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# Factors Contributing to Task Success: Safety-II in the Context of Community-Based Patient Discharge

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**Abstract.** This explorative study investigated Safety-I and Safety-II elements in six focus groups with experienced staff involved in the patient discharge process from a community perspective. The elements explored included defining a good discharge, potential errors, influencing factors, weak signals, learning opportunities, and elements that assisted in achieving a successful task outcome. Key findings included identifying person-, task-, and organization-related examples that promote a good discharge. The weak signals and elements aiding success were categorised using the SEIPS 2.0 model.

**Keywords.** Patient discharge, Safety II, Signals, Error

## 1. Introduction

Safety in the past has been defined as the absence of harm or risk, whereby the number of errors or negative outcomes is as low as acceptably possible (Reason, 1997). Consequently, it is measured by its absence (Hollnagel, 2014) and safety interventions are predominantly reactive, initiated by an adverse event. Because of this definition certain limitations are created which consist of focusing predominantly on incidents and adverse events, as well as limiting the opportunity for learning to events that only occur rarely (Hollnagel, 2014). Due to these limitations, a new definition of safety has emerged where the focus is on the ability to succeed under various circumstances (Hollnagel, 2014). This has also resulted in new opportunities for assessing and improving safety (Hollnagel et al., 2013).

Traditionally variability has been seen as a negative aspect that should be minimized and limited as much as possible to improve safety. However, performance variability within a system is both normal and a necessity for a system to function (Hollnagel et al., 2013). A worker's ability to adjust and adapt their performance may be key to completing tasks successfully by balancing the work system (Holden et al., 2013) to reduce the difference between actual and ideal performance (Hollnagel and Woods, 2005). This ability to adjust and adapt performance to ensure success is one of the elements of Safety-II. It requires anticipating, identifying and responding to signals to determine how to adapt one's behaviour (Hollnagel, 2014). By anticipating potential events, monitoring the current state, responding effectively and learning from past experiences, a system has the potential to become more resilient (Vogus & Sutcliffe, 2007).

The strength of those signals that can lead to anticipation are often weak, ambiguous and vague in nature (Ansoff & McDonnell, 1990). So they need to be actively sought out and created by processing interrelated events, prior knowledge and future expectations to understand the information they provide (Macrae, 2014). They also require interpretation and sense-making (Weick, 1995). An opportunity arises to address these unexpected events in a more cost-effective and timely manner through early detection by identifying these signals (Vogus & Sutcliffe, 2007). At present, very limited literature and methods for studying success as defined by Safety-II have been developed (Hollnagel, 2014).

As Safety-II aims to provide insight into how individuals, teams and organizations within a system continually achieve planned outcomes despite adversity (Vogus & Sutcliffe, 2007), traditional methods and models that have been used to assess work may provide a suitable starting point. The Systems Engineering Initiative for Patient Safety (SEIPS) 2.0 (Holden et al., 2013) is one such model. It provides a framework for the analysis of processes and the relationship of various elements that occur in healthcare (Carayon et al., 2006). It consists of three key components: the work system, which is composed of six elements; process; and outcomes (Carayon et al., 2014). The work system elements include the person, tasks, tools and technologies, the physical environment and the organizational conditions (Carayon et al., 2014).

Patient handover incidents have been identified as an international concern because of both the safety and cost implications, and have recently received an increased interest from the research community (World Health Organization (WHO), 2007). Communication during patient care handovers has been identified by WHO as one of the 'High 5' sentinel events (WHO, 2013) due to the potential for communication breakdown resulting in harm to the patient (WHO, 2007). In addition to the safety benefit, the discharge process has also been identified as a potential area for cost containment (Gonçalves-Bradley et al., 2016). By ensuring the discharge process is as quick and safe as possible, inpatient costs can be reduced. Ensuring that adequate post-discharge support is in place can also reduce unplanned readmissions in certain cases (Phillips et al., 2004). Even a slight decrease in readmission rates could potentially have a considerable financial impact (Burgess & Hockenberry, 2014). Despite numerous case studies being undertaken, the nature of discharge process is complex and an effective intervention is not yet available. So additional research in this field is justified and worthy of consideration.

