

# **Team Performance in High Risk Environments – Communication in the Operating Room**

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**Abstract:** Work in high hazard systems is characterized by a high hazard potential to the population. Several research results prove that the surgical operating room is exactly such a work system. Epidemiological basic data show that patients risk to become a victim of medical mistreatment in the operating room is 10% or higher. One of the most frequent causes for mistreatment is through miscommunication. Thus, communication is an essential part of the team performance which has to be created by the operating team in order to work successfully. How can this team performance that is operationalized by communication appraisal be measured? For this, the observation questionnaire KOMSTAT (version 2.0b) of the Basel canton hospital was further developed into a questionnaire.

## **1. Context of research**

Thinking of work systems with a high hazard potential first of all nuclear power station, rail network and civil aviation come into our mind. Three Miles Island (1979), Bhopal (1984), Tschernobyl (1986), Eschede (1998) and Überlingen (2002) are only a few of those names which implicate some of the resulting catastrophes. This is the reason why these places gained a worldwide negative reputation. Something is different about these catastrophes though: it is the very different dimension of damage these catastrophes can cause. Not only people who are directly participating in these processes of such soziotechnical systems can become the one to suffer but as well large parts of the worldwide population. The high hazard potential for the population caused by the work systems mentioned above can also be caused by other systems which have not awoken the public opinion that much so far. Such a work system with a less obvious high hazard potential is the operative medicare in the hospitals operating rooms.

Recent surveys show that medical mistreatment is one of the 8 most frequent causes of death. (Rall et al., 2001). In the United States, there are, according to an Institute of Medicine report (IOM, 1999), between 44,000 and 98,000 patients who have died due to medical mistreatment. Thus, the rate of this cause of death is higher than that of car accidents, breast cancer or AIDS. The costs to the health care system are estimated at up to €20-35 billion per year. Results of the “Australian Health Care Study” (1995) prove that 3.3 million days in hospital are caused by medical mistreatment. Furthermore, it was proved that 1.7 million (8%) of all days in hospital are avoidable.

Recent survey results from the University College of London (Vincent, 2001) determined randomly on the base of 1,000 patient report samples of two British hospitals 119 case reports which ended fatally because of medical mistreatment. Thus, every 10th patient was adversely affected during his stay in hospital. 43% of complications result from mistreatments in the operating room. 8% of affected patients died in hospital while 6% suffered from lifelong damage. The question is where are the causes of these medical mistreatments in the operating room to be found. Initial information is provided by the worldwide data bank CIRS (Critical Incidents in Anaesthesiology) which is hosted by the section of anaesthesiology of the University of Basel. It covers anonymous reports on medical faults. Statistical evaluation showed that in 20% of reported cases team and communication factors were named as causes. The people who reported these medical faults suggested in 24% of cases an improvement in

communication as a preventive measure. These results are supported by some findings of several medical institutions in the United States that distribute by way of their website and brochures some hints on how to prevent “Wrong Site Surgery” thus misplaced surgical operation. The Physician Insurers Association of America (PIAA), for instance, has documented 1,000 cases among their 155,000 collected complaints where a “wrong site surgery” plays a role. The cause of fault in these cases is also classified as mainly being a communication problem; on the one hand in the form of a lack of communication with the patient and on the other hand inadequate communication within the team of physicians. The problem described has only recently awoken public opinion in Germany. The daily press describes medical mistreatment more and more by reporting on individual cases. The case of a 52-year-old patient whose lung was operated on and due to a “mistake” a part of his healthy right lung was removed instead of from his left which was cancerous (Süddeutsche Zeitung, 09.11.1999, S. V 2/14). As a consequence, first indications of the causes of such “mistakes” can be described by these individual cases. They also refer to the same difficulty as the above mentioned surveys; the case of an anaesthetist, for instance, who asked the surgeon during the preparations of the operation if the patient wasn’t intended for a breast biopsy. She had been prepared though for a thyroid operation. After being told to just worry about the woman’s sleep, the offended anaesthetist focused again on his work and the patient was operated on the wrong organ (Source: Interview with Prof. Daniel Scheidegger; Süddeutsche Zeitung, 09.11.1999, S. V2/14). The fact that the cooperation of the individual team members in the operation room is often insufficient is picked out as a central theme in an article of the “Ärztliche Nachrichten”. It is pointedly emphasized by the following headline: Team Spirit in the Operating Room is Quite Elusive” (Marburger Bund - Ärztliche Nachrichten, 2001, Nr. 11, S. 5).

## 2. Definitions and the general model of teamwork

Cooperation within the operating team cannot be considered as static, ideal condition. Moreover, team cooperation is characterized by trying to achieve a common behaviour. The specific situation in the operating room is a well-targeted setting in which a multiplicity of persons who have different kinds of occupation and knowledge are working together in order to achieve a common goal: “...the well-being of the patient” (Schaefer, Helmreich & Scheidegger, 1995). But what is a team and how do team members cooperate?

According to Dickinson and McIntyre (1997) a team consists of several individuals working together toward a shared goal. In order to achieve this, the individual team members have to coordinate their work with other team members, so that relevant information is shared. “Those behaviours of team members that engender a sharing of information and a coordination of activities are collectively called teamwork” (Dickinson & McIntyre, 1997).

