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DisTeam: A decision support tool for surgical team selection

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Highlights

- We propose a decision support tool (DisTeam) for facilitating decision making in surgical team selection based on considering history of the surgical team, as well as the specific characteristics of each patient
- We take into account the surgical complications associated with teams and their members, their teamwork history, as well as patient's specific characteristics such as age, Body Mass Index (BMI) and Charlson Comorbidity Index score
- DisTeam is able to propose a ranked list of suggested surgical team(s) for a given patient that might minimize potential complications for the patient
- DisTeam was tested using intra-operative data from 6,065 unique orthopedic surgery cases
- Our results suggest high effectiveness of DisTeam in a health-care setting

Abstract

Objective

Surgical service providers play a crucial role in the healthcare system. Amongst all the influencing factors, surgical team selection might affect the patients' outcome significantly. The performance of a surgical team not only can depend on the individual members, but it can also depend on the synergy among team members, and could possibly influence patient outcome such as surgical complications. In this paper, we propose a tool for facilitating decision making in surgical team selection based on considering history of the surgical team, as well as the specific characteristics of each patient.

Methods

DisTeam (a decision support tool for surgical team selection) is a metaheuristic framework for objective evaluation of surgical teams and finding the optimal team for a given patient, in terms of number of complications. It identifies a ranked list of surgical teams personalized for each patient, based on prior performance of the surgical teams. DisTeam takes into account the surgical complications associated with teams and their members, their teamwork history, as well as patient's specific characteristics such as age, body mass index (BMI) and Charlson comorbidity index score.

Results

We tested DisTeam using intra-operative data from 6,065 unique orthopedic surgery cases. Our results suggest high effectiveness of the proposed system in a health-care setting. The proposed framework converges quickly to the optimal solution and provides two sets of answers: a) The best