UConn John Dempsey Hospital

Pharmacy & Therapeutics Approved Therapeutic Interchange List

Last update 09/21/22

For pharmacy policy, click this link: http://uchcportal.uchc.edu/clinical/jdh/standards/Records/UCHC/JDH/Pharmacy/Therapeutic%20Interchange.doc

For HAM policy, click this link: http://nursing.uchc.edu/hosp_admin_manual/docs/08-088.pdf

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Category I = Automatic substitution; Category II = Substitution with practitioner informed after substitution; Category III = Substitution with prior approval of practitioner informed by verbal or telephone contact; Category IV = Intravenous Immune Globulin.

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Acetaminophen orders or combinations of orders potentially exceeded 4GM per day.	I	Acetaminophen (Percocet®, Tylenol®, etc.)	Clarification order will be written such that combined dose of various medication orders will not exceed 4,000mg (4Gm) of Acetaminophen per day, in order to reduce the potential for liver toxicity (Even lower daily doses such as 2,000mg are suggested in patients on warfarin).
Acetaminophen 500 mg oral	I	Acetaminophen 650 mg	Dispense at equivalent dose
Acetaminophen 1000 mg oral	I	Acetaminophen 975 mg	Dispense at equivalent dose
Diflunisal (Dolobid®) 500mg BID	III	Naproxen 500mg BID	Alternative NSAIDs can be discussed with the prescriber (Ibuprofen, Meloxicam).
Ketorlac (Toradol®)	I	Ketorlac (Toradol ®)	Combination order will be such that combined injectable plus oral ketorolac, scheduled or prn, will not exceed 5 days duration.
Meperidine 75 mg injection 300 mg oral	III	Morphine or HYDROmorphone 10mg injection Morphine = 1.5mg injection HYDROmorphone 30mg oral Morphine = 6mg oral HYDROmorphone = 30mg oral HYDROcodone	Only approved for 25mg injection for shivering. Covert other meperidine injection or oral dose to equivalent injection or oral dose of morphine or HYDROmorphone.
Nabumetone (Relafen®) 1000 mg daily 1000 mg BID	III	Naproxen 375mg BID 500mg BID	Alternatives can be discussed with the prescriber (Ibuprofen, Meloxicam). Consult reference for further conversion information: http://test3-www.ashp.org/s_ashp/docs/files/NSAIDsConversiontools.pdf
OxyCODONE 5mg/Acetaminophen 325 mg (Percocet® 5/325)	I	OxyCODONE 5mg and Acetamophen (Tylenol®) 325 mg	Equivalent OxyCODONE dose plus equivalent Acetaminophen dose. Combined dose of various medication orders will not exceed 4,000mg (4Gm) of Acetaminophen per day, in order to reduce the potential for liver toxicity (Even lower daily doses such as 2,000mg are suggested in patients on warfarin).
OxyMORphone (Opana ER®) 10mg equivalent dose	III	OxyCODONE (Oxycontin®) 20mg equivalent dose	Other alternatives can be discussed with the prescriber.
Piroxicam (Feldene®) 20mg daily	III	Naproxen 500mg BID	Alternative NSAIDs can be discussed with the prescriber (Ibuprofen, Meloxicam). Consult reference for further conversion information: http://test3-www.ashp.org/s_ashp/docs/files/NSAIDsConversiontools.pdf
Tylox®	I	Percocet®	Dispense at the equivalent dose of OxyCODONE

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Select Antibiotics/Anti-infectives (see Carbepenems, cephalosporins, quinolones separately)

Non-Formulary Medication	Category	Therapeutic Substitution	Comments
Butaconazole Vaginal	I	Clotrimazole 1% Vaginal	Uncomplicated Vulvovaginal Candidiasis: Clotrimazole vaginal applicator daily for 7 days and Clotrimazole 1% topical cream topically to vaginal area BID PRN itching, up to 7 days can be ordered as well. OR Consider Fluconazole 150mg po x 1 after an appropriate review for cytochrome P450 3A4 drug interactions
Clindamycin 600 mg IV q6hrs	I	Clindamycin 600 mg IV q8hrs	
Clindamycin 900 mg IV q8hrs	I	Clindamycin 600 mg IV q8hrs	Do NOT interchange for PCP, toxoplasmosis, PID in an OB patient, pre-surgical dose (2013 update of Surgical Prophylaxis guidelines) or a therapeutic failure at a lower dose
Miconazole Vaginal all strengths and formulations	I	Clotrimazole 1% Vaginal	Uncomplicated Vulvovaginal Candidiasis: Clotrimazole vaginal applicator daily for 7 days and Clotrimazole 1% topical cream topically to vaginal area BID PRN itching, up to 7 days can be ordered as well. OR Consider Fluconazole 150mg po x 1 after an appropriate review for cytochrome P450 3A4 drug interactions
MetroNIDAZOLE IV Q6hrs	I	MetroNIDAZOLE IV Q8hrs	
Complera®– Emtricitabine, Rilpivirine, and Tenofovir Disproxil Fumarate 200-25-300mg per tablet: One talbet once daily	I	Truvada® - Emtricitabine, tenofovir disoproxil fumarate 200-300mg : One tablet once daily. AND Edurant® - Rilpilvirine 25mg tablet: One tablet once daily	

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Acyclovir Intravenous Weight and Renal Function Based Dose Adjustments

Dose calculation of intravenous acyclovir is based on a patient's calculated ideal body weight (IBW) and renal function.

1. Verify the patient's height and most recent weight
2. Determine the patient's IBW (see Appendix II). *If the patient's actual total body weight (TBW) is less than IBW then the dose should be calculated using TBW.*
3. Calculate the intravenous acyclovir dose using IBW or TBW (whichever is determined to be the most appropriate).
4. Round the acyclovir dose to the nearest 25 mg increment. *Using this rounding method, each patient will receive an acyclovir dose that will be within ± 4.3% of the exact IBW-based milligram per kilogram dose.*
5. Perform an assessment of current and historic values of serum creatinine. If a serum creatinine is not available, the pharmacist may order a serum creatinine based on their clinical judgement for its need.
6. Estimate the patient's renal function using the Cockcroft-Gault (CG) equation (see Appendix I).
7. Select the proper administration interval based on estimated renal function by the below table.

Creatinine Clearance (mL/min/1.73 m^2)	Percent of Recommended Dose	Dosing Interval (hours)
>50	100%	8
25 – 50	100%	12
10 – 25	100%	24
0 – 10	50%	24
http://www.accessdata.fda.gov/drugsatfda_docs/label/2004/18603slr027_zovirax_lbl.pdf (Accessed 6/22/2015)		

8. Enter the new rounded intravenous acyclovir dose and proper administration into the electronic health record (EHR).
9. The pharmacist must communicate to the practitioner the details of the dose and administration regimen as per Category II Substitution.

Dose review while order remains active

1. The pharmacist will review/monitor the patient's renal function at least every 72 hours.
2. If a serum creatinine has not been ordered within the past 72 hours, the pharmacist may order a serum creatinine based on his/her clinical judgement.
3. When appropriate, the pharmacist may modify the currently prescribed dose and/or administration interval to one more appropriate for any acute changes in the patient's renal function. Doses/administration intervals may be adjusted up or down based on the patient's renal function.
4. If a modification of currently prescribed regimen is needed, the pharmacist will enter the order into the electronic health record (EHR).
5. The pharmacist must communicate to the practitioner the details of the dose and administration regimen as per Category II Substitution.

References:

1. Acyclovir IV injection [Product Information] APP Pharmaceuticals, LLC Schaumburg, IL, March 2008.
2. Hernandez, Norstrom, and Wysock. Acyclovir-induced renal failure in an obese patient. Am J Health Syst Pharm. 2009 Jul 15;66(14):1288-91.
3. Seedat and Winnett. Acyclovir-induced acute renal failure and the importance of an expanding waist line. BMJ Case Report 2012 Jul 12; doi:10.1136/bcr-2012-006264.
4. Polso, Lassiter, & Nagel. Impact of hospital guideline for weight-based antimicrobial dosing in morbidly obese adults and comprehensive literature review. J Clin Pharm Ther. 2014 Dec;39(6):584-608.

Antibiotic Ophthalmic (Eye) and OTIC (Ear) Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Ciprofloxaxin/ Hydrocortisone OTIC (Cipro HC®) 3 drops into affected ear BID for 7 days	I	Ciprofloxacin/ Dexamethasone OTIC (Ciprodex®) 4 drops into affected ear BID for 7 days	
Erythromycin eye ointment	I	No change	
Gentamicin 0.3% eye drops and ointment	I	No change	
Moxifloxacin 0.5% eye drops	I	No change	
Neomycin/Polymyxin/Dexamethasone eye drops and ointment (Maxitrol®)	I	No change	
Neomycin/Polymyxin/Hydrocortisone (Cortisporin®) eye ointment during shortage	I	Neomycin/Polymyxin/Dexamethasone ointment (Maxitrol®)	Formulary conversion is only for when Cortisporin® is not available.
Ofloxacin (Floxin®) OTIC drops	I	Ofloxacin (Ocuflox®) Eye drops at same dosing	Floxin® OTIC drops have been on shortage.
Sulfacetamide 10% eyey	I	No change	
Tobramycin/Dexamethasone eye drops and ointment (Tobradex®)	I	No change	

Antimicrobial IV to PO Conversion

All of the antimicrobials listed below will be converted to regimens which will have identical dosages and administration intervals as the previous intravenously-administered regimens.

- Azithromycin
- Doxycycline
- Fluconazole
- LevoFLOXacin
- Linezolid
- Metronidazole
- Trimethoprim/Sulfamethoxazole
- Voriconazole

Refer to this policy:
http://uchcportal.uchc.edu/clinical/jdh/standards/Records/UCHC/JDH/Pharmacy/Antimicrobial%20IV%20to%20PO%20Conversion.doc

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Carbapenem Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Doripenem (Doribax®) 500 mg IV q8hrs	I	Meropenem (Merrem®) 500 mg IV q8hrs For severe infections: 1000 mg IV q8hrs	
Ertapenem (INVanz®) 1000 mg IV q24hrs except 1-2 as trial if to discharge outpatient shortly	I	Meropenem (Merrem®) 500 mg IV q8hrs For severe infections: 1000 mg IV q8hrs	
Imipenem-Cilastin (Primaxin®) 2 – 3 Gm IV daily	I	Meropenem (Merrem®) 500 mg IV q8hrs For severe infections: 1000 mg IV q8hrs	

Cephalosporin/Penicillin Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Cefotaxime	III	Cefotaxime will only be used in CCMC NICU. Consult provider based on diagnosis and cultures.	Formulary conversion is only for when Cefotaxime is on shortage.
CefTAZidime (Fortaz®) 2 Gm IV q8hrs 2 Gm IV q12hrs 2 Gm IV q24hrs 1 Gm IV q8hrs 1 Gm IV q12hrs 1 Gm IV q24hrs 1 Gm post dialysis	I	Cefepime (Maxipime®) 2 Gm IV q8hrs 2 Gm IV q12hrs 2 Gm IV q24hrs 1 Gm IV q8hrs 1 Gm IV q12hrs 1 Gm IV q24hrs 1 Gm post dialysis	During a medication shortage of Cefepime, the alternative of CefTAZidime is used. Decrease CefTAZidime dose and/or frequency for CrCl <50mL/min
Cephalothin 1 Gm IV q6hrs 2 Gm IV q6hrs	I	CeFAZolin (Ancef®) 1 Gm IV q8hrs 2 Gm IV q8hrs	Decrease dose as appropriate for renal insufficiency
Cephradine	I	Cephalexin	Dispense at equivalent dose
Oxacillin, while on shortage only	I	Nafcillin (1:1 Dose Conversion)	Formulary conversion is only for when Oxacillin is on shortage. Reference (Note: Nafcillin may have higher risk of ADEs): http://aac.asm.org/content /early/2016/03/02/AAC.03122-15.full.pdf

Daptomycin Dose Rounding

Daptomycin is currently classified as a Restricted Antimicrobial by the UConn Health/JDH Antimicrobial Stewardship Program (ASP). As such, all new orders for daptomycin will be reviewed for appropriateness of use within one working day by a representative from the ASP.

When a new order for daptomycin is written, the Pharmacist processing the order will:

- Verify the patient's height and weight.

