Nosanov et al. *The impact of blood product ratios in massively transfused pediatric trauma patients.* Am J of Surgery 2013

- Higher ratios were not associated with increased survival
- They did find that all deaths were caused by severe head injury
- Because of the retrospective nature, small numbers and lack of death due to hemorrhage, it is difficult to draw absolute conclusions from this study
- Currently still unclear what constitutes massive transfusion in pediatrics, when a MTP should be instituted and what product ratios are best

Additional prospective studies are needed!

WTA 2014 Plenary Paper

J Trauma Acute Care Surg 2014

Tranexamic acid administration to pediatric trauma patients in a combat setting: The pediatric trauma and tranexamic acid study (PED-TRAX)

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BACKGROUND: Early administration of tranexamic acid (TXA) has been associated with a reduction in mortality and blood product requirements in severely injured adults. It has also shown significantly reduced blood loss and transfusion requirements in major elective pediatric surgery, but no published data have examined the use of TXA in pediatric trauma.

METHODS: This is a retrospective review of all pediatric trauma admissions to the North Atlantic Treaty Organization Role 3 hospital, Camp Bastion, Afghanistan, from 2008 to 2012. Univariate and logistic regression analyses of all patients and select subgroups were performed to identify factors associated with TXA use and mortality. Standard adult dosing of TXA was used in all patients.

RESULTS: There were 766 injured patients 18 years or younger (mean [SD] age, 11 [5] years; 88% male; 73% penetrating injury; mean

*Retrospective review of pediatric trauma admissions over 4 yr period
*TXA use and mortality were analyzed
*TXA use was at discretion of physician, adult dosing regimen used
*TXA use was independently associated with decreased mortality among all patients,
-no increased in thromboembolic or cardiovascular adverse events and
-suggested improved discharge neuro status and decreased vent dependence

RCPCH
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Evidence Statement
Major trauma and the use of tranexamic acid in children
November 2012

Key points

- Tranexamic acid reduces mortality in adult trauma
- Early administration is vital for efficacy
- Due to the lack of published data on the use of tranexamic acid in paediatric patients who have undergone major trauma there is no evidence for a specific dose in this situation
- The RCPCH and NPPG Medicines Committee recommend a pragmatic dosage schedule – 15mg/kg tranexamic acid loading dose (max 1g) over 10 minutes followed by 2mg/kg per hour

CRASH-2 trial 2010

Dosing schedule based on CRASH-2 data (1gm LD and 1g over 8hours) but translated to children. Administration within the first 3 hrs of injury is likely beneficial.

Recombinant Activated Factor VIIa

- Only FDA approved for hemophilia patients with factor inhibitors
- The majority of its use has been "off label" – ie. hemorrhage in trauma
- Induces hemostasis at the site of vascular injury independent of FVIII and FIX by complexing with exposed tissue factor
- Although there have been a small handful of pediatric trauma case reports of its use, there are no prospective studies showing safety and efficacy
- Side effects: EXPENSIVE, risk of thromboembolus, short half life (2.7h)
- If used – ensure repletion of coagulation factors, correction of acidosis and hypothermia

Beno et al. *Transexamic acid in pediatric trauma: why not?* Critical Care 2014

- Authors argue "for" strong consideration of TXA in appropriate peds trauma victims
- Trauma induced coagulopathy has been documented in severely injured pediatric patients and has been associated with increased mortality
- Many published doses documented in non-trauma peds literature (10-100mg/kg LD): cardiac, spinal, craniofacial – adverse events are rare
- The emerging concern of post administration seizures has not been reported for the dose used in trauma

"Denying injured children TXA due to the lack of pediatric trauma trial evidence in this indication is likely shortsighted and unnecessary given the ample clinical evidence in other pediatric settings, the excellent safety record of the drug, and the clear mortality benefit seen in adult trauma."