Pharmacy and Therapeutics Committee Approvals, August 2014

P&T Date: August 5, 2014

AGENDA ITEM	P&T COMMITTEE DECISION	COMMENTS
Inco-botulinumtoxinA (Xeomin®)	• *Added* IncobotulinumtoxinA (Xeomin®) to formulary for use in ***outpatient*** areas	Indication: treatment of cervical dystonia, blepharospasm, moderate to severe rhytide of glabellar skin, and post-stroke upper limb spasticity. Usual dose range: – Cervical dystonia: 120 units (initial dose) – Blepharospasm: 1.25-2.5 units/injection site to maximum total dose of 70 units – Rhytide of glabellar skin: 4 units to each of 5 sites – Upper limb spasticity: up to 400 units (maximum) – Note: the potency units of botulinum toxin products are not interchangeable Adverse effects: most common: injection site pain, diarrhea, dysphagia, xerostomia, muscle weakness, musculoskeletal pain, headache, dry eyes, ptosis of eyelid, visual impairment, dyspnea, nasopharyngitis, respiratory tract infection Contraindications: hypersensitivity to botulinum toxin A or any other component of Xeomin® (human albumin, sucrose) Precautions: Pregnancy category C. Distant spread of toxin effects may lead to serious adverse effects hours to weeks after injection
Other Formulary Changes	The following were added to formulary • Paroex® (alcohol free) Chlorhexidine Gluconate 0.12% Oral Rinse will be the preferred agent for mucositis • Clopidogrel (Plavix®) 300mg • Bovine hyaluronidase (Amphadase®) The following were removed from formulary • Atazanavir (Reyataz®) 100 mg & 150 mg capsules – removed due to rarity of use/ no longer available. Maintain 200 mg and 300 mg capsules on formulary • Norfloxacin (Noroxin®) tablets – no longer available • Ovine hyaluronidase (Vitrase®)	
Tramadol (Ultram®) Schedule Change	Tramadol has been used as a substitute for other opioids. Due to an increase in abuse of tramadol products over the last few years, the DEA recently placed tramadol (Ultram®) into Schedule IV of the Controlled Substances Act. Tramadol tablets will be managed as a controlled substance throughout the Medical Center, meaning: – Tramadol tablets will be kept locked and secured at all times in Pyxis® or in locked narcotic drawers/cabinets/boxes – For areas where tramadol tablets are not available in Pyxis, they will be dispensed and tracked on a Controlled Medication Disposition Record (CMDR) form – Discharge prescriptions for tramadol must be written on secure paper or called in to a Pharmacist before the medication may be dispensed	
Ranitidine for injection shortage	In an effort to preserve remaining ranitidine injection supplies for pediatric uses, CPR trays, and anaphylaxis kits, Pharmacists will automatically substitute orders as follows: – Ranitidine 50 mg IVP Q8-24 hrs **TO** Pantoprazole 40 mg IVP daily in patients who cannot tolerate PO	

<table>
<tr><td>Heparin/ Enoxaparin Protocol Revision</td><td>

Heparin/enoxaparin protocol revision:
Change “Continue LMWH/heparin until INR is therapeutic (≥ 2) and a total of 5 days of overlap therapy have been completed”
<u>TO</u>
“Continue LMWH/heparin until INR is therapeutic (≥ 2 x 2 consecutive days) and a total of 5 days of overlap therapy have been completed”

