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Assessing the interrater reliability of the Assessment of Pediatric Resuscitation Communication (APRC)

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ASSESSING THE INTERRATER RELIABILITY OF THE ASSESSMENT OF PEDIATRIC RESUSCITATION COMMUNICATION (APRC)

A Thesis

by

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ABSTRACT

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The purpose of this study was to further validate the Assessment of Pediatric Resuscitation Communication (APRC), by establishing the interrater reliability of the instrument. The aim was to determine if the APRC instrument can be used by trained coders from a range of disciplines to assess the communication effectiveness of trauma team members and leaders during pediatric trauma resuscitations. These scores will be used to determine if team and leader communication is correlated with medical performance during trauma resuscitations. The sample included 8 participants from diverse backgrounds. A calculation of the Percentage of Agreement (1996) of 4 pediatric resuscitations was used to test the hypothesis and research question which proposed coders will be able to achieve interrater reliability at .80 or above after APRC training had been completed. Findings revealed that interrater reliability scores significantly improved after APRC training was conducted.

DEDICATION

To start with, I would like to express my gratitude to my family. The completion of my master's degree would not have been possible without their love and support. Thank you to my mother, Kelly Cerroni, my father, Patrick Cerroni, and my brother Derek Cerroni for always believing in me. Also, thank you to my mentor, Dr. Jessica Raley, for her continuous motivation and patience through this great journey. Thank you all for inspiring me and challenging me to be the best I can be.

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CHAPTER I

INTRODUCTION

While tremendous progress has been made to improve the effectiveness of pediatric trauma resuscitations, there is still considerable evidence that shows that ineffective team communication occurs during trauma resuscitations and may contribute to poor patient outcomes. According to the Joint Commission Sentinel (2010), the root cause of errors made during trauma resuscitations is miscommunication among trauma team members. Communication errors continue to exist even in established trauma centers, despite rigorous guidelines, protocols, and performance assessments (Ivatury, Guilford, Malhotra, Duane, Aboutanous, & Martin, 2008). Unfortunately, in trauma settings, the consequences of these communication errors are often fatal.

The patient safety literature is compiled with accounts of human error in the trauma setting contributing to patient injury. According to a HealthGrades (2004) study of 37 million patient records, an average of 195,000 people in the United States died due to preventable, in-hospital medical errors in each of the years 2000, 2001, and 2002. Vice President of HealthGrade's medical affairs Samantha Collier (2004) explains the severity of this finding best by saying, "The equivalent of 390 jumbo jets full of people are dying each year due to preventable in-hospital medical errors, making this one of the leading killers in the U.S."

Research shows that many of these in-hospital medical errors are occurring in trauma centers while trauma teams are conducting resuscitations. A study on enhancing patient safety in the trauma/surgical intensive care unit found that the rate of death due to error in the trauma setting is 2 to 4 times higher than deaths due to errors reported in the general hospital patient population (Stahl et al., 2009). Much of the death and injury is attributed to errors among trauma team members during resuscitations (Wheatley & Cass, 1990). Oakley, Stocker, Staubli & Young (2006) found that out of 90 pediatric resuscitations, management and communication errors occurred on an average of 5.9 times per patient.

Much of the trauma literature focuses on errors made during the trauma resuscitation of adults; however trauma is the leading cause of death in younger patients (Stahl et al., 2009). Pediatric trauma care, which is defined as the "The branch of medicine that deals with the development and care of infants and children and the treatment of their diseases and injuries (p.13)." is often overlooked even though one in four children in the United States sustains an unintentional injury that requires trauma medical care each year (Houghton Mifflin Company, 2007; Danesco et.al, 2000). Furthermore, child death due to injury surpasses all other causes of death for children and adolescents (Arias et al., 2003). The Child and Adolescent Department Visit Data Book noted that there are 31,447,000 child and adolescent visits to the emergency departments each year ("American academy of," 2001).

These medical errors are not only problematic for the patients involved but also has an enormous effect on physicians as there has been a steady increase in the number of malpractice claims brought against healthcare providers (Russell, 2009; Brennan et al., 1991). Our country is spending large sums of money on medical liability costs due to preventable errors, estimated at about $55.6 billion per year (Reid, 2010). According to the Annual Report National Practitioner

Data Bank (2008), between 50-65% of all doctors will be sued at least once in the career. Similarly, 1,500 lawsuits are filed against interns and other physicians each year. Again, studies show that a substantial amount of patient injury occurs because of communication errors between physicians. Therefore, there is a need for an assessment measure that will effectively evaluate the communication between trauma teams.

In order to identify the trauma team and leader communication errors made during pediatric trauma resuscitations, Raley and Mottet (2009) created the Assessment of Pediatric Resuscitation Communication (APRC). Specifically, the APRC instrument measures six team communication competencies and five leader communication competencies to ensure trauma team members and leaders are communicating effectively during pediatric trauma resuscitations. The development of a communication effectiveness assessment was necessary for two reasons. First, healthcare providers can use the APRC instrument to identify the reoccurring communication errors that are made by team members and leaders during resuscitations. Second, the APRC assessment can be used to train trauma team members and leaders to communicate more effectively during pediatric trauma resuscitations. However, to ensure that the APRC instrument is truly measuring communication effectiveness, validity must be achieved.

The validation of any instrument is important for a multitude of reasons. Validity is essential because it checks the quality of an instrument by testing to see whether or not the instrument measures what it claims to measure (Carmines, & Zeller, 1979). Validity and reliability are important concepts to an instrument because they address whether repeated measures will produce consistent results. There are three main types of validity: criterion, content, and construct validity. Reliability of an instrument is also noted as an important part of validation study. Reliability is comprised of test-restest, alternative form, split-half, and

interrtater reliability (Carmines & Zeller, 1979). Each of these types of validity and reliability takes a different approach in assessing if the instrument measures what it intends to measure (Carmines & Zeller, 1979). Each is important in defining an instrument, as they ensure the measurement is free from bias and distortion.

While many of these components have been addressed during the making of the APRC, the purpose of this study is to continue the validation process by measuring for interrater reliability. Reliability is defined as how much a specific variable influences a set of items (DeVellis, 1991). More specifically, interrater reliability concerns whether agreement between two people (raters/observers) is found pertaining to a specific variable (DeVellis, 1991). The purpose of this study is to test for interrater when using the APRC instrument. Again, it is important to note that interrater reliability is only one component of the validation process. However, interrrater reliability is the best method of assessing reliability when one is making an evaluation based on assessments (Devillis, 1991).

In order to ensure the development of a valid measure, Raley and Mottet (2009) took several steps. First, the APRC was created after researchers meticulously reviewed and analyzed the current trauma literature and the trauma handbook from the trauma center they were working with. This extensive review allowed the researchers to better understand the previously identified team and leader behaviors enacted during a trauma activation (Raley & Mottet, 2009). Along with reviewing the literature and trauma handbook, the researchers conducted a focus group where they received feedback about trauma procedures from trauma physicians. Finally, to further assess the face validity and to identify the communication behaviors of trauma teams and leaders, researchers observed live and videotaped resuscitations. Each of these steps was taken to

ensure the APRC is a valid tool that can be used to identify communication errors and ultimately improve trauma team and leader communication (Raley & Mottet, 2009).

To further validate the APRC, the interrater reliability of the instrument needs to be assessed. As such, the purpose of the present study was to test the interrater reliability of the APRC instrument using a four step process. First, participants were asked to assess the communication effectiveness of one live pediatric trauma resuscitation using the APRC instrument prior to receiving any training or information about how to use the APRC. Following the initial assessment, interrater reliability was computed using the Percentage of Agreement (Rubin, 1996) statistic to determine the level of agreement among coders' APRC scores. Second, an APRC training program was created and conducted to educate the same participants on how to use the APRC instrument to assess the communication effectiveness of trauma teams and leaders during live resuscitations. Third, the interrater reliability of the APRC instrument was assessed a second time after coders assessed live pediatric trauma resuscitations that occur during the February 28th- April 17th. Fourth, the interrater agreement scores of the coders before training and after training was compared to determine if the APRC training was an effective way to prepare coders to use the APRC instrument. Ultimately, the aim of the present study was to determine if the APRC instrument is a reliable tool that can be used by trained coders to assess the communication effectiveness of team members and leaders during a live pediatric trauma resuscitation.

Once interrater reliability has been established, the communication effectiveness scores yielded by the APRC instrument will be used to determine if team and leader communication effectiveness is correlated with medical performance during pediatric trauma resuscitations. After the APRC has been validated, trauma centers will be able to identify the team and leader

communication behaviors that may need to be improved upon during pediatric trauma resuscitations. Once healthcare providers are aware of the communication behaviors that need improvement, they will also be able to implement a new resuscitation training system that includes information on effective team and leader communication. In short, this study is important to physicians and healthcare administrators, as well as the patients of trauma centers, because it helps to solidify the APRC instrument as a reliable and valid communication effectiveness assessment tool.

Validation of the APRC instrument will accurately assist healthcare providers in identifying communication errors among trauma team members and leaders. In doing so, healthcare providers will be better able to adapt their training and learning techniques to improve the trauma team staff and increase patient safety. Therefore, patients and parents of the patients will be more satisfied with their care.

CHAPTER II

LITERATURE REVIEW

Assessing Medical Performance Effectiveness

In any healthcare organization, it is extremely important to routinely evaluate methods and techniques to ensure efficiency. This is particularly true in the medical field as patient outcomes depend on the success and growth of a program (Blank-Reid, & Kaplan, 1996). As such, it is necessary for health administrators, educators, and other key personnel to modify or terminate any ineffective programs. Furthermore, it is their duty to create and implement new systems that build upon new medical knowledge. However, Sexton, Thomas and Helmreich (2000) found that the pressure to continuously perform effectively has made it difficult for physicians to admit their mistakes and therefore, hinders any opportunities for improvement.

Personal reputation, high expectations of the patients' family or society, possible disciplinary actions by licensing boards, threat to job security, and expectations or egos of other team members were among the reasons that medical physicians do not acknowledge or discuss the errors they make (Sexton, Thomas & Helmreich, 2000).

Previous studies have shown that effective team and leader communication within an organization positively impacts the organization's success (Driscoll & Vincent, 1992). Many would argue that communication is the most important factor in bettering team and leader performance (Patrashkova-Volzdoska, McComb, Green & Compton, 2003). This is especially

true in trauma settings as failure to communicate effectively and in a timely manner contributes to errors which can negatively impact the outcome of patient care (Helmreich & Merritt, 1998).

