Purpose: Our trauma program was verified as an American College of Surgeons Level 1 Pediatric Trauma center in 2011. In the first few years, there was difficulty having universal packed red blood cells (pRBCs) available in a timely fashion in the trauma bay. Particularly at night, there was limited availability of blood bank personal to respond to activations. Therefore, the emergency department (ED) became responsible for obtaining blood for activations, which lead to low compliance of this performance improvement measure.

Resources: The trauma service worked in conjunction with the blood bank and emergency department to purchase the refrigerators and place one in the ED as well as one in the operating room (OR). Each refrigerator contained four units of irradiated, universal donor packed red blood cells. The refrigerators were later equipped with a door alarm, which notifies the blood bank when the product is removed from the refrigerator. The blood bank then calls the clinical department (ED or OR) to determine if more blood products are needed or more personal may be needed to prepare for a massive transfusion situation.

Description: An Emergency Release of uncross matched red blood cells form will be signed by ordering physician with the nature of emergency documented. Product information will be documented on the Transfusion record tag, trauma flow sheet, and in the electronic chart IVIEW in the ED. Documentation for the OR is on the blood administration sheet which is scanned into the electronic chart. The pink copy of the transfusion record tag will be sent to the Blood bank to dispense in the computer by blood bank technologist to charge to the patient. Four uncross matched O negative pRBCs will be stored in each refrigerator in the ED and the OR. As soon as possible, a properly labeled specimen should be collected following the Transfusion Services guidelines for sample labeling. A type and cross must be ordered if any uncrossmatched O negative pRBCs are transfused to ensure that the uncrossmatched transfused units are subsequently cross matched with the patient’s sample. Turnaround time is approximately 45 minutes. The Blood bank technologist will check stock every two weeks on a rotating basis with a par level 4 and a restock level 2. When products are exhausted, the blood bank will replenish the entire stock. The Blood Bank staff perform daily temperatures, quarterly alarm checks and responsible for all maintenance.

Effectiveness: The availability of universal donor blood at the time of trauma stat activations was measured as part of the performance improvement program. In 2010, blood was available for 88% of trauma stat activations within minutes of their arrival. When the blood bank was no longer able to respond to stat activations, the percentage dropped to 25% in the 4th quarter of 2011. The blood refrigerators were purchased and fully in use in 2013, and the compliance increased to 100%. The implementation of the blood refrigerator allowed universal donor packer red blood cells to be available to any trauma stat activation on arrival.

Lessons Learned: Because the blood bank did not have to be contacted for the initial blood, they were unaware of possible massive transfusion situations leading to delays in other product availability and additional blood products. The alarms were added to the refrigerator door to notify the blood bank and alert them to contact the clinical department for more information and allow for increase in personal if needed. When blood was delivered to the ED or OR in a cooler, it may be discarded if not used or returned in a timely fashion. The blood refrigerators keep the blood cooled and are re-stocked as needed by transfusion services.

Conclusions: The implementation of blood refrigerators in the ED and OR gave immediate access of universal donor pRBCs for trauma patients leading to compliance with the ACS performance measure and improving blood accessibility for all pediatric patients at our facility.

Benefits to Others: This project can improve blood availability for trauma activations while decreasing waste of blood products.

Implementation by Others: Other centers should partner with the blood bank, ED and pharmacy to implement blood refrigerators to allow for rapid transfusion of packed red blood cells in emergent situations in the emergency department and operating room.