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<tr><td>Regional Anesthesia and Minimum Timing of Antithrombotic Agents Physician Guideline - Update</td><td>Revised to include information for apixiban (Eliquis®):
<table>
<tr><th>Anticoagulant/ Antiplatelet/ Thrombolytic Agent</th><th>Timing of Last Dose → Insertion of Spinal Needle or Placement of Epidural Catheter</th><th>Restarting Medication after Placement (post-op)</th><th>Timing of Last Dose → Removal of the Epidural Catheter</th><th>Removal of the Epidural Catheter → First Dose</th></tr>
<tr><td colspan="5"><u>THERAPEUTIC</u> DOSES of Anticoagulant Agents (<u>NOT</u> prophylaxis)</td></tr>
<tr><td>Apixiban (Eliquis®) 2.5 - 5mg PO twice daily</td><td colspan="2">No information available; Avoid in setting of neuraxial anesthesia (spinal injection or epidural catheter)</td><td>≥24 hours</td><td>≥ 5 hours</td></tr>
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<tr><td>Pre-procedural Medication Assessment Guideline</td><td>Perioperative Management Guide v</td></tr>
<tr><td>Guidelines</td><td>The following were approved:

Tumor Lysis Syndrome (TLS) Guidelines
TLS Adult and Pediatric Guideline.pd
Stress Ulcer Prophylaxis – ICU Guidelines
ICU Stress Ulcer Prophylaxis Guideline
Ketorolac Guidelines in Neonates and Infants
Ketorolac Ped Guidelines.pdf

</td></tr>
<tr><td>MERP 2014 UPDATE</td><td>MERP 2014 Plan Update.pdf</td></tr>
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Requests for full monographs or questions regarding this listing may be addressed to the Drug Information Center at **(310) 423-3784**

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Pre-Procedural Medication Assessment Guideline
Recommendations for Holding Medications

The following recommendations are intended as a general guideline for perioperative medication management. This guideline should not supplant clinical judgment. The potential benefits of stopping anticoagulation should be weighed against the risks, with consideration of the indication(s) for anticoagulation, the patient's current clinical condition/medical history and risks associated with the procedure.

For additional information, please refer to Physician Guideline for Minimum Timing of Antithrombotic/Thrombolytic Agents in Regional Anesthesia.

Medication	Recommendation for Discontinuation
Anticoagulants	
Unfractionated Heparin	Therapeutic use (IV): 4 to 6 hours prior to surgery or procedure Therapeutic use (SC): 12 – 24 hours prior to surgery or procedure Prophylactic use (SC): If discontinuation is required then 12 hours prior to surgery or procedure
Enoxaparin (Lovenox®)* Dalteparin (Fragmin®)*	Therapeutic use (SC): 24 hours prior to procedure Prophylactic use (SC): If discontinuation is required then 12 hours prior to surgery or procedure
Warfarin (Coumadin®)	5 – 6 days prior to surgery or procedure depending on current INR and physician preference for INR on day of surgery or procedure (Bridge patients at high risk for thromboembolism)
Dabigatran (Pradaxa®)*	CrCl ≥ 50 mL/min: 1 – 2 days prior to surgery or procedure CrCl < 50 mL/min: 3 – 5 days prior to surgery or procedure ➢ Consider longer times for major surgery, neuraxial puncture, or placement of spinal/epidural catheter/port
Rivaroxaban (Xarelto®)*	At least 24 hours prior surgery or procedure ➢ Consider discontinuing for longer periods prior to surgery or procedure for patients with renal impairment ➢ Consider longer times for major surgery, neuraxial puncture, or placement of spinal/epidural catheter/port
Apixaban (Eliquis®)*	Moderate to high bleed risk procedures: at least 48 hours Low bleed risk procedures: at least 24 hours ➢ Consider discontinuing for longer periods prior to surgery or procedure for patients with renal impairment ➢ Consider longer times for major surgery, neuraxial puncture, or placement of spinal/epidural catheter/port
Antiplatelet Consider risk/benefit when assessing continuation or discontinuation of aspirin and/or dual antiplatelet therapy. Please refer to cardiologist or interventional cardiologist for further consultation.	
Aspirin (Ecotrin®, Bayer®)	Minor dental/dermatologic/cataract surgeries: continue aspirin Non-cardiac surgery: • Moderate to high CV risk patients: continue aspirin • Low CV risk patients: discontinue 7 – 10 days prior to surgery or procedure CABG surgery: • Continue aspirin until day of surgery • If dual antiplatelet therapy, continue aspirin and discontinue clopidogrel for at least 5 days/prasugrel for at least 7 days before surgery Coronary stent patients with dual antiplatelet therapy (DAT): • Defer surgery ≥ 6 weeks after Bare Metal Stent (BMS) placement • Defer surgery ≥ 6 months after Drug-Eluting Stent (DES) placement • If surgery cannot be deferred, continue DAT to surgery
Clopidogrel (Plavix®)	Minimum 5 days prior to surgery or procedure
Ticagrelor (Brilinta®)	Minimum 5 days prior to surgery or procedure
Prasugrel (Effient®)	Minimum 7 days prior to surgery or procedure
Ticlopidine (Ticlid®)	Minimum 10 – 14 days prior to surgery or procedure

