

**WHITE PAPER**

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**ENABLING FASTER EMS  
TURNAROUND AND IMPROVED  
PATIENT HANDOFF IN  
CRITICAL PATIENT CASES**

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How TrackEMS Solves  
Communication Needs in  
EMS and Hospital Systems

**eso**

## INTRODUCTION

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Headlines today highlight a healthcare crisis in the United States, with everything from seasonal complications such as the flu to skyrocketing opioid usage to obesity related complications as reasons EMS agencies are continually deployed to provide patient care. Not surprisingly, these increased call volumes can lead to a harried staff which often yields an inefficient patient handoff at the hospital.

Poor patient handoffs can generate slower turnaround times, adverse patient outcomes and care providers who lack the full picture prior to continuing treatment in the hospital setting. According to the Journal of Computer Information Systems, communication breakdowns in the ED can bring data loss, time delays and miscommunication, all of which are critical during emergency situations.

Verbal communication reports can also prove inefficient. The same study noted that verbal patient care report transfers are only 50% accurate and that in order for handoffs to be successful, they must be rapid and complete. EMS agencies looking to create a stronger handoff to improve clinical data accuracy and patient outcomes must find systems which can quickly convey data that is timely and error free.



## SEARCHING FOR A SOLUTION

When Indian River County Fire Rescue in Vero Beach, Florida was searching for a way to improve patient handoffs while still delivering quality care, they sought out TrackEMS, an EMS to hospital alert system. Assistant Chief Cory Richter recalls, “I was looking for a complete notification system between the ambulance and the ED, not just one for STEMI or stroke.”

TrackEMS is an electronic communication system used by hospital emergency departments and emergency medical services (EMS) personnel to securely collect, transmit, display and report critical patient information. Richter notes, “The format is quick and easy to use and yet the ED gets more information than they did from the encode. They also know exactly when the patient is going to arrive with GPS tracking.”

### Setting the Standards for Project Success

To advance patient handoff between EMS and the hospital emergency department staff, Indian River County Fire Rescue and four hospitals within the region initiated a project to improve ED patient throughput. The project goals were to alert the ED of the inbound patient, especially time sensitive emergencies, succinctly share critical patient information, reduce the time to treatment, reduce the time required for the EMS unit to return to service and ultimately, create a better patient handoff process.

Indian River Medical Center,  
Sebastian River Medical Center,  
Lawnwood Regional Hospital and

## About TrackEMS

Using smartphones or smart tablets, EMS professionals input case information while on scene or transporting, using a configurable interface. Case record elements can include demographics, driver's license information, assessment and treatment details, video, and pictures. Once the clinical record is built, the EMS team then selects from a list of hospitals provided which can accept the patient. The case is electronically transmitted to computer dashboards in the emergency department, cath lab, registration department, or any area in the receiving hospital that has been pre-assigned.



## SEARCHING FOR A SOLUTION

Homes Regional Medical Center participated in the initial project. The outcome of interest was the time to clear a patient, defined as the time from when the ambulance arrived at the hospital until the time when the patient was ready to receive treatment. Data were collected on the nature of the call (NOC) as defined at the point of dispatch using the APCO call taking system, time call was received, and destination hospital for each patient.

There were two periods of data collection. The first, (which served as a control), was in calendar year 2015 prior to implementation of TrackEMS; the second served as the intervention and was in calendar year 2017 after TrackEMS was operational at the four participating hospitals. Data from 2016 was not utilized due to a “partial” TrackEMS implementation.

Prior to project implementation, EMS and hospital staff received training on how to operate and use TrackEMS.

### Understanding Impact with TrackEMS

A total of 15,716 patients were transported in 2015 and 17,583 patients were transported in 2017, the latter where TrackEMS was used for the majority of the calls. The mean time to clear was analyzed via an analysis of variance model that included the variables listed above. Thus, the time to clear was adjusted for factors that might obscure the main effect; implementation of TrackEMS.

Using data from all four hospitals, the adjusted mean time to clear was 22.4 minutes in 2015, which was reduced to 17.7 minutes after TrackEMS was operational in 2017. This amounts to a decrease of 4.7 minutes (21% decrease, statistically significant at  $P > 0.001$ , 95% confidence interval = [4.0,5.4]). Summing over all patients in 2017, this 4.7-minute decrease resulted in 1,377 total unit hours returned to the system, illustrating a faster turnaround time and improved patient handoff process. As shown in Table One, each hospital experienced a decrease in time to clear (Lawnwood and Holmes Hospitals has small numbers and were grouped together).

**Table One: Time to clear pre- and post-implementation of TrackEMS at four Florida hospitals (Lawnwood & Holmes combined due to smaller numbers)**

Hospital	Number of Patients (2015; 2017)	2015 Mean Time to Clear: Before Track EMS implementation	2017 Mean Time to Clear: After Track EMS implementation
Indian River Ctr.	(12,699; 14,305)	21.9 minutes	16.4 minutes
Sebastian River Med.	(2,735; 2,850)	19.7 minutes	14.9 minutes
Lawnwood & Holmes	(1,282; 428)	25.6 minutes	21.6 minutes

The implementation of TrackEMS not only impacted the time to clear but also improved the experience of emergency department operations. Indian River Medical Center Charge Nurse Tanya Chrzan notes, "TrackEMS has allowed us to streamline the process for incoming ambulance crews with the ability to pre-register patients. The GPS function lets us know exactly when they will arrive, which has dramatically decreased the time spent waiting at the charge nurse station."

### **Delivering Stronger Outcomes with TrackEMS**

In this study, the implementation of TrackEMS significantly reduced the time required to initiate ED patient care and return EMS units to service. The similar decrease across multiple hospitals is further confirmation of the ability to TrackEMS to effect a timely change. TrackEMS was also effective when adjusting for the nature of call (STEMI, stroke, trauma and other conditions). Assistant Chief Richter also adds, "With TrackEMS, the point of entries are right out of our protocols so the interventions follow our protocols, making the transition to TrackEMS easy for our crews".

Timing and communication matter for effective care delivery in EMS and hospital systems. By utilizing tools such as TrackEMS, providers can ensure the time they spend on patient care is efficient, valuable and

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transmitted correctly to the appropriate parties. For Indian River County Fire Rescue, TrackEMS has proved an effective tool. "Our crews like that TrackEMS has our protocols when checking completed interventions, it helps not only with documentation but knowing which treatment modalities are available to treat that particular patient," relays Assistant Chief Richter. Richter also notes that TrackEMS offers a positive benefit for both EMS and hospitals, "The hospitals think this thing is the best thing since sliced bread. TrackEMS has exceeded our expectations and is the next generation for sending data to the ED."

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