Dickinson and McIntyre (1997) identified seven substantial components of teamwork. The components refer to the three variables: *Input*, *Throughput* and *Output*. The general teamwork model, as shown below in Figure 1, identifies the seven main components of teamwork. Communication is the major component of the teamwork process. Dickinson & McIntyre (1997) describe Communication as is the “glue” of teamwork, i.e. the component that links the other components. The term communication is conceptualised as both explicit and implicit means of distributing information within the team. Verbal communication will be defined as the only type of explicit communication. The question is how to observe and to measure the communication within an OP-Team for assessing the team performance?

grey columns = TSA related behaviour:

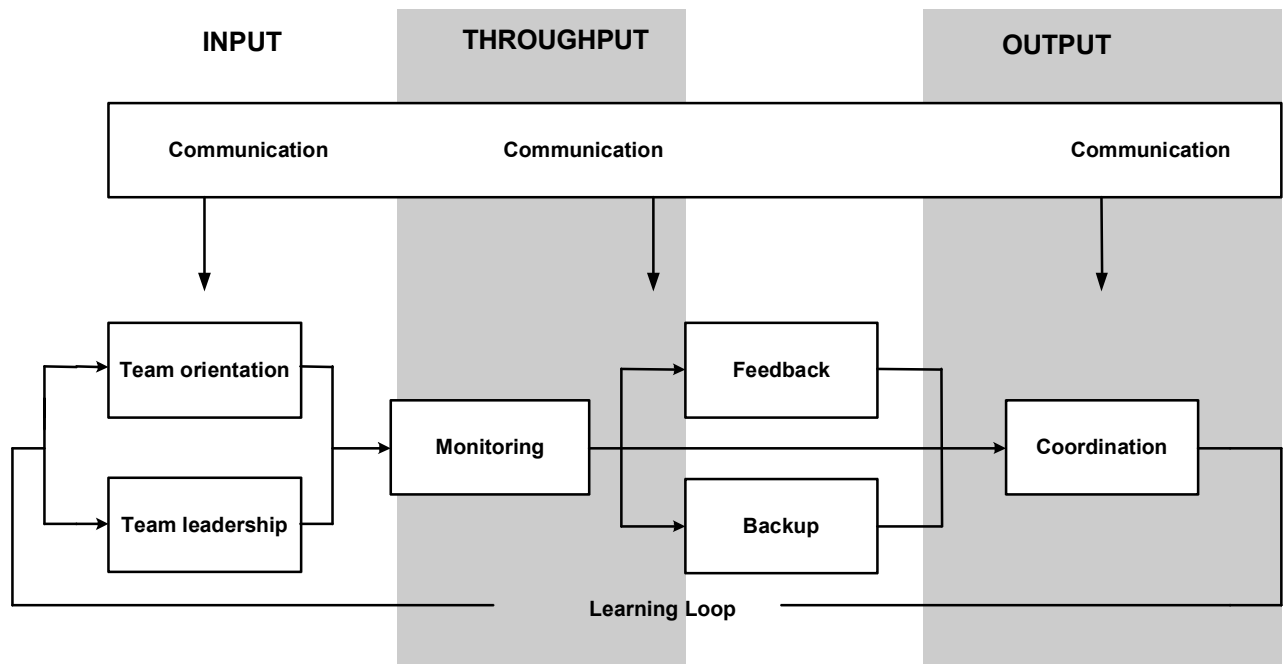


Figure 1: Teamwork Model, Dickinson & McIntyre, 1997

### 3. Method and sample

In view of the problem presented and considering the theoretical background an observing instrument was modified for the application in the OP-Team. The observation questionnaire KOMSTAT (Human Factors Gruppe, 1997) in the 2.0b version that was created in Basel canton hospital in order to judge team efficiency in operating teams was modified into a team performance questionnaire through the use of a 7-step Likert-scales. KOMSTAT was created according to an instrument that was developed to observe the team performance in aviation by assessing communication processes. After the adaptation of the instrument team performance in the operating room was ascertained on the dimensions “team concerns”, “decision making/communication” and “management of the labour situation”. Dimensions weren’t altered and items were modified to statements. By the modifications it was taken into consideration that the operating team observer differentiated in their values of observation (by using KOMSTAT) which was expressed in their interrater-reliabilities (Küpper, 2001). Thus, the enquiry using the questionnaire was preferred by all occupational groups in the operating room.

Up to now n=190 participants from the occupational groups of anaesthesia, surgery and nursing staff of different hospitals were asked about their experiences of team performance in the operating room by using the new questionnaire. In doing so particular attention was paid to the fact that the randomly chosen sample possesses a sufficiently large variance according to its expertise in the respective profession. Up to now there are 8 hospitals in different countries who are participating in the project. The first results are expected in the third quarter of 2003.

### 4. Perspective

The chosen method represents an initial attempt to allow an assessment of performance concerning specifically chosen criteria; thus an ergonomic and a psychological basis for two different aspects can be provided: 1. a selection of teams or people who in the sense of a

measure of a human resources development participate on a communication training and 2. an example for a scientifically evaluated method for an assessment of performance can be generated which has not existed in this way so far. For the concrete context of research this means that a basis was established on which methods of training can be developed and /or pre-existing procedures can be inserted in order to raise the patient's safety in the surgical operating room.

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