Non-Steroidal Anti-Inflammatory (NSAIDs) and Selective COX-2 Inhibitors Generally recommended to discontinue 7 days prior to surgery or procedure
Ibuprofen (Advil®, Motrin®)
Naproxen (Naprosyn®, Naprosyn ER®, Aleve®)
Ketorolac (Toradol®)
Fenoprofen (Nalfon®)
Piroxicam (Feldene®)
Indomethacin (Indocin®)
Diclofenac (Voltaren®)
Meloxicam (Mobic®)
Celecoxib (Celebrex®) May be discontinued at surgeon's discretion
Herbal Supplements Generally recommended to discontinue 1 week prior to surgery or procedure

* Longer elimination times will be required in patients with impaired renal function

Communication:

1. Surgeons or proceduralist should contact the clinician managing antithrombotic therapy at least 7 days before surgery to develop a perioperative plan.
2. Patients should be given written instructions outlining the perioperative plan for holding antithrombotic therapy, the use of bridging therapy (if needed), laboratory needs, and when to restart antithrombotic therapy.

References

1. Douketis JD, Spyropoulos AC, Spencer FA, et al. Perioperative management of antithrombotic therapy: Antithrombotic therapy and prevention of thrombosis, 9th ed: american college of chest physicians evidence-based clinical practice guidelines. *Chest*. 2012;141(2_suppl):e326S–e350S. doi:10.1378/chest.11-2298.
2. Ansell J, Hirsh J, Poller L, Bussey H, Jacobson A, Hylek E. The pharmacology and management of the vitamin k antagonists : The seventh accp conference on antithrombotic and thrombolytic therapy. *Chest*. 2004;126(3_suppl):204S-233S. doi:10.1378/chest.126.3_suppl.204S.
3. Falck-Ytter Y, Francis CW, Johanson NA, et al. Prevention of VTE in orthopedic surgery patients: Antithrombotic therapy and prevention of thrombosis, 9th ed: american college of chest physicians evidence-based clinical practice guidelines. *Chest*. 2012;141(2_suppl):e278S-e325S. doi:10.1378/chest.11-2404.
4. *Lovenox [Package Insert]*. Sanofi-Aventis.; 2013.
5. Dabbagh A, Esmailian F, Aranki SF. *Postoperative Critical Care for Cardiac Surgical Patients*. 2014 edition. Springer; 2013.
6. *Pradaxa [Package Insert]*. Boehringer Ingelheim Pharmaceuticals, Inc.; 2013.
7. *Xarelto [Package Insert]*. Janssen Pharmaceuticals, Inc.; 2014.
8. *Eliquis [Package Insert]*. Bristol-Myers Squibb Company; 2012.
9. *Plavix [Package Insert]*. Bristol-Myers Squibb/Sanofi Pharmaceuticals Partnership; 2013.
10. *Brilinta [Package Insert]*. AstraZeneca LP; 2013.
11. *Effient [Package Insert]*. Eli Lilly and Company; 2013.
12. *Ticlopidine [Package Insert]*. Genpharm ULC; 2008.
13. Pass SE, Simpson RW. Discontinuation and reinstitution of medications during the perioperative period. *Am J Health Syst Pharm*. 2004;61(9):899–912.
14. Ang-Lee MK, Moss J, Yuan C. Herbal medicines and perioperative care. *JAMA*. 2001;286(2):208–216. doi:10.1001/jama.286.2.208.