Trauma errors occur for a variety reasons. Some errors are due to unstable patients, fatigued physicians, incomplete histories, critical-time decisions; complex teams with differing experience and backgrounds, and concurrent tasks (Stahl et al., 2009). These errors often lead to a communication or management breakdown that can affect the patient outcome. Regardless of the level of trauma, errors are occurring. Research shows that patients who are classified as a Level I trauma suffer from serious injury and are more likely to die, than patients who are treated as a Level II trauma (Demetriades et al., 2005). Ivatury et al., studied 764 fatal outcomes in a Level I trauma setting and found that 76 (9.9%) of the deaths were due to communication and management errors (2008). In a separate study, Davies et al. (1992) found that out of 1,295 Level I trauma deaths, 1,032 significant patient errors occurred and were deemed avoidable. According to the Joint Commission Sentinel Event data (2010), the majority of these medical mistakes occur because of miscommunication between physicians. Therefore, optimal communication between team members and leaders is needed for effective teamwork to occur in the trauma setting.

Effective trauma team communication is especially important during trauma resuscitations. The purpose of a trauma resuscitation is to identify and treat any life threatening injuries as soon as possible. When trauma activations occur, team members must rush in and assesses the patient's medical status. Therefore, it is critical that trauma team members communicate effectively in order to accomplish their medical task. Within the trauma setting, resuscitation teams are typically comprised of 8-11 members depending on the level of the trauma. They may include: emergency physicians, trauma surgeons, neurosurgeons, orthopedic

surgeons, anesthesiologists, emergency and critical care nurses, respiratory therapists, x-ray technicians, lab/blood bank technicians, a surgery team and chaplains. There are two levels of trauma resuscitations or activations. Level II trauma activations are typically not life threatening, In fact, surgical teams are often unnecessary as they require fewer physicians, Level II physicians will often assess patients with minor injuries such as broken bones and will send the patients to get x-rays. However, Level I trauma activations are extremely serious and the injuries are often life threatening. For that reason, an emergency medicine physician and/or surgeon is required to manage the situation.

In each level of activation, a leader must be present who is responsible for supervising and coordinating the tasks and roles of the team members (Cicala & Murphy, 1993). McGinley (2005) notes that the trauma team leader's main purpose is to oversee, direct, and manage the team members during the resuscitation. Trauma team leaders should be hands-off and should not touch the patient (McGinley, 2005). The other team members play a part in managing the situation by completing their assigned tasks given by the trauma team leader.

Although most trauma centers have standardized guidelines for trauma activations, few evaluate their performance by looking at their healthcare providers' abilities to communicate effectively with one another during pediatric trauma resuscitations (Hamilton et al., 2009). While there has been a substantial amount of research done on teamwork effectiveness and medical performance, no scales have been created to measure the effectiveness of team and leader communication during pediatric trauma resuscitations. The current teamwork, leadership, and performance scales used in trauma settings today tap into various medical performance competencies and team/leader roles but do not directly assess communication

effectiveness. Consequently, there is a need for a standard instrument that assesses communication effectiveness during pediatric trauma activations.

Medical Performance Assessments

Although the communication effectiveness of trauma team members and leaders has yet to be assessed, previous researchers have designed instruments and training methods that measure the medical performance of trauma teams during activations. The medical performance of trauma teams is currently assessed using an ATLS (Advance Trauma Life Support) assessment which was established in 1976. The ATLS acts as a 'checklist' of what medical procedures should occur during each trauma activation. The ATLS protocol recommends that trauma teams follow a six step in hospital clinical process: (1) Preparation, (2) Triage, (3) Primary survey and resuscitation, (4) secondary survey, (5) continued post resuscitation monitoring and reevaluation, (6) definitive care.

In order to ensure that trauma team members understand how to follow the ATLS protocol, they are asked to take the Advanced Trauma Life Support course. This course is among the most commonly used methods to train trauma healthcare providers how to successfully perform medical procedures during trauma resuscitations. Developed by The American College of Surgeons (ACS) and its Committee on Trauma (COT), the ATLS course teaches a systemic approach to trauma management. The ATLS has been used by many medical institutions worldwide as a guideline for proper protocol for each trauma member during activations. This teaching protocol is used to both train and evaluate trauma employees on their medical performance. Previous research has found that the ATLS course effectively prepares students and physicians on the proper ways to medically manage trauma patients (Ali, Cohen, Gana, & Al-Bedas, 1998; Capella et al., 2010).

In short, the ATLS instrument or "checklist" is currently being used to measure the medical performance of trauma teams during trauma activations. While the ATLS instrument assesses the medical performance of trauma teams, it fails to measure the teams' ability to communicate effectively. The medical performance of a trauma team is just one aspect of the overall trauma activation. It is also important to assess the overall team dynamic in order to unveil communication errors made by team members or leaders that may lead to errors made during trauma activations.

Medical institutions also use trauma simulations and videos of live resuscitations to assess medical performance effectiveness in the trauma setting. Recently, recording live activations has become more popular among health administrators (Blank-Reid & Kaplan, 1996). Video recordings of trauma activations have become a prominent means for assessing the effectiveness of trauma team medical performance and are valued as an efficient teaching tool. Medical institutions have found video recordings to be effective in detecting medical performance errors, because trauma activations can be reviewed multiple times by multiple observes (Jeffcott & Mackenzie, 2008). Furthermore, research shows that video recordings are more valuable than traditional medical performance assessments because the evaluator's perceptions are subjective and therefore may not always be accurate (Oakley et al., 2006; Rosen et al., 2010).

Prior to recording the live activations, health administrators relied on simulations of resuscitations to evaluate trauma team effectiveness. Evaluating simulated trauma activations can be beneficial in identifying medical performance mistakes during trauma activations; however, researchers agree that assessing real life trauma activations is the ultimate test of

medical performance effectiveness (Jeffcott & Mackenzie, 2008). While simulation-based training can be very educational, there are few studies that show that simulated learning positively influences patient outcomes and reduces errors (Lateef, 2010). Assessing real life trauma activations is more beneficial because one's performance during simulated mock events may not be as realistic or true to live resuscitations (Weston et al., 1992).

Consequently, many trauma departments are combining ATLS instruments and training guidelines with video recordings as a means of measuring medical performance effectiveness in the trauma setting. Guideline standards from training courses like the ATLS are used as scoring sheets for experts evaluating medical procedures. These set criteria can help experts identify what was performed correctly or incorrectly during each recorded activation.

Many hospitals have established effective ways to measure, evaluate, and improve the medical performance of trauma teams during trauma resuscitations. However, these instruments measure the behavioral and technical aspects of trauma resuscitations but fail to evaluate communication between trauma team members and leaders. In addition, the curricula of many medical institutions has focused on individual medical performance but have failed to incorporate trauma team and leader communication into their trainings or courses. Consequently, there are plenty of measurements that assess effectiveness pertaining to team and leader medical performance during trauma activations, but few researchers have attempted to design an assessment that measures communication effectiveness during trauma activations.

Teamwork Assessments

In addition to the assessment of medical performance, teamwork is often examined in trauma settings. Specifically, there are reoccurring teamwork competencies that are assessed during surgical procedures, clinical consultations, and multidisciplinary medical rounds

(Frankel, Gardner, Maynard & Kelly, 2007). Team competencies are defined by Jeffcot and Mackenzie (2008) as "the learned capacity to interact with other team members at some minimal level of proficiency (p.190)." An extensive review of trauma literature revealed that within the trauma setting, there are four main teamwork competencies that are routinely assessed including pre-determined roles, situation awareness, time management, and use of common language.

Predetermined roles occur when each team member has an assigned task (Davies, 2005). The most effective team organization occurs when each team specialist carries out individual tasks simultaneously (Lanzetta & Roby, 1956; Hallam & Stammers, 1981; Falcone, 2008). Each team member should have a clear understanding of what they are supposed to do. Even though trauma teams are multidisciplinary and can bring different viewpoints and knowledge to the team, teams are most effective when members adhere to their own individual tasks. A study completed by Driscoll and Vincent (1992) found that resuscitation times were significantly reduced, falling from 122 minutes to 55 minutes, when task allocation was implemented. Mannebach and Spahr (2010) believe that a universal medical rule should be enforced regarding assumed roles during trauma team resuscitations. Pre-determined roles would eliminate confusion and instill collaboration among the involved specialists. Turnover within the medical academic centers is common, especially with resuscitation team personnel (Mannebach & Spahr, 2010). This negatively impacts the effectiveness of teams because it is hard to establish a rhythm among the members. Therefore, having standardized tasks for each role eliminates ambiguity when new members are incorporated into the team. In sum, trauma researchers agree that establishing pre-determined team roles improves teamwork effectiveness in the trauma setting.

Another teamwork competency routinely mentioned in the trauma literature is situation awareness (Morey et al., 2002; Thomas, Sexton, & Helmrich, 2004). Situation awareness can be explained by three questions: Where have we come from? Where are we now? Where are we going (Morey et al., 2002)? Simply put, situational awareness occurs when all team members are actively involved with the process occurring. All members should be able to see any monitors or screens during the resuscitation to ensure that everyone is on the same page (Davies, 2005). Situational awareness promotes information sharing among trauma team members and allows all members to have a clear understanding of what is required. Information sharing is defined as the extent to which team members address important information to each other during patient management (Davies, 2005). Currently, there are no widely known measurements that assess information sharing, however research shows that there is a correlation between increased information sharing and situational awareness (Davies, 2005). In short, situational awareness promotes communication between team members, which allows members to call attention to what they feel could cause errors during resuscitations.

Time management is another important teamwork competency discussed in the trauma literature. Resuscitations that occur in the trauma setting require a coordinated, organized, and quick response (ATLS, 2010). For example, The Advanced Trauma Life Support course notes the importance of trauma team members responding to all activations or procedures in a timely manner (ATLS, 2010).

Lastly, the use of common language among team members is a teamwork competency discussed throughout the trauma literature. For instance, Frankel, Gardner, Maynard, and Kelly (2007) found ‘critical language’ to be one of the important behaviors used during operations performed in trauma settings. Researchers believe that the use of common or key phrases can

promote effective communication and save time (Frankle et al., 2007). Particularly, the language used during trauma procedures should be understood by all members and verbalized loudly so that all team members are aware of what is happening during trauma procedures.

