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Establishing a patient safety pilot program in UCSF Medical Center – Benioff Children's Hospital: Principles, System Analysis, and Initial Steps

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Abstract

Patient safety is a serious public health issue impacting individuals in all healthcare settings. UCSF Medical Center is a leading healthcare organization in San Francisco, dedicated to providing the safest and highest quality care to its patients. In an effort to further promote patient safety, the Family Escalation Project was created to enhance the communication between patients, families, and healthcare providers in the UCSF Benioff Children's Hospital. This project was created in response to an adverse event in which a safety concern was not appropriately escalated. The goal of the project is to create a mechanism for patients and families to independently escalate their safety concerns. The project utilized a multidisciplinary team to investigate the human and system errors that contribute to compromises in patient safety. This investigation assisted the team in developing a comprehensive mechanism and workflow for patients and families to escalate their safety concerns. This paper outlines the core principles and analysis patient safety and healthcare systems, details the specific activities completed for this project and describes the next steps for the program going forward.

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Introduction

I conducted my fieldwork at UCSF Medical Center. This facility is a leading healthcare organization comprised of over 8,000 employees who provide patient care and conduct pioneering research with locations throughout San Francisco and outreach clinics in Northern California and beyond. UCSF Medical Center is dedicated to providing the safest and highest quality of care for its patients. In an effort to promote patient safety, the Family Escalation Project hopes to develop a mechanism for parents and patients to use in the Benioff Children's Hospital (BCH) to escalate their safety concerns.

In my fieldwork, I served as a member on a multidisciplinary team to create the Family Escalation Project, with a goal to establish a mechanism for families and patients in BCH to independently escalate their safety concerns. The team researched and collaborated on possible mechanisms and identified resources within the Medical Center to help create the framework for this program. The team has developed the necessary workflow and response for this process and is continuing to create education materials for staff and families. This ongoing project will be launched in the UCSF Benioff Children's Hospital in the coming months.

Patient safety is a complex public health issue with a variety of contributing factors. This project required a great deal of investigation and research into the human and system elements that contribute to adverse patient safety events. This investigation assisted in the development of a robust solution for families and patients to escalate their safety concerns and to facilitate the communication between patients and providers.

BACKGROUND

Patient Safety

Patient safety is a serious public health issue impacting individuals in all healthcare settings. Simply put, patient safety means the extent to which potential risks are avoided and inadvertent harm reduced in care delivery processes (Wale, 2005). There is significant evidence that demonstrates a multitude of patients are harmed from their healthcare, either resulting in permanent injury, increased length of stay in hospitals, and even death. According to the Center for Patient Safety, up to 98,000 patients die annually in hospitals due to medical errors (2016). Additionally, an estimated 1.7 million healthcare-associated infections occur each year leading to 99,000 deaths (Center for Patient Safety, 2016). A multitude of factors, including individual and system components, influences patient safety and the incidence of medical errors.

Systems: *Healthcare – Sociotechnical System*

Technological advances have greatly impacted the healthcare system in the last few decades. Today, the seemingly nebulous term "healthcare delivery" refers the complex dynamic processes occurring within a system of social interactions and sophisticated technology (Effken, 2002; Carayon, Bass, Bellandi, & Gurses, 2011). Not surprisingly, human technological interface has become an increasingly critical component of this delivery system. The dimensions of the social system encompass social structures, relationships and culture of people and also psychological variables such as how people think, make decisions and work together in teams (Stotts, 2015). Likewise technical systems include not only equipment but also communication systems,

tasks, behaviors and performance, procedures, therapeutics and environment characteristics (Carayon et al., 2006; Spath, 2011). This complex human technological interface can have serious impacts on patient safety if failures or gaps in these systems occur.

