Harper Hospital
Detroit Medical Center / Wayne State University

5WN/8WN
Oncology

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Process Improvement Plan
5WN & 8WN
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Services:

5WN:

- medical oncology service A
  (managed by attending oncologist + fellow + residents)
- medical oncology service B (managed by physician extenders)
- malignant hematology including leukemia, lymphoma, multiple myeloma, MDS, aplastic anemia (managed by attending hematologist + fellow + residents)
- benign hematology including sickle cell disease, idiopathic thrombocytopenia (ITP), TTP (managed by attending hematologist + residents)
- hospice (Dr. Stellini, Dr. Amouzegar)
- private physicians – Dr. Curry, Dr. Fregene, Dr. Vaughn

8WN:

- GU-ONC
- GYN-ONC (5548#)
- Above services listed on 5WN

Pharmacokinetics:

- Level order: please write "IVDT to draw, fax transmittal to IVDT".

Anticoagulation:

- Prefer LMWH for long-term anticoagulation management if OP Rx covers or qualified for Lovenox assistance program. Avoid any SC routes as possible when plt <20k
- Monitor closely warfarin drug interactions with some chemotherapeutic agents (5-FU, capecitabine, gemcitabine, etoposide, carboplatin, interferon, antiandrogen, tamoxifen, gleevec) beside other drugs.
- Warfarin dosing on GYN-ONC patients should be cautious, especially in patients s/p post-op or with existing vaginal bleeding. This also applies to any other oncology patients with existing bleeding problems.
- Very low dose warfarin prophylaxis for line-related thrombosis (1mg qd for most patients)– no need to follow

Chemotherapy:

- All chemotherapy must be written on the chemotherapy order form and signed off by the attending physicians. Pay more attention to the oral agents (such as capecitabine, hydroxyurea, imatinib). Please get the stop date of capecitabine to avoid potential overdosing.

- Biochemotherapy protocol: cipro 250 mg po bid, Indocin 25 mg po q8h, meperidine, dopamine drip, sodium bicarb, H2-blocker or PPI, Lomotil, etc. monitor renal function and adjust dosing.
- High dose MTX treatment: continue leucovorin and urine alkalization until MTX < 0.02 umol/L
- Ifosfamide treatment: must have mesna order.
- Malignant hematology patients should be on allopurinol 300-600mg po daily starting before or during the chemotherapy especially when pretreatment uric acid is greater than 7mg/dl or patients with bulky tumor.
- Malignant hematology patients (AML, aggressive lymphoma) should be on selective GI decontamination regimen during and after chemotherapy until neutrophil count is recovered. The regimen include norfloxacin 400mg po q12hr, fluconazole 100mg po daily, acyclovir 400mg po q12h if history of HSV infection.

Emesis management:

Drug	Antiemetic Activity	Traditional Dosing	Common Adverse Effects	Comments
Granisetron (Kytril®) $$$$$$ - 1 mg IV $$$$ - 2 mg PO $$$ - 1 mg PO	*5*	*1 – 2 mg PO, 1 mg IV*	*Headache, constipation, diarrhea, abdominal pain*	*Used for prevention of CINV or RINV*
Dolasetron (Anzemet®) $$$ - 12.5 mg IV	*5*	*12.5 – 100 mg IV*	*Headache, constipation, diarrhea, abdominal pain*	*12.5 mg IV for PONV can cause QT prolongation at higher dose*
Metoclopramide (Reglan®) $ - 20 mg IV, PO	4	20 – 30 mg PO, IV Q4-6H for treatment of emesis	Drowsiness, restlessness, headache, extrapyramidal effects, skin rash	Contraindicated in GI obstruction
Droperidol (Inapsine®) $ - 2.5 mg IV	3	0.625 – 2.5 mg IV, IM Q4-6H (Max: 10 mg/day)	Drowsiness, extrapyramidal effects	Use with caution in cardiac patients, hepatic or seizure disorders, *potential for serious and fatal QT prolongation*

Dexamethasone (Decadron®) $$ - 10 mg IV $ - 8 mg PO	3	4 – 10 mg IV Q6H 4 – 8 mg PO Q4-6H	Fluid retention, weight gain, restlessness, anxiety, mood changes, sweating	Used in combination with other antiemetic agents
Lorazepam (Ativan®) $$ - 2 mg IV $ - 2 mg PO	2	1 – 2 mg PO, IV Q4-6H	Drowsiness, dizziness, clumsiness, or trouble concentrating	Used for anticipatory emesis
Prochlorperazine (Compazine®) $$$ - 10 mg IV $ - 10 mg PO	2	10 mg PO, IV Q4-6H 25 mg PR Q4-6H	Drowsiness, restlessness, headache, extrapyramidal effects, skin rash	Use with caution in cardiac patients, hepatic or seizure disorders.
Promethazine (Phenergan®) $ - 25 mg IV, PO	2	25 mg PO, PR, IM, IV Q6H	Drowsiness, dry mouth or throat, restlessness	IV rate no faster than 25 mg/min
Trimethobenzamide (Tigan®) $$ - 200 mg IM $ - 250 mg PO	1	300 mg PO Q6H 200 mg IM, PR Q6H DO NOT GIVE IV PUSH	Blurred vision, dizziness, headache	Suppository is non-formulary