- Determine the patient's IBW using standard equations (see Appendix II).
    - ***NOTE: *If the patient's actual TBW is less than IBW, then the patient's daptomycin dose should be calculated using TBW.*
- Screen the patient for these two exclusion criteria for using IBW-based dose calculation:
    - An estimated CLcr of <30 ml/min and/or receiving renal replacement therapies
    - Patients with documented endocarditis or prosthetic-device-related infections without device removal
        - ***NOTE: If endocarditis or prosthetic-device-related infections are suspected based on patient medical record review and/or discussion with caregivers, then the patient should be initially excluded from the IBW-based dose calculation
- Verify the desired daptomycin mg/kg dose if it is not clearly indicated in the order (e.g., 4 mg/kg, 6 mg/kg, or other mg/kg dose).
- Calculate the daptomycin dose using the IBW or TBW (whichever is determined to be appropriate).
- Round the daptomycin dose to the nearest 50-milligram increment. See the daptomycin dose rounding chart contained within this section.
    - ***NOTE: Using this rounding method, each patient will receive a daptomycin dose that will be within +10% of the ordered milligram-per-kilogram dose
- Enter the new rounded daptomycin dose into the computerized pharmacy system.

4mg/kg Daptomycin Dosing		6mg/kg Daptomycin Dosing	
Patient Weight (kg)	Rounded Daptomycin Dose (mg)	Patient Weight (kg)	Rounded Daptomycin Dose (mg)
40 – 43	150	40 – 45	250
44 – 56	200	46 – 54	300
57 – 68	250	55 – 62	350
68 – 81	300	63 – 70	400
82 – 93	350	71 – 79	450
94 – 106	400	80 – 87	500
107 – 118	450	88 – 95	550
119 – 131	500	96 – 104	600
132 – 140	550	105 – 112	650
		113 – 124	700
		125 – 129	750
		130 – 140	800

References:
1. Dvorchik & Damphousse [J Clin Pharmacol 2005;45:48-56.]
2 Pai, Norenberg, et al. [Antimicrob Agents Chemother 2007;51:2741-2747]
3. Bhavnani, Rubino, et al. [Clin Inf Diseases 2010;50(12):1568-74.]:
4. Ng, Schulz, et al [Antimicrob Agents & Chemother. 2014; 58(1):88-93.]

Quinolone Therapeutic Interchange and Renal Function Dose Adjustments

Orders for other Quinolones should be reviewed for appropriateness by the Pharmacist and then discussed with the prescriber for possible substitution to LevoFLOXacin. The first chart depicts the conversion chart for those with normal renal function. Consult the second chart for dosage adjustment schedule for patients with renal dysfunction receiving LevoFLOXacin.

Diagnosis	**Ciprofloxacin Oral Dose[1]**	**Ciprofloxacin IV Dose[1]**	**Moxifloxacin Oral/ IV Dose[1]**	**LevoFLOXacin Oral/IV Dose[1]**
Complicated Urinary Tract Infection	500mg q12h	400mg IV q12h	Not indicated	750mg q24h x 5 days 250mg q24h x 10

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				days
Acute Bacterial Exacerbation of Chronic Bronchitis	750mg q12h	400mg IV q8h	400mg q24h	500mg q24h x 7 days
Community Acquired Pneumonia (CAP)	500mg q12h	400mg IV q12h	400mg q24h	750mg q24h x 5 days
Severe CAP/ Nosocomial Pneumonia (HAP)[3]	750mg q12h	400mg IV q8h	Not indicated	750mg q24h x 7 days
Uncomplicated Skin and Structure Infection (SSSI)	500mg q12h	400mg IV q12h	400mg q24h	500mg q24h x 7 days
Complicated SSSI	750mg q12h	400mg IV q8h	400mg q24h	750mg q24h x 7 days
Intra-abdominal infections♦	500mg q12h	400mg IV q12h	Not indicated	500-750mg q24h x 7 days

1 – Unless otherwise specified, durations of treatment are 7-14 days.
2 – Clinical effectiveness only proven in infections caused by penicillin susceptible *S.pneumoniae*, *H.influenzae, H.parainfluenzae, M.pneumoniae*, and *C.pneumoniae*.
3 – Combination therapy should be considered for Nosocomial Pneumonia
♦ - Used in conjunction with metroNIDAZOLE

Community Acquired Pneumonia/Nosocomial Pneumonia (HAP)/ Complicated Skin & Structure Infection

Renal Function (Est CrCl)	Initial Dose	Subsequent Dose
≥50ml/min	750mg	750mg q24h
20-49 ml/min	750mg	750mg q48h
10-19 ml/min	750mg	500mg q48h
Hemodialysis/CAPD	750mg	500mg q48h

Acute Bacterial Exacerbation of Chronic Bronchitis/Community Acquired Pneumonia

Renal Function (Est CrCl)	Initial Dose	Subsequent Dose
≥50ml/min	500mg	500mg q24h
20-49ml/min	500mg	250mg q24h
10-19ml/min	500mg	250mg q48h
Hemodialysis/CAPD	500mg	250mg q48h

Complicated UTI/Acute Pyelonephritis (High Dose, Short Duration)

Renal Function (Est CrCl)	Initial Dose	Subsequent Dose
≥ 50ml/min	750mg	750mg q24h
20-19ml/min	750mg	750mg q48h
10-19ml/min	750mg	500mg q48h
Hemodialysis/CAPD	750mg	500mg q48h

UTI (Low Dose, Longer Duration)

Renal Function (Est CrCl)	Initial Dose	Subsequent Dose
≥20ml/min	250mg	250mg q24h

< 20ml/min	250mg	250mg q48h

Renal Dose Adjustments of Specific Antibiotics

The Pharmacist has authorization from the Pharmacy and Therapeutics Committee to make renal function-based adjustments to the dosage and/or administration regimen for the medications listed below:

- Cefepime
- Piperacillin-Tazobactam (Zosyn®)

These medications were chosen based on their high volume of use, complicated/multiple dosing regimens, and/or past reports of adverse drug reactions when not properly adjusted for renal impairment. This Category II substitution protocol is intended to quickly establish and maintain therapeutic dosing concentrations, while avoiding excessive accumulation of the drug and/or its metabolites to minimize risks of toxicity.

To perform this Category II substitution, the Pharmacist will do the following:

On receipt of the initial order:

- Perform an assessment of current and historic values of serum creatinine. If a serum creatinine is not available, the pharmacist may order a serum creatinine based on their clinical judgement for its need.
- Estimate the patient's renal function using the Cockcroft-Gault (CG) equation (see Appendix I).
- For the antimicrobials (cefepime, piperacillin/tazobactam), determine the type of infection being treated. This should be done via review of electronic and/or written medical record information. If the type of infection is not documented in these resources, the Pharmacist will directly contact the prescriber to obtain this information.
- When renal function is determined (and the type of infection, if applicable), the Pharmacist will use the dosing tables (listed in this section) to determine the most appropriate dose and administration regimen to use for the medication.
- Enter the order into the computerized pharmacy system.
- The pharmacist must communicate to the practitioner the details of the dose and/or administration regimen change after any adjustments have been made as per Category II Substitution policy. A progress note "Renal Adjustment of Medication" will be placed in the patient's chart.

While the order for the medication remains active, the Pharmacist will:

- Review/monitor the patient's renal function at least every 72 hours.
- If a serum creatinine has not been evaluated with the past 72 hours, the pharmacist may order a serum creatinine based on his/her clinical judgement.
- When appropriate, modify the currently-prescribed dose and/or administration interval to one more appropriate for any acute changes in the patient's renal function. Doses/administration intervals may be adjusted up or down based on patient's renal function.
- If a modification of currently-prescribed regimen is needed, the Pharmacist will enter the order into the computerized pharmacy system.
- The pharmacist must communicate to the practitioner the details of the dose and/or administration regimen change after any adjustments have been made as per Category II Substitution policy. A progress note "Renal Adjustment of Medication" will be placed in the patient's chart.

Additional Notes / Exclusions:

- The Pharmacist-selected dose/administration interval conversion may be overridden, at any time, by the prescriber. If this occurs, the pharmacist should contact the prescriber to discuss this change.
- The procedure described in this section does not apply to the first ordered dose of the medications.
- The procedure described in this section does not apply to orders of these medications in the neonatal patient population.
- Pharmacists will indicate in the computerized pharmacy system in the pharmacist notes section if warranted: (a) that the medication order has been properly screened for dosage and/or administration regimen adjustments based on renal function, and (b) whether a dose and/or administration regimen change was made.

Guidelines for Cefepime Dose and/or Administration Interval Adjustments:

Mild-to-Moderate Infections:

- Urinary Tract Infections without evidence of sepsis/septic shock

Cefepime IV	Renal Dosing
>60 mL/min	1 Gm Q12 hrs
30 – 60 mL/min	1 Gm Q24 hrs
11 – 29 mL/min	500 mg Q24 hrs
<11 mL/min	250 mg Q24 hrs

Moderate-to-Severe Infections

- Urinary Tract Infections with evidence of sepsis/septic shock (Urosepsis)
- Skin & Skin Structure Infections / Cellulitis

Cefepime IV	Renal Dosing
>60 mL/min	2 Gm Q12 hrs
30 – 60 mL/min	1 Gm Q12 hrs
11 – 29 mL/min	1 Gm Q24 hrs
<11 mL/min	500 mg Q24 hrs

Other Infections

- Febrile Neutropenia
- Pneumonia / Respiratory Tract Infections

Cefepime IV	Renal Dosing
>60 mL/min	2 Gm Q8 hrs
30 – 60 mL/min	2 Gm Q12 hrs
11 – 29 mL/min	1 Gm Q12 hrs
<11 mL/min	1 Gm Q24 hrs

Dialysis Dosing (all indications)

- Peritoneal dialysis: 1 Gm Q24 hrs
- Hemodialysis: 2 Gm after HD

Cefepime Dose Adjustments for Kidney Function[a]

CrCl (mL/minute)[b]	Dose			
>60 (usual recommended dose)[c]	1 g every 12 hours	2 g every 12 hours	1 g every 6 hours	2 g every 8 hours
30 to 60	1 g every 24 hours	1 g every 12 hours	1 g every 8 hours[d]	2 g every 12 hours
11 to 29	500 mg every 24 hours	1 g every 24 hours	1 g every 12 hours	1 g every 12 hours
<11	250 mg every 24 hours	500 mg every 24 hours	1 g every 24 hours	1 g every 24 hours

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[a]Kuti 2010; Lodise 2006; Tam 2003; manufacturer's labeling.
[b]CrCl can be calculated using the Cockcroft-Gault equation (Jonckheere 2016).
[C]Choose usual recommended dose based on indication and disease severity (see adult dosing), then choose the adjusted dose from that column corresponding to the patient's CrCl
[d]Dose is decreased from 1 g every 6 hours to 1 g every 8 hours at CrCl <50 (Lodise 2006).

Residual kidney function and organism susceptibility	**Cefepime dose for a 2-day interdialytic interval (ie, next dialysis expected in 48 hours)**	**Cefepime dose for a 3-day interdialytic interval (ie, next dialysis expected in 72 hours)**
Patient is anuric **AND** the organism MIC <4 mg/L	1.5 g after hemodialysis	2 g after hemodialysis
Any of the following: Empiric therapy **OR** Patient has residual kidney function **OR** Organism MIC ≥4 mg/L	2 g after hemodialysis	2 g after hemodialysis

References:

- *Cefepime. Lexi-Drugs. Lexicomp. Wolters Kluwer Health, Inc. Riverwoods, IL. Available at: http://online.lexi.com. Accessed February 19, 2020.*
- *Cefepime [package insert]. Lake Forest, IL: Hospira, Inc; 2012.*

Guidelines for Piperacillin/Tazobactam Dose and/or Administration Interval Adjustments:

ALL infections EXCEPT Nosocomial Pneumonia (Healthcare-Associated Pneumonia):

Piperacillin/Tazobactam IV (Zosyn®)	**Renal Dosing:**
> 40mL/min	3.375 Gm Q6hrs
20 – 40 mL/min	2.25 Gm Q6hrs
< 20mL/min	2.25 Gm Q8hrs
Hemodialysis	2.25 Gm Q12hrs post hemodialysis. If next regularly scheduled dose is not due right after dialysis session, administer an additional dose of 0.75 Gm after the dialysis session.
CAPD	2.25 Gm Q12h

Nosocomial Pneumonia / Healthcare-Associated Pneumonia:

Piperacillin/Tazobactam IV (Zosyn®)	**Renal Dosing:**
≥ 40mL/min	4.5 Gm Q6hrs
21 – 39 mL/min	3.375 Gm Q6hrs
≤ 20mL/min	2.25 Gm Q6hrs
Hemodialysis	2.25 Gm Q8hrs post hemodialysis. If next regularly scheduled dose is not due right after dialysis session, administer an additional dose of 0.75 Gm after the dialysis session.
CAPD	2.25 Gm Q8h

References:

1. Cockroft DW, Gault MH. Prediction of creatinine clearance from serum creatinine. Nephron. 1976;16(1):31-41.
2. Salazar DE, Corcoran GB. Predicting creatinine clearance and renal drug clearance in obese patients from estimated fat-free body mass. Am J Med. 1988;84:1053-60.
3. Stevens LA, Nolin TD. Comparison of Drug Dosing Recommendations Based on Measured GFR and Kidney Function Estimating Equations. Am J Kid Dis. 2009;54:33-42.
4. National Kidney Foundation. K/DOQI Clinical Practice Guidelines for Chronic Kidney Disease: Evaluation, Classification and Stratification. Am J Kidney Dis. 2002;39:S1-S266.
5. Cefepime and Piperacillin/Tazobactam Product Inserts.