Adverse events are incidents in which a patient is unintentionally harmed by medical treatment. Adverse events usually originate in a variety of systemic features operating at different levels – the individual, the task, the team, the work environment, and the organization (Vincent, 2004). Individual factors may include lack of knowledge or experience on the part of particular staff members. Task factors may include the unavailability of test results or protocols. Team factors may include inadequate supervision or poor communication among staff members. Factors related to the work environment may include heavy workloads, inadequate staffing, or limited access to vital equipment. Finally, organization and management factors may include lack of awareness of safety issues on the part of senior management or policies in place that lead to inadequate staffing levels (Vincent, 2003).

When an adverse event occurs, it is crucial for facilities to investigate the root causes of these incidents. However, investigations usually focus on the actions of individuals and seldom examine the background to these events (Vincent, 2004). Analyses of accidents in medicine and elsewhere have led to a much broader understanding of accident causation; with less focus on the individuals who makes an error and more on preexisting organizational factors that provide the conditions in which errors occur. This "human factors" approach, as it is called, is a hybrid discipline that focuses on the human component within complex sociotechnical systems (Vincent,

1998). This method emphasizes the importance of examining the chain of events that leads to an accident or adverse outcomes, consider the actions of those involved, and then, crucially, look further back at the conditions in which staff were working and the organizational context in which the incident occurred (Vincent, 1998).

In order to remedy the errors made in this case, it is necessary to go further and reflect what the incident reveals about the gaps and inadequacies in the health system in which it occurred. This incident acts as a "window" on the system – hence systems analysis. Failure Modes and Effects Analysis (FMEA) examine the process of care and are seen as prospective (Vincent, 2004). It is critical to analyze not only the human aspects of the error, but also the preexisting systems that were in place, as healthcare systems must move away from the current ''blame and shame'' culture that prevents acknowledgement of error and therefore obstructs any possibility of learning from error. Safety improvement requires that healthcare systems have ready access to information that supports learning from experience in order to promote systems that both prevent errors and mitigate the impact of errors that occur (Nieva, 2003).

Patient/Family Engagement

In order to effect change, patients and families must be engaged in the transformational process. Barry et al. describe that advances in medical science have provided new options that, although often improving outcomes, have inadvertently distanced physicians from their patients (2012). The result is a health care environment in which patients and their families are often excluded from important discussions and left feeling in the dark about how their problems are being managed and how to navigate the overwhelming array of diagnostic and treatment options available to them (Barry, 2012).

However, more recently patient and family engagement has been recognized as an increasingly critical aspect of the healthcare delivery system (Carmen et al., 2013). Patient and family engagement further enhances the quality and safety of healthcare delivery by encouraging the clinicians and patients to work together to produce the best possible outcomes.

In addition, patient and family empowerment is a critical part of the recovery process. To be empowered, patients and family members need access to information and the opportunity to make their own choices (Carmen et al., 2013). Carmen and colleges define patient and family engagement as "patient and family engagement as patients, families, their representatives, and health professionals working in active partnership at various levels across the health care system— direct care, organizational design and governance, and policy making—to improve health and health care (Carmen et al., 2013). For example, patients can help design health care facilities, serve on hospitals' family advisory councils, and participate in the design and execution of quality improvement projects (Carmen et al., 2013). There are ample opportunities for families and patients to engage in their healthcare, which can support

Finally, the literature emphasizes that technology is one means of empowering patients and promoting patient safety. As Korda and Itali write, "People of all demographics are adopting these technologies whether on their computers or through mobile devices, and they are increasingly using these social media for health-related issues". Advances in technology have provided healthcare with a new platform to leverage the communication between patients, families and providers and promote patient safety processes. Further, technology can assist healthcare organizations in the

development, dissemination and evaluation of patient safety programs. Patient safety programs must reach a wide audience, consisting of not only patient and families, but healthcare staff members as well. Therefore, the use of technology is a paramount feature in the promotion and implementation of patient safety programs.