The four trauma teamwork competencies (pre-determined roles, situation awareness, time management, and use of common language) are measured using specific team assessment scales in a variety of different trauma contexts including surgical procedures, consultations, and resuscitations. For the purpose of this study, the teamwork assessments used to measure teamwork effectiveness during trauma resuscitations will be reviewed.

The Mayo High Performance Teamwork Scale was developed as an assessment tool to evaluate the effectiveness of team behavior during trauma resuscitations (Hamilton et al., 2009). The scale was originally designed to test team effectiveness during simulated trauma activations. This scale operationalizes principles of crises management, including components such as situational awareness, communication skills, anticipation of errors, and containment of errors (Hamilton et al., 2009). While some components of the instrument are effective in assessing teamwork during trauma activations, the Mayo High Performance Teamwork Scale fails to assess the emotional control of team members during live trauma activations. For example, in the component Team Dynamic, the APRC-TA scale rates the trauma team's emotional control as either Poor=1, Fair=2, Good=3, or Excellent=4.

Other limitations include that the scale does not successfully examine conflict between team members, verbal responses regarding errors, team leader maintenance, and checking for clarity. Unlike the APRC, The Mayo High Performance Teamwork Scale also fails to evaluate "team space negotiation" and "noise management." In terms of the leader's communication style, the Mayo High Performance Teamwork Scale only identifies one of the important components

needed for an effective leader. Specifically, this scale is lacking face validity. The scale assesses whether a leader is clearly recognized by all members, however, it does not evaluate the leaders ability to preview tasks, provide support for team members, delegate, and establish credibility. As a result, the instrument does not effectively measure all aspects of teamwork and communication needed during trauma activations.

In addition to the Mayo High Performance Teamwork Scale, the Anesthesiologist Non-Technical Skills (ANTS) instrument was developed to assess teamwork during anesthesiologist procedures performed during trauma resuscitations (Flin & Maran, 2004). This commonly used instrument evaluates teamwork by measuring the competencies of task management, situation awareness, team working, and decision making. This instrument was developed using simulated observations and scenarios to assess the performance of the anesthesiologists during trauma resuscitations. While the components identified in the ANTS instrument could be applied to evaluate overall teamwork effectiveness during trauma activations, it was originally created to assess the teamwork of anesthesiologists. As such, the ANTS instrument is a good assessment of anesthesiologists' teamwork performance during trauma activations; however it is not a holistic assessment of the entire trauma teams' teamwork effectiveness.

Taken together, the Mayo High Performance Teamwork Scale and the ANTS instrument are currently being used to assess teamwork effectiveness during trauma resuscitations. While these assessments appear to examine teamwork competencies utilized during trauma activations, they fail to measure the key communication behaviors that enable team members to successfully perform trauma activations as a team such as "team space negotiation," "team listening," and "team support." Both scales function as satisfactory assessment tools, they fail to provide meaningful feedback or address specific changes that must be made (Rosen et al., 2010). These

measurements act as a global assessment that merely identifies that there is a problem among the team.

Leadership Assessments

Aside from teamwork assessments, researchers have designed a few instruments to measure the medical performance of leaders in the trauma setting. In demanding circumstances like trauma settings, team members rely heavily on the trauma team leader for expertise and guidance. Yet, there is little research done regarding leader communication behaviors and their influence on team performance and patient outcomes.

There has been a recent debate regarding leadership structure during trauma resuscitations. Traditionally, trauma resuscitations were managed by surgeons who were clinically trained in pediatric surgery or trauma surgery (Mannenbach & Spahr, 2010). However in many medical institutions, Emergency Department (ED) physicians have taken on the role of team leader during trauma resuscitations (Mannenbach & Spahr, 2010). Many health administrators believe that a surgeon is not necessary during trauma resuscitations because other team members are capable of performing the leader's procedures. Also, they believe that the hospitals' resources will become strained due to the limited number of surgeons and the abundance of other tasks they are needed for. In contrast, other health administrators believe that having a surgeon present is essential to the success of trauma resuscitations because they are typically the most experienced and qualified members of the trauma team. However, the literature overwhelmingly suggests that what is most important during trauma resuscitations is that there is a team leader present who is in control and can direct team members when necessary (Yun, Faraj, & Sims Jr., 2005).

As physicians, there are different types of leadership styles that can impact the outcome of trauma resuscitation. The two types of leadership styles that are used most frequently during trauma resuscitations are a directive approach and an empowering approach (Yun, Faraj, & Sims Jr., 2005). Some trauma leaders prefer to use a directive approach in which they develop and finalize the resuscitation plans without consulting other team members. Under the directive approach, trauma team members typically carry out any directions given to them by their leader. This approach is more militaristic, where one person is in command of the rest (Yun, Faraj, & Sims Jr., 2005).

Another commonly used leadership style is the empowering approach, in which trauma team members are more inclined to participate in the decision making and task management of each resuscitation. While the team members still adhere to authority, the leader allows each member to take initiative and express their thoughts regarding the patients' status (Yun, Faraj, & Sims Jr., 2005). Empowering leaders allow the power to be distributed among other members and decisions are more likely to be made by consensus.

The effectiveness of leadership styles in the trauma setting found tends to vary depending on the setting or intensity of the trauma situation. For example, researchers found that directive leadership is more effective when the trauma level had a high level of intensity and the empowering approach is more effective when the severity of the situation was lower (Yun, Faraj, & Sims Jr., 2005). However, in any circumstance, a leader must be clearly identified and trusted by team members. Oakley et al., (2010) observed 50 pediatric resuscitations and found that 50% of the resuscitations observed did not establish a leader at the beginning of the resuscitations which caused confusion among team members and contributed to errors. Although team leaders are encouraged to be flexible, it is their responsibility to decide what needs to be done and how it

should be accomplished (Cooper & Wakelam, 1999; Sarcevic, 2009). This may include assigning particular tasks or providing expectations to members of the team (Klien, Ziegert, Knight, & Xiox, 2006). The designated team leader should have the final decision over all the trauma team members.

Another trait found to be effective during high intensity situations is having leaders that maintain a positive attitude. Though statistics suggest that over half of resuscitations attempts will not be successful, it is important for team moral that the leader be encouraging and positive throughout the resuscitations (Cooper & Wakelam, 1999). In 1990, Burrell acknowledged that the lack of support from a team leader can be the main reason for ineffective teamwork. A separate study using five different measures to test eight hypotheses concluded that when leaders create an environment based on support and teamwork, the overall team experience can be improved drastically (Montes, Moreno & Morales, 2005).

Finally, poor communication with other team members is often the main problem with leaders during trauma resuscitations (Sugrue et al., 1995). Communication is valued as the most important component during complex trauma situations (DeVita et al., 2008). If leaders are unable to delegate effectively, team members feel unorganized and hesitant in their executions. Cooper and Wakelam (1999) explain that leaders who do not initiate structure, would be described as hesitant and would respond only when asked directly. This can prompt poor communication between team members.

Many of these leadership components are measured through scales or instruments developed specifically to assess leadership behaviors in trauma settings. A frequently used instrument is the Leadership Behavior Description Questionnaire (LBDQ); (Cooper & Wakelam, 1999). The LBDQ measures effective leadership through two components, consideration and

initiating structure. Consideration is the extent to which a leader supports, and shows appreciation for other team members (Cooper & Wakelam, 1999). This specific study found consideration to be relatively unimportant due to the restricted amount of time during resuscitations. A leader should initiate structure by organizing the activities during resuscitations. In other words, the leader is in charge of deciding what should occur during each resuscitation, while following uniform guidelines (Cooper & Wakelam, 1999).

Similar to teamwork effectiveness, a leader's responsibilities are often defined and measured through the Advanced Trauma Life Support guidelines (ATLS, 2010). Many medical institutions evaluate leaders through real life video recordings or simulated trauma activations. Using the ATLS as a guidebook, chosen experts will mark down what was and was not done successfully.

One downfall of many of these leadership instruments is that they have been developed to measure medical performance effectiveness instead of communication effectiveness. Generally, the instruments act as a checklist to determine if the medical procedures such as completed tasks such as a primary survey and secondary survey of the patient (ATLS, 2010). ATLS have been preformed or delegated effectively by leaders. Consequently, a communication assessment is needed to measure the communication effectiveness of trauma team leaders (Cooper & Wakelam, 1999).

Although medical performance assessments which measure teamwork and leadership effectiveness during pediatric trauma resuscitations do exist, there is a need for an instrument that measures the communication effectiveness of trauma team members and leaders. While medical performance assessments should not be devalued, many do not fully address the team and leader communication factors that may influence patient outcomes during trauma

resuscitations (Barker et al., 2006). To address this need, Raley and Mottet (2009) created an instrument titled The Assessment of Pediatric Resuscitation Communication (APRC), to assess the communication effectiveness of trauma team members and leaders during pediatric trauma resuscitations. While this scale appears to measure communication effectiveness during trauma activations, researchers have yet to determine the interrater reliability of the APRC. Thus, the purpose of the present study is to assess the interrater reliability of the APRC to determine if the APRC can be used by communication researchers to consistently measure the communication effectiveness of trauma teams during pediatric trauma resuscitations. With this goal in mind, the following research question is proposed:

> *RQ1*: Is the APRC instrument a valid tool to use to assess the communication effectiveness of trauma team members and leaders during live pediatric trauma resuscitations?

The development and validation of the Assessment of Pediatric Resuscitation Communication (APRC) instrument was necessary for two reasons. First, unlike other communication or teamwork instruments, the APRC offers healthcare providers an accurate measurement to assess the communication effectiveness of the trauma team and leader during live pediatric trauma resuscitations. Second, the measurement also allows for healthcare providers to specifically identify problems within the trauma setting that may influence patient outcomes. By identifying these problems, healthcare providers can restructure or design medical curricula and trainings to ensure better patient outcomes.

Development of the APRC

The APRC instrument was developed using a step by step process in which team and leader competencies were identified. After reviewing the trauma literature, Raley and Mottet

(2009) familiarized themselves with a trauma handbook that displayed the process that pediatric trauma leaders and team members are instructed to go through during Level I and Level II trauma activations. The trauma handbook informed the researchers about each physician's specific task, and the location of each team member during both Level I and Level II trauma resuscitations.

