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## International Emergency Medicine

### CAUSES OF EMERGENCY DEPARTMENT OVERCROWDING AND BLOCKAGE OF ACCESS TO CRITICAL SERVICES IN BEIJING: A 2-YEAR STUDY

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**Abstract—Background:** Emergency department (ED) overcrowding is a serious issue worldwide. **Objectives:** This study was done to evaluate the degree of overcrowding in local “teaching hospitals” in Beijing, and to ascertain the apparent root causes for the pervasive degree of overcrowding in these EDs. **Methods:** This is a multicenter cross-sectional study. The studied population included all ED patients from 18 metropolitan teaching hospital EDs in Beijing for calendar years 2013 and 2014. Patient characteristics, and the primary reasons that these patients sought care in these EDs, are described. **Results:** The total numbers of annual emergency visits were 1,554,387 and 1,615,571 in 2013 and 2014, respectively. High acuity cases accounted for 4.6% and 5.5% of the total annual emergency visits in 2013 and 2014, respectively. The percentage of patients placed into “Observation” beds, which were created to accommodate patients deemed to have problems too complex to be treated in an inpatient bed, or to accommodate patients simply needing chronic care, was 11.9% and 13.1% in 2013 and 2014, respectively. The ED-boarded patients accounted for 2.71% and 2.6% of the total annual emergency visits in 2013 and 2014, respectively. The average waiting time to admit the ED-boarded patients was 37.1 h and 36.2 h in 2013 and 2014, respectively. Respiratory symptoms were the most common presenting complaints, and an upper respiratory infection was the most common ED diagnosis. Patients who had pneumonia or various manifestations

of end-stage diseases, such as advanced dementia or multiple organ dysfunction, were the most common characteristics of patients who had stays in “Observation” units. **Conclusions:** One principal reason for ED crowding in Beijing lies in the large numbers of patients who persist in the expectation of receiving ongoing care in the ED for minor illnesses. However, as is true in many nations, one of the other most important root causes of ED crowding is “access block,” the inability to promptly move patients deemed by emergency physicians to need inpatient care to an inpatient bed for that care. However, in our system, another challenge, not widely described as a contributor to crowding in other nations, is that doctors assigned to inpatient services have been empowered to refuse to admit patients perceived to have overly “complex” needs. Further, patients with multisystem illnesses or end-stage status, who need ongoing chronic care to manage activities of daily living, have begun to populate Beijing EDs in increasing numbers. This is an issue with various root causes. © 2018 Elsevier Inc. All rights reserved.

**Keywords—**emergency department; overcrowding; observation; emergency department-boarded patients

#### INTRODUCTION

Emergency departments (EDs) are designed primarily to provide care for patients with sudden deterioration, due to

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either acute exacerbations of chronic diseases, or to sudden and potentially severe manifestations of an acute illness or injury. The role of the ED is crucial for public health. Providing acutely ill patients with rapid access to emergency care is the prime role of emergency medicine (1).

In 1981, the Chinese government published and enacted a policy that required EDs to become created in urban hospitals that had a large inpatient bed capacity. Since the creation of these EDs, the number of patients served as inpatients and in these hospitals' EDs has grown markedly, whereas the resources made available to provide inpatient and ED care have not been similarly expanded. One result has been severe ED overcrowding. ED overcrowding has been described as "the most serious issue confronting EDs in the developed world," and has been recognized internationally as an "international symptom of health care system failure" (2–6).

Since 1981, EDs in Beijing have had "urgent care" and "outpatient" beds. Urgent care beds were created for the care for the sickest patients, whereas outpatient beds have been utilized for care of the less critically ill.

Recent increases in ED overcrowding have necessitated the subsequent creation of 2 new classes of beds. These include beds in "ED Intensive Care Units" (ED-ICUs) and beds in "ED Observation" units with "ED Ward" (EW) beds. ED-ICUs serve patients who merit ICU-level care but who remain in the ED due to "access block," well after the decision to admit them has been reached, due to the unavailability of an appropriate inpatient ICU bed. Observation units with EW beds, created as a response to ED overcrowding, enable new, additional capacity within EDs to provide care for non-ICU patients who, for various reasons, cannot or will not be admitted promptly to hospital inpatient beds. Reasons for the inability to promptly admit these patients include not only access block, but also, refusals by inpatient doctors to accept certain patients for inpatient care. Inpatient admission refusals by inpatient physicians accrue in our system due to the perceived complexity required to provide that patient's inpatient care, or due to the patient's needs for long-term care.

Because emergency medicine is a relatively young discipline in China, publications reporting how Chinese EDs are administered are rare. The purpose of this study is to describe the ED patients' characteristics and their lengths of stay in the ED, the presence or absence of "exit block" due to a lack of inpatient capacity, and the apparent underlying causes for overcrowding in Beijing-area teaching hospitals.

## MATERIALS AND METHODS

This is a multicenter cross-sectional study. This research focused on results of a survey completed by the staff who were responsible for work organization at that ED, from

18 metropolitan teaching hospitals for the calendar years 2013 and 2014. The questionnaire included: A description of the source of data for each ED to complete the data collection from that ED, demographic information for each ED (including total annual census, subdivided as the total numbers of urgent care visits and the total numbers of outpatient visits), and the total numbers of ED-ICU and ED-Observation patients served each year in each ED (whether ED-Observation status occurred due to an inability to obtain agreement by inpatient doctors to admit the patient due to the perceived complexity of their needs, or due to the patient's need for long-term care of chronic or end-stage illness), and the total number of patients "boarded" in each ED each year before they were moved to an inpatient bed. To qualify as being "boarded," the patient who was subsequently moved to an inpatient bed had to have stayed in the ED a minimum of 8 h after the decision to admit them for inpatient care was made, in keeping with the Australasian definition of "access block." The time of a case of ED boarding starts when the decision to seek inpatient admission is made, and ends when the patient leaves the ED on their way to their inpatient bed.

Also compiled were the 10 most frequent diagnoses for each ED's patients, including categories of diseases for the ED visits, categories of diseases necessitating urgent care, categories of patients placed in ED-Observation status, and symptom groupings for ED visits and hospital admissions. Also reported are the "average ED waiting time" for obtaining physician care (the average of the total time between initial registration or triage until the patient was first seen by a physician) and the average time spent in ED-boarding status (for those patients boarded in the ED before they were moved to an inpatient bed), and the average time spent in ED-Observation status for the ED-Observation patients (the interval between the time of arrival at triage until the time of departure of the patient from the ED after being in ED-Observation status).

The demographic portion of the form was completed by the staff who was responsible for work organization at that ED. The administrative department of the hospital was responsible for the assurance of completion of the survey. The study team at each hospital was responsible for data entry work. Data were recorded manually on data collection sheets and subsequently transferred into a data spreadsheet (Excel, 2003; Microsoft Corporation, Redmond, WA) for further analysis.

## RESULTS

The study included ED visit data from all 18 of the city of Beijing's teaching hospitals for the calendar year 2013 and 2014. The data source for hospitals entering data

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