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Tumor Lysis Syndrome Guidelines

All patients should receive the following:

1) **HYDRATION** of 2-3 L/m^2/day and maintain urine output of 80-100 mL/m^2/hour
   - **PEDIATRIC PATIENTS** should receive hydration at double the maintenance rate unless contraindicated
   - ALKALINIZATION is **not** recommended due to risk of calcium phosphate precipitation and potential obstructive uropathy
2) **Allopurinol** 600-800mg/day in 2-3 doses. 300 mg PO BID commonly used to decrease pill burden (not to exceed 800 mg/day)
   - **PEDIATRIC PATIENTS**: allopurinol 10mg/kg/day PO divided BID or TID (maximum 800mg/day) unless contraindicated
   - **RENAL IMPAIRMENT**: Creatinine Clearance (CrCl) 10-20 ml/minute: 200 mg daily. CrCl 3-10ml/minute: ≤100 mg daily

RASBURICASE CRITERIA FOR USE[1-6]

Can only be ordered under the guidance of Hematology-Oncology attending physicians in adults. For pediatric patients, can be ordered by Pediatric or Hematology-Oncology attending physicians. Must meet **ONE of the FIVE indications** listed below:

1) Laboratory tumor lysis syndrome (LTLS) defined as ≥2 of the following:

a)	Uric acid (UA)	≥ 8 mg/dL
b)	Potassium	≥ 6 mmol/L
c)	Phosphorus	≥ 4.5 mg/dL
d)	Corrected calcium	≤ 7 mg/dL

OR above labs changed >25% from baseline within 3 days before or 7 days after cytotoxic therapy

2) Clinical tumor lysis syndrome (CTLS) is **LTLS with**

a) Cardiac arrhythmia b) Seizure

c) **OR** Renal insufficiency (SCr increase ≥ 0.3 mg/dL, SCr ≥ x1.5 upper limit of normal or urine output < 0.5 mL/kg/hour x 6 hours)

3) HIGH RISK

a) Burkitt's lymphoma/leukemia
b) Lymphoblastic lymphoma
c) Burkitt's acute lymphoblastic leukemia
d) ALL$^{\alpha}$ with WBC ≥ 100,000 or LDH ≥ 2 times ULN
e) AML$^{\beta}$ with WBC ≥ 50,000 or LDH ≥ 2 times ULN
f) Lymphoma with large mediastinal mass

4) INTERMEDIATE RISK receiving prophylactic allopurinol*

a) Diffuse large B-cell lymphoma
b) ALL$^{\alpha}$ with WBC 50,000 to 100,000
c) AML$^{\beta}$ with WBC 10,000 to 50,000
d) CML† **OR** CLL‡ (WBC 10-100,000 treated with fludarabine)

5) Severe allopurinol intolerance (i.e., hypersensitivity, rash or renal failure)

$^{\alpha}$ALL: Acute lymphoblastic leukemia $^{\beta}$AML: Acute myeloid leukemia †CML: Chronic myeloid leukemia ‡CLL: Chronic lymphocytic leukemia SCr: serum creatinine

*May be considered as initial management of pediatric patients with intermediate risk (without prophylactic allopurinol)

RASBURICASE DOSING

Adult Rasburicase Dosing Algorithm

IF INITIAL UA < 12 mg/dL	IF INITIAL UA ≥ 12 mg/dL
1. **INITIAL DOSE:** 3 mg in 50mL NS IV infusion x1 a. Check UA 4-6 hours after initial dose b. If UA is **increasing**, repeat 3 mg x1 2. **24 HOUR DOSE:** Repeat 3 mg x1 at 24 hours if UA still > 8	1. **INITIAL DOSE:** 6 mg in 50mL NS IV infusion x1 a. Check UA 4-6 hours after initial dose 2. **REPEAT DOSE:** 3 mg x1 if UA is elevated > 8

