room: _____

***NF Drug, generic (brand):** _____ ***Strength:** _____

***Dose:** _____ ***Route:** _____ ***Frequency:** _____

*Prescriber: _____ *Pager: _____ Smart Web

*Treatment for: _____

*I spoke to Dr. _____ *and offered these alternatives below:

_____

_____

_____

*Reason for not accepting: Select...

If other, please explain: _____

*Pharmacist: _____ *Extension: _____

Request must be authorized by a supervisor before medication is dispensed to patient

Approved by: Select... *By method of: Select...

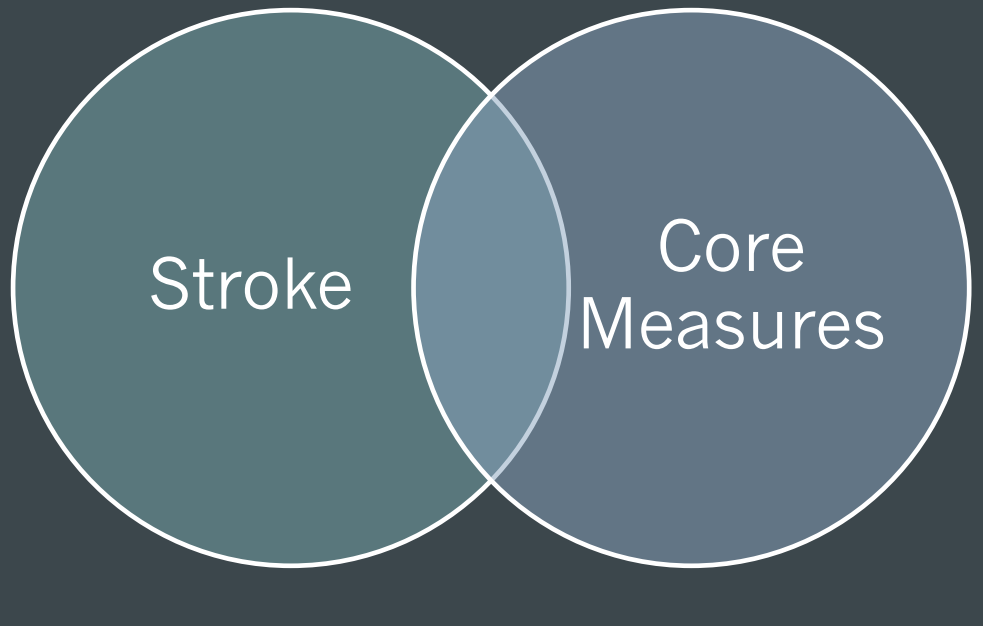
☐ Changed to formulary alternative ☐ Order discontinued

When completed, please print off and fax to:

Shift	Contact/Fax To
Days	Pharmacy Purchasing, Fax: 82426
Afternoons	Afternoon Supervisor, Fax: 82426
Midnights	Pharmacy Purchasing, Fax: 82426

MIDNIGHTS ONLY may remove product from NF stock without supervisor authorization (If product is removed from NF shelf, please fill in NDC below)

STROKE LIST



STROKE LIST

Purpose: Evaluate compliance with Joint Commission Core Measures for patients with ischemic stroke

- Pharmacist receives daily email from Wendy Carriveau (Wendy.Carriveau@beaumont.org) and Caitlin Woodruff (Caitlin.Woodruff@beaumont.org)
- Email contains Stroke List Excel file with the different core measures and responsible personnel
- For patients already discharged home-UBS pharmacist will review the After Visit Summary (AVS) to confirm patient was discharged on appropriate medications

STROKE CORE MEASURES

- STRK 5 – Antiplatelet therapy by end of day 2 (second midnight after admission, NOT 48 hours)
- STRK 2 – Discharged on antiplatelet therapy
- STRK 6 – Discharged on statin
- STRK 3 – Anticoagulant therapy for atrial fibrillation/flutter

