

(Hanson, Rochelle, F.)

Project Description

Project Summary. The objectives of this proposal are to further develop an ID/IP team that will work collaboratively to address a critical gap in research and quality of healthcare for children experiencing abuse and trauma-related behavioral health problems. Using the Four-Phase Model of Transdisciplinary (TD) Team Science¹ (Figure 1), this proposal will identify key factors at the patient and pediatric primary care provider levels that influence identification, behavioral health referral and follow-up for patients experiencing abuse and/or trauma-related problems (*Developmental phase*); finalize the proposed methods for conducting the research study (*Conceptualization phase*); conduct a feasibility trial with 50 pediatric residents to implement and test a brief provider training vs. provider training+implementation support package (*Implementation phase*); and examine preliminary effectiveness data, as measured by number of patients screened for trauma history, number referred for trauma-focused behavioral health treatment services, and provider follow-up activities (*Translation phase*). All funded activities will support iterative refinement of the conceptual framework and research design for future extramurally funded studies in this line (*Conceptualization phase*). Throughout the grant period, we will examine process and quantitative productivity indicators measuring the ID/IP team collaboration, including numbers of conference presentations submitted, manuscripts developed, and number/frequency and content of team meetings.

Rationale for Team Science ID/IP Team's Composition. While extensive research indicates high trauma exposure rates among children and adolescents, with a heightened risk for adverse physical and behavioral health outcomes, many of these youth are not identified, which means they are not likely to receive evidence-based trauma-focused behavioral health interventions. Since primary care providers are often a family's only contact with a health care professional, they offer the opportunity to bridge this gap between physical and behavioral health services. To foster research and integrated behavioral health and primary care, this proposal aims to develop an ID/IP collaborative partnership between researchers and clinical providers from multiple disciplines who have expertise in several unique and complementary areas. These include: implementation science and traumatic stress research; clinical expertise in trauma-focused evidence-based behavioral health interventions; child abuse, primary care service provision and reimbursement patterns; and resident training. This ID/IP team bridges two departments and four divisions within the College of Medicine at the Medical University of SC, which will promote a collaborative forum for research on key barriers and facilitators to increase reach of evidence-based interventions for trauma-exposed children and adolescents and thereby improve quality of care for this population. The proposal also permits the exploration of the effectiveness of a team science approach to further the proposed research agenda and planned program of ongoing research.

Plan to evaluate project's outcome. As a feasibility study, one objective is to collect preliminary data, at the provider and patient levels, to evaluate a training curriculum designed to target knowledge, attitudes and practice among pediatric primary care providers related to the identification and referral for children adversely impacted by maltreatment and/or other potentially traumatic events. Provider level variables will include recruitment to participate in the training, active participation in training and implementation activities, and within subject pre-post intervention changes in knowledge (via self-report), attitudes (via self-report) and practice. Indicators of practice change, also collected pre-post intervention, will include numbers of screens, referrals, and follow-ups. Interviews with providers at the end of the intervention phase will elicit feedback about the training and any ongoing barriers to screening and referral activities. Benchmarks include at least 80% recruitment of providers, 100% participation in initial training, 80% participation in implementation support activities, 25% increase in trauma screening, at least one referral and one follow-up contact for behavioral health interventions, and high provider satisfaction with training. Pre-post EMR review will examine patient level variables (e.g., demographics, diagnoses) and documentation related to trauma and abuse screening, referral for specialty care and follow-up activities. Measures to assess the ID/IP productivity and collaboration include: numbers of conference presentations submitted, manuscripts developed, and number/frequency of team meetings.

Function of team science ID/IP. The ID/IP team proposes to work collaboratively to identify barriers and facilitators to trauma screening, referral and follow-up in primary care and test the feasibility and preliminary effectiveness of a brief provider-directed intervention. A primary aim is to collect these data to support a R01 application to further this line of research. Thus, the team will work to review extant research and develop an evidence-based training and implementation curriculum, which will undergo preliminary testing in this feasibility trial. The ID/IP team is critical to success of this work because of the importance of leveraging the expertise of behavioral health and primary care specialists and traumatic stress/implementation science researchers to address a critical research and practice gap. In addition to reviewing relevant research and developing an evidence-based intervention program, the ID/IP team will be finalize all outcome measures, oversee the EMR review, conduct data analyses and program evaluation, and work collaboratively to publish and disseminate study findings, to support a subsequent grant application and further this important line of research.

PROJECT DESCRIPTION (one page limit)**A. Summary**

The effective and safe navigation of an inpatient through a trauma episode requires teamwork and coordination of multiple professions, facilities and information distributed across a hospital⁹. The unpredictable, time-pressured, team based and resource-dependent nature of trauma care provides multiple opportunities for disruptions, inefficiencies, and errors arising not from technical incompetence but from the complexity and challenges of the team-working environment^{1,2}. Challenges include (i) assembling the care team, preparing for patient arrival and ensuring appropriate shared goals (ii) communicating and coordinating across diverse departments, personnel, and hospital locations (iii) accessing specialist expertise and distributing patient information in a timely manner. Ill-preparedness leads to misperceptions, poor decision making, errors, and delays that can lead to substantial reductions in the quality of care^{3,4}. This effect is multiplied by simultaneous traumas, and with higher acuity patients^{5,6}. Trauma care is thus cognitively and physically challenging for the individuals and teams that participate. Providing the right information at the right time could greatly improve quality of trauma care⁷, as well as in more frequently encountered care contexts⁸.

B. Rationale for the team science ID/IP team's composition

The high tempo, physical, cognitive, team and organizational demands of trauma care makes it experimentally sensitive to the re-configuration of information provision at the right time and the right place for improved teamwork. We propose a model of care where the management and distribution of key patient information leads to better teamwork through better shared understanding within the trauma team^{9,10}. It also provides better coordination across hospital locations and specialist services. This leads to improved contextual decision-making, reduced disruptions, and time, safety and efficiency benefits within the 'golden hour' of trauma care. We provide integrated expertise in trauma care, anesthetics, human factors, perioperative quality, information technology development and implementation, trauma care, teamwork, process and outcome measurement, quality improvement science, statistics and experimental design necessary to deliver this project.

C. Plan for evaluation of project outcome

This will be an interrupted time-series (before / after) design, first observing 20 traumas without the smartapp technology, and subsequently observing 20 traumas with the technology. The main outcome measures are flow disruption rates^{1,11,12}, treatment times (total time in ED, time-to-CT, time-in-CT), and teamwork scores¹³. These will all be collected through direct observation, complimented with video. Flow disruptions (FD) are defined as "deviations from the natural progression of an operation thereby potentially compromising the efficiency or safety of care"^{14,15} and describe process problems that arise from mismatches between operational demands and the configuration of the system-of-work (protocols, checklist, procedures, equipment etc). Teamwork will be scored on the T-NOTECHS^{13,16} behavioral marker scale.

D. Function of the team science ID/IP team

The PI is a trauma surgeon with a growing research portfolio and research interests. She will work closely with an early career research anesthesiologist with an interest in human factors, safety, quality and teamwork. The data collection will be conducted by a research nurse with experience in clinical observation and video data collection. The team will be supported by an experienced biostatistician, and from a human factors, teamwork, and scientific perspective by a SmartState funded research professor with appointments in the College of Nursing, Department of Anesthesia, and the Patient Safety team. The technology will be supplied by an experienced healthcare app solutions provider. They will all report to the Trauma Medical Director and head of perioperative quality at MUSC.