After reviewing the trauma handbook, researchers watched real life videotaped trauma resuscitations to identify and understand the team and leader communication behaviors exhibited during trauma activations at the southern medical institution. After viewing each resuscitation, they discussed the communication behaviors they noticed the team members and leaders performing. From these findings, Raley and Mottet (2009) developed a list of common team and leader communication competencies performed during pediatric trauma resuscitations. These communication competencies were incorporated into a first draft of the APRC, which included a team section and leader section. The team communication competencies measured turn taking, space negotiation, support, and listening. The leader communication competencies measured leader support, delegation, and credibility.

In order to improve the first draft of the APRC instrument, the researchers conducted a focus group with pediatric healthcare providers to assess the face validity of the existing team and leader communication competencies. The focus group included an emergency medicine physician, charge nurse, nurse practitioner, and child life specialist. After reviewing the initial draft of the APRC, the healthcare providers were asked to assess the face validity of the instrument. The physicians concluded that the instrument did address a number of verbal and nonverbal communication behaviors present during pediatric trauma resuscitations.

During the focus group discussion however, the healthcare participants identified additional common communication behaviors that trauma team members and leaders often engage in during trauma activations. Defensiveness was the first type of ineffective communication behavior discussed. It was determined that defensiveness can be problematic during crisis situations because healthcare providers begin to second guess themselves and therefore are unable to think and act quickly. The focus group also discussed the communication behaviors that make trauma team leaders effective. The emergency medicine physician claimed that trauma team leaders would be more effective if they communicated the plan of action prior to the start of the pediatric resuscitation. The trauma team agreed that providing the physicians with a medical history of the child and explaining the plan of action for each activation would allow the participating physicians to feel more confident and prepared prior to the activation.

Participants also discussed the environmental factors that inhibit effective team communication. The focus group noted that environmental noises often interfere with effective team communication. They explained that noises come from trauma team member and leaders, patients, patients' families, and medical equipment. The participants agreed that they all have been involved in a trauma activation that was very noisy and distracted them from hearing the trauma leader's directions or announcements of the patient's medical status. Once the focus group was complete, researchers reviewed the group discussions and identified two leader communication competencies and one team communication competency. The three competencies were added to the initially developed APRC instrument. Researchers added a *preview* competency in order to measure a leader's ability to set patient expectations, define team roles, and implement a plan of attack prior to the start of the resuscitation. The researchers also added the competency *trust team members* to the leader section of the APRC. This competency

measures the leader's ability to relinquish power when necessary and to appear open and approachable (Raley & Mottet).

Along with adding to the team leader competencies, researchers also added the competency *noise management* to the team section of the APRC (Raley & Mottet, 2009). The noise management competency measures whether team members manage noise during trauma resuscitations so that it does not interfere with the team's ability to effectively communicate and complete tasks. Each of these competencies added to the APRC instrument were constructed to reflect the communication behaviors identified during the focus group discussion.

After conducting the focus group, Raley and Mottet (2009) were invited to view a live pediatric trauma resuscitation to continue to assess the face validity of the APRC instrument. Observing a live resuscitation allowed the researchers to view firsthand the verbal and nonverbal communication that occurs between the trauma team leader and group members and to better understand the additional communication behaviors discussed during the focus group. During this observation period, Raley and Mottet (2009) also noted another communication behavior that stood out to them that was not mentioned during the focus group discussion. They found that emotional control was an important aspect of each trauma resuscitation as members were expected to verbalize messages in a normal tone, volume, and rate for the emergency department. As a result, the *communication competency* team dynamic was added to the team section of the APRC. This competency measures the team's ability to manage the emotional, relational and organizational climate during trauma resuscitations.

Taking all of this knowledge into account, Raley and Mottet's (2009) APRC is currently comprised of three components: Resuscitations Activation Information, Team Assessment, and Leader Assessment. The first component, the Resuscitation Activation Information sheet is an

information sheet which serves as a log and includes 24 pieces of information that will later be used as control variables. The information log includes items such as coder name, video identification number, estimated age of patient, patient sex, type of trauma, number of people in the room at beginning and end of activation, and whether family members were present. The second component, the Team Assessment (APRC-TA) contains six competencies: Team Dynamics, Team Turn Taking, Team Space Negotiation, Noise Management, Team Support, and Team Listening. Each competency has three behavioral sub-competencies and one overall sub-competency. Each item is assessed using a 4-point Likert-type scale item with 1=Poor, 2=Fair, 3=Good, 4=Excellent. Until normative data can be established, scores higher than 60 are considered effective team communication and scores below 60 are considered ineffective team communication (See Appendix A).

The final component of the APRC includes the Leader Assessment (APRC-LA) which includes five competencies: Preview, Support, Delegation, Credibility, Trust Team Members. Consistently, each main competency has three behavioral sub-competencies and one overall sub-competency. Each item is assessed using a 4-point Likert-type scale item with 1=Poor, 2=Fair, 3=Good, 4=Excellent. Until normative data can be established, scores higher than 50 are considered effective leader communication and scores below 50 are considered ineffective leader communication (See Appendix B).

Once the final draft of the APRC was completed, the researchers developed an APRC codebook to use when training coders how to use the APRC instrument. The codebook was divided into three sections: Definitions and Coder Instructions, Team Competencies, and Leader Competencies (See Appendix C).

When testing the interrater reliability of an instrument, researchers need to ensure that coders understand how to properly use the instrument before calculating interrater agreement. Inconsistencies of coder scores occur for a variety of reasons. Colton et al. (2007), claims that coder inconsistency is often due to inadequate training of raters, or "the inability of raters to internalize the rubrics (p. 4)." In addition, Wolfe, Koa, and Ranney (1998) imply that coders who differ in levels of scoring ability often have an inconsistent understanding about the scoring criteria. To avoid this, researchers traditionally train coders to ensure proper understanding of the instrument in question. Mist, Ritenbaugh, and Aiken (2009) found that interrater reliability may be improved through questionnaire-based diagnosis and training, and therefore, should be used to improve the reliability of measurements. Given these findings, the present researcher conducted an APRC training session to avoid potential coder inconsistencies when testing the interrater reliability of the APRC instrument. With this goal in mind, the following hypothesis was proposed:

> *H1:* After completing an APRC training session, coders will be able to achieve interrater reliability at .80 or above when using the APRC instrument to assess the communication effectiveness of pediatric trauma teams and leaders.

The APRC training session included a three step process. First, the coders participated in an extensive review of the APRC instrument and codebook. Second, the coders watched two videotaped trauma resuscitations. The first video depicted a trauma team and leader communicating effectively, and the second videotape depicted ineffective team and leader communication during a trauma activation. Third, the coders practiced using the APRC instrument by coding videos of live trauma resuscitations and discussing their results.

Following the APRC training, the trained coders were asked to use the APRC instrument to assess the communication effectiveness of live videotaped resuscitations. The coders did not know if the resuscitations were ineffective or effective prior to their assessments. After the live video tapped assessment occurred, the coders were instructed to assess any live pediatric trauma resuscitations occurring from February 28th, 2011 – April 18th, 2011. Following each assessment, interrater reliability scores were assessed using the "percentage of agreement" calculation (Rubin, 1996).

CHAPTER III

METHODOLOGY

This chapter examines the methodology that was used to test the hypothesis and answer the research question specified in the Literature Review. Specifically, this chapter will review the participants, research design, and procedures that were used to conduct the present study.

Participants

Upon receiving approval from the Institutional Review Board, participants were chosen through a convenience sample. The convenience sample for this study included eight participants from two different disciplines. Three of the participants were students enrolled in various undergraduate and graduate communication studies classes from a southwestern university. Two of the participants were communication studies professors from a southwest university. The other three participants were research scientists from the Trauma Services Department at southwest hospital. The participants ranged in age from 20-49. Seven of the eight participants were female. Six of the participants were white, and two of the participants were Hispanic. It is important to note that 5 of the participants have no background in pediatric trauma, while three of the participants were well versed in pediatric trauma.

Research Design

A simple pretest/posttest design (without a control group) was used to determine if the APRC instrument is a reliable tool which can be used by trained coders to measure the communication effectiveness of trauma team members and leaders conducting a live pediatric trauma resuscitation. The treatment for this study was the APRC training session. The dependent variable was the interrater reliability scores computed after the treatment. In order for the treatment to have an effect on the dependent variable, it was expected that the interrater reliability would not be achieved in the pretest condition but would be achieved in the posttest condition. A level of agreement .80 or above is considered an acceptable level of coder agreement (Rubin, 1996).

A pretest/posttest design without a control group was used to conduct this study because it is widely used in behavioral research and is effective for comparing groups and measuring change results from treatments (Dimitrov & Rumrill, 2003; Bonate, 2000). One benefit to using a pretest/posttest design is that if the researcher finds that one group performs better than the other, he or she can easily establish that the stimulus did have an effect on the dependent variable being measured (Gribbons & Herman, 1997).

Participants were administered the pretest prior to receiving any APRC training. Following the pretest, the participants partook in APRC training in which they learned the differences between ineffective and effective communication. Finally, after the APRC training was completed, the participants engaged in the posttest. Pretest and posttest scores were computed and compared following the tests. By comparing the pretest and posttest scores, researchers were able to monitor the effects that APRC training had on interrater reliability. This

design has been used many times in research and across all areas. For example, Vecchio (1999) explains that an abundance of companies and organizations have designed training programs to improve the skills of new and old employees. In doing so, they need a means of evaluating whether their training was effective and objectives were met (Vecchio, 1991). The purpose of the pretest/posttest design for this study is to determine if the APRC instrument is more effective in finding interrater reliability when APRC training is involved.

Procedure

To determine the interrater reliability of the APRC instrument, the present study was conducted using a four step process: Pretest, APRC Training, Posttest, and Comparing Interrater Reliability scores for Pretest and Posttest. Each step was crucial in determining the observed agreement between raters when evaluating the communication effectiveness of trauma team members and leaders during pediatric resuscitations. Following the pretest, APRC training, and posttest, the researcher calculated the Percentage of Agreement (1996) as an indication of interrater reliability.

