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14. ABSTRACT

This project examines the benefits of a standardized Emergency Code Call system for healthcare facilities of the Western Region Medical Command (WRMC). It looks at the need for standardize or universal overhead calls in an emergent situation and what other agencies are doing, to include the American Hospital Association and Washington State Hospital Association, to mitigate the problem. A survey was done to gain the perceptions of the staff in WRMC and their response when they hear certain overhead pages. This project transitions to becoming part of the US Army Medical Command (MEDCOM) working group that was formed to standardize code calls across the Army Medical Department (AMEDD), with adoption of the same system by the US Air Force (USAF) and US Navy (USN). It scrutinizes the group dynamics and power distribution of team work within a working group that formulates policy. Finally, the study concludes with the way ahead and lessons learned.

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Standardization and implementation of a standard emergency
code call system within Western Region Medical Command

Madigan Army Medical Center, Tacoma, WA

MAJ Michael Wissemann, AN,

United States Army

Preceptor: LTC Tamara Freeman

Prepared for LTC Matthew Brooks

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I would like to begin by expressing my sincere appreciation for many people who assisted me in my Graduate Management Project. First, my preceptors, LTC Tamara Freeman and LTC Laura Trinkle, for guidance and saying that this was a ‘can-do’ project; to Carol Wagner at the Washington State Hospital Association as well as Nancy Foster at the American Hospital Association; to Edean Berglund in the Madigan library, who taught me more than I could learn in a year; to the department of Nursing Research who doubled my limited stats knowledge; to Emily Mize, my mother-in-law, PhD student, and nursing instructor who doubled that knowledge again; to MAJ Ann Sims, the previous Baylor Resident and Nurse Methods Analyst (NMA) who I was constantly gripping to and bouncing ideas off of.

There are countless others of course. My biggest thanks has to go to my champion for me, my wife Jennifer, who listened to me complain while carrying our second child and took care of me as well. And finally to our son, Christopher, who reminds me anything is possible and reinvigorated the work ethic I received from my parents.

Abstract

This project examines the benefits of a standardized Emergency Code Call system for healthcare facilities of the Western Region Medical Command (WRMC). It looks at the need for standardize or universal overhead calls in an emergent situation and what other agencies are doing, to include the American Hospital Association and Washington State Hospital Association, to mitigate the problem. A survey was done to gain the perceptions of the staff in WRMC and their response when they hear certain overhead pages. This project transitions to becoming part of the US Army Medical Command (MEDCOM) working group that was formed to standardize code calls across the Army Medical Department (AMEDD), with adoption of the same system by the US Air Force (USAF) and US Navy (USN). It scrutinizes the group dynamics and power distribution of team work within a working group that formulates policy. Finally, the study concludes with the way ahead and lessons learned.

Disclaimer

The views expressed in this study are those of the author and do not reflect the official policy or position of the U.S. Government, the Department of Defense (DOD), the Department of the Army (DA), or Madigan Army Medical Center.

Statement of Ethical Conduct in Research

The author declares no conflict of interest or financial incentives in any product or service mentioned in this article. On August 26, 2008, the Madigan Army Medical Center Institutional Review Board approved the project for Institutional Review Board exemption. It was determined that the protocol had scientific merit and qualified for exempt research designation in accordance with 32 CFR 219, 45 CFR 46.101 (b) (2), survey procedures, and AR 40-38, B-5 public behavior. The research conducted was judged to constitute no more than minimal risk. No personally identifiable information was used to identify who took the voluntary survey.

Foreword

This project began as an examination of what would be the most effective code call system to implement in the Western Regional Medical Command. It was inspired after hearing Bill Roscoe from the Greater San Antonio Hospital Counsel (GSAHC) address the Army-Baylor class in the spring of 2008. He mentioned that the GSAHC, sharing medical staff among facilities, chose to standardize their emergency code calls. While the intent was always MEDCOM wide, I chose WRMC as a more feasible project.

About 3 months after the Graduate Management Project Proposal (GMPP) was submitted and approved, the author received a notification from Lisa Danforth-Lewis, the Chief of MAMC's Quality Management Division, that MEDCOM was examining the feasibility of such a project across the AMEDD. The author was invited to participate in the working group. This changed the focus of the Graduate Management Project (GMP) from a 'what if' local project to a case study of a DOD wide standardization initiative of which I was invited to become a key member. As such, changes were made during the course of the project that made it differ from a traditional policy GMP. The standardization of emergency code calls is still ongoing as this GMP is being completed. Therefore, the conclusion extrapolates things that will need to occur to complete the implementation of the chosen policy.

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Introduction

In the fall of 1999, staff responded to a code called for an agitated person in a Southern California emergency room. After the death of his mother, an irate man returned and was now wielding a gun. Based off of their understanding of the overhead page, staff rushed to subdue what they were led to believe was only an agitated and unarmed person. The man opened fire, leaving three hospital workers dead and several more wounded (Truesdell, 2005). Would the results have been different if the call had gone out for an armed, as well as, an agitated person? We can only speculate, but use that lesson as a jumping off point for improvement. And that is what members of the Healthcare Association of Southern California (HASC) did.

Realizing they had no way to differentiate between an armed and unarmed threat, HASC established a peer group to examine the arduous task of standardizing code calls and responses in the Los Angeles area. Six months after they began, the group produced a practice of uniform code calls based on a simple color scheme. The document also contained standard responses to situations for which a code is called. Since 2001, over 90% of healthcare facilities throughout California have adopted the HASC protocol, prompting nearly a dozen states to standardize their code calls as well (Wagner, 2008).

Throughout healthcare, there is a move towards standardization and homogenizing operations and procedures to improve processes and safety. Another example of recently adopted uniformity is the implementation of color code wrist bands by both the Arizona Hospital and Healthcare Association and the Wisconsin Hospital Association (Arizona Hospital and Healthcare Association, 2008; Grasmick, 2008; WI hospitals standardize..., 2008). The potential for near misses increases when patients

with colored wristbands are transferred between facilities utilizing different colored armbands. For example, a purple wristband may be a patient identification wristband at one hospital, but it may indicate do not resuscitate (DNR) at another. Nationwide trends are to move towards purple to indicate DNR, red to indicate allergies and yellow to indicate a patient who is at risk for falls (Arizona Hospital and Healthcare Association, 2008; Grasmick, 2008). The second and ninth National Patient Safety Goals for 2009 deal with improving communication between care givers and reducing harm from patient falls (The Joint Commission NPSG, 2008). The use of color coded wrist bands across different hospital systems represents steps by regional level organizations to meet these goals.

A problem exists with the continuity of the code calls within in the Army Medical Department (AMEDD). As military personnel move, or Permanent Change of Station (PCS), from assignment to assignment, they must unlearn what they had learned at a previous hospital and reeducate themselves with a new code system. As seen in the opening anecdote, getting it wrong may have dire consequences, if not only for the patient, but for the hospital employee. These behaviors and responses may be hard to change as they are often drilled at facilities until they become conditioned. As the military moves to more inter-service and joint assignments in the healthcare arena, and expands partnering with the Veteran's Administration (VA) hospitals, it would behoove us to standardize not only across the AMEDD, but the Department of Defense (DOD) and potentially the VA as well.

For the purpose of this study, we will examine if we should standardize codes in the Western Region Medical Command (WRMC) and what barriers exist to such a

movement. Additionally, we will look at perceptions of the population this will affect and what, if we do standardize, should we consider for code calls. Based on the standardization of an AMEDD region, we can then use the lessons learned to implement such standardization across the AMEDD with the end state of standardizing across all DOD and VA medical facilities.

There are several reasons this problem was not previously addressed. Organizational leaders often have an overview of the organization, but seldom delve into the nuts and bolts of why or how things are done. It could be that a specific problem is just a minor annoyance, and complaints or problems from several people may move through different channels and wind up at a number of different supervisors. With a large dispersion of these voiced concerns, no one problem ever reaches a critical mass to report it to a higher level and initiate the actions that would affect change.

Weick (1995) coined this concept as the fallacy of centrality. This conundrum states that if a senior leader does not know of the problem, it does not exist. In essence, experts and leaders misjudge the probability that they would surely know about the phenomenon if it actually were occurring. A good way for a leader to counter such a problem is to get out and walk through the work areas for which the manager is responsible. This makes the leader more approachable and appear concerned for the workers and organization.

In 1996, Karl Weick explored why a set of wilderness firefighters, faced with a rapidly advancing fire, needlessly perished and how their lessons can be applied to organizations. Several of the lessons learned can theoretically be applied to healthcare organizations, their need to evolve, and what prevents them from doing so. Among some

of the reasons stated were lack of justification for change, issues of trust, unwillingness to embrace the unfamiliar, the reluctance to accept risk and the possibility of failure, social dynamics, and consequences.

Without a valid explanation, people lack the justification to change. Weick describes, “How people persist when they are given no good reason for change” (Weick, 1996: 304). Explaining the reasons why the organization should change is imperative to achieve ‘buy in’ from staff. Employees are more likely to embrace the change once they understand what and why changes are occurring. In Weick’s parable, the firefighters are trying to out race a rapidly advancing wildfire when the supervisor shouts to drop their tools and light a fire. At the time, this technique of lighting a ‘backfire’ was new. The purpose was to set a smaller fire that would scorch the earth and deprive the advancing fire of needed fuel to burn, providing a safe area to huddle. Without that explanation, the firefighters continued to run until exhausted and overcome by fire. This is why it is important to explore the problem and explain the new solution to staff whenever feasible. We know that there are times when this is not always possible, and in those cases, the credibility of personnel in leadership positions becomes essential.