### *1.1 Aims and Objectives*

The aim of this study was to better understand the system for transfer of care once the patient has been discharged into the community. The objectives included: identifying the potential errors and influencing factors in the discharge process from the perspective of the community staff involved; determining the characteristics and elements of the work system and processes that help ensure the discharge is a success. The discharge process is complex and spans several different subsystems within healthcare. So, in planning the development of an appropriate intervention, one first needs to determine both the elements of the current system that work well and the types of things that go wrong. This study aimed to complete this initial requirement and provide the basis for an intervention development plan.

## **2. Methods**

The study adopted an explorative qualitative method aimed at investigating aspects that lead to performance failure and success within the patient discharge field using focus groups. This qualitative approach was adopted due to the fuzzy nature of weak signals and to recognise that the field of Safety-II is still emerging. The focus groups drew upon the experience of the staff involved in the discharge process to investigate: why discharges fail; could such failures be prevented; and the characteristics that ensure a successful discharge. Six focus groups were conducted across three directorates of the Nottinghamshire Healthcare NHS Foundation Trust (NHCT). Each focus group comprised of two consecutive components, one focusing on Safety-I elements, the other on Safety-II. Each component was about 45 minutes long with a 20-minute break in-between the two. The project was described to the participants of each focus group before starting, and the project information

sheet, the informed consent sheet, and demographic information sheet was distributed and returned.

The emphasis of the first component in the focus group was on the elements of the discharge process that work well and improve patient safety. These questions were developed using the SEIPS 2.0 model (Holden et al., 2013), specifically incorporating the work system elements, and the literature on Safety-II. During the main discussion, the group was encouraged to develop a definition of a good discharge from the perspective of the staff as well as that of the patient. Participants were encouraged to discuss how stable their work conditions are, if their work requires a high degree of improvisation and how predictable the work situation is. Following the development of the definition, the discussion was guided by one of the researchers through the following series of questions:

1. What is the best or optimal way to perform your work? What personal elements ensure a good discharge? (Person-related) What needs to be in place? (Requirements)
2. What can happen unexpectedly during the task and how do you prepare for it? (Task-related)
3. Are tools in place that assist with this? (Tool-related)
4. What do you need to be in place for the discharge to be a success from your team/unit? (Requirements for team/group/unit/departement)
5. What organizational elements assist in ensuring the discharge is a success? (Organizational factors)

The emphasis of the second component in the focus group was on the potential elements for error recovery and identification of weak signals. These questions were developed based on the Safety-II literature. The main discussion was guided through the following series of questions by one of the researchers:

1. What could go wrong with this task? (Error)
2. What external factors would influence this task? (External Factors)
3. How do you know the task is going wrong? (Trigger)
4. When you know it is going wrong, how do you correct yourself? Can you pre-empt the task? (Reaction/Monitoring)
5. Do you use this knowledge next time you do this task? (Learning)

The discussions for both components of the focus groups were recorded using two audio recorders and one researcher writing field notes. During both discussions, one of the researchers compiled a summary of the key points raised on a white board or flip chart. The audio data was transcribed by the researcher E. Burford and analysed together with the field notes and summary points made during the discussion. The results were analysed by identifying common themes across the groups and by using the SEIPS 2.0 model. Ethical approval for this project was granted by the Loughborough University Ethics Approval (Human Participants) Sub-Committee and the NCHT.

### **3. Results**

#### *3.1 Participant Characteristics*

There were seven participants each in five of the six focus groups. The sixth had four. The mean number of years involved in patient care across all six was 16.6 years ( $\pm 10.6$ ). The mean number of years in the current position was 3.6 years ( $\pm 3.6$ ). These positions included

community and district nurses, locality managers, community physiotherapists and occupational therapists, assistant practitioners, and a team leader of a care home team.