- **PEDIATRIC PATIENTS:** 0.15 mg/kg (preferred in intermediate risk patients or baseline UA <7.5mg/dL) or 0.2 mg/kg (preferred in high risk patients or baseline UA ≥7.5 mg/dL). Dilute dose in 50 ml NS and give as an IV infusion over 30 minutes. Maximum 6 mg per dose, rounded to the nearest 1.5mg vial. May repeat dose in 24 hours.
- Typically 1-2 doses are sufficient to lower uric acid to acceptable levels. **MAXIMUM** treatment duration of 5 days
- **MONITORING:** Monitor UA **4-6 hours after initial rasburicase dose**, followed by levels every 8 hours in high risk patients, every 12 hours in intermediate risk patients for 48-72 hours after rasburicase therapy

RASBURICASE CONTRAINDICATIONS[7]

1) Patients with a known history of G6PD deficiency. **SCREENING**: All patients with **potential for G6PD deficiency** (e.g. African, Mediterranean, Southeast Asian ancestry) should be screened PRIOR to rasburicase administration
2) Patients with a known history of **methemoglobinemia OR anaphylaxis/hypersensitivity reaction** to rasburicase
3) Pregnant or lactating women

RASBURICASE ADMINISTRATION[7]

- Optimal timing for rasburicase is **4 HOURS PRIOR** to cytotoxic chemotherapy in patients who met the above criteria
- **Do not shake, mix or invert the bag**. May store reconstituted or diluted solution up to 24 hr at 2 to 8 degrees C°
- Infuse over 30 minutes. Do NOT infuse with any other medications

BLOOD SAMPLE COLLECTION[7] Rasburicase will enzymatically degrade UA in blood samples at room temperature. Collect blood samples in pre-chilled tubes, immediately immerse and maintain in an ice water bath. Assay samples within 4 hours of collection

REFERENCES: 1. Cairo MS, Coiffier B, Reiter A, Younes A, Panel on behalf of the TE. Recommendations for the evaluation of risk and prophylaxis of tumour lysis syndrome (TLS) in adults and children with malignant diseases: an expert TLS panel consensus. *Br J Haematol*. 2010;149(4):578–586. doi:10.1111/j.1365-2141.2010.08143.x. 2. Coiffier B, Altman A, Pui C-H, Younes A, Cairo MS. Guidelines for the Management of Pediatric and Adult Tumor Lysis Syndrome: An Evidence-Based Review. *J Clin Oncol*. 2008;26(16):2767-2778. doi:10.1200/JCO.2007.15.0177. 3. Howard SC, Jones DP, Pui C-H. The Tumor Lysis Syndrome. *N Engl J Med*. 2011;364(19):1844-1854. doi:10.1056/NEJMra0904569. 4.McBride A, Lathon SC, Boehmer L, Augustin KM, Butler SK, Westervelt P. Comparative Evaluation of Single Fixed Dosing and Weight-Based Dosing of Rasburicase for Tumor Lysis Syndrome. *Pharmacother J Hum Pharmacol Drug Ther*. 2013;33(3):295–303. doi:10.1002/phar.1198. 5. Trifilio SM, Pi J, Zook J, et al. Effectiveness of a single 3-mg rasburicase dose for the management of hyperuricemia in patients with hematological malignancies. *Bone Marrow Transplant*. 2011;46(6):800-805. doi:10.1038/bmt.2010.212. 6. Herrington JD, Dinh BC. Fixed, low-dose rasburicase for the treatment or prevention of hyperuricemia in adult oncology patients. J Oncol Pharm Pract Off Publ Int Soc Oncol Pharm Pract. 2014. 7. Rasburicase (Elitek®) [package insert]. Sanofi-Aventis U.S. LLC. 1/2011

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ICU STRESS ULCER PROPHYLAXIS GUIDELINES

All patients admitted to the ICU should be evaluated for risk for stress related mucosal disease.

