

Chapter 14

Appointment Order Outpatient Scheduling System with Consideration of Ancillary Services and Overbooking Policy to Improve Outpatient Experience

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ABSTRACT

Patient wait time and access to care have long been a recognized problem in modern outpatient health-care delivery systems. In spite of all the efforts to develop appointment rules and policies, the problem of long patient waits persists. Despite the reasons, the fact remains that there are few implemented models for effective scheduling that consider patient wait times, physician idle time, overtime, ancillary service time, as well as individual no-show rate, and are generalized sufficiently to accommodate a variety of outpatient clinic settings. The goal of this chapter is to improve the quality and efficiency of healthcare delivery by developing a physician schedule that meets the clinical policies without overbooking using an innovative wait ratio concept, a patient arrival schedule from the physician schedule accounting for ancillary services, an evidence-based predictive model of no-show probability for individual patient, and a model-supported dynamic overbooking policy to reduce the negative impact of no-shows.

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INTRODUCTION

Patient wait time and access to care have long been a recognized problem in modern outpatient healthcare delivery systems which impact patient and medical staff productivity and stress, the quality and efficiency of the medical care, the cost of healthcare. Despite all the efforts to develop appointment rules and policies, the problem of long patient and appointment availability during a clinic day persists. Regardless of the reasons for this problem, there are few implemented models for effective scheduling that consider patient wait time, physician idle time, overtime, ancillary service time, as well as individual no-show rate and that are generalized sufficiently to accommodate a variety of outpatient health care settings.

The goals of this chapter are to improve healthcare delivery by reducing patient wait time and increasing access to care; and to allow physicians to see the desired number of patients, while providing quality care across various outpatient clinic settings and specialties. To accomplish this goal, the four specific aims of developing a scheduling system are:

1. To develop a physician treatment schedule by using a 'wait ratio' concept instead of the traditional cost ratio that best accommodates the variation in visit types, treatment time, and clinic constraints, without overbooking.
2. To develop patient arrival schedule, based on the physician treatment schedule, accounting for ancillary services required before physician's visits (such as x-rays) minimizing patient wait time and eliminating unnecessary first consultations by the physician.
3. To develop evidence-based overbooking policies by understanding the cause of patient no-show, using a predictive statistical model that can estimate the probability of no-show rate for any individual patient that

incorporates the patient's characteristics, environmental concerns, and preference.

4. To incorporate a model-supported, dynamic overbooking policy into the scheduling system that minimizes the costs of patient wait, physician idle, and clinic overtime.

This chapter provides a step-by-step method for improving patient scheduling including data collection, determination of the best scheduled time interval for each visit type, creation of a physician schedule, a corresponding patient arrival schedule appropriate for required pre-activities such as x-ray and lab tests, and development of the evidence-based dynamic overbooking policies. The successful implementation of this approach will provide evidence to build a patient-centric outpatient environment, improving outpatient experience in terms of waiting and access to care.

By achieving the specific aims of this research, systemic wait times are expected to be reduced for both physician and patient and improve patient access to care by determining the most adequate treatment time interval for treating each patient type equally in terms of the 'wait ratio' under clinic constraints, taking into account any ancillary services required prior to physician's visit, and incorporating an overbooking policy that considers individual patient's characteristics and preferences. Access to care and efficiency of healthcare delivery will be improved, as well as the overall quality of healthcare. Since reduced patient wait times have the potential to reduce clinic and practitioner stress levels, turnover is expected to be reduced in the clinic, which will lead to improved overall quality of care. In short, the success of implementing the approach will improve the outpatient experience for both patients and medical staff and create outpatient clinics as healthier, more cost-efficient, and more approachable environments to ultimately improve the quality of care.

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