To that end, being able to trust those who are in charge is another critical issue. Establishing trust takes place over time through interactions and shared experiences. With a fluid population that rotates frequently between jobs, we often use rank to compensate or symbolize trust. A Colonel has decades of experience compared to a Second Lieutenant, and as such, appears more dependable and responsible in decision making when viewed through the eyes of Soldiers. Rank, in essence, becomes the de-facto measure of technical competence, knowledge, and trust worthiness. It is imperative that

their subordinates trust a commander and leaders at all levels throughout the organization. Trust is often the difference between an employee doing something because they are told to versus doing it because they believe the senior leader has their and the organization's best interests in mind.

Sometimes organizations will not or chose not to embrace an idea or change because they are unfamiliar with it. There is the parable of "Green Eggs and Ham" by Doctor Seuss. The protagonist refuses to try something new, not for any good reason, just out of sheer stubbornness or unfamiliarity. Remaining with the status quo is often comforting while the change may produce anxiety and drive staff from their comfort zone.

Reluctance to accept failure as an option may be the reason for a delay in adopting a new strategy. While consequences may not result in all out failure, the times may have changed so that our procedures are antiquated or obsolete. Such as the case with Smith-Corona typewriters, who refused to morph with the advent of the personal computer. Instead, they went out of business. A similar situation exists with the Ford, Chrysler and GM, where failing to change with market indicators now has brought the three companies to the brink of bankruptcy. With healthcare being a rapidly evolving environment, those who do not adapt, remain relevant, and create value for their customer service base have the potential to become financially insolvent. The same way we no longer use flammable ether for anesthesia because it is outdated, it is easy to see how failure to stay current can lead to poor patient outcomes, and in turn, litigation.

Social dynamics can often play a role in failing to evolve. Pluralistic ignorance describes the experience of everyone disagreeing, but no one voices their concerns. In

essence, they are afraid of making waves or dissenting from the believed unanimous group. This is also the group-think circumstance described in the story, *The Road to Abilene* by Jerry Harvey. New and young staff may have a different or fresh perspective on how to solve a problem, but don't speak up for fear of embarrassment. As we move around in the military, we may have observed a better way of doing something, but do not speak up for fear of upsetting social harmony. This is also true of civilians who work at multiple hospitals or hospital systems in the civilian community, and can cross-breed best practices from one organization to another. Finally, employees become content with the idea of doing something one way because, "This is the way we have always done it". A procedure or report is passed on from staff to staff for years, but the reasons why it was done may have become outdated or unnecessary due to new technology. This dissent needs a constructive forum or outlet so outside-the-box solutions and better business practices have a nurturing environment for development.

Finally, people will not change if they believe that doing so will not produce quality results. Employees resist speaking up if all that results is lip service ("Thanks for your suggestion"). Again, they must trust that the supervisor or leader will consider their idea. They want to be involved as a member of the team. They want to see their ideas embraced and come to fruition. Personnel are more likely to share the idea that may improve quality if they believe that sharing ideas will be considered by their leaders,

Finally, a last reason corporations may not change is the costs associated with such a change. The purpose of a profit driven company is to create wealth for their shareholders. Anything that detracts from that profit margin is closely scrutinized and evaluated, often in the form of a business case analysis (BCA). If it has the potential to

improve efficiency or satisfy a customer need, they are sometimes adopted. Projects with exorbitant costs are seldom adopted.

Evidence

Agitated Persons

While the opening anecdote may seem extreme, it is this very extremity that was a catalyst change. Hospital employees are four times more likely to face violence on the job than the average worker (NIOSH, 2002). Emergency rooms are the most volatile areas of the hospital and the most likely location for violence against employees (Barlow, 1997). While public hospitals are more prone to violence than private institutions, many of the Army's Graduate Medical Education (GME) programs (such as Emergency Medicine and General Surgery) require student-residents to complete a specific number of trauma hours. In order to meet those hours and sustain the GME programs, it often necessitates opening of military health system's (MHS) facilities to civilian trauma. According to the Accreditation Council for Graduate Medical Education (ACGME), doctors pursuing a specialty in emergency medicine, for example, "should treat a significant number of critically ill or critically injured patients at the primary clinical site, constituting at least 3% or 1,200 of the emergency department (ED) patients per year" (ACGME, 2008). This puts military emergency room and hospital staff at similar risks for violence to those in the civilian sector. When we consider those with post-traumatic stress disorder are more prone to violent outbursts (Fehon et al., 2005), we can surmise that as the War on Terror continues and we continue to treat more Post-traumatic Stress Disorder (PTSD) patients, our staff will also be at greater risk for injury from violence.

Violence against staff is not confined to the ED. Mental health workers are prone to violence as well (Nolan et al., 1999; Arthur, et al. 2003). A study of mental health providers in Georgia (n=1,131) found that 29% had feared for their life while “61% of the respondents had been victimized in violent acts of psychological or physical nature...” Nolan, et al. (1999), expanded the study beyond providers and looked at the violence against a wider demographic of mental health workers. He used Berkowitz’s (1989), definition of violence: “aggressive behavior, including spitting, scratching, deploying physical force, or using an object as a weapon, either to threaten or physically assault.” The same study noted that 81% of hospital based mental health nurses (n=201) had experienced violence in the course of their duties during their career. Almost 50% had experienced violence “once” or “several times” in the past year. When violence is considered as a reason nurses leave the workforce (Jackson, 2002), any steps taken to intervene and make the staff feel safe can be crucial in retaining staff. An emergency code that helps nurses effectively deal with combative patients or staff may make staff feel safer, but a conclusive study needs to be done. In the end, a sense of safety may lead to greater staff retention and decreased turnover costs.

According to the emergency call center at Madigan Army Medical Center (MAMC), they initiated an overhead page four times in Calendar Year (CY) 2007 for a combative patient (Rita Rairdan, personal communication, October 2, 2008). In actuality, the code likely occurred more often than that. The problem lies in that the proponent for that call, the provost marshal’s office, often receives calls directly from the inpatient psychiatric wards. When queried, the Provost Marshals office stated that in CY 2008, they responded to 94 calls for agitated patients (Eric Delegard, personal communication,

March 3, 2009). It is not clear if this is in addition to, or supplemental to, calls handled by the emergency call center in 2008, but clearly the hospital responds on average more than once a week to subdue an agitated patient.

Cardiac Arrest

Codes called in the hospital are not limited to dealing with combative or agitated patients. Another important response initiated by an overhead call is a response to a cardiac arrest. In CY 2007, MAMC activated their emergency call system for cardiac arrest, 'Charlie Alpha', 69 times (Rita Rairdan, personal communication, August 11, 2008). The following year MAMC responded to 85 cardiac arrests (Rita Rairdan, personal communication, March 3, 2009). In the United States in 2005, over 860,000 people died of a heart attack (Rosamond, et al., 2008). From 2002 to 2004, the overall rate of in-hospital deaths decreased by just over a third, from 4.5% to 3.2%.

A possible reason for the greater survival rate is the increased emphasis on rapid response. In February, 2000, Brooke Army Medical Center (BAMC) offered time response guidelines for patients suffering from an in-hospital cardiac arrest. In fact, the timelines recommended that code team response and defibrillation occur within three minutes. When those timelines were met it showed a marked improvement on survival (Kinney, 2004). Having that team respond quickly can often be the difference between life, debilitating brain injury, and death. When picking up the phone to activate the code system, the code staff uses to quickly relay information to the operator should be as reflexive and intuitive as we expect the medical response to be. This may also be the reason behind many facilities move towards a rapid response team, or a pre code team.

Codes for Abduction

Time is just as critical when it comes to locking down a facility in response to an infant or child abduction. An infant abductor has often scoped out the area and can be out of the facility in a little over 90 seconds. When calling for a missing child, it is essential that all staff in the facility understand their roles and act as a team (Glasson, et al., 2008; Butler, 2003). Once a child is abducted, it is no longer a unit emergency; it is a facility-wide emergency. The profile of a child or infant abductor is well documented (Rabun, 2005; Butler, 2003; Nahirney, 2002). The typical abductor is an overweight woman of child bearing age who is manipulative and often incapable of having her own children. Often they will carry a large bag or pocketbook in which to sneak the child out.

Since 1983, 253 infant abductions have occurred in the United States, with 48% occurring in healthcare facilities. Of the 123 taking place in healthcare facilities, 70 were infants taken directly from the mother's room. Fortunately, 117 of the 123 were located, and that is a testimony to the community and law enforcement (NCMEC, 2008). According to Burns (2003), of the seven abductions that occurred in multiple hospitals between May 1997 and March 2002, there were three main reasons cited for the abductor being able to get as far as they did. First, in three separate cases, the security system failed. In three other cases, the perpetrator cut off the security tag attached to the infant. That tag electronically locks the doors when the sensor approaches the door. In the final case, the sensor on the infant locked the door, the alarm sounded, and the abductor was thwarted (Burns, 2003).