While there is a variety of statistical tests available to measure interrrater reliability, Percentage of Agreement calculation (1996) was chosen because it is noted as a strong measurement based on conceptual formula. Its purpose is to measure the agreement between two raters using the APRC. The Percentage of Agreement (1996) was selected because it is best suited for a nominal scale, which is used to assess the team and leader communication effectiveness (See Appendix A & B). Although other measures could be used to address interrrater reliability such as Holsti's method (1969) and Scott's pi statistic (1955), Percentage of Agreement is a simple means of measurement to determine how well the APRC instrument works.

Holsti's method (1969) was not used because it has been viewed as an inaccurate measure as it fails to consider that two people who were randomly assessing would agree occasionally by chance. Scott's pi statistic (1955) has been acknowledge by some as a more sufficient estimator than Percentage of Agreement (1996) calculation because it is "more susceptible to the judgments of a coder that categorizes unlike most other coders might, because each coder's distribution is used individually to derive expected disagreement (Hayes, 2005, p. 125)." However, many studies have concluded that the Percentage of Agreement (1996) calculation and Scott's pi statistic (1955) are so close that they will usually produce the same results (Hayes, 2005; Gewt, 2002). Therefore, Percentage of Agreement (1996) is an accurate means of measurement for interrater reliability.

APRC Pretest

Once the assessment team reached the southwestern hospital on February 28th, 2011 each member was given a copy of the APRC instrument and codebook and was immediately asked to assess the communication effectiveness of trauma teams and leaders performing a pediatric trauma resuscitation. The assessment team watched a live videotaped pediatric trauma resuscitation and assessed the communication prior to receiving any APRC training.

APRC Training

Before continuing to measure the interrater reliability of the APRC instrument, it is important for the assessment team to understand how to use the APRC instrument and codebook. Therefore, the present researcher conducted an all day APRC training session. The purpose of the APRC training session was to ensure that the assessment team understood how to use the APRC instrument to measure the communication effectiveness of trauma team members and leaders during live pediatric resuscitations.

The training session began with brief introductions of the assessment team and an overview of the development of the APRC instrument. Following the introductions, the researcher discussed the purpose of the present study. After relaying the intent of the study and the appropriate background information, the present researcher answered any questions. Following the discussion the researcher proceeded with the training (See Appendix C).

To ensure that the members of the assessment team understood how to properly use the APRC instrument, the present researcher reviewed key terms, and explained how to correctly score the competencies. After a general understanding of the assessment was met, the present researcher reviewed the codebook in detail with the assessment team. This review started with a thorough examination of the team and leader communication competencies and sub-competencies using the APRC codebook (See Appendix C). First, the present researcher defined and discussed the six team competencies and eighteen sub-competencies. Second, the assessment team discussed about the team competencies to address any questions. Third, the present researcher reviewed the five leader competencies and fifteen sub-competencies. Fourth, the assessment team discussed the leader competencies to address any additional questions.

Following the review and discussion of team and leader competencies, the present researcher then reviewed the coder ratings and instructions located in the APRC codebook (See Appendix B). She began by explaining the rating system and what it means to give a team and/or leader a rating of excellent, good, fair, and poor. Also, she explained that the coder must give a global rating for each team and leader competency and a rating for each team and leader sub-competency. After, the assessment team understood how to rate team and leader competencies and sub-competencies, the present researcher explained how to calculate the ratings to obtain a score for each trauma activation that is coded. Each coder should have one score for team

effectiveness and one score for leader effectiveness. Following the scoring discussion, the present researcher explained how to determine if the scores indicate effective or ineffective team and leader communication (See Appendix C).

Once the members of the assessment team fully understood how to use the APRC instrument, the assessment team was asked to put their training into practice. The members of the assessment team watched two different live trauma activation videos together and coded each practice video using the APRC instrument. After coding each video, the coder scores were immediately collected. The present researcher then led the assessment team in a discussion about what they observed and how they rated the communication effectiveness of the team members and leaders depicted in the videos. As the training came to a close, the present researcher asked all participants to reflect upon the training experience and review all of the materials and study protocols associated with the APRC instrument. Moreover, she reaffirmed that the purpose of the APRC training was to ensure that members of the assessment team are fully prepared to use the APRC instrument to assess the communication effectiveness of trauma team members and leaders during live pediatric trauma resuscitations.

APRC Posttest

Once the APRC training was complete, the assessment team was asked to participate in the posttest. The posttest scores were measured two ways. First, the assessment team was instructed to evaluate the communication effectiveness of videotaped pediatric trauma resuscitation. The data were collected and scored following the resuscitation. Second, the assessment team was required to assess all live pediatric resuscitations that occurred at the southwestern hospital during February 28th- April 17th. Specifically, participants assessed all pediatric trauma resuscitations of children (0-17 years of age) that are admitted to the Children's

Emergency Department. Pediatric trauma resuscitations were omitted from the study under the following criteria: Extreme severity cases (including death); multiple trauma activations that occur concurrently; any trauma resuscitation that includes ED staff members who have opted not to participate in the research study; participants who speak languages other than English or Spanish; and if parental consent for the child has not been provided. As activations occurred, the assessment team was notified by healthcare administrators and instructed to go to the ED room where they individually assessed the communication effectiveness of trauma team members and team leaders using the APRC instrument. The participants stood unobtrusively on the periphery of the trauma bay to observe and assess the communication effectiveness. They evaluated the communication for the length of time it takes the trauma team to finish the activation. The data was collected and scored following the assessments.

Following the activation the two coders who work for the hospital obtained delayed parental consent. Due to the high intensity situation, parents of the children admitted to the trauma centers may be experiencing psychological stress, and therefore, delayed consent was used so parents could attend to the immediate needs of their child being treated. Consent to participate in the research study was obtained at the earliest practical time, but no later than 24 hours after the activation had occurred. The two coders obtained consent by approaching the parents of the patients that have met the criteria, and explained the purpose of the study and addressed any questions or concerns the parents may have. Parents were required to provide authorization for the use or disclosure of information regarding their child's medical assessment. If consent was not provided, the data were omitted from the study. Once the data were collected and scored, the present researcher computed interrater reliability for the posttest APRC scores. In order for the APRC instrument to be considered reliable, the participants needed to achieve an

acceptable level of interrater reliability. Interrater reliability was measured using the Percentage of Agreement (1996) calculation. An agreement of .80 or above among is considered an acceptable level of interrater reliability (Rubin, 1996).

CHAPTER IV

RESULTS AND DISCUSSION

Communication in stressful medical situations like pediatric trauma resuscitations is hardly taught, and is often learned through hard experiences (Sarcevic, 2009). Therefore, the purpose of this study was to evaluate the team and leader communication effectiveness using the APRC instrument. More specifically, the present researcher wanted to test for interrater reliability to determine whether the APRC instrument produced reliable scores between the coders.

This chapter reviews the results that tested the projected hypotheses and research question for this thesis. The results were calculated by the Percentage of Agreement formula [Na / (Na + Nd)] x 100 (See Appendix C). First, the researcher calculated the number of agreements by totaling the number of coder matches for the global competencies. If all coders rated a competency on the positive side of the valence line, it would be considered a match. For example, if all coders rated the global competency "The teams overall dynamic was…" as either good or excellent, it would be considered a match because they are on the positive side of the valence line. The same rule applied for ratings on the negative valence line. Once the matches were counted the interrater reliability was calculated using the Percentage of Agreement (1996) formula.

Hypothesis one predicted that after completing an APRC training session, coders would be able to achieve interrater reliability at .80 or above when using the APRC instrument to assess the communication effectiveness of pediatric trauma teams and leaders. This hypothesis was partially supported. Pretest scores from the video resuscitation revealed a 64% interrater reliability score among the seven coders prior to APRC training. Following the training, the posttest video scores indicated a 36% increase in interrater reliability. The video posttest score showed a 100% agreement between the seven coders as all of the coders rated the competencies and behaviors on the positive side of the valence line. The coders also decreased the range of the total performance scores from video pretest to the video posttest. The pretest total performance scores revealed the team communication range as 67-93 and the leader communication range as 49-72. In contrast, the posttest showed a smaller range between the coders having a team communication range of 74-87 and a leader communication range of 53-64. These findings suggest that there was a greater degree of agreement after APRC training had been conducted.

Table 1: APRC Pretest Video

Assessment of Pediatric Resuscitation Communication (APRC-TA & APRC-LA) Team Assessment & Leader Assessment **PRETEST VIDEO**				
Team Competency	Number of Agreement*	Percentage of Agreement	Positive or Negative Valence	Effective TC or Ineffective TC
Team Dynamic	**7**/7	100%	Positive	Range: 67-93 >60 = 7 EFFECTIVE
Team Turn Taking	**7**/7	100%	Positive	
Team Space Negotiation	**7**/7	100%	Positive	
Noise Management	**6**/7	86%	Positive	
Team Support	**7**/7	100%	Positive	
Team Listening	**7**/7	100%	Positive	
Leader Competency	Number of Agreement*	Percentage of Agreement	Positive or Negative Valence	Effective LC or Ineffective LC
Preview	**4**/7	57%	Positive	Range: 49-72 >50 = 5 EFFECTIVE <50 = 1 INEFFECTIVE
Support	**5**/7	71%	Positive	
Delegation	**6**/7	86%	Positive	
Credibility	**7**/7	100%	Positive	
Trust Team Members	**7**/7	100%	Positive	
Interrater Reliability	**64%**			

*Bolded number represents the majority number of agreement

Table 2: APRC Posttest Video

Assessment of Pediatric Resuscitation Communication (APRC-TA & APRC-LA) Team Assessment & Leader Assessment **POSTTEST VIDEO**				
Team Competency	Number of Agreement*	Percentage of Agreement	Positive or Negative Valence	Effective TC or Ineffective TC
Team Dynamic	**7**/7	100%	Positive	Range: 74-87 >60 = 7 EFFECTIVE
Team Turn Taking	**7**/7	100%	Positive	
Team Space Negotiation	**7**/7	100%	Positive	
Noise Management	**7**/7	100%	Positive	
Team Support	**7**/7	100%	Positive	
Team Listening	**7**/7	100%	Positive	
Leader Competency	Number of Agreement*	Percentage of Agreement	Positive or Negative Valence	Effective LC or Ineffective LC
Preview	**7**/7	100%	Positive	Range: 53-64 >50 = 5 EFFECTIVE
Support	**7**/7	100%	Positive	
Delegation	**7**/7	100%	Positive	
Credibility	**7**/7	100%	Positive	
Trust Team Members	**7**/7	100%	Positive	
Interrater Reliability	**100%**			

*Bolded number represents the majority number of agreement

The live posttest revealed two different interrater reliability outcomes. Live resuscitation one found a 91% degree of agreement between the two coders. The coders differed on one global competency score. One coder rated Team Space negotiation on the negative side of the valence line, and the other coder rated it on the positive side of the valence line. However, both coders scored the trauma resuscitation as effective.

