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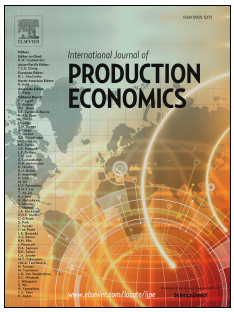

A bi-objective integrated approach to building surgical teams and nurse schedule rosters to maximise surgical team affinities and minimise nurses' idle time

C. Di Martinelly, N. Meskens

PII: S0925-5273(17)30159-7

DOI: 10.1016/j.ijpe.2017.05.014

Reference: PROECO 6720

To appear in: *International Journal of Production Economics*

Received Date: 2 September 2016

Revised Date: 17 April 2017

Accepted Date: 27 May 2017

Please cite this article as: Di Martinelly, C., Meskens, N., A bi-objective integrated approach to building surgical teams and nurse schedule rosters to maximise surgical team affinities and minimise nurses' idle time, *International Journal of Production Economics* (2017), doi: 10.1016/j.ijpe.2017.05.014.

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A bi-objective integrated approach to building surgical teams and nurse schedule rosters to maximise surgical team affinities and minimise nurses' idle time

C. Di Martinelly[1], N. Meskens[2]

[1]: IÉSEG, School of Management, LEM-CNRS (UMR 9221), 3 rue de la Digue, 59000 Lille, France, c.dimartinelly@ieseg.fr

2: UCL Mons, Louvain School of Management, 157 Chaussée de Binche, 7000 Mons, Belgique, Nadine.meskens@uclouvain.be

Abstract: This paper addresses the detailed assignment of nurses to surgical operations taking into account the skills requirements. We consider the building of weekly nurse schedule roster by assigning the nurses to surgical operations while generating teams which have strong affinities and minimising nurse idle times. Nurses are assigned to shifts based on their availability, legal constraints on their working hours and the elective surgery schedule. Building on the ε-constraint method, we propose a new bi-objective approach that can solve the problem faster and more accurately, as well as provide insight into the trade-offs between the two objectives. The approach is also used to gain more insight into the problem and evaluate the impact of nurse settings. In this paper, we considered the impact of using circulating and scrub nurses or using polyvalent nurses. In all instances and settings, the affinities between the surgical team members were more sensitive to variations in idle time. Furthermore, the use of polyvalent nurses yielded rosters with reduced idle time and better surgical team member affinities.

Keyword: operating room management, nurse assignment, multi-objective optimisation, surgical team affinities

Corresponding author: C. Di Martinelly, IÉSEG, School of Management, LEM-CNRS (UMR 9221), 3 rue de la Digue, 59000 Lille, France, c.dimartinelly@ieseg.fr, +33 (0)320 545 892

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