Anticoagulants/Blood Factor Products

Non-Formulary Medication	Category	Therapeutic Interchange	Comments

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C1 Esterase Inhibitor (Human) (Berinert®)	I	C1 Esterase Inhibitor (Human) (Berinert®)	Prefer to round up to the nearest vial size. Three or more vials will be prepared by pharmacy. Administer 1000 units if weight is ≤50 kg. Administer 1500 units if weight is >50 kg and ≤75 kg. Administer 2000 units if weight is >75 kg and ≤100 kg. Administer 2500 units if weight is >100 kg. Reference: https://www.uptodate.com/contents/hereditary-angioedema-treatment-of-acute-attacks and https://aacijournal.biomedcentral.com/articles/10.1186/1710-1492-7-1
Factor Blood Products (e.g. Humate P®, Benefix®, Novoseven®)	I	Factor Blood Products (Humate P® ordered as Von Willebrand Factor)	Prefer to round up to the nearest vial size

Enoxaparin Dose Adjustments based on commercial availability

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Enoxaparin (Lovenox®)	I	Enoxaparin (Lovenox®)	Dosages should be ordered in 10mg increments. It is not necessary to discard the nitrogen bubble in the syringe when administering the entire dose in the syringe. It may be safely injected subcutaneously. Monitor renal function and orders should be reflective of the appropriate interval based on renal function.
25 – 34 mg	I	30 mg syringe	
35 – 44 mg	I	40 mg syringe	
45 – 54 mg	I	50 mg dose* 60 mg syringe	*Dose not commercially available. RN will discard the mg amount to reach the ordered dose. The nitrogen bubble may be cautiously expelled before measuring the dose to be administered.
55 – 64 mg	I	60 mg syringe	
65 – 74 mg	I	70 mg dose* 80 mg syringe	*Dose not commercially available. RN will discard the mg amount to reach the ordered dose. The nitrogen bubble may be cautiously expelled before measuring the dose to be administered.
75 – 84 mg	I	80 mg syringe	
85 – 94 mg	I	90 mg dose* 100 mg syringe	*Dose not commercially available. RN will discard the mg amount to reach the ordered dose. The nitrogen bubble may be cautiously expelled before measuring the dose to be administered.
95 – 104 mg	I	100 mg syringe	
105 – 114 mg	I	110 mg dose* 120 mg syringe	*Dose not commercially available. RN will discard the mg amount to reach the ordered dose. The nitrogen bubble may be cautiously expelled before measuring the dose to be administered.
115 – 124 mg	I	120 mg syringe	
125 – 134 mg	I	130 mg dose* 150 mg syringe	*Dose not commercially available. RN will discard the mg amount to reach the ordered dose. The nitrogen bubble may be cautiously expelled before measuring the dose to be administered.
135 – 144 mg	I	140 mg dose* 150 mg syringe	*Dose not commercially available. RN will discard the mg amount to reach the ordered dose. The nitrogen bubble may be cautiously expelled before measuring the dose to be administered.
145 – 154 mg		150 mg syringe	

Enoxaparin Renal Dose Adjustments

Category I = Automatic substitution; Category II = Substitution with practitioner informed after substitution; Category III = Substitution with prior approval of practitioner informed by verbal or telephone contact; Category IV = Intravenous Immune Globulin.

The Pharmacist has authorization from the Pharmacy and Therapeutics Committee to make renal function-based adjustments to the dosage and/or administration regimen for the medication listed below:

- Enoxparin (Lovenox®)

This Category II substitution protocol is intended to quickly establish and maintain therapeutic dosing concentrations, while avoiding excessive accumulation of the drug and/or its metabolites to minimize risks of toxicity.

To perform this Category II substitution, the Pharmacist will do the following:

On receipt of the initial order:

- Perform an assessment of current and historic values of serum creatinine. If a serum creatinine is not available, the pharmacist may order a serum creatinine based on their clinical judgement for its need.
- Estimate the patient's renal function using the Cockcroft-Gault (CG) equation (see Appendix I).
- When renal function is determined, the Pharmacist will use the dosing tables (listed in this section) to determine the most appropriate dose and administration regimen to use for the medication.
- Enter the order into the computerized pharmacy system.
- The pharmacist must communicate to the practitioner the details of the dose and/or administration regimen change after any adjustments have been made as per Category II Substitution policy. A progress note "Renal Adjustment of Medication" will be placed in the patient's chart.

While the order for the medication remains active, the Pharmacist will:

- Review/monitor the patient's renal function at least every 72 hours.
- If a serum creatinine has not been evaluated with the past 72 hours, the pharmacist may order a serum creatinine based on his/her clinical judgement.
- When appropriate, modify the currently-prescribed dose and/or administration interval to one more appropriate for any acute changes in the patient's renal function. Doses/administration intervals may be adjusted up or down based on patient's renal function.
- If a modification of currently-prescribed regimen is needed, the Pharmacist will enter the order into the computerized pharmacy system.
- The pharmacist must communicate to the practitioner the details of the dose and/or administration regimen change after any adjustments have been made as per Category II Substitution policy. A progress note "Renal Adjustment of Medication" will be placed in the patient's chart.

Additional Notes / Exclusions:

- The Pharmacist-selected dose/administration interval conversion may be overridden, at any time, by the prescriber. If this occurs, the pharmacist should contact the prescriber to discuss this change.
- The procedure described in this section does not apply to the first ordered dose of the medications.
- The procedure described in this section does not apply to orders of these medications in the neonatal patient population.
- Pharmacists will indicate in the computerized pharmacy system within the pharmacist notes section if warranted: (a) that the medication order has been properly screened for dosage and/or administration regimen adjustments based on renal function, and (b) whether a dose and/or administration regimen change was made.

Guidelines for Enoxaparin Dose and/or Administration Interval Adjustments:

Enoxaparin SC (Lovenox®)	Renal Dosing:
≥ 30 mL/min	Treatment: 1 mg/kg Q12hrs or 1.5 mg/kg Q24hrs Prophylaxis: 40 mg Q24hrs or 30 mg Q12hrs
< 30mL/min	Treatment: 1 mg/kg Q24hrs Prophylaxis: 30 mg Q24hr
Hemodialysis	Has not been FDA approved for use in dialysis patients

Immune Globulin

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Immune Globulin (IVIG)	IV	Privigen ® Immune Globulin	Dose should be changed to the nearest 5Gm within 10% of original order. Privigen is our preferred product. Other products may be used if documented adverse event or therapeutic failure to preferred product. Privigen is pooled for inpatient units only.

Antihistamine Agents

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Cetirizine (Zyrtec®) oral 5 mg or 10 mg daily	I	Loratadine (Claritin®) 10 mg daily	
Cetirizine/Pseudoephedrine (Zyrtec-D®) oral All Doses	I	Loratadine (Claritin®) 10 mg daily plus Equivalent Pseudoephedrine up to 60mg po QID	
Desloratidine (Clarinex®) oral 5 mg daily	I	Loratadine (Claritin®) 10 mg daily	
Fexofenadine (Allegra®) oral All Doses	I	Loratadine (Claritin®) 10 mg daily	
Fexofenadine/Pseudoephedrine (Allegra-D®) All Doses	I	Loratadine (Claritin®) 10 mg daily plus Equivalent Pseudoephedrine up to 60mg po QID	
Levocetirizine (Xyxal®) oral 2.5 mg to 5 mg daily	I	Loratadine (Claritin®) 10 mg daily	
Loratadine/Pseudoephedrine (Claritin-D®)		Loratadine (Claritin®) 10 mg daily plus Equivalent Pseudoephedrine up to 60mg po QID	

Cardiovascular Agents

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Nitroglycerin spray 0.4 mg spray	I	Nitroglycerin tablets 0.4 mg tablet	
Sildenafil (Viagra®)	III	Sildenafil (Rovatio®) dose per discussion with prescriber	

Angiotensin Converting Enzyme (ACE) Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange Equivalent Oral Daily Dosage	Comments
Benazepril (Lotensin®) 10 mg Intermediate Acting	I	Captopril (Capoten®) 6.25 mg TID Lisinopril (Zestril®, Prinivil®) 10 mg	Captopril has no hepatic activation, titratable and short-acting. Lisinopril has no hepatic activation and long-acting.
Enalapril (Vasotec®) 5 mg	I	Captopril (Capoten®)	Captopril has no hepatic activation, titratable and short-acting.

Category I = Automatic substitution; Category II = Substitution with practitioner informed after substitution; Category III = Substitution with prior approval of practitioner informed by verbal or telephone contact; Category IV = Intravenous Immune Globulin.

Intermediate Acting		6.25 mg TID Lisinopril (Zestril®, Prinivil®) 10 mg	Lisinopril has no hepatic activation and long-acting.
Enalaprilat 1.25 mg IV q6hrs	I	Lisinopril (Zestril®, Prinivil®) 10 mg	
Fosinopril (Monopril®) 10 mg Intermediate Acting	I	Captopril (Capoten®) 6.25 mg TID Lisinopril (Zestril®, Prinivil®) 10 mg	Captopril has no hepatic activation, titratable and short-acting. Lisinopril has no hepatic activation and long-acting.
Moexipril (Univasc®) 7.5 mg Intermediate Acting	I	Captopril (Capoten®) 6.25 mg TID Lisinopril (Zestril®, Prinivil®) 10 mg	Captopril has no hepatic activation, titratable and short-acting. Lisinopril has no hepatic activation and long-acting.
Perindopril (Aceon®) 4 mg Long Acting	I	Captopril (Capoten®) 6.25 mg TID Lisinopril (Zestril®, Prinivil®) 10 mg	Captopril has no hepatic activation, titratable and short-acting. Lisinopril has no hepatic activation and long-acting.
Quinapril (Accupril®) 10 mg Intermediate Acting	I	Captopril (Capoten®) 6.25 mg TID Lisinopril (Zestril®, Prinivil®) 10 mg	Captopril has no hepatic activation, titratable and short-acting. Lisinopril has no hepatic activation and long-acting.
Ramipril (Altace®) 2.5 mg Intermediate Acting	I	Captopril (Capoten®) 6.25 mg TID Lisinopril (Zestril®, Prinivil®) 10 mg	Captopril has no hepatic activation, titratable and short-acting. Lisinopril has no hepatic activation and long-acting.
Trandolapril (Mavik®) 2 mg Long Acting	I	Captopril (Capoten®) 6.25 mg TID Lisinopril (Zestril®, Prinivil®) 10 mg	Captopril has no hepatic activation, titratable and short-acting. Lisinopril has no hepatic activation and long-acting.

Angiotensin Receptor Antagonist (ARB) Therapeutic Interchange

Patients will receive Losartan (Cozaar®) as ordered as our current formulary ARB due to Valsartan (Diovan®) shortage as some manufacturers had trace amounts of an impurity N-nitrosodimethylamine (NDMA). Combination products such as Hyzaar®, Micardis HCT®, Avalide, etc will be converted to the equivalent components. For example, Hyzaar® (50mg Losartan and 12.5mg HydroCHLOROthiazide) will be converted to Losartan 50mg and HydroCHLOROthiazide 12.5mg.

