

Patient Scheduling Improvement in a Cancer Treatment Clinic Using Optimization Techniques

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Abstract : Chemotherapy is one of the most popular and effective cancer treatments offered to patients in outpatient oncology centers. In such clinics, patients first consult with an oncologist and the oncologist may prescribe a chemotherapy treatment plan for the patient based on the blood test results and the examination of the health status. Then, when the plan is determined, a set of chemotherapy and consultation appointments should be scheduled for the patient. In this work, a comprehensive mathematical formulation for planning and scheduling different types of chemotherapy patients over a planning horizon considering blood test, consultation, pharmacy and treatment stages has been proposed. To be more realistic and to provide an applicable model, this study is focused on a case study related to a major outpatient cancer treatment clinic in Montreal, Canada. Comparing the results of the proposed model with the current practice of the clinic under study shows significant improvements regarding different performance measures. These major improvements in the patients' schedules reveal that using optimization techniques in planning and scheduling of patients in such highly demanded cancer treatment clinics is an essential step to provide a good coordination between different involved stages which ultimately increases the efficiency of the entire system and promotes the staff and patients' satisfaction.

Keywords : chemotherapy patients scheduling, integer programming, integrated scheduling, staff balancing

Conference Title : ICHSOP 2019 : International Conference on Healthcare Systems Optimization and Performance

Conference Location : Rome, Italy

Conference Dates : March 05-06, 2019