

## Exploring the nature of high responsibility teams– a case study of emergency medical care

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### Key Words

High Reliability Organization, High Responsibility Teams, Emergency Medical care

### Abstract

*Organizations have been attempting to influence safety culture at their sites to transform into a High Reliability Organization (HRO). These organizations are technologically sophisticated and more proactive to promote culture of safety. Emergency Medical Care (EMC) is one such HROs, have gained a lot of researcher's attention in the recent times. People in EMC are highly trained and they are confronted with uncertainty and fluctuating workload. The ability to provide immediate medical care is fundamental and critical. Methods for identifying and monitoring work and contextual factors to enable team performance are rare. In this case study we have observed the nature of High Responsibility Teams (HRTs) operating in EMC of a major Cardio vascular research institute which is accredited by National Accreditation Board of Hospitals (NABH) at Bangalore, India. We observed the work flow and operational challenges faced by the HRTs.*

*A multiple case study design method was implemented coupled with a contextual enquiry by exploratory and confirmatory interviews of doctors and nurses who worked together as a team in EMC. To analyze the result we used pattern matching method described by Donald Campbell (1975).The analysis showed that the role of teamwork between nurses and doctors is critical to the patient safety. The results from the case study specified five aspects of work environment (a) Complexity (2) Responsibility & Accountability (3) Effective Communication (4) Difference to expertise and Dynamic Work Environment. This present study concludes how understanding the role of team work is crucial and emphasis on the need of team work training in EMC.*

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### 1. Introduction

In recent years there is an increase of studies emphasizing the control of major hazardous risks, in particular to the philosophies of high reliability organizations, resilience management and safety culture (Lekka. C, 2011).High Reliability Organizations (HROs) are defined as complex and technologically sophisticated, where in a system failure may result in catastrophe (Perrow, 1984; Roberts and Rousseau, 1989). High Responsibility Teams (HRTs) are occupied in medical, crisis management, and air traffic control teams; they face many challenges during their daily tasks. These challenges include working under time constraints, unexpected events, and severe consequences of errors (V. Hagemann et al., 2012).

The concept of HROs has been around for more than 20 years, but has recently begun to take hold in health care with the publication of *To Err Is Human* and The Agency for Healthcare Research and Quality (AHRQ's) patient safety agenda (BakerD. P, DayR., and SalasE., 2006). Emergency medical care (EMC) providers just like aviation crews, work with different partners in a variety of settings. These highly trained individuals routinely are asked to perform together but rarely have formal training in doing (Williams, Rose and Simon, 1999). This clearly indicates the principles of HRO have been identified in the field of medical care especially with respect to emergency and trauma care. Therefore there is a pressing need for research to provide a more nuanced, contingency framework, to help organizations to identify HRTs practices that fit their particular situation. Hence the present case study aims to understand the nature of team work in EMC.

## 2. Aim and Objectives

The aim of the study was to understand the nature of work context of HRTs to determine the relevant variables or aspects to be included in a questionnaire by assessing the work and situational factors by exploratory & Confirmatory Interviews. The objectives of this study are (a) to determine collective work flow and operational challenges faced by HRTs and (b) To Link the collective flow model with theoretical propositions. Following are theoretical frame work given to understand the context and structure of HRO.

- To understand the nature of HROs Karl and Weick proposed 5 principle of HROs, (a) Preoccupation with failure (b) Reluctance to simplify (c) Sensitivity to operations (d) Commitment to resilience and (d) Difference to expertise (Weick, K. E., & Sutcliffe, K. M., 2011).
- To understand the structural response of the team we employed La Porte and Consolini's (1998), three modes of organizational behavior in HRO; (a) Routine or Bureaucratic (b) High - tempo and (c) Emergency.

## 3. Methodology

**3(a) Choice of Method:** The case study method was adopted to understand the contemporary phenomenon within in real-life context and we learnt the fact that the boundaries between phenomenon and context are not clearly evident in HRTs and in real life situation too. A case study is an analysis of a single unit (e.g., a person, group, process, or object) focusing on the developmental factors of that unit in relation to the context (Strauss A. L. and Corbin.J. M, 1990), so we explored work context through contextual enquiry. Figure 1 below shows the phases of interview conducted.

**3(b) Data material and analysis:** The present study we have two level of analysis, (a) To build a collective flow model and (b) To Link the flow model with theoretical propositions

- Building up consolidated flow model:** To bring together each different type of work model to reveal flow of information, team members co-ordination, operational challenges and task environment.
- Confirmatory Interviews:-** We had interpretation session with the team members of EMC. The aim of the session was to create a shared understanding of the observed work flow and operational challenges from exploratory interviews. The session focused to capture the conversation, including breakdowns and influences in sequence.
- Linking data with proposition:-** From the developed collective work flow model, the components of the model which is representing several pieces of information were related to theoretical propositions of HRO literature by pattern matching method described by Donal Campbel (1975).