Methodology

Another important element for the promotion of patient safety is the response the healthcare organization has when an adverse patient safety event occurs. A common methodology that is used is the Communication and Optimal Resolution (CANDOR) process. This process improves patient safety through an empathetic, fair and just approach to medical errors and promotes a culture of safety that focuses on caring for the patient, family, and caregiver; an in-depth event investigation and analysis; and resolution (CANDOR, 2016). The CANDOR process consists of five components – identification of the adverse event, system activation, response and disclosure, investigation and analysis, and resolution – all of which highlight the use of multidisciplinary teams and collaboration to successfully implement a comprehensive solution to the adverse patient safety event (Figure 1). This process served as the framework for the Family Escalation Project.

Project Plan

Agency

UCSF Medical Center is a leading healthcare organization in the San Francisco Bay Area. This facility is comprised of over 8,000 employees and delivers superior patient care and conducts pioneering research. This organization provides its services at dozens of locations through San Francisco as well as outreach clinics throughout

Northern California. UCSF Medical center generates over 770,000 patient visits in its clinics and over 38,000 hospital admissions every year. This high volume of patient care increases the Medical Center's dedication to provide the safest and highest quality care to all of its patients.

Project overview

The goal of the Family Escalation Project is to implement a process for families to independently escalate safety concerns within the UCSF Benioff Children's Hospital (BCH). This project came to fruition in response to a medical error that occurred in BCH. This catalyst was a combination of human and preexisting system failures, in which a pediatric patient received the incorrect dose of medication for several days. The patient's mother raised questions about the medication dosage several times, but her concerns were not escalated until several days had passed and a traveling nurse recognized the error.

This catalyst spawned the development of the Family Escalation Project, which aspired to create a mechanism for patients and families to independently escalate their safety concerns. The project began by creating a multidisciplinary task force, which included representatives from a number of departments including patient safety, pharmacy, patient relations, physicians, nursing staff, and family advocates. As an active member of this task force, I worked (and continue to work) towards viable solutions to improve patient safety at UCSF.

My role

My role throughout this project consisted of a variety of tasks. I was responsible for organizing the team's monthly meetings by creating the agenda, assigning and

following up on action items, taking minutes, and researching relevant literature to send to the group. Further, I was responsible for organizing and participating in the collaborations with appropriate stakeholders throughout the development of the project. For example, I participated in separate meetings with the stakeholders when researching the technological aspects of the project. Additionally, I took part in collaborative meetings with members of the Patient Experience Department in order to discuss potential evaluative methods for the project. Finally, I participated in the monthly task force meetings, contributing to the discussion with the relevant literature I had researched prior to the meetings.

Activities of Task force

This task force first performed a gap analysis and evaluated the literature as it related to patient safety programs that involved family-initiated safety escalation as well as patient and family engagement in their healthcare. Through this literature review, the team discovered several gaps in knowledge as it related to the project goals. Most importantly, the team discovered that there was very little literature related to family-initiated safety escalation patient safety programs. Therefore, the team needed to pioneer this process with little guidance from other institutions.

The team needed to create a mechanism for families to initiate their safety concerns. Initially, the task force planned to have three different modes of contact, an app (to be displayed on the OneView TV system that is in every patient room), an online portal and a phone line. However, upon examining the feasibility of these contact modes, it became apparent that the phone line would be the best choice for the pilot period of this program. The representatives from the family advocacy groups felt that patients had little

education on the OneView system and would likely not know how to utilize this feature. Further, the task force felt that the online portal would not be utilized often and could be added to the program at a later time. Therefore, the group agreed that the phone line would be the best mode of contact for families to escalate their safety concerns during the pilot phase of this program and the other modes of contact could be integrated at a later date.

The next step in the development of this program was to determine an appropriate response to these safety concerns. This included identifying the primary department or individual that would receive the notification, as well as creating the workflow surrounding the response. The group determined that this department or individual needed to be available 24/7 and staff individuals with appropriate clinical training and background to respond to these safety concerns. The group determined that the House Supervisor, a team of nurses that is on call 24/7 and can respond to emergencies and other clinical needs, was the most appropriate department to receive these calls. Representatives from the department attended task force meetings and assisted in the development of their workflow.

