Big Data in Emergency Department Care Delivery: Benefits of Radio Frequency Identification

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Background and Objectives

• Lack of a coordinated primary care system is forcing individuals to seek emergency departments (EDs) as gateway into the health system.
• As volumes increase and cases become more complex, combined with inadequate downstream capacity lead to boarding, bottlenecks and wait times.
• Technology and sensors have been used in healthcare, Radio Frequency identification (RFID) mostly used in supply chain management.
• Potential for use of RFID in healthcare, and benefits relating to improved operations.
• The goal was to review benefits of RFID demonstrated in the literature in the ED.

Method and Results

Method
• Article searches were conducted and they were categorized based on benefits in three areas:
  o Patients
  o Staff
  o Assets

Results
• Evidence of use of RFID in ED went as far back as 2006 with both domestic and international applications mostly using active technology.
• Majority of the articles demonstrated reducing wait times in the ED.
• One of the articles in turn demonstrated impact on patient satisfaction.
• Reduction in wait times were demonstrated when admitting patients into ICU from the emergency setting.
• In case of staff, use of RFID demonstrated increased satisfaction in a pediatric emergency setting.
• Evidence also exists in better tracking of assets and equipment in the ED.
• Very little evidence of use of RFID in simulation and analytical models exist.
• Most of the studies were retrospective in nature.
• Wait times and asset tracking are tangible benefits with direct impact on return-on-investment.

Discussion and Conclusion

• RFID has been used in various settings in healthcare and quality benefits have been demonstrated.
• Lesser evidence of RFID use in the ED exists.
• RFID benefits have primarily been demonstrated with regard to wait times and asset tracking and management.
• Patient and staff satisfaction are more intangible benefits.
• As EDs start to reap benefits with wait times, use in simulation and advanced analytical models could potentially inform workload, team configuration and team dynamics studies.
• As healthcare moves into the era of big data, live streaming RFID data can be tapped for real-time decision making.

References