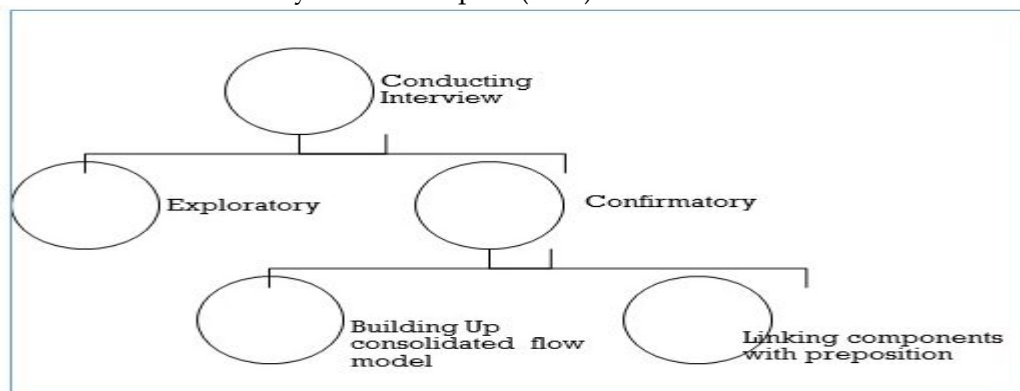


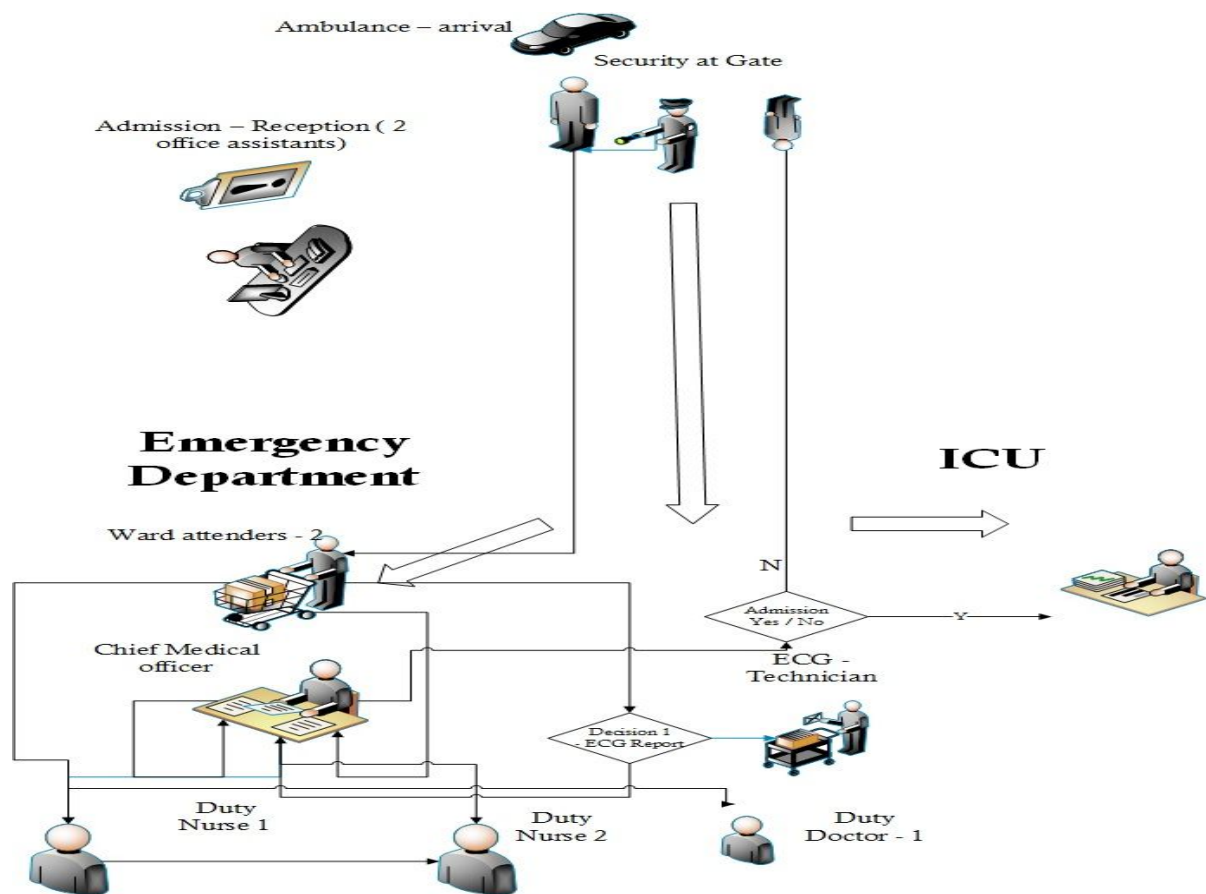
Figure 1: Showing the phases of interview conducted