The team next needed to create the marketing aspect for patients and families, as well as the education for staff. The team decided to market this program with a brochure using a slogan and a brief description of the process. The slogan the team chose was "Stop for Safety Check". Currently, the brochure is still being created and the education for staff is being developed.

Challenges to effecting change

A challenging portion of this program development was creating the education for patients and families about the process. The group decided that a slogan needed to be developed in order to encompass the mechanism in a concise manner. There was much deliberation about the phrasing of this slogan, as group members worried that using the word "stop" in the slogan would imply the clinical staff would stop caring for the patient. However, after much deliberation and reviewing relevant literature, a slogan was created: "Stop for safety check".

Another challenge was identifying potential barriers to staff and patient adoption. The group identified several barriers pertaining to the staff adoption of the program, which included inappropriate activation by families, negative impacts on workflow, perceived loss of control with family escalation, and sending messages to families that they should not talk to their medical teams first about their concerns (Gill et. al, 2016). Further, the group identified several barriers to families utilizing this service, such as health literacy barriers, fear or intimidation to escalate concerns, and a lack of willingness to engage. Despite a long list of potential barriers, this identification process also allowed the group to identify potential facilitators to the project. For example, to address staff fears of inappropriate activation by families and patients, the team decided to market the program by emphasizing that this process is a last resort and that families should still communicate with their medical team. Further, to compensate for potential patient and family utilization barriers, the team decided to develop the family education by working closely with the family advisor, as she had much insight about an appropriate method for teaching families about this process.

Results from System Analysis

Upon examining the catalyst to the Family Engagement Project, the team identified a number of system and individual errors that contributed to the miscalculation of the patient's weight and ultimately the incorrect dose of medication. The medical error that served as the catalyst for the Family Engagement Project was a combination of human and preexisting system failures. There was clearly a normalization of deviance in the workflow of the staff and the systems in place on the unit. The event, during which a child's weight was entered in pounds as opposed to kilograms, resulted in the child receiving an incorrect medication dosage for several days. The staff did not recognize the technological error made in the scales. However, the scales allowed the child to be weighed in pounds when the dosage required the weight in kilograms. The human technology interface that existed significantly contributed to this error.

The Family Escalation Project has examined both the individual and systematic errors that were revealed via this incident. The Family Engagement Project has incorporated this critical component of the healthcare delivery system into many elements of the planning and implementation of the program. The analysis that has taken place will move the Medical Center towards a creating a safer environment for patients and healthcare providers.

Future work

There is still a great deal of work to be completed before this pilot program can disseminate throughout the UCSF Benioff Children's Hospital. The next step of this program is to develop education for staff, which is currently undergoing review by the group. Once the appropriate departments have approved the education and marketing, this will be disseminated throughout BCH. After the staff has been educated about the

process, the program can go into full affect and families can utilize the process to escalate any safety concerns they may have. Since this program is part of an ongoing process, the success of all aspect cannot yet be fully assessed. However, after the program has been in place for several months, the evaluation process can begin. The evaluative criteria has not been developed yet, however two physicians on the team have received a grant to measure family and patient perceptions of safety within the Medical Center. Therefore, they will be able evaluate this program when conducting their research. The ultimate goal of this project is to disseminate this process throughout the entire organization.

Application of MPH Competencies

The scope of work this project required allowed me to utilize a number the University of San Francisco Master of Public Health (MPH) program competencies, as well as Council on Education in Public Health Core Knowledge areas and cross-cutting/interdisciplinary values.