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Azilsartan (Edarbi®) 20mg PO daily 40mg PO daily 80mg PO daily	I	Losartan (Cozaar) 25mg PO daily 50mg PO daily 100mg PO daily	
Candesartan (Atacand®) 4mg PO daily 8mg PO daily or 4mg PO BID 16mg PO daily or 8mg PO BID 32mg PO daily or 16mg PO BID	I	Losartan (Cozaar) 25mg PO daily 50mg PO daily 100mg PO daily See comment	Max Losartan dose is 100mg daily, if higher dosing required use patient own med if possible.
Eprosartan (Teveten®) 400mg PO daily 600mg PO daily 800mg PO daily	I	Losartan (Cozaar) 25mg PO daily 50mg PO daily 100mg PO daily	
Irbesartan (Avapro®) 75mg PO daily	I	Losartan (Cozaar) 25mg PO daily	

150mg PO daily 300mg PO daily		50mg PO daily 100mg PO daily	
Olmesartan (Benicar®) 20mg PO daily 40mg PO daily	I	Losartan (Cozaar) 50mg PO daily 100mg PO daily	
Telmisartan (Micardis®) 20mg PO daily 40mg PO daily 80mg PO daily	I	Losartan (Cozaar) 25mg PO daily 50mg PO daily 100mg PO daily	
Valsartan (Diovan®) 40mg PO daily 80mg PO daily 160mg PO daily	I	Losartan (Cozaar) 25mg PO daily 50mg PO daily 100mg PO daily	

Beta-Blocker Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Bisoprolol (Zebeta®) 5mg PO daily	I	Atenolol 50mg PO daily	
Bisoprolol/HydrocCHLOROthiazide (Ziac®) 2.5/6.25 mg PO daily 5/6.25 mg PO daily 10/6.25 mg PO daily	I	Atenolol AND HydroCHLOROthiazide 25 mg PO daily and 6.25 mg PO daily 50 mg PO daily and 6.25 mg PO daily 100 mg PO daily and 6.25 mg PO daily	
Carvedilol Phosphate Extended Release (Coreg CR®) 10 mg PO daily 20 mg PO daily 40 mg PO daily 80 mg PO daily	I	Carvedilol Immediate Release (Coreg®) 3.125 mg PO BID 6.25 mg PO BID 12.5 mg PO BID 25 mg PO BID	In Elderly: Consider using lower starting dose of ER when switching from higher doses of IR e.g. 25mg IR BID to ER 40mg daily due to higher risk of hypotension.
Nebivolol (Bystolic®) 5 mg PO daily 10 mg PO daily	I	Metoprolol 50 mg PO BID 100 mg PO BID	

Calcium Channel Blocker Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Felodipine (Plendil®) 2.5 mg PO daily 5 mg PO daily 10 mg PO daily	I	Amlodipine (Norvasc®) 2.5 mg PO daily 5 mg PO daily 10 mg PO daily	

Fibric Acid, Antilipemic Agent Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments

Category I = Automatic substitution; Category II = Substitution with practitioner informed after substitution; Category III = Substitution with prior approval of practitioner informed by verbal or telephone contact; Category IV = Intravenous Immune Globulin.

Fenofibrate (generic) 50 mg, 54 mg, or 67 mg Antara® 43 mg Fenoglide® 40 mg Fenofibric acid Lofibra® 54 mg or 67 mg Lipofen® 50 mg Triglide® 50 mg TriLipix® 45 mg	I	Fenofibrate (Tricor®) 48mg	
Fenofibrate (generic) 120 mg, 134 mg, 150 mg, 160 mg, or 200 mg Antara® 130 mg Fenoglide® 120 mg Lofibra 134 mg, 160 mg, or 200 mg Lipofen 150 mg TriLipix® 135 mg	I	Fenofibrate (Tricor®) 145mg	

HMG CoA Reductase Inhibitor Therapeutic Interchange

Daily dose at in evening for all HMG CoA Reductase Inhibitors. Dose Equivalency based on percentage of LDL lowering. Atorvastatin generic is the preferred formulary statin due to data on efficacy, low drug interaction potential, potency for cholesterol lowering, data with AMI, and preferred status on outpatient pharmacy insurance plans. There is a lower risk of Rhabdomyolysis with Atorvastatin versus Simvastatin with strong CYP3A4 inhibitors. Protease Inhibitors may increase the serum concentration of Atorvastatin. Management: Maximum adult Atorvastatin doses: 20mg/day with darunavir/ritonavir, fosamprenavir, fosamprenavir/ritonavir, saquinavir/ritonavir, 40mg/day with nelfinavir; lowest necessary dose with lopinavir/ritonavir. Avoid Atorvastatin with tipranavir/ritonavir. Lipid lowering agents that can cause myopathy when used alone include Gemfibrozil, CycloSPORINE, Danazol, and Niacin >1gm/day. If patient is stable on these medications and Atorvastatin, continue both.

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Fluvastatin (Lescol®) 40mg daily 80mg daily	I	Atorvastatin (Lipitor®) 5mg daily 10mg daily	
Lovastatin (Mevacor®) 20mg daily 40mg daily 80mg daily	I	Atorvastatin (Lipitor®) 5mg daily 10mg daily 20mg daily	
Pravastatin (Pravachol®) 20mg daily 40mg daily 80mg daily	I	Atorvastatin (Lipitor®) 5mg daily 10mg daily 20mg daily	Non-formulary but restricted to patients who have myopathy, myositis, or rhabdomyolysis from other statins.
Rosuvastatin (Crestor®) 5mg daily 10mg daily 20mg daily 40mg daily	I	Atorvastatin (Lipitor®) 20mg daily 40mg daily 80mg daily 80mg daily	
Simvastain (Zocor®) 10mg daily 20mg daily 40mg daily	I	Atorvastatin (Lipitor®) 5mg daily 10mg daily 20mg daily	

Pitavastatin 1mg daily 2mg daily 4mg daily	I	Atorvastatin (Lipitor®) 5mg daily 10mg daily 20mg daily	

Reference: Relative LDL-lowering Efficacy of Statin and Statin-based Therapies[1]*

Atorva	Fluva	Pitava	Lova	Prava	Rosuva	Simva	%↓ LDL-C
-----	40 mg	1 mg	20 mg	20 mg	-----	10 mg	25-32%
10 mg	80 mg	2 mg	40 or 80 mg	40 mg	-----	20 mg	31-39%
20 mg	-----	4 mg	80 mg	80 mg	5 mg	40 mg	37-45%
40 mg	-----		-----	-----	10 mg	80 mg	48-52%
80 mg	-----		-----	-----	20 mg	-----	55%-60%
	-----		-----	-----	40 mg	-----	60-63%

Atorva=Atorvastatin; Fluva=Fluvastatin; Pitava=Pitavastatin; Lova=Lovastatin; Prava=Pravastatin; Rosuva=Rosuvastatin; Simva=Simvastatin.
*Based on individual statin efficacy data, not head-to-head comparisons between statins.
[1]FDA Drug Safety Communication: New restrictions, contraindicatiosn and dose limitation for Zocor (simvastatin) to reduce the risk of muscle injury. June 8, 2011. Available at: http://wayback.archive-it.org/7993/20161022203921/http://www.fda.gov/Drugs/DrugSafety/ucm256581.htm. Accessed November 22, 2017.

Central Nervous System Agents

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
BuPROPion Extended Release (Wellbutrin XL®) 150 mg XL PO daily 300 mg XL PO daily 450 mg XL PO daily	I	Bupropion sustained release (SR) or immediate release (IR) 150 mg SR PO daily or 75 mg IR PO BID 150 mg SR PO BID or 100 mg IR PO TID 200 mg SR PO BID or 100 mg IR PO QID	Avoid taking doses later than 6pm as may cause insomnia.
DiphenhydrAMINE for use PRN insomnia for patients >65 yrs	III	Provider discretion	Per Beers Criteria, this medication should be avoided in older adults.
Donepezil (Aricept®) 23 mg PO daily	I	Donepezil (Aricept®) 20 mg PO daily	
Flurazepam (Dalmane®)	I	Temazepam (Restoril®)	Dispense at equivalent dose
Memantine XR (Namenda XR®) 7 mg PO daily 14 mg PO daily 21 mg PO daily 28 mg PO daily	I	Memantine (Namenda®) 5 mg PO daily 5 mg PO BID 15 mg PO total daily dose given in 5 mg and 10 mg separate doses 10 mg PO BID	
Methylphenidate Extended Release (Concerta®)	I	Methylphenidate Immediate Release	Methylphenidate Immediate Release should be given 30 to 45 minutes before a meal. Ensure last

18 mg PO daily 36 mg PO daily 54 mg PO daily 72 mg PO daily		5 mg PO TID 10 mg PO TID 15 mg PO TID 20 mg PO TID	daily dose is administered before 6pm.
Paliperidone (Invega®) 3 mg PO daily 6 mg PO daily 9 mg PO daily 12 mg PO daily	III	Risperidone (Risperdal®) 1mg PO daily 3mg PO daily 4mg PO daily 6mg PO daily	Patients with hepatic impairment may require to remain on paliperidone due to minimal hepatic metabolism. Paliperidone is the major active metabolite of risperidone. The bioavailability of risperidone is 70%. The bioavailability of paliperidone is 28%.
Paroxetine continuous release (Paxil CR®) 12.5 mg CR PO daily 25 mg CR PO daily 37.5 mg CR PO daily	I	Paroxetine (Paxil®) 10 mg PO daily 20 mg PO daily 30 mg PO daily	
Quetiapine Extended Release (Seroquel XR ®) 150mg XR PO daily 200mg XR PO daily 300mg XR PO daily 400mg XR PO daily	I	Quetiapine Immediate Release (IR) 75mg IR PO BID 100mg IR PO BID 150mg IR PO BID 200mg IR PO BID	
Zaleplon (Sonata®) 5 – 10 mg PO HS	I	Zolpidem (Ambien®) 10 mg PO HS	
Zolpidem CR (Ambien CR®) 6.25 mg PO HS 12.5 mg PO HS	I	Zolpidem (Ambien®) 5 mg PO HS 10 mg PO HS	

Non-Formulary medication	Category	Therapeutic Interchange	Comments
Carbidopa/Levodopa ER (Rytary®)	II	Carbidopa/Levodopa IR (Sinemet®)	The doses of carbidopa/levodopa IR are not interchangeable on a 1:1 basis with the dosages of RYTARY. Dosing is based upon max dose of levodopa and discretion of prescriber.
23.75/95 mg • 3-4 caps tid		TDD levodopa in Rytary: 855-1140 Carbidopa/Levodopa IR 10-100mg • 1-2 tabs qid	
36.25/145 mg • 3 caps tid		TDD levodopa in Rytary: 1305 Carbidopa/Levodopa IR 10-100mg • 2 tabs qid Carbidopa/Levodopa IR 25-250mg • 1 tab tid/ 1 tab qid	
48.75/195 mg • 3-4 caps tid		TDD levodopa in Rytary: 1755-2340 Carbidopa/Levodopa IR 25-250mg • 1 tab qid/ 1 tab five times daily	
61.25/245 mg • 3 caps tid		TDD levodopa in Rytary: 2205 Carbidopa/Levodopa IR 25-250mg • 1 tab five times daily • 2 tabs qid	

TDD=total daily dose

Endocrine/Hormones and Synthetic Agents including Respiratory Agents

Dipeptidyl Peptidase IV (DPP-IV) Inhibitor Therapeutic Interchange

All combination products (Kazano®, Oseni ®, Jentadueto®, Kombiglyze XR ®, Janumet®, Janumet XR®, Juvisync®, etc.) will be switched to their individual ingredients with conversion to our appropriate formulary substitutions.					
Drug Name	Dose equivalency	Dosage Adjustment in Renal Insufficiency			Dosage adjustment with concomitant use of strong CYP3A4/5 inhibitors
		CrCl ≥ 50mL/min	CrCl ≥ 30mL/min to < 50mL/min	CrCl<30 or dialysis	
SITagliptin (Januvia®) Formulary Medication	100mg PO daily with or without food	None	50mg PO daily	25mg PO daily without regard to time of dialysis	None
Alogliptin (Nesina®)	25mg PO daily	None	12.5mg PO daily (CrCl ≥ 30mL/min to <60mL/min)	6.25mg PO daily without regard to time of dialysis	None
Linagliptin (Tradjenta®)	5mg PO daily	None	None	None	Use of CYP3A4 or P-gp inducers is not recommended.
Saxagliptin (Onglyza®)	2.5mg or 5mg PO daily	None	2.5mg PO daily	2.5mg PO daily following dialysis	2.5mg PO daily

SGLT-2 Inhipitors Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Invokana® canagliflozin 100mg once daily Invokana® canagliflozin 300mg once daily	III	Jardiance® empagliflozin 10mg once daily Jardiance® empagliflozin 25mg once daily	Avoid in patients with eGFR <45ml/min/1.73m2
Farxiga® dapagliflozine 5mg once daily Farxiga® dapagliflozine 10mg once daily	III	Jardiance® empagliflozin 10mg once daily Jardiance® empagliflozin 25mg once daily	Avoid in patients with eGFR <45ml/min/1.73m2
Steglarto® ertugliflozin 5mg once daily Steglarto® ertugliflozin 15mg once daily	III	Jardiance® empagliflozin 10mg once daily Jardiance® empagliflozin 25mg once daily	Invokana® - Avoid in patients with eGFR <45ml/min/1.73m2 Steglarto® - Avoid in patients with eGFR <45ml/min/1.73m

Inhaled Anticholinergic Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Ipratropium MDI (Atrovent®)	I	Tiotropium 18 mcg INH daily or an alternative of Ipratropium (Atrovent®) nebulized solution	

Inhaled Corticosteroid Therapeutic Interchange

Formulary Medication	Category	Therapeutic Interchange	Comments
Mometasone MDI (Asmanex HFA)	I	Mometasone DPI (Asmanex Twisthaler)	

Category I = Automatic substitution; Category II = Substitution with practitioner informed after substitution; Category III = Substitution with prior approval of practitioner informed by verbal or telephone contact; Category IV = Intravenous Immune Globulin.