## 4. Discussion

### 4.1 Context

The Cardiovascular Sciences & Research institute is a Government owned Autonomous Institute and is offering super specialty treatment to all Cardiac patients. It has got 600 bed strength. Presently on an average 800-1000 patients are visiting this hospital every day. The emergency department on an average attends 80-100 emergency cases less than 24 hours. (2) The Multi super specialty Hospital is private owned offering round the clock service in (a) Accident & Emergency, (b) Blood Bank, (c) Dialysis, (d) Laboratory (e) Radio diagnosis (f) Pharmacy & (g) Inpatient Services. It has got 650 bed strength. The A&E department on an average attends 50-60 emergency cases less than 24 hours. The hospital have accredited by NABH on providing continual quality patient care with the NABL accredited Laboratory and radio-diagnostics.

From the confirmative interview collective work flow model was derived (as shown in the figure - 2 below) and the components of the model were linked to HROs theoretical prepositions.



**Figure 2:** Showing the Collective Work flow model

During the operational tasks carried out by the members of EMC, we observed the prevalence traditional hierarchy during routine period involving initial assessment, vital assessment and case history. The traditional structure is derived from the present case study on the observations of workflow pattern. But during critical or high peak hours of ED (for ex; when more two emergency cases reported back to back) we have observed a gradual dissolving in the traditional hierarchy structure and task was carried out by prioritizing the safety of patient first based on the degree and severity of emergency cases. Further from the interview and observations from field, we listed out the operational challenges faced by CMO, Duty Medical Officer and Nurses in EMC.

**4.2: The Operational Challenges - Duty Medical Officer (DMO):** The DMO are accustomed to communicate and make the patients understand about the non- speciality versus speciality cases to convince patients to go to other general hospitals. The legal and medical issues in declaring death on arrival are the critical situation handled by DMO. In case of multiple organ failure, prioritizing the heart with other organs is difficult and taking opinion from other speciality experts will delay the decision making of the patient. To handle the instructions and different opinions of their senior colleagues, specialist and experts. DMO has to work in collaboration, also he has to collaborate with ICU department for resource allocation and manage manpower during peak workload.

**Duty Doctors (Residents):** During the observation most of the duty doctors were Post Graduate students working as residents who are posted to ED on adhoc basis. We observed communication problem with PG students with respect to local language. Language barrier in understanding the patient's history was a huge challenge. Unable to match local language required a mediator to communicate with patients. Most of the time this assistance is provided by the nursing staff to help with translation. Further, PG students found difficulty to provide understanding to patient and their relatives about the non- speciality versus speciality cases.

**Duty Nurses:** As soon as patient admitted in ED gets an initial treatment and stabilized, the next task for duty nurses is to shift the patients to Intensive Care Unit (ICU) for observations and further medications. During the observation we found that duty nurses and ICU staff co-ordination was a problem at the time of admission of the patient. At the surge of peak workload, nursing staff face difficulty to have proper communication with patient attendees, which may lead to conflict. The non-availability of beds or delay in shifting the patients was creating a bottle neck in workflow. Duty nurses were required to assist PG doctors with language translation in each step of emergency care. In our observation we found majority of communication with patients and relatives are all handled by nurse.

We observed the prevalence of traditional hierarchy during routine period involving initial assessment, vital assessment and case history. This traditional structure is derived from the observations of collective workflow model and norms followed by the ED teams. At the first contact, nurse staff attended the patient for initial and vital assessment, followed by ECG technician to carry out test, then the resident or duty doctor to collect the case history and further treatment plan is advocated by the CMO. But during critical or high peak hours of ED (for ex; when more two emergency cases reported back to back) we observed a gradual disappearance in the traditional hierarchy structure and task was carried out by prioritizing the safety of patient first and workload is divided based on the severity of emergency cases.