STROKE LIST

Fill in daily and email back by end of the day

this list, please page
be added and ensure
rs - unknown

Stroke List

Friday, November 15, 2019

9:12 AM

Admission	LOS	Stroke Category	NIHSS/Shift Needed?	Transition of Care Complete (tPA/ intervention pts only)	Statin for >100 LDL	Antithrom. D/C	Anticoag aFib D/C	Early Antithrom.	IV t-PA	Verified?	Education	Rehab Considered	Intervention	Initial mRs
					PHARMACY				ADMIN	NURSING			IR	Rehab
11.15.19 Transferred from	1	Phase B	Yes											
11.14.19	2	Phase A	Yes											
11.7.19	9 day since event	IP	Yes	X						V			Right ICA/MCA Thrombectomy	11-14-19/5
11.9.19 Transferred from	7	Phase C	Yes											11-10-19/4
10.30.19	17	Phase A	Yes		C	C	n/a	N		V				11-5-19/1
11.14.19	2	Phase B	Yes							V				
10.31.19	3 days since event	IP	Yes											
10.3.19	44 days since event	IP	Yes							V				11-13-19/4
10.26.19	18 days since event	IP	Yes											11-7-19/5
11.12.19	4	Phase B	Yes	X						V			R MCA Thrombectomy	11-13-19/5
11.6.19	10	Hem	Yes							V				
11.13.19	3	Hem	Yes							V				
11.4.19 Transferred from	11	Phase C	Yes							V				11-8-19/5
11.13.19	3	Phase B	Yes											
11.14.19	2	Phase B	Yes											
11.9.19 Transferred fro	7	Phase B	Yes		c	c	no - awaiting clearance	y		V				11-11-19/4
11.13.19	3	TIA	No		c	no - as warfarin is	c	y		--				11-14-19/3
11.9.19	7	Hem	Yes		n/a	n/a	n/a	n/a		V				11-11-19/4
11.14.19	2	Phase B	Yes		c	c	c	y						
11.8.19 Transferred from	8	Phase A	Yes	X	c	c	n	n	IV tPA 14:19	V				11-12-19/4
11.3.19	13	Phase C	Yes		c	c	N/A	Y		V				11-5-19/4
11.14.19	2	Phase A	Yes		c	c	no- awaiting neuro	pending- ordered						
11.11.19	5	Phase A	Yes		c	no- none ordered	n/a	no- hemorrhagic		V				11-14-19/4
10.14.19	33	Phase C	Yes		C	C	N/A	Y		V				10-18-19/5
11.1.19 Transferred from	15	Phase B	Yes		c	c	n/a	y		V				11-4-19/4
11.3.19	13	Phase B	Yes		c	c	no - cleared by neurology	y		V				11-5-19/3

Pharmacist Key for Documentation in Excel File

Statin on D/C	Antithrombotic on D/C	Anticoagulation on D/C	Antithrombotic by end of hospital day 2
Yes – Compliance evaluated post D/C	Yes – Compliance evaluated post D/C	Yes – Compliance evaluated post D/C	Yes
No – Documented reason	No – Documented reason	No – Documented reason	No – Documented reason
(blank) – not yet completed	(blank) – not yet completed	(blank) – not yet completed	X – non-compliant
X – non-compliant post D/C	X – non-compliant post D/C	X – non-compliant post D/C	
C – currently on medication	C – currently on medication	C – currently on medication	

STROKE CORE MEASURES DOCUMENTATION

- Open “Core Measure” i-Vent on ”Patient Specific Medication”
  - Subtype: “Stroke”
- Once all measures are met, document in “Pharmacist Progress Note”
  - **UBS Pharmacist Stroke Core Measure Evaluation:**
    - Patient is currently on the following stroke core measure medications:
      - Anti-thrombotic by end of hospital day 2: **Yes**
      - Anti-thrombotic: **Aspirin 325mg daily**
      - Statin: **Pravastatin 20mg every night at bedtime**
      - Anticoagulation: **Not indicated** in this patient
    - Patient was evaluated to assure core measures were met
    - **Pharmacist**: **Les Strokes** ext. 89558

ANTIBIOTIC TIME OUT TOOL

ANTIBIOTIC TIME OUT TOOL

Purpose: De-escalation of therapy to avoid resistance and unnecessary antibiotic use

- Identifies patients on antibiotics initiated within **past 48 to 72 hours**
- Open patient lists > Epidemiology (2nd listing) > Select respective floor
- Assess antibiotic usage and appropriateness of continued therapy for possible interventions
- Open “Antimicrobial Stewardship” i-Vent, as necessary
- Document assessment through “.abxtot” SmartPhrase
  - Contact Rachael Fuller, Prakash Shah, or Christy Yost to gain access to SmartPhrase

QUESTIONS

UNIT-BASED PHARMACY SERVICES

JORDAN M POTTER, PHARMD

PHARMACY GRAND ROUNDS

BEAUMONT HOSPITAL, ROYAL OAK, MI