Live resuscitation two revealed unexpected results. Results from the percentage agreement calculation showed on 73% interrater reliability score. The coders differed on three global competency scores. In the APRC –TA the coders disagreed on the competency Team

Support. In the APRC –LA the coders disagreed on the Support and Trust Team members competencies. The 73% degree of agreement may be attributed to a leader change that occurred during the resuscitation. At the start of the activation, the resuscitation team was led by the ED physician on staff, however, a few minutes into the activation the ED physician was replaced by an ED surgeon. This impacted the coder's ability to score leader effectiveness as they unsure of which leader they should code.

Table 3: APRC Live Resuscitation One

Assessment of Pediatric Resuscitation Communication (APRC-TA & APRC-LA) Team Assessment & Leader Assessment **LIVE RESUSCITATION ONE**				
Team Competency	Number of Agreement*	Percentage of Agreement	Positive or Negative Valence	Effective TC or Ineffective TC
Team Dynamic	**2**/2	100%	Positive	Range: 66-77 >60 = 2 EFFECTIVE
Team Turn Taking	**2**/2	100%	Positive	
Team Space Negotiation	½	N/A	Did Not Agree	
Noise Management	**2**/2	100%	Positive	
Team Support	**2**/2	100%	Positive	
Team Listening	**2**/2	100%	Positive	
Leader Competency	Number of Agreement*	Percentage of Agreement	Positive or Negative Valence	Effective LC or Ineffective LC
Preview	**2**/2	100%	Positive	Range: 69-77 >50 = 2 EFFECTIVE
Support	**2**/2	100%	Positive	
Delegation	**2**/2	100%	Positive	
Credibility	**2**/2	100%	Positive	
Trust Team Members	**2**/2	100%	Positive	
Interrater Reliability	**91%**			

*Bolded number represents the majority number of agreement

Table 4: APRC Live Resuscitation Two

Assessment of Pediatric Resuscitation Communication (APRC-TA & APRC-LA) Team Assessment & Leader Assessment **LIVE RESUSCITATION #2**				
Team Competency	Number of Agreement*	Percentage of Agreement	Positive or Negative Valence	Effective TC or Ineffective TC
Team Dynamic	**2**/2	100%	Positive	Range: 55-62 >60 = 2 EFFECTIVE
Team Turn Taking	**2**/2	100%	Positive	
Team Space Negotiation	**2**/2	N/A	Positive	
Noise Management	**2**/2	100%	Positive	
Team Support	**½**	N/A	Did Not Agree	
Team Listening	**2**/2	100%	Positive	
Leader Competency	Number of Agreement*	Percentage of Agreement	Positive or Negative Valence	Effective LC or Ineffective LC
Preview	**2**/2	100%	Positive	Range: 51-60 >50 = 2 EFFECTIVE
Support	**½**	N/A	Did Not Agree	
Delegation	**2**/2	100%	Positive	
Credibility	**2**/2	100%	Positive	
Trust Team Members	**1**/2	N/A	Did Not Agree	
Interrater Reliability	**73%**			

*Bolded number represents the majority number of agreement

Research question one explored whether or not the APRC instrument should be considered a valid tool to use to assess the communication effectiveness of trauma team members and leaders during live pediatric trauma resuscitations. Results from the interrater reliability scores help to support the validation of this instrument. The drastic increase in interrater reliability scores from the pretest to the posttest suggests that the codebook and administration manual have been constructed in a meaningful way that makes assessing team and leader communication easy for coders from a range of disciplines. Also, the APRC training helped to ensure that coders fully understood the competency and sub-competency definitions, as

well as how to properly use the APRC instrument before assessing communication effectiveness. While establishing interrater reliability is just one piece of the overall validation process, it is a crucial component in determining the accuracy and consistency of multiple coder ratings. Though validation is not determined by interrater reliability alone, the findings suggest that there is a degree of agreement between the coders as intended. Therefore, the instrument can be considered valid when assessing interrater reliability.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

An assortment of implications was found through this study that help to further validate the APRC instrument. Each part of the study brought challenges that researchers used to change and improve the APRC instrument.

APRC Video Assessment

APRC Video Pretest

The pretest results showed an intercoder agreement of only 64%. The eight coders matched on eight of the eleven overall competencies except for "team noise management," "leader support" and "leader delegation." Six of the coders believed that the pediatric trauma resuscitation team displayed effective team communication, while one coder believed the team did not.

A great deal was learned through this pretest. First, noise can be perceived many different ways. It is important that coders give a global rating of "team noise management" instead of focusing on one outlet of noise. For example, if a patient is screaming or making a lot of noise, raters must remind themselves to pay attention to the overall team management of that noise, not the noise itself.

Second, researchers decided to change the "leader solicited questions" sub-competency in the "leader support" competency because the definition was somewhat subjective. Based on the

feedback provided by the coders, the researcher decided to change the behavior's title to "leader remained open." This better encompasses the idea that the leader remained approachable and open to questions, comments, or concerns.

Third, in our discussion following the pretest, the assessment team decided that when rating "leader delegation", coders must be aware of leader anticipatory cues and leader assignments. When evaluating the "leader delegation" competency, coders should assess whether the leader is using specific names when assigning tasks. For example, the leader should say "Jessica, put in a central line," instead of "Someone get me a central line." It is especially important in these stressful situations to be direct and descriptive when giving instructions.

Finally, the interrater reliability scores showed an interesting relationship between the coder's scores and the hospitals standards of effective and ineffective resuscitations. Coders rated the posttest video as effective trauma resuscitation, similar to the hospital's QIPI medical standards which also rated the video as effective. The pretest results showed that the coders rated the majority of the competencies on the positive valence side, which shows that the APRC communication effectiveness scores do in fact correlate with medical performance standards. Being that this was prior to any APRC training, it can be implied that the codebook is so detailed and understandable that we may not need to conduct an APRC training to rate communication effectiveness**.**

APRC Video Posttest

The posttest results showed a significant improvement in intercoder agreement from the pretest scores. The posttest calculation of percentage of agreement revealed an intercoder agreement of 100%, suggesting that the APRC training had a positive impact on the degree of

agreement between coders. Therefore, it can be implied that APRC assessment and training are reliable measures of communication effectiveness of pediatric trauma teams and leaders.

APRC Live Assessment

APRC Resuscitation One

To further validate the APRC instrument, coders tested for interrater reliability during live pediatric trauma resuscitations. Results from the percentage of agreement calculations found a 91% agreement between the two coders. Both coders rated the overall communication as effective for the live resuscitation. The coders agreed on all of the overall competency scores except for "team space negotiation." Specifically, the coders disagreed on the teams ability to get-in/get out when tending to the patient. When evaluating the "team space negotiation," coders should watch to see if teammates are appropriately yielding space during the resuscitation.

APRC Resuscitation Two

Results from the second live pediatric trauma resuscitation found differing results. The percentage of agreement calculation found only a 73% inters coder agreement. The two coders did not match on three overall competencies. First, the coders differed on "team support" scores. One coder believed the overall "team support" was ineffective while the other coder believed it was effective. Specifically, the coders differed when rating the behaviors "The team's ability to offer assistance to each other…" and "The team's ability to offer praise to each other…" Both behaviors were discussed after the resuscitation and some changes were made to the APRC codebook and administration manual. We also reinforced the idea that "team support" should be measured on a global level, not individually. Coders should ask themselves; did the team as a whole assist each other either verbally or nonverbally? It is important for coders to remember not to evaluate the entire team based on one or two people's mistakes.

Another behavior that researchers made changes to was the "The team's ability to offer praise to each other…" Changes were made because of perceptual difference of the word praise. We further defined what praise meant by adding the term "Thank you" into the behavior's definition. We originally didn't think that "thank you" was a form of praise; however, after much discussion we decided that it should be included as it can be a way to commend someone. Also, while there is not a lot of time for praise during emergency situations, we decided that minimal praise is needed to warrant a good rating of praise.

Second, the coders differed in their rating of the "leader support" competency and the Trust Team Members competency in the leader assessment. These differing results were to be expected as a change of leader occurred during the resuscitation. At the start of the resuscitation, the leader was an ED physician. Three minutes and thirty-seven seconds into the resuscitation a surgeon came in and relieved the ED physician of his/her leadership duties. This may have been problematic to the interrater reliability scores because the coders did not know how to rate the overall communication of the leaders as each displayed different communication and management styles.

Limitations

The first limitation of the study was that there was not a control group. While having a control group would be ideal, it is nearly impossible because of strict IRB regulations as well as hospital regulations from the hospital's steering committee. A control group would have been ideal for this study because the participants in the control group would not be subjected to the APRC training and their results could be compared to the results from the experimental group that received APRC training. It would be valuable to compare these two groups because the percentage of agreement scores would indicate whether or not APRC training is effective and if

it would increase the communication effectiveness. However, it was nearly impossible to use a control group because the study would have needed to involve 8-10 other participants in the assessment of activations, and the IRB and hospital administration would not allow us to do so. Rules and regulations stated that a variety of coders would not be allowed inside the trauma bay as it could pose a threat to the patients and healthcare providers. Therefore, the IRB and hospital administration would not approve a control group.

The second limitation was that the study only analyzed two live pediatric resuscitation videos and two live pediatric resuscitations. Therefore, the data assessed is relatively small. It would have been more beneficial to assess 5-10 pediatric resuscitations; however, due to hospital limitations and deadlines, this was not possible. Also, pediatric resuscitations occur on an average 2 times a week. Due to the infrequent nature of pediatric trauma resuscitation cases, it was difficult to obtain an ideal amount of cases with our given time period.

The third limitation was that the team and leader communication effectiveness range may not have been the most accurate way of measuring overall communication effectiveness (See Appendix A). The range may not be indicative of effectiveness because coders can match on the same valence side for almost all competencies, and still have a total performance score indicating differences in overall communication effectiveness. This can also be influenced by perceptual differences. Even though each participant is provided with an APRC administration manual and codebook that includes detailed descriptions of each competency and behavior, some people have a difficult time deciphering between what constitutes poor or fair ratings and good and excellent ratings. Some people may avoid using extreme scores in Likert-type questionnaires. For example, some people are more inclined to always give “good” ratings instead of “excellent” ratings. This can have a large effect on the total effectiveness score.