$ - ≤ 1.00, $$ - 1.01-5.00, $$$ - 5.01-10.00, $$$$ - 10.01 – 20.00, $$$$$ - 20.01 – 40.00, $$$$$$ - 40.01 – 100.00

Febrile Neutropenia:

- Monotherapy: cefepime 2 g q8h. consider aztreonam for patients with PCN allergy
- Add vancomycin if suspected line infection
- Neutropenic colitis or typhlitis: Zosyn or imipenem + metronidazole, consult ID immediately
- Some malignant hematology patients should be on fluconazole 100mg po qd for fungal infection prophylaxis and acyclovir 400mg po bid if patients have a history of HSV infection.
- G-CSF use is not indicated

G-CSF Use:

- G-CSF standing order form must be filled out. Check absolute neutrophil count (ANC) daily and discontinue filgrastim per automatic discontinuation
- GCSF dosing is 5mcg/kg (prefer to round the dose to either 300mcg or 480mcg)
- Pegfilgrastim (restricted to outpatient) is not allowed.

Bisphosphonate Use Guidelines

Indication: Bone metastases from solid tumors and multiple myeloma at outpatient

Pre-existing renal insufficiency and multiple cycles of zoledronic acid are risk factors for subsequent renal deterioration. Serum creatinine must be measured within 7 days before each zoledronic acid dose.

Dose should be withheld for the following (Exception - ESRD patient on hemodialysis):

1. Severe renal impairment: serum creatinine ≥ 3mg/dL
2. Renal deterioration from zoledronic acid use defined as follows:
    - ♦ for patients with normal baseline creatinine, increase of 0.5 mg/dL
    - ♦ for patients with abnormal baseline creatinine, increase of 1.0 mg/dL

Dose should be adjusted per creatinine clearance (CrCl):

Creatinine Clearance (ml/min)	Zoledronic acid dose (mg)
> 60	4.0
50 – 60	3.5
40 – 49	3.3
30 – 39	3.0

Pre-printed order form MUST be utilized and each order is only valid for 3 months. Pharmacist may adjust dose according to patient's renal function (CrCl) and rewrite the order per Hematology/Oncology Pharmacy & Therapeutics Subcommittee.

Indication: Hypercalcemia

- ♦ Hydration (200-500 ml/hr, depending on the cardiovascular and renal status of the patient)
- ♦ Serum creatinine must be measured within 1-2 day prior to zoledronic acid or pamidronate dose. The dose should not be repeated within 6 days.

	Zoledronic acid (recommended outpatient med)	Pamidronate (recommended inpatient med)
Dose	Corrected Ca^{2+} ≥ 12mg/dL = 4mg	Corrected Ca^{2+}: 12-13 mg/dL = 60-90mg IV Corrected Ca^{2+} > 13 mg/dL = 90 mg IV
Dose adjustments per renal function	See above table No dose if serum creatinine ≥ 3mg/dL	No dose if serum creatinine ≥ 3mg/dL
Infusion time	15 minutes	2-24 hours
Cost	$759.50	60mg = $128.00

		90mg = $192.00

In patients with Serum creatinine ≥ 3mg/dL, recommend calcitonin 4 units/kg IM or subQ q12 hours x 2-4 doses, and then reassess renal function and calcium level. Please round dose to nearest vial size (400 unit/2ml vial). Exception: ESRD patient on hemodialysis

Anemia

- Darbepoetin 100mcg SC QWK
- Please D/C erythropoietin agent if Hg >12 mg/dL

Hyperuricemia

- Rasburicase guidelines:
  Uric Acid ≥ 8 mg/dL in patients with bulky tumor (↑WBC ≥50K or ↑LDH ≥500) receiving chemotherapy
  May order one dose of rasburicase, if
  - Can not take allopurinol OR
  - Failed allopurinol OR
  - Renal impairment

  Check uric acid level daily, and redose rasburicase per uric acid level

  Dosing:
  - 0.15 mg/kg/day IV over 30 minutes, use adjusted body weight for obese patients; please round the dose to the nearest vial size as possible (vial size – 1.5 mg; cost - $300.00)
  - dosage adjustment are not necessary in patients with renal or hepatic impairment

  Checking uric acid level:
  - May check uric acid level 12 hours after rasburicase dose
  - Blood samples must be kept in an ice bath and assayed within 4 hours of collection

  The lower limit of sensitivity of uric acid assay is 0.5 mg/dL

Sickle Cell Pain Episode-DMC Clinical Pathway

The clinical pathway and pre-printed physician order sheet are available on 5WN and 8WN. The order form is utilized on every patient.