--		110mcg 1-2 INH QPM 220mcg 1 INH QPM	
100mcg 2 INH BID		110mcg 3-4 INH QPM 110mcg 2 INH BID 220mcg 2 INH QPM 220mcg 1 INH BID	
200mcg 2 INH BID		110mcg ≥ 3 INH BID 220mcg ≥ 2 INH BID	

Drug	Low Daily Dose	Medium Daily Dose	High Daily Dose	Max Daily Dose Per Manufacturer
Beclomethasone Dipropionate HFA (QVAR REDIHALER)	80-240mcg	241-480mcg	>480mcg	640 mcg
40mcg/puff (#120)	1-3 puffs BID	4-6 puffs BID	Use 80mcg inhaler	
80mcg/puff (#120)	1 puff qam 2 puffs qpm	2-3 puffs BID	4 or more puffs BID	
Budesonide (PULMICORT FLEXHALER)	180-540mcg	541-1080mcg	>1200mcg	1440 mcg
90 mcg/inhalation (#60)	1-3 INH BID	--	--	
180 mcg/inhalation (#120)	1 INH qam 2 INH qpm	2-3 INH BID	4 INH BID	
Ciclesonide MDI (ALVESCO)	80-160 mcg	161-320mcg	>320 mcg	640 mcg
80mcg/puff (#60)	1 puffs BID	2 puffs BID	--	
160mcg/puff (#60)	--	1 puffs BID	2 puffs BID	
Fluticasone (FLOVENT HFA)	88-264mcg	265-440mcg	>440mcg	1760 mcg
44mcg/puff (#120)	1-3 puffs BID	--	--	
110mcg/puff (#120)	1 puff BID	2 puffs BID	3 puffs BID	
220mcg/puff (#120)	--	1 puff BID	2 or more puffs BID	
Fluticasone DPI (FLOVENT DISKUS)	100-300mcg	301-500mcg	>500mcg	2000 mcg
50mcg/inhalation (#60)	1-3 INH BID	--	--	
100mcg/inhalation (#28)	--	2 INH BID	3 or more INH BID	
250mcg/inhalation (#28)	--	1 INH BID	2 or more INH BID	
Mometasone MDI (ASMANEX HFA)	--	400mcg	800mcg	800 mcg
100mcg/actuation (#120)	--	2 puffs BID	--	
200mcg/actuation (#120)	--	--	2 puffs BID	
Mometasone DPI (ASMANEX TWISTHALER)	110mcg	>110-440mcg	>440mcg	880 mcg
110mcg/actuation (#30)	1-2 INH QPM	3-4 INH QPM or 2 INH BID	3 or more INH BID	
220mcg/actuation (#14, 30, 60, 120)	1 INH QPM	2INH QPM or 1 INH BID	2 or more INH BID	

Adapted from: *Global Strategy for Asthma Management and Prevention (2011) & NIH Asthma Guidelines (2007) & Global Initiative for Asthma Guidelines (GINA 2017) & National Asthma Education and Prevention Program guidelines (NAEPP 2007)*

Inhaled Combination Medication Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments

Category I = Automatic substitution; Category II = Substitution with practitioner informed after substitution; Category III = Substitution with prior approval of practitioner informed by verbal or telephone contact; Category IV = Intravenous Immune Globulin.

Fluticasone/Salmeterol (Advair®) 100/50 mcg 1 puff BID 250/50 mcg 1 puff BID 500/50 mcg 1 puff BID	I	Budesonide/Formoterol (Symbicort®) 80/4.5 mcg 2 puffs BID 160/ 4.5 mcg 2 puffs BID 160/4.5 mcg 2 puffs BID	Aerochamber must with be ordered with the metered dose inhaler (MDI)
Fluticasone/Salmeterol (Advair®) 45/21 mcg 2 puffs BID 115/21 mcg 2 puffs BID 230/21 mcg 2 puffs BID	I	Budesonide/Formoterol (Symbicort®) 80/4.5 mcg 2 puffs BID 160/4.5 mcg 2 puffs BID 160/4.5 mcg 2 puffs BID	Aerochamber must with be ordered with the metered dose inhaler (MDI)
Fluticasone/Vilanterol (Breo®) 100/25 mcg daily 200/25 mcg daily	I	Budesonide/Formoterol (Symbicort®) 80/4.5 mcg 2 puffs BID 160/4.5 mcg 2 puffs BID	Aerochamber must with be ordered with the metered dose inhaler (MDI)
Ipratropium/Albuterol (Combivent®)	I	Albuterol MDI same dose and frequency plus Tiotropium (Spiriva® Respimat) 2 INH daily	Aerochamber must with be ordered with the metered dose inhaler (MDI)
Mometasone/Formoterol (Dulera®) 100/5 mcg 2 puffs BID 200/5 mcg 2 puffs BID	I	Budesonide/Formoterol (Symbicort®) 160/4.5 mcg 2 puffs BID 160/4.5 mcg 2 puffs BID	Aerochamber must with be ordered with the metered dose inhaler (MDI)
Tiotropium (Spiriva® Handihaler) Inhale contents of once capsule (18mcg) daily	I	Tiotropium (Spiriva® Respimat) 2 inhalations (2.5mcg) daily (Alternative: Duoneb® ATC)	long acting muscarinic antagonist
Salmeterol (Serevent®) 1 puff BID	I	Olodaterol (Striverdi Respimat®) 2 INH once daily	long acting beta$_2$ agonist
Tiotropium/olodaterol (Stiolto Respimat®) 2.5/2.5 mcg 2 inhalations daily	I	Olodaterol (Striverdi Respimat®) 2 INH once daily **and** Tiotropium (Spiriva® Respimat) 2 INH daily (Alternative: Duoneb® ATC)	
Umeclidinium/ Viltanterol (Anoro Ellipta®) 62.5/ 25 mcg daily	I	Olodaterol (Striverdi Respimat®) 2 INH once daily **and** Tiotropium (Spiriva® Respimat) 2 INH daily (Alternative: Duoneb® ATC)	Umeclidinium is a long acting muscarinic antagonist. Viltanterol is a long acting beta$_2$ agonist.

Insulin Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
HumuLIN® and Novolin® 70/30 (70% NPH + 30% regular)	I	HumaLOG Mix® (75% lispro protamine + 25% lispro) 1:1 conversion	
Insulin Aspart (NovoLOG®)	I	Insulin Lispro (HumaLOG®) 1:1 conversion	
Insulin degludec (Tresiba®)	1	Insulin glargine (Lantus®) 1:1 conversion. A 20% dose reduction can also be considered.	Reference: https://www.tresibapro.com/prescribing-and-dosing/how-to-prescribe.html For adults with type 1 and type 2 diabetes already on insulin therapy, start Tresiba® at the same unit dose as the total daily long- or intermediate-acting insulin unit dose
Insulin Detemir (Levemir®)	I	Insulin Glargine (Lantus®) 1:1 conversion	
NovoLOG Mix® 70/30 (70% aspart protamine + 30% aspart)	I	HumaLOG Mix® (75% lispro protamine + 25% lispro)	

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		1:1 conversion	

Nasal Inhaled Corticosteroid Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Beclomethasone dipropionate (Qvar®) 1 spray each nostril BID	I	Fluticasone (Flonase®) 1 spray each nostril daily	Safety and efficacy below age 4 is outside of the manufacturer's approval. Maximum dosage of 4 sprays daily.
Budesonide (Rhinocort Aqua®) 1 spray each nostril BID	I	Fluticasone (Flonase®) 1 spray each nostril daily	Safety and efficacy below age 4 is outside of the manufacturer's approval. Maximum dosage of 4 sprays daily.
Dexamethasone Spray (Dexacort Phosphate in Turbinaire®) 2 sprays each nostril BID	I	Fluticasone (Flonase®) 1 spray each nostril daily	Safety and efficacy below age 4 is outside of the manufacturer's approval. Maximum dosage of 4 sprays daily.
Flunisolide (Nasalide®) 2 sprays each nostril BID	I	Fluticasone (Flonase®) 1 spray each nostril daily	Safety and efficacy below age 4 is outside of the manufacturer's approval. Maximum dosage of 4 sprays daily.
Mometasone (Nasonex®) 2 sprays each nostril daily	I	Fluticasone (Flonase®) 1 spray each nostril daily	Safety and efficacy below age 4 is outside of the manufacturer's approval. Maximum dosage of 4 sprays daily.
Triamcinolone (Nasacort®) 2 sprays each nostril daily	I	Fluticasone (Flonase®) 2 sprays each nostril daily	Safety and efficacy below age 4 is outside of the manufacturer's approval. Maximum dosage of 4 sprays daily.

Zoledronic Acid Renal Dose Adjustments

The Pharmacist has authorization from the Pharmacy and Therapeutics Committee to make renal function-based adjustments to the dosage regimen for the medications listed below:

1) Zometa®
2) Reclast®

This Category II substitution protocol is intended to quickly establish and maintain therapeutic dosing regimens, while avoiding excessive accumulation of the drug and/or its metabolites to minimize risks of toxicity.

To perform this Category II substitution, the Pharmacist will do the following:
On receipt of the initial order:

- Perform an assessment of current and historic values of serum creatinine. If a serum creatinine is not available, the pharmacist may order a serum creatinine based on their clinical judgement for its need.
- Estimate the patient's renal function using the Cockcroft-Gault (CG) equation (see Appendix I).
- When renal function is determined, the Pharmacist will use the dosing table (listed in this section) to determine the most appropriate dose to use for the medication.
- Enter the order into the computerized pharmacy system.
- The pharmacist must communicate to the practitioner the details of the dose and/or administration regimen change after any adjustments have been made as per Category II Substitution policy. A progress note "Renal Adjustment of Medication" will be placed in the patient's chart.
- Calcium, magnesium and potassium must be check with-in 1 week prior to therapy and corrected with supplementation if needed.

- The Pharmacist-selected dose/administration interval conversion may be overridden, at any time, by the prescriber. If this occurs, the pharmacist should contact the prescriber to discuss this change.. .
- Pharmacists will indicate in the computerized pharmacy system with the pharmacist notes section if warranted: (a) that the medication order has been properly screened for dosage and/or administration regimen adjustments based on renal function, and (b) whether a dose and/or administration regimen change was made.

Baseline CrCl (mL/min)	Renal Dosing:*
> 60 mL/min	4 mg
50-60 mL/min	3.5 mg
40-49 mL/min	3.3 mg
30-39 mL/min	3.0 mg

*Above dosing is for Zometa® dosing schedules.
**No dosage adjustment need for renal impairment for treatment of Hypercalcemia of malignancy
***The use of Reclast® is contraindicated in patients with a CrCl < 35 mL/min.