A well rehearsed and solid security plan should be enough to prevent, if not all out discourage, potential criminals from attempting an abduction. In the previous

example, a properly functioning security system may have stopped almost half of the abductions. In fact, a properly functioning security system did thwart three of the seven abduction attempts. Other safety measures include the use of photo IDs, primary and secondary (automated) locks on doors, card readers, cameras and infant monitors (Butler, 2003). Finally, according to the National Center for Missing and Exploited Children's 2005 publication, *For Healthcare Professionals: Guidelines on Prevention of and Response to Infant Abductions*, if a child is abducted, "Using a code word ... to alert facility personnel there is a missing infant, is recommended as part of the facility's critical-incident-response plan in the event of an infant abduction..." (p. 26). Mock infant abduction drills should be part of orientation for new staff and be rehearsed (Miller, 2007).

If an offender does make it out of the facility with an infant or child, a statistic that can not be measured is the havoc a child abductor can wield on a healthcare facility and the community (Nahirney, 2005; Butler, 2003). Besides taking an emotionally destructive toll on the family members, staff often feel that they are at fault when it indeed may be a technology failure. The publicity and resulting press coverage, national and/or international, from such an event can have a devastating effect on the healthcare system. In almost all cases, litigation of the hospital is almost certain.

A good use of standardization across the United States in these instances is the utilization of Amber Alerts in the first few hours of a missing child. This well known public information system naturally lends itself to use in a hospital setting when discussing the use of a color-coded call system to announce emergencies. A "Code Amber" or overhead page of "Amber Alert" easily lends itself to memory. In fact, with

the latter, hospital staff may get assistance from visiting patients or family members who recognize this call for a missing child.

Codes for Fire

Fire has the potential to cripple or completely disable a facility. The United Kingdom's National Health Service (NHS) has over 1.7 billion patient encounters a year and has over million employees (UK Yearbook, 2004). Despite the staggering numbers, it averages only about 1,000 fires a year in its institutions, an exceptionally low percent when compared with other businesses. Of those fires, there are less than 10 fatalities a year. These fatalities often involve psychiatric patients who chose to end their life using fire (Charters, 2008). If these are the realities, why should fire be a concern?

Of the 275 reported hospital evacuations reported in the United States between 1971 and 1999, the largest single attributable reason was fire (Sternberg, et. al., 2004). The US Fire Administration's latest statistics show that roughly 2,500 fires break out in US healthcare facilities every year, causing nearly \$9 million dollars worth of damage (USFA, 2002). In most cases (53%), the detector in the room operated as advertised and alerted staff to the impending fire. In 25% of the cases however, there was no detector in the room or the fire was too small to activate the alarm. A human response is essential, as the sprinkler worked and/or activated in only 6% of all fires. An emergency code that is intuitive and easy to remember is the catalyst for the response to that fire incident.

When the Joint Commission (TJC) surveys healthcare facilities for compliance with standards, one area they consider is the Environment of Care (EOC). The EOC standards incorporate the National Fire Protection Association's Life Safety Codes (LSCs) (Davis, et al., 2007). Most of the LSCs deal with ensuring that the facility meets

the proper standards to minimize risk to their customers and patients. The Joint Commission (TJC) assesses staff knowledge on the procedures of how to activate a fire alarm in the hospital, check for pull stations, extinguishers, and fire wall protection. It is not difficult to see how the emergency code for fire, as well as knowing the location of pull stations, extinguishers, what to do in case of a fire, and other critical items, becomes critical in receiving accreditation from TJC.

Several historic fires that occurred in industry throughout history have influenced these codes (Coté, 1997). One such example is the Triangle Shirtwaist Fire of 1896 in which over 140 workers perished. This fire led to the advent of worker safety conditions. The Coconut Grove fire in 1942, which trapped people behind a revolving door, led to the advent of fire exits as well as placing limits on building occupancy. Unfortunately, it took the loss of about 100 patrons to initiate this change. Finally, nearly 100 pupils and nuns lost their life in the Our Lady of Angels School fire in Chicago in 1958 when a staff member hesitated in alerting the fire department. This led, in part, to the advent of the fire alarm and fire proof doors (Coté).

Another factor affecting the need to quickly contain a growing fire is that a hospital is often a multi-storied building that is rich with unique challenges. Laboratory chemicals, radiological isotopes and hazardous materials are just a few of the common substances found in hospitals that are bound to complicate responses. Additional factors impacting the severity of a large fire are the vertical evacuation of bed-ridden patients, elderly patients with decreased mobility, and psychiatric patients that require special attention when being evacuated. When a large fire does occur, all these factors may

combine. It goes without saying that the result can be catastrophic and evacuating the facility is essential.

The above mentioned evacuation may take several hours. Schultz, et al., 2003, looked at how long the evacuation of a hospital took following immediate damage by an earthquake. While one hospital with 320 patients was able to evacuate within 9 hours, it took two hospitals with 25 and 76 patients 13 hours to evacuate (Schultz, et al., 2003). There are no standards that establish the amount of time it should take to evacuate. The previous example goes to show that evacuation times may vary greatly depending on a number of factors. The amount of time needed to evacuate a facility is often dependent on staff, immediacy, resources and coordination of the emergency operations center. Often it will depend on patient acuity and mobility. In one case where immediate evacuation was required, evacuated first were those who could walk, while those who were self-sufficient but bed ridden followed. Those evacuated last were the intensive care unit (ICU) patients. Ambulances provided transport for the critically ill ICU patients while the rest were cared for outside and adjacent to the facility (Schultz, 2003).

Flight from an endangered facility is a complicated process. It is easy to see how in an evacuation due to fire or a fault in structural integrity, time is critical. A well drilled plan can lead a facility to be on the low end of the afore mentioned timescale. Therefore, a code that allows staff to recognize and respond quickly to the call to evacuate is needed.

Bomb threats, terrorism and active shooter scenarios

U.S. Code, Title 18, Section 2331, defines terrorism as acts that endanger life and are intended to intimidate a civilian population, to influence the policy of a government through intimidation, or to affect the conduct of a government by mass destruction

(United States Code, 2007). The Federal Emergency Management Agency (FEMA) is more succinct, defining terrorism as “The use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom” (FEMA, 2009). This makes clear that terrorism is not just the violence of action, but the threat of force.

The effect of blowing up a hospital would cripple the ability of the community to respond to the disaster as well as panic the public. Medical facilities represent grandiose, high-profile, targets for terrorists. In September of 2007, Germany arrested several German Nationals who were in the advanced stages of planning attacks on several American installations in Germany (Landler, 2007). Included in this list were Ramstein Air Force Base and Landstuhl Regional Medical Center. Like the Germans planning those attacks, al-Qaeda has a penchant for targeting areas that will create shock and awe (Ervin, 2006). Just the threat of targeting hospitals has the potential to make the public more reluctant to seek care if they think they could be a victim of terrorism.

As Americans continue to tighten security around high-profile targets such as airports, sea ports, subways, and reservoirs, soft targets become a much more inviting target for terrorism. According to Clark Ervin (2006, ¶ 3), “To be sure, al-Qaeda has a history of preferring plots for spectacular attacks that can kill thousands, or even millions, of people and cause millions of dollars in collateral economic damage.”

An attack on a hospital, especially a military hospital on US or foreign soil, certainly meets that description. In fact, as demonstrated by attacks on the Oklahoma City federal building in 1995 and the Pentagon on September 11th, 2001, government facilities are often preferred targets. Many people see hospitals as a place of refuge. To destroy the

mental security that a hospital provides as a place of sanctuary through a terrorist act could have a profoundly negative effect on a community's psyche. Senator Shelby, the Vice-Chairman of the Senate Intelligence Committee stated in a 2002 interview with CNN that, "I think hospitals would be a very soft target" (Senator Richard Shelby's interview with Paula Zahn, 2002).

Soft targets have been the choice of terrorists in recent past. These have the effect of shocking the general public and are designed to intimidate, very similar to the FEMA definition stated earlier. Some high-profile recent examples include a hotel and restaurant in Morocco in 2003, trains in Madrid in 2004, and buses and subways in London in 2005.

Medical facilities have been the source of terrorism in the recent past. Eric Rudolph was arrested for bombing abortion clinics throughout the southwest United States, which included killing a part-time security guard at one of the facilities. Though his purpose of bombing the abortion clinics was out of the protest of abortion (Mattingly, 2005), it demonstrates how soft a target medical facilities are.

Another possible scenario being addressed in hospital emergency management plans is the 'active shooter' scenario. Examples of active shooter scenarios include Charles Whitman who killed 16 on the campus of University of Texas-Austin in 1966, the Columbine High School shooting in Colorado which left 15 dead and the Beslan School Massacre in Russia in 2004. Most recently the shooting at Virginia Tech University by Cho Seung-Hui killed 32 and left almost half as many wounded (Virginia Tech Review Panel, 2007). In light of these circumstances, a response is needed to neutralize a potential active shooter should it occur on a medical campus.