Recommendations for Future Research

Further research on team and leader communication during pediatric trauma resuscitations is important because it helps to identify and eliminate physician error. In the future, researchers should continue to validate the APRC instrument to ensure that it is an appropriate measure to assess team and leader communication. Evaluating 150 resuscitations would be helpful in fully determining if there is a correlation between communication effectiveness and medical performance. Also, evaluating these resuscitations will help to identify any other variables in the activation list that can affect communication effectiveness.

After the APRC has been fully validated, researchers should then begin developing the Communication Effectiveness training based on the most errors found within the data. Identifying the most common errors that the physicians commit will help structure and create the training towards trauma teams' needs. Also, researchers should conduct focus groups and interviews with professional trainers and trauma physicians to receive feedback on the training materials.

Once the training materials have been reviewed, the researchers should begin to implement the Communication Effectiveness training at any Southern Research Collaborative Institutes. Both team members and leaders will be trained in Communication Effectiveness. The purpose of this training is to ensure that trauma physicians understand the communication behaviors and competencies and are able to perform properly perform these skill during trauma resuscitations.

Prior to the Communication Effectiveness training, the researchers should give the team members and leaders a pretest to determine their baseline knowledge. The pretest will include having them assess the team and leader communication of the trauma physicians during a

pediatric activation. Following the pretest, the researchers should conduct the Communication Effectiveness training. Once the training is complete, trauma teams should take a posttest to measure if a change in scores occurred. The posttest will determine whether or not the communication effectiveness training influenced the team's behaviors.

Following the Communication Effectiveness training, researchers should re-assess the team and leader communication effectiveness and continue to collect data. The data will serve as greater validation as it can be compared to the 150 resuscitations evaluated prior to Communication Effectiveness training. This added data will confirm that the measurement developed was optimally suited for the research study (DeVellis, 1991). Also, an introduction of such trauma training could help to optimize trauma care, as communication scholars, researchers and healthcare provider can use the instrument to assess communication effectiveness.

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APPENDIX A

APPENDIX A

ASSESSMENT OF PEDIATRIC RESUSCITATION COMMUNICATION (APRC-TA) TEAM ASSESSMENT

						Total	Observation Notes
Team Dynamic		**Poor**	**Fair**	**Good**	**Excellent**		
	The team's emotional control was. . .	1	2	3	4		
	The team's ability to collaborate was. . .	1	2	3	4		
	The team's level of organization was. . .	1	2	3	4		
	The team's overall dynamic was. . .	1	2	3	4		
Team Turn Taking		**Poor**	**Fair**	**Good**	**Excellent**		
	The team's ability to let others speak without interruption was. .	1	2	3	4		
	The team's ability to use regulatory cues was. . .	1	2	3	4		
	The team's ability to not talk over each other was. . .	1	2	3	4		
	The team's overall turn taking ability	1	2	3	4		

	was. . .					
Team Space Negotiation		**Poor**	**Fair**	**Good**	**Excellent**	
	The team's ability to yield to each other was. . .	1	2	3	4	
	The team's ability to not hover over each other was. . .	1	2	3	4	
	The team's ability to get-in/get-out when tending to patient was.	1	2	3	4	
	The team's overall ability to negotiate space was. . .	1	2	3	4	
Noise Management		**Poor**	**Fair**	**Good**	**Excellent**	**Observation Notes**
	The team's ability to manage environmental noise was. . .	1	2	3	4	
	The team's ability to manage team member noise was. . .	1	2	3	4	
	The team's ability to manage interpersonal noise was. . .	1	2	3	4	
	The team's overall ability to manage	1	2	3	4	

	noise was. . .					
Team Support		**Poor**	**Fair**	**Good**	**Excellent**	
	The team's ability to offer assistance to each other was. . .	1	2	3	4	
	The team's ability to offer praise to each other was. . .	1	2	3	4	
	The team's ability to avoid defensiveness was. . .	1	2	3	4	
	The team's overall ability to support of each other was. . .	1	2	3	4	
Team Listening		**Poor**	**Fair**	**Good**	**Excellent**	
	The team's ability to pay attention to each other was. . .	1	2	3	4	
	The team's ability to understand each other was. . .	1	2	3	4	
	The team's ability to respond to each other was. . .	1	2	3	4	

	The team's overall ability to listen to each other was. . .	1	2		3	4		
Scoring	**Performance Factors**	**Total**						**Observation Notes**
	1. Team Dynamic							
	2. Team Turn Taking							
	3. Team Space Negotiation							
	4. Noise Management							
	5. Team Support							

	6. Team Listening		
	Team APRC Total		
	Scale Range = 24 – 96; Midpoint = 60 > 60 = Effective Team Communication < 60 = Ineffective Team Communication		

APPENDIX B

APPENDIX B

ASSESSMENT OF PEDIATRIC RESUSCITATION COMMUNICATION (APRC-LA)
LEADER ASSESSMENT

							Total	**Observation Notes**
Preview		**Poor**	**Fair**		**Good**	**Excellent**		
	The leader's ability to set expectations was. . .	1	2		3	4		
	The leader's ability to define roles was.	1	2		3	4		
	The leader's ability to implement a plan was. . .	1	2		3	4		
	The leader's overall ability to preview was. . .	1	2		3	4		
Support		**Poor**	**Fair**		**Good**	**Excellent**		
	The leader's ability to offer praise was. .	1	2		3	4		
	The leader's ability to solicit questions was. . .	1	2		3	4		
	The leader's ability to reduce defensiveness was. . .	1	2		3	4		Tr
	The leader's overall ability to support team	1	2		3	4		

	members was. . .						
Delegation		**Poor**	**Fair**		**Good**	**Excellent**	
	The leader's ability to offer anticipatory cues was. . .	1	2		3	4	
	The leader's ability to name tasks to be completed was. . .	1	2		3	4	
	The leader's ability to assign team members to specific task was. . .	1	2		3	4	
	The leader's overall ability to delegate was. . .	1	2		3	4	
Credibility		**Poor**	**Fair**		**Good**	**Excellent**	
	The leader's ability to act competently was. . .	1	2		3	4	
	The leader's ability to act confidently was. . .	1	2		3	4	
	The leader's ability to remain composed was. . .	1	2		3	4	
	The leader's overall credibility was. .	1	2		3	4	
Trust Team Members		**Poor**	**Fair**		**Good**	**Excellent**	**Observation Notes**
	The leader's ability to let go of control was. . .	1	2		3	4	

	The leader's ability to retain big picture was. . .	1	2	3	4	
	The leader's ability to accept feedback was. . .	1	2	3	4	
	The leader's overall ability to trust team members was. . .	1	2	3	4	
Scoring	**Performance Factors**	**Total**				
	1. Leader Preview					
	2. Leader Support					
	3. Leader Delegation					
	4. Leader Credibility					
	5. Leader Trust Team Members					
	Leader APRC Total					
	Scale Range = 20 –					

	80; Midpoint = 50 > 50 = Effective Leader Comm < 50 = Ineffective Leader Comm					

APPENDIX C

APPENDIX C

ASSESSMENT OF PEDIATRIC RESUSCITATION COMMUNICATION (APRC) CODEBOOK AND ADMINISTRATION MANUAL

Introduction

The Assessment of Pediatric Resuscitation Communication (APRC) is an instrument designed to assess the communication effectiveness of healthcare providers during a pediatric trauma resuscitation. Specifically, the instrument assesses the communication effectiveness of both the leader and the team members. The instrument was developed to ensure that pediatric healthcare providers receive proper instruction and develop competency in effective team and leader communication.

Competencies were developed for both trauma team members and leaders. These competencies are in turn assessed using a 4 point scale. Team competencies include team dynamics, team turn taking, team space negotiation, noise management, team support, and team listening. Leader competencies include preview, support, delegation, credibility, and trust of team members. Within each competency, four communication behaviors are measured resulting in one score for each competency. For the team, six competencies are examined that include 24 communication behaviors. The total score can range from 24-96 with a midpoint of 84. Scores above 84 indicate effective team communication. For the leader, five competences are examined which in turn includes 20 communication behaviors. The total score can range from 20-80 with a midpoint of 50. Scores above 50 indicate effective leader communication.

The instrument was developed by three communication researchers based on current communication literature that was adapted to this specific context. Contextual information was obtained from focus group participants, in-depth interviews, and videos of actual pediatric trauma resuscitations.

Instructions for APRC Coders:

Before using the Assessment of Pediatric Resuscitation Communication (APRC) instrument coders must first read the codebook, key terms, and coder notes to become familiar with the different competencies and communication behaviors included in the APRC instrument. Once these materials are reviewed coders can assess the communication effectiveness of trauma team members and leaders using the APRC instrument either by viewing a live or a recorded pediatric trauma resuscitation.

Key Terms:

APRC = Assessment of Pediatric Resuscitation Communication

Competencies = There are 6 team competencies and 5 leader competencies included in the APRC. Each competency is an umbrella term or construct that represents the first three communication behaviors included under each competency name.

Global Assessment = The fourth communication behavior under each team and leader competency.

Communication Behaviors = The first three subcategories included under each team and leader competency.

Descriptor = Excellent, Good, Fair, Poor

Rating = 1, 2, 3, 4

Total APRC Team Score = sum of all 6 team competency ratings

Total APRC Leader Score = sum of all 5 leader competency ratings

Effective Team Communication Score = 84 or higher

Effective Leader Communication Score = 50 or higher

Verbal communication = written or spoken language that creates meaning for someone (Beebe, Beebe, & Ivy, 2008)

Nonverbal communication = communication other than written or spoken language that creates meaning for someone such as a person's use of posture, movement, gestures, eye contact, space, or vocal tone (Beebe, Beebe, & Ivy, 2008)

Coder Notes:

- Do not restrict coding to examples given in codebook. Other instances or examples may occur that are not specified in the codebook descriptions.
- Competencies are in no particular order.
- The APRC can be completed during or after viewing a live or videotaped pediatric trauma resuscitation.
- Feel free to take notes on the APRC while watching the pediatric trauma resuscitation.