Additional Information:

- Zoledronic acid is not recommended in patients with severe renal impairment (defined as CrCl < 30 mL/min) due to limited pharmacokinetic data in this population.
- Suggestions for dosing in patients with a CrCl < 30 mL/min that must continue on Zoledronic acid therapy include the following
  - Reduce the dose further
  - Extend dosing interval beyond 3-4 weeks
  - Increase the infusion time beyond 30 minutes

References:

1. Novartis. Zometa® (zoledronic acid) Prescribing information. Nov 2012.
2. Skerjanec A, Berenson J, Hsu C, et al. The Pharmacokinetics and Pharmacodynamics of Zoledronic Acid in Cancer Patients with Varying Degrees of Renal Function. J Clin Pharmacol. 2003;43:154-6

Gastrointestinal Agents

Non-Formulary Medication	Category	Therapeutic Interchange Equivalent Oral Daily Dosage	Comments
Maalox or Mylanta (with or without simethicone)	I	Aluminum Hydroxide and Magnesium Hydroxide with Simethicone	

Antiemetic Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Granisetron (Kytril®) 1 mg IV 2 mg PO	I	Ondansetron (Zofran®) 8 mg IV 16 mg PO	Ondanestron is the preferred 5HT3 antagonist for the prevention of chemotherapy, radiation induced nausea and vomiting and for general medical/surgical prophylaxis.
Palonosetron (Aloxi®)	I	Ondansetron (Zofran®)	Ondanestron is the preferred 5HT3 antagonist for the prevention of chemotherapy, radiation induced nausea and vomiting and for general medical/surgical prophylaxis. Palonosetron is just limited to use in Oncology.
Emend®	I	Cinvanti™	Pharmacy to substitute aprepitant for

(fosaprepitant) for injection 150 mg IV over 30 minutes		(aprepitant) for injection 130 mg IV push	fosaprepitant in any treatment plan

H-2 Antagonist Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Cimetidine (Tagamet®) 300 mg PO QID 300 mg PO BID 800 mg PO HS	I	Famotidine (Pepcid®) 20 mg PO BID 20 mg PO daily 40 mg PO HS	CrCl < 50ml/min, reduce dose by 50% or extend interval to q48hrs Example: Famotidine 20mg PO BID to Famotidine 20mg PO daily or Famotidine 20 mg IV q24h to Famotidine 20 mg IV q 48h
Nizatidine (Axid®) 150 mg PO BID 150 mg PO daily 300 mg PO HS	I	Famotidine (Pepcid®) 20 mg PO BID 20 mg PO daily 40 mg PO HS	CrCl < 50ml/min, reduce dose by 50% or extend interval to q48hrs Example: Famotidine 20mg PO BID to Famotidine 20mg PO daily or Famotidine 20 mg IV q24h to Famotidine 20 mg IV q 48h
RaNITIdine (Zantac®) 150 mg PO BID 150 mg PO daily 300 mg PO HS 50 mg IV q8hrs 50 mg IV q12hrs	I	Famotidine (Pepcid®) 20 mg PO BID 20 mg PO daily 40 mg PO HS 20 mg IV q12hrs 20 mg IV q24hrs	CrCl < 50ml/min, reduce dose by 50% or extend interval to q48hrs Example: Famotidine 20mg PO BID to Famotidine 20mg PO daily or Famotidine 20 mg IV q24h to Famotidine 20 mg IV q 48h

Pancreatic Enzyme Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Lipase Content = 4,000 Pertzye 4,000	I	Pancreaze 4	Lipase = 4,200/ Protease = 14,200/Amylase 24,600
Lipase Content = 3,000 – 6,000 Creon 3 / Creon 6			
Lipase Content = 3,000 – 5,000 Zenpep 3,000 / Zenpep 5,000			
Lipase Content = 8,000 Pertzye 8,000	I	Pancreaze 4 (2 caps)	Lipase = 8,400/ Protease = 28, 400/ Amylase 49,200
Lipase Content= 10,440 Viokace 10,440	I	Pancreaze 10	Lipase = 10,500/ Protease = 35,500/ Amylase 61,500
Lipase Content = 12,000 Creon 12			
Lipase Content = 10,000 Zenpep 10,000			
Lipase Content = 16,000 Pertzye 16,000	I	Pancreaze 16	Lipase = 16,800/ Protease = 56,800/ Amylase 98,400
Lipase Content = 15,000 Zenpep 15,000			
Lipase Content = 20,880 Viokace 20,880	I	Combo 1 Pancreaze 4(1 cap) + Pancreaze 16 (1 cap)	Combo 1 Lipase = 21,000/Protease = 71,000/Amylase 123,000

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Lipase Content = 20,000 Zenpep 20,000		OR Combo 2 Pancreaze 10 (2 caps)	OR Combo 2 (Creon 24) Lipase = 21,000/Protease = 71,000/Amylase 123,000
Lipase Content = 24,000 Creon 24 Lipase Content = 25,000 Zenpep 25,000	I	Combo 1 Pancreaze 10 (1 cap) + Pancreaze 16 (1 cap) OR Combo 2 Pancreaze 4 (1 cap) + Pancreaze 10 (2 caps)	Combo 1 Lipase = 27,300/ Protease = 92,300/ Amylase 159,900 OR Combo 2 Lipase = 25,200/ Protease = 85,200/ Amylase 147,600
Lipase Content = 36,000 Creon 36	I	Combo 1 Pancreaze 10 (2 caps) + Pancreaze 16 (1 cap) OR Combo 2 Pancreaze 4 (1 cap) + Pancreaze 10 (3 caps)	Combo 1 Lipase = 37,800/ Protease = 127,800/ Amylase 221,400 OR Combo 2 Lipase = 35,700/ Protease = 120,700/ Amylase 209,100
Lipase Content = 40,000 Zenpep 40,000	I	Combo 1 Pancreaze 10 (4 caps) OR Combo 2 Pancreaze 4 (2 caps) + Pancreaze 16 (2 caps) OR Combo 3 Pancreaze 10 (1 cap) + Pancreaze 16 (2 caps)	Combo 1 Lipase = 42,000/ Protease = 142,000/ Amylase 246,000 OR Combo 2 Lipase = 42,000/ Protease = 142,600/ Amylase 246,000 OR Combo 3 Lipase = 44,100/ Protease = 149,100/ Amylase 258,300
Lipase Content = Approx 4,000 (round if necessary) Creon 6	I	Pancreaze 4,200	Lipase = 4,200/Protease = 10,000/Amylase 17,500
Lipase Content = Approx 10,000 (round if necessary) Creon 12	I	Pancreaze 10,500	Lipase = 10,500/Protease = 25,000/Amylase 43,750
Lipase Content = Approx 16,000 (round if necessary)	I	Pancreaze 16,800	Lipase = 16,800/Protease = 40,000/Amylase 70,000
Lipase Content = Approx 20,000 (round if necessary) Creon 24	I	Combo 1 Pancreaze 4,200 (1cap) + Pancreaze 16,800 (1 cap) OR Combo 2 Pancreaze 10,500 (2 caps)	Combo 1 Lipase = 21,000/Protease = 50,000/Amylase 87,500 Combo 2 (Creon 24) Lipase = 21,000/Protease = 50,000/Amylase 87,500 Pancreaze 21,000 (We do not carry) Lipase = 21,000/Protease = 37,000/Amylase 61,000

Proton Pump Inhibitor Therapeutic Interchange

Non-Formulary Medication	Category	Therapeutic Interchange	Comments

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Dexlansoprazole (Dexilant®) 30 mg 60 mg	I	Pantoprazole (Protonix®) 20 mg same frequency 40 mg same frequency	
Esomeprazole (NexIUM®) capsules for tube administration	I	Omeprazole (Prilosec®) Suspension	Omeprazole suspension will be used for all tube administration in same daily dose due to risk of clogging tubes. For stress ulcer prophylaxis with GI tubes use Omeprazole 40mg suspension daily.
Esomeprazole (NexIUM®) 20 mg 40 mg	I	Pantoprazole (Protonix®) 20 mg same frequency 40 mg same frequency	
Esomeprazole (NexIUM®) IV 80mg bolus plus 8mg/hr for acute 8mg/hr for acute GI Bleed with endoscopic intervention	I	Pantoprazole (Protonix®) IV	
Lansoprazole (Prevacid®) 15 mg 30 mg	I	Pantoprazole (Protonix®) 20 mg same frequency 40 mg same frequency	
Omeprazole (Prilosec®) 20 mg 40 mg	I	Pantoprazole (Protonix®) 20 mg same frequency 40 mg same frequency	Omeprazole suspension will be used for all tube administration in same daily dose due to risk of clogging tubes. For stress ulcer prophylaxis with GI tubes use Omeprazole 40mg suspension daily.
Rabeprazole (Aciphex®) 20 mg 40 mg		Pantoprazole (Protonix®) 20 mg same frequency 40 mg same frequency	

Ulcerative Colitis

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Mesalamine (Apriso®) 1.5 Grams daily	I	Mesalamine (Delzicol®) 800mg BID	Maintenance of remission in ulcerative colitis in adults
Mesalamine (Asacol HD®)	I	Mesalamine (Delzicol®)	Maintenance of remission in ulcerative colitis in adults (Dose is different for active treatment)
Mesalamine (Canasa®) 1000mg daily at bedtime	I	Mesalamine (Rowasa®) Enema 4Gm/60mL bottle daily at bedtime	
Mesalamine (Lialda®) 2.4 Grams daily	I	Mesalamine (Delzicol®) 800mg BID	Maintenance of remission in ulcerative colitis in adults
Reference: Sandborn et. al. Once-daily dosing of delayed-release oral mesalamine (400-mg tablet) is as effective as twice-daily dosing for maintenance of remission of ulcerative colitis. *Gastroenterology.* 2010 Apr;138(4):1286-96. Once-daily dosing of delayed-release mesalamine at doses of 1.6-2.4 g/day was shown to be as effective as twice-daily dosing for maintenance of clinical remission in patients with UC. Available at: https://www.ncbi.nlm.nih.gov/pubmed/20064514			

IV to PO Conversions

A Pharmacist will review the Daily IV to PO Report to identify patients that are on meds that may qualify for the criteria listed below. Pharmacist will review patient profiles, read the progress notes, review current labs, and discuss with the patient's nurse to determine eligibility for the IV to PO conversion. Patients must meet at least one of the inclusion criteria and none of the exclusion criteria. If the patient meets the criteria, The Pharmacist will by P&T Committee Approval discontinue the IV or PO form and order

the appropriate PO or IV form. *The PO route <u>may include</u> feeding tube, nasogastric tube (ensure NG is not on continuous suction), G tube and other enteral routes.* A pharmacy note in the pharmacy system must be added to state the switch and rationale. Pharmacists to inform practitioners of the switch from IV to PO or PO to IV so they are aware and for any updates on GI status as a Category II.

<u>Inclusion</u>

- Patients improving clinically
- Tolerating food or enteral feeding, oral mediations
- Able to adequately absorb oral medications via the oral, gastric tube, or nasogastric tube route.
- Not displaying signs of shock, not on vasopressor blood pressure support

<u>Exclusion</u>

- NPO status
- Refuses oral medication
- Patient with the following GI conditions:
    - Active gastrointestinal (GI) bleeding
    - Dysphagia and unable to tolerate enteral meds
    - Persistent nausea and vomiting, diarrhea (e.g. >5 liquid stools/day)
    - Ileus or suspected ileus with no active bowel sounds
    - Patient is known to have a malabsorption syndrome
    - Proximal resection of small intestines
    - High nasogastric (NG) tube output or requiring continuous GI suction (>500mL/day)
    - Active gut graft versus host disease (GVHD)
    - Continuous tube feedings that cannot be interrupted and patient requires a medication known to bind to enteral nutrition formulas
- Patients with Grade III or IV mucositis
- Wernicke's encephalopathy (Thiamine)
- Myxedema coma (Levothyroxine)

IV Drug/Regimen	Oral Drug/Regimen*	Oral Bioavailability	Comments
Acetaminophen IV (Ofirmev®) (restricted only for those With strict NPO)	Acetaminophen tablet or liquid PO	85-98%	Same dose regimen and frequency. May need to adjust in multiples of 325mg. IV acetaminophen doses limited to 2 doses for PRN orders and 4 doses for scheduled orders.
Famotidine (Pepcid®) 20 mg IV daily 20 mg IV q12hrs	Famotidine (Pepcid®) tablet 20 mg PO daily 20 mg PO q12hrs	80-90%	Same dose regimen. Dose or interval may need to be adjusted for renal dysfunction
Folic Acid 1mg IV daily	Folic Acid tablet 1mg PO daily		
Levothyroxine (Synthroid®) ____ mcg dose IV daily	Levothyroxine (Synthroid®) tablet ____ mcg PO daily	70-80%	The IV dose is equivalent to 75% of the oral dose.
Metoclopramide (Reglan®) 5 – 10 mg IV q___hrs ATC or prn	Metoclopramide (Reglan®) tablet or liquid 5 – 10 mg PO q___hrs ATC or prn	80%	Same dose regimen. Dose or interval may need to be adjusted for renal dysfunction
Multivitamin-Adult not in TPN (during shortages)	Multivitamin tablet or liquid PO daily OR		

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	Thiamine 100mg & Folic Acid 1mg IV daily		
Pantoprazole (Protonix®) 40 mg IV daily 40 mg IV q12hrs	Pantoprazole (Protonix®) tablet 40 mg PO daily 40 mg PO q12hrs Omeprazole liquid (Prilosec®) 40 mg PO daily 40 mg PO q12hrs	90%	Same dose regimen.
Phenytoin ____ mg IV q____hrs	Phenytoin capsules or liquid ____ mg PO q____hrs	70-100%	Same dose regimen. Dose or interval may need to be adjusted for renal dysfunction
Thiamine 100mg IV daily	Thiamine tablet 100mg mg PO daily		Please allow 2 days of IV Thiamine prior to conversion for alcohol withdrawal.
Valproic Acid (Depakene®) ____ mg IV q____hrs	Divalproex DR same dose daily with BID or Valproic Acid liquid same daily dose, BID or TID.	90%	Same dose regimen. Dose or interval may need to be adjusted for renal dysfunction
*The PO route may include feeding tube, nasogastric tube (ensure NG is not on continuous suction), G tube and other enteral routes.			

