

University of Iowa Hospitals & Clinics

Drug Monitoring Guide: Ambulatory Care

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ANTICOAGULATION

Medication and Indication	Lab(s)	Routine Interval	Possible to Delay Lab Interval?	Justification or Data for Delayed or Non-Delayed Lab Interval	Pharmacy Contact
DOACs (Apixaban, Dabigatran, Edoxaban, Rivaroxaban) Atrial fibrillation DVT/PE	Serum creatinine	Annually for all patients and every 6 months for patients with CrCl <60 mL/min	If CrCl >60 mL/min, reasonable to push out 3 months	Clinical judgment involving high risk medication	Deanna McDanel, PharmD, BCPS, BCACP deanna-mcdanel@uiowa.edu Michelle Krummel, RPh, BCPS michelle-krummel@uiowa.edu
Warfarin Atrial fibrillation DVT/PE Valve replacement	INR	Initial: 2-3 days Dose Change: 2-3 weeks Maint: 4-8 weeks	Yes, 5-7 days	Long-term (≥ 3 months) history of consecutive therapeutic INRs	

HEMATOLOGY AND ONCOLOGY

Medication and Indication	Lab(s)	Routine Interval	Justification or Data for Delayed or Non-Delayed Lab Interval	Pharmacy Contact
Anagrelide (Agrylin®) Polycythemia Vera	CBCD LFTs	platelet counts should be performed every two days during the first week of treatment and at least weekly thereafter until the maintenance dosage is reached. Others baseline then as clinically indicated	Clinical judgment involving high risk medication	Marie Shinkle, PharmD, BCOP, BCPPS, BCACP marie-shinkle@uiowa.edu
Deferasirox (Jadenu®, Exjade®) Anemia	CBCD Ferritin Renal function LFTs	Baseline then monthly, more frequently in those with high risk	Clinical judgment involving high risk medication	
Desmopressin (Stimate®) vWD	FVIII levels vWF levels Sodium levels	As clinically appropriate	Clinical judgment involving high risk medication	
Eltrombopag (Promacta®) Severe aplastic anemia ITP	CBCD LFTs	CBCD: baseline, weekly until dose/counts stabilized, then monthly LFTs: baseline, every 2 weeks during dose titration, then monthly	Clinical judgment involving high risk medication	

HEMATOLOGY AND ONCOLOGY, cont.

Medication and Indication	Lab(s)	Routine Interval	Justification or Data for Delayed or Non-Delayed Lab Interval	Pharmacy Contact
ESA (epoetin alfa, darbepoetin) Chemotherapy induced anemia	Hgb	Prior to each dose	Due to REMs and insurance criteria, Hgb usually required prior to each dose	Marie Shinkle, PharmD, BCOP, BCPPS, BCACP marie-shinkle@uiowa.edu
rFVIII, pdFVIII, pdFVIII-vwf Hemophilia	FVIII levels FVIII inhibitor CBC	FVIII level/inhibitor diagnosis, every 3 months during first 50 FEDs in previously untreated patients	Clinical judgment involving high risk medication	
Factor IX (FIX) Hemophilia B	FIX levels CBC	Diagnosis, with bleeds	Clinical judgment involving high risk medication	
Hydroxyurea Sickle Cell Disease	LFTs CBC Hgb S Fraction Renal function	Prior to initiation, monthly with dose changes, then every 3 months	Clinical judgment involving high risk medication	

HEMATOLOGY AND ONCOLOGY, cont.

