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Emergency Medical Services and beyond: Addressing new challenges through a wide literature review

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Abstract

One of the most important health care services is emergency medical service as it plays a vital role in saving people's lives and reducing the rate of mortality and morbidity. Over the last years, many review papers have discussed emergency medical services (EMS) location problems, however, only few review papers consider the full range of EMS systems. This review paper tries to fill this gap. Our review introduces the concept of emergency care pathway following the current trend in health care systems, i.e., shifting the central role from health care providers to patients. Considering the emergency care pathway, we provide a broad literature review and analysis in order to identify emerging challenges for future research.

Keywords — Emergency Medical Service, Emergency Department, Operations Research, Data Mining, Health Technology Assessment, Clinical Pathway.

1 Introduction

Emergency medical service is one of the most important health care services as it plays a vital role in saving people's lives and reducing the rate of mortality and morbidity. The importance and sensitivity of decision making in the Emergency Medical Services (EMS) field have been recognized by operations research scientists, EMS planners, and health care practitioners who studied many problems arising in the management of EMS systems since the 1960s.

Locating EMS vehicles has been widely studied as is shown by numerous review papers that appeared over the last years. One of the first review papers that addressed EMS location models is the paper of ReVelle et al. [1]. Brotcorne et al. [2] presented a review paper on ambulance location and relocation problems, and classified the existing models in three main groups: static and deterministic models, probabilistic models, and dynamic models. Goldberg [3] surveyed operations research models for the deployment of EMS vehicles while focusing on modeling aspects and problems assumptions. In these

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