Risk Assessment

The use of stress ulcer prophylaxis (SUP) should be considered for patients with:

1. Anticipated duration of mechanical ventilation > 48 hours
2. Coagulopathy (INR > 1.5, Plt <50, PTT > 2 x normal)
3. Moderate-Severe Head injury (GCS 3-12 out of 15 due to head injury)

The risks and benefits of SUP should be considered in patients with relative indications. In critically ill patients, relative indications for SUP include:

1. Acute renal failure
2. Acute hepatic failure
3. Sepsis syndrome
4. Prolonged hypotension
5. Severe spinal cord injury
6. Multiple trauma
7. Use of ulcerogenic medications such as ASA, NSAIDs, High-dose corticosteroids
8. Major surgery (>4 hours)
9. History of GI bleed
10. Post-organ transplant

The following are NOT indications for SUP:

1. NPO status
2. Advanced age

Therapeutic Options

- Recommended first-line agent: IV H_2 antagonist
  Consider conversion to a PO H_2 antagonist when the patient is tolerating PO.
- Recommended second-line agent: IV Proton pump inhibitors (PPI)
  Consider in the following patients:
  - GERD, PUD, gastritis, esophagitis
  - Concurrent anticoagulants or antiplatelets or chronic NSAID in combination with ASA
  - Concurrent chronic steroids
  - Transplant patient
  - Plt <100,000
  - Jehovah's witness
  - Post-esophagectomy, post-op gastric bypass
  - Traumatic brain injury

  Consider conversion to a PO PPI when the patient is tolerating PO.

On-going evaluation

Due to risk associated with SUP such as hospital-acquired infections, the need for on-going SUP should be reevaluated every day.

- SUP should be discontinued after the patient has been extubated unless there are other indications to continue therapy and the patient remains critically ill.

- SUP should be discontinued upon discharge from the ICU unless the patient was on therapy prior to admission.
- Consider discontinuation of SUP when the patient is tolerating enteral nutrition through a *gastric* tube.

References

1. Cook et al. *A Comparison of Sucralfate and Ranitidine for the Prevention of Upper Gastrointestinal Bleeding in Patients Requiring Mechanical Ventilation.* New England Journal of Medicine 1998; 791.
2. Huang et al. *Effect of Histamine-2-receptor Antagonists Versus Sucralfate on Stress Ulcer Prophylaxis in Mechanically Ventilated Patients: A Meta-analysis of 10 Randomized Controlled Trials.* Critical Care 2010; R194.
3. Lin et al. *The Efficacy and Safety of Proton Pump Inhibitors vs Histamine-2 Receptor Antagonists for Stress Ulcer Bleeding Prophylaxis Among Critical Care Patients: A Meta-analysis.* Critical Care Medicine 2010; 38:1197-1205.
4. ASHP Therapeutic Guidelines on Stress Ulcer Prophylaxis. American Journal of Health-System Pharmacy 1999; 600.
5. Cook, DJ, et al. *Risk Factors for Gastrointestinal Bleeding in Critically Ill Patients.* NEJM 1994; 330: 378.
6. Cook, DJ et al. *Risk Factors for Clinically Important Upper Gastrointestinal Bleeding in Patients Requiring Mechanical Ventilation.* Critical Care Medicine 1999; 12: 2812.
7. Marik, PE, et al. *Stress Ulcer Prophylaxis in the New Millenium: A Systematic Review and Meta-analysis.* Critical Care Medicine 2010; 38:2222.
8. Cohen H, et al. Guidelines for Stress Ulcer Prophlylaxis in Critically Ill Adults. In Progress.
9. Linsky, A et al. *Proton Pump Inhibitors and Risk for Recurrent Clostridium difficile Infection.* Archives of Internal Medicine 2010; 772.
10. Gulmez, SE et al. *Use of Proton Pump Inhibitors and the Risk of Community-Acquired Pneumonia.* Archives of Internal Medicine 2007; 950.
11. Guillamondegui, OD, et al. *Practice Management Guidelines for Stress Ulcer Prophylaxis. EAST Practice Management Guidelines Committee.* Eastern Association of the Surgery of Trauma 2008.

