

# **Interactions and Performance in Healthcare Teams: The Case of AUOP Brest Unit**

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## **Extended Abstract**

Most healthcare services are strongly dependent on the patient case, medical knowledge and clinical evidence. Accordingly, they require a huge coordination effort in order to guarantee high quality care at affordable costs. Information sharing, communication, and coordination of multiple actors through internal and external processes have in fact a key role for achieving effectiveness, efficiency and flexibility of such operations. In this aim, clinical activities often rely on team-based work and involve collaborative features, typical of low or unstructured processes, which have not the same level of predictability of traditional ones (e.g. clinical procedures, medical treatments, etc). Specifically, the importance of interaction between physicians, medical staff and patients becomes ever more important for complex (e.g. Oncology) or chronic conditions where the diagnostic and treatment processes are highly interconnected, multidisciplinary and difficult to plan in advance. Wagner (2001) shows, for example, how quality of chronic illness care is affected by productive interactions between practice team and patients.

Past research has addressed coordination and collaboration issues in healthcare processes, particularly analyzing the link between team coordination and process effectiveness and efficiency (Borrill et al., 2000; Grippa et al., 2012). It is commonly accepted in fact that higher quality and more innovative care occur when professionals work and learn together, and engage in multidisciplinary meetings to improve clinical outcomes (Brown, 1982; Bell, 2001; Wagner et al., 1996; Sexton et al., 2006; Makary et al., 2006; Grippa et al., 2012). Nevertheless, teams and individuals are two fundamental nodes also for achieving efficiency and resilience (i.e. the intrinsic ability of a System to adjust its functioning prior to, during, or following changes) to healthcare systems – both at a macro and at a micro (patient) level. Teams for instance are engaged in a number of risky decisions whose success is strongly depending on capabilities characterizing resilient systems (Hollnagel et al., 2007): 1) the ability to predict something bad happening (e.g. teams assess scenario analysis for patient treatments in multidisciplinary meetings); 2) the ability to prevent something bad becoming worse (e.g. teams periodically re-evaluate patients' condition and plan for changes during the clinical treatment); and 3) recovery or the ability to recover from something bad once it has happened (e.g. teams flexibly organize internal resources to provide patients an adequate care in case of crisis).

Thus, understanding team dynamics and their relationships with team performance is valuable both for research and practice in order to improve

operational effectiveness, efficiency and resilience of collaborative activities in such a context.

In this direction, this study explores team dynamics accordingly to a novel perspective, the lens of microscopic social network, which are directly and quantitatively assessed through interactions of participants during teamwork. The work has to be framed in a wider research aiming at improving healthcare organizations by new organizational strategies, tools and work practices for better coordination among team participants.

Research question: How much the patterns of interactions within healthcare teams influence performance of coordination or collaborative activities.

The measure of physical interactions is enabled by the use of sociometric badges. Sociometric badges are wearable sensors and can directly measure and predict individual and collective patterns of behavior from unconscious social signals, identify social affinity among individuals working in the same team, and enhance social interactions by providing feedback to the users of system. The tool allows researchers to conduct more in depth quantitative analysis of interactions inside healthcare organizations leading to high level descriptions of human behavior in terms of (i) physical activity/human movement, (ii) prosodic speech features (rather than raw audio), (iii) indoor localization, (iv) proximity to other individuals, and (v) face-to-face interactions (Olguin-Olguin et al. 2009). The approach seems particularly valuable for informal coordination mechanisms, which are hidden to more formal methods and can allow overcoming limitation of past empirical analysis based on survey data collected by interviews, questionnaires and reports or direct observation which is up to subjective evaluation of the observer.

Data were collected during a 8 weeks contiguous period in the Breast Unit of AUOP, monitoring the activity of about 15 people during cross-functional meetings hold twice a week for discussing patient cases, decide treatments, planning the operating rooms and related surgery activities. A total of 15 meetings and 150 valid observations were gathered (about 50 working hours were recorded by sensors and available for the analysis). Also, through a survey to participants, we evaluated four main dimensions of performances of the meetings: the efficacy, the efficiency, the working climate during the meeting, and the overall satisfaction.

Preliminary results show that greater physical activity and less consistency in the body movement of team members indicate inhibition of participants and are correlated with a worse working climate during the meeting. Evidence also suggests that the magnitude and consistency of speaking during the meeting is correlated to the perceived results in term of both coordination efficacy and efficiency. Specifically, a high amount of speaking and a low consistency level in speech of participants worsen the efficacy and efficiency of the meeting as coordination mechanism. In addition, low consistency jointly with a high volume of speech is correlated to a lower satisfaction of participants. Finally, as expected, an increase in proximity of team members seems to increase the perceived efficacy and efficiency of the meeting.

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