An example illustrating the point and potential consequences occurred at Fairchild Air Force Base in 1994 (Arnold Air Force Base Newspaper, 2008). The Air Force was discharging an Airman for psychiatric reasons. He entered the base hospital and began shooting. His actions left two psychiatrists dead and wounded 23 others. A similar incident occurred in April 2007 (four days after the Virginia Tech incident) at Johnson Space Center, an area that most people would consider to have excellent security (Fox News, 2007). An employee brought in a handgun, shot his supervisor and took a hostage. Both these instances took place in military/ government facilities. It goes to show that, even though military base hospitals maintain perimeter checkpoints, they remain vulnerable to an active shooter scenario.

Of note is that once inside a military base perimeter, access to firearms is not difficult. Most military go to the firing range at least two times a year. Familiarization with firearms is a cornerstone of the military culture. This accommodation of firearms may make military personnel more apt to purchase a personally owned weapon and keep it in the home. As LTC David Grossman, a military professor of psychology at West Point, cited in his book, *On Killing: The Psychological Cost of Learning to Kill in War and Society*, once a person kills, it is easier for them to do so again (Grossman, 1997). As we come to the end of the first decade of the War on Terror where Soldiers have done multiple combat tours, this becomes infinitely more relevant.

In March 2009, as this GMP concluded, a man entered a skilled nursing facility in North Carolina and began shooting (Fox news, 2009; CNN, 2009). His rampage killed one staff member, seven patients, and left several injured, including the police officer who shot and stopped the suspect. The timeliness of this event can not underscore enough

the need for an in-hospital response to such a scenario. Could there have been fewer lives lost if the patients were isolated and the shooter contained?

The purpose of this review of incidences is to show that there truly is a risk of violence in the hospital and military facility. Codes that identify threats should allow the employee to discriminate between a potential bomb and a first person shooter. In a bomb threat, it is ideal to evacuate the building if feasible. When there is an active shooter roaming the hallways, as occurred at Virginia Tech, it is best to shelter in place and restrict access for the shooter.

Other Codes

From time to time, the need may arise to respond to internal or external emergencies that have the potential to disrupt the flow of normal operations or overwhelm the capabilities of the staff. Some examples of an external threat may include an earthquake, hurricane, approaching wildfire, or other natural disaster. They can also be manmade, such as a crash of an aircraft. Military examples include the disaster at Pope Air Force Base in 1994 when a fighter jet crashed into a gathering of a few hundred Soldiers preparing to board a cargo aircraft for an airborne jump (24 dead, 100+ injured) (Condon-Rall, 1996) or the Ramstein Airshow disaster in 1988 (70 dead, 300+ injured) (Fullerton, C., et al., 2000). Some examples of internal threats include a potential or imminent structural collapse, a hostage or gunman situation, or bomb threat.

After the Northridge, California earthquake in 1994, depending on the surveyor questioned, between 8 and 14 hospitals were evacuated due to the structural damage (Schultz, et al. 2003; Sternberg, et al. 2004). The use of flashlights in darkened stairwells were necessary to conduct the evacuations in many cases, due to the failure of the

emergency generators on several buildings. Two hospitals had to eventually be condemned, but were not evacuated until a third survey found structural flaws (Schultz, et al., 2003).

Wildfires pose another threat to hospitals. Many military installations have large training areas that may be difficult for standard firefighting equipment to access. If fires start remotely, they may be unable to be contained before they grow. Tracer ammunition and other incendiary training aids have the potential to ignite such fires. One example is Camp Pendleton, California. This large training area has been the sight of several significant wildfires over the last decade (Martel, 1998; Urrea, 2004; Fox News, 2008). A rapidly moving wildfire on such a base may require the evacuation of hospitals.

Background on the Current State of Emergency Codes

Multiple problems exist within the emergency system. A quick survey of numerous hospitals across Washington State in the summer of 2008 showed over 20 different phone numbers to call if trying to activate a code response (Wagner, 2008). Among the 34 different hospitals surveyed in Washington, fifteen unique or different call codes were in place if a child was missing with the possibility of having been abducted. In Oregon, 14 unique codes are in use by 31 surveyed hospitals to indicate a bomb threat. Conversely, 80% of Washington and 82% of Oregon surveyed hospitals used 'Code Red' to indicate a fire in the facility, indicating some degree of similarity. As staff move from facility to facility, or work part-time in multiple facilities with different emergency code calls, the need for standardization quickly becomes apparent.

A list of states that had standardized or begun the standardization processes was obtained from Carol Wagner, Vice President Patient Safety for the Washington State

Hospital Association (personal communication, August 20, 2008). Carol was a member of the working group that developed the American Hospital Association's (AHA) recommendations as well. States that had done so included California, Colorado, Ohio, Florida, Georgia, Louisiana, New Jersey, Rhode Island and West Virginia. All these states had chosen Code Blue and Code Red as in-house medical emergency and fire, respectively. Similarly, all had chosen Code Orange to represent a hazardous material spill. This is quite intuitive when you consider the color of the hazardous material stickers placed on substances in healthcare and industry. Of the six states that chose to set an explicit code call for bomb threat, four chose black; the other two chose yellow and one left it up to the facilities. Some other states chose to incorporate it into their "Internal triage" code call. The American Hospital Association (AHA) recommends against that for reasons that will be discussed later in the paper.

The Military Health System (MHS) has many similarities to the civilian care system. The same way Kaiser Permanente has niches in Georgia, California, Hawaii, etc., the Army MHS is divided into regions. Within these regions, Army Medical Centers (MEDCENSs) and Army Community Hospitals (ACHs) exist the same way that Kaiser has established different levels of services within a geographical region (Hawaii: Hilo, Kona, Honolulu, Maui, etc). Under these hospitals are often clinics in both the civilian and military sector.

The Western Regional Medical Command (WRMC) is currently comprised of one MEDCEN, two ACHs and nine physically detached clinics that often work under the same policies in place at their parent hospitals. Western Region will more than double its number of facilities by summer of 2009 and the geographic area of responsibility is

expected to grow to encompass a 20 state region, which will increase its size by over 300 percent. An informal questioning of facilities currently in WRMC shows that Code Red and Doctor Firestone code calls are in place to call a fire emergency; two others exist for notifying staff of a cardiac arrest.

Costs become a factor when we consider the amount of time employees need to accomplish mandatory training before they begin patient care. One of the most sought after and robust group of employees in a healthcare organization is its registered nurses (RNs). In an effort to hire more nurses, many nurses receive lucrative bonuses to recruit them. With RNs in such high demand, it is imperative to keep them satisfied with their employment and employer. Throughout the training process a new RN forms their initial impression about the organization. Orientation plays a critical role in the satisfaction, and therefore retention, of nurses (Revis, 1996). If orientation is streamlined and incorporates self-learning modules, nursing satisfaction can be increased and lead to a decrease in turnover (Matthews and Nunley, 1992). As Reiter (2007) points out, recruiting, bringing on board, and orienting a new nurse to the organization can cost between \$39,000 and \$65,000. In light of these costs, it is essential to make orientation as parsimonious and user friendly as possible. Eliminating the need to reorient military staff and new hires to new codes with every PCS, or limiting it to review in a computer based module, can save time, and therefore money, when orienting new employees to the organization.

Evaluative Criteria and Survey

Due to the lack of information and literature in the area of code standardization, it was decided that it might be advantageous to conduct a survey of employees' impressions of emergency codes. The 15-question survey was developed as a method of determining

what current WRMC employees deem intuitive when activating the code system. The survey contained two main subsections: background information/ work experience and what would be the easiest code calls to remember. The survey is available at Appendix A.

The first section consists of six questions establishing the employees' background without providing personally identifiable information. These questions include work location (MAMC, Basset ACH, Weed ACH, Okobu Clinic, Nisqually Clinic or McChord Clinic), employee role (Provider, RN, etc), type of employee (military, civilian or contract), years of experience in healthcare (fill in the blank), years and months at current facility, and finally the number of facilities worked in during the last 10 years (>2, 2, 3...7, >7).

The second section and remaining 9 questions asked about what they determined is the easiest codes to remember for emergent situations. The questions posed, "From your perspective, what is the most intuitive code call for a (cardiac arrest/ fire/ bomb threat/ infant or child abduction, etc)?" These questions are multiple-choice with the option of writing in if they selected OTHER. The pre-printed answers for the latter questions were selected based on codes currently in common usage (code blue or code red for example), those used at MAMC, and finally those used by other organizations (Stanford Health Systems, 2008; Texas Tech University Health Sciences Center, 2008; Theda Care, 2008) because their codes and data were easily available via web search.

Face validity addresses whether the reviewers feel the survey is worded appropriately for the target audience (Netemeyer, et al., 2003). To ensure comprehension of the survey instrument across the educational spectrum, several hospital personnel from varying educational backgrounds reviewed the survey. Reviewers included a PhD

prepared nurse, a PhD nursing student, a Master's prepared nurse, a Bachelors prepared RN, a Licensed Practical Nurse (LPN), an Army medic/ nursing aide, and an administrator. While some possible bias exists due to the fact that most reviewers were nurses, the more critical issue was to get a spectrum of educational levels to respond. All reviewers stated that they were able to understand the assessment.