The MPH competencies addressed include the assessment of public health literature, application of theoretical constructs of social change in planning interventions, articulating the relationship between healthcare delivery and health systems, demonstration of leadership abilities, and the development of public health programs. The initial gap analysis performed called for an evaluation of relevant literature relating to family initiated safety programs, patient and family engagement, and patient safety program planning. Throughout the course of the project, the team reviewed additional literature as it related to the project plan, such as identifying barriers to adoption. Furthermore, the initial literature review explored theoretical frameworks for our process, such as the CANDOR model, which served as our methodology when developing the

project plan. Further, the use of this model served as a theoretical construct when creating the interventions for this program. Additionally, the collaboration about the system level failures and potential solutions pertaining to patient and family initiated escalation allowed the group to analyze the relationship between healthcare delivery and the systems that were in place within BCH. Further, my participation on the multidisciplinary team allowed me to demonstration leadership abilities during the collaboration and coordination of the program meetings and action items to ultimately create a patient safety program.

The core knowledge areas that were addressed throughout this project include social and behavioral sciences, environmental health, and public health administration and leadership. The team needed to examine potential barriers and facilitators to this program development and implementation. This research called up an analysis of potential social and behavioral barriers as well as environmental factors that may prohibit or facilitate this program development. Further, this project required an analysis of the healthcare administration and processes within BCH and called upon the team to demonstrate leadership abilities in order to create a comprehensive intervention for families and patients to escalate their safety concerns.

Conclusion

Patient safety is a serious public health issue in all healthcare settings throughout the world. Compromises to patient safety create adverse events, which can result in serious patient injury or even death. There are many human and system components that contribute to adverse events; therefore it is essential to explore all aspects when investigating such events. The Family Escalation Project examined these human and

system failures that occurred at UCSF Medical Center, and created a patient safety solution to foster the communication and engagement between families, patients and providers. This solution will allow families and patients to escalate their safety concerns independently, ultimately promoting patient safety throughout the Medical Center.

The Family Escalation Project served as an appropriate end my to MPH degree. The principles and objectives required for this project allowed me to utilize key concepts I learned throughout the course of the MPH program. The opportunity to serve on a multidisciplinary team and collaborate with a variety of experts served as my biggest learning experience. I was able to see ideas discussed with many different perspectives and participate in the development of a comprehensive patient safety solution. I learned that utilizing a multidisciplinary team is essential for creating a robust and successful patient safety program and that the input of different perspectives truly enhanced the program development. Also, the research that this project required helped me learn about the importance of patient safety, family/patient engagement, system analysis and how to implement a successful patient safety program. Further, this project emphasized patient and family engagement in healthcare and stressed the importance of communication between providers and patients. I am looking forward to continuing to work with the Family Escalation team and eventually see the program implemented throughout the UCSF Benioff Children's Hospital.

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Appendix A

Paige Porter – Learning Objectives

Fieldwork 2016

Goal: Implement a process for families to independently escalate safety concerns at UCSF Benioff Children's Hospital.

Objectives:

1. Develop a method for families to initiate contact with a UCSF Benioff representative to voice concerns
    a. Tactics:
        1. Determine feasibility of various modes of contact (OneView, on-line portal, phone number)
        2. Determine department who will receive calls
            i. House Supervisor
            ii. Patient relations
            iii. Access Center

2. Develop workflow for families to contact UCSF Benioff representative
    a. Tactics
        1. Determine workflow for responding to family concerns

3. Develop and disseminate workflows to families, staff, trainees and faculty
    a. Tactics:
        1. Develop slogan for program
        2. Develop "stop-the-line" language for families such as "Let's pause to talk over a concern I have"
        3. Sensitize staff, trainees and faculty to "stop-the-line" request
            i. Determine process for teaching
            ii. Develop teaching materials
            iii. Disseminate

4. Develop process for program evaluation

Student responsibilities include:

- Organize and prepare appropriate material for monthly multidisciplinary meetings.
    - Take minutes
    - Create Agendas
    - Follow up on action items
    - Send group relevant literature
- Collaborate with appropriate stakeholders to develop family escalation safety process.
    - Organize separate meetings with stakeholders
    - Research technological uses – OneView app, phone line, online portal
    - Research potential responder for process – House Supervisor, Access Center, Patient Relations, etc.