Reference: *Competence Assessment Tools for Health-System Pharmacies, 4th Edition*

Miscellaneous

If any change in medication code, route or schedule, the pharmacist is required to enter a corresponding order into the written chart or the Electronic Health Record (EHR).

Biosimilar Medications

-*Preferred agents* should be utilized for inpatient and outpatient use. If a patient's payor requires use of a non-preferred agent, the non-preferred biosimilar may be used.

Reference Product	Category of Substitution	Therapeutic Interchange with Preferred Agent Idenitified	Comments
Avastin® - bevacizumab	II	Mvasi®- bevacizumab-awwb	
Procrit®/Epogen® - epoetin alpha	I	Retacrit®- epoetin alpa-epbx	
Neupogen® - filgrastim, Granix® -tbo-filgrastim	I	Zarxio® - filgrastim-sndz	
Remicade® -infliximab	II	*Renflexis® - infliximab-abda (preferred)* Avsola® - infliximab-axxq Inflectra® - infliximab-dyyb	As required by payer
Remicade® -infliximab	I	Unbranded infliximab	As allowed by payer
Neulasta® prefilled syringe - pegfilgrastim	II	Neulasta On-Pro®-pegfilgrastim *Fulphila® pre-filled syringe-pegfilgrastim-jmdb (preferred)* *Udenyca®pre-filled syringe – pegfilgrastim-cbqv*	*Neulasta OnPro® is the preferred delivery device. If a prefilled syringe in preferred by the patient, provider or payor, then Fulphila should be used, unless the payor requires an alternative pre-filled syringe product (e.g. Udenyca®, Neulasta®) *Pegfilgrastim is **nonformulary for inpatients**. Filgrastim should be used for inpatinets. In cases where a patient needs

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			pegfilgrastim to facilitate discharge, Fulphila® should be the product of choice for inpatients via the non-formulary pathway.
Rituxan® - rituximab	II	*Riabni® - rituximan-arrx (preferred)* Ruxience® - rituximab-pvvr	
Herceptin®- traztuzumab	II	Kanjinti®- traztuzumab-anns	

Dose changes based on pharmacy availability

- Pharmacist may automatically change of dose strengths (a) based on pharmacy availability or (b) change between sustained release dosage form and immediate release dosage form such as the below examples:
    - Fluoxetine (PROZAC) 30mg po daily and pharmacist changes product to 3 of 10mg capsule equivalent to 30mg dosage
    - Warfarin 7mg as 1.4 of 5mg tablet and pharmacist changes product to 5mg and 2mg tablet equivalent to 7mg dosage
    - Cardizem CD 180mg po daily. Patient cannot take CD or medication needs to be crushed or nurse's preference and pharmacist changes product to DiltiaZEM 60mg po q8hrs or TID (9-3-9)

Dose Rounding for Continuous Ambulatory Infusions of Oncology Medications

1. Upon receipt of new orders for chemotherapy or biotherapy, the pharmacist shall verify all calculations for dosage of agents as ordered by the MD.
2. The pharmacist shall evaluate the availability of the medications ordered. If the medication is available as a single use vial, the pharmacist shall calculate the difference in the dose ordered and the dose rounded to vial size.
3. For all single use vials of chemotherapy the pharmacist shall round the dose to a vial size (if less than ½ the next vial size) within a 10% range of the dose ordered.
4. For all single use vials of monoclonal agents, the pharmacist shall round the dose to vial size (if less than ½ the next vial size) within a 10% range of the dose ordered.
5. The provider **will not be notified for dose changes of up to 5%** for either chemotherapy or monoclonal agents.
6. The provider **will be notified for dose changes greater than 5% and up to 10%** for either chemotherapy or monoclonal agents, but the pharmacist will not require approval before proceeding.
7. Patients enrolled in a clinical trial shall be excluded from the policy (unless dose rounding is specifically allowed in the investigational protocol).
8. The pharmacist will document "Dose rounded from XXXmg to XYYmg (ZZ%) per protocol" within the Ivent and within the *Admin Instructions* and *Note to Pharmacy* sections when validating the order
9. The pharmacist will change the ordered dose to the rounded dose upon verification of the order in EPIC.
10. If the physician does not wish to have the rounding policy applied, they will document on the order "No dose rounding" in the Note to Pharmacy section of the order within the treatment plan

Duplicate Orders

- Pharmacist may delete duplicate orders of the same medication, dose, and route with varying schedules. E.g. Acetaminophen 650mg po q4hrs prn pain and Acetaminophen 650mg po q6hrs prn pain. Pharmacist can authorize to delete and add additional comment not to Exceed 4GM/day.
- Orders for the same medication with different routes are accepted but the pharmacist may delete one route if the Physician and patient's nurse agree that this route is not intended to be used for a finite period (see Therapeutic Duplications for further I). e.g. Patient is NPO, has Gastric obstruction, intubated, discuss with practitioner and patient's nurse option to delete PO until PO medications and diet are tolerated.

Interchange between liquid and solid dosage forms

- Pharmacist may automatically interchange between liquid and solid forms and route (if necessary). E.g. Patient is receiving medication and/or feedings via NG,OG,PEG ; Pharmacist after discussion with patient's nurse will switch from oral to liquid form (if available).
- For phenytoin, pharmacist to consult with the practitioner.

Now and Routine Orders

- Pharmacist may automatically change now and routine priority medication orders that might result in the patient receiving 2 unintended doses within a short period of time. e.g. Practitioner changes order of Metoprolol 50mg daily to 50mg PO BID as a priority of now and routine if within several hours of next scheduled dose routine with intent of increasing to 2 doses per day – RPh changes priority to routine.

Patient Weight

- The Pharmacist has authorization from the Pharmacy and Therapeutics Committee to do the following to place an order under a P&T order to weigh a patient. This will be for patients that are on weight based medications and their care may be impacted if an incorrect weight is used.
- If a discrepancy is noticed between PCD and patient factors with a weight difference of 10% (either plus or minus), a pharmacist can adjust patient factors accordingly.
- Weights will only be recorded in kilogram (kg) to prevent medication related errors.

Therapeutic Duplications

- Duplicate orders for the same indication are only appropriate if clear instructions around the circumstances each order applies to are indicated by the ordering practitioner. Any duplicative order without clear distinction will be assessed and addressed by the reviewing pharmacist.
- Any parenteral (IV, IM, SQ) or rectal (PR) medication ordered as needed (PRN), will have direction added by pharmacist to "use when unable to tolerate oral" if another order for an oral alternative is ordered for the same as needed indication.
    - Order written for *Ondansetron 4mg IV q8h prn Nausea/vomiting* with an existing *Ondansetron 4mg PO q8h prn Nausea/vomiting.* Pharmacist to clarify in the comment field of the IV order: *Ondansetron 4mg IV q8h prn Nausea/vomiting, use when unable to tolerate oral*
    - Order written for *Oxycodone 5mg PO q4h prn pain scale 4-7* with *an existing Hydromorphone 0.4mg IV q4h prn pain scale 4-7.* Pharmacist to clarify in the comment field: *Hydromorphone 0.4mg IV q4h prn pain scale 4-7, use when unable to tolerate oral*
- Any order for a parenteral (IV, IM, SQ) as needed (i.e., PRN) opioid will be discontinued when a subsequent order for a parenteral PRN opioid is placed unless there is clear criteria included on the order for when to administer one opioid over the other (e.g. breakthrough pain).
    - Order written for *HYDROmorphone (Dilaudid®) 0.5 mg IV q4h PRN pain 8-10 ordered on a patient with an existing order for Morphine 2 mg IV q4h PRN pain 8-10*. Pharmacist will discontinue the existing Morphine order and validated the new HYDROmorphone (Dilaudid®) order.
- Any order for a short-acting PRN oral opioid will be discontinued when a subsequent order for a short-acting oral PRN opioid is placed unless there is clear criteria included on the order for when to administer one opioid over the other (e.g. breakthrough pain).
    - Order written for *Oxycodone Immediate Release (IR) 5 mg PO q4h prn pain 8-10 ordered on a patient with an existing order for Tramadol (Ultram) 50 mg PO q4h prn pain 8-10*. Pharmacist will discontinue the existing Tramadol order and validate the new Oxycodone order.
- Any orders for parenteral or oral as needed (i.e. PRN) opioids will discontinued when a subsequent order for a PCA or epidural is placed unless a clear indication that both can be administered concurrently via an order clarified with the provider.
- Any orders for parenteral or oral as needed (i.e. PRN) opioids will be left unvalidated if ordered at the same time as a PCA or epidural unless a clear indication that both can be administered concurrently via an order clarified with the provider. Upon PCA or epidural discontinuation, parenteral or oral as needed opioids will be validated.
- Any orders with overlapping pain scales ordered at the same time will be clarified that the higher dose of medication is clarified to the higher pain scale as long as no medication is indicated for that pain scale.
    - Orders written for *Oxycodone Immediate Release 2.5mg PO q4h prn pain 4-7 and Oxycodone Immediate Release 5mg PO q4h prn pain 4-7.* Pharmacist will adjust the *Oxycodone Immediate Release 5mg PO q4hr prn pain 4-7 to a pain scale of 8-10 upon validation.*
- Any orders with pain scales of 1-3 or 4-7 and no order or information that include the higher pain scales will be clarified to include the higher pain scale as long as no medication is indicated for that pain scale.
    - Order written for *Tramadol 50mg PO q4hr prn pain 4-7*. Pharmacist will adjust the Tramadol 50mg PO q4hr prn pain 4-7 to a pain scale of 4-10 upon validation.

- Any orders with overlapping constipation medication orders for Milk of Magnesium (MOM) (onset of action can be between 30 minutes to 6 hours), Bisacodyl 10mg rectally (onset of action is approximately 60 minutes) and Fleet Enema PR will be clarified by the pharmacist to add the comments on sequence of usage as written in the following order:
    - MOM 30mL po qday prn constipation will be administered first in sequence if ordered with comments "*Administer first*". It should be noted that Patients in severe renal failure should not receive magnesium due to toxicity from accumulation. Patients with a CrCl<30mL/minute receiving magnesium should be monitored by serum magnesium levels.
    - Bisacodyl 10mg rectally will be administered second in sequence if ordered with comments If MOM ordered: "*Administer second if no response from MOM > 6 hours*". If MOM not ordered, "*Administer first*"
    - Fleet enema will be administered last in any sequence of these two or three and noted by the pharmacist as such in the comments "*Administer last if no response from Bisacodyl PR for > 60 minutes*"

Ophthalmic Agents (non-antimicrobial)

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Apraclonidine (Iopidine®) 0.5%, 1%	I	Brimonidine (Alphagan®) 0.15%	
Artificial Tears	I	Refresh	
Artificial Tears Preservative FREE	I	Tears Natural Free	
Betaxolol (Betoptic®) 0.25%, 0.5%	I	Timolol 0.5%	
Bimatoprost (Lumigan®) 1 drop in the affected eye(s) once daily at HS	I	Latanoprost (Xalatan) 1 drop in the affected eye(s) once daily at HS	
Brimonidine (Alphagan) 0.2%	I	Brimonidine (Alphagan) 0.15%	
Brimonidine 0.2%/Timolol 0.5% (Combigan®)	I	Order Brimonidine 0.15% and Timolol 0.5% separately	
Brinzolamide (Azopt®) 1%	I	Dorzolamide (Trusopt) 2%	
Brinzolamide 1%/Brimonidine 0.2% (Simbrinza®)	I	Order Dorzolamide 2% and Brimonidine 0.15% separately	
Carbachol 1.5%, 3%	I	Pilocarpine 1%, 2%	
Carbachol (Miostat®) 0.01%	I	No change	
Cyclopentolate (Cyclogyl®, AK-Pentolate®) 0.5%, 1%, 2%	I	No change	
Dexamethasone Suspension	I	Dexamethasone 0.1% drops	
Diclofenac (Voltaren®) 0.1%	I	Flurbiprofen (Ocufen®) 0.03%	
Dorzolamide/Timolol (Cosopt®)	I	Order Dorzolamide 2% and Timolol 0.5% separately	
Homatropine 2%, 5% only for procedures (Homatropaire®, Isopto Homatropine®)	I	No change	
Ketorolac (Acular®) 0.4%	I	No change	
Latanoprost (Xalatan®)	I	No change	
Levobunolol (Betagan®) 0.25%, 0.5%	I	Timolol 0.5%	
Phenylephrine 2.5% drops refrigerated	I	Phenylephrine (Ak-Dilate®) non-refrigerated	
Pilocarpine (Isopto Carpine®) 1%, 2%	I	No change	
PrednisoLONE 0.12%	I	PrednisoLONE 1%	
Rimexolone 1%	I	PrednisoLONE 1%	
Scopolamine 0.25%	I	Tropicamide (Mydriacyl®) 0.5%, 1%	
Timolol 0.25%	I	Timolol 0.5%	

