

Decreasing the Time to Recognition and Administration of First Fluid Bolus in Children with Septic Shock- a Quality Improvement Initiative

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Background

- Septic Shock is one of the common pediatric emergencies worldwide and is an important cause of death in children.
- Delays in recognition/ resuscitation – common in emergency departments
- Each additional hour of persistent shock leads to two fold increased odds of death.
- Mortality conferences in the department revealed time to recognition of shock and administration of fluid bolus was often delayed and led to poor outcomes in these children.

Aims and objectives

- Our aims were to 1) identify children with shock within 10 minutes of their arrival to the pediatric casualty and 2) intervention within 10 minutes of recognition of shock in the form of fluid bolus administration.

Methods

- We used the PDSA (Plan, Do, Study, Act) model of improvement for implementing the project.
- Our first PDSA comprised of the following elements

- Next we created a triage tool for recognizing patients with shock without delay and made a SHOCK protocol.
- We also rearranged the space in the emergency with a dedicated triage corner and resuscitation corner and reorganized the crash cart



- The project was implemented over 2 months (August and September)
- Five members of the QI team (nurses), the senior residents and the nurses posted in the emergency implemented the project

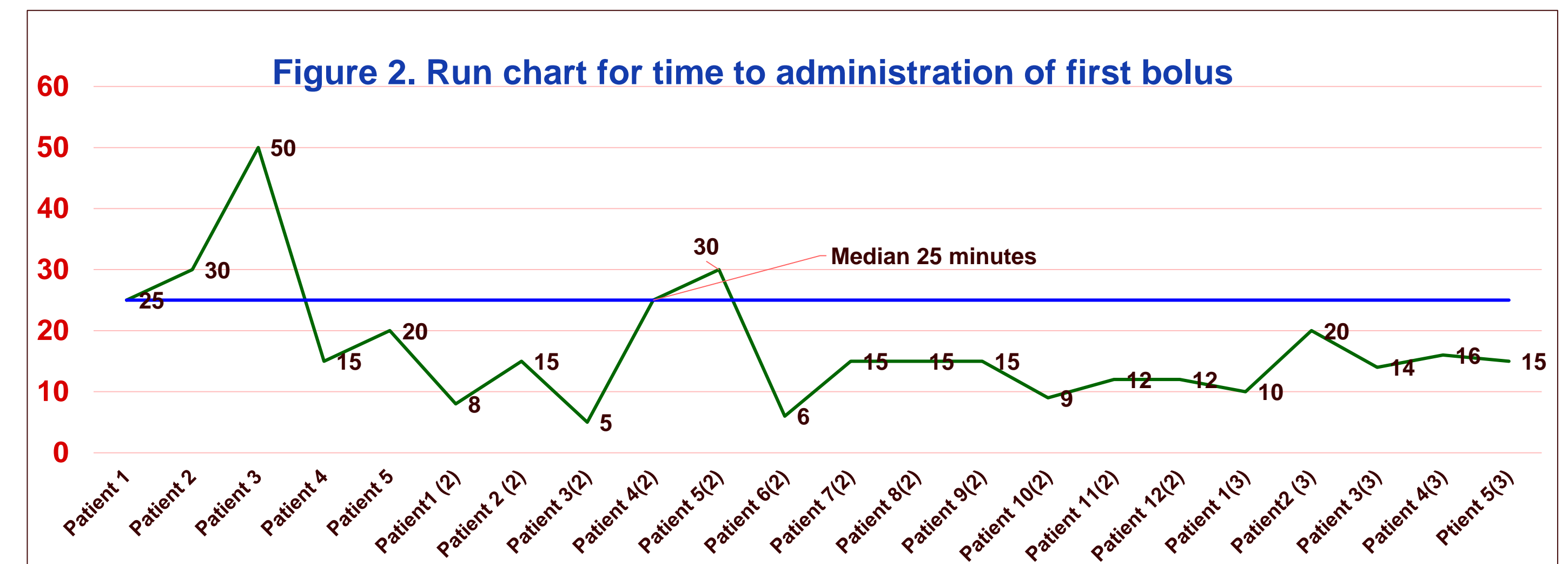
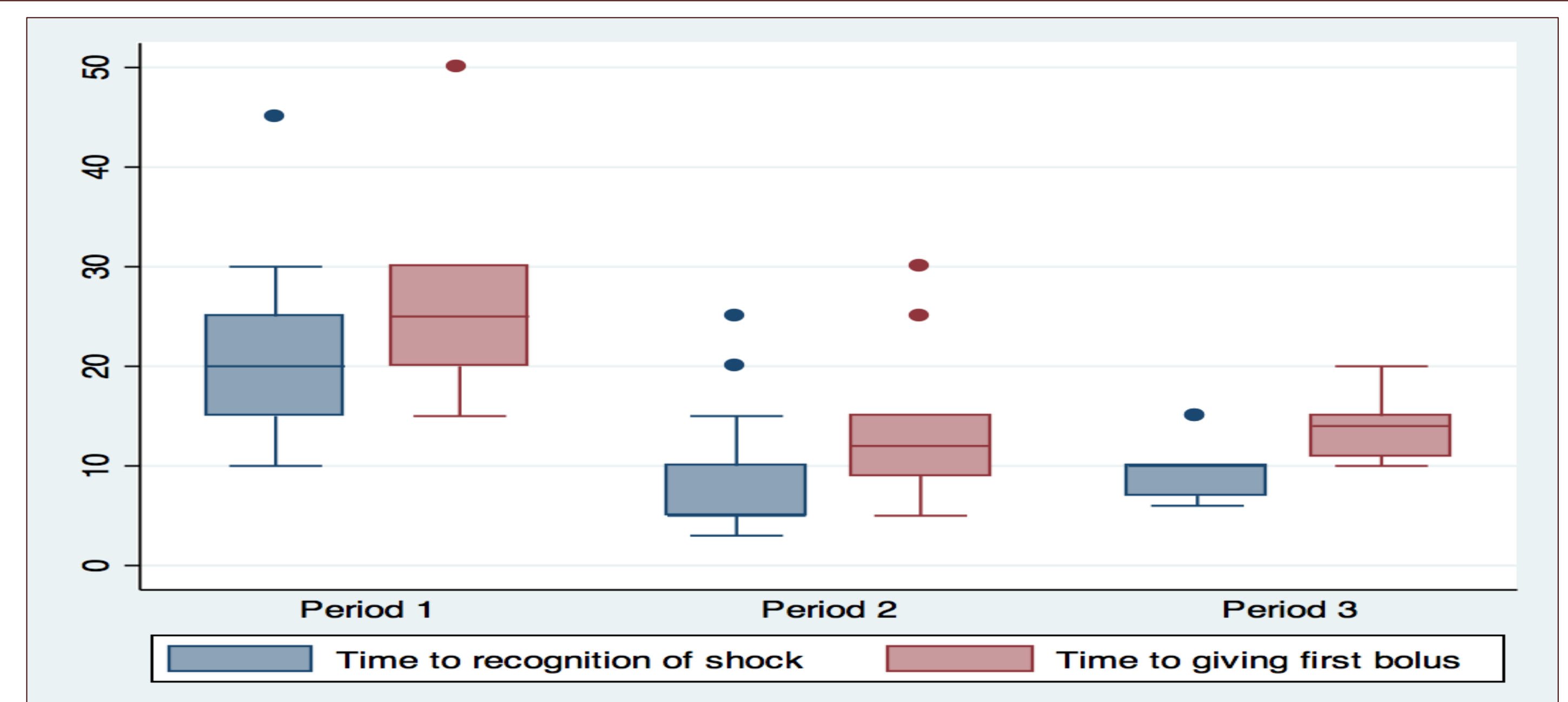
Results

- The median time to shock recognition reduced from 20 to 5 minutes ($p=0.002$)
- Administration of first fluid bolus – reduced from 25 to 10 minutes ($p=0.002$)

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| <ul style="list-style-type: none"> Based on the results we will plan the next PDSA and track the progress <p>Act</p> | <ul style="list-style-type: none"> Document time to recognition of shock and administration of fluids in the existing set up Identify process barriers that lead to delayed recognition and management <p>Plan</p> |
| <ul style="list-style-type: none"> QI team members will triage patients and help the senior resident in management as per protocol Run charts will be prepared to track the progress <p>Study</p> | <ul style="list-style-type: none"> Orient the QI team to the triage tool and management protocol for children with shock Orient the senior residents and the nursing staff in the casualty to the project and take feedback and discuss implementation of the same <p>Do</p> |