How to Use the APRC:

1. Review the codebook and key terms to make sure you understand the communication behaviors and competencies.
2. Make sure a trauma activation number is assigned to the assessment form.
3. Indicate what type of leader is being assessed trauma surgeon or emergency medicine physician.
4. Indicate if family is present.
5. When assigning a rating for the first three communication behaviors under each competency establish a valence. Ask yourself is the communication behavior negative (i.e., poor or fair) or positive (i.e., good or excellent)?
6. After you have decided on a valence for the first three communication behaviors under each competency circle the rating under the descriptor that best reflects the performed communication behavior.
7. In order to circle a rating for the fourth communication behavior under each competency you must make a global assessment of each competency. To do this ask yourself overall how did the team or leader perform the competency? [1]
8. After assigning a rating for all communication behaviors and global assessments add your scores. You should have one team communication effectiveness score and one leader communication effectiveness score. Write the score in the blank at the bottom of each assessment form and indicate if the score reflects effective or ineffective team and leader communication.

APRC Ratings:

Excellent = Team members or Leaders exceeded expectations

Good = Team members or Leaders met expectations

Fair = Team members or Leaders somewhat met expectations

Poor = Team members or Leaders did not meet expectations

Intercoder Agreement:

To properly assess team member and leader communication effectiveness during pediatric trauma resuscitations coders must be completely separated when using the APRC.

Coders must come together and check intercoder agreement after every five APRC assessments have been independently completed. Intercoder agreement is calculated by obtaining the number of agreements (Na) divided by the number of agreements (Na) and disagreements (Nd), all

multiplied by 100 as follows: [Na ÷ (Na +Nd)] × 100. Coders must obtain a minimum of 80% agreement during each intercoder agreement check.

If coders fail to reach the appropriate percentage of agreement they should go back and reread the codebook, key terms, and coder notes in order to clarify the points of disagreement.

CODEBOOK

Competency 1	**TEAM DYNAMIC** Refers to the team's ability to manage the emotional, relational, and organizational climate in the ED. Team members are able to remain emotionally controlled, foster a collaborative approach, and retain an organized structure throughout the trauma resuscitation.
	Team Emotional Control Team members used verbal messages that were normal in tone, volume, and rate for the ED. Their nonverbal messages were not overly exaggerated, extreme, abrupt, or clipped. Team members did not appear to be behaving in a nervous, uneasy, apprehensive, or fearful manner, nor were they acting aggravated, annoyed, or upset.
	Team Collaboration Team members were responsive and cooperative with each other. They maintained fluidity and cohesiveness.
	Team Organization Team members performed their roles with ease. There was little hesitation as to who was to perform a certain task. When team members needed a particular person to complete a task, they used the person's name and stated the task to be completed. For example, a team member may have said Jessica put a central line in instead of someone get me a central line.
Competency 2	**TEAM TURN TAKING** Refers to the team's ability to take turns making requests and providing patient descriptions by refraining from interruptions or talking over one another and attempting to use regulatory cues.
	Team Members Refrained from Interruption Team members refrained from cutting others off in mid-sentence. Instead, they used verbal or nonverbal messages to indicate to other team members they needed to speak when important requests or patient descriptions needed to be communicated.
	Team Members Used Regulatory Cues Team members used nonverbal behaviors to control the flow of requests and patient descriptions given during the resuscitation. They used eye contact, posture, gestures, facial expressions, and body position that indicated when team members should make requests, provide patient descriptions, or listen to others.

	Team Members Refrained from Talking Over Each Other Team members refrained from beginning another important request or patient description while another team member was communicating a request or patient description.
Competency 3	**TEAM SPACE NEGOTIATION** Refers to the team's ability to share the limited space around the bedside of the patient by negotiating when they should move in and do their job and when they should yield to their teammates in order to avoid unnecessary hovering or crowding.
	Team Members Yielded to Each Other Team members were willing to step back from the bed to give their colleagues sufficient space to move in and assist the patient.
	Team Members Refrained from Hovering Team members refrained from crowding their colleagues or violating personal space needs when assisting the patient.
	Team Members Got in/Got out Team members assumed their position by the patient in order to complete their task and then stepped aside without lingering.
Competency 4	**NOISE MANAGEMENT** Refers to the presence of messages or sounds that may interfere with communication between team members.
	Team Management of Environmental Noise Team members managed noise made from machines used to assist the patient (i.e. beeping, ringing, suctioning, etc.) so that it did not interfere with the team's ability to communicate with one another.
	Team Management of Team Noise Team members refrained from side conversations or discussions both around the bedside of the patient and in the background that could interfere with team communication during the resuscitation. All communication between members was task oriented.

	Team Management of Interpersonal Noise Team members managed any patient noise (i.e. screaming, crying, thrashing, seizing, etc.) and family member communication (i.e. soothing the patient, asking questions, making requests, etc.) so that it did not interfere with the team's ability to communicate with one another.
Competency 5	**TEAM SUPPORT** Refers to the amount and quality of support, assistance and encouragement given by a team member to others. It also refers to how members react to one another when suggestions and comments are made or tasks are executed.
	Team Members Offered Assistance Team members communicated their willingness to help or assist others either verbally or nonverbally. For example, team members asked what can I do to help or volunteered to help with the execution of a particular task.
	Team Members Offered Praise Team members offered positive feedback and praised each other when a team member provided an idea or executed a task. Team members verbally or nonverbally offered recognition for a job well done by patting a colleague on the back, smiling and nodding, or simply saying well done, nice job, thank you, or great work.
	Team Members Avoided Defensiveness Team members refrained from exhibiting defensive behaviors such as verbal attacks or rolling of the eyes when tasks were executed or requests were made.

Competency 6	**TEAM LISTENING** Refers to the amount and quality of listening that takes place among team members. Listening takes place when directions, suggestions or comments are made.
	Team Members Paid Attention to Each Other Team members exhibited attentiveness when listening to another member. Attentiveness is acknowledging and not ignoring the comments of others. Attention can be exhibited through verbal and non-verbal manifestations such as through words or nodding of the head.
	Team Members Understood Each Other

	Refers to the level of understanding to the messages provided by team members. Team members exhibited understanding by carrying out instructions, repeating comments for clarification or requesting additional clarification.
	Team Members Responded to Each Other Refers to whether team members responded to and/or acknowledged the messages provided by other team members. Acknowledgement can be provided in words or through nonverbal manifestations such as nodding the head, etc.
Competency 1	**PREVIEW** This competency deals with leadership effectiveness prior to the arrival of the patient and the administration of the resuscitation. Leader meets with team and discusses patient condition and provides a course of action.
	Leader Set Expectations Leader provided information on the case prior to the patient's arrival and reviewed the condition of the patient and what team members were expected to do on arrival.
	Leader Defined Roles Prior to patient's arrival, leader explained the course of action needed to be taken and provided clear instructions on who is to do what.
	Leader Implemented A Plan Prior to patient's arrival, leader outlined and/or discussed a course of action or process to be taken with patient.
Competency 2	**SUPPORT** Leader provides a positive emotional climate for team members by offering praise, soliciting questions, and reducing defensiveness.
	Leader Offered Praise Leader offered positive verbal feedback to team members (i.e., good job, nice work, way to go, etc.) or positive nonverbal feedback (i.e., smiling and eye contact, patting on the back, head nods, etc.) in recognition of a job well done.

	Leader Remained Open Leader remained approachable. He/she seemed open to questions or feedback and/or checked in with team members either nonverbally (i.e. hand on back, eye contact, or gestures) or verbally (i.e. you ok or how are you doing).
	Leader Reduced Defensiveness Leader provided constructive criticism and feedback that was helpful for team members using a calm voice and refrained from personal attacks. Actions and decisions were criticized but team members were not. The leader did not utter profanities or lose his/her temper when providing team members with criticism or feedback.
Competency 3	**DELEGATION** Refers to the leader's ability to recognize what tasks need to be completed and clearly articulate who should complete which task by using both verbal and nonverbal messages.
	Leader Offered Anticipatory Cues The leader used verbal cues (i.e., first, second, next, etc.) or nonverbal cues (i.e., gestures, touch, eye contact, etc.) to prompt team members to complete particular tasks during the resuscitation.
	Leader Named Tasks to be Completed The leader provided specific directions by naming and/or describing the task that needed to be completed.
	Leader Assigned Team Members To Specific Tasks The leader asked a specific team member to complete a specific task. For example, the leader may have said Jessica put a central line in instead of someone get me a central line.
Competency 4	**CREDIBILITY** Refers to the leader's ability to appear competent, confident, and composed throughout the resuscitation even when important tasks are not completed or team members become anxious or frustrated.
	Leader Competency The leader appeared to be effective. He/she commanded a positive and helpful presence and engaged

	team members in a controlled manner.
	Leader Confidence The leader refrained from communicating uncertainty by asking questions about resuscitation procedures or using nonverbal such as eye contact, facial expressions, posture, or gestures that communicate hesitation, doubt, and indecision.
	Leader Composure The leader was emotionally controlled. His/her verbal messages were normal in tone, volume, and rate for the ED. His/her nonverbal messages were not overly exaggerated, extreme, abrupt, or clipped. He/she did not repeat questions and/or directions using an aggravated or frustrated tone.
Competency 5	**TRUST TEAM MEMBERS** Refers to leader's ability to relinquish control and appear open and approachable.
	Leader Let Go Of Control The leader allowed team members to do their job without verbal interference (i.e., do it this way, why are you doing it that way, you are doing it wrong, etc.) or nonverbal interference (i.e., reaching in doing a team members job, slapping a team members hand away, taking control of a task, etc.)
	Leader Retained Big Picture Leader physically positioned himself/herself in order to have a clear visual of the entire trauma team and electronic monitors. Leader also physically distanced himself/herself from the patient and minimized touch to the patient.
	Leader Accepted Feedback Leader remained open to constructive criticism or feedback and fostered a collaborative team approach by asking for help, advice, or opinions.

BIOGRAPHICAL SKETCH

Alyssa Terese Cerroni earned a Master of Arts in Communication with a concentration in Instructional Communication from the University of Texas-Pan American in May 2011. She also received a Bachelors of Arts in Communication from the State University of New York at Cortland in May 2009. During her time as a graduate student, she worked as a Graduate Teaching Assistant in the Department of Communication where she taught Introduction to Communication and Presentational Speaking. Cerroni resides in Mission, Texas.