Content validity is concerned with the adequacy of the instrument to test the desired problem stated by the researcher. In order to establish content validity, subject matter experts reviewed the survey instrument. Dissention amongst experts necessitates the modification of the tool until a consensus is obtained on the question format (DeVellis, 2003; Selby-Harrington, et al., 1994). Content validity testing occurred by sending the survey to the Provost Marshal, patient safety manager, the MAMC ER assistant head nurse and the director of the emergency preparedness plan, Seventy-five percent agreement between subject matter experts was expected. All items were rated as a 3 or 4 (1= not relevant; 2= unable to assess relevance without item revision; 3= relevant, but needs minor alterations; 4= very relevant). All items were returned as a 3 or 4, with >75% of the questions receiving all 4s, therefore negating the need for a Cronbach's Alpha. The instruction letter to the raters and the Content Validity Index Score sheet are included as Appendixes B and C, respectively.

Some minor revisions were conducted to the survey tool (I.E., 'or child' being added to the infant abduction question; the capitalization of the main subject of the question in questions 7-15). One reviewer recommended adding "Are you a healthcare provider or healthcare administrative personnel?" The reviewer felt that "This question may assist in further identifying your target audience as well as the total years of

experience...” The author decided that further distinction added no additional value for the main purpose of this study (identifying code call perceptions) and kept the survey as succinct as possible. The author then posted the final edition of the survey to the website, www.surveymonkey.com.

This website provided a better forum than a MEDSHARE site (web site developed by MAMC that is accessible to all from a computer on the MAMC/ AMEDD server) for three reasons. First, multiple facilities, serving multiple services (US Army and US Air Force), needed access to the surveys. Second, there was the convenience that the practical nurse course located at Madigan already had an annual subscription to the site. Finally, the results were easily downloadable as a compressed Microsoft Excel® spreadsheet that could, with little effort, be imported into Statistical Package for the Social Sciences® (SPSS), version 14. The author used SPSS and Excel to provide the necessary statistical evaluation. The uploaded version appears as Appendix A.

After uploading of the survey, an initial test group of 5 researchers, consisting of Masters and PhD prepared nurses and Baylor MHA residents, conducted initial field testing. The first two days elicited three responses, a 60% response rate. The author cleared all survey responses in order to make changes to the questions. After the first change, the question format revision allowed for only one, instead of multiple, answers. An additional change included rewording of the instructions to read at a Flesch-Kincaid grade level of less than 9th as determined by Microsoft Word®.

MAMC’s Department of Clinical Investigations (DCI) for Institutional Review Board (IRB) examined the submitted materials for the online survey. They determined the survey eligible for exemption status if the Primary Investigator (PI) completed the

Collaborative Institutional Training Initiative (CITI) course for examination of human subjects. The packet underwent one revision and received approval for distribution on August 26, 2008 (Appendix D), with the investigator notified a week later. On September 30th, 2008, the military treatment facility (MTF) Deputy Commanders for Administration (DCA) and clinic administration officers (AOs) received the survey link via an email for distribution to their staff. The survey website received its first response later that same day. Difficulty existed in getting the link sent out to distribution lists. Buy-in from the hospital Deputy Commanders for Administration (DCA) and clinic administration officers (AOs) was gained through repetitive emails. Within two weeks, response volume significantly increased. The survey closed after eight weeks, on 25 November 2008 with a total respondent sample size of 1040. Due to hiring, firing and PCS actions, an exact total population is difficult to ascertain, but the researcher estimates it to be between 5,000 to 6,000 personnel.

Results

The excel zip file downloaded from www.surveymonkey.com was not ready for direct import into SPSS. The biggest problem was that the survey allowed a fill-in-the-blank response for “Number of Years in Healthcare Experience” as well as “Time at current facility”. Therefore, responses varied in text and numerical values, and included “6 years”, “8 mo”, “3 yr Nov”, “thirteen plus”, and “2002-2008”, amongst others. The researcher converted these into numbers. In examples of “x plus”, the number was rounded down to just “x”. The response of “6 yrs mil and 10 yrs civilian” translated into “16”. This researcher then imported this into SPSS.

Question 1, asking about respondent location, was modified so that a non-response was coded as -8. The labeling of columns and values was completed using the variable view. Forty surveys without a response to question 4 ('Number of years of healthcare experience') were eliminated. Twenty surveys with responses to this question that exceeded the value of "years at current facility" (question 5) were eliminated. Next, those whose responses were missing data were examined. If "years in healthcare" was empty, but "months in healthcare" had a response, a 0 was put in the "years" column. This was done because it was feasible for a new employee to have been working for less than a year. Next, those who were missing data in months at a facility but had years at a facility, were give a 0 in the months at facility column. For example, if someone wrote 30 in years, but left months empty, 0 was written in. If after this was done there was a 0 in years and 0 in months, they were dropped from the survey. This left 980 valid responses to work with.

The prior mentioned substituting zeros was necessary so that an average time at the current facility could be calculated. The "Months at current facility" was transformed into a decimal (0=0, 1= .08, 2= .17...12=1, missing data=-8). The compute function was used to add this new column to "Years at current facility" to give a year/ month value such as '12.75 years'.

It became apparent that non-responses in some questions resulted in a 0 when imported into SPSS. Additionally, those who responded "Other" and wrote in a response were also coded as 0 by the SPSS program. Since this portion of the population was minimal, the respondents were kept so that their response to other questions could be included.

Response rates were greatest from MAMC, the largest facility in WRMC, with 697 (71.6% of responses) respondents. Basset ACH (Fairbanks, AK) and Weed ACH (Fort Irwin) contributed 134 (13.8%) and 55 (5.6%) responses, respectively. McChord clinic, recently adopted by the Army due to BRAC, contributed 54 (5.5%) responses. Finally, Nisqually and Okubo clinics on Fort Lewis combined for 32 responses, just over 3% of the total responses. Due to turnover of staff in multiple medical facilities, and the little to no value added, a response rate was not calculated. These numbers are provided to show the potential influence of having over two-thirds of the respondents originate at MAMC. When the clinics are added to that number, nearly 4 in 5 in were familiar with the codes that MAMC used.

The codes in these facilities include Charlie Alpha for Cardiac Arrest, Dr. Firestone for fire, Code Purple for infant or child abduction, Doctor Boomer for bomb threat, and Code Orange for HAZMAT spill. In fact, the only facilities that do not use these codes in WRMC are WACH at Fort Irwin, CA, and BACH at Fort Richardson, AK. This probably tainted the results of what is intuitive.

Some basic demographic statistical results of the survey reveal that 459 of 980 (46.8%) respondents categorized themselves as “Support Staff/ Other” (see Table 1). This group may have little clinical experience and therefore a code blue, the color a patient turns when having a cardiac arrest, may be less intuitive. However, one of the comments made in the survey included, “I know Code Blue from watching TV”. With the preponderance of medical television shows, such as “ER”, “Grey’s Anatomy”, or “House”, clinical and non-clinical staff members alike may be influenced towards what is often called a “Code Blue” on TV.

Table 1.

Employee Role

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
Valid	No response	6	.6	.6	.6
	Provider	194	19.8	19.8	20.4
	LPN/ Aide/ Medic	115	11.7	11.7	32.1
	RN	206	21.0	21.0	53.2
	Support Staff/ other	459	46.8	46.8	100.0
	Total	980	100.0	100.0	

When given the choice of “Military”, “Civilian”, or “Contract”, only 31.7% of respondents characterized themselves as military (see Table 2). This is significant when we consider standardizing since, according to the MAMC’s Nurse Recruiter, there may be a public predisposition to think of military facilities being manned by military personnel (Personal Correspondence, Sandy Jones). This is often not the case, with civilians providing the continuity of care. In fact, over 73% of staff at MAMC classified themselves as non-military, and most likely do not PCS between facilities often. If military personnel PCSing is our motivation to standardize, then we may be missing the boat. Of note is that while this was originally a consideration, MEDCOM stated that all Army Medical Department facilities would adopt a standardized code. At that point, consideration of moving MTFs in line with state standardization policies became a moot point.

Table 2.

<i>Employee Type</i>		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
Valid	No response	2	.2	.2	.2
	Military	309	31.5	31.5	31.7
	Civilian	641	65.4	65.4	97.1
	Contractor	28	2.9	2.9	100.0
	Total	980	100.0	100.0	

What should be a consideration is that 66% of personnel surveyed have worked in more than one facility in the last 10 years (646 personnel). This means the personnel may be moonlighting downtown. Standardizing codes based on what states, healthcare consortiums, or the American Hospital Association has recommended may prove more advantageous in the long run and needs to be a consideration for any working group.

To see if there was a difference in response to intuitive codes between those who have worked at one facility and those who have worked at more than one in the last ten years, data was recoded into a new variable. Those who worked in one facility were coded into a 1, while those who worked in more than one facility were coded as a 2. The researcher conducted an independent samples t-test. Next, the researcher ran a Levene's Test for Equality of Variance to see which sig (2 tailed) statistic to utilize. The transformed variables resulted in two dichotomous, mutually exclusive, collectively exhaustive variables, and therefore resulted in using the value of the 2-tailed test. Differences were noted in the code calls for cardiac arrest, fire, and abduction (at the p=

.000 level for all three) as well as the most intuitive call for an unarmed combative patient (p=.033) (see Table 3).

Table 3.