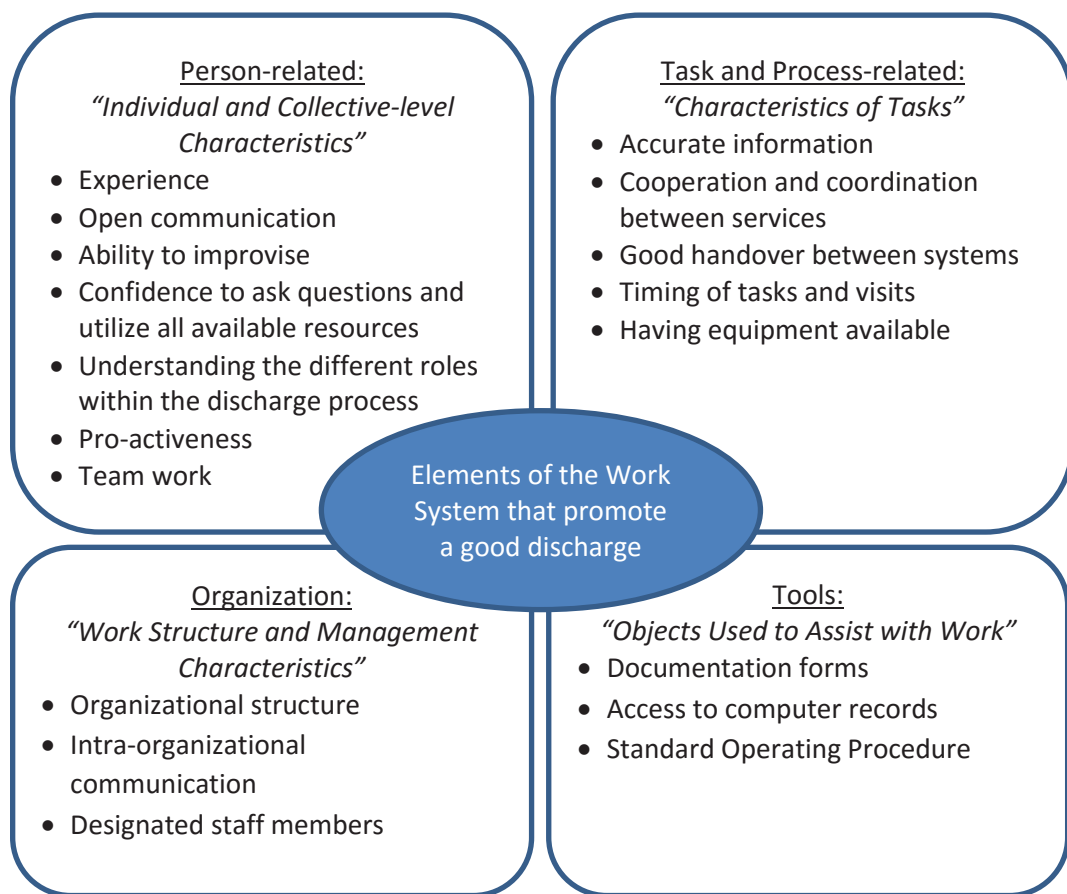
### *3.2 Safety-I*

Common errors identified included errors relating to inappropriate or missing equipment, missing medication and inadequate packages of care. Error producing conditions identified consisted of a lack of communication between the different services involved in the process, and missing or incomplete information or documentation. Potential factors that would influence the task and task-related behaviour identified included patient-related factors, time-related factors, and organizational factors. The organisational factors may relate to the internal organisation (in this case NHCT) or to external organisations such as an acute hospital provider. These organisational and managerial factors may not only influence the worker and task but may also affect an individual's ability to adapt and adjust their performance.

### *3.3 Safety-II*

Participants were asked to consider from their experience the aspects of a good discharge, both from the patient's and the staff member's perspective. During the discussion on the definition of a good discharge, the groups mentioned that many of the aspects that made the discharge a positive experience for the patient were similar to those that made it a positive experience for the staff members. This included: information being available and accurate e.g. information for the family as well as for other service providers involved in the discharge process; effective communication between patient, family, staff and other services involved; accurate documentation; and that the necessary medication and medical supplies were available and given to the patient at the point of discharge. The additional patient-specific aspects of a good discharge included: being timely; the family being informed in advance; the home environment being prepared and ready to receive the patient; a smooth transition of care; and organized transport. During the discussions on the definition of a good discharge, numerous participants also described the discharge process as being potentially unpredictable in certain cases. This required staff to be reactive towards the presenting situation and services to change to support the anticipation of the unexpected.

Following this, participants were asked to consider the elements that assist in promoting a good discharge. The results have been categorized according to the SEIPS 2.0 model, and the results for the different elements are depicted in Figure 1.



