PEDIATRIC NEWBORN MEDICINE CLINICAL PRACTICE GUIDELINES

Pharmacologic Prevention of Severe Intraventricular Hemorrhage

Implementation Date: March 3, 2015

Clinical Practice Guideline: Pharmacologic Prevention of Severe Intraventricular Hemorrhage

Points of emphasis/Primary changes in practice:

1. All neonates born at ≤ 1500 grams should be screened for risk of severe IVH using a published predictive model available online.

2. Prophylactic indomethacin will be utilized for neonates with ≥ 15% risk of severe IVH.

Rationale for change:

To optimize and standardize pharmacologic prevention of severe IVH.

Questions? Please contact: NICU Clinical Pharmacist

Clinical Guideline Name	Pharmacologic Prevention of Severe Intraventricular Hemorrhage
Implementation Date	01/15/16
Due for CPC Review	01/15/17
Contact Person	NICU Clinical Pharmacist
Approved By	Department of Pediatric Newborn Medicine Clinical Practice Council _01/15/16___ CWN SPP 7/13/2016 SPP Steering 10/21/2016 Nurse Executive Board/CNO 10/26/2016

This is a clinical practice guideline. While the guideline is useful in approaching pharmacologic prevention of severe intraventricular hemorrhage, clinical judgment and / or new evidence may favor an alternative plan of care, the rationale for which should be documented in the electronic health record. These guidelines are based on consensus and resources currently available at Brigham and Women's Hospital.

I. Purpose

The purpose of this clinical practice guideline is to address the pharmacologic prevention of severe intraventricular hemorrhage (IVH). The scope of this guideline includes the following aspects of medical management:

A. Screening for severe IVH risk
B. Prophylactic indomethacin
C. Other strategies

II. Scope

Inclusion criteria:	Neonates ≤ 1500 grams
Exclusion criteria:	Neonates > 1500 grams
	Known congenital abnormalities contradicting ductus arteriosus closure

III. Screening for severe IVH risk

We will screen all infants born at ≤ 1500 grams immediately after birth for risk of severe IVH.

We will utilize a published, validated predictive model for severe IVH.[1] Strengths of this model include utilization of clinical variables available immediately after birth and validation in neonates with similar demographics to our patient population. Weaknesses include reliance on relatively subjective APGAR scores and dichotomous characterization of antenatal corticosteroid exposure.
https://sites.google.com/a/neoqic.org/neoqic-public-1/sivh-calculator

IV. Indications for prophylactic indomethacin

Prophylactic indomethacin decreases the incidence of hsPDA and severe intraventricular hemorrhage (IVH).[2] However, prophylactic indomethacin does not impact the incidence of gastrointestinal morbidity or chronic lung disease (CLD).[2]

A threshold of 15% risk will be utilized as an indication for indomethacin prophylaxis.

Indomethacin dosing and monitoring will be guided by the indomethacin Drug Administration Guideline (abbreviated in Appendix 1). Prophylactic indomethacin will be initiated within the first 6 hours of life, when indicated.

Gut priming should occur during prophylactic indomethacin therapy, if clinically appropriate.

V. Other strategies

Pancuronium has been shown to decrease IVH in ventilated preterm infants with evidence of asynchronous respiratory efforts, but cannot be considered due to uncertain safety and long-term effects in the era of early extubation.[3]

Phenobarbital has been extensively studied with inconsistent results and results in an increased need for mechanical ventilation.[4]

Vitamin E supplementation decreases the risk of IVH, but increases the risk of sepsis when used intravenously in high doses.[5]

Appendix 1 – Abbreviated indomethacin drug administration guideline

Postnatal age (hours)	Dose and interval
< 12	0.1 mg/kg IV q 24 hr x 3

Generally, hold doses for urine output < 1 mL/kg/hr or serum creatinine increase of 0.5 mg/dL over baseline.

Prostaglandin inhibitor for the closure of the ductus arteriosus and prophylaxis of IVH.

Administration time and preparation: Infuse dose ≤ 0.3 mg/kg over 60 minutes.

Compatibility: D5W, NS, furosemide, insulin, potassium chloride, standard UAC fluids
Incompatibilty: D10W, TPN, dobutamine, dopamine, Fentanyl, midazolam

Monitoring: Urine output (notify MD for < 1 mL/kg/hr); platelet count (maintain ≥ 100 x 10^9/L during therapy*), serum creatinine before each dose or once daily
*Platelet count of < 50 x 10^9 utilized as exclusion criteria in the largest trial of indomethacin prophylaxis (reflected as a relative contraindication above). In a retrospective study, treatment with a COX inhibitor was associated with an increased incidence of IVH in infants with a platetlet count of 50– 99 x 10^9 versus ≥ 100 x 10^9 (reflected as the desired platelet count above).

Adverse Effects: GI perforation (active corticosteroid therapy is a relative contraindication), decreased urine output, inhibits platelet aggregation

Evidence
Prophylactic dosing reflects the most common regimen utilized in large randomized controlled trials.[2]

References

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2. Fowlie PW, Davis PG, McGuire W. Prophylactic intravenous indomethacin for preventing mortality and morbidity in preterm infants. The Cochrane database of systematic reviews. 2010:CD000174.
3. Cools F, Offringa M. Neuromuscular paralysis for newborn infants receiving mechanical ventilation. The Cochrane database of systematic reviews. 2000:CD002773.
4. Whitelaw A, Odd D. Postnatal phenobarbital for the prevention of intraventricular hemorrhage in preterm infants. The Cochrane database of systematic reviews. 2007:CD001691.
5. Brion LP, Bell EF, Raghuveer TS. Vitamin E supplementation for prevention of morbidity and mortality in preterm infants. The Cochrane database of systematic reviews. 2003:CD003665.