

Using social network analysis to identify sub-groups in the operating room

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Abstract

The frequency with which operating room (OR) staff work together can impact patient safety because staff who often work together share a set of experiences which may enable them to anticipate each other's actions and reactions in the future. Identifying sub-groups of staff who frequently work together is thus a significant step in investigating team skills and the knowledge needed to prevent mishaps. Here, social network analysis (a set of statistical techniques for analyzing networks of interactions) is used to quantify the frequency with which individual OR staff members in a large university hospital worked together on three types of operation over a period of 2.6 years. Details of the specific techniques used are given. It is concluded that social network analysis is a viable method to identify sub-groups in the OR.

Introduction

Operating room (OR) staff who frequently work together may be more effective in preventing mishaps because these staff share a set of experiences which enables them to anticipate each other's actions and reactions, especially in emergency situations where communication may otherwise be ineffective. An example of such *tacit communication* is described in a study by Friedman and Bernell (2006): A perfusionist was being interviewed when she suddenly excused herself and walked into the OR where her team was performing a coronary artery bypass graft surgery. She immediately prepared the heart-lung machine before hooking the patient's heart up into the machine without being told to do so by anybody. When asked about this afterwards, she told the interviewer that when she saw the monitor which provided the patient's vital signs, she knew that the procedures to isolate a small part of the patient's heart without using the heart-lung machine (an "off-pump" procedure) had gone wrong and that the surgeon, whom she had worked together with for many years, would want to put the patient on the heart-lung machine (an "on-pump" procedure) to circulate and oxygenate the blood while the heart was stopped and being operated. As a result, without having any explicit communication between the perfusionist and the surgeon, a potential mishap was prevented.

In D. de Waard, J. Godthelp, F.L. Kooi, and K.A. Brookhuis (Eds.) (2009). *Human Factors, Security and Safety* (pp. 391 - 400). Maastricht, the Netherlands: Shaker Publishing.