*Figure 1: The categories of the results found for the 6 focus groups for the different elements of the work system from the SEIPS 2.0 model that promote a good discharge.*

Examples of work system elements that promote a good discharge categorized as person-related included: experience; open communication; ability to improvise; confidence in asking questions as well as utilizing all available resources; understanding the job-roles of the individuals involved in the process; good team work; and being proactive e.g. by “chasing” discharges for that day in the morning. Examples of task-related elements included: the information provided during the task is up-to-date and accurate; effective cooperation and coordination between the services involved; good timing of tasks e.g. the timely informing of other services about the discharge; ensuring cut-off times are considered and maintained to ensure patient safety; and that the necessary and appropriate equipment is in place before discharge. Examples of tool-related elements included: well completed documentation forms including referrals, therapy forms and discharge letters; having access to computer records to access the latest information on the patient; and standard operating procedures. The standard operating procedures were described as an aid in specific cases in easing the discharge process across localities. Examples of organization-related elements included: organizational structures such as integrated teams; good intra-organizational communication; and designated staff members such as having a key contact person within the acute hospital.

In the second component of the focus group, participants were asked to discuss how they knew the task may be going wrong, and the signals that indicated this and that may suggest that an adjustment or adaptation is necessary. These signals if acted on can change the



progression of the task and may assist in ensuring a successful outcome. The signals identified in the focus groups were classified as either indicating a mechanism for the identification of the signal or the source of the signal. The mechanisms for identifying signals included: visual signs; integrated teams; and awareness of a patient's history and current health status. The source of signals identified included: the patient's physical state and the state of their home; patient documentation; and key aspects of the patient history e.g. on previous readmissions. The experience of interaction with the patient's family was also identified as a source e.g. families continuously contacting health services for support, family behaviours such as becoming intense and disengaged during interactions with community staff. The participants mentioned that they also felt that identifying these signals is a necessary component of their current work, as this requires them to adapt the patient's treatment plan accordingly to avoid readmission.

The identified signals were then classified further according to the SEIPS 2.0 model whereby the sources of signals corresponded to the work system elements and the manifestation form of the signals corresponded predominantly to the work process elements of the model. The sources of the signals could be categorized as the following elements from the work system: "person", "tasks", "organization" and "internal environment". Examples of signals originating from "person(s)" in the system included the patient's physical state, and feedback from the patient and their family. Signals originating from the "internal environment" included the state of the patient's home. The manifestations of the signals included the different sensory signals as well as feelings that could not be described in more detail other than the experience of intuition. These forms included heightened awareness due to an unfamiliar aspect or element of the task, and visual or sensory signals.

The final aspect discussed during the focus groups considered the potential learning opportunities and how one would pass the knowledge regarding signal identification on to more junior members. These included: the need for reflection with different staff members; regular meetings to allow for feedback; team handovers to share best and worst practice; clinical supervision; and sharing experiences and information with different occupational groups. For these learning opportunities to be realized it would be necessary to ensure that learning and adaptation occurred throughout the organization because the organization as a whole would need to assist in ensuring that the work environment allows for learning at an individual, unit and potentially at other levels.

#### **4. Discussion and Conclusion**

The method above investigated both Safety-I and Safety-II elements. The Safety-I elements addressed in this study included specific potential errors and error producing conditions related to the discharge process that may result in adverse events whereas the Safety-II elements investigated included signals, learning opportunities and work elements that may assist in task success. These Safety-II elements may aid in rendering a system more resilient by improving the ability to succeed under varying conditions (Hollnagel, 2014). Weak signals may also provide a means for effective risk management in that they provide an opportunity to be proactive and identify aspects that threaten safety (Macrae, 2014), and consequently to respond to hazards earlier. The proposed method provides a preliminary basis for the investigation of signals and work elements that may aid in task success. This research provides a practical basis for developing work processes so that current aspects that staff feel work well are incorporated into new procedures. Participants gave positive feedback on the focus groups as a source of sharing ideas and as a platform to discuss task aspects that work well. They also felt that the Safety-II aspect was novel and could possibly offer a new element or perspective for developing interventions. Further investigations are

required to identify additional elements that aid in task success as well as the factors that promote or inhibit signal identification. Future research should also investigate the role Safety-II elements can play in intervention development plans.

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