Code call perceptions with regards to work in multiple facilities

		<i>Levene's Test for Equal Variances</i>		<i>t-test for equality of means</i>		
		<i>F</i>	<i>Sig.</i>	<i>t</i>	<i>Df</i>	<i>Sig. (2-tailed)</i>
Most intuitive code for cardiac arrest	Equaled variances assumed	.317	.574	7.417	978	.000
	Equaled variances not assumed			7.449	681.411	.000
Most intuitive code for fire	Equaled variances assumed	3.297	.070	5.542	978	.000
	Equaled variances not assumed			5.505	661.062	.000
Most intuitive code for abduction	Equaled variances assumed	.294	.588	3.637	978	.000
	Equaled variances not assumed			3.629	669.580	.000
Most intuitive code for unarmed combative	Equaled variances assumed	8.790	.003	2.086	978	.037
	Equaled variances not assumed			2.132	714.840	.033

These results are significant because it reveals that those who are familiar with multiple codes have a preference for a particular code. When working at only one facility for ten years, what is used at that facility is the only experience we have or remember. In this case it was Code Blue for cardiac arrest and Code Red for fire. Code Pink, a fairly common term in past years is the most intuitive for a possible abduction. While Code Pink is familiar, Amber Alert, or Code Amber, followed by a description may be a better choice for reasons stated earlier (page 11). It will alert staff AND patients to be on the

lookout for an individual. Finally, significant at the 0.033 level was Doctor Strongarm for an unarmed combative patient. Sixty-three percent of the 646 personnel working at multiple facilities identified Doctor Strongarm as the best way to identify an unarmed combative patient. Unfortunately, this group also identified Doctor Stongarm as the most intuitive code for an ARMED patient. If we can not distinguish between the two, we very easily can become involved in an incident similar to that which opened this study.

While useful to identify perceptions, a simple ‘majority rules’ may not be the best approach when standardizing code calls.

Changes to the GMP

About halfway through the survey, MAMC’s Chief of Patient Safety approached the researcher stating that she had heard that MEDCOM patient safety office was in the process of standardizing codes calls throughout the Army Medical Department. A point of contact at MEDCOM was identified (Mr. James Wenzel), communication was initiated with the individual, and the researcher received an invitation to be included on the working group.

Marion-Webster defines policy as, “a: a definite course or method of action selected from among alternatives and in light of given conditions to guide and determine present and future decisions; b: a high-level overall plan embracing the general goals and acceptable procedures especially of a governmental body”. Ideally, when policy is set across an organization, working groups should include subject matter experts and stakeholders. They should collaborate on what is in the best interest of the organization and its constituents, in this case the staff of the Army Medical Command and its patients. Another consideration when drafting policy that may become law is the

interest of the public. While this has little implication to the public at large, a poor policy implemented by senior leaders in the Army can reflect negatively on the public's view of the organization.

This working group consisted of nearly a dozen people, including Mr. Wenzel from the MEDCOM patient safety office (lead on the project), a Lieutenant Colonel (LTC) who was the chief of the patient safety program and quality management group, members of the Great Plains Regional Medical Command (GPRMC) who had just finished standardizing their codes, along with patient safety representatives from several Army hospitals (see Appendix E for more information on how the AHA, WSHA and GPRMC model compare). A video-teleconference (VTC) was held in early January to field ideas and theories on what would best fit the MEDCOM. Approximately a half-dozen individuals attended the VTC. The researcher shared some results from the recent survey of WRMC employees. The group discussed the intuitiveness of codes and communicated thoughts related to standardization. The VTC lasted about 15 minutes and no clear outline of the way ahead was presented or formulated.

Policy formation, policy implementation and policy modification is an ongoing process (Longest, 2006), and all three are interrelated. The standardization of code calls within the MEDCOM or a region most closely reflects policy formation, as opposed to modification. While each facility may already have codes to represent what call indicates what code, there is no standardization at an enterprise level (MEDCOM). If we standardized, and later went and changed the code for a fire from Code Red to Dr. Firestone, this would be an example of policy modification.

All policy should be forward looking. In essence, we should look at not just what problems exist currently, but also anticipate upcoming problems. While it is imperative to address preconceived notions and where the policy originates from, policies of an organization should be very much like their vision; where it will be in the future.

Current MEDCOM Progress in Hospital Code Standardization

After the VTC in early January to discuss the codes, there was no communication with the working group. The researcher emailed Mr. Wenzel the first week of February to inquire about an update on the progress of current codes. Mr. Wenzel shared the policy in draft format which described standardized codes for 10 emergency situations in the hospital (Appendix F). Based on the MEDCOM model, facilities were also given the choice of implementing an additional code for the Rapid Response System (in essence a pre-code team) with the call, Code Violet. The Rapid Response System is tied to a Joint Commission patient safety goal to increase survivability of in-hospital emergent situations. This is in contrast to the WSHA and the AHA recommendations of an overhead page of “Rapid Response Team”.

It became immediately apparent that the policy incorporated very little of the AHA’s standards. Of the 11 codes standardized, the codes for fire, cardiac arrest, bomb and hazmat (red, blue, black and orange respectively) mimic those recommended by the AHA as well as the WSHA. But that is where similarities ended. The codes drafted for adoption were the same codes that GPRMC had just adopted throughout their region in the previous months. The region had likely expended considerable time, money and effort changing reference cards, overhead paging system modules, and rolling this out to the

entire region. This may have well been a factor considered when selecting codes that mimicked the GPRMC model.

A few years back the Greater San Antonio Hospital Counsel (GSAHC), led by Bill Rascoe and lacking a national recommendation, had taken the initiative to standardize code calls within San Antonio, Texas. Staff in the area worked at multiple facilities, and early on they recognized the problems associated with staff moonlighting. The potentiality of calling a code blue for a cardiac arrest and instead getting a police response existed because the same code in different facilities may have had explicitly different response. Noting this gap, the GSAHC got buy in from their constituents on a voluntary effort to bring all facilities on board with standards. This all occurred prior to the initiation of any national recommendations.

What most likely occurred is that Brooke Army Medical Center (BAMC), located at Fort Sam Houston in San Antonio, adopted these standards. While mostly a teaching hospital, it is one of only three Level 1 trauma hospitals in San Antonio. As staff may train at this as well as other San Antonio hospitals, the thought may have been to bring them in line with the GSAHC's standards on emergency code calls. When GPRMC began standardizing their emergency code calls, they looked to their largest constituency and medical center in the region, BAMC, to provide guidance. BAMC had GSAHC's pre-national standards in place. While well intentioned, BAMC may not have been aware of a national recommendation. Further conversations indicate that the patient safety advocate at GPRMC stated they adopted the South Texas Trauma Consortium's codes. This is the clinical partner of the GSAHC's administrative function. While the proper

name is the Greater San Antonio Hospital Counsel, the organization in actuality reaches as far south as Laredo, halfway to Houston, and as far north as Austin.

The researcher emailed the officer in charge of MEDCOM's patient safety office to voice concerns with the choices made for code standardization. If a national standard exists, despite partial standardizations, and an organization is moving towards an enterprise standardization, the national standards warrant consideration, despite past attempts. The patient safety chair at MEDCOM remained unconvinced that there was a national recommendation established by the American Hospital Association. The chart utilized by the WSHA as a tool to initiate their standardization with Oregon, and contained the AHA recommendations, was not sufficient according to him. The researcher contacted the AHA and eventually set up a telephone conference with Nancy Foster, Chief of Policy for the AHA. She had just completed work on the inclusions in the 2009 Congressional Stimulus package.

Having had time to review the documents, she stated that they did not come from her policy department. She did state that they had come from the Emergency Management (EM) department of the AHA, and that the Department of Homeland Security (DHS) had taken an interest in their work. Roslynn Schulman, who runs the EM department in the Washington DC office, could not narrow down where they originated and believed they may have come from the Chicago office of the AHA.

A second VTC occurred 20 February 2009. The VTC audience was the officer in charge of patient safety at MEDCOM, his civilian counterpart (Mr. Wenzel), and patient safety representatives/ quality management division chiefs from Southeast, Northern, Great Plains, and Western Region Medical Commands. He began by stating the codes we

adopted here, the USAF and USN would follow suit in adopting. This had, in essence, become a Department of Defense (DOD) standardization. The main purpose of the VTC was to discuss whether we should adopt GPRMC's codes. He immediately mentioned that the researcher made a case for adoption of a different model, and turned it over to the researcher.

Group Dynamics

Collaboration and working as part of a group is an important step of formulating policy. The success and failure of a group can often hinge on how the team bonds, and this policy formation group is no exception. Bruce Tuckman in 1965 spoke about the stages of team building and described them as "Forming, storming, norming, and performing". This is now referred to as the Tuckman Model.

In the forming stage, team members come together for a common purpose. They become acquainted with each other and establish behaviors. A knowledge deficit may be present and members will often seek better information. There is a lot of independent work during this stage and the leader must give direction to the group.

In the storming phase, ideas and personalities clash. People who believe strongly in their idea may be unwilling to compromise for the good of the group. This can lead to anger, resentment and open hostility. The purpose more defined than in the forming phase. A group must move past the phase in order to be successful. Having a leader at this stage can help mitigate some problems.

The next stage is norming. This is the stage where things are more placid. Email communication may use 'reply to all' to spread group thought. The team comes to agreement on roles and responsibilities as well as rules. The civilian counter-part to the

LTC in the standardization working group was in essence running the group and facilitating when needed. Group think at this stage is a potential pitfall, where members think that the idea courted is the best and that everything else may be wrong.