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KETOROLAC GUIDELINES IN NEONATES AND INFANTS

UPDATED: JUNE 2014

Traditionally, pharmacological pain management in NICU patients has consisted of acetaminophen PO/PR and opioids IV. In the post-op setting, most patients require IV analgesics. IV opioids are associated with respiratory depression a well as hemodynamic changes.

IV ketorolac represents an alternative or adjunct to the medication regimen. However, literature suggests that the use of IV ketorolac in neonates and infants can potentially increase the risk of bleeding and renal impairment. This guideline is proposed to help guide the safe use of ketorolac in this population, whose renal function is still developing.

EXCLUSIONS

- Infants <37 weeks PMA
- Infants with
  - SCr > 0.7 mg/dL or other evidence of renal insufficiency
  - GI bleeding
  - Peritonitis
  - Serious infection that may be associated with coagulopathy
  - At risk for IVH
  - Functionally univentricular anatomy
- Platelets < 80,000
- On corticosteroids such as hydrocortisone
- On both aminoglycoside and loop diuretic or other nephrotoxic agents

START TIME

- Start at least 12 hours after surgery

MAXIMUM DOSE

- Term infants < 1 month of age: 0.5 mg/kg/dose IV Q8H for maximum of 48 hours
- Term infants ≥ 1 month of age: 0.5 mg/kg/dose IV Q6H for maximum of 72 hours

HYDRATION

Patient to receive at least 100 ml/kg/day of maintenance fluids, either IV or PO

MONITORING

- If UOP is < 1 ml/kg/hour since the previous dose, hold dose and notify MD
- SCr Daily
- HCT, Hgb, Plt Daily

REFERENCES:

1. Aldrink JH et al., Safety of ketorolac in surgical neonates and infants 0 to 3 months old. Journal of Pediatric Surgery (2011)46, 1081-1085
2. Burd RS et al., Ketorolac for Pain Management after abdominal surgical procedures in Infants. Southern Medical Journal Vol 95 No. 3 p. 331-333, March 2002
3. Dawkins TN et al., Safety of intravenous use of ketorolac in infants following cardiothoracic surgery. Cardiology in the Young. 19(1):105-8. 2009 Feb
4. Gupta A et al., Prospective Randomized Trial of Ketorolac After Congenital Heart Surgery. Journal of Cardiothoracic and Vascular Anesthesia, Vol 18, No 4 (August), 2004: pp 454-457
5. Moffett BS et al., Safety of Ketorolac in neonates and infants after cardiac surgery. Pediatric Anesthesia 2006;16:424-428
6. Papacci P et al., Use of intravenous ketorolac in the neonate and premature babies. Pediatric Anesthesia 2004 (14):487-492
7. Zuppa et al., Population Pharmacokinetics of Ketorolac in Neonates and Young Infants. American Journal of Therapeutics 16, 143-146 (2009)

MERP 2014 Plan Update

- CDPH conducting pilots which combines both MERP and Patient Safety Licensing survey (PSLS) as one survey
  - 1/2016 anticipated survey based on last MERP survey 1/2013
- MERP 2014 Plan
  - 23 topics on the 2014 MERP plan
  - Entire plan / details on Sharepoint
  - Completed topics: 10
  - In progress: 10
  - To be started: 3
    - Medication orders held during transfer
    - Evaluation of pediatric medication doses (pt specific vs. batched smaller doses vs. manufacturer doses)
    - Vincristine preparation in IVPB only
  - Approved revisions to the MERP plan:
    - Replace end tidal CO2 module with use of pulse oximetry to monitor patients on PCA
    - Replace Alaris CQI topic with safety implications of the Alaris pump integration and new drug library build