Medication and Indication	Lab(s)	Routine Interval	Justification or Data for Delayed or Non-Delayed Lab Interval	Pharmacy Contact
Voxelotor (Oxbryta®) SCD	CBC LFTs	Baseline then as clinically indicated	Clinical judgment involving high risk medication	Marie Shinkle, PharmD, BCOP, BCPPS, BCACP marie-shinkle@uiowa.edu
Ibrutinib (Imbruvica®) CLL	CBCD, SCr, Blood Pressure, LFTs, ECG, TLS Labs (during initiation)	CBCD: baseline then monthly SCr and TLS Labs: monitor routinely in those with high tumor burden Others: baseline then periodically	Clinical judgment involving high risk medication	Susan Fajardo, PharmD, BCACP susan-fajardo@uiowa.edu
Tyrosine Kinase Inhibitors CML	CMP, Mag, Phos, CBCD, ECG (with Tasigna®, others with patients with risk factors), BCR-abl	Initial: CBC every 2 weeks first two months then monthly; Others initially then periodically based on patient factors ECG: Tasigna with initiation then every 7 days after dose adjustments BCR-abl: every 3 months in maintenance or monthly after discontinuation	Clinical judgment involving high risk medication	
Ruxolitinib (Jakafi®) Myeloproliferative Neoplasm GVHD	CBCD Lipid panel	CBCD: every 2-4 weeks after initiation or with any dose adjustments until stable then as clinically appropriate Lipid panel: 8-12 weeks after initiation (may delay in patients without risk)	Clinical judgment involving high risk medication	

SOLID ORGAN TRANSPLANTATION

Medication and Indication	Lab(s)	Routine Interval	Possible to Delay Lab Interval?	Justification or Data for Delayed or Non-Delayed Lab Interval	Pharmacy Contact
<p>Cyclosporine Solid organ transplantation</p>	Cyclosporine trough level	<p>Initial: 2x/week Dose Change: 2x/week Maintenance: 4 weeks - 12 weeks</p>	Yes, 5-7 days	Renal, pancreas, and liver transplant: at least 2 years post-transplant and when obtaining routine labs (without a prompting event); History of consecutive therapeutic troughs; no signs/symptoms of toxicity; no recent changes to interacting medications	<p>Kelli Christopher, PharmD, BCPS kelli-christopher@uiowa.edu</p> <p>Tricia Suarez, PharmD, BCPS tricia-suarez@uiowa.edu</p>
<p>Enoxaparin Anticoagulation in <i>outpatient lung transplant recipients</i></p>	Anti-Xa enoxaparin assay	<p>Initial: peak 3-5 hours after 3rd dose Dose Change: peak 3-5 hours after 3rd dose Maintenance: Individualized, may include trough or repeat peaks every 2 weeks</p>	Yes, 1-2 days for peak; maintenance delay on an individualized basis	Logistics of getting labs; Clinical judgment involving high risk medication	<p>Sarah Minner, PharmD, BCPS sarah-minner@uiowa.edu</p> <p>Laura (Halder) Czerniak PharmD, BCPS, BCCP laura-halder@uiowa.edu</p>

SOLID ORGAN TRANSPLANTATION, cont.

Medication and Indication	Lab(s)	Routine Interval	Possible to Delay Lab Interval?	Justification or Data for Delayed or Non-Delayed Lab Interval	Pharmacy Contact
Everolimus Solid organ transplantation	Everolimus trough level	Initial: 2x/week Dose Change: 2x/week Maintenance: 4 weeks - 12 weeks	Yes, 5-7 days	Renal, pancreas, and liver transplant - at least 2 years post-transplant and when obtaining routine labs (without a prompting event); History of consecutive therapeutic troughs; no signs or symptoms of toxicity; no recent changes to interacting medications	Kelli Christopher, PharmD, BCPS kelli-christopher@uiowa.edu
Sirolimus Solid organ transplantation	Sirolimus trough level				Tricia Suarez, PharmD, BCPS tricia-suarez@uiowa.edu
Tacrolimus Solid organ transplantation	Tacrolimus trough level				Sarah Minner, PharmD, BCPS sarah-minner@uiowa.edu
					Laura (Halder) Czerniak PharmD, BCPS, BCCP laura-halder@uiowa.edu