    - Discuss follow up process with patient experience via Orchid App.
- Develop process for staff education/adoption
- Research theoretical framework to be applied to development of safety process
    - Research academic literature
- Identify environmental factors that impact change and a safety culture within an inpatient setting.
- Identify behavioral components of family escalation and patient safety.

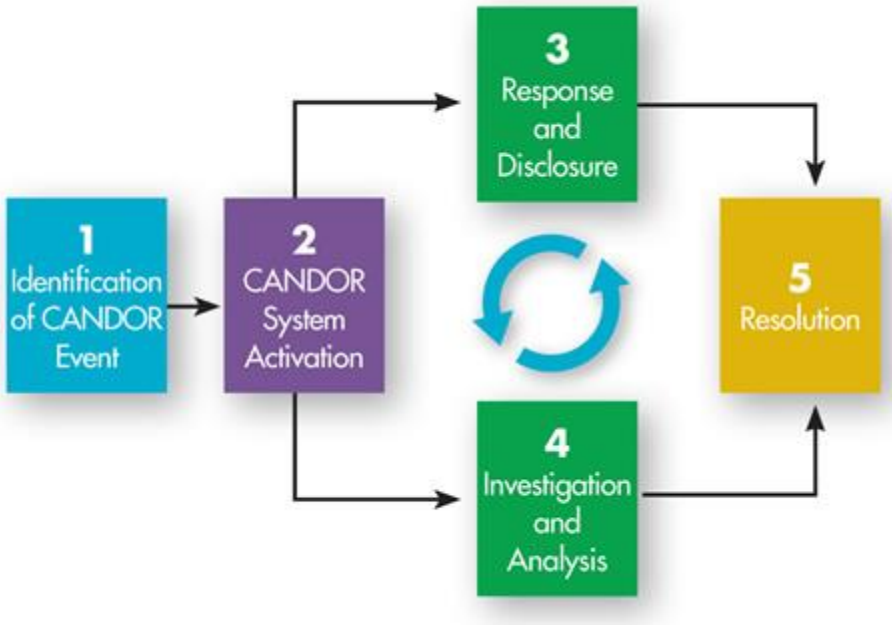

Figure 1: The Communication and Optimal Resolution (CANDOR) Process. From Communication and Optimal Resolution Toolkit (2016). Implementation guide for the CANDOR process. *Agency for Healthcare Research and Quality, 16,* 1-19.

MPH Program Competency Inventory

USF MPH Competencies	Notes
1. Assess, monitor, and review the health status of populations and their related determinants of health and illness.	
2. Demonstrate the ability to utilize the proper statistical and epidemiologic tools to assess community needs and program outcomes.	
3. Identify and prioritize the key dimensions of a public health problem by critically assessing public health literature utilizing both quantitative and qualitative sources.	Achieved through the gap analysis and ongoing research related to the project plan.
4. Specify approaches for assessing, preventing, and controlling environmental hazards that pose risks to human health and safety.	Examined the environmental system factors that contribute to adverse patient safety events.
5. Apply theoretical constructs of social change, health behavior and social justice in planning community interventions.	Achieved by applying the CANDOR process to the program development and the potential barriers to program adoption.
6. Articulate the relationship between health care delivery and financing, public health systems, and public policy.	Achieved by analyzing the relationship between human and technological systems in healthcare delivery. Also, by identifying barriers in public health systems.
7. Apply evidence-based principles to the process of program planning, development, budgeting, management, and evaluation in public health organizations and initiatives.	Developed a pilot patient safety program for UCSF Medical Center.
8. Demonstrate leadership abilities as collaborators and coordinators of evidence based public health projects.	Served on a multidisciplinary team to create a pilot patient safety program.
9. Identify and apply ethical, moral, and legal principles in all aspects of public health practice.	
10. Develop public health programs and strategies responsive to the diverse cultural values and traditions of the communities being served.	
11. Effectively communicate public health messages to a variety of audiences from professionals to the general public.	
12. Advance the mission and core values of the University of San Francisco.	Serving the patient population at UCSF Medical Center by creating a patient safety