Based on these observations form the work flow and the operational challenges, we observed a set of categories which govern the nature of team work in EMC. (a) **Complexity:** - Teams operate in higher degree of complexity, especially when we look at the challenges faced by the doctors and nurses. The complexity is contingent upon the multiple informational cues, wide range of safety critical systems, monitors and nurse call systems (b) **Responsibility & (c) Accountability:** - Responsibility is the ability of the team to perform under stated conditions for the required period of time. Accountability is team being answerable to one's superior for the exercise of one's authority and the performance of one's duties, which we observed under nursing staffs and residents in their respective units. (d) **Effective Communication:** - The team's ability to plan and work together depends on communication strategies. Regardless of how brief, efficient communication is essential to share information of the situation and create a plan for solving the challenges posed in team. Here we did not find any communication strategies by residents. But majority of communication was handled by nurse and supporting technician, including the counselling of the patients. Due to the language barrier only few of doctors were able to communicate to patients about workups, discharge and follow-ups of the patients.

(e) **Dynamic Work Environment:** - What we observed in this case study is that, nature of actions and task carried out by the team is highly dependent on time and environment. The uncertainty with the nature of medical cases, timely availability of critical information and extent of interdependency between uncertainty and environment are unpredictable by the doctors. Hence they operate under highly constrained systems where the actions of the agent (doctor or nurse) and time is highly interdependent, because sometimes rate of emergency cases are high or low, the extent and severity of emergency cases are unknown (multiple organ failure) and the availability of time to react is very less.

The above observed patterns among the members of EMC are the characteristics of HROs which is an essential component of such ED. HROs will not achieve high reliability unless its members are able to communicate effectively and efficiently coordinate their activities with other team members. The challenges faced by the EMC teams are basically due to lack of effective communication (language matching), co-ordination, task simplification and prioritization at different levels.

### 5. Limitation and Future directions

This study similar to all case studies has limitations. But the contextual enquiry have helped us to build collective frame work in which the present study may implemented new way information manage system to monitor, control and modify team work. Indeed many scholars have tried to understand the nature of team work from its antecedents like output, quality and other performance indicators. Future research we are focused to determine the relevant variables or aspects of the work and situational factors HRTs. To develop and test a questionnaire based methodology to empirically validate theoretical principles of HROs and Insights form case studies.

### 6. Conclusion

The present we focused on two basic themes. First, Collective Work flow model, by its nature, requires that organizations providing such services act as HROs and second challenges faced by EMC, as patients today expect error-free care (G.E Knox & K.R Simpson, 2004). From the case study it reveals that teamwork is an essential reliability and accountability. We had observed set of governing themes in understanding the nature of HRTs in EMC. Although it is not the sole determinant of high reliability, HROs are comprised of teams embedded in multi-team systems and effective teamwork is critical in environments that demand high reliability for success (K.A Wilson, C.S Burke, H Priest, & E. Salas (2005).

### References

- Baker, D. P., Day, R., & Salas, E. (2006). Teamwork as an essential component of high-reliability organizations. *Health services research*, 41(4p2), 1576-1598.
- Campbell, D. T. (1975). III. "Degrees of freedom" and the case study. *Comparative political studies*, 8(2), 178-193.
- Williams, K. A., Rose, W. D., & Simon, R. (1999). Teamwork in emergency medical services. *Air medical journal*, 18(4), 149-153.
- Knox G.E & Simpson K.R (2004) "Teamwork: The Fundamental Building Block of High-Reliability Organizations and Patient Safety." In *Patient Safety Handbook*, edited by B. J. Youngberg and M. J. Hatlie, pp. 379-415. Boston: Jones and Bartlett.
- Hagemann, V., Kluge, A., & Ritzmann, S. (2012). Flexibility under complexity: Work contexts, task profiles and team processes of high responsibility teams", *Employee Relations*, Vol. 34 Iss: 3 pp. 322 - 338.
- La Porte, T., & Consolini, P. (1998). Theoretical and operational challenges of 'high reliability organizations': air traffic control and aircraft carriers. *International Journal of Public Administration*, 21 (6-8), 847-852.



- Lekka, C., & Sugden, C. (2011). The successes and challenges of implementing high reliability principles : A case study of a UK oil refinery. *Process Safety and Environmental Protection*, 89(6), 443–451. doi:10.1016/j.psep.2011.07.003
- Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. New York: Basic Books.
- Roberts, K. & Rousseau, D. M. (1989). Research in nearly failure-free, high reliability organisations: Having the bubble. *IEEE Transactions on Engineering Management*, 36 (2), 132–139.
- Weick, K. E., & Sutcliffe, K. M. (2011). *Managing the unexpected: Resilient performance in an age of uncertainty* (Vol. 8). John Wiley & Sons.
- Wilson KA, Burke CS, Priest H, & Salas E. (2005). "Promoting Health Care Safety through Training High Reliability Teams." *Quality and Safety in Health Care* 14: 30
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