NEUROLOGY AND PSYCHIATRY

Medication and Indication	Lab(s)	Routine Interval	Possible to Delay Lab Interval?	Justification or Data for Delayed or Non-Delayed Lab Interval	Pharmacy Contact
Clozapine Schizophrenia BPD	ANC	ANC ≥ 1500/μL: Initial/Restart: 7 days x 6 mos Dose Change: 7 days Maintenance: - 2 weeks (6-12 months) - 4 weeks (≥ 12 months) Neutropenia: https://tinyurl.com/rgqa7go	ANC ≥ 1500/μL: Yes, 1-2 weeks Neutropenia: Daily/thrice weekly ANC can be delayed if benefit outweighs risk of continuing	“The FDA does not intend to take action against sponsors and others for the duration of the public health emergency for failing to adhere to REMS requirements for certain laboratory testing or imaging studies.” - COVID-19 FDA Press Release (3/22/20): https://tinyurl.com/yxxbw6ok	Emily Neddermeyer, PharmD, BCACP emily-neddermeyer@uiowa.edu
Lithium BPD MDD	Lithium trough level	Initial: 2x/week Dose Change: 2x/week Maintenance: 1-3 months	Yes, 5-7 days	History of consecutive therapeutic troughs, no signs/symptoms of toxicity, no significant changes to renal function/urine output	
Natalizumab (Tysabri®) Multiple Sclerosis	JCV Antibody Index	Every 4 weeks	Yes 2 - 3 months, depending on previous antibody index result	*REMS program* Patients with consistently low recent antibody levels may be able to delay. Patients with levels trending up should avoid delaying, if at all possible, due to the risk of developing Progressive Multifocal Leukoencephalopathy (PML)	

INFECTIOUS DISEASE

Medication and Indication	Lab(s)	Routine Interval	Possible to Delay Lab Interval?	Justification or Data for Delayed or Non-Delayed Lab Interval	Pharmacy Contact
Outpatient Intravenous Antimicrobial Therapy Various infections	CBC BMP LFTs Serum levels	Once to twice weekly (dependent on drug)	Variable: weekly labs could be pushed out to two weeks but dressing change interval could not	Most patients on IV therapy require weekly dressing changes, which requires infusion center or nurse visit UIHC Microguide: https://tinyurl.com/we88v6r	Deb Killion, PharmD debra-killion@uiowa.edu Kelly Percival, PharmD, BCPS-AQ ID kelly-percival@uiowa.edu
Ribavirin (generic) Hepatitis C	CBC	Initial: 2 weeks Maintenance: every 2 weeks; every 1 week if hemoglobin <10 g/dL OR stable cardiac disease and decrease in hemoglobin by ≥2 g/dL during any 4-week treatment period	Yes: 2 weeks if ribavirin dose unchanged for ≥4 weeks; hemoglobin ≥12 g/dL, stable renal function, not Decompensated cirrhosis	Certain factors are predictive of increased risk for developing hemolytic anemia; Antiviral Therapy 2010 15:687-95; Copegus package insert 2015; Rebetol package insert 2015.	Heidi Wood, PharmD, BCPS heidi-wood@uiowa.edu Tony Huynh, PharmD, BCACP tony-huynh@uiowa.edu

CARDIOVASCULAR

Medication and Indication	Lab(s)	Routine Interval	Possible to Delay Lab Interval?	Justification or Data for Delayed or Non-Delayed Lab Interval	Pharmacy Contact
ACEIs, ARBs, ARAs HTN HF	CHEM-6	Annually or more frequent if dosing change or abnormal result	If stable dosing, reasonable to push out 3 months	Clinical Judgment	Ryan Jacobsen, PharmD, BCPS ryan-jacobsen@uiowa.edu Randi Beranek, PharmD, BCPS randi-beranek@uiowa.edu Keri Hogan, PharmD keri-hogan@uiowa.edu
Amiodarone Arrhythmia	TSH LFTs	Every 6 months	If normal results in past, reasonable to push out 1 to 3 months		
Diuretics (thiazide, loop) HTN Hypervolemia	CHEM-6	Annually or more frequent if dosing change or abnormal result	If stable dosing, reasonable to push out 3 months		
Statins Hyperlipidemia	Lipids LFTs	Lipids: Routine monitoring not essential LFTs: Routine monitoring not essential unless abnormal results then should repeat testing as originally planned	If abnormal LFTs, recommend monitoring as originally planned		