Reduction in average ambulance response time of interfacility transfer for life-saving cases (STEMI, STROKE, RTA) in Eastern health cluster of Saudi Arabia

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Introduction:
Interfacility transport (IFT) is a complex component of out-of-hospital Emergency Medical Services (EMS) which provides care and transport to patients who need transfer from one facility to another. The aim of IFT is that patients receive the care they need in a time-efficient and safe manner, and it helps in maintaining high practice standards and reduces financial burden. The delay in response time of interfacility transfer for life-saving cases may result in adverse health outcomes.

Objective:
The study aimed to identify possible causes of delay in ambulance response time for three life-saving categories (CVA, Stroke & RTA) and to reduce the average response time by applying improvement initiatives.

Methods:
This was a QI study. It was carried out by EMS at Eastern Health Cluster (EHC) Saudi Arabia from August 2022 till June 2023. In the first phase retrospective analysis was conducted for the pre-intervention period (Jan 2022 to Aug 2022) to assess average response time for interfacility transfer of life-saving cases and to identify possible causes of delay through root cause analysis (RCA). In the second phase (Sep 2022 to April 2023) IHI improvement approach was applied to improve the efficiency of interfacility transfer for life-saving cases.

Results:
The retrospective data analysis highlighted the average response time for three lifesaving categories was 17 minutes. Certain interventions were applied and there was a significant reduction in average response time for three life-saving categories from 17 minutes to 9 minutes. The results of the paired-t test indicated that there was a significant difference $t(7) = 15.3$, $p < .001$ between before intervention response time ($M = 17$, $SD = 1.7$, $n=8$) and after intervention response time ($M = 9.1$, $SD = 2$, $n=8$). The highest average response was in December 2022 and average number of cases increased from 39 to 42 cases per month.

Conclusion:
The findings of this showed significant improvement in response time by merely introducing soft interventions e.g., EMS smart solution, and without acquiring additional staff or required ambulances. The rural region in EHC is vast with less concentration of stations, ambulances, and staff. Use of technology and staff resistance were also challenges. A fully functional EMS headquarter with resource control center may further improve EMS functioning. Hiring staff, acquiring ambulances & staff development is necessary to maintain and enhance gains. These findings can be replicated to improve IFT response time in different settings.

Keywords:
Interfacility transport, Emergency medical services, Average response time