The final stage of Tuckman's work addresses performing. At this stage, rules have been established and individual roles are well known. Little input is needed from the leader as the team in essence works autonomously. Disagreements occasionally occur within the group but are handled in a positive method. With the exception of orchestrating the group's policies and perhaps drawing the individuals together, there is little work for the leader.

The researcher joined the group between what he feels was the third and fourth stage, norming or performing. The storming stage is a better time for the introduction of new ideas. While Tuckman stated that groups normally progress through the stages in order, some never leave storming if they can not find a consensus. Additionally, while it is possible to revert to an earlier stage, there is often little benefit to the group.

While Tuckman looked at interpersonal relationships of the group, another important concept to understand in group dynamics is the forms of power. Applicable to the current situation is French and Raven's five forms of power. Now half a century old, they still hold true and are often cited among leaders in social studies. According to French and Raven (1959) there are five forms of power. These are legitimate, expert, referent, reward, and coercive power.

Coercive power is the power to force someone to do something against their will. This may at times include physical force. Fear is the manifestation of this power, or

making the person uncomfortable enough that they capitulate. A good example of this power was that which Mussolini and Hitler wielded during World War II.

Reward power is having the ability to recognize people for their work with something of value. That value could be a salary, a ribbon for Soldiers, or a pat on the back. Another example of reward power is the ability to withhold rewards, such as an expected promotion. While not as harsh as coercive, the ability to abuse such a power exists.

Referent power is the ability to build loyalty through charisma or a common purpose. People want to be near that leader and emulate them. It is the type of power used by celebrities. Followers want to be recognized with that element they are following. A good example of this is the use of national pride to motivate Soldiers.

Legitimate power comes from being placed in a position of authority. The President of the United States is a prime example. It is the most obvious sign of power. In the code standardization group, the leader was the LTC in charge of patient safety. He received legitimate power when the Army Surgeon General anointed him as the head of the committee.

Finally, expert power is the most common power. It comes with being a specialist in a certain field. A doctor has expert power by nature of his training in the medical field. This power goes beyond being well informed. Expert power means that someone has the knowledge that others require. Having examined the topic extensively for the better part of 6 months, the researcher brought a different dynamic to the group; expert power. The researcher had examined how other states had implemented their policies, what codes

were adopted, and is involved in a group considering code standardization (the need portion of the power).

The researcher discussed the AHA model. When the LTC stated that he believed the AHA had developed standardization for color coded wrist bands, but not for code calls, the researcher cited the date, author, and verbiage from a printed email that had been brought to the teleconference. The email stated that while the policy did not come from the AHA's policy office, it most likely originated in the Emergency Management department. Again, the group leader was not convinced that the AHA had a policy as it was not posted to their website. The argument was made by the researcher that while not yet posted, a policy, if not fully adopted yet, was at the least under development.

The representative from GPRMC stated that perhaps we should adopt the GPRMC model and change it in the future to the AHA model, if one evolves. The researcher asked about the costs involved and she stated that they were minimal, but could not cite specifics. She discussed the cost of producing new cards for everyone's name tag. The researcher stated that each automated voice module for the MAMC intercom system costs roughly \$2000 (personal communication with Lynne Murphy, December 4, 2008). MAMC has an antiquated overhead paging system that uses voice modules to notify staff. This prevents an overhead page from an excited operator that startles staff. Additionally, time for training staff on the new codes was not discussed.

Based on these arguments, the researcher was given two weeks by the group leader to try to nail down a specific policy of the AHA. Multiple emails and phone calls to the AHA went unreturned. The researcher went back to the source of the AHA recommendations, Carol Wagner at the Washington State Hospital Association. She

explained that the AHA recommendations came from the “A2Q”, a sub-working group of the AHA. The researcher explained the importance of running this to ground and Carol called the AHA on the researchers’ behalf. Before the researcher received a phone call back, Carol was out of the office for about two weeks. Attempting to gather information on the A2Q group, the researcher coordinated through another employee at the WSHA. This information was emailed to the entire group that received the working draft from MEDCOM patient safety. This was the status of the project as of March 17th, 2009.

The way ahead

Regardless of what model the MEDCOM decides they will adopt as a new DOD standard, there are a number of things that will need to be completed once that standard is chosen.

A working group is designed so that the boss does not need to spend excessive time in the weeds and can focus on the more global problems. The working group, which builds a consensus, will eventually bring the group’s work to the boss or CEO. In the case of standardization of MEDCOM policy, it goes to the Army Surgeon General, Lieutenant General Eric B. Schoomaker. The surgeon general will either accept or decline the group’s recommendation and the group leader will draft a policy letter on LTG Schoomaker’s behalf.

The policy letter should include some important pieces of information. It should begin with what the letter is addressing, normally located in the background section. Another segment should address the reasons behind the change, though not always. As discussed earlier, when staff are educated about the reason for change, they are less likely to resist it. This is typically included in the purpose section. The letter will also address

applicability, or for whom the policy applies. That may be MEDCENs, MEDDACs or clinics. In this case, since we are trying to standardize, it will most likely be all Army Medical Treatment Facilities. Finally, it should have an implementation timeline. “No later than...” is the most common manifestation of a timeline. If funding is available for those changes, the letter should mention that as well.

When it reaches the MTFs, they will need to implement the policy at a local level. This often involves training staff on the new procedures. Two common venues for training are conducting it on-line and through staff meetings. Both have a cost associated with them; when staff are doing this training they will not be delivering patient care. Given that constraint, the training should be kept as short as possible, while still accomplishing training objectives.

A recent trend in training is to use online training. A current example of this is detainee healthcare operations training sponsored by the AMEDD. It allows for standardization of the information to be distributed and negates variability that may exist between two instructors teaching the same topic. This ensures all individuals receive the exact same information.

Leaders at staff meetings can also cover training. Conducting updates this way is often beneficial because such a policy will affect different types of personnel differently. For example, registered nurses may need to know more than LPNs or support staff who only initiate the code. Covering it at staff meetings allows the updates to be tailored to a specific audience. The downside is that by decentralizing the training, variability between presenters will exist. Regardless of the venue, it is imperative all personnel complete the training.

Conclusion

If all personnel do not complete the training or MEDCOM decides against the recommendations of the policy, we lose the hours of manpower that was put into a project. Operating efficiency is lost as employees will need to relearn new codes each time a person changes duty stations. Of significant concern is that we have not met our boss's intent of what he set us out to do. As this project continues to evolve, the author will continue to be involved in the working group as well as acting as the conduit between MEDCOM and the AHA and WSHA.

Finally, of utmost concern, is that the potentiality would still exist for another incident similar to the one that opened this report. It would be horrible if a tragedy like that occurred again when the AMEDD has the ability to tailor its response to the incident at hand. It is imperative that as leaders we protect the safety of our patients and our staff. Standardizing code calls and putting additional codes in place has the ability to save the lives of our Soldiers, patients and staff.

Appendix A

Online Survey

Code calls perceptions in WRMC

[Exit this survey](#)**1. Instructions**

This 15-question, multiple-choice survey is designed to determine perceptions of staff when activating the emergency code system of a hospital (Cardiac arrest, bomb threat, child abduction, etc). It should take less than 5 minutes to complete and will aid in standardizing hospital code calls across the WRMC. Participation is completely voluntary and there are no questions that will allow the survey team to identify you; it is completely anonymous.

The first 6 questions ask about your work experience. The following 9 questions ask what would be the EASIEST codes for you to remember, not necessarily what is in use at your facility. Thank you for your time.

1. Location:

- Madigan AMC Bassett ACH Weed ACH
 Nisqually AHC Okubo Clinic McChord Clinic

2. Employee role:

- Provider (including NP) RN
 LPN/ Aide/ Medic Support Staff/ other

3. Type of employee:

- Military Civilian Contract

4. Number of years of healthcare experience:

5. Years and months at current facility:

Years

Months

6. Number of healthcare facilities worked in during the last 10 years, including this one:

- | | | |
|-------------------------|-------------------------|--------------------------|
| <input type="radio"/> 1 | <input type="radio"/> 4 | <input type="radio"/> 7 |
| <input type="radio"/> 2 | <input type="radio"/> 5 | <input type="radio"/> >7 |
| <input type="radio"/> 3 | <input type="radio"/> 6 | |

7. From your perspective, what is the most intuitive code call for a CARDIAC ARREST?

- Code Blue
- Code 99
- Charlie Alpha
- N/A

Other (please specify) _____

8. From your perspective, what is the most intuitive code call for a FIRE?

- Code Red
- Dr. Firestone
- NA

Other (please specify) _____

9. From your perspective, what is the most intuitive code call for an INFANT OR CHILD ABDUCTION?

- Code Amber
- Code Pink
- Code Purple
- Code Stork
- Code Adam
- N/A

Other (please specify) _____

10. From your perspective, what is the most intuitive code call for a BOMB THREAT?

- Code Black
- Dr. Boomer
- Code Yellow
- Code Triage
- N/A

Other (please specify) _____

11. From your perspective, what is the most intuitive code call for a HAZARDOUS SUBSTANCE SPILL?

- Code Orange
- Code Yellow
- N/A

Other (please specify) _____

12. From your perspective, what is the most intuitive code call for an AGITATED OR COMBATIVE ***UNARMED*** PATIENT OR STAFF MEMBER?