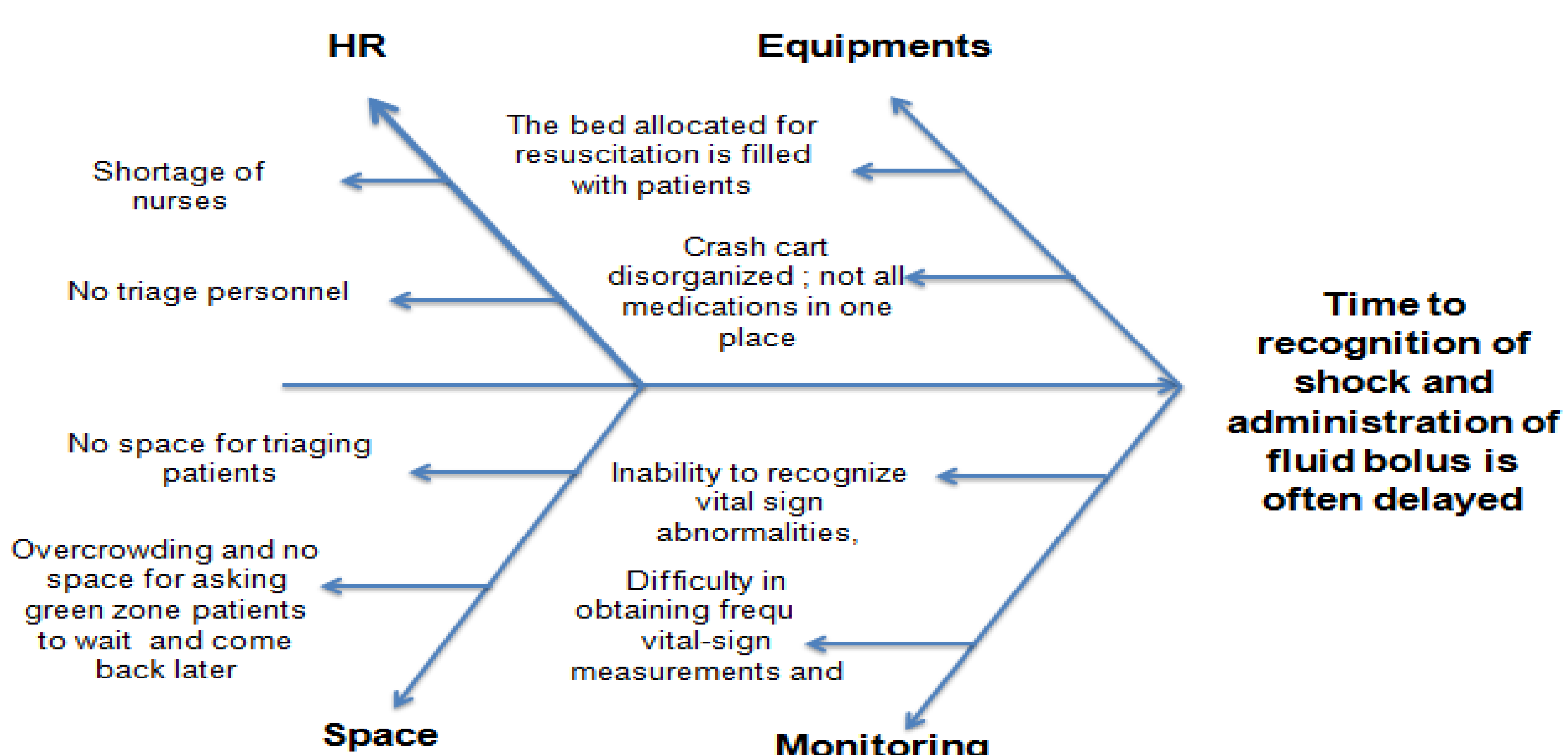
The Measures (Outcome and Process):
Children with shock identified within 10 minutes and bolus administered within 10 minutes of recognition

Figure 1. Median time to recognition of shock and administration of boluses during the three study periods



- For implementing the QI project we worked on these areas
- We first identified process barriers to timely recognition by collecting baseline data over 5 days
- The process barriers identified are depicted in the fish bone diagram (Figure 1).

Root cause analysis - Fishbone



Conclusions

- Use of a triage tool and shock protocol as part of a QI initiative resulted in earlier recognition of shock and substantial reduction in the time to administration of first fluid bolus.

Challenges and way forward

- Time to recognition and intervention may again touch baseline (overcrowding, difficulties with venous access and shortage of human resources).
- To scale up to other pediatric emergencies with time.
- Seek help of Hospital Administration- space, two dedicated nurses for triaging and training in intra-osseous access.