- **Pneumonia**
  Follow DMC CAP pathway. However most patients have poor venous/vascular access, azithromycin is the preferred agent over erythromycin.

- **Pain Management:**
  PCA is utilized all the time in conjunction with oral pain medication if patients tolerate oral route.
  Available PCAs

Morphine PCA:	1mg/ml
	5mg/ml
	10mg/ml
	25mg/ml
	50mg/ml
hydromorphone PCA:	1mg/ml
	4mg/ml
Fentanyl PCA	50mcg/ml
Codeine PCA:	30mg/ml

Equianalgesic Chart of Opioids

Drug	Parenteral (mg)	oral (mg)	Interval (hr)	Comments
Morphine (IR) (Roxanol®)	10	30-60	3-4	60 mg for single dose or intermittent dosing; 30 mg with chronic dosing on a fixed schedule.
Morphine (SR) (MS Contin®; Oramorph SR®; Kadian®)	-	30	8-12	Kadian® is qd dosing
Morphine ER liposome injection (DepoDur)				Indicated for epidural administration at the lumbar levels prior to surgery (no need of catheter). One dose good for 48hrs
Codeine	130	200	3-4	for mild to moderate pain; for combination products, do not exceed 4grams/day acetaminophen or 5.4 grams/day of aspirin.
Fentanyl (Sublimaze®) (Duragesic®) (Actiq®)	0.1	-	1 72 q15min	IV form has a rapid onset and short duration patch 25-50 mcg/hr Q72hr is equivalent to 45mg morphine SR q12hr and has 12-16 hour delay in onset/off patch; breakthrough pain meds should be provided. used in patients tolerating $\geq$ 50 mcg/hr patch or 60mg/d morphine po; titrate up dose if no pain relief after 2 doses
Hydrocodone (Lorcet®; Lortab®;	-	30	3-4	see codeine Vicoprofen®(hydrocodone 7.5mg + ibuprofen 200mg)

Vicodin®)				
Hydromorphone (Dilaudid®)	1.5	7.5	3-4	shorter duration than morphine
Levorphanol (Levo-Dromoran®)	2	4	6-8	risk of CNS depression with repeated use and accumulation in elderly or persons with impaired renal function with regular dosing because of long half life.
Meperidine (Demerol®)	75	300	2-3	normeperidine causes CNS excitation; avoid in patients with impaired renal function or who are taking MAOI; avoid chronic use
Methadone (Dolophine®)	10	20	6-8	see levorphanol
Oxycodone(IR) (Roxicodone®; Percocet®; OxyIR®; Percodan®)	-	20-30	3-4	see codeine
Oxycodone (SR) (OxyContin®)	-	20-30	8-12	
Oxymorphone (Numorphan®)	1		3-4	cause more N/V and euphoria
Propoxyphene (Darvon®)				weak analgesic effect norpropoxyphene may cause seizures
Tramadol (Ultram®)			6	weak μ-opioid agonist; increased risk of seizures at dose ≥ 400mg/d

* Equianalgesic doses are approximate. Individual patient response must be observed. Doses and intervals are titrated according to the patient's response.

** When converting from one narcotic to another, initiate the new narcotic @ ~ 70% of the calculated dose. This will prevent potential overdosing due to 70% cross-tolerance to the new narcotic.

Available Oral Narcotic Medications

DRUG	STRENGTH	FORM	COLOR	INTERVAL
MSContin/Oramorph	15 mg	TAB	BLUE/WHITE	Q8-12H
	30 mg	TAB	VIOLET/WHITE	
	60 mg	TAB	ORANGE/WHITE	
	100 mg	TAB	GRAY/WHITE	
	200 mg	TAB	GREEN	
MORPHINE IR	15 mg	TAB	WHITE	Q2-4H
	30 mg	TAB	WHITE	
	20 mg /ml	SOLN		
OXYCONTIN	10 mg	TAB	WHITE	Q8-12H
	20 mg	TAB	PINK	
	40 mg	TAB	YELLOW	
	80 mg	TAB	GREEN	
OXYCONDONE IR	5 mg	TAB	WHITE	Q2-4H
	15 mg	TAB	WHITE	
	30 mg	TAB	WHITE	
	20mg/ml	SOLN		
HYDROMORPHONE	1 mg	TAB	GREEN	Q1-4H
	2 mg	TAB	ORANGE	
	4 mg	TAB	YELLOW	