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Timolol gel suspension (Timoptic XE®) 0.25%, 0.5% Daily dosing	I	Timolol 0.5% BID dosing	
Tafluprost (Zioptan®)	I	Latanoprost (Xalatan®)	
Travoprost (Travatan®) 1 drop in the affected eye(s) once daily at HS	I	Latanoprost (Xalatan®) 1 drop in the affected eye(s) once daily at HS	
Tropicamide (Mydriacyl®, Tropicacyl®) 0.5%, 1%	I	No change	

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Supplements

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Calcium Products	I	Calcium Carbonate (TUMS) 500mg *(Elemental Calcium 200mg)* Calcium Carbonate (OSCAL) 1250mg *(Elemental Calcium 500mg*) Oyster Shell Calcium (OSCAL 500 + D) Calcium Carbonate 1250mg *(Elemental Calcium 500mg*) with Vitamin D 200 units Calcium Carbonate Suspension 1250mg/5ml *(Elemental Calcium 500mg/5ml*)	Calcium Citrate (without Vitamin D) is also available for those on a proton pump inhibitor (PPI). 500 mg calcium citrate = 105 mg of elemental calcium. 500 mg calcium carbonate = 200 mg elemental calcium. Reference: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4525469/pdf/nihms411803.pdf
Fat Emulsion 20% (TPN)	I	Fat Emulsion 20% (TPN) Flow rate of 20mL/hr to ensure infusion duration is ≤ 12hrs	Exception is PPN (peripheral parenteral nutrition)
Multivitamin PO	I	Multivitamin PO	Therapeutic Multivitamin: NDC 00904-0539-61 Vitamin A 5000 IU, Vitamin C 90mg, Vitamin D 400 IU, Vitamin E 30IU, Thiamine 3mg, Riboflavin 3.4mg, Niacin 20mg, Vitamin B-6 3mg, Folate 400mcg, Vitamin B-12 9mcg, Biotin 30mcg Pantothenic Acid 10mg, Calcium 66mg, Multivitamin Tablet: NDC # 00904-0530-61 Vitamin A 5000IU, Vitamin C 60mg, Vitamin D 400iu, Vitamin E 30IU, Thiamine 1.5mg, Riboflavin 1.7mg, Niacin 20mg, Vitamin B-6 2mg, Folate 400mcg, Vitamin B-12 6mcg, Pantothenic Acid 10mg Multivitamin Liquid: NDC # 50383-0683-04 per

			5mls Vitamin A 5000IU, Vitamin C 200mg, Vitamin D 400IU, Thiamine 10mg, Riboflavin 10mg, Niacin 100mg, Vitamin B-6 4.1mg, Vitamin B-12 5mcg, Pantothenic Acid 21.4mg

Topical Agents

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Anusol	I	Dibucaine Ointment	Dispense at equivalent dose
Eucerin® Lotion	I	Lubriderm® Unscented Lotion	Check generic products for fragrance; unscented products only for oncology and radiation oncology patients. Cream version of Eucerin is still on formulary.

Lidocaine Topical Patches

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Lidocaine 5% patch	I	Lidocaine 4% patch	Utilize 4% patch in place of 5% patch with same instructions.

Topical Corticosteroids Therapeutic Interchange

The potency of a topical corticosteroid depends on the formulation. Potency is also increased when a formulation is used under occlusive dressing or intertriginous areas. In general, ointments are more potent than creams or lotions. Steroids are absorbed at different rates from different parts of the body. A steroid that works on the face may not work on the palm but a potent steroid may cause side effects on the face. It should be noted:

- Forearm absorbs 1%
- Armpit absorbs 4%
- Face absorbs 7%
- Eyelids and genitals absorb 30%
- Palm absorbs 0.1%
- Sole absorbs 0.05%

The below table details our formulary medication and a category I substitution to the appropriate formulation (e.g.cream or ointment) if a non-formulary product is ordered.

Group	**Formulary Medication for this Group**	**Non-Formulary Medication**
I Ultra High	Clobetasol propionate cream 15Gm, ointment 15Gm, solution 0.05% 50mL (Temovate®)	• Augmented Betamethasone dipropionate 0.05% Gel, Ointment (Diprolene®) • Clobetasol propionate 0.05% Gel, Foam (Olux®, Clobex®) • Diflorasone diacetate 0.05% Ointment (Psorcon®) • Fluocinonide 0.1% Cream (Vanos®) • Halobetasol propionate 0.05% Cream, Ointment 50Gm (Ultravate®)
II High	Fluocinonide 0.05% Cream, Ointment 15Gm (Lidex®)	• Amcinonide 0.1% Ointment (Cyclocort®) • Augmented Betamethasone dipropionate 0.05% Cream (Diprolene®) • Betamethasone dipropionate 0.05% Ointment 15Gm (Diprosone®) • Desoximetasone 0.25% Cream Ointment, 0.05% Gel(Topicort®)

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		• Diflorasone diacetate 0.05% (Apexicon®) • Fluocinonide 0.05% Cream 60Gm, Ointment 60Gm, Gel 60Gm, Solution 60mL (Lidex®) • Halcinonide 0.1% Cream (Halog®) • Mometasone furoate 0.1% Ointment 15Gm (Elocon®) • Triamcinolone 0.5% Ointment (Cinalog®)
III Upper Mid-Strength	Triamcinolone acetonide 0.5% Cream 15Gm (Kenalog®) Betamethasone valerate 0.1% 45Gm Ointment (Beta-Val®)	• Amcinonide 0.1% Cream (Cyclocort®) • Betamethasone dipropionate 0.05% Cream 15Gm (Diprosone®) • Desoximetasone 0.05% Cream (Topicort®) • Diflorasone diacetate 0.05% cream (Florone®) • Flucinonide emulsified based 0.05% Cream 60Gm (Lidex-E®) • Flurandrenolide 0.05% Cream, Lotion (Cordran®) • Fluticasone propionate 0.005% Ointment (Cutivate®) • Halcinonide 0.1% Ointment, Solution (Halog®) • Prednicarbate 0.1% Cream, Ointment (Dermatop®)
IV Moderate	Triamcinolone acetonide 0.1% Cream 15Gm-80Gm, Ointment 15Gm-80Gm (Kenalog®) Mometasone 0.1% Cream (Elocon®)	• Fluocinolone acetonide 0.025% Ointment (Synalar®) • Flurandrenolide 0.05% Ointment (Cordran®) • Triamcinolone acetonide 0.1% Cream 454Gm (Kenalog®)
V Lower Mid-Strength	Triamcinolone acetonide 0.025% Ointment 15Gm, 80Gm (Kenalog®) Betamethasone valerate 0.1% Cream 45Gm (Luxiq®)	• Bethamethasone valerate 0.1% Cream 15Gm Foam (Beta-Val®, Luxiq®) • Fluocinolone acetonide 0.025% Cream (Synalar®) • Fluticasone propionate 0.05% Cream, Lotion (Cutivate®) • Hydrocortisone butyrate 0.1% Cream, Ointment, Solution (Locoid®) • Hydrocortisone valerate 0.2% Cream, Ointment (Westcort®) • Triamcinolone acetonide 0.1% Lotion 60mL (Kenalog®)
VI Low Potency	Triamcinolone acetonide 0.025% Cream 15Gm, 80Gm, Lotion 60mL (Kenalog®)	• Alclometasone dipropionate 0.05% Cream, Ointment (Aclovate®) • Bethamethasone valerate Lotion (Beta-Val®, Luxiq®) • Desonide 0.05% Gel, Ointment, Cream, Lotion, Foam (Desowen®, Desonate®, Lokara®, Verdeso®) • Fluocinolone 0.01% Cream, Lotion, Solution (Synlar®) • Hydrocortisone butyrate 0.1% (Locoid®)
VII Least Potent	Hydrocortisone 1% Ointment 30Gm, 454Gm, 2.5% cream 30Gm Hydocortisone acetate1% and Pramoxine 1% (Epifoam®)	• Hydrocortisone 1%, 2.5% Lotion • Hydrocortisone 0.5% Cream 30Gm (CCMC) • Hydrocortisone 1% Cream 30Gm, 454Gm (CCMC)
Reference: Ference JD, Last AR. Choosing Topical Corticosteroids. *Am Fam Physician.* 2009 Jan 15;79(2):135-140. Comparison of Topical Corticosteroid Pharmacist's Letter September 2012		

Unclassified Medications

Non-Formulary Medication	Category	Therapeutic Interchange	Comments
Alteplase (Activase®)	I	Alteplase (Activase®)	A standardized procedure should be used to ensure delivery of the full dose of alteplase, including the volume in the IV tubing. At UConn John Dempsey Hospital, a 50 mL of 0.9% Sodium Chloride is infused through the alteplase infusion set when the alteplase vial is empty. Additionally, regulatory bodies require a written order be available to hang the 50mL 0.9% sodium chloride.

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			After mixing an order for alteplase for the indication of stroke, the pharmacist will enter a 50mL 0.9% sodium chloride one time order in LCR to infuse any remaining alteplase in the line. This order will be placed in LCR, if not yet done by the provider, per the Pharmacy and Therapeutics committee. The order will be for 0.9% Sodium Chloride ONCE in LCR using the Alteplase Order entry, with Rate of 0.81 mL/kg/hr, max rate of 81 mL/hr, and additional directions to "Infuse at same rate as TPA infusion to flush all TPA through IV"
Risedronate (Actonel®) 5mg daily 35mg weekly	I	Alendronate (Fosamax®) 10mg daily 70mg weekly	
Alfuzosin (Uroxatral®) 10mg PO daily	I	Tamsulosin (Flomax®) 0.4mg PO daily	
Defarasirox (Exjade®) 250 mg PO daily 500 mg PO daily	I	Defarasirox (Jadenu®) 180 mg PO daily 360 mg PO daily	The dose of Jadenu® should be about 30% lower, rounded to the nearest whole tablet
Filgrastim (Neupogen®) 1 mcg	I	tbo-Filgrastim (Granix®) 1 mcg	This is only for inpatient substitution and excludes NICU
Oxymetazoline (Afrin®) Orders lasting more than 3 days	I	Oxymetazoline (Afrin®) Clarification order will be written such that order will not exceed 3 days duration.	
Potassium Oral Doses > 40meq per dose	I	Potassium 40meq per oral dose at 2 hour intervals (excluding maintenance dosing)	Packets are preferred for faster absorption when replacing potassium. Maximum dose of 40meq oral.

Appendix I: Cockcroft-Gault (C-G) equation for estimation of renal function

[(140-age) X Actual Body Weight (kg) / (Serum Cr X 72)] = Creatinine Clearance (mL/min)
***multiply the result by 0.85 for females
Additional Adjustments to the C-G equation:

- If actual weight is < IBW, use actual weight
- If actual weight is > IBW but < 120% of IBW, use IBW
- If actual weight is ≥ 120% IBW, use Adj BW
- For patients ≥ 65 years with SCr < 0.8 mg/dL, round SCr to 0.8 mg/dL.

Additional Notes & Considerations about C-G equation:

- Serum creatinine or estimated creatinine clearance may be misleading indicators of renal function in certain situations.
- Calculated clearances may be inaccurate in patients with chronic kidney disease, obesity, volume overload, diabetes, low creatinine, hypoalbuminemia, hypermetabolic conditions, advanced age, decreased muscle mass (as seen in cirrhotics or debilitation).
- Renal function may be overestimated in situations associated with rapidly rising serum creatinines, which includes all cases of acute kidney injury such as: hepato-renal syndrome, ischemic injury, or drug induced nephrotoxicity.
- It can also be underestimated in periods of rapidly falling serum creatinine, such as is seen after renal transplant or rehydration in patients with acute renal insufficiency due solely to severe dehydration.

Appendix II: Ideal Body Weight (IBW) calculation

IBW_{males} = 50 kg + 2.3*(inches of height above 5 feet)
$IBW_{females}$ = 45 kg + 2.3*(inches of height above 5 feet)

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