- Code Gray
- Code Silver
- Dr. Strongarm
- Manpower
- Code North
- N/A

Other (please specify) _____

13. From your perspective, what is the most intuitive code call for an AGITATED OR COMBATIVE ***ARMED*** PATIENT OR STAFF MEMBER?

- Code Gray
- Code Silver
- Dr. Strongarm
- Manpower
- Code North
- N/A

Other (please specify) _____

14. From your perspective, what is the most intuitive code call for an EXTERNAL DISASTER?

- Code Zebra
- Code Triage External
- Code Yellow
- Code Black
- Code White
- N/A

Other (please specify) _____

15. From your perspective, what is the most intuitive code call for an INTERNAL DISASTER?

- Code Brown
- Code Triage Internal
- Code Green
- Code White
- N/A

Other (please specify) _____

Done

Appendix B

Letter to Reviewers

Dear Reviewers,

Thank you in advance for serving as a subject matter expert about standardizing code calls. As such, your opinions will affect what is measured when I survey employees about hospital codes.

Codes for calling in-hospital emergencies often vary from organizations to organizations and sometimes within institution themselves. As employees move within the organization (AMEDD and WRMC) or new employees are hired, it behooves the organization to have codes which are simplistic and intuitive. Code calls are used to call for medical assistance, warn of a fire, or to notify staff of a child abduction or hazardous substance spill. They are also used to request assistance in internal and external disasters, responding to combative (armed and unarmed patients) and warn of potential bomb threats.

The specific purpose of this survey is to find which code calls are most easily remembered among staff members about to initiate a call. This will provide a baseline for assessment of institutional knowledge as well as which codes may be adopted if an organizational wide code policy is put in place.

Please review the questions for their content and make necessary notes. If you feel anything is missing, please feel free to note so on the bottom of the survey.

Sincerely,

Michael Wissemann, RN

Appendix C

Content Validity Index Score Sheet

Reviewer:
Date of Review:

Instructions:

Please circle on the content validity index the number that best represents your opinion of the relevance of the 8 items for oral care practices it is intended to measure.

Construct: Standardization of code calls in Western Region Medical Command

Code Calls	Not relevant	Unable to assess relevance without item revision	Relevant but needs minor alteration	Very relevant
1) Experience in years in healthcare: _____	1	2	3	4
2) Years and months at current job: _____ years, _____ months	1	2	3	4
3) Number of healthcare facilities worked in during the last 10 years, including this one: <2 2 3 4 5 6 7 >8	1	2	3	4
4) From your perspective, what is the most intuitive code call for a Cardiac Arrest? Code Blue Charlie Alpha Code 99 Other _____ N/A	1	2	3	4
5) From your perspective, what is the most intuitive code call for a fire? Dr. Firestone Code Red Other _____ N/A	1	2	3	4

Code Calls	Not relevant	Unable to assess relevance without item revision	Relevant but needs minor alteration	Very relevant
6) From your perspective, what is the most intuitive code call for an infant abduction? Code Amber Code Pink Code Purple Code Stork Code Adam Other _____ N/A	1	2	3	4
7) From your perspective, what is the most intuitive code call for a bomb threat? Code Triage Code Black Code Yellow Doctor Boomer Other _____ N/A	1	2	3	4
8) From your perspective, what is the most intuitive code call for a hazardous substance spill? Code Orange Code Yellow Other _____ N/A	1	2	3	4
8) From your perspective, what is the most intuitive code call for an agitated or combative UNARMED patient? Code Gray Code Silver Dr. Strongarm Manpower Code North Other _____ N/A	1	2	3	4

Code Calls	Not relevant	Unable to assess relevance without item revision	Relevant but needs minor alteration	Very relevant
9) From your perspective, what is the most intuitive code call for an agitated or combative ARMED patient? Code Gray Code Silver Dr. Strongarm Manpower Code North Other _____ N/A	1	2	3	4
10) From your perspective, what is the most intuitive code call for an external disaster? Code Triage External Code Zebra Code Yellow Code Black Code White Other _____ N/A	1	2	3	4
11) From your perspective, what is the most intuitive code call for an internal disaster? Code Triage Internal Code Green Code Brown Code White Other _____ N/A	1	2	3	4

For Content Validity Reviewers:

Please list any additional items I may have forgotten or additional practice items I should include:

Appendix D

Institutional Review Board Letter

MCHJ-CI

26 August 2008

MEMORANDUM FOR CPT Michael W. Wissemann, AN, Principal Investigator, MHA Baylor Resident, Madigan Army Medical Center, Tacoma, WA

SUBJECT: Exempt research application assigned MAMC #208102, entitled: **“Emergent Code Calls in the MTF Setting”**

1. The Department of Clinical Investigation at Madigan Army Medical Center (MAMC) performed a review of the aforementioned protocol. The undersigned have determined that the protocol has scientific merit and qualifies for **exempt research designation** in accordance with 32 CFR 219, 45 CFR 46.101 (b) (2), survey procedures, and AR 40-38, B-5 public behavior. The research proposed was judged to constitute no more than **minimal risk**. This study uses an anonymous survey of male and female, civilian, military, and contract employees working in medical facilities within the WRMC. Employees are asked to characterize themselves as RN, LPN/nurse aide, provider, or support staff/other. The survey will be distributed through hospital and clinic XOs/DCAs to the populations of Madigan Army Medical Center, Weed ACH, Bassett ACH, and Nisqually, Okubo and McChord Clinics. Desired sampling return is 10-20%
2. Please refer to the protocol #208102 in all correspondence. Please inform this office when the research is completed or terminated and forward any significant findings to DCI.
3. Human subject research training has been completed by the investigator.
4. No protected health information (PHI) will be collected in this research, so HIPAA regulations do not apply.
5. No funding has been requested through DCI/GME for presentation / publication.
6. Any manuscripts resulting from the research described must be submitted in compliance with MAMC Regulation 360-2 for approval prior to publication.
7. The MAMC IRB will be informed of this action at the next regularly scheduled meeting. POC with questions is the undersigned at (253) 968-1160.

PAUL J. AMOROSO, MD, MPH
COL, MC
Chief, Department Clinical Investigation

BARBARA JONES, CIP
IRB Protocol Manager/Auditor
RAS, Department of Clinical Investigation

Appendix E

Code Calls Matrix

Incident	American Hospital Association	Washington State Hospital Association	Great Plains Regional Medical Command
Fire	Code Red	Code Red	Code Red
Cardiac or Respiratory Arrest	Code Blue	Code Blue	Code Blue
Infant or Child Abduction	Code Amber	Amber Alert	Code Pink
Bomb Threat	Code Black	N/A	Code Black
Hazardous Material Spill	Code Orange	Code Orange	Code Orange
Unarmed Combative	Code Gray	Code Gray	Code Green
Armed Combative	Code Silver	Code Silver	Code White
External Disaster	Triage External	External Triage	Code Gray
Internal Disaster	Triage Internal	Internal Triage	Code Gray
Utility Failure	N/A	N/A	Code Yellow
Lost/ Eloped Child	N/A	N/A	Code Silver
Rapid Response Team	“Rapid Response Team”	“Rapid Response Team”	Code Violet

Appendix F

MEDCOM Policy Draft

D R A F T

(MEDCOM Letterhead)

MCHO-Q

MEMORANDUM FOR ALL U.S. Army Medical Command (MEDCOM) ACTIVITIES

SUBJECT: Common Emergency Codes

1. **BACKGROUND:** The Center for Medicare and Medicaid Services in 2000 recommended that hospitals adopt a common emergency code system. The first state to do so was California; New Jersey Health Care system implemented statewide system in 2004. Louisiana, Rhode Island and Ohio followed in 2005. Recently Great Plains Regional Medical Command has published a policy on standardized codes for their Medical Treatment Facilities (MTFs).

2. **PURPOSE:** To establish common emergency codes for use in our MTFs to reduce risk to patients and to ensure appropriate response by staff members who move between MEDCOM facilities.

3. **APPLICABILITY:** This policy applies to all MEDCOM activities worldwide.

4. **CODES:** The following codes will be adopted throughout MEDCOM activities.

CODE	CLEAR TEXT	DESCRIPTION
RED	Fire	Call code: Location
BLUE	Cardiac or Respiratory Arrest	Call code: Location
PINK	Infant / Child Abduction	Call code: Age, Location
SILVER	Child / Adult - Lost / Eloped	Call code: Age, Location
BLACK	Bomb Threat	Call code: Location
GREY	Disaster (activate plan)	Call code: Description
GREEN	Combative Person	Call code: Location
ORANGE	HazMat	Call code: Location
WHITE	Armed Intruder / Active Shooter	Call code: Location
YELLOW	Utility Failure	Call code: Affected Utility
VIOLET	OPTIONAL MTF USE - RRS	Call code: Location

5. **POLICY:** This policy is effective 1 September 2009. MEDCOM activities will adopt the above codes and ensure MTF staff are informed and trained. Additional codes may be added to meet local requirements.

6. Point of contact for this action is LTC Anthony Bohlin, Chief, Patient Safety Program, Quality Management Division, (210) 221-6195, DSN: 471-6195. Anthony.Bohlin@amedd.army.mil.

TSG to sign.

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